

## Reserva da República Popular da China

“No que se refere ao artigo 10.º, a República Popular da China não reconhecerá como válido um pedido dirigido pela Potência detentora dos prisioneiros de guerra a um Estado neutro ou a uma organização humanitária, para assumir as funções que competem a uma Potência protectora, a menos que tenha sido obtida a concordância do governo do Estado de que os prisioneiros de guerra são nacionais. No que se refere ao artigo 12.º, a República Popular da China considera que a Potência detentora de origem que tenha transferido prisioneiros de guerra para outra Potência Contratante não fica por esse motivo isenta da sua responsabilidade pela aplicação da Convenção durante o tempo em que os prisioneiros de guerra estiverem sob a custódia da Potência que aceitou recebê-los. No que se refere ao artigo 85.º, a República Popular da China não se encontra vinculada pelo artigo 85.º quanto ao tratamento dos prisioneiros de guerra condenados nos termos da legislação da Potência detentora em conformidade com os princípios estabelecidos nos julgamentos de crimes guerra ou de crimes contra a humanidade pelos Tribunais Militares Internacionais de Nuremberga e de Tóquio.”

### 第 118/2015 號行政長官公告

中華人民共和國於一九九九年十二月十三日以照會通知聯合國秘書長，經修訂的《1974年國際海上人命安全公約》自一九九九年十二月二十日起適用於澳門特別行政區；

國際海事組織海上安全委員會於二零零四年十二月十日透過第MSC.176(79)號決議通過了《國際散裝運輸危險化學品船舶構造和設備規則》(IBC規則)2004年修正案，該修正案自二零零七年七月一日起適用於澳門特別行政區；

基於此，行政長官根據第3/1999號法律《法規的公佈與格式》第六條第一款的規定，命令公佈包含上指修正案的MSC.176(79)號決議的中文及英文文本。

二零一五年八月六日發佈。

行政長官 崔世安

### Aviso do Chefe do Executivo n.º 118/2015

Considerando que a República Popular da China, por nota datada de 13 de Dezembro de 1999, notificou o Secretário-Geral das Nações Unidas sobre a aplicação da Convenção Internacional para a Salvaguarda da Vida Humana no Mar de 1974, tal como emendada, na Região Administrativa Especial de Macau a partir de 20 de Dezembro de 1999;

Considerando igualmente que, em 10 de Dezembro de 2004, o Comité de Segurança Marítima da Organização Marítima Internacional, através da resolução MSC.176(79), adoptou emendas de 2004 ao Código Internacional para a Construção e Equipamento de Navios que Transportam Substâncias Químicas Perigosas a Granel (Código IBC), e que tais emendas são aplicáveis na Região Administrativa Especial de Macau desde 1 de Julho de 2007;

O Chefe do Executivo manda publicar, nos termos do n.º 1 do artigo 6.º da Lei n.º 3/1999 (Publicação e formulário dos diplomas), a resolução MSC.176(79), que contém as referidas emendas, nos seus textos em línguas chinesa e inglesa.

Promulgado em 6 de Agosto de 2015.

O Chefe do Executivo, *Chui Sai On*.

## 第 MSC.176 (79) 號決議

(2004 年 12 月 10 日通過)

### 《國際散裝運輸危險化學品船舶構造和設備規則》

#### (IBC 規則) 2004 年修正案

海上安全委員會，

憶及《國際海事組織公約》關於本委員會職能的第 28 (b) 條，

注意到海安會第 MSC.4 (48) 號決議，委員會以該決議通過了《國際散裝運輸危險化學品船舶構造和設備規則》(以下簡稱“IBC 規則”)，根據《1974 年國際海上人命安全 (SOLAS) 公約》(以下簡稱“公約”) 第 VII 章，該規則已具有強制性，

還注意到公約關於 IBC 規則修正程序的第 VIII (b) 條和第 VII/8.1 條，

希望保持對 IBC 規則的更新，

在其第七十九屆會議上審議了根據公約第 VIII (b) (i) 條建議並散發的 IBC 規則修正案，

考慮到，因 IBC 規則在《經 1978 年議定書修訂的〈1973 年國際防止船舶造成污染公約〉》(73/78 防污公約) 和 1974 年 SOLAS 公約下均具有強制性，使其保持一致很有必要，

1. 根據公約第 VIII (b) (iv) 條，通過了 IBC 規則的修正案，正文列於本決議之附件；



2. 決定，根據公約第 VIII (b) (vi) (2) (bb) 條，上述修正案將於 2006 年 7 月 1 日視為已被接受，除非在該日期以前，有超過三分之一的締約國政府或者合計商船總噸位佔世界商船總噸位不少於 50% 的締約國政府通知其反對修正案；
3. 提請公約締約國政府注意，根據公約第 VIII (b) (vii) (2) 條，修正案在根據上文第 2 段被接受後，將於 2007 年 1 月 1 日生效；
4. 要求秘書長根據公約第 VIII (b) (v) 條，將本決議及其所附修正案正文的核證無誤副本發送公約的所有締約國政府；
5. 還要求秘書長將本決議及其附件的副本送所有非公約締約國政府的本組織成員。

## 附件

### 《國際散裝運輸危險化學品船舶構造和設備規則》

#### (《國際散化規則》) 2004 年修正案

《國際散化規則》的全文由以下內容取代：

#### “前言

- 1 本規則的目的是為海上安全運輸本規則第 17 章所列的散裝危險化學品和有毒液體物質提供一個國際的標準。本規則考慮到所涉及產品的性質，規定了從事此種運輸的船舶（不論噸位大小）及其船上所應裝配設備的設計和建造標準，以便使船舶、船員和環境所受到的風險減至最小。
- 2 本規則的基本理念是按船舶運載本規則所列貨品的危險程度為每艘化學品船規定一種船型。每一貨品可具有一種或多種危險特性，包括易燃性、毒性、腐蝕性和反應性，以及可能對環境造成的危害。

3 在制訂本規則的整個過程中，人們認識到規則必須以完善的造船學和工程學原理，以及對本規則所列的各種貨品的危險性有徹底了解作為牢固基礎。並進一步認識到，化學品船的設計技術不僅是一門複雜的技術，而且還在飛速發展，因此，本規則也不應靜止不變。因此，本組織要考慮到經驗和技術的發展，定期對本規則進行複審。

4 涉及新產品及其運載條件要求的本規則修正案，一經本組織海上安全委員會（MSC）和海洋環境委員會（MEPC）分別根據《1974 年國際海上人命安全公約》（《74 年安全公約》）第八條和《經 1978 年議定書修訂的〈1973 年國際防止船舶造成污染公約〉》（《73/78 防污公約》）第十六條的規定通過，在其生效前，將暫時作為建議案散發。

5 本規則主要涉及船舶的設計和設備。但為了確保這些貨品的安全運輸，必須對整個系統做出評估。這些貨品安全運輸的其他重要方面，如培訓、操作、交通管制和港口裝卸等事項，本組織正在或將會作進一步研究。

6 本規則的制訂得到了許多具有諮詢地位的組織，如國際船級社協會（IACS）和國際電工委員會（IEC）的大力協助。

7 本規則涉及化學品船操作要求的第十六章強調了在其他章節中屬操作性的條款，並提到了化學品船安全操作特有的其他重要方面。

8 本規則的編排與海上安全委員會第 48 屆會議通過的《國際散裝運輸液化氣體船舶構造和設備規則》（IGC 規則）是一致的，如 IGC 規則所規定，氣體運輸船也可以散裝運輸本規則所覆蓋的液體化學品。

9 本規則 1998 年版以海安會第 MSC.4 (48) 號決議通過的最初的文本為基礎。為了回應 1973 年國際防止海洋污染大會第 15 號決議，環保會在其第 22 屆會議上以第 MEPC.19 (22) 號決議通過了將 IBC 規則擴大到包括實施《73/78 防污公約》附則 II 的防止海洋污染方面。

10 本規則的這一版本包括了由下列決議通過的各項修正案：

	決議	通過日期	默認接受日期	生效日期
1	MSC.10 (54)	1987 年 4 月 29 日	1988 年 4 月 29 日	1988 年 10 月 30 日
2	MSC.14 (57)	1989 年 4 月 11 日	1990 年 4 月 12 日	1990 年 10 月 13 日
	MEPC.32 (27)	1989 年 3 月 17 日	1990 年 4 月 12 日	1990 年 10 月 13 日
3	MSC.28 (61)	1992 年 12 月 11 日	1994 年 1 月 1 日	1994 年 7 月 1 日
	MEPC.55 (33)	1992 年 10 月 30 日	1994 年 1 月 1 日	1994 年 7 月 1 日
4	MSC.50 (66)	1996 年 6 月 4 日	1998 年 1 月 1 日	1998 年 7 月 1 日
	MEPC.69 (38)	1996 年 7 月 10 日	1998 年 1 月 1 日	1998 年 7 月 1 日
5	MSC.58 (67)	1996 年 12 月 5 日	1998 年 1 月 1 日	1998 年 7 月 1 日
	MEPC.73 (39)	1997 年 3 月 10 日	1998 年 1 月 10 日	1998 年 7 月 10 日
6	MSC.102 (73)	2000 年 12 月 5 日	2002 年 1 月 1 日	2002 年 7 月 1 日
7	MSC.176 (79)	2004 年 12 月 9 日	2006 年 7 月 1 日	2007 年 1 月 1 日
	MEPC.119 (52)	2004 年 10 月 15 日	2006 年 7 月 1 日	2007 年 1 月 1 日

11 從《74 年安全公約》1983 年修正案生效之日（即 1986 年 7 月 1 日）和《73/78 防污公約》附則 II 實施之日（即 1987 年 4 月 6 日）起，本規則成為上述公約下的強制性要求。因此，本規則的修正案，無論是從安全角度還是從海洋污染角度，都必須分別根據《74 年安全公約》第八條和《73/78 防污公約》第十六條規定的程序通過和生效。

## 第一章

### 總則

#### 1.1 適用範圍

1.1.1 本規則適用於從事運輸散裝危險化學品或有毒液體物質（NLS）的船舶，不論尺寸大小，包括小於 500 總噸的船舶，但不包括載運石油或下列類似的易燃貨品的船舶：

- .1 具有重大火災危險性的貨品，其危險程度超過石油產品和類似的易燃產品；
- .2 除易燃性外具有其他重大危險性，或無易燃性但具有其他重大危險性的貨品。

1.1.2 對於經過審查並確定其安全和污染危害程度未達到需實施本規則的貨品，見第十八章。

1.1.3 本規則所包括的液體是指那些在溫度為 37.8°C 時，其蒸氣壓力不超過 0.28MPa（絕對壓力）的液體。

1.1.4 就《1974 年 SOLAS 公約》而言，本規則適用於從事運輸基於其安全特性被列入本規則第十七章，且在“d 欄”中被標識為 S 或 S/P 的貨品的船舶。

1.1.5 就《73/78 MARPOL 公約》而言，本規則僅適用於附則 II 第 1.16.2 條定義的從事在第十七章“c 欄”中被標識為 X、Y 和 Z 的有毒液體物質運輸的 NLS 液貨船。

1.1.6 對於建議散裝運輸但未列入本規則第十七章或第十八章的貨品，主管機關以及與此運輸有關的港口當局應針對散裝化學品危險性

的評定指標，對適當的運載條件作出初步規定。在評估此類貨品的污染危害和確定其污染類別時，必須遵循《73/78 MARPOL 公約》附則 II 第 6.3 條中規定的程序。將貨品列入本規則時的所考慮的條件應通知本組織。

1.1.7 除非另有明文規定，本規則適用於 1986 年 7 月 1 日或以後安放龍骨或處於如下階段的船舶：

- .1 可識別船舶建造開始；和
- .2 對該船已開始裝配了至少 50 噸或所有結構材料估算重量的 1%，取其小者。

1.1.8 無論船舶為何時建造，如在 1986 年 7 月 1 日或以後被改建成化學品船，應被視為在改建開始之日建造的化學品船。此改建規定不適用於《73/78 防污公約》附則 II 第 1.14 條所述的船舶改裝。

1.1.9 凡引用本規則某一條款時，該條款下的所有分項的規定均應適用。

## 1.2 危害性

本規則所涉及的貨品的危害性包括：

1.2.1 火災危險性，由化學品的閃點、爆炸/可燃性極限/範圍和自燃溫度所確定。

1.2.2 健康危害性，由下述情況所確定：

- .1 在液體狀態下，對皮膚的腐蝕作用；或



.2 劇毒性作用，要考慮到以下數值：

LD<sub>50</sub> (口服)：口服時，接受試驗的對象的致死率為 50% 的劑量；

LD<sub>50</sub> (皮膚)：作用於皮膚時，接受試驗的對象的致死率為 50% 的劑量；

LD<sub>50</sub> (吸入)：吸入時，接受試驗的對象的致死率為 50% 的濃度；或

.3 其他諸如致癌及過敏的健康影響。

1.2.3 反應危險性，由與下列物質的反應所確定：

.1 水；

.2 空氣；

.3 其他化學品；或

.4 化學品本身（如，聚合作用）。

1.2.4 海洋污染危害性，由下述情況所確定：

.1 生物積聚；

.2 缺乏生物易降解性；

.3 對水生物有劇毒性作用；

.4 對水生物有慢性毒性作用；

.5 對人類健康的長期影響；及

- .6 引起貨物漂浮或下沉從而對海洋生物有負面影響的物理特性。

### 1.3 定義

除非另有明文規定，本規則適用的定義如下（附加定義列於各個章節中）：

1.3.1 *起居處所*係指用作公共處所、走廊、盥洗室、居住室、辦公室、醫務室、電影院、娛樂室、理髮室、無炊具的配膳室以及類似處所的處所。*公共處所*係指用作大廳、餐室、休息室的那部分起居處所及類似的永久性圍蔽處所。

1.3.2 *主管機關*係指船舶有權懸掛其旗幟的國家政府。*主管機關*（港口）見港口當局。

1.3.3 *周年日*係指相應於《國際散裝運輸危險化學品適裝證書》有效期截止日期的每年的月和日。

1.3.4 *沸點*係指貨品呈現蒸氣壓力等於大氣壓力時的溫度。

1.3.5 *船寬*（B）係指船舶最大寬度，對於金屬船體，在船中部量至肋骨型線；對於用其他材料建造的船體，在船中部量至船體外表面。船寬（B）以 m 計。

1.3.6 *貨物區域*係指船上含有液貨艙、污液艙、包括泵艙在內的貨泵艙、隔離艙、鄰接液貨艙的壓載艙或留空處所的部分，以及在上述處所上方整個長度和寬度內的甲板區域。如果貨艙處所內設有獨立艙，則最後一個貨艙處所後面或最前一個貨艙處所前面的隔離艙、壓載艙或留空處所不應被作為貨物區域。

1.3.7 *貨泵艙*係指裝有供裝卸本規則所列貨品用的泵及其屬具的處所。

1.3.8 *貨物服務處所*係指貨物區域內用作工作間、物料間，以及用於貯存貨物裝卸設備的面積 2m<sup>2</sup>以上的儲物間的處所。

1.3.9 *液貨艙*係指用於裝運貨物的容器。

1.3.10 *化學品船*係指建造或改建成用於散裝運輸第十七章所列的任何液體貨品的貨船。

1.3.11 *隔離艙*係指兩個相鄰鋼質艙壁或甲板之間的隔離處所。該處所可以是空艙或壓載艙。

1.3.12 *控制站*係指設有船舶無線電台、主要航行設備或應急電源的處所，或火災記錄器或失火控制設備集中的處所。但不包括通常設置在貨物區域內的專用火災控制設備。

1.3.13 *危險化學品*係指基於本規則第十七章的貨品安全標準規定的會構成安全危害的液體化學品。

1.3.14 *密度*係指某一貨品的質量與其體積之比值，以千克每立方米為單位。本定義適用於液體、氣體及蒸汽。

1.3.15 *爆炸（可燃）性極限（範圍）*係指在給定的試驗裝置中，對燃料—氧化劑混合物施以一個足夠強的外部着火源，使其剛好能產生燃燒的條件。

1.3.16 *閃點*係指某一貨品釋放出足以被點燃的易燃蒸氣的攝氏溫度。本規則給出的數值基於用認可的閃點裝置測定的“閉杯試驗”的數值。

1.3.17 貨艙處所係指由船舶結構圍蔽的內部設有獨立液貨艙的處所。

1.3.18 獨立係指例如一個管系或透氣系統，不以任何方式與另一系統連接，也沒有任何設施能與其他系統進行潛在的連接。

1.3.19 船長 ( $L$ ) 係指從龍骨上緣量至最小型深的 85% 處的水線上總長的 96%，或在該水線處從首柱前緣量至舵杆中心線的長度，取其較大者。對設計成傾斜龍骨的船舶，量取長度的水線應與設計水線平行。船長 ( $L$ ) 應以米計。

1.3.20 A 類機器處所係指內含下列設施的處所以及通往這些處所的圍蔽通道：

- .1 用於主推進的內燃機；或
- .2 用於除主推進以外的其他用途，且合計輸出總功率不小於 375kW 的內燃機；或
- .3 任何燃油鍋爐或燃油裝置或鍋爐以外的任何燃油設備，如惰性氣體發生器，焚燒爐等。

1.3.21 機器處所係指所有 A 類處所和裝有推進機械、鍋爐、燃油裝置、蒸汽機和內燃機、發電機和主要電力機械、加油站、製冷機、減搖、通風和空調機等所有其他處所和類似處所，以及通往這些處所的圍蔽通道。

1.3.22 《MARPOL 公約》係指經修訂的《經 1978 年議定書修訂的〈1973 年國際防止船舶造成污染公約〉》。

1.3.23 有毒液體物質係指在《國際散化規則》第十七或十八章的污染類別欄中或在現行的環保會通函 MEPC.2/Circular 中標出，或臨時根據《MARPOL 公約》附則 II 第 6.3 條的規定評估為 X、Y 或 Z 類的物質。

1.3.24 燃油裝置係指用於準備燃油向燃油鍋爐輸送的設備，或者用於準備加熱燃油向內燃機輸送的設備，並包括在錶壓超過 0.18MPa 的壓力下處理油類的任何油壓泵、過濾器 and 加熱器。

1.3.25 本組織係指國際海事組織（IMO）。

1.3.26 處所的滲透率係指在某一處所內假定被水浸佔的容積與該處所總容積之比。

1.3.27 港口當局係指船舶裝卸的港口所在國的有關當局。

1.3.28 貨品係指有毒液體物質及危險化學品的總稱。

1.3.29 泵艙係指位於貨物區域內，內設用於裝卸壓載水和燃油的泵及其輔助設備的處所。

1.3.30 認可標準係指主管機關所接受的適用的國際或國內標準，或符合本組織通過的標準並為主管機關所認可的由某一組織規定和維護的標準。

1.3.31 參考溫度係指貨物蒸汽壓力相當於減壓閥設定壓力時的溫度。

1.3.32 隔離係指，例如，一貨物管系或貨物透氣系統不與另一貨物管系或貨物透氣系統相連接。



1.3.33 服務處所係指用作廚房、備有炊具的配膳室、物料間、郵件室和貴重物品室、儲藏室、不是機器處所組成部分的工作間的處所和類似處所，以及通往這些處所的圍蔽通道。

1.3.34 《SOLAS 公約》係指經修訂的《1974 年國際海上人命安全公約》。

1.3.35 蒸氣壓力係指在特定溫度下在某液體上面的飽和蒸氣的平衡壓力，以帕斯卡（帕）計。

1.3.36 留空處所係指貨物區域內的液貨艙外部的封閉處所，但不包括貨艙處所、壓載艙、燃油艙、貨泵艙、泵艙或通常由人員使用的任何處所。

#### 1.4 等效

1.4.1 凡本規則要求船上應裝設或配備的專門裝置、材料、器具、儀器、設備項目，或其型式，或應設置的任何專門設施，或應符合的任何程序或佈置，主管機關可准許該船上裝設或配備任何其他裝置、材料、器具、儀器、設備項目，或其型式，或設置任何其他設施、程序或佈置，只要其通過試驗或其他方法，確定這些裝置、材料、器具、儀器、設備項目，或其型式，其他的專門設施、程序或佈置其至少與本規則所要求者具有同等效能。然而，除本規則另有規定者外，主管機關不能允許用操作方法或程序代替本規則規定的專門裝置、材料、器具、儀器、設備項目或其型號。

1.4.2 如果主管機關准許以任何裝置、材料、器具、儀器、設備的部件、或其型式，或設施、程序或佈置進行替代，應將其細節連同驗證報告送交本組織，以便本組織能將這些信息通告給《SOLAS 公約》的其他締約國政府和《MARPOL 公約》的當事國，供其官員知曉。

## 1.5 檢驗與發證

### 1.5.1 檢驗程序

1.5.1.1 有關本規則各項規定的執行和准予免除執行的船舶檢驗，應由主管機關的官員進行。但是，主管機關可將這些檢驗委託給為此目的指定的驗船師或其認可的組織進行；

1.5.1.2 《MARPOL 公約》附則 II 第 8.2.1 條中提及的認可組織，應符合可能由本組織修訂的本組織以 A.739 (18) 號大會決議通過的導則和可能由本組織修訂的本組織以 A.789 (19) 號大會決議通過的規範。但此類修正案應根據《MARPOL 公約》第 16 條和《SOLAS 公約》關於適用於本規則修正程序的第 VIII 條通過、生效和實施。

1.5.1.3 主管機關指定驗船師或認可組織開展檢驗，至少應向指定的驗船師或認可的組織授予以下權力：

- .1 要求船舶進行修理；和
- .2 應港口國有關當局的要求進行檢驗。

主管機關應將被指定的驗船師或其認可的組織的具體責任以及對他們授權的條件通知本組織，以便通告各締約國政府。

1.5.1.4 當被指定的驗船師或被認可的組織判定，船舶或其設備的狀況與《國際散裝運輸危險化學品適裝證書》的內容在實質上不相符，或其狀況會對船舶或船上人員產生危險，或對海洋環境會造成不當危害的威脅，因而船舶不適用於出海航行時，該驗船師或組織應立即確保採取糾正措施並及時通知主管機關。如果未採取此種糾正措施，則應撤銷證書並立即通知主管機關。如船舶位於另一締約國政府的港口，

則應立即通知該港口國的有關當局。在主管機關的官員、被指定的驗船師或被認可的組織通知了該港口國的有關當局之後，有關的港口國政府應向該官員、驗船師或組織提供任何必要的幫助，以便他們履行本段中規定的義務。如果適用，有關的港口國政府應採取措施，保證不讓該船航行，直至該船可以出海航行或離港駛往最近的合適修船廠而不會危及船舶或船上人員的安全並且不會構成破壞海洋環境的不當威脅時為止；

1.5.1.5 在任何情況下，主管機關均應保證檢驗的完整性和有效性，並保證為履行這一職責作出必要的安排。

#### 1.5.2 檢驗要求

1.5.2.1 化學品船的結構、設備、裝置、佈置和材料（不包括簽發《貨船構造安全證書》、《貨船設備安全證書》和《貨船無線電安全證書》或《貨船安全證書》的有關項目）應接受下列檢驗：

- .1 初次檢驗，應在船舶投入營運前或在第一次簽發《國際散裝運輸危險化學品適裝證書》前進行。就本規則涵蓋的船舶而言，此項檢驗應包括對結構、設備、裝置、佈置和材料的全面檢查。本檢驗應確保船舶的結構、設備、裝置、佈置和材料完全符合本規則中適用的規定。
- .2 換證檢驗，其間隔期應由主管機關確定，但不得超過 5 年，適用第 1.5.6.2.2 段、第 1.5.6.5 段、第 1.5.6.6 段或第 1.5.6.7 段的情況除外。換證檢驗應確保結構、設備、裝置、佈置和材料完全符合本規則中適用的規定。

- .3 期間檢驗，應在證書的第 2 個周年日之前或之後 3 個月內，或在證書的第 3 個周年日之前或之後 3 個月內進行，並應取代第 1.5.2.1.4 段規定的一次年度檢驗。期間檢驗應確保安全設備和其他設備及其有關的泵和管系完全符合本規則中適用的規定並處於良好的工作狀態。此種期間檢驗應簽註在根據第 1.5.4 段或第 1.5.5 段簽發的證書上。
- .4 年度檢驗，應在證書的每一周年日之前或之後 3 個月內進行，包括對第 1.5.2.1.1 段中所述的結構、設備、裝置、佈置和材料的總體檢查，確保其已按第 1.5.3 段的要求得以維護並能滿足船舶預定的用途。此種年度檢驗應簽註在根據第 1.5.4 段或第 1.5.5 段簽發的證書上。
- .5 附加檢驗，視情況可為總體或局部檢驗，應在第 1.5.3.3 段規定的調查後有要求時進行，或在進行過任何重大修理或更新後進行。此種檢驗應確保必要的修理或更新得以有效進行，該修理或更新所用的材料和技術工藝符合要求，船舶適於出海航行而不會危及船舶或船上人員的安全並且不會構成破壞海洋環境的不當威脅。

### 1.5.3 保持檢驗後的狀態

1.5.3.1 應保持船舶及其設備符合本規則規定的狀態，確保船舶一直適於出海航行而不會危及船舶或船上人員的安全並且不會構成破壞海洋環境的不當威脅；



1.5.3.2 在根據第 1.5.2 段對船舶進行的任一檢驗完成之後，非經主管機關批准，不得對檢驗範圍內的結構、設備、裝置、佈置和材料做任何改變，但直接更換者除外；

1.5.3.3 一旦船舶發生事故或者被發現有缺陷，無論其影響到船舶的安全還是影響到本規則所包括的船舶救生設備或其他設備的有效性和完整性，船舶的船長或船東應儘早向負責簽發有關證書的主管機關、被指定的驗船師或被認可的組織報告，該主管機關、驗船師或組織則應安排對這些情況進行調查，以確定是否有必要進行第 1.5.2.1.5 段所要求的檢驗。如果船舶位於另一締約國政府的某一港口，船長或船東還應立即向該港口國的有關當局報告，被指定的驗船師或被認可的組織應確認是否已經做出了此種報告。

#### 1.5.4 《國際適裝證書》的簽發或簽註

1.5.4.1 在經過初次檢驗或換證檢驗後，應向符合本規則有關規定的從事國際航行的化學品船舶頒發一份《國際散裝運輸危險化學品適裝證書》。

1.5.4.2 該證書應按附錄中給出的格式進行製作，如果所使用的文字不是英文、法文或西班牙文，則其文本應包括其中一種文字的譯文。

1.5.4.3 按本節規定簽發的證書應存放於船上，隨時供檢查。

#### 1.5.5 由另一國政府簽發或簽註《國際適裝證書》

1.5.5.1 既是《1974 年 SOLAS 公約》締約國政府又是《73/78 MARPOL 公約》當事國的政府，應另一此種政府的請求，可安排實施對有權懸掛該另一國旗幟的船舶進行檢驗，並且如確認該船符合本規則的規定，可向該船簽發或授權簽發《國際散裝運輸危險化學品適裝證書》，



如果合適，根據本規則的規定簽註或授權簽註船上的證書。這樣簽發的任何證書上應註明該證書係應船旗國政府的請求予以簽發的。

#### 1.5.6 《國際適裝證書》的期限和有效期

1.5.6.1 應根據主管機關規定的期限簽發《國際散裝運輸危險化學品適裝證書》，該期限不應超過 5 年。

1.5.6.2.1 儘管有第 1.5.6.1 段的規定，當換證檢驗係在現有證書到期之日前 3 個月內完成時，則新證書的有效期應從完成換證檢驗之日起至不超過現有證書到期後 5 年的某日止；

1.5.6.2.2 如果換證檢驗係在現有證書到期之日後完成，則新證書的有效期應從完成換證檢驗之日起至不超過現有證書到期後 5 年的某日止；

1.5.6.2.3 如果換證檢驗係在現有證書到期之日前 3 個月以外完成，則新證書的有效期應從完成換證檢驗之日起至換證檢驗完成後不超過 5 年的某日止。

1.5.6.3 如果所簽發證書的有效期短於 5 年，只要按第 1.5.2.1.3 段和第 1.5.2.1.4 段的規定實施了簽發 5 年期限證書所適用的各種檢驗，主管機關可將該證書的有效期延長至第 1.5.6.1 段所規定的最長期限。

1.5.6.4 如果換證檢驗已經完成，但新證書在現有證書到期之日前不能簽發或不能被放到船上，則經主管機關授權的人員或組織可在現有證書上簽註。這樣的證書可繼續有效一段時間，但從該證書到期之日起不得超過 5 個月。

1.5.6.5 如果船舶在證書到期時不在其將接受檢驗的某個港口，主管機關可以延長該證書的有效期，但此種延期只在為使船舶完成其開往接受檢驗港口的航行時才准許，並且只有在認為適當和合理時才可以這樣做。

1.5.6.6 發給從事短途航行船舶的證書，如果沒有根據上述規定被延期，主管機關可給予延期，但該寬限期從該證書到期之日起最多為 1 個月。在完成換證檢驗後，新證書的有效期應從現有證書在未被延期前的到期日起不超過 5 年。

1.5.6.7 在特殊情況下，由主管機關確定，新證書的日期不必從第 1.5.6.2.2 段、第 1.5.6.5 段或第 1.5.6.6 段所要求的現有證書到期日起算。在這些特殊情況下，新證書的有效期應從完成換證檢驗之日起不超過 5 年。

1.5.6.8 如果年度檢驗或期間檢驗係在第 1.5.2 段規定的期限之前完成，則：

- .1 應通過簽註將證書上標明的周年日改為不晚於檢驗完成之日後 3 個月內的某一日期；
- .2 第 1.5.2 段要求的後續年度檢驗或期間檢驗應使用新的周年日按該節規定的間隔期完成；以及
- .3 如進行了一次或多次年度檢驗或期間檢驗（如適當），因而沒有超過第 1.5.2 段所規定的最長檢驗間隔期，則有效期可保持不變。

1.5.6.9 根據第 1.5.4 段或第 1.5.5 段簽發的證書，在下列任一情況下應不再有效：

- .1 如果在第 1.5.2 段規定的期限內未完成有關檢驗；
- .2 如果未按本章第 1.5.2.1.3 段或第 1.5.2.1.4 段簽註證書；
- .3 在船舶變更船旗國時。簽發新證書的政府只有在對船舶符合第 1.5.3.1 段和第 1.5.3.2 段要求方面完全滿意時才應簽發新證書。如果船旗的變更是在兩個既為《1974 年 SOLAS 公約》締約國政府又為《73/78 MARPOL 公約》當事國的政府之間進行，若在變更船旗後 3 個月內船舶的新船旗國提出要求，則船舶以前有權懸掛其旗幟的國家政府應儘快將該船在變更船旗前所攜帶證書的副本以及有關的檢驗報告（如有時）送交新船旗國的主管機關。

## 第二章

### 船舶殘存能力和液貨艙位置

#### 2.1 一般要求

2.1.1 受本規則約束的船舶，應能承受假定船體受到某些外力的破損之後正常浸水的影響。此外，為了保護船舶和環境，對某些類型船舶的液貨艙應加以保護，防止船舶碰到諸如碼頭或拖船時而產生較小破損所引起的穿透，並通過把液貨艙佈置在舷內距船體外板有規定的最小距離之處，提供防止船舶碰撞或觸礁而引起破損的保護性措施。假定的破損以及液貨艙與船體外板之間的距離，均取決於所裝貨品的危險程度。

2.1.2 受本規則約束的船舶應按照下列標準之一進行設計：

- .1 1 型船舶為用於裝運第十七章所列的對環境或安全有極其嚴重危害的貨品的化學品船，要求採用最高防範措施防止此類貨物的溢漏；
- .2 2 型船舶為用於裝運第十七章所列的對環境或安全有較嚴重危害的貨品的化學品船，要求採用重要防範措施防止此類貨物的溢漏；
- .3 3 型船舶為用於裝運第十七章所列的對環境或安全有足夠嚴重危害的貨品的化學品船，要求採用中等程度的圍控，以增加其在破損條件下的殘存能力。

因此，1 型船舶為用於裝運具有最大總體危險性貨品的化學品船，2 型和 3 型船舶是用於裝運危險性第次減少的貨品的化學品船。所以，1 型船舶應能經受得住最高的破損標準，其液貨艙應位於規定的舷內距外板最大距離之處。

2.1.3 各種貨品所要求的船型，列於第十七章表格的“e 欄”中。

2.1.4 對於擬裝運一種以上第十七章所列貨品的船舶，其破損標準應對應於對船型要求最嚴格的該種貨品。但對於各個液貨艙位置的要求應為擬裝運的相關貨品各自對液貨艙位置的要求。

## 2.2 乾舷和完整穩性

2.2.1 受本規則約束的船舶，可以按現行的《國際船舶載重線公約》勘定最小乾舷。但是，與乾舷相應的吃水應不大於本規則其他部分所允許的最大吃水。

2.2.2 船舶在所有航行條件下的穩性，應達到主管機關所接受的標準。

2.2.3 在計算裝載狀態下消耗液體的自由液面影響時，應對每種類型的液體至少假定一對橫向液艙或一個中間液艙存在自由液面，所考慮的某個液艙或組合液艙，應是自由液面影響最大的艙。在計算未破損艙室的自由液面影響時，應使用主管機關接受的方法。

2.2.4 在貨物區域的雙層底處所一般不應使用固體壓載。但是，如果出於對穩性的考慮，將這種處所用於固體壓載不可避免時，其佈置應根據需要進行調整，確保因底部破損引起的衝擊載荷不會直接被傳遞到液貨艙結構上。

2.2.5 應向船長提供一本《裝載和穩性資料手冊》。該手冊應包括典型服務和壓載狀態的細節、用於估算其他裝載狀態的規定和船舶殘存能力的總結等。此外，該手冊應包含足夠資料，使船長能用安全和適航的方式裝載貨物和操縱船舶。

### 2.3 乾舷甲板以下的舷側排放

2.3.1 為從乾舷甲板以下處所或從乾舷甲板上設有風雨密門的上層建築及甲板室內通過舷側外板進行排放而裝設的閘門的設置與控制應滿足現行的《國際船舶載重線公約》的有關要求，但對閘門的選擇應限於：

- .1 設一個能從乾舷甲板上方操縱的有強制關閉裝置的自動止回閘；或
- .2 如果夏季載重水線至排放管舷內端的垂直距離超過 0.01L，設置兩個無強制關閉裝置的自動止回閘，除非舷內閘在工作狀態下，始終能夠接近檢查。



2.3.2 就本章而言，“夏季載重線”和“乾舷甲板”與現行的《國際船舶載重線公約》所規定的意義相同。

2.3.3 第 2.3.1.1 段和第 2.3.1.2 段中提及的自動止回閥應能完全有效地防止海水進入船內，要考慮到第 2.9 段殘存要求中的下沉、縱傾和橫傾，並且應符合認可的標準。

## 2.4 裝載狀態

應根據提交給主管機關的裝載資料，針對所有預期的裝載狀態以及吃水和縱傾方面的變化，研究破損殘存能力。如果該化學品船不載運本規則所涉及的貨品，或僅載運此類貨品的殘餘物，則可不必考慮其壓載狀態。

## 2.5 破損假定

2.5.1 假定的最大破損範圍應為：

.1	舷側破損：		
.1.1	縱向範圍：	$1/3L^{2/3}$ 或 14.5m，取小者	
.1.2	橫向範圍：	B/5 或 11.5m，取小者 (從舷側垂直於夏季載重線高度上的中心線在舷內量得)	
.1.3	垂向範圍：	向上沒有限制 (從中心線處船底殼板型線量起)	
.2	船底破損：	從距船舶首垂線起 0.3L	船舶的任何其他部位
.2.1	縱向範圍：	$1/3L^{2/3}$ 或 14.5m，取小者	$1/3L^{2/3}$ 或 5m，取小者
.2.2	橫向範圍：	B/6 或 10m，取小者	B/6 或 5m，取小者
.2.3	垂向範圍：	B/15 或 6m，取小者 〔從中心線處船底殼板型線量起 (見本章 2.6.2)〕	B/15 或 6m，取小者 〔從中心線處船底殼板型線量起 (見本章 2.6.2)〕

2.5.2 如果範圍小於第 2.5.1 段中規定的最大破損值的任何破損導致船舶出現更嚴峻的狀態，則此類破損應予以考慮。

## 2.6 液貨艙的位置

2.6.1 應將液貨艙設在舷內的下述位置：

- .1 1 型船舶：從舷側外板起，不小於第 2.5.1.1.2 段規定的橫向破損範圍，從中心線處船底殼板型線起，不小於第 2.5.1.2.3 段規定的垂向破損範圍，但任何部位距船體外板都不應小於 760mm。此要求不適用於作為稀釋洗艙污水的液艙；
- .2 2 型船舶：從中心線處船底殼板型線起，不小於第 2.5.1.2.3 段規定的垂向破損範圍，但任何部位距船體外板都不應小於 760mm。此要求不適用於作為稀釋洗艙污水的液艙；
- .3 3 型船舶：無要求。

2.6.2 除 1 型船舶外，安裝在液貨艙中的吸水井可突入到第 2.5.1.2.3 段規定的船底垂向破損範圍內，但此類吸水井應儘可能小，在內底板以下的突出部分應不超過雙層底高度的 25% 或 350mm，取小者。若無雙層底，船底破損上限以下的獨立液貨艙吸水井的突出部分應不超過 350mm。在確定受破損影響的艙室時按本段設置的吸水井可以被忽略不計。

## 2.7 浸水假定

2.7.1 應通過計算證實本章第 2.9 的要求，在計算中應考慮到船舶

的設計特性，破損艙室的佈置、形狀和所裝載的貨品，液體的分佈、相對密度和自由液面的影響，以及所有裝載狀態下的吃水和縱傾。

2.7.2 假定受破損處所的滲透率如下：

處所	滲透率
物料貯存處所	0.60
起居處所	0.95
機器處所	0.85
留空處所	0.95
用於裝消耗液體的處所	0 至 0.95*
用於裝其他液體的處所	0 至 0.95*

2.7.3 如果破損穿透裝有液體的液貨艙，應假定其所裝載的液體從該艙完全流失，並用水位到達最終平衡面的海水代替。

2.7.4 對於第 2.5.1 段定義的最大破損範圍內的每一水密分隔，如果認為第 2.8.1 段所述位置已經遭受破損，應假定為該分隔被穿透。如果根據第 2.5.2 段的規定破損被認為小於最大範圍，則應假定只有較小破損範圍內的水密分隔或一組水密分隔被穿透。

2.7.5 船舶的設計應通過有效的佈置使不對稱浸水減至最小。

2.7.6 需要使用諸如閘門或橫通調平管之類的機械輔助設備的平衡裝置，如果安裝，不應認為該裝置會減小橫傾角或會達到最小剩餘穩性範圍從而滿足第 2.9 段的要求；如果使用了平衡裝置，在所有階段均應保持足夠的剩餘穩性。對於使用大截面管道連接的處所，可被認為是互通處所。

\* 部分充裝的液體的滲透率應與該艙所載運的液體量相一致。

2.7.7 如果管子、導管、圍壁通道或隧道位於第 2.5 段規定的假定破損穿透範圍之內，則其佈置應為在每一種破損情況下，連續浸水不會擴展到那些被假定浸水的液艙之外的艙。

2.7.8 直接位於舷側破損上方的任何上層建築的浮力，應不予考慮。然而，破損範圍之外的上層建築未浸水部分，可予考慮。條件是：

- .1 用水密分隔將它們與破損處所隔開，且這些完整處所應滿足第 2.9.3 段的要求；和
- .2 對這些分隔內的開口，能用遙控的滑動水密門關閉，第 2.9 段所要求的最小剩餘穩性範圍內的未被保護的開口未被浸沒。但是，能水密關閉的任何其他開口可允許被浸沒。

## 2.8 破損標準

2.8.1 船舶應能在第 2.7 段所述的假定浸水情況下，經受住第 2.5 段所述的破損。該能力根據船型依下列標準決定：

- .1 對於 1 型船舶，應被假定為經受住其船長範圍內的任何部位的破損；
- .2 對於船長超過 150m 的 2 型船舶，應被假定為經受住其船長範圍內的任何部位的破損；
- .3 對於船長為 150m 或以下的 2 型船舶，應被假定為經受住其船長範圍內的任何部位的破損，但不包括船艙機器處所邊界的任一艙壁；

- .4 對於船長超過 225m 的 3 型船舶，應被假定為經受住其船長範圍內的任何部位的破損；
- .5 對於船長為 125m 或以上但不超過 225m 的 3 型船舶，應被假定為經受住其船長範圍內的任何部位的破損，但不包括船艙機艙邊界的任一艙壁；
- .6 對於船長小於 125m 的 3 型船舶，應被假定為經受住其船長範圍內的任何部位的破損，但不包括船艙機器處所的破損。但是，主管機關應考慮機器處所浸水後的船舶殘存能力。

2.8.2 對於不能在所有方面都滿足第 2.8.1.3 段和第 2.8.1.6 段要求的 2 型和 3 型小船，只有在能夠採取達到同樣的安全程度的替代措施時，主管機關才可以考慮給予特別免除。替代措施的性質應經過認可並應清楚地加以說明，隨時備港口國當局檢查。任何此類免除均應在第 1.5.4 段所述的《國際適裝證書》上適當註明。

## 2.9 殘存要求

2.9.1 受本規則約束的船舶應能在穩定平衡的狀態下，按第 2.8 段規定的破損標準經受住第 2.5 段所述的假定破損，並應滿足下列衡準。

2.9.2 在浸水的任何階段：

- .1 考慮到下沉、橫傾和縱傾的情況，水線應低於任何開口的下緣，連續浸水或向下浸水可能通過這些開口發生。此類開口中應包括空氣管和以風雨密門或艙口蓋作為關閉裝置的開口，但可不包括那些用水密人孔蓋和與甲板平齊的小艙口蓋、能保持甲板高度完整性的小型水密液



貨艙艙口蓋、遙控水密滑動門和非開啓式舷窗作為關閉裝置的開口；

- .2 不對稱浸水引起的最大橫傾角不應超過  $25^{\circ}$ ，但如果不出現甲板被浸沒的情況，則可將此角度增加到  $30^{\circ}$ ；
- .3 浸水中間階段的剩餘穩性應達到主管機關滿意的標準，但決不應顯著低於第 2.9.3 段的要求。

#### 2.9.3 在浸水後的最終平衡狀態：

- .1 復原力臂曲線在平衡位置以外應有一個  $20^{\circ}$  的最小範圍，且在  $20^{\circ}$  範圍內的最大剩餘復原力臂至少為 0.1m；在此範圍內，該曲線下的面積應不小於 0.0175 米·弧度。在上述橫傾範圍內，未被保護的開口不應被浸沒，除非有關處所被假定為浸水。在此範圍內，第 2.9.2.1 段所列的任何開口和能被風雨密關閉的其他開口均可允許被浸沒；
- .2 應急電源應能夠工作。

### 第三章

#### 船舶佈置

##### 3.1 貨物分隔

3.1.1 除非另有規定，應該用隔離艙、留空處所、貨泵艙、泵艙、空液艙、燃油艙或其他類似處所將裝有本規則所適用的貨物或貨物的殘餘物的液貨艙與起居處所、服務處所、機器處所、飲用水艙和生活用品儲藏室分隔開。

3.1.2 貨物管系不應通過任何起居處所、服務處所或除貨泵艙或泵艙之外的機器處所。

3.1.3 與其他貨物、殘餘物或混合物起危險反應的貨物、貨物的殘餘物或含有貨物的混合物，應：

- .1 用隔離艙、留空處所、貨泵艙、泵艙、空液艙或裝有相容貨物的液貨艙與此類其他貨物分隔開；
- .2 具有獨立的泵系和管系，不通過含有此類貨物的其他液貨艙，除非它們被圍閉在隧道之內；並
- .3 具有獨立的液貨艙透氣系統。

3.1.4 如果要將貨物管系或貨物通風系統分隔開，可使用設計或操作方法達到這樣的分隔。操作方法不應在液貨艙內使用，它們應包括下列形式之一：

- .1 拆卸短管或閘門及封住管路末端；
- .2 佈置兩個串聯盲通法蘭，帶有檢測泄漏物進入兩個盲通發蘭之間管道的裝置。

3.1.5 受本規則約束的貨物不應裝運在首尖艙和尾尖艙內。

### **3.2 起居、服務和機器處所以及控制站**

3.2.1 不得將起居處所或服務處所或控制站設置在貨物區域內，但在符合《SOLAS 公約》第 II-2/4.5.1 至 4.5.2.4 條的貨泵艙或泵艙的凹進部分之上者除外；不應將液貨艙或污水艙設置在任何起居處所的前端之後。

3.2.2 為了防止危害性蒸氣的侵襲，應充分考慮到通往起居處所、服務處所和機器處所以及控制站的空氣進口和開口的位置與貨物管系和貨物透氣系統有關。

3.2.3 起居處所、服務處所、機器處所和控制站的入口、空氣進口和開口不應面向貨物區域。應將它們設置在不面向貨物區域的端壁處和（或）距上層建築或甲板室面向貨物區域的端壁至少為船長（L）的 4%，但不少於 3m 的上層建築或甲板室的外側。但該距離不必超過 5m。在上述範圍內不得設有門，但在不通往起居處所、服務處所或控制站等處所（如貨物控制站和儲藏室）可以設門。如果設有這種門，該處所邊界的絕熱應達到“A-60”標準。為了移動機器，可在上述範圍內裝設由螺栓固定的平板門。只要在設計上能確保對駕駛室的門和窗進行快速和有效的氣密和蒸氣密關閉，則這些門和窗可位於上述範圍之內。面向貨物區域和在上層建築及甲板室兩側上述範圍內的窗和舷窗應當為固定型（非開啓式）。在主甲板上的第 1 層此種舷窗上應裝有鋼質或等效材料的內蓋。

### 3.3 貨泵艙

3.3.1 貨泵艙的佈置應確保：

- .1 在任何時候都能從任一扶梯平臺或從艙底板不受限制地通過；和
- .2 讓佩戴個人保護設備的人員能不受限制地接近貨物裝卸所需的所有閥門。

3.3.2 應設有能用救生索提升受傷人員的永久性裝置，並避免受到任何凸出物的阻礙。

3.3.3 在所有扶梯和平台上都應設有欄杆。

3.3.4 正常出入泵艙的扶梯不應垂直設置，而且應在適當間隔處設置平台。

3.3.5 在貨泵艙內應裝有能處理貨泵艙內的貨泵和閘門的排泄物或任何可能的泄漏物的設施。供貨泵艙用的艙底管系應能從貨泵艙外進行操作。應設有一個或幾個污液艙，用以儲存艙底污水或洗艙水。還應配備帶有標準對接的通岸接頭或其他設備，以便把污液輸送至岸上的接收設施。

3.3.6 應將泵的排放壓力錶裝在貨泵艙之外。

3.3.7 如果機器由穿過艙壁或甲板的軸驅動，應在艙壁或甲板處安裝高效潤滑的氣密裝置或能確保其氣密性能的其他設施。

#### **3.4 進入貨物區域內處所的通道**

3.4.1 進入貨物區域內的隔離艙、壓載艙、液貨艙和其他處所的通道應直接通到開敞甲板，並應能確保對上述艙室進行全面檢查。進入雙層底處所的通道可以通過貨泵艙、泵艙、深隔離艙、管隧或類似艙室，但必須對其通風方面予以考慮。

3.4.2 對於以水平的開口、艙口或人孔作為出入口者，其尺寸應能足以讓佩戴自給式呼吸器及保護設備的人員上下任何扶梯而無阻礙，同時還應設置一個無障礙的開口，以便從該處所底部提升受傷人員，該開口的最小尺寸不得小於 600 mm×600 mm。

3.4.3 對於以垂向開口或人孔作為出入口縱向和橫向通過處所者，其最小淨開口不得小於 600 mm × 800 mm，且離船底板的高度不超過 600 mm，除非設有格柵或其他腳蹬。

3.4.4 如果通過此類開口或搬移受傷人員的能力能使主管機關滿意，在特殊情況下，主管機關也可批准較小尺寸的開口。

### 3.5 艙底及壓載佈置

3.5.1 為永久壓載艙服務的泵、壓載管路、透氣管路和類似設備應獨立於服務液貨艙的類似設備和液貨艙本身。應將鄰接液貨艙的永久壓載艙排放裝置設置在機器處所和起居處所的外面。可將充裝設備位於機器處所內，但此類設備應能確保從液貨艙的甲板平面充注並應設置止回閥。

3.5.2 對液貨艙進行壓載充裝時，可以使用服務於永久壓載艙的泵在甲板平面上進行，但注入管路與液貨艙或液貨艙管路不應有永久連接，且在注入管路上應裝有止回閥。

3.5.3 貨泵艙、泵艙、留空處所、污液艙、雙層底和類似處所的艙底水泵裝置應完全位於貨物區域內。但對於留空處所、雙層底艙和壓載艙，當用雙層艙壁將其與裝有貨物或貨物殘餘物的液貨艙相隔開時，則為例外。

### 3.6 泵和管路的識別

在泵、閥和管路上，應設有區別標記，以識別它們的用途和它們所服務的艙。

### 3.7 船艙或船艙的裝卸裝置

3.7.1 可允許設置船艙或船艙的貨物裝卸管路。不准使用可攜式裝置。



3.7.2 不得將船艙或船艙的裝卸管路用於駁運那些要求使用 1 型船舶載運的貨品。除非經主管機關特別批准，否則不得將船艙或船艙的裝卸管路用於駁運須符合第 15.12.1 段要求的釋放有毒蒸氣的貨物。

3.7.3 除第 5.1 段要求外，還應適用下列規定：

- .1 應將貨物區域以外的管路設置在開敞甲板上舷內側距船舷至少為 760 mm 處。對此類管路應明確標識，並且在其與貨物區域內的貨物管系的連接處設置截流閥。當不使用時，還應能用可拆短管和盲板法蘭在這一位置對管路進行分隔；
- .2 在通岸接頭上應裝設截流閥和盲板法蘭；
- .3 對管路應採用全焊透對接焊，並應對其進行全部射線探傷。只准許在貨物區域內和通岸接頭上的管路中使用法蘭接頭；
- .4 應在第 3.7.3.1 段規定的接頭處裝設防濺板和具有泄放裝置且有足夠容量的收集盤；
- .5 管路應能自行將管內殘留貨物泄放到貨物區域，且最好能泄入液貨艙。主管機關可接受泄放管路的替代裝置；
- .6 應設置清洗裝置，使此類管路在使用後得到清洗，並且在不使用時保持其氣體安全。與清洗裝置相連的透氣管應位於貨物區域。此管路上的有關接頭上應設截流閥和盲板法蘭。

3.7.4 通向起居、服務和機器處所及控制站的入口、空氣進口和開口不應面向船艙或船艙裝卸裝置的貨物通岸接頭的位置。它們應位於上層建築或甲板室的外側，從上層建築或甲板室面向船艙或船艙裝卸裝置的貨物通岸接頭位置的一端起距離至少為船長的 4%，且不得小於 3 m。但此距離不必超過 5 m。面向通岸接頭位置的舷窗和上述距離之內的上層建築和甲板室側壁上的舷窗均應為固定（非開啓）型舷窗。此外，在使用船艙或船艙裝卸裝置期間，相應的上層建築或甲板室側壁上的所有門、舷窗和其他開口都應保持關閉狀態。對於小型船舶，若不能滿足第 3.2.3 段和本段要求，主管機關可以批准對上述要求給予放寬。

3.7.5 對通向第 3.7.4 段未列入的封閉處所的空氣管及其他開口應予遮蓋，以防破裂軟管或接頭產生的任何飛濺。

3.7.6 逃生通道不得終止於第 3.7.7 段所要求的圍板之內，或圍板外 3 m 的距離之內。

3.7.7 應設置適當高度的連續圍板，以將任何溢漏貨品保留在甲板上並遠離起居和服務區域。

3.7.8 在第 3.7.7 段要求的圍板之內或在圍板外 3 m 距離之內的任何電氣設備均應符合第十章的要求。

3.7.9 船艙或船艙裝卸區域的消防設備應符合第 11.3.16 段的要求。

3.7.10 如有必要，應在貨物控制站和貨物通岸接頭位置之間提供通訊方式，並應經過安全認可。應設有能從貨物通岸接頭位置遙控關閉貨泵的設施。

## 第四章

### 貨物容器

#### 4.1 定義

4.1.1 獨立液貨艙係指外殼不與船體結構相連接或不是船體結構組成部分的裝貨容器。建造和安裝獨立液貨艙是為了在任何可能的情況下消除因相鄰的船體結構的應力或移動對液貨艙所造成的應力（或將其降至最小）。獨立液貨艙對船體的結構完整性不是必需的。

4.1.2 整體液貨艙係指外殼構成船體結構一部分的裝貨容器，且以相同方式與鄰近的船體結構一起承受相同的載荷，通常為船體結構完整性所必需。

4.1.3 重力液貨艙係指其艙頂設計壓力（錶壓）不大於 0.07 MPa 的液貨艙。重力液貨艙可以是獨立液貨艙或整體液貨艙。重力液貨艙應按照認可的標準建造和試驗，並應考慮貨物的載運溫度和相對密度。

4.1.4 壓力液貨艙係指設計壓力（錶壓）大於 0.07 MPa 的液貨艙。壓力液貨艙應為獨立液貨艙，其結構的設計應按照經認可的壓力容器的設計標準。

#### 4.2 對各種貨品的艙型要求

各種貨品關於艙型的安裝和設計要求見第十七章表格中的“f”欄。

## 第五章

### 貨物駁運

#### 5.1 管子尺寸

5.1.1 按本章第 5.1.4 段規定的條件，管子的壁厚（ $t$ ）應不小於：

$$t = \frac{t_0 + b + c}{1 - \frac{a}{100}} \quad (\text{mm})$$

式中：

$t_0$  = 理論厚度

$t_0$  =  $PD/(2Ke+P)$  (mm)

式中：

$P$  = 第 5.1.2 段中所指的設計壓力 (MPa)

$D$  = 外徑 (mm)

$K$  = 第 5.1.5 段中所指的允許應力 ( $\text{N}/\text{mm}^2$ )

$e$  = 有效系數。對於無縫鋼管和由認可的焊接管製造商供貨，且按認可標準經過非破壞性試驗認為與無縫鋼管相當的縱向或螺旋焊接管， $e$  為 1.0；在其他情況下，按照認可的標準，根據製造工藝可能要求  $e$  值小於 1.0。

$b$  = 彎曲附加餘量 (mm)。對  $b$  值的選取，應使管子僅在內壓力作用時，其彎曲部位的計算應力不超過材料的允許應力。如果沒有正當的理由， $b$  值不得小於：

$$b = \frac{Dt_0}{2.5r} \quad (\text{mm})$$

式中：

$r$  = 平均彎曲半徑 (mm)。

$c$  = 腐蝕餘量 (mm)。如果預計有腐蝕或侵蝕，則管子的壁厚應在其他設計要求的數值上有所增加；

$a$  = 厚度的製造負公差 (%)；

5.1.2 在第 5.1.1 段的  $t_0$  公式中的設計壓力  $P$  是該系統在工作中可能承受的最大錶壓力，同時要考慮到系統中的任何釋放閥的最高調定壓力。

5.1.3 對沒有用釋放閥保護或可能與釋放閥隔離的管路和管系部件至少應按下述壓力中的最大值進行設計：

- .1 對於可能存在一些液體的管系或部件，取該液體在 45°C 時的飽和蒸氣壓力；
- .2 與其相接的泵的排放釋放閥的調定壓力；
- .3 當與其相接的泵未裝有排放釋放閥時，取該泵出口處的最大可能總壓頭。

5.1.4 除了管端敞開的管路以外，管路的設計壓力不得小於 1 MPa；對於管端敞開的管路，其設計壓力不得小於 0.5 MPa。

5.1.5 對於管路，第 5.1.1 段的  $t_0$  公式中的允許應力值  $K$ ，應取按下述兩式計算值的較小者：

$$\frac{R_m}{A} \text{ 或 } \frac{R_e}{B}$$



式中：

$R_m$  = 材料在環境溫度下的規定最低抗拉強度 ( $N/mm^2$ )

$R_e$  = 材料在環境溫度下的規定最低屈服強度 ( $N/mm^2$ )。  
如果應力—應變曲線上沒有明顯的屈服點，取 0.2% 的條件屈服強度。

A 和 B 的值至少應為：A=2.7 和 B=1.8。

5.1.6.1 最小壁厚應符合經認可的標準。

5.1.6.2 如需要管路有足夠的機械強度，以防止因管子的自重和管內貨物的重量以及來自支撐、船舶變形或其他原因的疊加載荷所引起的管子的損傷、破斷、過度中垂或失穩，則應增加按第 5.1.1 段規定所求得的管壁厚度。如果這樣做不現實或會引起過大的局部應力，則應採取其他的設計方法減小、防止或消除上述載荷；

5.1.6.3 法蘭、閘門和其他附件均應符合認可的標準，並應考慮到根據第 5.1.2 段所確定的設計壓力；

5.1.6.4 若採用不符合標準的法蘭，則法蘭及其連接螺栓的尺寸均應經主管機關同意。

## 5.2 管路製造和連接細節

5.2.1 本節的要求適用於液貨艙內部和外部的管路。但是，可以根據認可的標準對端部敞開的管路和液貨艙內的管路放寬要求，服務於其他液貨艙的貨物管路除外。

5.2.2 貨物管路應通過焊接連接，但下列情況除外：

- .1 連接截流閥的認可連接和膨脹接頭；和
- .2 由主管機關特別許可的其他例外情況。

5.2.3 可考慮下列無法蘭管段的直接連接：

- .1 在所有的使用情況下，均可採用根部全焊透的對接焊連接；
- .2 只能將套裝焊接接頭用於外徑 50 mm 或以下的管子，其套管的尺寸和有關的焊接尺寸均應符合認可的標準。但預計可能發生縫隙腐蝕時，不得採用這種連接形式；
- .3 對於符合認可標準的螺紋連接，只能用於外徑 25 mm 或以下的次要管路和儀錶管路。

5.2.4 若在管系中設置了膨脹圈或膨脹彎管，通常應允許管系擴張。

- .1 對符合認可標準的波紋管可以給予特別考慮；
- .2 不得使用滑動式接頭。

5.2.5 應按認可的標準進行焊接、焊後熱處理和非破壞性試驗。

### 5.3 法蘭連接件

5.3.1 法蘭應為整體型、套裝焊接型或插入焊接型。標準尺寸大於 50 mm 的管子不得採用插入焊接型法蘭。

5.3.2 法蘭的型式、製造和試驗應符合認可的標準。

### 5.4 對管系的試驗要求

5.4.1 本節的試驗要求適用於液貨艙內部和外部的管路。但對於液貨艙內的管路和管端敞開的管路，可按照認可的標準放寬這些要求。

5.4.2 組裝完畢後，對每一液貨管系均應經靜液壓試驗，其試驗壓力至少為設計壓力的 1.5 倍。如果管系或管系的一部分為整體製成品並配備了所有附件，可在安裝到船上之前對其進行靜液壓試驗。在船上進行焊接的接頭應按設計壓力的 1.5 倍進行靜液壓試驗。

5.4.3 在船上安裝完工之後，應對每一貨物管系進行泄漏試驗，其試驗壓力取決於所採用的方法。

## 5.5 管路佈置

5.5.1 除非能保持破艙保護所要求的距離（見第 2.6 段），否則貨物管路不得被安裝在甲板以下的裝貨處所外側和船體外板之間；但是，如果管子損壞不會導致貨物外流，只要能保持檢查所需的空間，則可以減小上述距離。

5.5.2 位於主甲板以下的貨物管路可以通過其所服務的液貨艙並穿過艙壁或穿過縱向或橫向的與液貨艙、壓載艙、空液艙、泵艙或貨泵艙相鄰的共同周界，但是，在其所服務的液貨艙內的管路上，應裝有能在露天甲板上操作的截流閥，並且要確保貨物的相容性以備管路失效。作為例外，如果液貨艙與貨泵艙相鄰，在露天甲板上操作的截流閥可位於貨泵艙一側的液貨艙艙壁上。但是，在艙壁上的閥和貨泵之間的管路上，應加裝一個截流閥。也可同意使用安裝在液貨艙外面的全封閉液壓操縱閥，但該閥應滿足下列條件：

- .1 設計成無泄漏危險；
- .2 安裝在其所服務的液貨艙艙壁上；
- .3 經適當保護，防止機械損傷；

- .4 安裝的位置與外板之間的距離滿足破艙保護要求的距離；
- .5 能從露天甲板上操作。

5.5.3 在任何貨泵艙內，如果一台泵服務於一個以上液貨艙時，應在通往每個液貨艙的管路上安裝一個截流閥。

5.5.4 安裝在管隧內的貨物管路也應滿足第 5.5.1 段和第 5.5.2 段的要求。管隧應滿足對關於液貨艙結構、位置和通風的所有要求以及防止電氣危險的要求。應確保貨物的相容性以備管路失效。除了通往露天甲板和貨泵艙或泵艙的開口以外，在管隧上不得設有任何其他開口。

5.5.5 穿過艙壁的貨物管路的佈置應能夠防止其在艙壁處產生過大的應力，並且不得使用以螺栓穿過艙壁進行固定的法蘭。

## 5.6 貨物駁運控制系統

5.6.1 為適當控制貨物，貨物駁運系統應：

- .1 在每個液貨艙的注入管路和排放管路上設有一個能手動操作的截流閥，該閥應位於靠近管子穿過液貨艙之處；如果採用獨立深井泵排放貨艙內的貨物，則不要求在該艙的排放管路上設置截流閥；
- .2 在每個貨物軟管連接處設有一個截流閥；
- .3 為所有貨泵和類似設備均裝設遙控關閉裝置。

5.6.2 除本規則其他條文已涉及的貨泵艙內的控制裝置以外，為駁運或輸送本規則所規定的貨物所必需的控制裝置均不得設在露天甲板以下。

5.6.3 在第十七章的表格的“o”欄內，列出了某些貨品的貨物駁運控制的附加要求。

## 5.7 船用貨物軟管

5.7.1 駁運氣體和液體所用的貨物軟管應與貨物相容，並應適合於貨物的溫度。

5.7.2 對於承受液貨艙壓力和貨泵排放壓力的軟管，其設計爆破壓力應不低於在駁運貨物期間軟管所承受的最大壓力的 5 倍。

5.7.3 對於 2002 年 7 月 1 日或之後安裝在船上的貨物軟管，裝畢端部裝置的每一新型貨物軟管應在正常環境溫度下經受 200 次從零壓力到至少為規定的最大工作壓力 2 倍的壓力循環原型試驗。循環壓力試驗完成之後，該原型壓力試驗應表明在極端工作溫度之下其爆破壓力至少為規定最大工作壓力的 5 倍。原型試驗用過的軟管不得再用於貨物輸送。此後，在投入使用之前，所生產的每一根新的貨物軟管都應在環境溫度下進行靜壓力試驗，其試驗壓力應不小於規定的最大工作壓力的 1.5 倍，但不必大於其爆破壓力的五分之二。應採用噴印或其他方法在軟管上標出其試驗日期及規定的最大工作壓力，並且對於在非環境溫度下使用的軟管，還應視情標出其最高和最低工作溫度。規定的最大工作壓力應不低於錶壓 1 MPa。

## 第六章

### 結構材料、保護性襯墊及塗層

6.1 用於建造液貨艙的結構材料，連同相連的管路、泵、閥門、通風管及其連接材料，應適合於所載貨物的溫度和壓力，並經主管機關認可。鋼材被認為是通常的結構材料。



6.2 船廠負責將兼容性信息提供給船舶經營人和（或）船長。在交船之前或在對結構材料作相關改動之前應及時提供這些信息。

6.3 在選用結構材料時，應視需要注意下列要素：

- .1 在作業溫度下的缺口韌性；
- .2 貨物的腐蝕作用；
- .3 貨物與結構材料之間產生有害反應的可能性；

6.4 貨物的託運人負責將兼容性信息提供給船舶經營人和/或船長。在貨品運輸之前應及時提供這些信息。貨物應與所有的結構材料兼容，從而：

- .1 不對結構材料的完整性造成損害；和（或）
- .2 不產生危險或潛在的危險反應。

6.5 在將一種產品提交給國際海事組織評估時，以及在貨品與第6.1段中所述材料的兼容性有特殊要求時，散裝液體和氣體分委會的貨品數據報表中應提供有關結構材料的信息。這些要求應反映在第十五章中並在第十七章的“o”欄中提及。報表還應標明有無特殊要求。貨品的生產商有責任提供正確的信息。

## 第七章

### 貨物溫度控制

#### 7.1 一般要求

7.1.1 如設有貨物加熱或冷卻系統，其製造、安裝和試驗均應使主管機關滿意。溫度控制系統中使用的構造材料應適合於將要裝運的貨品。

7.1.2 用於加熱或冷卻特定貨物的媒介應為經認可的類型。應對加熱盤管或導管的表面溫度給予考慮，以避免因貨物局部過熱或過冷而產生危險的反應。(另見第 15.13.6 段)。

7.1.3 加熱或冷卻系統應設有控制閥，以便隔斷每個液貨艙的加熱或冷卻系統，並可以用人工調節其流量。

7.1.4 在任何加熱或冷卻系統中均應配備確保在任何條件下（系統已被排空者除外）均能保持該系統中的壓力高於液貨艙內貨物可能作用於該系統最大壓頭的裝置。

7.1.5 應設有測量貨物溫度的裝置。

- .1 如果某種物質要求限制式或封閉測量裝置時，測量貨物溫度的裝置應分別為限制式或封閉式，如第十七章的表格的“j”欄所示。
- .2 限制式溫度測量裝置應符合第 13.1.1.2 段中關於限制式測量裝置的定義（例如放入限制式表管內的便攜式溫度計）。
- .3 封閉式溫度測量裝置應符合第 13.1.1.3 段中關於封閉式測量裝置的定義（例如傳感器安裝在液貨艙內的遙測溫度計）。
- .4 如果過熱或過冷會導致危險情況發生，應設有監測貨物溫度的警報系統。(另見第 16.6 段的操作要求)。

7.1.6 在對第十七章表格的“o”欄內列有 15.12、15.12.1 或 15.12.3 的貨品進行加熱或冷卻時，其加熱或冷卻媒介應在下述循環管路中工作：

- .1 除另一貨物的加熱或冷卻系統外，獨立於船上其他用途的系統，而且不進入機器處所；或
- .2 位於裝運有毒貨品的液貨艙之外；或
- .3 在媒介被循環到船上其他用途的系統或進入機器處所之前，應對其取樣檢查，以便檢查有無貨物存在。取樣設備應位於液貨艙區域內，並能檢測出存在任何已被加熱或已被冷卻的有毒貨品。如果採用這種方法，則不僅在開始加熱或冷卻有毒貨品時應對盤管回流進行檢測，而且在裝過不需加熱或冷卻的有毒貨品之後首次使用盤管時也要對其進行檢測。

## 7.2 附加要求

對於某些貨品，第十五章中所述的附加要求已被列於第十七章表格的“o”欄內。

## 第八章

### 液貨艙透氣和除氣裝置

#### 8.1 適用範圍

8.1.1 除另有明確規定外，本章適用於在 1994 年 1 月 1 日或以後建造的船舶。

8.1.2 1994 年 1 月 1 日以前建造的船舶應符合在該日之前有效的本規則第八章的要求。

8.1.3 就本條而言，“建造的船舶”一詞的定義與《SOLAS 公約》第 II-1/1.3.1 條的定義相同。

8.1.4 對於在 1986 年 7 月 1 日或以後但在 1994 年 1 月 1 日以前建造的船舶，如果完全符合當時適用的規則要求，可被視為符合《SOLAS 公約》第 II-2/4.5.3、4.5.6 至 4.5.8、4.5.10 和 11.6 條的要求。

8.1.5 對於本規則所適用的船舶，應適用本章的要求以代替《SOLAS 公約》第 II-2/4.5.3 和 4.5.6 條。

8.1.6 1986 年 7 月 1 日或以後但在 2002 年 7 月 1 日以前建造的船舶應符合第 8.3.3 段的要求。

## 8.2 液貨艙透氣

8.2.1 在所有液貨艙中應設置適合於所載運貨物的透氣系統，這些系統應獨立於該船所有其他艙室的空氣管和透氣系統。液貨艙透氣系統的設計應能最大限度地減少貨物蒸氣在甲板集聚和進入起居、服務和機器處所及控制站的可能性，並最大限度地減少易燃蒸氣進入或聚集在有着火源的處所或區域的可能性。液貨艙透氣系統的佈置應能防止水進入液貨艙，同時其透氣出口應能使蒸氣以噴射形式直接向上排出而不受阻礙。

8.2.2 應將透氣系統連接到每個液貨艙的頂部，並應儘可能在所有正常橫傾和縱傾的操作條件下使貨物透氣管路能自行將貨物蒸氣排放到液貨艙內。如果必需對設在任何壓力/真空閥上面的透氣系統進行排空，則應配置封蓋式或塞封式排放旋塞。

8.2.3 應配備設施確保任何液貨艙內的貨物壓頭不超過對該液貨艙的設計壓頭。為此目的可允許採用適當的高液位警報裝置、溢流控制系統或溢流閥，再配以測量裝置和液貨艙的充裝程序等。如果限制液貨艙過壓的裝置中包括自動關閉閥，該閥應符合第 15.19 段的有關規定。

8.2.4 對液貨艙透氣系統的設計和操作應能保證在裝卸期間液貨艙內所產生的壓力和真空都不會超過液貨艙的設計參數。在確定液貨艙透氣系統的尺度時應考慮下述主要因素：

- .1 設計的裝卸速率；
- .2 裝貨期間氣體溢出量：應考慮將最大裝貨速率乘以至少為 1.25 的系數；
- .3 貨物蒸氣混合物的密度；
- .4 透氣管、三通閥和配件中的壓力損失；
- .5 釋放裝置的壓力/真空調定。

8.2.5 對於與抗腐蝕材料製造的液貨艙或者與按本規則要求加有襯裏或塗層以裝載特殊貨物的液貨艙相接的透氣管路，應同樣加有襯裏或塗層，或者用抗腐蝕材料製造。

8.2.6 應向船長提供與透氣系統設計相一致的每個或每組液貨艙的最大許用裝卸速率。

### 8.3 液貨艙透氣系統的類型

8.3.1 開放式液貨艙透氣系統係指在正常操作期間，對貨物蒸氣進出液貨艙的自由流動無任何限制（摩擦損失除外）的系統。開放式透氣系統可以由每個液貨艙的單獨透氣管構成，也可以在充分考慮到貨物分隔的情況下，將上述單獨透氣管組合成一個或幾個總管。但在任何情況下，在各透氣管或總管上均不得設置截流閥。

8.3.2 控制式液貨艙透氣系統係指在每一液貨艙內設置了壓力和真空釋放閥或壓力/真空閥以限制液貨艙中的壓力或真空的系統。控制



式液貨艙透氣系統可由在每個液貨艙中單獨設置的透氣管構成，在充分考慮到貨物分隔的情況下，還可僅將上述受壓側的單獨透氣管組合成一個或幾個總管。在任何情況下都不得在壓力或真空釋放閥或壓力/真空閥的上面或下面設置截流閥。在某些操作條件下，可以設有壓力或真空釋放閥或壓力/真空閥的旁通裝置，但應符合第 8.3.6 段的要求，並且應有一個適當的指示器以表明該閥是否被旁通。

8.3.3 控制式液貨艙透氣系統應包括一個主要通道和一個輔助通道，蒸汽可充分流動釋放，以防止其中一個通道損壞時造成壓力過大或壓力不足。或者，輔助通道可包括安裝在各液貨艙的壓力傳感器和安裝在船舶貨物控制室或通常進行貨物操作的位置的監控系統。此種監控設備還應裝有在液貨艙內超壓或低壓情況下可激活的警報設施。

8.3.4 控制式液貨艙透氣系統的透氣出口的位置應佈置成：

- .1 在露天甲板上的高度不小於 6 m，如將其設在升高步橋的 4 m 範圍內，則在升高步橋以上的高度應不小於 6 m；
- .2 離開起居、服務和機器處所的空气進口或開口及着火源的最近水平距離至少為 10m。

8.3.5 只要設有認可型式的高速透氣閥將蒸氣/空氣混合物以至 30 m/s 的出口速度向上自由噴射，則可視情況將第 8.3.4.1 段所述的透氣口在甲板或升高步橋以上的高度減為 3 m。

8.3.6 對於載運閃點不超過 60°C（閉杯試驗）的貨物的液貨艙，在其控制式透氣系統中應設有防止火焰進入液貨艙的裝置。對該裝置的設計、試驗和安裝應符合主管機關的要求，該要求至少應包括由本組織通過的標準。

8.3.7 在設計透氣系統和選擇併入液貨艙透氣系統中的防止火焰進入裝置時，應充分注意該系統和附件被堵塞的可能性，例如，在惡劣氣候狀況下貨物蒸氣冷凝、聚合、大氣塵灰或冰凍等。在此應注意火蝕消除器和防火網易於被堵塞的情況。應做出適當安排，以便能夠對該系統和附件進行檢驗、操作性檢查、清潔或更新。

8.3.8 第 8.3.1 段和第 8.3.2 段中有關透氣管路中禁止使用截流閥的規定應被理解為包括所有其他隔斷裝置，包括盲通法蘭和盲板法蘭。

#### 8.4 各種貨品的透氣要求

各種貨品的透氣要求已列於第十七章表格的“g”欄內，附加要求列於“o”欄內。

#### 8.5 液貨艙除氣

8.5.1 對於裝載不允許用開放式透氣的貨物的液貨艙，其除氣裝置應能使易燃或有毒蒸氣在大氣中的擴散危害或液貨艙中的易燃或有毒蒸氣混合物造成的危害降到最低限度。因此，所進行的除氣作業應使蒸氣通過下列出口排放：

- .1 通過第 8.3.4 和 8.3.5 段中所規定的透氣出口；或
- .2 通過比液貨艙甲板平面至少高出 2 m 的出口，且在除氣作業期間保持至少 30 m/s 的垂直噴射速度；或
- .3 通過比液貨艙甲板平面至少高出 2 m 的出口，且保持至少為 20 m/s 的垂直噴射速度，同時用適當裝置予以保護，防止火焰通過。

如果出口處的易燃蒸氣濃度已被降至可燃下限的 30%，並且在有毒貨品的蒸氣濃度對健康沒有嚴重危害時，可在液貨艙甲板平面上繼續進行除氣。

8.5.2 第 8.5.1.2 和 8.5.1.3 段中所述的出口可為固定式或可移動式管道。

8.5.3 在按照第 8.5.1 段設計除氣系統時，特別是為了達到第 8.5.1.2 段和第 8.5.1.3 段所要求的出口速度，應充分考慮到下列因素：

- .1 系統的構造材料；
- .2 除氣時間；
- .3 所使用的排氣扇的氣流特性；
- .4 由導管、管路、液貨艙進口和出口所引起的壓力損失；
- .5 排氣扇驅動媒介（例如：水或壓縮空氣）中可達到的壓力；以及
- .6 所載運的貨物範圍內的貨物蒸氣/空氣混合物的密度。

## 第九章

### 環境控制

#### 9.1 一般要求

9.1.1 液貨艙內的蒸氣空間，以及在某些情況下液貨艙周圍的空間，可要求具有受特別控制的氣體環境。

9.1.2 對於液貨艙有以下四種不同的控制類型：

- .1 惰化法：用不助燃也不與貨物反應的氣體或蒸氣充入液貨艙及其管系和液貨艙周圍空間（若第十五章有規定時）並維持這種狀態。
- .2 隔絕法：將液體、氣體或蒸氣充入液貨艙及其管系，使貨物與空氣隔絕並維持這種狀態。
- .3 乾燥法：將無水氣體或在大氣壓力下其露點為 $-40^{\circ}\text{C}$ 或更低的蒸氣充入液貨艙及其管系並維持這種狀態。
- .4 通風法：強制或自然通風。

9.1.3 當要求對液貨艙採用惰化法或隔絕法時：

- .1 除非能從岸上供應，否則應攜帶或在船上製造充足的惰性氣體，以供對液貨艙進行裝、卸貨時使用。此外，船上還應另外備有足夠的惰性氣體，以補償其航行途中的正常損耗。
- .2 船上的惰性氣體系統應能使圍護系統內始終保持至少為 $0.007\text{ MPa}$ 的錶壓力。此外，惰性氣體系統不得使液貨艙內的壓力升高到超過液貨艙的釋放閥調定壓力。
- .3 採用隔絕法時，應對隔絕媒介的供應做出與上述第9.1.3.1段和第9.1.3.2段關於惰性氣體供應要求相同的安排。
- .4 應設有能監測液面以上空間內的氣體覆蓋層的裝置，以確保維持其恰當的氣體狀態。

- .5 如果對易燃貨物採取惰化安排或隔絕安排或二者兼用，在惰性媒介被充入過程中，應儘量減少靜電荷的產生。

9.1.4 如果採用乾燥法並使用乾燥氮氣作為媒介，應對乾燥劑的供應做出與第 9.1.3 段的要求相同的安排。如果在貨艙的所有空氣入口處用乾燥劑作為乾燥媒介，應為整個航程期間攜帶充分的乾燥劑，並應考慮到每日的溫度變化範圍以及預期的濕度影響。

## 9.2 各種貨品的環境控制要求

某些貨品的環境控制要求類型見第十七章表格的“h”欄。

# 第十章

## 電氣裝置

### 10.1 一般要求

10.1.1 本章的規定與《SOLAS 公約》第 II-1 章 D 部分一併適用於載運因本身或與其他物質反應後有易燃性或對電氣設備有腐蝕作用的貨物的船舶。

10.1.2.1 電氣裝置應使因易燃貨品而發生火災和爆炸的危險降至最低。

10.1.2.2 當某種貨物有可能對電氣設備中通常所用的材料造成損壞時，應對所選擇的用作導體、絕緣、金屬部件等材料的各自特性作適當的考慮。如果有必要，應對這些部件加以保護，以防止其與易遇到的氣體或蒸氣相接觸。

10.1.3 主管機關應採取適當措施，確保在執行和適用本章對電氣裝置的有關規定時的一致性。



10.1.4 電氣設備、電纜或電線不得被安裝在危險位置，除非其符合不低於本組織接受的標準\*。但是，對於這些標準中未涵蓋的處所，不符合標準的電器設備、電纜或電線可根據主管機關接受的風險評估安裝在危險位置，但應確保其有同等安全水平。

10.1.5 本章所允許的裝於危險位置的電氣設備應能使主管機關滿意，並應具有主管機關承認的有關當局核發的能夠在可燃氣體環境中工作的證明，如第十七章表格的“i”欄內所示。

10.1.6 作為指導，如果某一物質的閃點超過 60°C，則予標明。對於加熱的貨物，可能需要確定出裝運條件，並適用對閃點不超過 60°C 的貨物的要求。

## 10.2 接地

對獨立液貨艙應作電器接地處理，接到船體上。對所有裝有墊圈的貨管接頭和軟管接頭應進行電氣接地處理。

## 10.3 各種貨品的電氣要求

對各種貨品的電氣要求見第十七章表格的“i”欄。

# 第十一章

## 防火和滅火

### 11.1 適用範圍

11.1.1 《SOLAS 公約》第 II-2 章中對油船的要求應適用於本規則所涵蓋的船舶，無論其噸位如何，包括小於 500 總噸的船舶，但以下內容除外：

- .1 第 4.5.5、10.8 和 10.9 條不適用；
- .2 不必適用第 4.5.1.2 條（即對主貨物控制站位置的要求）；
- .3 第 10.2、10.4 和 10.5 條適用，如同其適用於 2,000 總噸及以上的貨船；
- .4 應適用第 11.3 段的規定，以代替第 10.8 條；以及
- .5 應適用第 11.2 段的規定，以代替第 10.9 條。

11.1.2 儘管有第 11.1.1 段的規定，僅載運非易燃貨品（最低要求一覽表的“i”欄內註明為 NF）的船舶，不必滿足《SOLAS 公約》第 II-2 章所規定的關於油船的要求，條件是它們滿足該章關於貨船的要求，但這些船舶不必適用第 10.7 條，也不必適用下文第 11.2 段和第 11.3 段。

11.1.3 對於僅從事載運閃點為 60°C 及以上的貨品（最低要求一覽表的“i”欄內註明為“是”）的船舶，可適用《SOLAS 公約》第 II-2 章第 II-2/1.6.4 條中規定的要求以代替本章的規定。

## 11.2 貨泵艙

11.2.1 應在任何船舶的貨泵艙中設置《SOLAS 公約》第 II-2/10.9.1.1 條中規定的固定式二氧化碳滅火系統。應在控制站中標明：由於有靜電起火的危險，此系統僅用於滅火而不得用作惰化目的。《SOLAS 公約》第 II-2/10.9.1.1.1 條中所述的警報裝置，應能安全地用於易燃貨物蒸氣/空氣混合氣體中。就該條要求而言，應設置適合於機器處所使用的滅火系統。但是在任何情況下，船上攜帶滅火劑的數量應足以供應相當於貨泵艙總容積 45% 的自由氣體。

11.2.2 對於專門載運限定貨物的船舶的貨泵艙，應採用由主管機關認可的合適的滅火系統加以保護。

11.2.3 如果將載運的貨物不宜採用二氧化碳或相應等效的滅火劑滅火，則貨泵艙應由固定的壓力水霧系統或高倍泡沫系統組成的滅火系統來保護。在《國際散裝運輸危險化學品適裝證書》上應反映出這一條件性要求。

### 11.3 貨物區域

11.3.1 根據第 11.3.2 至 11.3.12 段的要求，每艘船舶都應裝設固定甲板泡沫系統。

11.3.2 只准提供一種類型的泡沫劑，該泡沫劑應對擬載運的最大可能數量貨物有效。對於泡沫對其無效或與泡沫不相容的其他貨物，應另設主管機關滿意的附加滅火裝置。不應使用普通蛋白泡沫。

11.3.3 用於輸送泡沫的裝置應能把泡沫輸送到整個液貨艙甲板區域，並且能把泡沫送入假定甲板已經破裂的任何液貨艙內。

11.3.4 甲板泡沫系統應能簡單、迅速地操作。該系統的主控制站應設在貨物區域以外的適當位置，並應鄰近起居處所，以便在被保護區域發生火災時能易於接近和操作。

11.3.5 泡沫液的供給速率應不小於下列規定中的最大值：

- .1 按液貨艙甲板區域的面積計算，每平方米為 2 l/min。液貨艙甲板區域的面積是指船舶的最大寬度乘以總的液貨艙處所的縱向長度；
- .2 按具有最大面積的單個液貨艙的水平截面面積計算，每平方米為 20 l/min；

- .3 按最大的泡沫炮所保護的區域面積計算，此區域完全位於該泡沫炮的前方，每平方米為 10 l/min，但總量應不小於 1,250 l/min，對小於 4,000 載重噸的船舶，其泡沫炮的最小排量應使主管機關滿意。

11.3.6 應提供足夠的泡沫劑，以確保在使用第 11.3.5.1、11.3.5.2 和 11.3.5.3 段規定的最大泡沫液供給速率時產生泡沫的時間至少能持續 30 min。

11.3.7 固定泡沫系統的泡沫液應通過若干泡沫炮和泡沫槍提供。每具泡沫炮的排量至少應為第 11.3.5.1 或第 11.3.5.2 段所要求的泡沫液供給速率的 50%。任何泡沫炮的排量，按其所保護的甲板區域面積計算，每平方米至少為 10 l/min，該區域完全位於泡沫炮的前方。總排量應不小於 1,250 l/min。對小於 4,000 載重噸的船舶，泡沫炮的最小排量應使主管機關滿意。

11.3.8 從泡沫炮到其前部的被保護區域最遠端的距離應不大於該泡沫炮在靜空氣中射程的 75%。

11.3.9 在尾樓前端的左右兩舷或面向液貨艙區域的起居處所的左右兩舷，應各裝一具泡沫炮和連接泡沫槍的軟管接頭。

11.3.10 應提供能在消防作業中操作靈活並能覆蓋泡沫炮所保護的區域的泡沫槍。任何泡沫槍的排量應不小於 400 l/min，且在靜空氣中的射程應不小於 15 m。每艘船舶所配備的泡沫槍數量應不少於 4 枝。泡沫總管出口的數量和佈置應能使至少從兩枝泡沫槍噴出的泡沫直接射至液貨艙甲板區域的任何部位。

11.3.11 在泡沫總管上應設置截流閥，如果消防總管為甲板泡沫系統的組成部分，在消防總管上也應設置截流閥。應將這些截流閥設在任何泡沫炮的前方，以隔斷總管的破損管段。

11.3.12 按所需輸出量使用甲板泡沫系統時，應能同時按所需壓力從消防總管噴射出最低要求數量的水柱。

11.3.13 對專門載運限定貨物的船舶應採用主管機關滿意的替代消防設施予以保護，但該替代設施對有關貨品的有效程度應達到所要求的甲板泡沫系統一般易燃貨品的有效程度。

11.3.14 應設有適用於所裝貨品的手提式滅火設備，並保持其良好工作狀態。

11.3.15 當裝載易燃貨物時，應將所有着火源從危險部位排除，除非該火源符合第 10.1.4 段。

11.3.16 對設有船艙或船艙裝卸裝置的船舶，應額外設置 1 具符合第 11.3.7 段要求的泡沫炮和 1 枝符合第 11.3.10 段要求的泡沫槍。應將附加的泡沫炮設在便於保護船艙、船艙裝卸裝置的部位。貨物區域之前或之後的貨物管路區域應由上述泡沫槍予以保護。

#### 11.4 特殊要求

經確定適合於每種貨品的滅火劑列於第十七章表格的“l”欄內。

## 第十二章

### 貨物區域的機械通風

對於本規則所適用的船舶，應以本章的要求替代《SOLAS 公約》第 II-2/4.5.2.6 和第 4.5.4 條的規定。



但是對於第 11.1.2 段和第 11.1.3 段所涉及的貨品，除酸類和第 15.17 段所適用的貨品外，可適用《SOLAS 公約》第 II-2/4.5.2.6 和第 4.5.4 條來代替本章的規定。

## 12.1 裝卸貨作業期間經常進入的處所

12.1.1 對貨泵艙和內設貨物裝卸設備的其他圍蔽處所以及進行貨物操作的類似處所均應裝設機械通風系統，並應能從上述處所的外部對該系統進行控制。

12.1.2 應採取措施，以便在進入艙室和操作設備之前對上述處所進行通風，在該艙室之外還應貼有需要進行通風的警告牌。

12.1.3 機械通風系統進氣口和排氣口的佈置應保證有足夠的空氣在該處所內流通，以避免有毒蒸氣或易燃氣體或二者（考慮其蒸氣密度）的積聚，並確保有足夠的氧氣來提供一個安全的工作環境。但無論如何，按處所的總容積計算，通風系統應具有每小時不小於 30 次的空氣交換能力。對於某些貨品，應按照第 15.17 段的規定增加貨泵艙的通風率。

12.1.4 通風系統應為固定式並而且通常應為抽氣型。應能從花鐵板的上面和下面抽氣。在裝有驅動貨泵的電動機的艙室內，通風系統應為正壓式。

12.1.5 貨物區域內各處所的通風排氣管道應向上排放，其排氣口的位置與通風進氣口和起居處所、服務處所、機器處所、控制站及貨物區域以外的其他處所的開口之間的水平距離至少為 10 m。

12.1.6 通風進氣口的佈置應最大限度地減小任何通風排氣口排出的危險蒸氣發生再循環的可能性。

12.1.7 通風管道不得穿過起居處所、服務處所和機器處所或其他類似處所。

12.1.8 如果船舶擬裝運易燃貨品，則應將驅動風機的電動機安裝在通風管道的外面。用於第十章所述的危險位置的通風扇和風扇導管（僅在風扇處）應為下文所定義的非火花型結構：

- .1 應為非金屬材料的葉輪或殼體，並充分考慮到消除靜電；
- .2 應為有色金屬材料的葉輪和殼體；
- .3 應為奧氏體不鏽鋼葉輪和殼體；和
- .4 應為葉尖間隙不小於 13 mm 的黑色金屬葉輪和殼體。

對於鋁合金或鎂合金的固定或轉動部件和黑色金屬的固定或轉動部件的任何組合結構，不論其葉尖間隙大小，均被視為有產生火花的危險，故不得在上述處所中使用。

12.1.9 船上應為本章要求的每種類型的風扇配有足夠的備件。

12.1.10 在通風導管的外部開口處應設置單個網孔面積不大於 13mm × 13mm 的保護網。

## 12.2 泵艙及其他通常進人的圍蔽處所

第 12.1.1 段未涉及的泵艙和其他通常進人的圍蔽處所均應設置機械通風系統，能從上述處所的外部進行控制並符合第 12.1.3 段的要求，但根據上述處所的總容積計算，其容量不得小於每小時完成 20 次空氣交換。應做出安排，在人員進入上述處所之前先要進行通風。

### 12.3 通常不進人的處所

雙層底艙、隔離空艙、箱形龍骨、管隧、貨艙處所以及可能積聚貨物的其他處所均應能進行通風，以確保在必須進入這些處所時有一個安全的環境。如果上述處所內未設有固定通風系統，應備有認可型移動式機械通風設備。在必要時，出於處所佈置的需要，例如貨艙處所，其通風的主要管道應為永久性裝置。永久性通風裝置的排量應能夠每小時空氣交換 8 次，移動式通風系統應能夠每小時空氣交換 16 次。風扇或風機應遠離人員的出入口，並應符合第 12.1.8 段的規定。

## 第十三章

### 儀錶

#### 13.1 測量

13.1.1 液貨艙內應設有下列類型之一的液位測量裝置：

- .1 *開放式裝置*：通過液貨艙的開口，將測量儀錶置於貨物或其蒸氣之中，例如液面測量孔。
- .2 *限制式裝置*：伸入液貨艙內，並在使用時，允許少量貨物蒸氣或液體與大氣接觸；不使用時，這種裝置是完全封閉的；其設計應確保在打開這種裝置時不致使艙內貨物（液體或氣霧）發生危險性的外溢；
- .3 *封閉式裝置*：伸入液貨艙內，但為封閉系統的一部份，而且能防止艙內貨物溢出，例如浮筒式系統、電子探頭、磁性探頭和帶有防護裝置的觀察器等；也可採用不穿過液貨艙殼板而與液貨艙無關的*間接式裝置*，如貨物稱重裝置和管式流量計等。

13.1.2 測量裝置應獨立於第 15.19 段所要求的設備。

13.1.3 開放式和限制式裝置只能用於下列情況：

- .1 本規則允許使用開放式透氣者；或
- .2 設有能在操作測量裝置之前釋放艙內壓力的裝置者。

13.1.4 對各種貨品的測量裝置型式的規定見第十七章表格的“j”欄。

## 13.2 蒸氣探測

13.2.1 對載運有毒或易燃貨品或有毒且易燃品的船舶，至少應配備 2 套專為該類蒸氣設計的並經校準的試驗儀器，如果這種儀器不能被兼用於試驗毒性濃度和可燃濃度，則應各備有 2 套單獨的儀器。

13.2.2 蒸氣探測儀可為便攜式或固定式。如果安裝了一個固定式探測系統，則至少還應備有 1 套便攜式探測儀。

13.2.3 如第十七章表格的“k”欄所示，如果需要探測某些貨品的有毒蒸氣但無探測設備，主管機關可以免除對該船的探測要求，但應在《國際散裝運輸危險化學品適裝證書》上作適當的記錄。在批准這一免除時，主管機關應認識到增加呼吸用空氣供應量的必要性，並應在《國際散裝運輸危險化學品適裝證書》上註明，以引起對第 14.2.4 和 16.4.2.2 段規定的注意。

13.2.4 對各種貨品的蒸氣探測要求見第十七章表格的“k”欄。

## 第十四章

### 人員保護

#### 14.1 保護設備

14.1.1 為保護從事裝卸作業的船員，船上應有合適的保護設備，包括大圍裙、有長袖的專用手套、適用的鞋襪、用抗化學性材料製成的連衣工作服以及護目鏡和/或面罩等。保護性服裝和設備應圍罩全身皮膚，使整個身體受到保護。

14.1.2 工作服和保護設備應保存在易於接近的專用儲存櫃內。除了新的和沒有被用過的設備以及經徹底洗淨後沒有被用過的設備外，這些設備均不應存放在起居處所內。但是，如果能將存放此類設備的儲藏室與生活處所（例如臥室、過道、餐廳、浴室等）作適當地隔離，則主管機關也可批准將此類儲藏室設在起居處所內。

14.1.3 在可能對人員產生危險的所有作業中均應使用保護設備。

#### 14.2 安全設備

14.2.1 當船舶載運在第十七章表格中的“o”欄列有 15.12、15.12.1 或 15.12.3 的貨物時，船上應有足夠數量的（但不小於 3 整套）安全設備，每套設備能使人員進入充滿氣體的艙室並工作至少 20 min。這些設備是在《SOLAS 公約》第 II-2/10.10 條要求的設備之外增加的內容。

14.2.2 整套安全設備應包括：

- .1 自給式空氣呼吸器 1 個（不使用儲存的氧氣）；
- .2 保護服、長靴、手套和護目鏡；



- .3 能經受所載貨物的配有腰帶的防火救生索；以及
- .4 防爆燈。

14.2.3 就第 14.2.1 段所要求的安全設備而言，所有船舶都應配備下列之一：

- .1 為每個呼吸器配備的 1 套充滿空氣的備用空氣瓶；
- .2 1 台能供應所需純度的高壓空氣的特種空氣壓縮機；
- .3 1 台能對足夠數量的呼吸器備用空氣瓶進行充注的充氣閥箱；或
- .4 在《SOLAS 公約》第 II-2/10.10 條的要求以外，為船上每個呼吸器配備的充滿空氣的備用空氣瓶，總容量至少為 6,000 l 的自由空氣。

14.2.4 如果船舶載運需符合第 15.18 段要求的貨物，或載運第十七章表格“k”欄要求進行有毒蒸氣探測的貨物，其貨泵艙如無探測設備，應有下列設備之一：

- .1 適合用於第 14.2.1 段所要求呼吸器的帶有軟管接頭的低壓管系。該系統應能提供充足的高壓空氣，通過減壓裝置提供充足的低壓空氣供 2 個人在氣體危險處所內至少工作 1 h 而不需使用呼吸器的氣瓶。應做出安排，使適合於提供所需純度的高壓空氣的特種空氣壓縮機能對固定的空氣瓶和呼吸器空氣瓶進行再充氣；或
- .2 等量的備用瓶裝空氣代替低壓空氣管。

14.2.5 應至少有 1 套符合第 14.2.2 段要求的安全設備存放在貨泵艙附近易接近且有明顯標誌的合適儲藏櫃內。其他幾套安全設備也應存放在合適的、有明顯標誌並易於接近的處所。

14.2.6 負責的高級船員應對呼吸器每月至少檢查 1 次，並把檢查結果記錄在船舶的航海日誌中。該設備應由專業人員每年至少檢查和試驗 1 次。

### 14.3 應急設備

14.3.1 載運第十七章表格“*n*”欄內為“是”的貨物的船舶，應為船上配備足夠每個人應急逃生使用的合適呼吸裝置和眼保護裝置，並符合下列要求：

- .1 不能使用過濾式的呼吸裝置；
- .2 自給式呼吸器的持續工作時間至少應為 15 min；
- .3 應急逃生呼吸裝置不得用於消防或裝卸貨物的目的，並應對其作出專門標誌。

14.3.2 應根據本組織指定的導則在船上配備醫療急救設備，包括氧氣復蘇設備和針對所載貨物的解毒劑。

14.3.3 適合於從貨泵艙等處所吊起受傷人員的擔架，應放置在易於接近的位置。

14.3.4 在甲板上方便的位置，應設置有合適標誌的能消除污染的淋浴和眼沖洗設備。這些淋浴和眼沖洗裝置應在所有環境條件下可用。

## 第十五章

### 特殊要求

#### 15.1 一般要求

15.1.1 本章的規定適用於在第十七章表格的“o”欄內有具體要求的貨物。這些要求是對本規則一般要求以外的要求。

#### 15.2 硝酸銨溶液（93%或以下）

15.2.1 硝酸銨溶液按重量計至少含水 7%。該溶液在按重量以 10 份水與 1 份溶液進行稀釋時，酸度（pH）應在 5.0 和 7.0 之間。該溶液中所含的氯離子和鐵離子均不應超過 10 ppm，並不得含有其他雜質。

15.2.2 用於裝載硝酸銨溶液的液貨艙和設備應獨立於裝載其他貨物或易燃貨品的液貨艙和設備。不得使用那些在使用中或在發生故障時會將可燃物品（如潤滑油）釋放至貨物中的設備。液貨艙不得用於海水壓載。

15.2.3 除非主管機關明確表示同意，不得在以前裝過其他貨物的液貨艙內裝運硝酸銨溶液，但能將液貨艙及其相關設備清洗至主管機關滿意者除外。

15.2.4 液貨艙加熱系統中，熱交換媒介的溫度不得超過 160°C。該加熱系統應設有控制裝置，使散裝貨物的平均溫度保持在 140°C。應設有能在 145°C 和 150°C 時發出警報的高溫警報裝置及在 125°C 時發出警報的低溫警報裝置。當熱交換媒介的溫度超過 160°C 時，也應發出警報。溫度警報及控制應位於駕駛室內。

15.2.5 如果散裝貨物的平均溫度達到 145°C，則應對貨物取樣，按重量以 10 份蒸餾水或軟水對 1 份貨物進行稀釋，使用具有精確測量範圍的試紙或試棒確定其 pH 值。酸度測量應每隔 24 小時進行一次。如果 pH 值低於 4.2，則應將氨氣注入貨物，直至 pH 值達到 5.0。

15.2.6 應設有能將氨氣注入貨物的固定裝置。該系統的控制器應位於駕駛室內。為此目的，船上每 1,000 t 硝酸銨溶液應備有 300 kg 氨。

15.2.7 貨泵應為離心式深井泵或水密封式離心泵。

15.2.8 透氣管上應設有經認可的風雨帽蓋，以防阻塞。此種帽蓋應能易於接近進行檢查和清洗。

15.2.9 凡是與硝酸銨溶液接觸過的液貨艙、管系和設備，只有在徹底清除其內外的所有硝酸銨的痕跡後，方可進行熱工作業。

### 15.3 二硫化碳

二硫化碳可根據以下段落中的規定在水墊或適當的惰性氣體墊之下載運。

#### 在水墊下載運

15.3.1 在裝載、卸載和駁運期間，應採取措施保持液貨艙內有一層水墊。此外，在駁運期間應保持液貨艙液面以上的空間有一層惰性氣體墊。

15.3.2 所有開口應位於液貨艙頂部甲板以上。

15.3.3 裝載管路的端頭應接近液貨艙底部。

15.3.4 應備有標準的液面測量孔以使用於應急測量。

15.3.5 貨物管路和透氣管路應獨立於其他貨物的管路和透氣管路。

15.3.6 可以用泵卸貨，但此種泵應為深井泵或液壓驅動的可潛泵。深井泵的驅動裝置不應產生能點燃二硫化碳的着火源，並且不得採用溫度可能超過 80°C 的設備。

15.3.7 如果採用卸貨泵，則應把它放入一個從艙頂伸到接近艙底的圓柱形阱內。在準備把泵取出之前，阱內應形成一層水墊，除非能證明該液貨艙已無氣體。

15.3.8 如果貨物系統是按預計壓力和溫度設計的，則可以用水或惰性氣體置換進行卸貨。

15.3.9 安全釋放閥應使用不鏽鋼製造。

15.3.10 由於二硫化碳的低着火溫度和需用較小的間隙阻止其火焰傳播，在危險位置只允許設置自身安全的系統和電路。

#### *在適當的惰性氣體墊下載運*

15.3.11 二硫化碳應裝載於設計壓力不小於 0.06 MPa 錶壓的獨立液貨艙中。

15.3.12 所有開口都應位於液貨艙頂部甲板之上。

15.3.13 用於圍護系統的墊圈，應為不會與二硫化碳發生反應或溶解於二硫化碳的材料。

15.3.14 在貨物圍護系統包括蒸汽管路中，不允許使用螺紋接口。

15.3.15 裝載之前，應在液貨艙內注入適當的惰性氣體直到氧氣水平按體積為 2% 或以下。裝載、運輸、卸載過程中，應使用適當的惰性



氣體自動保持液貨艙的正壓力。系統應能夠將該正壓力應保持在 0.01 和 0.02 MPa 之間，能夠遙控監視並應裝有高壓/低壓警報。

15.3.16 裝有二硫化碳的獨立艙周圍的貨艙處所，應注入適當的惰性氣體直到氧氣水平為 2% 或以下。在整個航程內應有保持這種條件的措施。應能夠取樣檢查這些處所的二硫化碳蒸汽。

15.3.17 裝載、運輸和卸載二硫化碳應防止其向空氣中透氣。如果二硫化碳蒸汽在裝載時被輸送回岸上或在卸載時被輸送回船上，則蒸汽回流系統應獨立於其他所有圍護系統。

15.3.18 只能使用浸沒的深井泵或適當的惰性氣體置換卸載二硫化碳。浸沒的深井泵應防止泵內熱量的升高。泵殼上還應裝有溫度傳感器，在貨物控制室裝有遙控讀數器和警報器。警報器應設為 80°C。貨泵還應設有自動關閉裝置，卸載時貨艙壓力如果低於大氣壓力則自動關閉。

15.3.19 系統內含有二硫化碳時不允許空氣進入液貨艙、貨泵或管路中。

15.3.20 在裝載或卸載二硫化碳的過程中不允許進行其他貨物裝卸、貨艙清洗或減壓載。

15.3.21 應設置具有足夠容量的水霧滅火系統，以有效地覆蓋設有裝載支管的周圍區域、露天甲板上與貨品裝卸有關的管路和液貨艙頂部。對管路和噴嘴的佈置應能以噴灑率 10 l/m<sup>2</sup>/min 均勻噴灑。應將遙控手動操作裝置設在貨物區域外、鄰近居住處所的合適位置，以便在受保護區域發生火災時能遙控啟動水霧系統的供水泵，遙控操作該系統中通常關閉的任何閥門。應能對該水霧系統進行就地和遠距離的

人工操作，而且應將其佈置成能把任何泄漏的貨物沖洗掉。此外，在大氣溫度許可時，應將加壓的供水軟管與噴嘴相連接，以便在進行裝卸作業時可以立即使用。

15.3.22 在基準溫度（R）下，任何液貨艙可能裝載的貨物量均不得超過液貨艙容積的 98%；

15.3.23 一個液貨艙能裝載貨物的最大容積（ $V_L$ ）應為：

$$V_L = 0.98V \frac{\rho_R}{\rho_L}$$

式中：

V = 該液貨艙的容積

$\rho_R$  = 貨物在基準溫度（R）時的密度

$\rho_L$  = 貨物在裝載溫度時的密度。

R = 基準溫度

15.3.24 針對每一液貨艙，可能適用的每一裝載溫度和可能適用的最大基準溫度的最大充裝極限，應在主管機關認可的格式上予以標明。應由船長將該格式的副本永久保存在船上。

15.3.25 對於經核准適於裝載二硫化碳的液貨艙，距液貨艙開口、氣體或蒸氣出口、貨物管法蘭或貨物閘門 3 m 之內的開敞甲板上的區域或開敞甲板上的半圍蔽處所應符合第十七章第“i”欄所列的關於二硫化碳的電器設備要求。並且，在特殊區域內的其他如蒸汽管道等熱源的表面溫度不可超過 80°C。

15.3.26 應能在無需打開液貨艙或不擾動惰性氣體層的情況下測量和取樣檢查貨品。

15.3.27 只有按照主管機關批准的貨物裝卸計劃才可運輸貨物。貨物裝卸計劃應標明整個貨物管系。船上應保存一份經認可的貨物裝卸計劃的副本；對《國際散裝運輸危險化學品適裝證書》的簽註應包括提及經批准的貨物裝卸計劃。

## 15.4 乙醚

15.4.1 除非已被惰化，否則在船舶航行時，對液貨艙周圍的留空處所應進行自然通風。如果設有機械通風系統，所有鼓風機應為無火花型結構。不得將機械通風設備置於液貨艙周圍的留空處所內。

15.4.2 對於重力液貨艙，其壓力釋放閥的調定值不得小於 0.02 MPa 錶壓。

15.4.3 如果貨物系統是按預計壓力設計的，則可用惰性氣體置換進行壓力艙卸貨。

15.4.4 為防止發生火災，應在貨物區域內採取措施避免產生任何着火源或熱。

15.4.5 可以用泵卸貨，但這種泵的設計型式應能滿足避免對泵軸的密封壓蓋產生液體壓力，或採用適於該種貨物的液壓操作的可潛泵。

15.4.6 液貨艙在裝載、卸載和駁運時，應採取措施以使艙內保持惰性氣體墊。

## 15.5 過氧化氫溶液

15.5.1 按質量計 60% 以上但不超過 70% 過氧化氫溶液

15.5.1.1 只能用專用船舶載運按質量計 60%以上但不超過 70%的過氧化氫溶液，該船不得載運其他貨物。

15.5.1.2 應採用純鋁(99.5%)或全不鏽鋼(304L、316、316L 或 316Ti)建造液貨艙及其設備，並按認可的程序對其進行鈍化。不得用鋁建造甲板上的管路。用於建造圍護系統的所有非金屬材料不能受到過氧化氫的侵蝕，也不能有助於過氧化氫的分解。

15.5.1.3 泵艙不得用於貨物駁運作業。

15.5.1.4 應使用隔離艙將液貨艙與燃油艙或裝有易燃或可燃材料的其他處所隔開。

15.5.1.5 擬載運過氧化氫的液貨艙不得用海水進行壓載。

15.5.1.6 在液貨艙的頂部和底部應設置溫度傳感器。溫度遙測讀數裝置和連續監測裝置應設在駕駛室內。如果艙內溫度升高超過 35°C，應在駕駛室內應發出聲光警報。

15.5.1.7 在與液貨艙鄰接的留空處所內應設有固定式氧氣監測器(或氣體取樣管路)，以探測是否有貨物泄漏到這些處所內。遙測讀數裝置、連續監測裝置(如果採用氣體取樣管路，可間歇取樣)以及類似用於溫度傳感器的聲光警報裝置也應設在駕駛室內。如果在這些留空處所內氧濃度按體積計超過 30%，則應發出聲光警報。應配備兩個便攜式氧氣監測器作為備用系統。

15.5.1.8 為防止發生無法控制的分解，應設置貨物拋棄系統，以便將貨物排放到船外。如果在 5 小時內每小時貨物溫升超過 2°C，或者艙內溫度超過 40°C 時，應將該貨物拋棄。



15.5.1.9 液貨艙的透氣系統應具有用於正常控制透氣的壓力/真空釋放閥和用於應急透氣的安全膜或類似裝置，以防因無法控制的貨物分解導致液貨艙壓力迅速升高。應根據液貨艙的設計壓力、液貨艙的尺寸和預計的貨物分解率確定安全膜的尺寸。

15.5.1.10 應設置固定式水霧系統，以便稀釋並洗掉溢漏在甲板上的任何濃縮的過氧化氫溶液。水霧所覆蓋的區域應包括支管/軟管接頭和用於載運過氧化氫溶液的專用液貨艙的頂部。最小噴灑率應符合下列標準：

- .1 應在貨品溢漏後 5 min 內把其原來的濃度（按質量計）稀釋到 35%；
- .2 溢漏率和估計的溢漏量應根據預計的最大裝卸率、液貨艙溢流或管路/軟管破損時停止貨物流通所需的時間以及從貨物控制站或駕駛室啓動稀釋水噴灑裝置所需的時間予以確定。

15.5.1.11 只允許載運那些在 25°C 時的年最大分解率為 1% 的過氧化氫溶液。託運人用以說明貨品符合這一標準的證書應送交船長並將其保存在船上。製造商應派技術代表上船監察駁運操作，並應具有測試過氧化物穩定性的能力。技術代表應向船長證明，貨物是在穩定狀況下被裝載的。

15.5.1.12 涉及貨物裝卸作業的每一位船員均應配備能抵禦過氧化氫溶液的防護服。防護服應包括不易燃的連衣褲工作服、合適的手套、靴子和眼保護裝置。

15.5.2 按質量計 8% 以上但不超過 60% 的過氧化氫溶液



15.5.2.1 不得以船體外板作為裝載本品的液貨艙的任何邊界。

15.5.2.2 過氧化氫應在徹底有效地清除了以前所裝貨物的痕迹及貨物蒸氣或壓載水的液貨艙內載運。液貨艙的檢驗、清洗、鈍化和裝載的程序應符合第 MSC/Circ.394 號通函的要求。表明已遵循通函中規定程序的證書應存放在船上。對於國內短途航行的船舶，主管機關可免除其鈍化要求。為確保安全載運過氧化氫，還應特別注意下列關鍵性要求。

- .1 載運過氧化氫時不得同時裝運其他貨品；
- .2 對於裝運過過氧化氫的液貨艙，按第 MSC/Circ.394 號通函規定的程序進行清洗後可用於裝運其他貨物；
- .3 設計液貨艙時應考慮儘量減少艙內構件、艙底自由排放、卸空後艙內無液貨存留以及易於進行外觀檢查。

15.5.2.3 液貨艙及其設備應採用純鋁（99.5%）或全不鏽鋼（例如 304、304L、316、316L、316Ti）製造。不得用鋁製造甲板上的管路。用於製造圍護系統的所有非金屬材料不能受到過氧化氫的侵蝕，也不能有助於過氧化氫的分解。

15.5.2.4 在液貨艙與燃油艙或裝有與過氧化氫不相容的材料的其他處所之間，應用隔離艙加以分隔。

15.5.2.5 在液貨艙的頂部和底部應設置溫度傳感器。溫度遙測讀數裝置和連續監測裝置應設在駕駛室內。如果艙內溫度升高超過 35°C，則在駕駛室內應發出聲光警報。

15.5.2.6 在與液貨艙鄰接的留空處所內應設有固定氧氣監測器（或氣體取樣管路），以探測是否有貨物泄漏到這些處所內。還應注意到由於氧氣聚集使可燃性增大的危險情況。遙測讀數裝置、連續監測裝置（如果採用氣體取樣管路，可間隔取樣）以及類似用於溫度傳感器的聲光警報裝置也應設在駕駛室內。如果在這些留空處所內氧濃度按體積計超過 30%，則應發出聲光警報。應配備兩個便攜式氧氣監測器，作為備用裝置。

15.5.2.7 為防止發生無法控制的分解，應設置貨物拋棄系統以便將貨物排放到船外。如果在 5 小時內每小時貨物溫升超過 2°C，或者艙內溫度超過 40°C 時，應將該貨物投棄。

15.5.2.8 裝有過濾器的透氣系統應具有正常控制透氣壓力的真空釋放閥，同時還應具有應急透氣裝置，以防因第 15.5.2.7 段所述的無法控制的貨物分解而引起液貨艙壓力迅速升高。設計透氣系統時應考慮不得使海水進入液貨艙內，即使是在嚴重海況下。應根據液貨艙的設計壓力和液貨艙的尺寸確定所需的應急透氣能力。

15.5.2.9 應設置固定水霧系統以稀釋並洗掉溢漏在甲板上的任何濃縮的過氧化氫溶液。水霧所覆蓋的區域應包括支管/軟管接頭和用於載運過氧化氫溶液的專用液貨艙的頂部。最小噴灑率應符合下列標準：

- .1 應在貨品溢漏後 5 min 以內把其原來的濃度（按質量計）稀釋到 35%；
- .2 溢漏率和估計的溢漏量應根據預計的最大裝卸率、液貨艙溢流或管路/軟管破損時停止貨物流通所需的時間以及從貨物控制站或駕駛室啓動稀釋水噴灑裝置所需的時間予以確定。

15.5.2.10 只允許載運那些在 25°C 時的年最大分解率為 1% 的過氧化氫溶液。託運人用以說明貨品符合這一標準的證書應送交船長並將其保存在船上。製造商應派技術代表上船監督駁運操作，並具有試驗過氧化物穩定性的能力。技術代表應向船長證明，貨物是在穩定狀況下被裝載的。

15.5.2.11 涉及貨物裝卸作業的每一位船員均應配備能抵禦過氧化氫溶液的防護服。防護服應包括不易燃的連衣褲工作服、合適的手套、靴子和眼保護裝置。

15.5.2.12 在進行過氧化氫駁運作業時，應將與駁運有關的管系與其他管系分隔開。在用於駁運過氧化氫的貨物軟管上應標明“過氧化氫駁運專用”。

15.5.3 *裝載過其他貨物的液貨艙載運 8 – 60% 過氧化氫溶液或在載運過氧化氫之後裝載其他貨物的檢查、清洗、鈍化和裝載程序*

15.5.3.1 裝載過除過氧化氫以外貨品的液貨艙，在重新用於運輸過氧化氫之前，應經過檢驗、清洗、鈍化。下文第 15.5.3.2 至 15.5.3.8 段中的檢查和清洗程序同時適用於不鏽鋼或純鋁液貨艙（見第 15.5.2.2 段）。鈍化的程序分別見第 15.5.3.9（不鏽鋼液貨艙）及 15.5.3.10 段（鋁質液貨艙）。除非另有規定，所有步驟均適用於液貨艙及一切與其他貨品有接觸的設備。

15.5.3.2 以前裝載的貨品卸載後，應保證液貨艙使用安全，並檢查其是否有殘餘物、水鏽和鐵鏽。

15.5.3.3 應使用經過濾的清水清洗液貨艙及相關設備，所使用的水應至少具有含氯量低的飲用水的質量。

15.5.3.4 應使用蒸汽清洗液貨艙及相關設備，清除以前裝載貨品的殘餘物和蒸氣。

15.5.3.5 應使用清水（要求如上）再次清洗液貨艙及設備，並用經過濾的不含油的氣體風乾。

15.5.3.6 應對液貨艙的空氣進行取樣，檢查其是否含有有機蒸氣及氧氣濃縮物。

15.5.3.7 應再次通過目測檢查液貨艙是否還有以前所載貨品的殘餘物、水鏽、鐵鏽以及以前所載貨物的味道。

15.5.3.8 如檢查或測量發現有以前所載貨品的殘餘物或其蒸汽，應重複第 15.5.3.3 段至第 15.5.3.5 段的步驟。

15.5.3.9 用不鏽鋼建造的液貨艙及設備，如裝載過過氧化氫之外的貨品或曾經過檢修，無論其以前是否經過鈍化，應按照以下程序進行清洗和鈍化：

- .1 新的焊接管和其他檢修零件應使用不鏽鋼絲刷、鑿子、沙紙或皮革清潔和拋光。粗糙表面應予磨平，最後還應擦光。
- .2 油脂或油類殘餘物應使用適當的有機溶劑或清潔劑水溶液去除。不得使用含氯化化合物的清潔劑，因為它們會嚴重影響鈍化。
- .3 應去除脫脂劑的殘餘物，然後用水清洗。



- .4 下一步應使用酸（如硝酸和氫氟酸的混合物）去除水鏽和鐵鏽，再用清水清洗。
- .5 所有與過氧化氫發生接觸的金屬表面應使用質量濃度為 10%–35%的硝酸進行鈍化。所用硝酸不得含有重金屬、其他氧化劑或氟化氫。鈍化過程應視酸的濃度、環境溫度及其他因素持續 8 至 24 小時。在此過程中，應保證所需鈍化的表面與硝酸的持續接觸。如表面過大，可再循環使用酸。鈍化過程中可能產生氫氣，導致液貨艙內存在爆炸氣體。因此還需採取適當措施避免爆炸氣體的積累和點燃。
- .6 鈍化之後，表面應用經過濾的清水徹底清洗。清洗過程應持續到注入水與流出水的 pH 值相同為止。
- .7 按以上步驟處理的表面首次接觸過氧化氫時可能引起一些分解。這種分解在短時間內可以消除（通常在兩到三天內），因此建議再用過氧化氫清洗至少兩天。
- .8 在此過程中只能使用過氧化氫生產者建議使用的脫脂劑及酸性清潔劑。

15.5.3.10 鋁質的液貨艙及設備，如果曾裝載過氧化氫之外的貨物或經過檢修，應進行清洗和鈍化，以下為建議採取的程序的示範：

- .1 液貨艙應使用磺化清潔劑的熱水溶液清洗，隨後用清水清洗。
- .2 表面應使用質量濃度為 7%的氫氧化鈉溶液處理 15 至 20 分鐘，或使用濃度較低的溶液處理更長時間（如：用 0.4



— 0.5% 的氫氧化鈉溶液處理 12 小時)。為防止使用較高濃度氫氧化鈉溶液時對液貨艙底部造成過度腐蝕，應不斷注入清水，稀釋聚集在液貨艙底部的氫氧化鈉溶液。

- .3 液貨艙應使用清潔的過濾水徹底清洗。清洗之後應儘快使用質量濃度為 30% 和 35% 的硝酸對其表面進行鈍化。鈍化過程應持續 16 至 24 小時，在此過程中應保持鈍化表面與硝酸的持續接觸。
- .4 鈍化之後，表面應用清潔的過濾水徹底清洗。清洗過程應持續到流出水與注入水的 pH 值相同時為止。
- .5 應進行目測檢查，以確保所有表面都已經過處理。建議使用質量濃度約為 3% 的過氧化氫稀釋溶液再次沖洗至少 24 小時。

15.5.3.11 應確定裝載的過氧化氫溶液的濃度和穩定性。

15.5.3.12 裝載過氧化氫時，應不斷從適當開口目測檢查液貨艙的內部。

15.5.3.13 如發現嚴重起泡現象且在完成裝載之後 15 分鐘內不消失，應卸載液貨艙裏所有貨品並以環保的方式進行處理。液貨艙及設備應按照上述程序再次鈍化。

15.5.3.14 應再次確定過氧化氫溶液的濃度和穩性。如果取得的各項指標均在第 15.5.3.10 段中的誤差範圍內，則可認為液貨艙已完成適當鈍化可以裝載。

15.5.3.15 第 15.5.3.2 至 15.5.3.8 段中的工作應在船長或託運人監督下進行。第 15.5.3.9 至 15.5.3.15 段的工作應在過氧化氫製造商所派代表或熟悉過氧化氫相關安全屬性的人員的現場監督和負責之下進行。

15.5.3.16 曾裝載過氧化氫溶液的液貨艙用於載運其他貨品時應按以下程序進行（除非另有規定，各步驟均適用於與過氧化氫接觸過的液貨艙及所有相關設備）：

- .1 應儘可能排淨液貨艙和設備裏的過氧化氫殘餘物。
- .2 液貨艙及設備應用清水沖洗，隨後再用清水徹底清洗。
- .3 液貨艙內部應晾乾並檢查其是否有殘餘物。

第 15.5.3.16 段 .1 至 .3 中的步驟應在船長或託運人的監督下進行。第 15.5.3.16 段 .3 中的步驟應在熟悉所運化學品及過氧化氫的相關安全屬性人員的監督下進行。

**特別警告：**

- 1 過氧化氫分解可能增加空氣中的氧氣含量，必需採取適當的預防措施。
- 2 第 15.5.3.9.5 段、第 15.5.3.10.2 段及第 15.5.3.10.4 段中所述的鈍化過程中可能產生氫氣，導致液貨艙中出現爆炸氣體。因此還應採取適當措施避免爆炸氣體的積累和點燃。

## **15.6 發動機燃油抗爆化合物（含有烷基鉛）**

15.6.1 用於裝載這些貨物的液貨艙不得被用於運輸任何其他貨物，但用於裝載煉製發動機燃油用的含有烷基鉛的抗爆化合物的液貨艙除外。

15.6.2 如果貨泵艙按第 15.18 段的規定位於甲板平面上，則通風裝置應符合本章第 15.17 段的要求。

15.6.3 非經主管機關批准，不得進入用於運輸這些貨物的液貨艙。

15.6.4 在允許人員進入貨泵艙或液貨艙周圍留空處所之前，應對其進行空氣分析，以測定其含鉛量是否合格。

### 15.7 磷（黃磷或白磷）

15.7.1 無論何時，對磷進行裝載、運輸和卸載都必須使其處於最小深度為 760 mm 的水墊之下。在卸載作業期間，應做出安排以確保水能佔據已卸去的磷的體積。裝載磷的液貨艙排出的水，只能被輸回到岸上的裝置。

15.7.2 按設計的裝載條件，並應考慮磷所處的深度、相對密度和裝卸方法，液貨艙的設計和試驗應至少能使液貨艙能承受高出艙頂 2.4 m 的水頭。

15.7.3 液貨艙的設計應儘量減少液體磷與其水墊之間的交界面積。

15.7.4 在水墊上面至少應保持 1% 艙容的空間。在這些空間內應充以惰性氣體，或用兩個具有通風帽的不同高度豎管對其進行自然通風，豎管至少高出甲板 6 m，高出泵室頂至少為 2 m。

15.7.5 液貨艙的所有開口都應位於艙的頂部，用於製造開口的附件和連接件的材料均應為能抵禦五氧化二磷的材料。

15.7.6 應在溫度不超過 60°C 的條件下裝載磷。

15.7.7 液貨艙的加熱裝置應位於液貨艙外，並應備有合適的溫度控制方法以確保磷的溫度不超過 60°C。應裝設高溫警報器。

15.7.8 在液貨艙周圍的所有留空處所內，均應設有主管機關接受的水淋系統。當發生磷溢出情況時，該系統能自動運轉。

15.7.9 應在第 15.7.8 段所述的留空處所配備有效的機械通風裝置，在遇到緊急情況時應能迅速將其關閉。

15.7.10 在裝卸磷時，應由船上中央系統予以控制，該系統除有高液位警報器外，還應能保證液貨艙不會溢流，而且遇緊急情況時，能在船上或岸上迅速停止裝卸作業。

15.7.11 在貨物駁運中，應將甲板上的水龍帶與水源連接，並保持在整個作業中有水流通，以保證能夠立刻用水洗去任何溢漏的磷。

15.7.12 船、岸裝卸管路接頭的型式應經主管機關認可。

## **15.8 環氧丙烷或環氧乙烷含量（按質量）不超過 30%的環氧乙烷/環氧丙烷混合物**

15.8.1 按本節規定運輸的貨品，不應含有乙炔。

15.8.2 除非液貨艙已被適當清洗，凡以前三個航次中有一個航次曾裝過已知能產生催化聚合作用的貨品的液貨艙，不得裝運這些貨品。已知能產生催化聚合作用的貨品例如：

- .1 無機酸（如硫酸、鹽酸、硝酸）；
- .2 羧酸和酞（如甲酸、醋酸）；
- .3 鹵化羧酸（如氯醋酸）；
- .4 磺酸（如苯磺酸）；
- .5 苛性鹼（如氫氧化鈉、氫氧化鉀）；

- .6 氨及氨溶液；
- .7 胺及胺溶液；和
- .8 氧化物質。

15.8.3 在裝載前，應對液貨艙進行徹底和有效的清洗，以便清除液貨艙及其管路內以前所裝貨物的所有痕跡，但前一次所裝貨物是環氧丙烷或環氧乙烷/環氧丙烷混合物者除外。在用非不鏽鋼建造的鋼質液貨艙內裝載氨時，應予特別注意。

15.8.4 在任何情況下，應以適當的試驗或檢查對液貨艙及其管路的清潔程序的有效性進行檢查，以確定其不存在酸或鹼的物質痕跡，這些物質的存在可能會產生危險情況。

15.8.5 在液貨艙首次裝載這些貨品之前，每次均應進入液貨艙並進行檢查，確保不存在污跡、大量的鐵鏽沉澱物和明顯的結構缺陷。如果液貨艙連續載運這些貨品，則此種檢查的間隔期應不超過兩年。

15.8.6 裝運這些貨品液貨艙應為鋼或不鏽鋼結構。

15.8.7 在對裝運這些貨品的液貨艙及其附屬管路系統進行徹底清洗或驅氣以後方可裝運其他貨物。

15.8.8 所有閘門、法蘭、附件和附屬設備的型式必須適用於這些貨品，並應採用符合認可標準的鋼或不鏽鋼製造。閘門的閘盤或閘盤面、閘座和其他磨損部分，應採用含鉻不少於 11% 的不鏽鋼製造。

15.8.9 所有墊圈應使用不會與這些貨品起反應、不會溶解於這些貨品、不會降低這些貨品的自燃溫度、耐火以及具有足夠力學性能的材料製造。墊圈接觸貨物的一面應為聚四氟乙烯（PTFE）或按其惰性



具有同樣安全程度的材料。可以允許用帶有 PTFE 填料或類似的氟化聚合物填料的螺旋纏繞不鏽鋼作為密封墊圈。

15.8.10 如果使用絕緣和填料，應採用不與這些貨品起反應、不會溶解於這些貨品也不會降低這些貨品的自燃溫度的材料。

15.8.11 下列材料一般不宜被用作裝載這些貨品的圍護系統中的墊圈、填料和類似用途，若要使用，須在主管機關批准之前進行試驗：

- .1 氯丁橡膠或天然橡膠（如果會與這些貨品接觸）；
- .2 石棉或石棉用的黏結料；
- .3 含有鎂氧化物的材料，如礦物棉。

15.8.12 在貨物液體和蒸氣的管路中，禁止使用螺紋接頭連接。

15.8.13 裝載和卸載的管路應延伸至距液貨艙或任何聚液井底部 100 mm 之內。

15.8.14.1 用於裝有這些貨品的液貨艙的圍護系統應設有由閥門控制的蒸氣回路接頭；

15.8.14.2 在裝卸這些貨品時，不能使液貨艙與大氣相通；如果在液貨艙裝載期間將蒸氣輸回到岸上，連接到該貨品圍護系統的蒸氣回路系統與所有其他圍護系統分開；

15.8.14.3 在卸貨作業期間，液貨艙的壓力必須保持在 0.007 MPa 錶壓以上。

15.8.15 只能使用深井泵、液壓操作的可潛泵或惰性氣體置換法卸貨。每一貨泵的佈置應確保在泵的排出管路被關閉或阻塞時不致使貨品大量生熱。

15.8.16 載運這些貨品的液貨艙的透氣管應獨立於載運其他貨品的液貨艙的透氣管。應配備無需向大氣開口而能對貨艙進行取樣的設施。

15.8.17 用於駁運這些貨品的貨物軟管上應標明“駁運烯化氧專用”。

15.8.18 與載運環氧丙烷的整體重力液貨艙相鄰的液貨艙、留空處所和其他圍蔽處所均應裝載相容的貨物(第 15.8.2 段中所列貨物是被作為不相容貨物的例子)或充入合適的惰性氣體惰化。應對設有獨立液貨艙的任何貨艙處所進行惰化。應監測被惰化的處所和液貨艙中的這些貨品和氧氣。這些處所內的含氧量均應保持在 2% 以下。允許使用便攜式取樣設備。

15.8.19 在貨泵或管系內存在這些貨品時，在任何情況下均應禁止空氣進入該貨泵或管系。

15.8.20 在拆卸岸上管路之前，應通過設在裝貨端管上的閥門釋放液體和蒸汽管路內的壓力。不准將從這些管路中流出的液體和蒸氣排入大氣。

15.8.21 可以在壓力液貨艙或獨立重力液貨艙或整體重力液貨艙內載運環氧丙烷。環氧乙烷/環氧丙烷混合物應在獨立重力液貨艙或壓力液貨艙內載運。液貨艙的設計應能使其承受貨物裝載、運輸和卸載中預計會遇到的最大壓力。

15.8.22.1 用於載運環氧丙烷的設計壓力小於 0.06 MPa 錶壓的液貨艙及用於載運環氧乙烷/環氧丙烷混合物的設計壓力小於 0.12 MPa 錶壓的液貨艙均應具有冷卻系統，以保持貨物低於基準溫度。

15.8.22.2 對於在有限航區營運或從事有限時間航行的船舶，主管機關可免除對設計壓力小於 0.06 MPa 錶壓的液貨艙的製冷要求，在此種情況下應考慮到對該液貨艙的隔熱措施。在《國際散裝運輸危險化學品適裝證書》的載運條件中應標明該船被允許營運的航區和年限。

15.8.23.1 任何冷卻系統均應能保持艙內液體溫度低於在圍護壓力下液體的沸點溫度，至少應配備能根據液貨艙內的溫度變化進行自動調節的兩整套冷卻裝置；對每套裝置應配齊正常作業時所必需的輔助設備。還應能對其控制系統進行人工操作。應設有一個警報器用於指出溫度控制的故障。每個冷卻系統應能足以保持液體貨物的溫度低於該系統的基準溫度。

15.8.23.2 作為替代安排，可設 3 套冷卻裝置，其中任何 2 套裝置應能足以保持液體溫度低於基準溫度。

15.8.23.3 如果冷卻媒介與貨品之間僅用單壁分隔，其應不與這些貨品發生起反應。

15.8.23.4 禁止使用需要對貨品進行壓縮的冷卻系統。

15.8.24 壓力釋放閥的調定壓力應不小於 0.02 MPa 錶壓，對於載運環氧丙烷的壓力液貨艙，應不大於 0.7 MPa 錶壓，對於載運環氧乙烷/環氧丙烷混合物的壓力液貨艙，應不大於 0.53 MPa 錶壓。

15.8.25.1 應將用於裝載這些貨品的液貨艙的管系與所有其他艙（包括空液艙）的管系隔離（按第 3.1.4 段），若用於所裝液貨艙的管系不是獨立的（如第 1.3.18 段），則可拆去短管、閥件或其他管段，並在這些位置安裝盲板法蘭，以達到所需的管系分隔。所要求的分隔適用於所有液體和蒸氣管系、液體和蒸氣透氣管路以及任何其他可能的連接管路，例如公用惰性氣體供給管路等。

15.8.25.2 只有按照主管機關批准的貨物裝卸計劃才可運輸這些貨品。所擬定的每種裝載佈置應顯示在單獨的貨物裝卸計劃中。貨物裝卸計劃應顯示整個貨物管系和為符合上述管系分隔要求需安裝的盲板法蘭的位置。船上應保存 1 份經認可的貨物裝卸計劃的副本。應對《國際散裝運輸危險化學品適裝證書》予以簽註，包括提及經批准的貨物裝卸計劃。

15.8.25.3 每次船舶首次裝載這些貨品之前以及在裝運過其他貨品後又轉為裝載這些貨品之前，均應從港口當局所承認的負責人員處獲得能證明該船業已達到所需管系分隔的證書並將其存於船上。在盲板法蘭和管路法蘭的每個接頭處均應由負責人員裝設金屬線和鉛封，以保證盲板法蘭不被誤拆。

15.8.26.1 在基準溫度下，任何液貨艙的載貨量均不得超過 98%。

15.8.26.2 一個液貨艙所能裝載貨物的最大容積應為：

$$V_L = 0.98V \frac{\rho_R}{\rho_L}$$

式中：  $V_L$  = 液貨艙載運的最大容積

$V$  = 該液貨艙的容積

$\rho_R$  = 貨物在基準溫度時的密度

$\rho_L$  = 貨物在裝載溫度和裝載壓力下的密度。

15.8.26.3 每一液貨艙在可適用的每一裝載溫度和可適用的最大基準溫度時的最大充裝極限應在主管機關批准的清單上註明。該清單的一份副本應永久放在船上，由船長保存。

15.8.27 應在合適的氮氣保護層之下載運貨物。應裝有自動補充氮氣的系統，以便在由於環境條件或製冷系統運轉故障而致使貨品溫度下降時能夠防止液貨艙的壓力不致低於 0.007 MPa 錶壓。在船上應提供充足的氮氣以便滿足自動壓力控制的需要。用於保護層的氮應為工業用純質的（體積純度為 99.9%）。通過降壓閥連接液貨艙的一組氮氣瓶可滿足上述“自動”的要求。

15.8.28 在裝載前後均應對液貨艙的蒸氣空間進行測試，以保證其含氧量按體積為 2% 或以下。

15.8.29 應設置具有能力足夠的水霧滅火系統，有效地覆蓋設有裝載支管的周圍區域以及露天甲板上的與貨品裝卸有關的管路和液貨艙的頂部。管路和噴嘴的佈置應具備  $10 \text{ l/m}^2/\text{min}$  的均勻噴灑率。遙控手動操作裝置應設在貨物區域外鄰近居住處所的合適位置，以便在受保護區域發生火災時能遙控起動水霧系統的供水泵和遙控操作該系統中通常關閉的任何閥門。應能對該水霧系統進行就地和遠距離的人工操作，且其佈置應能做到把任何泄漏的貨物沖洗掉。此外，在大氣溫度許可時，應將加壓的供水軟管與噴嘴相連接，以備在進行裝卸作業時立即使用。

15.8.30 在貨物駁運時使用的每個貨物軟管接頭處，均應配備一個能控制關閉速率的遙控截流閥。

## **15.9 氯酸鈉溶液（質量濃度為 50% 或以下）**

15.9.1 對於裝過本貨品的液貨艙及其附屬設備，只有經過徹底的清洗或驅氣後，才能裝運其他貨物。



15.9.2 一旦發生本貨品泄漏時，應立即將所有泄漏的液體徹底沖洗掉，不得延誤。為使火災危險減至最小，不允許使泄漏物乾透。

#### 15.10 硫（熔化的）

15.10.1 應對液貨艙提供通風，以便在所有載運條件下均能保持液貨艙內的整個蒸氣空間中的硫化氫濃度低於其爆炸下限的一半（即按體積低於 1.85%）。

15.10.2 如果使用機械通風系統保持液貨艙內的低氣體濃度，應設有一個警報系統以便在系統失效時發出警報。

15.10.3 通風系統的設計和佈置應防止出現硫在該系統內積存。

15.10.4 通向鄰接液貨艙的留空處所開口的設計和安裝應能防止水、硫或貨物蒸氣進入該留空處所。

15.10.5 應設有能對留空處所內的蒸氣進行取樣和分析的接頭。

15.10.6 應設有貨物溫度控制裝置，以確保硫的溫度不超過 155°C。

15.10.7 硫（熔化的）的閃點超過 60°C；但對於出現的氣體，應保證電氣設備的安全。

#### 15.11 酸類

15.11.1 不得將船體外板用作裝載礦物酸的液貨艙的周界。

15.11.2 主管機關可以考慮關於採用抗腐蝕材料作為鋼質液貨艙和有關的管系襯裏的建議。襯裏的彈性應不低於其支承周界板的彈性。

15.11.3 除非完全採用抗腐蝕材料建造或艙內裝有經認可的襯裏，確定艙壁厚度時應考慮其受貨物腐蝕的影響。

15.11.4 裝卸支管的連接法蘭應設有防護罩，以防貨物噴出的危險，該防護罩可以是移動式的；此外，還應設有滴盤，以防貨物滴漏到甲板上。

15.11.5 由於在裝載這些酸類物質時會出現產生氫的危險，所以電氣設備應符合第 10.1.4 段的規定。經認可的安全型設備應適合於在氫氣和空氣的混合氣體中使用，而且在這些處所內不得有其他着火源。

15.11.6 受本節要求約束的貨物除應符合第 3.1.1 段的分隔要求外，還須將其與燃油艙隔開。

15.11.7 應配備合適的儀器以探測貨物是否溢漏到鄰近處所。

15.11.8 貨泵艙的艙底泵裝置及排放裝置均應由抗腐蝕材料製成。

## **15.12 有毒貨品**

15.12.1 液貨艙透氣系統排放口的位置應符合下列規定：

- .1 在露天甲板以上的高度為  $B/3$  或 6 m，取大者，對於甲板液貨艙，該高度從通道步橋量起；
- .2 如設在距步橋 6 m 的範圍內，則其高度應為前後步橋以上不小於 6 m；
- .3 與通向起居和服務處所的任何開口或空氣入口間的距離不小於 15m；以及
- .4 如適用，透氣管的高度可被減至在甲板或前後步橋以上 3 m，但在透氣管上應設置經主管機關型式認可的高速透氣閥，將蒸氣和空氣的混合物以至少 30 m/s 的出口速度向上無阻擋地噴出。

15.12.2 液貨艙的透氣系統應配備能使其蒸氣回路與岸上裝置連接的接頭。

15.12.3 此類貨品：

- .1 不得在鄰接燃油艙的液貨艙內儲存；
- .2 應具有獨立的管系；以及
- .3 應將液貨艙的透氣系統與裝載無毒貨品的液貨艙的透氣系統分開。

15.12.4 液貨艙壓力釋放閥的調定壓力的最小值應為 0.02 MPa 錶壓。

### 15.13 由添加劑保護的貨物

15.13.1 在第十七章表格的“o”欄內標出的某些貨物因其化學構成的性質，在某些溫度、暴露於空氣或與催化劑接觸的條件下，可能會發生聚合、分解、氧化或其他的化學變化。通過在液體貨物中加入少量化學添加劑或通過控制液貨艙的環境，可緩和這種可能性。

15.13.2 載運這些貨物的船舶的設計應排除液貨艙和貨物裝卸系統內可能對貨物起催化作用或破壞抑制劑的任何結構材料或污物。

15.13.3 應注意對這些貨物進行充分保護，在整個航行期間能防止貨物發生有害的化學變化。載運這種貨物的船舶應備有製造商提供的保護證書，並在航行期間將其保存在船上，其上應註明：

- .1 添加劑的名稱和數量；
- .2 添加劑是否需依賴氧氣；
- .3 將添加劑加入產品的日期及添加劑的有效期；

- .4 保證添加劑有效期的任何溫度界限；和
- .5 如果航行期超過添加劑有效期時應採取的措施。

15.13.4 以排除空氣作為防止貨物氧化的方法的船舶應符合第 9.1.3 段的要求。

15.13.5 應在無惰化的情況下（在容積不大於 3000 m<sup>3</sup> 的液貨艙中）載運含有依賴氧氣的添加劑的貨品。不應將這種貨物裝在根據《SOLAS 公約》第 II-2 章的要求需要進行惰化的液貨艙中進行運輸\*。

15.13.6 透氣系統的設計應能消除由於化學聚合物增多而造成的阻塞。透氣設備應為能夠定期檢查其使用性能的类型。

15.13.7 對於通常在融化狀態下載運的貨物，其結晶或凝固可能會導致液貨艙中部分貨物的抑制劑消耗。隨後的重新融化可能產生無抑制液體的積囊，進而出現聚合的危險。為防止這種情況發生，應採取措施保證貨物在任何時候和在液貨艙的任何部分都不會產生全部或局部的結晶或凝固。任何所需的加熱裝置應能保證不使液貨艙內任何部分的貨物被過份加熱至可能產生危險聚合反應的程度。若蒸汽盤管溫度可能導致貨物被過分加熱，應使用間接的低溫加熱系統。

#### **15.14 在 37.8°C 時絕對蒸氣壓力超過 0.1013 MPa 的貨物**

15.14.1 對於第十七章表格的“o”欄內提及本節的貨物，除非將貨物系統設計成能承受貨物在 45°C 時的蒸氣壓力，否則應設置機械製冷系統。如將貨物系統設計成能承受貨物在 45°C 時的蒸氣壓力且不設置製冷系統時，則應在《國際散裝運輸危險化學品適裝證書》的載運條件中註明，指出液貨艙所需的安全閥調定壓力。

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\* 關於裝載苯乙烯單體的等效安排參見 MSC/Circ.879 及 MSC/Circ.879/Corr.1 通函。

15.14.2 在液貨艙的設計壓力下，機械製冷系統應能將液體溫度保持在沸點以下。

15.14.3 若船舶在有限季節內營運於有限航區或從事有限時間的航行，則有關主管機關可同意免除關於製冷系統的要求。應將任何此類同意及列明的關於對載運區域和季節的限制或對航行時間的限制，包括在《國際散裝運輸危險化學品適裝證書》的載運條件內。

15.14.4 應設有能在裝載作業時把排出的氣體輸回岸上的管路接頭。

15.14.5 應對每個液貨艙均配備 1 隻壓力錶，用以指示貨物上面的蒸氣空間中的壓力。

15.14.6 如需對貨物進行冷卻，則應在每個液貨艙的頂部和底部設置溫度計。

15.14.7.1 在基準溫度（R）下，任何液貨艙內的液貨量均不得超過 98%；

15.14.7.2 一個液貨艙所能裝載貨物的最大容積（ $V_L$ ）應為：

$$V_L = 0.98V \frac{\rho_R}{\rho_L}$$

式中：V = 該液貨艙的容積

$\rho_R$  = 貨物在基準溫度（R）時的密度

$\rho_L$  = 貨物在裝載溫度下的密度

15.14.7.3 每一液貨艙在可適用的每一裝載溫度和可適用的最大基準溫度時的最大充裝極限應在主管機關批准的清單中列明。該清單的一份副本應永久放在船上，由船長保存。



### 15.15 點燃溫度低和易燃性範圍寬的貨物

已刪除。

### 15.16 貨物污染

15.16.1 已刪除。

15.16.2 若在第十七章表格的“o”欄內提及本節，則不允許使該貨物接觸到水，並應符合下列要求：

- .1 對於裝有貨物的液貨艙，其壓力/真空釋放閥的空氣進口應位於露天甲板以上至少 2 m 處。
- .2 在第七章所要求的貨物溫度控制系統內，不得用水或蒸汽作為熱量傳遞的媒介。
- .3 不得在鄰接固定壓載艙或水艙的液貨艙中載運此類貨物，除非這些艙室為空的而且乾燥。
- .4 在與污液艙或裝有壓載水或污液或可能引起危險反應的其他含水貨物的液貨艙鄰接的液貨艙內不得載運這些貨物。用於該類液貨艙的泵、管路或透氣管路均應獨立於裝載這些貨物的液貨艙的同類設備。除非有管隧的封閉，污液艙的管路或壓載管路不得穿過裝載這些貨物的液貨艙。

### 15.17 增加通風的要求

對於某些貨品，第 12.1.3 段中所述的通風系統的最小能力應為按該處所的總容積至少每小時換氣 45 次。通風系統的排氣導管距通向起居處所、工作區域或其他類似處所的開口及通風系統的進口至少應為 10 m，並應至少高出液貨艙甲板 4 m。

## 15.18 對特種貨泵艙的要求

用於某些貨品的貨泵艙應位於甲板平面上，或將貨泵設置在液貨艙內。對於低於甲板的貨泵艙，主管機關可給予特殊考慮。

## 15.19 溢流控制

15.19.1 本節的規定適用於第十七章表格的“o”欄內專門提及的貨物，是對測量裝置的補充要求。

15.19.2 當用於安全裝載的任何重要系統出現動力故障時，應能向有關操作人員發出警報。

15.19.3 當用於安全裝載的任何重要系統不運行時，應立即停止裝載作業。

15.19.4 在裝載作業前，應能對液位警報器進行試驗。

15.19.5 按第 15.19.6 段要求設置的高液位警報系統應獨立於按第 15.19.7 段要求設置的溢流控制系統，並應獨立於第 13.1 段要求的設備。

15.19.6 在液貨艙內應設置符合第 15.19.1 至 15.19.5 段規定的且能顯示液貨艙內液位達到正常滿載時的聲光高液位警報器。

15.19.7 本節所要求的液貨艙溢流控制系統應符合下列要求：

- .1 當液貨艙的液位超過正常滿載狀態而液貨艙的正常裝載程序不能制止液位上升時，該系統即能開始工作；
- .2 能向船上操作人員發出液貨艙溢流的聲光警報；

- .3 能提供與順序關閉岸泵和（或）閘門和關閉船上閘門相一致的信號。信號以及泵和閘門的關閉可由操作人員予以控制。只有從主管機關和港口國有關當局獲得專門批准後才允許船上使用自動關閉閘門。

15.19.8 液貨艙的裝載率（LR）應不超過：

$$LR = \frac{3600U}{t} (\text{m}^3/\text{h})$$

式中：U = 發出液位信號時液面以上空間的容積（m<sup>3</sup>）；

t = 從發出信號到完全停止貨物流入液貨艙所需的時間（s）。此時間應為每一順序動作（如操作人員對信號的響應、停泵和關閉閘門等）所需時間的總和；

此外，還應考慮管路系統的設計壓力。

## 15.20 硝酸辛酯（C<sub>7</sub>-C<sub>9</sub>），所有異構體

15.20.1 應將該貨品的運輸溫度保持在 100°C 以下以防其發生自續放熱分解反應。

15.20.2 不可將該貨品裝於永久固定在船舶甲板上的獨立壓力容器內進行運輸，除非：

- .1 將液貨艙與火充分隔絕；以及
- .2 船上設有用於液貨艙的浸水系統，使貨品溫度能保持在 100°C 以下，並且當火的溫度為 650°C 時，液貨艙中的溫升不超過每小時 1.5°C。

## 15.21 溫度傳感器

應使用溫度傳感器監測貨泵的溫度，以探測由泵的故障造成的過熱情況。

## 第十六章

### 操作要求

#### 16.1 每個液貨艙的最大允許裝貨量

16.1.1 要求在 1 型船舶內載運的貨物，其任一液貨艙所裝貨物量不得超過 1,250 m<sup>3</sup>。

16.1.2 要求在 2 型船舶內載運的貨物，其任一液貨艙所裝貨物量不得超過 3,000 m<sup>3</sup>。

16.1.3 對於在環境溫度下載運液體貨物的液貨艙，應考慮到所裝貨物可能達到的最高溫度，避免在航行期間液貨艙被液體充滿。

#### 16.2 貨物資料

16.2.1 在本規則所適用的每艘船上，應備有本規則的副本，或備有納入了本規則要求的船旗國規章。

16.2.2 對於需要散裝的任何貨物，應在運輸單證上標明該貨物在第十七章或十八章中所列的名稱、或其在 MEPC.2/Circ.通函的最新版本中所用的名稱或其被臨時審定的名稱。如果貨物為混合物，還應提供一份指出了使貨品產生危害的主要危險成分的分析；若有可能則應有一份完整的分析。此種分析應經過製造商或經主管機關承認的獨立專家的核證。

16.2.3 船上應備有提供安全載運散裝貨物所必需的數據的資料，並供所有有關人員查閱。此種資料應包括貨物裝載計劃，存放在易於接近處，指明船上的所有貨物，包括所載運的每種危險化學品：

- .1 對貨物進行安全圍護所必需的物理和化學性質（包括其反應性）的充分描述；
- .2 發生溢漏或滲漏時應採取的措施；
- .3 防止人體意外接觸的措施；
- .4 消防程序和滅火劑；
- .5 用於貨物駁運、液貨艙清洗、除氣和壓載的程序；以及
- .6 對於那些需要穩定或抑制的貨物，如果沒有這些段落所要求的證書，應拒絕載運。

16.2.4 如果不能得到安全運輸貨物所需的充足資料，應拒絕運輸該貨物。

16.2.5 凡能釋放出覺察不到的劇毒蒸氣的貨物，除非在貨物中放入能覺察到的添加劑，否則不得運輸。

16.2.6 凡第十七章表格“o”欄內提及本段，應在運輸單證上標明該貨物在 20°C 時的黏度，如果該貨物在 20°C 時的黏度超過 50 MPa.s，則在運輸單證中應標明該貨物在其黏度為 50 MPa.s 時的溫度。

16.2.7 刪除。

16.2.8 刪除。



16.2.9 凡第十七章表格“o”欄內提及本段，在運輸單證中應標明該貨物的熔點。

### 16.3 人員培訓

16.3.1 所有使用保護設備的人員均應經過適當的培訓，同時還應對他們進行與他們的職務相稱的應急情況下採取必要程序的基本培訓。

16.3.2 從事貨物操作的人員在貨物裝卸程序方面應經過適當的培訓。

16.3.3 根據本組織制定的指南，對高級船員應進行處理涉及到有關貨物的滲漏、遺漏或火災的應急措施培訓，還應對他們中足夠數目的人進行關於所載貨物的主要急救方法的講授和培訓。

### 16.4 液貨艙的開口及進入液貨艙

16.4.1 在裝卸和運載會產生易燃和（或）有毒蒸氣的貨物時，或在卸去這種貨物後進行壓載時，或在裝卸這種貨物時，液貨艙蓋應始終保持關閉。如裝有任何有危害性的貨物，只允許在必要時才能開啓液貨艙的艙蓋、液貨位測量孔、液貨艙的清洗出入口蓋。

16.4.2 人員不得進入液貨艙以及這些液貨艙周圍的留空處所、貨物裝卸處所或其他封閉處所，除非：

- .1 該艙室已無有毒蒸氣，並且不缺乏氧氣；或
- .2 人員已穿戴呼吸器具和其他必要的保護設備，並且整個操作將在一位負責的高級船員的密切監視下進行。

16.4.3 對於僅有易燃危險的處所，只有在一位負責的高級船員的密切監視下，才能准許人員進入。

### 16.5 貨物樣品的儲存

16.5.1 須保存在船上的貨物樣品應儲存在位於貨物區域的指定處所內，在特殊情況下，經主管機關批准可將其存放在其他處所內。

16.5.2 儲存處所應符合下列要求：

- .1 具有分隔的格柵，以防航行時瓶子移動；
- .2 由完全能抵禦擬儲存的各種液體的材料製成；並且
- .3 設有合適的通風裝置。

16.5.3 彼此發生危險反應的樣品不能相互緊靠儲存。

16.5.4 樣品留在船上的時間不應超過所要求的時間。

### 16.6 不得暴露於過熱狀態下的貨物

16.6.1 如果液貨艙或附屬管路內的貨物局部過熱可能產生危險的反應，如聚合、分解、熱不穩定性或放出氣體等，則應將這些貨物的裝載和運輸應與溫度高過其初始反應溫度的其他貨品充分隔離（見第 7.1.5.4 段）。

16.6.2 載運這些貨物的液貨艙內的加熱盤管應予盲斷或採取等效安全措施。

16.6.3 未經隔熱的甲板液貨艙不能載運熱敏貨品。

16.6.4 為了避免溫度升高，這些貨物不得在甲板艙內裝運。

## 第十七章

## 最低要求一覽表

對於僅有污染危害的有毒液體物質的混合物，如已按照《MARPOL 公約》附則 II 第 6.3 條的要求進行過評估或臨時評估，則可根據本規則對適用於本章的有毒液體物質（未另列明的）的要求進行載運。

## 註釋

貨品名稱 (a 欄)	對任何託運的散貨，在運輸單證中應使用貨品名稱。任何其他名稱可以放在貨品名稱後的括號內。某些貨品名稱可能與本規則以前版本中所列的名稱不一致。
聯合國編號 (b 欄)	已刪除
污染類別 (c 欄)	字母 X, Y 或 Z 係指按《MARPOL 公約》附則 II 所確定的每一貨品的污染類別
危害性 (d 欄)	“S” 係指由於其安全危害而被收錄到本規則的貨品； “P” 係指由於其污染危害而被收錄到本規則內的貨品； “S/P” 係指既由於其安全危害又由於其污染危害而被收錄到本規則內的貨品。
船型 (e 欄)	1： 1 型船舶（第 2.1.2.1 段） 2： 2 型船舶（第 2.1.2.2 段） 3： 3 型船舶（第 2.1.2.3 段）
艙型 (f 欄)	1： 獨立液貨艙（第 4.1.1 段） 2： 整體液貨艙（第 4.1.2 段） G： 重力液貨艙（第 4.1.3 段） P： 壓力液貨艙（第 4.1.4 段）
液貨艙透氣 (g 欄)	Cont： 控制式透氣 Open： 開放式透氣
液貨艙環境 控制 (h 欄)	Inert： 惰化（第 9.1.2.1 段） Pad： 液體墊或氣體墊（第 9.1.2.2 段） Dry： 乾燥（第 9.1.2.3 段） Vent： 自然或強制通風（第 9.1.2.4 段） No： 根據本規則無特殊要求

<p>電氣設備 (i 欄)</p>	<p>溫度等級 (i') T1 至 T6 :                      - 表示無要求                      空白 無資料                      設備分類 (i'') IIA、IIB 或 IIC :                      - 表示無要求                      空白 無資料                      閃點 (i''') Yes : 閃點超過 60°C (第 10.1.6 段)                      No : 閃點不超過 60°C (第 10.1.6 段)                      NF : 非易燃貨品 (第 10.1.6 段)</p>
<p>測量 (j 欄)</p>	<p>O : 開放式測量 (第 13.1.1.1 段)                      R : 限制式測量 (第 13.1.1.2 段)                      C : 封閉式測量 (第 13.1.1.3 段)</p>
<p>蒸氣探測 (k 欄)</p>	<p>F : 易燃蒸氣                      T : 有毒蒸氣                      No : 表示本規則無特殊要求</p>
<p>防火 (l 欄)</p>	<p>A : 抗乙醇泡沫或多用途泡沫                      B : 普通泡沫；包括所有非抗乙醇型的泡沫，其中包括氟化蛋白質和水膜泡沫 (AFFF)                      C : 水霧                      D : 化學乾粉                      No : 本規則無特殊要求</p>
<p>構造材料 (m 欄)</p>	<p>已刪除</p>
<p>緊急逃生 (n 欄)</p>	<p>E : 見第 14.3.1 段                      No : 本規則無特殊要求</p>
<p>特殊和操作性要求 (o 欄)</p>	<p>如果在第十五章和 (或) 第十六章中特別提及，這些要求應為其他各欄之外的附加要求。</p>

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
乙酸	Z	S/P	3	2G	Cont	No	T1 IIA	No	R	F	A	Yes	15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,15.11.9,16.2.9
乙酸酐	Z	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	A	Yes	15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,15.11.9,16.6.3
丙酮羧醇	Y	S/P	2	2G	Cont	No	T1 IIA	Yes	C	T	A	Yes	15.13,15.12,15.17,15.18,15.19,16.6.1,16.6.2,16.6.3
乙腈	Z	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	15.12,15.19.6
丙烯酸	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	15.13,15.19.6,16.6.1,16.2.9
丙烯酸	Y	S/P	2	2G	Cont	No	T1 IIB	No	C	F-T	A	Yes	15.12,15.13,15.17,15.19
聚醚多元醇分散體中的丙烯酸 - 苯乙烯共聚物	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6
己二腈	Z	S/P	3	2G	Cont	No	IIB	Yes	R	T	A	No	16.2.9
甲酸胺工藝 (90%或以上)	X	S/P	2	2G	Open	No		Yes	O	No	AC	No	15.19.6,16.2.9
乙醇 (C9-C11) 聚 (2.5-9) 乙氧基化物	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9
乙醇 (C6-C17) (仲) 聚 (3-6) 乙氧基化物	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9
乙醇 (C6-C17) 聚 (7-12) 乙氧基化物	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6,16.2.9
乙醇 (C12-C16) 聚 (1-6) 乙氧基化物	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9
乙醇 (C12-C16) 聚 (20+) 乙氧基化物	Y	P	3	2G	Open	No		Yes	O	No	A	No	16.2.9
乙醇 (C12-C16) 聚 (7-19) 乙氧基化物	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9
乙醇 (C13+)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.9
烷烴 (C6-C9)	X	P	2	2G	Cont	No		No	R	F	A	No	15.19.6
異烷烴與環烷(C10-C11)	Z	P	3	2G	Cont	No		No	R	F	A	No	
異烷烴與環烷(C12+)	Z	P	3	2G	Cont	No		No	R	F	A	No	
正-烷烴(C10+)	Z	P	3	2G	Cont	No		No	R	F	AB	No	
烯基(C16-C20)琥珀酸酐	Z	S/P	3	2G	Cont	No		Yes	C	T	No	Yes	15.12,15.17,15.19



第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
烷芳基磷酸酯混合物(二苯甲苯基磷酸酯 40%以上, 鄰位異構物 0.02%以下)	X	S/P	1	2G	Cont	No	T1	IIA	Yes	C	T	ABC	No	15.12,15.17,15.19
烷化 (C4-C9) 受阻酚	Z	S/P	2	2G	Open	No	-	-	Yes	O	No	BD	No	15.19.6,16.2.6,16.2.9
烷基苯, 烷基二氫茚, 烷基萘混合物(各 C12-C17)	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
烷基 (C5-C8) 苯	X	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
烷基 (C9+) 苯	Z	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	
烷基 (C12+) 二甲胺	X	S/P	1	2G	Cont	No	-	-	Yes	C	T	BCD	Yes	15.12,15.17,15.19
烷基二硫代氨基甲酸鹽 (C19-C35)	Y	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9
烷基二硫代噻二唑 (C6-C24)	Z	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	
烷基酯共聚物 (C4-C20)	Y	P	2	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9
烷基 (C8-C10) / (C12-C14) : (40%或以下/60%或以上) 聚葡萄糖溶液 (55%或以下)	Y	P	3	2G	Open	No	-	-	Yes	O	No	No	No	15.19.6,16.2.6,16.2.9
烷基 (C8-C10) / (C12-C14) : (60%或以上/40%或以下) 聚葡萄糖溶液 (55%或以下)	Y	P	3	2G	Open	No	-	-	Yes	O	No	No	No	16.2.9,16.2.6
烷基 (C8-C40) 酚硫化物	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
烷基 (C8-C9) 芳香劑中的苯胺	Y	P	2	2G	Cont	No	-	-	No	R	F	A	No	15.19.6
烷基 (C9-C15) 苯基丙氧基化物	Z	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	
烷基 (C8-C10) / (C12-C14) : (50%/50%) 聚葡萄糖溶液 (55%或以下)	Y	P	3	2G	Open	No	-	-	Yes	O	No	No	No	16.2.9,16.2.6
烷基 (C12-C14) 聚葡萄糖溶液 (55%或以下)	Y	P	3	2G	Open	No	-	-	Yes	O	No	No	No	15.19.6,16.2.9
烷基 (C8-C10) 聚葡萄糖溶液 (65%或以下)	Y	P	3	2G	Open	No	-	-	Yes	O	No	No	No	16.2.6

## 第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
烷基 (C10-C20, 飽和及不飽和) 亞磷酸鹽	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	16.2.9	
酚的烷基磺酸酯	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	15.19.6,16.2.6	
丙烯酸	Y	S/P	2	2G	Cont	No	T2 IIB	No	C	F-T	A	Yes	15.12,15.17,15.19	
丙烯基氨	Y	S/P	2	2G	Cont	No	T2 IIA	No	C	F-T	A	Yes	15.12,15.17,15.19	
硫酸鈉溶液	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6	
氨基乙醇胺	Z	S/P	3	2G	Open	No	T2 IIA	Yes	O	No	A	No		
2-氨基-2-甲基-1-丙醇	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
氨水的 (28%或以下)	Y	S/P	2	2G	Cont	No	No	NF	R	T	ABC	Yes		
磷酸氫二鈉溶液	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
硝酸鈉溶液 (93%或以下)	Z	S/P	2	1G	Open	No	No	NF	O	No	No	No	15.2,15.11.4,15.11.6,15.18,15.19.6,16.2.9	
多磷酸鈉溶液	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
硫酸鈉溶液	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
硫化鈉溶液 (45%或以下)	Y	S/P	2	2G	Cont	No	No	No	C	F-T	A	Yes	15.12,15.17,15.19,16.6.1,16.6.2,16.6.3	
醋酸戊酯 (所有異構物)	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6	
正戊醇	Z	P	3	2G	Cont	No	No	No	R	F	AB	No		
戊醇, 伯	Z	P	3	2G	Cont	No	No	No	R	F	AB	No		
仲戊醇	Z	P	3	2G	Cont	No	No	No	R	F	AB	No		
叔戊醇	Z	P	3	2G	Cont	No	No	No	R	F	A	No		
叔戊醇甲基醚	X	P	2	2G	Cont	No	T3	No	R	F	A	No	15.19.6	
苯胺	Y	S/P	2	2G	Cont	No	T1 IIA	Yes	C	T	A	No	15.12,15.17,15.19	
芳基羧酸 (C11-C50)	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9	

第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
航空烷基化汽油 (C8 烷属烃及異構烷属沸點 95 – 120°C)	X	P	2	2G	Cont	No	No	No	R	F	B	No	15.19.6
銀長鏈 (C11 – C15) 烷芳基磺酸酯	Y	SP	2	2G	Open	No	Yes	O	No	No	AD	No	15.12.3, 15.19, 16.2.6, 16.2.9
苯和含10%或以上的苯的混合物 (i)	Y	SP	3	2G	Cont	No	TI	IIA	No	C	F-T	No	15.12.1, 15.17, 15.19.6, 16.2.9
苯甲酸, 三辛酯	Y	P	2	2G	Open	No	Yes	O	No	No	AB	No	15.19.6, 16.2.6
乙酸辛酯	Y	P	2	2G	Open	No	Yes	O	No	No	A	No	
苯甲醇	Y	P	3	2G	Open	No	Yes	O	No	No	A	No	
溴氯甲烷	Z	SP	3	2G	Cont	No	NF	R	T	No	No	No	
乙酸丁酯 (所有異構物)	Y	P	3	2G	Cont	No	No	R	F	A	No	No	15.19.6
正丙酸丁酯 (所有異構體)	Y	SP	2	2G	Cont	No	T2	IIB	No	R	F-T	No	15.13, 15.19.6, 16.6.1, 16.6.2
叔丁醇	Z	P	3	2G	Cont	No	No	R	F	A	No	No	
丁胺 (所有異構物)	Y	SP	2	2G	Cont	No	No	R	F-T	A	Yes	Yes	15.12, 15.17, 15.19.6
丁苯 (所有異構物)	X	P	2	2G	Cont	No	No	R	F	A	No	No	15.19.6
鄰苯二甲酸丁基辛酯	X	P	2	2G	Open	No	Yes	O	No	No	A	No	15.19.6
鄰苯二甲酸丁基辛酯 (所有異構物)	Y	P	3	2G	Cont	No	No	R	F	A	No	No	15.19.6
乙基癸基十六烷基/二十烷基異丁烯酸混合物	Y	SP	2	2G	Cont	No	Yes	R	No	AD	No	No	15.13, 16.6.1, 16.6.2, 15.19.6
丁二醇	Z	P	3	2G	Open	No	Yes	O	No	No	A	No	
1,2-環氧乙烷	Y	SP	3	2G	Cont	Inert	T2	IIB	No	R	F	AC	No
													15.18.1-15.18.7, 15.8.12, 15.8.13, 15.8.16, 15.8.17, 15.8.18, 15.8.19, 15.8.21, 15.8.25, 15.8.27, 15.8.29, 15.19.6
正丁醚	Y	SP	3	2G	Cont	Inert	T4	IIB	No	R	F-T	A	No
													15.4.6, 15.12, 15.19.6
甲基丙烯酸丁酯	Z	SP	2	2G	Cont	No	IIA	No	R	F-T	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
丙酸正丁脂	Y	P	3	2G	Cont	No	No	R	F	A	No	No	15.19.6

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
丁醛 (所有異構物)	Y	S/P	3	2G	Cont	No	T3	IIA	No	R	F-T	A	No 15.19.6
丁酸	Y	S/P	3	2G	Cont	No			Yes	R	No	A	No 15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,15.15,19.6
γ-丁內酯	Y	P	3	2G	Open	No			Yes	O	No	AB	No 15.19.6
碳酸鈣結晶漿液	Z	P	3	2G	Open	No			Yes	O	No	AB	No
次氯酸鈣溶液 (15%或以下)	Y	S/P	2	2G	Cont	No			NF	R	No	No	No 15.19.6
次氯酸鈣溶液 (15%或以上)	X	S/P	1	2G	Cont	No			NF	R	No	No	No 15.19,16.2.9
長鏈烷基 (C5-C10) 酚鹽鈣	Y	P	3	2G	Open	No			Yes	O	No	A	No
長鏈烷基 (C11-C40) 酚鹽鈣	Z	P	3	2G	Open	No			Yes	O	No	A	No
長鏈烷基酚鹽硫化物鈣 (C8-C40)	Y	P	2	2G	Open	No			Yes	O	No	AB	No 15.19.6,16.2.6,16.2.9
ε-己內酰胺 (熔化的或水溶液)	Z	P	3	2G	Open	No			Yes	O	No	A	No
二硫化碳	Y	S/P	2	1G	Cont	Pad+ inert	T6	IIC	No	C	F-T	C	No 15.3,15.12,15.19
四氯化碳	Y	S/P	2	2G	Cont	No			NF	C	T	No	No 15.12,15.17,15.19.6
蓖麻油 (含量少於2%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No 15.19.6,16.2.6
甲基丙烯酸十六~二十甘肅混合物	Y	S/P	2	2G	Open	No			Yes	O	No	AD	No 15.13,16.6.1,16.6.2,15.19.6,16.2.9
氯化石蠟(C10-C13)	X	P	1	2G	Open	No			Yes	O	No	A	No 15.19,16.2.6
氯乙酸(80%或以下)	Y	S/P	2	2G	Cont	No			NF	C	No	No	No 15.11.2,15.11.4,15.11.6,15.11.7,15.11.8,15.12.3,15.19,16.2.9
氯苯	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	F-T	AB	No 15.19.6
氯仿	Y	S/P	3	2G	Cont	No			NF	R	T	No	Yes 15.12,15.19.6
(粗)氯乙醇	Y	S	2	2G	Cont	No		IIA	No	C	F-T	A	No 15.12,15.19
4-氯-2-甲基苯氧基酸, 二甲氧基醇溶液	Y	P	2	2G	Open	No			NF	O	No	No	No 16.2.9

第十七章

a	b	c	d	e	f	g	h	i'	i''	j	k	l	n	o
1-(4-氯苯基)-4,4-二甲基-戊-3-單	Y	P	2	2G	Open	No	No	Yes	O	No	ABD	No	15.19.6,16.2.6,16.2.9	
2-或3-氯丙酸	Z	SP	3	2G	Open	No	No	Yes	O	No	A	No	15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,16.2.9	
氯磺酸	Y	SP	1	2G	Cont	No	No	NF	C	T	No	No	15.11.2,15.11.3,15.11.4,15.11.5,15.11.6,15.11.7,15.11.8,15.12,15.16.2,15.19	
間-氯甲苯	Y	SP	2	2G	Cont	No	No	No	R	F-T	AB	No	15.19.6	
鄰-氯甲苯	Y	SP	2	2G	Cont	No	No	No	R	F-T	AB	No	15.19.6	
對-氯甲苯	Y	SP	2	2G	Cont	No	No	No	R	F-T	AB	No	15.19.6,16.2.9	
氯甲苯 (混有異構物)	Y	SP	2	2G	Cont	No	No	No	R	F-T	AB	No	15.19.6	
膾鹼鹽鹼溶液	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
檸檬酸 (70%或以下)	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
椰子油 (含量少於5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	--	Yes	O	No	ABCD	No	15.19.6,16.2.6,16.2.9	
玉米油 (含量少於10%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	--	Yes	O	No	ABCD	No	15.19.6,16.2.6	
棉子油 (含量少於12%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	--	Yes	O	No	ABCD	No	15.19.6,16.2.6,16.2.9	
甲酚 (所有異構物)	Y	SP	2	2G	Open	No	T1	IIA	Yes	O	No	AB	No	15.19.6,16.2.9
甲酚基酸, 脫酚	Y	SP	2	2G	Open	No	No	Yes	O	No	AB	No	15.19.6	
巴豆醛	Y	SP	2	2G	Cont	No	T3	IIB	No	R	F-T	A	Yes	15.12,15.17,15.19.6
1,5,9-環十二碳三烯	X	SP	1	2G	Cont	No	No	Yes	R	T	A	No	15.13,15.19,16.6.1,16.6.2	
環庚烷	X	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6	
環己烷	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6,16.2.9	
環己醇	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	15.19.6,16.2.9	
環己酮	Z	SP	3	2G	Cont	No	T2	IIA	No	R	F-T	A	No	15.19.6



## 第十七章

a	c	d	e	f	g	h	i	i''	i'''	j	k	l	n	o
環己酮，環己醇混合物	Y	S/P	3	2G	Cont	No	No	Yes	R	F-T	A	No	No	No
乙酸環己脂	Y	P	3	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
環己胺	Y	S/P	3	2G	Cont	No	T3 IIA	No	R	F-T	AC	No	No	15.19.6
1,3-環戊二烯二聚物(熔化的)	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6,16.2.6,16.2.9
環戊烷	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
環戊烯	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
對-散花煙	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
十氫七萘	Y	P	2	2G	Cont	No	No	No	R	F	AB	No	No	15.19.6
癸酸	X	P	2	2G	Open	No	No	Yes	O	No	A	No	No	16.2.9
丙烯酸癸酯	X	S/P	1	2G	Open	No	T3 IIA	Yes	O	No	ACD	No	No	15.13,15.19.6,16.6.1,16.6.2
癸醇(所有異構物)	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	No	15.19.6,16.2.9(c)
雙丙醇醇	Z	P	3	2G	Cont	No	No	No	R	F	A	No	No	
二煙基(C8-C9)二苯胺	Z	P	3	2G	Open	No	-	Yes	O	No	AB	No	No	
二煙基(C7-C13)鄰苯二甲酸酯	X	P	2	2G	Open	No	No	Yes	O	No	AB	No	No	15.19.6,16.2.6
二溴甲烷	Y	S/P	2	2G	Cont	No	No	NF	R	T	No	No	No	15.12.3,15.19
二丁胺	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	ACD	No	No	15.19.6
二丁基磷酸氫鹽	Y	P	3	2G	Open	No	No	Yes	O	No	A	E	No	15.19.9,16.2.9
鄰苯二甲酸二丁酯	X	P	2	2G	Open	No	No	Yes	O	No	A	No	No	15.19.6
二氯(代)苯(所有異構物)	X	S/P	2	2G	Cont	No	T1 IIA	Yes	R	T	ABD	No	No	15.19.6
3,4-二氯-1-丁烯	Y	S/P	2	2G	Cont	No	No	No	C	F-T	ABC	No	No	15.12.3,15.17,15.19.6
二氯乙醚	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	No	15.19.6

第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
2,2-二氯異丙醜	Y	S/P	2	2G	Cont	No		Yes	R	T	ACD	No	15.12,15.17,15.19
2,4-二氯酚	Y	S/P	2	2G	Cont	Dry		Yes	R	T	A	No	15.19.6,16.2.6,16.2.9
1,1-二氯丙烷	Y	S/P	2	2G	Cont	No		No	R	F-T	AB	No	15.12,15.19.6
1,2-二氯丙烷	Y	S/P	2	2G	Cont	No	T1 IIA	No	R	F-T	AB	No	15.12,15.19.6
1,3-二氯丙烷	X	S/P	2	2G	Cont	No	T2 IIA	No	C	F-T	AB	Yes	15.12,15.17,15.18,15.19
二氯丙烷/二氯丙烷混合物	X	S/P	2	2G	Cont	No		No	C	F-T	ABD	Yes	15.12,15.17,15.18,15.19
二乙醇胺	Y	S/P	3	2G	Open	No	T1 IIA	Yes	O	No	A	No	16.2.6,16.2.9
二乙胺	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	A	Yes	15.12,15.19.6
二乙醇基乙醇	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	AC	No	15.19.6
二乙苯	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6
二乙撑三胺	Y	S/P	3	2G	Open	No	T2 IIA	Yes	O	No	A	No	
二乙醜	Z	S/P	2	1G	Cont	Inert	T4 IIB	No	C	F-T	A	Yes	15.4,15.14,15.19
二(2-乙基己基)己二酸酯	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6
鄰苯二甲酸二乙酯	Y	P	2	2G	Open	No		Yes	O	No	A	No	
硫酸二乙酯	Y	S/P	2	2G	Cont	No		Yes	C	T	A	No	15.19.6
二庚基鄰苯二甲酸酯	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6
二正-己基乙二酸酯	X	P	1	2G	Open	No		Yes	O	No	A	No	15.19
己二基鄰苯二甲酸酯	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6
二異丁胺	Y	S/P	2	2G	Cont	No		No	R	F-T	ACD	No	15.12.3,15.19.6
二異丁烯	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6
二異丁基甲醜	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
鄰苯二甲酸二異丁酯	X	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6
鄰苯二甲酸二異辛酯	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6,16.2.6
二異丙醇胺	Z	SP	3	2G	Open	No	T2	IIA	Yes	O	A	No	16.2.9
二異丙胺	Y	SP	2	2G	Cont	No	T2	IIA	No	C	F-T	A	Yes 15.12,15.19
二異丙苯 (所有異構物)	X	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6
N, N-二甲基乙酰胺	Z	SP	3	2G	Cont	No	-	-	Yes	C	T	ACD	No 15.12,15.17
N, N-二甲基乙酰胺溶液 (40%或以下)	Z	SP	3	2G	Cont	No	No	Yes	R	T	B	No	15.12.1,15.17
二甲基己二酸酯	X	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6,16.2.9
二甲基醇液 (45%或以下)	Y	SP	3	2G	Cont	No	T2	IIA	No	R	F-T	ACD	No 15.12,15.19.6
二甲基醇液 (45%以上但不超過 55%)	Y	SP	2	2G	Cont	No	No	No	C	F-T	ACD	Yes	15.12,15.17,15.19
二甲基醇液 (55%以上但不超過 65%)	Y	SP	2	2G	Cont	No	No	No	C	F-T	ACD	Yes	15.12,15.14, 15.17,15.19
N, N-二甲基環己胺	Y	SP	2	2G	Cont	No	No	No	R	F-T	AC	No	15.12,15.17,15.19.6
二甲基二硫化物	Y	SP	2	2G	Cont	No	T3	IIA	No	R	F-T	B	No 15.12.3,15.12.4,15.19.6
N, N-二甲基十二烷胺	X	SP	1	2G	Open	No	No	Yes	O	No	B	No	15.19
二甲基乙醇胺	Y	SP	3	2G	Cont	No	T3	IIA	No	R	F-T	AD	No 15.19.6
二甲基甲酰胺	Y	SP	3	2G	Cont	No	T2	IIA	No	R	F-T	AD	No 15.19.6
二甲基戊二酸	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	
二甲基亞磷酸氫鹽	Y	SP	3	2G	Cont	No	No	Yes	R	T	AD	No	15.12.1,15.19.6
二甲基辛酸	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	16.2.6,16.2.9
鄰苯二甲酸二甲酯	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	16.2.9
二甲基聚矽氧烷	Y	P	3	2G	Open	No	No	Yes	O	No	AB	No	15.19.6

第十七章

a	c	d	e	f	g	h	i'	j''	i'''	j	k	l	n	o
2,2-二甲基丙烷-1,3-二醇 (熔融或溶液)	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
二甲基琥珀酸酯	Y	P	3	2G	Open	No			Yes	O	No	A	No	16.2.9
二硝基甲苯 (熔融)	X	S/P	2	2G	Cont	No			Yes	C	T	A	No	15.12,15.17,15.19,15.21,16.2.6,16.2.9,16.6.4
鄰苯二甲酸二辛酯	X	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6
1,4-二惡烷	Y	S/P	2	2G	Cont	No	T2	IIB	No	C	F-T	A	No	15.12, 15.19,16.2.9
二聚戊烯	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
聯苯	X	P	2	2G	Open	No			Yes	O	No	B	No	15.19.6,16.2.6,16.2.9
聯苯/二苯醌混合物	X	P	2	2G	Open	No			Yes	O	No	B	No	15.19.6,16.2.9
二苯醌	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6,16.2.9
二苯醌/二苯基二苯醌混合物	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6,16.2.9
二苯丙烷-表氯醇樹脂	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6,16.2.9
二-正-丙胺	Y	S/P	2	2G	Cont	No			No	R	F-T	A	No	15.12.3, 15.19.6
二丙基二醇	Z	P	3	2G	Open	No			Yes	O	No	A	No	
二硫代氨基甲酸鹽酯 (C7-C35)	X	P	2	2G	Open	No			Yes	O	No	AD	No	15.19.6,16.2.9
雙十一基甲鄰苯二甲酸酯	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6,16.2.9
十二烷 (所有異構物)	Y	P	2	2G	Cont	No			No	R	F	AB	No	15.19.6
叔十二烷硫醇	X	S/P	1	2G	Cont	No	-	-	Yes	C	T	ABD	E	15.12,15.17,15.19
十二(碳)烯 (所有異構物)	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
十二(烷)醇	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6,16.2.9
十二烷基苯	Z	P	3	2G	Open	No			Yes	O	No	A	No	
十二烷基經基丙基硫化物	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
甲基丙烯酸十二酯	Z	S/P	3	2G	Open	No	No	Yes	O	No	A	No	15.13
十二烷基十八烷基異丁烯酸鹽（混合物）	Z	S/P	3	2G	Open	No	No	Yes	R	No	AD	No	15.13,16.6.1,16.6.2
甲基丙烯酸十二~十五酯混合物	Y	S/P	2	2G	Open	No	No	Yes	O	No	AD	No	15.13,16.6.1,16.6.2,15.19.6
十二烷基苯酚	X	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6,16.2.6
十二烷基二甲苯	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	15.19.6,16.2.6
鑽井鹽水（含有鋅鹽）	X	P	2	2G	Open	No	No	Yes	O	No	No	No	15.19.6
鑽井鹽水，包括：溴化鈣溶液，氯化鈣溶液和氯化鈉溶液	Z	P	3	2G	Open	No	No	Yes	O	No	A	No	
表氯醇	Y	S/P	2	2G	Cont	No	IIB	No	C	F-T	A	Yes	15.12,15.17,15.19
乙醇胺	Y	S/P	3	2G	Open	No	T2 IIA	Yes	O	F-T	A	No	16.2.9
2-乙氧基醋酸乙酯	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6
長鏈（C16+）乙氧基化烷基氧基胺	Z	P	3	2G	Open	No	No	Yes	O	No	AB	No	
乙酸乙酯	Z	P	3	2G	Cont	No	No	No	R	F	AB	No	
乙酸乙酯	Z	P	3	2G	Open	No	No	Yes	O	No	A	No	
丙烯酸乙酯	Y	S/P	2	2G	Cont	No	T2 IIB	No	R	F-T	A	Yes	15.13,15.19.6,16.6.1,16.6.2
乙胺	Y	S/P	2	1G	Cont	No	T2 IIA	No	C	F-T	CD	Yes	15.12,15.14,15.19.6
乙胺溶液（72%或以下）	Y	S/P	2	2G	Cont	No	No	No	C	F-T	AC	Yes	15.12,15.14,15.17,15.19
乙苯	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6
乙基叔丁基醚	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6
乙基環己烷	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6
N-乙基環己胺	Y	S/P	2	2G	Cont	No	No	No	R	F-T	A	No	15.19.6



第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
S-乙基二丙硫代氨基甲酸酯	Y	P	2	2G	Open	No			Yes	O	No	A	No	16.2.9
乙撑氯醇	Y	S/P	2	2G	Cont	No	T2 IIA	No	No	C	F-T	AD	Yes	15.12,15.17,15.19
乙撑氯醇	Y	S/P	3	2G	Open	No	IIB	Yes	Yes	O	No	A	No	
乙二胺	Y	S/P	2	2G	Cont	No	T2 IIA	No	No	R	F-T	A	No	15.19.6,16.2.9
二溴化乙烯	Y	S/P	2	2G	Cont	No		NF	C	T	No	No	Yes	15.12,15.19.6,16.2.9
二氯化乙烯	Y	S/P	2	2G	Cont	No	T2 IIA	No	No	R	F-T	AB	No	15.19
乙二醇	Y	P	3	2G	Open	No		Yes	O	No	No	A	No	15.19.6
乙二醇醋酸酯	Y	P	3	2G	Open	No	-	Yes	O	No	No	A	No	
乙二醇丁酸酯	Y	P	3	2G	Open	No		Yes	O	No	No	A	No	
乙二醇單烷基醚	Y	S/P	3	2G	Cont	No		No	R	F	A	A	No	15.19.6,16.2.9
環氧乙烷環氧丙烷混合物 (其中環氧乙烷重量計含量不超過30%)	Y	S/P	2	1G	Cont	Inert	T2 IIB	No	No	C	F-T	AC	No	15.18,15.12,15.14,15.19
乙基-3-乙氧基丙酸酯	Y	P	3	2G	Cont	No		No	R	No	No	A	No	15.19.6
2-乙基己酸	Y	P	3	2G	Open	No		Yes	O	No	No	AB	No	15.19.6
丙烯酸 2-乙基己酯	Y	S/P	3	2G	Open	No	T3 IIB	Yes	O	No	No	A	No	15.13,15.19.6,16.6.1,16.6.2
2-乙基己胺	Y	S/P	2	2G	Cont	No		No	R	F-T	A	A	No	15.12, 15.19.6
2-乙基-2-(羥甲基)丙烷-1,3-二醇, C8-C10 酯	Y	P	2	2G	Open	No		Yes	O	No	No	A	No	15.19.6,16.2.6,16.2.9
乙叉降冰片烯	Y	S/P	2	2G	Cont	No		No	R	F-T	AD	AD	No	15.12.1,15.19.6
甲基丙烯酸乙酯	Y	S/P	3	2G	Cont	No	T2 IIA	No	No	R	F-T	AD	No	15.13,15.19.6,16.6.1,16.6.2
N-甲基乙基烯丙胺	Y	S/P	2	2G	Cont	No	T2 IIB	No	C	F	AC	AC	Yes	15.12.3,15.17,15.19

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o	
2-乙基-3-丙基丙稀醛	Y	S/P	3	2G	Cont	No	IIA	No	R	F-T	A	No	15.19.6,16.2.9	
乙基甲苯	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6	
脂肪酸 (飽和 C13+)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.9	
脂肪酸, 基本為線形, C6-C18, 2-乙基己基酯	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6	
氯化鐵溶液	Y	S/P	3	2G	Open	No		NF	O	No	No	No	15.11,15.19.6,16.2.9	
硝酸鐵/硝酸溶液	Y	S/P	2	2G	Cont	No		NF	R	T	No	Yes	15.11,15.19	
魚油 (含量少於4%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9	
甲醛溶液 (45%或以下)	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	Yes	15.19.6,16.2.9
甲酰胺	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9	
甲酸	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	T (g)	A	Yes	15.11.2,15.11.3,15.11.4,15.11.6,11.8,15.19.6,15.11.7,15.11.8,15.19.6,16.2.9
糠醛	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	No	15.19.6
糠醇	Y	P	3	2G	Open	No		Yes	O	No	A	No		
戊二醛溶液 (50%或以下)	Y	S/P	3	2G	Open	No		NF	O	No	No	No	15.19.6	
甘油三乙酸酯	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
C10 三烷基酯縮水甘油酯	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6	
甘氨酸, 氯化鈣溶液	Z	P	3	2G	Open	No		Yes	O	No	A	No		
乙醇溶液 (70%或以下)	Z	S/P	3	2G	Open	No	-	NF	O	No	No	No	15.19.6,16.2.9	
乙二醇溶液 (40%或以下)	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9	
乙酸苄酯	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9	
苯甲醇	Y	P	2 (k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9	

第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
庚烷 (所有異構體)	X	P	2	2G	Cont	No	No	No	No	R	F	A	No	15.19.6,16.2.9
正庚酸	Z	P	3	2G	Open	No	Yes	O	Yes	O	No	AB	No	
庚醇 (所有異構體) (d)	Y	P	3	2G	Cont	No	No	R	No	R	F	A	No	15.19.6
庚烯 (所有異構體)	Y	P	3	2G	Cont	No	No	R	No	R	F	A	No	15.19.6
醋酸庚酯	Y	P	2	2G	Open	No	Yes	O	Yes	O	No	A	No	15.19.6
1-十六烷基羧基/4-雙(十六烷基)羧基混合物	Y	P	2	2G	Open	No	Yes	O	Yes	O	No	AB	No	15.19.6
乙醇二胺(50%在水中)	Z	P	3	2G	Open	No	Yes	O	Yes	O	No	A	No	
乙醇二胺(熔化的)	Y	S/P	2	2G	Cont	No	Yes	C	Yes	C	T	C	Yes	15.12,15.17,15.18,15.19.6,16.2.9
乙醇二胺溶液	Y	S/P	3	2G	Cont	No	Yes	R	Yes	R	T	A	No	15.19.6
1,6-己二異氰酸酯	Y	S/P	2	1G	Cont	Dry	TI	IIB	Yes	C	T	AC(b),D	Yes	15.12, 15.17,15.16.2,15.18,15.19
1,6-己二醇	Z	P	3	2G	Open	No	Yes	O	Yes	O	No	A	No	
六甲撐四胺	Y	S/P	2	2G	Cont	No	No	R	No	R	F-T	AC	No	15.19.6
己烷 (所有異構體)	Y	P	2	2G	Cont	No	No	R	No	R	F	A	No	15.19.6
1,6-己二醇羧基頂端部分	Y	S/P	3	2G	Cont	No	--	--	Yes	R	T	ABCD	No	15.12,3,15.12.4,15.19.6,16.2.9
己酸	Y	P	3	2G	Open	No	Yes	O	Yes	O	No	A	No	15.19.6
己醇	Y	P	3	2G	Open	No	Yes	O	Yes	O	No	A	No	15.19.6
己烯 (所有異構體)	Y	P	3	2G	Cont	No	No	R	No	R	F	A	No	15.19.6
醋酸己酯	Y	P	2	2G	Cont	No	No	R	No	R	F	A	No	15.19.6
鹽酸	Z	S/P	3	1G	Cont	No	NF	R	NF	R	T	No	Yes	15.11
過氧化氫溶液 (60%以上, 70%以下)	Y	S/P	2	2G	Cont	No	NF	C	NF	C	No	No	No	15.5.1,15.19.6
2-乙基丙醇酸酯	Y	S/P	2	2G	Cont	No	Yes	C	Yes	C	T	A	No	15.12,15.13,15.19.6,16.6.1,16.6.2

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
正-(羥乙基)乙二胺三乙酸·三鈉鹽溶液	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6
2-羥基-4-(甲硫基)丁酸	Z	P	3	2G	Open	No		Yes	O	No	A	No	
異戊醇	Z	P	3	2G	Cont	No		No	R	F	AB	No	
異丁醇	Z	P	3	2G	Cont	No		No	R	F	AB	No	
甲酸異丁酯	Z	P	3	2G	Cont	No		No	R	F	AB	No	
異丁烯酸酯	Z	S/P	3	2G	Cont	No	IIA	No	C	F-T	BD	Yes	15.12,15.13,15.17,15.19,16.6.1,16.6.2
異佛爾酮	Y	S/P	3	2G	Cont	No		Yes	R	No	A	No	
異佛爾酮二胺	Y	S/P	3	2G	Cont	No		Yes	R	T	A	No	16.2.9
異佛爾酮二異氰酸酯	X	S/P	2	2G	Cont	Dry		Yes	C	T	ABD	No	15.12,15.16.2,15.17,15.19.6
異戊二烯	Y	S/P	3	2G	Cont	No	T3	IIB	No	R	F	No	15.13,15.14,15.19.6,16.6.1,16.6.2
異丙醇胺	Y	S/P	3	2G	Open	No	T2	IIA	Yes	O	F-T	A	No
乙酸異丙酯	Z	P	3	2G	Cont	No		No	R	F	AB	No	
異丙胺	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	F-T	CD	Yes
異丙基環己烷	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6,16.2.9
異丙醚	Y	S/P	3	2G	Cont	Inert		No	R	F	A	No	15.4.6,15.13.3,15.19.6
乳酸	Z	P	3	2G	Open	No		Yes	O	No	A	No	
乳脂溶液(80%或以下)	Y	S/P	2	1G	Cont	No		Yes	C	T	ACD	Yes	15.1,15.12,15.17,15.18,15.19,16.6.1,16.6.2,16.6.3
豬脂(含量少於1%游離脂肪酸)	Y	P	2(k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
十二酸	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6,16.2.9
亞麻子油	Y	P	2(k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6
液體化學廢物	X	S/P	2	2G	Cont	No		No	C	F-T	A	Yes	15.12,15.19.6,20.5.1

第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
長鏈烷芳基聚醚 (C11 - C20)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	16.2.6,16.2.9
L-賴氨酸 (60%或以下)	Z	P	3	2G	Open	No		Yes	O	No	A	No	
氯化鎂溶液	Z	P	3	2G	Open	No		Yes	O	No	A	No	
順丁烯二酐	Y	S/P	3	2G	Cont	No		Yes	R	No	AC (f)	No	16.2.9
巯基苯並噻唑鎓鎘鹽溶液	X	S/P	2	2G	Open	No		NF	O	No	No	No	15.19.6,16.2.9
異亞丙基丙酮	Z	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	No 15.19.6
變位鎂溶液	X	S/P	1	2G	Open	No		NF	O	No	No	No	15.19,16.2.9
甲基丙烯酸	Y	S/P	3	2G	Cont	No		Yes	R	T	A	No	15.13,16.6.1,15.19.6,16.2.9
二氯化乙烯中的甲基丙烯酸	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	F-T	AB	No 15.19,16.2.9
甲基丙烯腈	Y	S/P	2	2G	Cont	No		No	C	F-T	A	Yes	15.12,15.13,15.17,15.19
3-甲氧(基)-1-丁醇	Z	P	3	2G	Cont	No		No	R	F	A	No	
3-甲氧丁基乙酸鹽	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6
N-(2-甲氧基-1-甲基乙基)-2-乙基-6-甲基 乙酰苯胺	X	P	1	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6
乙酸甲烯	Z	P	3	2G	Cont	No		No	R	F	A	No	
乙酰乙酸甲酯	Z	P	3	2G	Open	No		Yes	O	No	A	No	
丙烯酸甲酯	Y	S/P	2	2G	Cont	No	T1	IIB	No	R	F-T	A	Yes 15.13,15.19.6,16.6.1,16.6.2
甲醇	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6
甲胺溶液 (42%或以下)	Y	S/P	2	2G	Cont	No		No	C	F-T	ACD	Yes	15.12,15.17,15.19
乙酸甲基戊酯	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6
甲基戊醇	Z	P	3	2G	Cont	No		No	R	F	A	No	15.19.6



## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o	
甲基·戊基(甲)酮	Z	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6	
甲基丁醇	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6,16.2.9	
甲基戊丁基醚	Z	P	3	2G	Cont	No	No	No	R	F	AB	No		
甲基丁基酮	Y	P	3	2G	Cont	No	No	No	R	F	AB	No	15.19.6	
甲基丁炔醇	Z	P	3	2G	Cont	No	No	No	R	F	A	No		
丁酸甲酯	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6	
甲基環己烷	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6	
甲基環戊二烯二聚物	Y	P	2	2G	Cont	No	No	No	R	F	B	No	15.19.6	
甲基環戊三錳酸	X	S/P	1	1G	Cont	No	-	Yes	C	T	ABCD	E	15.12, 15.18, 15.19, 16.2.9	
甲基二羥乙基胺	Y	S/P	3	2G	Open	No	No	Yes	O	No	A	No	16.2.6	
2-甲基-6-乙基苯胺	Y	S/P	3	2G	Open	No	No	Yes	O	No	AD	No		
甲基乙基酮	Z	P	3	2G	Cont	No	No	No	R	F	A	No		
2-甲基-5-乙基吡啶	Y	S/P	3	2G	Open	No	IIA	Yes	O	No	AD	No	15.19.6	
甲酸甲酯	Z	S/P	2	2G	Cont	No	No	No	R	F-T	A	Yes	15.12, 15.14, 15.19	
2-甲基-2-羥基-丁炔-(3)	Z	S/P	3	2G	Cont	No	IIA	No	R	F-T	ABD	No	15.19.6, 16.2.9	
甲基異丁基酮	Z	P	3	2G	Cont	No	No	No	R	F	AB	No		
甲基丙烯酸甲酯	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	F-T	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
3-甲基-3-甲氧基丁醇	Z	P	3	2G	Open	No	No	Yes	O	No	A	No		
甲基紫(溶液)	X	S/P	2	2G	Cont	No	No	Yes	R	No	AD	No	15.19.6	
2-甲基吡啶	Z	S/P	2	2G	Cont	No	No	No	C	F	A	No	15.12.3, 15.19.6	
3-甲基吡啶	Z	S/P	2	2G	Cont	No	No	No	C	F	AC	No	15.12.3, 15.19	

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a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
4-甲基吡啶	Z	S/P	2	2G	Cont	No	No	No	No	C	F-T	A	No	15.12,3,15.19,16.2.9
N-甲基-2-吡咯烷	Y	P	3	2G	Open	No	No	Yes	O	No	No	A	No	15.19.6
水楊酸甲酯	Y	P	3	2G	Open	No	No	Yes	O	No	No	A	No	15.19.6
α-甲基苯乙烯	Y	S/P	2	2G	Cont	No	T1 IIB	No	R	F-T	AD (j)	No	No	15.13,15.19.6,16.6.1,16.6.2
3-(甲硫基)丙醛	Y	S/P	2	2G	Cont	No	T3 IIA	Yes	C	T	BC	Yes	Yes	15.12,15.17,15.19
嗎啡	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F	A	No	No	15.19.6
內燃機燃料抗爆化合物 (包含鉛烷基)	X	S/P	1	IG	Cont	No	T4 IIA	No	C	F-T	AC	Yes	Yes	15.6,15.12,15.18,15.19
萘 (熔化的)	X	S/P	2	2G	Cont	No	T1 IIA	Yes	R	No	AD	No	No	15.19.6,16.2.9
新癸酸	Y	P	2	2G	Open	No		Yes	O	No	A	No	No	
硝化酸 (硫酸和硝酸混合物)	Y	S/P	2	2G	Cont	No		NF	C	T	No	Yes	Yes	15.11,15.16.2,15.17,15.19
硝酸 (70%及以上)	Y	S/P	2	2G	Cont	No		NF	C	T	No	Yes	Yes	15.11,15.19
硝酸 (70%及以下)	Y	S/P	2	2G	Cont	No		NF	R	T	No	Yes	Yes	15.11,15.19
次氯基三乙酸, 三鈉鹽溶液	Y	P	3	2G	Open	No		Yes	O	No	A	No	No	15.19.6
硝基苯	Y	S/P	2	2G	Cont	No	T1 IIA	Yes	C	T	AD	No	No	15.12,15.17,15.18,15.19,16.2.9
硝基乙烷	Y	S/P	3	2G	Cont	No	IIB	No	R	F-T	A (f)	No	No	15.19.6,16.6.1,16.6.2, 16.6.4
硝基乙烷 (80%) /硝基丙烷 (20%)	Y	S/P	3	2G	Cont	No	IIB	No	R	F-T	A (f)	No	No	15.19.6,16.6.1,16.6.2, 16.6.3
鄰-硝基苯酚 (熔化的)	Y	S/P	2	2G	Cont	No		Yes	C	T	AD	No	No	15.12,15.19.6,16.2.6,16.2.9
1-或 2-硝基丙烷	Y	S/P	3	2G	Cont	No	T2 IIB	No	R	F-T	A	No	No	15.19.6
硝基丙烷 (60%) /硝基乙烷 (40%) 混合物	Y	S/P	3	2G	Cont	No		No	R	F-T	A (f)	No	No	15.19.6
壬烷 (所有異構體)	X	P	2	2G	Cont	No		No	R	F	BC	No	No	15.19.6
壬酸 (所有異構體)	Y	P	3	2G	Open	No		Yes	O	No	AB	No	No	15.19.6,16.2.9



第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
有毒液體，易燃，(10) 未另列明 (運輸名稱...，含...)	Z	P	3	2G	Cont	No	T3	IIA	No	R	No	A	No	
ST3， Cat.Z														
(正) 辛烷 (所有異構體)	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
辛酸 (所有異構體)	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
辛醇 (所有異構體)	Y	P	2	2G	Open	No			Yes	O	No	A	No	
辛烯 (所有異構體)	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
辛醛	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6,16.2.9
烯烴-烷基酯共聚合物 (分子重 2000+)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9
烯 (C13+，所有異構體)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6,16.2.9
油酸	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6,16.2.9
發煙硫酸	Y	S/P	2	2G	Cont	No			NF	C	T	No	Yes	15.11.2-15.11.8,15.12.1,15.16.2,15.17,15.19,16.2.6
橄欖油 (含量少於 3.3%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
棕櫚仁油 (含量少於 5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	T3	IIB	Yes	Open	No	AB	No	15.19.6,16.2.6,16.2.9
棕櫚油 (含量少於 5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
棕櫚油精 (含量少於 5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
棕櫚硬脂精 (含量少於 5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	O	No	ABCD	No	15.19.6,16.2.6,16.2.9
石蠟	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9
仲醛	Z	S/P	3	2G	Cont	No	T3	IIB	No	R	F	A	No	15.19.6,16.2.9
仲醛-氮反應產物	Y	S/P	2	2G	Cont	No			No	C	F-T	A	No	15.12.3,15.19
五氮乙烷	Y	S/P	2	2G	Cont	No			NF	R	T	No	No	15.12,15.17,15.19.6
1,3-戊二烯	Y	S/P	3	2G	Cont	No			No	R	F-T	AB	No	15.13,15.19.6,16.6.1,16.6.2,16.6.3

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
戊烷 (所有異構體)	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.14,15.19.6
戊酸	Y	P	3	2G	Open	No	Yes	O	No	A	No	No	15.19.6
正戊酸 (64%) 2-甲基丁酸 (36%) 混合物	Y	S/P	2	2G	Open	No	T2	Yes	C	No	AD	No	15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,15.12.3,15.19
戊烯 (所有異構體)	Y	P	3	2G	Cont	No	No	R	F	A	A	No	15.14,15.19.6
正戊基丙酸	Y	P	3	2G	Cont	No	No	R	F	A	A	No	15.19.6
全氯乙烯	Y	S/P	2	2G	Cont	No	NF	R	T	No	No	No	15.12.1,15.12.2,15.19.6
礦脂	Z	P	3	2G	Open	No	Yes	O	No	AB	No	No	16.2.6,16.2.9
苯酚	Y	S/P	2	2G	Cont	No	T1 IIA	Yes	C	T	A	No	15.12,15.19,16.2.9
1-苯基-1-二甲苯基乙烷	Y	P	3	2G	Open	No	Yes	O	No	AB	No	No	
磷酸	Z	S/P	3	2G	Open	No	NF	O	No	No	No	No	15.11.1,15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8,16.2.9
磷·黃的或白的	X	S/P	1	1G	Cont	Pad+(vent or inert)	No (c)	C	No	C	E	No	15.7,15.19,16.2.9
酞酐 (熔化的)	Y	SP	2	2G	Cont	No	T1 IIA	Yes	R	No	AD	No	16.2.9,15.19.6,16.2.6
α-蒎烯	X	P	2	2G	Cont	No	No	R	F	A	A	No	15.19.6
β-蒎烯	X	P	2	2G	Cont	No	No	R	F	A	A	No	15.19.6
松油	X	P	2	2G	Open	No	Yes	O	No	A	No	No	16.2.6,16.2.9
二甲苯中聚烷 (C18 - C22) 丙稀酸鹽 (或酯)	Y	P	3	2G	Cont	No	No	R	F	A	No	No	15.19.6,16.2.6,16.2.9
二甲苯中聚烷 (C10 - C20) 異丁稀酸鹽 (或酯)	Y	P	2	2G	Open	No	Yes	O	No	AB	No	No	15.19.6,16.2.6,16.2.9
二甲苯中聚烷 (C10 - C18) 異丁稀酸鹽/乙稀-丙稀共 聚物混合物	Y	P	2	2G	Open	No	Yes	O	No	AB	No	No	15.19.6,16.2.6,16.2.9
聚乙稀聚胺	X	P	1	2G	Cont	No	Yes	R	No	AD	No	No	15.19.6,16.2.6,16.2.9



第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
聚乙二醇	Z	P	3	2G	Open	No		Yes	O	No	A	No		
聚乙二醇二甲醚	Z	P	3	2G	Open	No		Yes	O	No	A	No		
聚硫酸鐵溶液	Y	S/P	3	2G	Open	No	T3	IIA	Yes	O	No	No	No	
脂肪中聚異丁烯胺 (C10-C14) 溶剂	Y	P	3	2G	Open	No			Yes	O	No	A	No	
聚異丁烯基添加物	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
聚(4+) 異丁烯	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.9	
聚烯酰胺烯胺 (C17+)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6	
聚烯酰胺烯胺磷酸鹽 (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9	
聚烯酰胺 (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	A	No	16.2.9	
烷基 (C2-C4) 苯中聚烯酰胺	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6,16.2.6,16.2.9	
芳香溶剂中聚烯酰胺	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6,16.2.6,16.2.9	
聚烯酐	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9	
聚烯酯 (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9	
聚烯本酮胺 (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6,16.2.6,16.2.9	
聚烯經偶磷硫化銜衍生物 (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	16.2.6,16.2.9	
聚(20) 氧乙烯脫水山梨醇一油酸	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6,16.2.9	
聚丙二醇	Z	P	3	2G	Open	No		Yes	O	No	A	No		
聚硅氧烷	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6,16.2.9	
氫氧化鉀溶液	Y	S/P	3	2G	Open	No		NF	O	No	No	No	15.19.6	
油酸鉀	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6,16.2.9	
硫代硫酸鹽鉀 (50%或更少)	Y	P	3	2G	Open	No		NF	O	No	No	No	16.2.9	

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
正丙醇胺	Y	SP	3	2G	Open	No	No	Yes	O	No	AD	No	16.2.9,15.19.6
β-丙內脂	Y	SP	2	2G	Cont	No	IIA	Yes	R	T	A	No	
丙醛	Y	SP	3	2G	Cont	No	No	No	R	F-T	A	Yes	15.17,15.19.6
丙酸	Y	SP	3	2G	Cont	No	T1 IIA	No	R	F	A	Yes	15.11.2,15.11.3,15.11.4,15.11.6,15.11.7,15.11.8, 15.19.6
丙酸鈣	Y	SP	3	2G	Cont	No	T2 IIA	Yes	R	T	A	No	
丙腈	Y	SP	2	1G	Cont	No	T1 IIB	No	C	F-T	AD	Yes	15.12,15.17,15.18,15.19
正乙酸丙脂	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6
正丙醇	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6
正丙胺	Z	SP	2	2G	Cont	Inert	T2 IIA	No	C	F-T	AD	Yes	15.12,15.19
丙苯 (所有異構體)	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6
丙烯二醇甲基醚乙醚鹽	Z	P	3	2G	Cont	No	No	No	R	F	A	No	
丙烯二醇單烷基醚	Z	P	3	2G	Cont	No	No	No	R	F	AB	No	
丙烯二醇苯基醚	Z	P	3	2G	Open	No	No	Yes	O	No	AB	No	
氧化丙烯	Y	SP	2	2G	Cont	Inert	T2 IIB	No	C	F-T	AC	No	15.8,15.12.1,15.14,15.19
丙烯四聚物	X	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6
丙烯三聚物	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6
吡啶	Y	SP	2	2G	Cont	No	T1 IIA	No	R	F	A	No	15.19.6
菜子油 (低芥酸,含量少於4%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
松香	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	15.19.6,16.2.6,16.2.9
硅鋁酸鈉生料	Z	P	3	2G	Open	No	No	Yes	O	No	AB	No	
苯甲酸鈉	Z	P	3	2G	Open	No	No	Yes	O	No	A	No	

第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o	
氫氧化鈉 (15%或以下) / 氫氧化鈉溶液	Y	S/P	3	2G	Open	No	NF	O	No	No	No	No	15.19.6,16.2.6,16.2.9	
碳酸鈉溶液	Z	P	3	2G	Open	No	Yes	O	No	No	A	No		
亞硫酸氫鈉溶液 (50%或以下)	Z	S/P	3	2G	Open	No	NF	O	No	No	No	No	15.9,15.19.6,16.2.9	
重鉻酸鈉溶液 (70%或以下)	Y	S/P	2	2G	Open	No	NF	C	No	No	No	No	15.12.3,15.19	
亞硫酸鈉 (60%或以下) / 碳酸鈉 (3%或以下) 溶液	Z	P	3	2G	Open	No	NF	O	No	No	No	No	15.19.6,16.2.9	
亞硫酸氫鈉溶液 (45%或以下)	Z	S/P	3	2G	Open	No	NF	O	No	No	No	No	16.2.9	
氫硫化鈉/硫化胺溶液	Y	S/P	2	2G	Cont	No	No	C	F-T	A	Yes	Yes	15.12,15.14,15.17,15.19,16.6.1,16.6.2,16.6.3	
氫硫化鈉溶液 (45%或以下)	Z	S/P	3	2G	Cont	Vent or pad (gas)	NF	R	T	No	No	No	15.19.6,16.2.9	
氫氧化鈉溶液	Y	S/P	3	2G	Open	No	NF	O	No	No	No	No	16.2.6,16.2.9	
次氯酸鈉溶液 (15%或以下)	Y	S/P	2	2G	Cont	No	-	-	R	No	No	No	15.19.6	
亞硝酸鈉溶液	Y	S/P	2	2G	Open	No	NF	O	No	No	No	No	15.12.3.1,15.12.3.2,15.19,16.2.9	
硅酸鈉溶液	Y	P	3	2G	Open	No	NF	O	No	No	No	No	16.2.9	
硫化鈉溶液 (15%或以下)	Y	S/P	3	2G	Cont	No	NF	C	T	No	No	No	15.19.6,16.2.9	
硫化鈉溶液 (25%或以下)	Y	P	3	2G	Open	No	NF	O	No	No	No	No	15.19.6,16.2.9	
硫氰酸鈉溶液 (56%或以下)	Y	P	3	2G	Open	No	Yes	O	No	No	No	No	15.19.6,16.2.9	
大豆油 (含量少於 0.5%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6
礦基烷	Y	P	3	2G	Open	No	Yes	O	No	No	A	No	15.19.6,16.2.9	
磺酸鹽聚丙烯酸酯溶液	Z	P	3	2G	Cont	No	No	R	F	A	No	No		
硫 (熔化的)	Z	S	3	1G	Open	Vent or pad (gas)	Yes	O	F-T	No	No	No	15.10,16.2.9.	

## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
硫酸	Y	S/P	3	2G	Open	No	NF	O	No	No	No	No	15.11,15.6.2,15.19.6
廢硫酸	Y	S/P	3	2G	Open	No	NF	O	No	No	No	No	15.11,15.6.2,15.19.6
硫化脂肪 (C14—C20)	Z	P	3	2G	Open	No	Yes	O	No	AB	No	No	
向日葵籽油 (含量少於 7%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6
脂 (含量少於 15%游離脂肪酸)	Y	P	2 (k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9
四氯乙烯	Y	S/P	2	2G	Cont	No	NF	R	T	No	No	No	15.12,15.17,15.19.6
四甘醇	Z	P	3	2G	Open	No	Yes	O	No	A	No	No	
四乙撐五胺	Y	S/P	2	2G	Open	No	Yes	O	No	A	No	No	
四氫呋喃	Z	S	3	2G	Cont	No	T3 IIB	No	R	F-T	A	No	15.19.6
四氫化素	Y	P	2	2G	Open	No	Yes	O	No	A	No	No	
四甲苯 (所有異構體)	X	P	2	2G	Open	No	Yes	O	No	A	No	No	16.2.9
二氯化鈦生料	Z	P	3	2G	Open	No	Yes	O	No	AB	No	No	
甲苯	Y	P	3	2G	Cont	No	No	R	F	A	No	No	15.19.6
甲苯二胺	Y	S/P	2	2G	Cont	No	Yes	C	T	AD	Yes	Yes	15.12,15.17,15.19, 16.2.9,16.2.6
甲苯二異氰酸酯	Y	S/P	2	2G	Cont	Dry	T1 IIA	Yes	C	F-T	AC (b) D	Yes	15.12,15.16.2,15.17,15.19,16.2.9
鄰甲苯胺	Y	S/P	2	2G	Cont	No	Yes	C	T	A	No	No	15.12,15.17,15.19
磷酸三丁脂	Y	P	3	2G	Open	No	Yes	O	No	A	No	No	15.19.6
1,2,3-三氯苯 (熔化的)	X	S/P	1	2G	Cont	No	Yes	C	T	ACD	Yes	Yes	15.12,1,15.17,15.19,16.2.9,16.2.6
1,2,4-三氯苯	X	S/P	1	2G	Cont	No	Yes	R	T	AB	No	No	15.19,16.2.9
1,1,1-三氯乙烷	Y	P	3	2G	Open	No	Yes	O	No	A	No	No	

第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o
1,1,2-三氯乙烷	Y	S/P	3	2G	Cont	No	NF	R	R	T	No	No	15.12.1,15.19.6
三氯乙烯	Y	S/P	2	2G	Cont	No	T2 IIA	Yes	R	T	No	No	15.12,15.17,15.19.6
1,2,3-三氯丙烷	Y	S/P	2	2G	Cont	No	Yes	C	T	ABD	No	No	15.12,15.17,15.19
1,1,2-三氯-1,2,2-三氟乙烷	Y	P	2	2G	Open	No	NF	O	No	No	No	No	
磷酸三甲苯酯 (含有1%或以上的原異構體)	Y	S/P	1	2G	Cont	No	T2 IIA	Yes	C	No	AB	No	15.12.3,15.19,16.2.6
十三(碳)烷	Y	P	2	2G	Open	No	Yes	O	No	AB	No	No	15.19.6
十三(烷)酸	Y	P	2	2G	Open	No	Yes	O	No	A	No	No	15.19.6,16.2.6,16.2.9
十三烷基乙酯	Z	P	3	2G	Open	No	Yes	O	No	AB	No	No	
三乙醇胺	Z	S/P	3	2G	Open	No	IIA	Yes	O	No	A	No	16.2.9
三乙醇	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	AC	Yes	15.12,15.19.6
三乙基苯	X	P	2	2G	Open	No	Yes	O	No	A	No	No	15.19.6
三乙撑四胺	Y	S/P	2	2G	Open	No	T2 IIA	Yes	O	No	A	No	
磷酸三乙酯	Z	P	3	2G	Open	No	Yes	O	No	A	No	No	
亞磷酸三乙酯	Z	S/P	3	2G	Cont	No	No	R	F-T	AB	No	No	15.12.1,15.19.6,16.2.9
三異丙醇胺	Z	P	3	2G	Open	No	Yes	O	No	A	No	No	
三異丙基苯磺基磷酸鹽	X	P	2	2G	Open	No	Yes	O	No	A	No	No	15.19.6,16.2.6
三甲基乙胺	Y	S/P	3	2G	Cont	No	Yes	R	No	A	No	No	15.11.2,15.11.3,15.11.4,15.11.5,15.11.6,15.11.7,15.11.8,15.19.6,16.2.6,16.2.9
三甲胺溶液 (30%或以下)	Z	S/P	2	2G	Cont	No	No	C	F-T	AC	Yes	Yes	15.12,15.14,15.19,16.2.9
三甲苯 (所有異構體)	X	P	2	2G	Cont	No	No	R	F	A	No	No	15.19.6
2,2,4-三甲基-1,3-戊二醇 二異丁酸酯	Z	P	3	2G	Open	No	Yes	O	No	AB	No	No	



## 第十七章

a	c	d	e	f	g	h	i'	i''	j	k	l	n	o	
2,2,4-三甲基-1,3-戊二醇-1-異丁酸酯	Y	P	2	2G	Open	No		Yes	O	No	A	No		
1,3,5-三惡烷	Y	S/P	3	2G	Cont	No		No	R	F	AD	No	15.19.6,16.2.9	
三聚丙稀二醇	Z	P	3	2G	Open	No		Yes	O	No	A	No		
磷酸(三)二甲苯酯	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.6	
桐油(含量少於2.5%游離脂肪酸)	Y	P	2(k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6,16.2.6,16.2.9	
松節油	X	P	2	2G	Cont	No		No	R	F	A	No	15.19.6	
十一烷酸	Y	P	2	2G	Open	No		Yes	O	No	A	No	16.2.6,16.2.9	
1-十一碳烯	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6	
十一醇	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6,16.2.9	
尿素硝酸鈉溶液	Z	P	3	2G	Open	No		Yes	O	No	A	No		
尿素/硝酸鈉溶液(含氨水)	Z	S/P	3	2G	Cont	No		NF	R	T	A	No	16.2.9	
尿素/磷酸鈉溶液	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6	
尿素溶液	Z	P	3	2G	Open	No		Yes	O	No	A	No		
戊醛(所有異構體)	Y	S/P	3	2G	Cont	Inert	T3	IIB	No	R	F-T	A	No	15.4.6, 15.19.6
植物蛋白溶液(水解的)	Z	P	3	2G	Open	No		Yes	O	No	A	No		
乙酸乙稀	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.13,15.19.6,16.6.1,16.6.2
乙烯基基醚	Z	S/P	2	1G	Cont	Inert	T3	IIB	No	C	F-T	A	Yes	15.4,15.13,15.14,15.19,16.6.1, 16.6.2
二氯乙稀	Y	S/P	2	2G	Cont	Inert	T2	IIA	No	R	F-T	B	Yes	15.13,15.14,15.19.6,16.6.1,16.6.2
新癸酸乙稀酯	Y	S/P	2	2G	Open	No		Yes	O	No	AB	No	15.13, 15.19.6,16.6.1,16.6.2	
乙稀基甲苯	Y	S/P	2	2G	Cont	No	IIA	No	R	F	AB	No	15.13,15.19.6,16.6.1,16.6.2	
蠟	Z	P	3	2G	Open	No		Yes	O	No	AB	No	16.2.6,16.2.9	

第十七章

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
二甲苯	Y	P	2	2G	Cont	No	No	No	No	R	F	A	No	15.19.6,16.2.9(h)
二甲苯酚	Y	S/P	3	2G	Open	No	IIA	Yes	O	O	No	AB	No	15.19.6,16.2.9
烷基二硫代磷酸鹽 (C7-C16)	Y	P	2	2G	Open	No		Yes	O	O	No	AB	No	16.2.6,16.2.9
烷基甲酰胺	Y	P	2	2G	Open	No		Yes	O	O	No	AB	No	15.19.6,16.2.6
烷基二硫代磷酸鹽 (C3-C14)	Y	P	2	2G	Open	No		Yes	O	O	No	AB	No	15.19.6,16.2.6

- a 如果將要載運的貨品含有閃點不超過 60°C 的易燃溶劑，應設有特殊電氣系統和易燃蒸氣探測器。
- b 雖然水適合用於熄滅涉及本腳註所適用的化學品的露天火災，但不得使水沾污裝有這些化學品的封閉液貨艙，因為會導致產生有害氣體的危險。
- c 因黃磷或白磷是在其自燃溫度以上的狀態下載運的，因此用閃點不合適。對電氣設備的要求可與載運閃點為 60°C 以上的物質時對電氣設備的要求類似。
- d 這些要求的依據是閃點為 60°C 或以下的異構體；但有些異構體的閃點高於 60°C，因此以可燃性為依據的要求不適用於這些異構體。
- e 僅適用於正 - 癸醇。
- f 不得用化學乾粉作滅火劑。
- g 對於封閉處所，應同時測定其甲酸蒸氣和一氧化碳氣體的含量。一種分解貨品。
- h 僅適用於對 - 二甲苯
- i 適用於不含其他有安全危害成分的混合物，且污染類別為 Y 或以下。
- j 只有某些抗已醇泡沫才有效。
- k e 欄中確定的關於船型的要求可能需符合《73/78 MARPOL 公約》附則 II 第 4.1.3 條。
- l 當熔點大於或等於 0°C 時適用。

## 第十八章

### 本規則不適用的貨品清單

18.1 下面是其安全和污染危害性已被進行過審查並已確定其危害性尚不足以適用本規則的貨品。

18.2 雖然本章所列的貨品不屬本規則的適用範圍，但主管機關仍應注意，為安全運輸這些貨品，可能需要採取某些安全措施。因此，主管機關還應規定一些適當的安全要求。

18.3 有些液體物質被確定為屬 Z 類污染物，因此，須滿足《73/78 MARPOL 公約》附則 II 的某些要求。

18.4 對於按《73/78 MARPOL 公約》附則 II 第 6.3 段的要求被評定或臨時評定為 Z 類污染物或 OS 類污染物、且不具有安全危害的液體混合物，可按本章對“未另列明的有毒或無毒液體物質”的適當條目進行載運。

#### 註釋

貨品名稱 對任何交運的散裝貨物，應在運輸單證上使用貨品名稱。任何其他名稱可放在貨品名稱後的括號內。在某些情況下，貨品名稱可能與本規則以前版本中給出的名稱不同。

污染類別 字母 Z 係表示按《73/78 MARPOL 公約》附則 II 所確定的各貨品的污染類別。OS 係指該貨品已被評定並認為其污染類別不屬 X、Y 或 Z 類。

## 第十八章

貨品名稱	污染類別
丙酮	Z
含酒精飲料，未另列明的	Z
蘋果汁	OS
正－丁醇	Z
仲－丁醇	Z
黏土泥漿	OS
煤泥漿	OS
二甘醇	Z
乙醇	Z
碳酸乙烯酯	Z
葡萄糖溶液	OS
甘油	Z
甘油一油酸	Z
烏洛托品溶液	Z
己二醇	Z
異丙醇	Z
高嶺土漿	OS
氫氧化鎂漿	Z
葡甲胺溶劑（70%或以下）	Z
甲基丙基酮	Z
糖蜜	OS
有毒液體，（11）未另列明（運輸名稱...，含...）Cat.Z	Z
無毒液體，（12）未另列明（運輸名稱...，含...）Cat.OS	OS
聚氯化多鋁溶液	Z
甲酸鹽溶劑	Z
碳酸丙烯	Z
丙烯乙二醇	Z
乙酸鈉溶液	Z
硫酸鈉溶液	Z
四乙基硅酸單體/低聚體（20%乙醇溶劑）	Z
三乙二醇	Z
水	OS



## 第十九章

### 散裝運輸貨品索引

19.1 散裝運輸貨品索引（以下簡稱“索引”）的第 1 欄中列出了所謂的索引名稱。如果索引名稱為黑體，則索引名稱與第十七章或第十八章中所列的貨品名稱相同。因此列出貨品名稱的第 2 欄是空的。如果貨品名稱為非黑體，表明第十七章或第十八章列出的貨品名稱的同義詞在第 2 欄中列出。IBC 規則的有關章節號列於第 3 欄。第 4 欄列出了各貨品截止 2001 年 2 月已有的聯合國編號。

19.2 所編製的索引僅供參考。第 1 欄中所示的小寫索引名稱不應用作運輸單證上的貨品名稱。

19.3 作為名稱組成部分的前綴以普通（羅馬）字母形式表示，且在確定條目的字母順序時給以考慮，其中包括以下前綴：

Mono（1）Di（2）Tri（3）Tetra（4）Penta（5）Iso（同）Bis（雙）  
Neo（新）Ortho（鄰）

19.4 以下前綴在字母順序安排中未予考慮：

n-	（正一）
sec-	（叔一）
tert-	（仲一）
o-	（鄰一）
m-	（變位一）
p-	（對一）
N-	
O-	
Sym-	（均一）
uns-	（偏一）
dl-	
cis-	

trans-  
 ( E ) -  
 ( Z ) -  
 alpha- ( α - )  
 beta- ( β - )  
 gamma- ( γ - )  
 epsilon- ( ε - )

索引名稱	貨品名稱	章	UN 編號
松香酸酐	松香	十七	
二甲基醋酰胺	N, N-二甲基乙酰胺	十七	
乙醛合氰化氫	乳腈溶液 ( 80% 或以下 )	十七	
乙醛三聚合物	仲醛	十七	
乙酸		十七	
乙酸酐	醋酐	十七	
乙酸, 乙酯	乙酸乙烯	十七	
乙酸, 甲酯	乙酸甲烯	十七	
乙酸, 乙烯基酯	乙酸乙烯	十七	
乙酸酐		十七	1715
乙酸酯	乙酸乙酯	十七	
乙酸乙酯	乙酸乙酯	十七	
醋酐	乙酸酐	十七	
乙酰乙酸, 甲酯	乙酰乙酸甲酯	十七	
乙酰乙酸酯	乙酰乙酸乙酯	十七	
丙酮		十八	
丙酮氰醇		十七	1541
乙腈		十七	1648
乙酰酐	乙酸酐	十七	
四氯化乙炔	四氯乙烷	十七	
乙酰乙酯	乙酸酐	十七	
乙酰甲酯	乙酸酐	十七	
蒾烯	蒾烯	十七	
丙烯酸	丙烯腈	十七	
丙烯酸		十七	2218
丙烯酸, 2-羥乙基酯	2-羥乙基丙烯酸酯	十七	

索引名稱	貨品名稱	章	UN 編號
丙烯酸樹脂單體	甲基丙烯酸甲脂	十七	
丙烯腈		十七	1093
聚醚多元醇分散體中的		十七	
丙烯腈－苯乙烯共聚物			
乙二酸，二－（2－乙基	二（2－乙基己基）已二	十七	
己基）－酯	酸酯		
己二腈		十七	2205
甲草胺工藝（90%或以上）		十七	
乙醇	乙醇	十八	
乙醇，（C10）	雙丙酮醇	十七	
乙醇，（C11）	十一醇	十七	
乙醇，（C12）	十二（烷）醇	十七	
乙醇，（C7）	庚醇（所有異構體）（D）	十七	
乙醇，（C8）	辛醇（所有異構體）	十七	
乙醇，（C9）	壬醇（所有異構體）	十七	
含酒精飲料，未另外說明的		十八	
乙醇（C9－C11）聚（2.5		十七	
－9）乙氧基化物			
乙醇（C6－C17）（仲）		十七	
聚（3－6）乙氧基化物			
乙醇（C6－C17）聚（7		十七	
－12）乙氧基化物			
乙醇（C12－C16）聚（1		十七	
－6）乙氧基化物			
乙醇（C12－C16）聚（20		十七	
＋）乙氧基化物			
乙醇（C12－C16）聚（7		十七	
－19）乙氧基化物			
乙醇（C13＋）		十七	
乙醇，C13－C15	乙醇（C13＋）	十七	
可力丁醛	2－甲基－5－乙基吡啶	十七	
醛基胺	2－甲基－5－乙基吡啶	十七	
烷烴（C6－C9）		十七	
異烷烴與環烷（C10－		十七	
C11）			

索引名稱	貨品名稱	章	UN 編號
異烷烴與環烷 (C12+)		十七	
正-烷烴 (C10+)		十七	
鏈烷磺酸 (C10-C18), 苯酯	酚的烷基磺酸酯	十七	
烯基 (C16-C20) 琥珀 酸酐		十七	
酐		十七	
烷芳基磷酸酯混合物(二 苯甲苯基磷酸酯 40%以 上,鄰位異構物 0.02%以 下)		十七	
烷化 (C4-C9) 受阻酚		十七	
烷基苯, 烷基二氫茛, 烷 基茛混合物 (各 C12-C 17)		十七	
烷基 (C5-C8) 苯		十七	
烷基 (C9+) 苯		十七	
烷基 (C12+) 二甲胺		十七	2735
烷基二硫代氨基甲酸鹽 (C19-C35)		十七	
烷基二硫代噻二唑 (C6 -C24)		十七	
烷基酯共聚物 (C4-C 20)		十七	
烷基 (C8-C10) / (C12 -C14) (40% 或以下 /60%或以上) 聚葡萄糖苷 溶液 (55%或以下)		十七	
烷基 (C8-C10) / (C12 -C14) (60% 或以上 /40%或以下) 聚葡萄糖苷 溶液 (55%或以下)		十七	
2,2'-[3-(烷基(C16 -C18)氧化)丙基亞氨 基]二乙醇	長鏈(C16+)乙氧基化烷 基烷氧基胺	十七	
烷基 (C8-C40) 酚硫化 物		十七	

索引名稱	貨品名稱	章	UN 編號
烷基 (C8 – C9) 芳香劑 中的苯胺		十七	1993
烷基 (C9 – C15) 苯基丙 氧基化物		十七	
烷基 (C12 – C14) 聚葡 糖苷溶液 (55% 或以下)		十七	
烷基 (C8 – C10) 聚葡糖 苷溶液 (65% 或以下)		十七	
烷基 (C10 – C20, 飽和 及不飽和) 亞磷酸鹽		十七	
酚的烷基磺酸酯		十七	
3-烷基 (C16 – C18) 氧 化-N, N' - 雙 (2-乙 二醇) 丙基-1-胺	長鏈 (C16+) 乙氧基化 烷基烷氧基胺	十七	
烯丙醇		十七	1098
烯丙基氯		十七	1100
硅酸鋁氫氧化物	高嶺土漿	十八	
硫酸鋁溶液		十七	
氨基乙酸, 鈉鹽溶液	甘氨酸, 氯化鈉溶液	十七	
1-氨基-3-氨基-3, 5, 5-三甲基環己烷	異佛爾酮二胺	十七	
氨基苯	苯胺	十七	
1-丁胺	丁胺 (所有異構物)	十七	
2-丁胺	丁胺 (所有異構物)	十七	
氨基環己烷	環己胺	十七	
氨基乙烷	乙胺	十七	
氨基乙烷溶液, 72% 或以 下	乙胺溶液 (72% 或以下)	十七	
2-氨基乙醇	乙醇胺	十七	
2- (2-氨基乙基氨基) 乙 醇	氨基乙基乙醇胺	十七	
氨基乙基乙醇胺		十七	
正- (2-氨基乙基氨基) 乙 1, 2-乙二胺	二乙撐三胺	十七	
2-氨基異丁烷	丁胺 (所有異構物)	十七	
氨基甲烷	甲胺溶液 (42% 或以下)	十七	



索引名稱	貨品名稱	章	UN 編號
氨基甲烷溶液，42%或以下	甲胺溶液（42%或以下）	十七	
1-氨基-2-甲苯	鄰甲苯胺	十七	
2-氨基-1-甲苯	鄰甲苯胺	十七	
2-氨基-2-甲基-1-丙醇		十七	
3-氨基-3,5,5-三亞甲基環目胺	異佛爾酮二胺	十七	
氨基苯	苯胺	十七	
1-胺基丙烷	正丙胺	十七	
2-氨基丙烷	異佛爾酮二胺	十七	
1-氨基-2-丙醇	異佛爾酮二胺	十七	
1-胺基丙烷-2-醇	異佛爾酮二胺	十七	
3-胺基丙烷-1-醇	正丙胺	十七	
2-氨基甲苯	鄰甲苯胺	十七	
正-氨基甲苯	鄰甲苯胺	十七	
5-氨基-1,3,3-三亞甲基環目胺	異佛爾酮二胺	十七	
氨水的（28%或以下）		十七	2672
氨水（28%或以下）	氨水的（28%或以下）	十七	
磷酸氫二銨溶液		十七	
氫氧化氨，28%或以下	氨水的（28%或以下）	十七	
硝酸銨溶液（93%或以下）		十七	
多磷酸銨溶液		十七	
硫酸銨溶液		十七	
硫化銨溶液（45%或以下）		十七	2683
醋酸戊酯（所有異構物）		十七	1104
醋酸戊酯，商業的	醋酸戊酯（所有異構物）	十七	
乙酸正戊酯	醋酸戊酯（所有異構物）	十七	
仲戊醇	醋酸戊酯（所有異構物）	十七	
乙酸戊酯	醋酸戊酯（所有異構物）	十七	
戊醇	正戊醇	十七	
正戊醇		十七	
戊醇，伯		十七	
仲戊醇		十七	

索引名稱	貨品名稱	章	UN 編號
叔戊醇		十七	
戊基醛	戊醛（所有異構體）	十七	
戊基甲醇	己醇	十七	
α-正-戊烯	戊烷（所有異構體）	十七	
叔戊醇	叔戊醇	十七	
叔-戊烯類	戊烷（所有異構體）	十七	
戊基水合物	正戊醇	十七	
戊基氫化物	戊烷（所有異構體）	十七	
叔戊醇甲基醚		十七	1993
正-二戊基甲基甲酮	甲基·戊基（甲）酮	十七	
正-丙酸戊酯	正戊基丙酸	十七	
麻醉的醚	二乙醚	十七	
苯胺		十七	1547
苯胺油	苯胺	十七	
對抗油，人造的	糠醛	十七	
蘋果汁		十八	
硝酸	硝酸（70%及以上）	十七	
花生油	花生油（含量少於4%游離脂肪酸）	十七	
鋁氧土	高嶺土漿	十八	
芳基聚烯烴（C11-C50）		十七	
航空烷基化汽油（C8 烷屬烴及異構烷烴沸點 95-120°C）		十七	
氮雜環庚烷	六甲撐亞胺	十七	
3-氮雜戊烷-1,5-二胺	二乙撐三胺	十七	
六甲撐亞胺	六甲撐亞胺	十七	
硝酸	硝酸（70%及以上）	十七	
乙酸戊酯	醋酸戊酯（所有異構物）	十七	
銀長鏈（C11-C50）烷		十七	2810
芳基磺酸酯			
蓄電池酸	硫酸	十七	
二十二醇	乙醇（C13+）	十七	
苯扎明	2-甲基-5-乙基吡啶	十七	
1,2-苯二甲酸，二乙酯	二庚基鄰苯二甲酸酯	十七	
1,2-苯二甲酸，雙十一	雙十一基甲鄰苯二甲酸	十七	

索引名稱	貨品名稱	章	UN 編號
基酯	酯		
苯和含 10%或以上苯的混合物 (i)		十七	1114
苯三酸，三辛酯		十七	
苯酚	苯酚	十七	
苯	苯和含 10%或以上苯的混合物 (i)	十七	
苯	苯和含 10%或以上苯的混合物 (i)	十七	
苯並酚	苯酚	十七	
苯並三唑-2-硫脲 (， 鈉鹽溶液)	巯基苯並噻唑鈉鹽溶液	十七	
2-苯並三唑硫脲 (，鈉 鹽溶液)	巯基苯並噻唑鈉鹽溶液	十七	
(2-苯並三唑硫脲)鈉 鹽溶液	巯基苯並噻唑鈉鹽溶液	十七	
巯基苯並噻唑鈉鹽溶液		十七	
巯基苯並噻唑鈉鹽溶液		十七	
鄰苯二甲酸丁基苄基酯	鄰苯二甲酸丁基苄基酯	十七	
$\beta$ -丙內脂	$\beta$ -丙內脂	十七	
樺木油	水楊酸甲酯	十七	
乙二醛	乙二醛溶液 (40%或以 下)	十七	
聯己基	十二(碳)烯(所有異構 物)	十七	
聯苯	聯苯	十七	
二(甲基環戊二烯)	甲基環戊二烯二聚物	十七	
2,5-二(烷基(C7+) 硫)-1,3,4-噻重氮	烷基二硫代噻二唑(C6 -C24)	十七	
二(2-氨基)胺	二乙撐三胺	十七	
N,N'-二(2-氨基)	三乙撐四胺	十七	
乙烷-1,2-二胺			
N,N'-二(2-氨基)	三乙撐四胺	十七	
1,2-己二酸			
N,N'-二(羧甲基) 氨基乙酸三鈉鹽	次氨基三乙酸,三鈉鹽溶 液	十七	

索引名稱	貨品名稱	章	UN 編號
二（氯乙基）醚	二氯乙醚	十七	
二（2-氯乙基）醚	二氯乙醚	十七	
二（2-氯異丙基）醚	2，2-二氯異丙醚	十七	
二（2-氯基-1-甲基乙基）醚	2，2-二氯異丙醚	十七	
二（2-乙基己基）己二酸	二（2-乙基己基）己二酸酯	十七	
二（2-乙基己基）鄰苯二甲酸酯	鄰苯二甲酸二辛酯	十七	
二（2-羥基己基）胺	二乙醇胺	十七	
二（2-羥基己基）醚	二甘醇	十八	
二（2-羥基丙基）胺	二異丙醇胺	十七	
二（6-甲基庚基）鄰苯二甲酸酯	鄰苯二甲酸二辛酯	十七	
廢糖蜜	糖蜜	十八	
高齡土	高嶺土漿	十八	
糠油	糠醛	十七	
硫磺石	硫（熔化的）	十七	
溴氯甲烷		十七	
丁醛	丁醛（所有異構物）	十七	
正丁醛	丁醛（所有異構物）	十七	
正-正丁醛	丁醛（所有異構物）	十七	
丁烷-1，3-二醇	丁二醇	十七	
丁烷-1，4-二醇	丁二醇	十七	
丁烷-2，3-二醇	丁二醇	十七	
1，3-丁二醇	丁二醇	十七	
1，4-丁二醇	丁二醇	十七	
2，3-丁二醇	丁二醇	十七	
丁酸	丁酸	十七	
丁醇	正-丁醇	十八	
丁醇-1	正-丁醇	十八	
丁-1-醇	正-丁醇	十八	
丁-2-醇	仲-丁醇	十八	
1-丁醇	正-丁醇	十八	
2-丁醇	仲-丁醇	十八	
丁醇醋酸酯	乙酸丁酯（所有異構物）	十七	
2-丁醇醋酸酯	乙酸丁酯（所有異構物）	十七	

索引名稱	貨品名稱	章	UN 編號
丁-4-交酯	$\gamma$ 丁內酯	十七	
1,4-丁交酯	$\gamma$ -丁內酯	十七	
正-丁醇	正-丁醇	十八	
仲-丁醇	仲-丁醇	十八	
叔-丁醇	叔-丁醇	十七	
丁-2-酮	甲基乙基酮	十七	
2-丁酮	甲基乙基酮	十七	
2-丁烯醛	巴豆醛	十七	
丁烯二聚物	辛烯(所有異構體)	十七	
1-丁氧基丁烷	正丁醚	十七	
2-丁氧基乙醇	乙二醇單烷基醚	十七	
2-仲-丁氧基乙醇	乙二醇單烷基醚	十七	
2-丁氧基乙基醋酸酯	乙二醇醋酸酯	十七	
1-丁氧基丙烷-2-醇	丙二醇單烷基醚	十七	
乙酸丁酯	乙酸丁酯(所有異構物)	十七	
乙酸丁酯(所有異構物)		十七	1123
正-乙酸丁酯	乙酸丁酯(所有異構物)	十七	
仲-乙酸丁酯	乙酸丁酯(所有異構物)	十七	
叔-乙酸丁酯	乙酸丁酯(所有異構物)	十七	
正丙烯酸丁酯(所有異構體)		十七	2348
正-正丙烯酸丁酯	正丙烯酸丁酯(所有異構體)	十七	
丁醇	正-丁醇	十八	
正-丁醇		十八	
仲-丁醇		十八	
叔-丁醇		十七	
正-丁醛	丁醛(所有異構物)	十七	
丁胺(所有異構物)		十七	1125, 12
正-丁胺	丁胺(所有異構物)	十七	
仲-丁胺	丁胺(所有異構物)	十七	
叔-丁胺	丁胺(所有異構物)	十七	
丁基苯(所有異構物)		十七	2709
叔-丁基苯	丁基苯(所有異構物)	十七	
鄰苯二甲酸丁基苄基酯		十七	
鄰苯二甲酸丁基苄基酯	鄰苯二甲酸丁基苄基酯(所有異構物)	十七	



索引名稱	貨品名稱	章	UN 編號
鄰苯二甲酸丁基苄基酯 (所有異構物)		十七	
正-鄰苯二甲酸丁基苄基酯	鄰苯二甲酸丁基苄基酯 (所有異構物)	十七	
正-丁基甲醇	正戊醇	十七	
乙二醇二丁醚	乙二醇單烷基醚	十七	
乙二醇二丁醚醋酸酯	乙二醇醋酸酯	十七	
丁基/癸基/十六烷基/二十 烷基異丁烯酸混合物		十七	
丁基/癸基/十六基/二十 烷基異丁烯酸混合物	丁基/癸基/十六烷基/二十 烷基異丁烯酸混合物	十七	
丁二醇		十七	
α-丁二醇	丁二醇	十七	
β-丁二醇	丁二醇	十七	
丁二醇一乙基醚	3-甲氧(基)-1-丁醇	十七	
丁二醇一乙基醚醋酸酯	3-甲氧丁基乙酸鹽	十七	
亞丁基氧	四氫呋喃	十七	
1,2-環氧乙烷		十七	3022
丁酯	乙酸丁酯(所有異構物)	十七	
丁基乙酸酯	乙酸丁酯(所有異構物)	十七	
丁基醚	正丁醚	十七	
正丁醚		十七	1149
丁基乙基醋酸	辛酸(所有異構體)	十七	
1-丁基乙炔	己烯(所有異構體)	十七	
叔-丁基乙基醚	乙基·叔丁基醚	十七	
丁醇醚	乙酸丁酯(所有異構物)	十七	
異-丁酮	二異丁基甲酮	十七	
甲基丙烯酸丁酯		十七	
叔-丁基甲基醚	甲基戊丁基醚	十七	
丁基甲基酮	甲基丁基酮	十七	
鄰苯二甲酸丁酯	鄰苯二甲酸二丁酯	十七	
丙酸正丁脂		十七	1914
丁醛(所有異構物)		十七	1129
正-丁醛	丁醛(所有異構物)	十七	
丁酸		十七	2820
正-丁酸	丁酸	十七	
丁醇	正-丁醇	十八	

索引名稱	貨品名稱	章	UN 編號
丁醛	丁醛 (所有異構物)	十七	
$\gamma$ -丁内酯		十七	
白千層菇	二聚戊烯	十七	
溴化鈣/溴化鋅溶液	鑽井鹽水 (含有鋅鹽)	十七	
碳酸鈣結晶漿液		十七	
次氯酸鈣溶液 (15% 或以 下)		十七	
次氯酸鈣溶液 (15% 或以 上)		十七	
長鏈烷基 (C5-C10) 酚 鹽鈣		十七	
長鏈烷基 (C11-C40) 酚鹽鈣		十七	
長鏈烷基酚鹽硫化物鈣 (C8-C40)		十七	
甘蔗廢糖蜜	糖蜜	十八	
菜籽油	菜籽油 (低芥酸, 含量少 於 4% 游離脂肪酸)	十七	
癸酸	癸酸	十七	
己酸	己酸	十七	
$\alpha$ -己酸	辛酸 (所有異構體)	十七	
己内酰胺	$\epsilon$ -己内酰胺	十七	
$\epsilon$ -己内酰胺 (熔化的或 水溶液)		十七	
辛基醇	己醇	十七	
辛醇	辛醇 (所有異構體)	十七	
辛酸	辛酸 (所有異構體)	十七	
碳酰二胺	尿素溶液	十七	
甲醇	甲醇	十七	
石碳酸	苯酚	十七	
二硫化碳	二硫化碳	十七	
二硫化碳		十七	1131
四氯化碳		十七	1846
脲	尿素溶液	十七	
尿素	尿素溶液	十七	
1,3-碳酸基丙烷	碳酸丙烯	十八	
蓖麻油 (含量少於 2% 游		十七	

索引名稱	貨品名稱	章	UN 編號
離脂肪酸)			
氫氧化鉀溶液	氫氧化鉀溶液	十七	
苛性鈉	氫氧化鈉溶液	十七	
苛性鈉溶液	氫氧化鈉溶液	十七	
乙酸溶纖劑	2-乙氧基醋酸乙酯	十七	
乙二醇乙醚溶劑	乙二醇單烷基醚	十七	
甲基丙烯酸十六~二十		十七	
甘酯			
鯨蠟基/硬酯醇	乙醇 (C13+)	十七	
桐油	桐油 (含量少於 2.5%游 離脂肪酸)	十七	
高齡土	高嶺土漿	十八	
氯化石蠟 (C10-C13)		十七	
氯乙酸 (80%或以下)		十七	1750
α-氯基烯丙基氯	1,3-二氯丙烯	十七	
氯丙炔	烯丙基氯	十七	
氯苯		十七	1134
氯苯	氯苯	十七	
氯溴甲烷	溴氯甲烷	十七	
1-氯基-2-(β-乙	二氯乙醚	十七	
基)乙烷			
1-氯基-2,3-環氧丙	表氯醇	十七	
烷			
氯乙醇-2	乙撐氯醇	十七	
2-氯乙醇	乙撐氯醇	十七	
2-氯乙基醇	乙撐氯醇	十七	
β-氯乙基醇	乙撐氯醇	十七	
氯乙基醚	二氯乙醚	十七	
2-氯基-6'-乙基-	N-(2-甲氧基-1-甲	十七	
正-(2-甲氧基)乙酸	基乙基)-2-乙基-6		
-鄰-酰替甲苯胺	-甲基乙酰氯苯胺		
2-氯基-正-(2-乙基	N-(2-甲氧基-1-甲	十七	
-6-甲苯基)-正-(2	基乙基)-2-乙基-6		
-甲氧基-1-甲乙基)	-甲基乙酰氯苯胺		
乙酰胺			
氯仿		十七	1888
(粗)氯乙醇		十七	

索引名稱	貨品名稱	章	UN 編號
間-氯甲基苯	間-氯甲苯	十七	
鄰-氯甲基苯	鄰-氯甲苯	十七	
對-氯甲基苯	對-氯甲苯	十七	
氯甲基乙烯氧化物	表氯醇	十七	
(2-氯基-1-甲乙基) 醚	2, 2-二氯異丙醚	十七	
2-氯基-1-甲乙基醚	2, 2-二氯異丙醚	十七	
氯甲基環氧乙烷	表氯醇	十七	
4-氯-2-甲基苯氧基酸, 二甲銨鹽溶液		十七	
1-(4-氯苯基)-4, 4-二甲基-戊-3-單		十七	
2-或 3-氯丙酸	2-或 3-氯丙酸	十七	
3-氯丙烯	烯丙基氯	十七	
2-或 3-氯丙酸		十七	2511
$\alpha$ -或 $\beta$ -氯丙酸	2-或 3-氯丙酸	十七	
3-氯丙烯	烯丙基氯	十七	
$\alpha$ -氯丙烯	烯丙基氯	十七	
氯丙烯氧化物	表氯醇	十七	
氯磺酸		十七	1754
氯硫酸	氯磺酸	十七	
3-氯甲苯	間-氯甲苯	十七	
4-氯甲苯	對-氯甲苯	十七	
間-氯甲苯		十七	2238
鄰-氯甲苯		十七	2238
對-氯甲苯		十七	2238
氯甲苯 (混有異構物)		十七	2238
精細蛋白油	脂 (含量少於 15% 游離脂肪酸)	十七	
膽鹼鹽酸鹽溶液		十七	
萘烯	二聚戊烯	十七	
順式-丁烯二酐	順丁烯二酐	十七	
順式-9-十八碳烯酸	油酸	十七	
順式-戊二烯	1, 3-戊二烯	十七	
順式-轉-1, 3-戊二烯	1, 3-戊二烯	十七	
檸檬酸 (70% 或以下)		十七	
黏土泥漿		十八	

索引名稱	貨品名稱	章	UN 編號
煤泥漿		十八	
椰子油	椰子油（含量少於 5% 游離脂肪酸）	十七	
椰子油（含量少於 5% 游離脂肪酸）		十七	
乙醇胺	乙醇胺	十七	
香水級乙醇	乙醇	十八	
甲醇	甲醇	十七	
松香	松香	十七	
甲醇	甲醇	十七	
甲醇	甲醇	十七	
椰子油	椰子油（含量少於 5% 游離脂肪酸）	十七	
玉米油（含量少於 10% 游離脂肪酸）		十七	
棉子油（含量少於 12% 游離脂肪酸）		十七	
木溜油鹽類	萘（熔化的）	十七	
甲酚（所有異構物）		十七	2076
甲酚基酸，脫酚		十七	
甲酚酸類	甲酚（所有異構物）	十七	
甲酚	甲酚（所有異構物）	十七	
巴豆醛		十七	1143
巴豆醛	巴豆醛	十七	
異丙基苯	丙苯（所有異構體）	十七	
異丙基苯	丙苯（所有異構體）	十七	
丙烯腈	丙烯腈	十七	
2-氰-2-丙醇	丙酮氰醇	十七	
2-氰丙-2-醇	丙酮氰醇	十七	
2-氰丙烯-1	甲基丙烯酸	十七	
環狀丙烯碳酸酯	碳酸丙烯	十八	
1, 5, 9-環十二碳三烯		十七	
環庚烷		十七	2241
環乙甲亞胺	六甲撐亞胺	十七	
環己烷		十七	1145
環己醇		十七	
環己酮		十七	1915



索引名稱	貨品名稱	章	UN 編號
環己酮，環己醇混合物		十七	
環己三烯	苯和含 10%或以上苯的混合物 (i)	十七	
乙酸環己脂		十七	2243
環己胺		十七	2357
環己二甲胺	N, N-二甲基環己胺	十七	
環己(乙基)胺	N-乙基環己胺	十七	
環己基甲酮	環己酮	十七	
環己基甲烷	甲基環己烷	十七	
1, 3-環戊二烯二聚物 (熔化的)		十七	
環戊烷		十七	1146
環戊烷		十七	2246
環四氫呋喃	四氫呋喃	十七	
對-散花烴		十七	2046
甲基異丙基苯	對-散花烴	十七	
二甲氨基乙醇	二甲基乙醇胺	十七	
十氫化萘		十七	
癸酸		十七	
癸-1-醇	癸醇(所有異構物)	十七	
正-癸醇	癸醇(所有異構物)	十七	
癸酸	癸酸	十七	
丙烯酸癸酯		十七	
癸醇	癸醇(所有異構物)	十七	
癸醇(所有異構物)		十七	
癸基苯	烷基(C9+)苯	十七	
癸酸	癸酸	十七	
1-脫氧-1-甲氨基-D-葡糖醇	葡甲胺溶劑(70%或以下)	十八	
烷基苯	烷基(C9+)苯	十七	
雙乙酸酯	乙酰乙酸乙酯	十七	
雙丙酮	雙丙酮醇	十七	
雙丙酮醇		十七	
雙〔烷基/鏈烯基(C10-C20)〕 氫亞磷酸鹽	烷基(C10-C20, 飽和及不飽和)亞磷酸鹽	十七	
二烴基(C8-C9)二苯胺		十七	

索引名稱	貨品名稱	章	UN 編號
二氫基 (C7 – C13) 鄰苯二甲酸酯		十七	
1, 2-二氨基乙烷	乙二胺	十七	
1, 6-二氨基己烷	乙撐二胺 (熔化的)	十七	
1, 6-二氨基己烷溶液	乙撐二胺溶液	十七	
2, 6-二氨基己酸	L-賴氨酸 (60%或以下)	十七	
二氨基甲苯	甲苯二胺	十七	
2, 4-二氨基甲苯	甲苯二胺	十七	
2, 6-二氨基甲苯	甲苯二胺	十七	
4, 6-二氨基-3, 5, 5-三甲基-2-環己烯	異佛爾酮二胺	十七	
3, 6-二氮正辛烷-1, 8-二氮	三乙撐四胺	十七	
1, 2-二溴乙烷	二溴化乙烯	十七	
二溴甲烷		十七	
二丁胺		十七	
二丁基苯-1, 2-乙二酸	鄰苯二甲酸二丁酯	十七	
二丁甲醇	壬醇 (所有異構體)	十七	
二丁醚	正丁醚	十七	
正-二丁醚	正丁醚	十七	
二丁過氧化亞磷酸鹽	二丁基磷酸氫鹽	十七	
二丁基磷酸氫鹽		十七	
二丁膦酸鹽	二丁基磷酸氫鹽	十七	
鄰苯二甲酸二丁酯		十七	
二丁基正-鄰苯二甲酸鹽	鄰苯二甲酸二丁酯	十七	
二氯 (代) 苯 (所有異構物)		十七	
1, 2-二氯 (代) 苯	二氯 (代) 苯 (所有異構物)	十七	
間-二氯 (代) 苯	二氯 (代) 苯 (所有異構物)	十七	
正-二氯 (代) 苯	二氯 (代) 苯 (所有異構物)	十七	
3, 4-二氯-1-丁烯		十七	
3, 4-二氯丁-1-烯	3, 4-二氯-1-丁烯	十七	
2, 2'-二氯二乙醚	二氯乙醚	十七	

索引名稱	貨品名稱	章	UN 編號
二氯二異丙烯基	2, 2-二氯異丙醚	十七	
1, 2-二氯乙烷	二氯化乙烯	十七	
1, 1-二氯乙烷	二氯乙烯	十七	
二氯醚	二氯乙醚	十七	
1, 1-二氯乙烯	二氯乙烯	十七	
二氯乙醚		十七	1916
2, 2'-二氯乙醚	二氯乙醚	十七	
二氯乙基氧化物	二氯乙醚	十七	
2, 2-二氯異丙醚		十七	2490
2, 4-二氯酚		十七	2021
1, 1-二氯丙烷		十七	
1, 2-二氯丙烷		十七	1279
二氯丙烯/二氯丙烯混合物	二氯丙烯/二氯丙烷混合物	十七	
1, 3-二氯丙烯		十七	2047
二氯丙烯/二氯丙烷混合物		十七	
二氯丙烯	1, 3-二氯丙烯	十七	
1, 4-二氯基丁烷	丙烯腈	十七	
二聚環戊二基	1, 3-環戊二烯二聚物 (熔化的)	十七	
鄰苯二甲酸二癸酯	二烴基(C7-C13)鄰苯 二甲酸酯	十七	
十二仲鄰苯二甲酸酯	二烴基(C7-C13)鄰苯 二甲酸酯	十七	
二乙醇胺		十七	
二乙胺		十七	1154
二乙胺基乙醇		十七	2686
2-二乙胺基乙醇	二乙胺基乙醇	十七	
二乙苯		十七	2049
1, 4-二噁烷	1, 4-二噁烷	十七	
二亞乙基醚	1, 4-二噁烷	十七	
二甘醇		十八	
二亞乙基氧化物	1, 4-二噁烷	十七	
二乙撐三胺		十七	2079
N, N-二乙胺	三乙胺	十七	
二乙胺基乙醇	二乙胺基乙醇	十七	

索引名稱	貨品名稱	章	UN 編號
N, N-二乙胺基乙醇	二乙胺基乙醇	十七	
二乙醚		十七	1155
N, N-二乙基胺	三乙胺	十七	
二(2-乙基己基)己二酸酯		十七	
二乙基氧化物	二乙醚	十七	
鄰苯二甲酸二乙酯		十七	
硫酸二乙酯		十七	1594
二甲酰基	乙二醛溶液(40%或以下)	十七	
二甘醇	二甘醇	十八	
鄰苯二甲酸二乙酯		十七	
己二基	十二烷(所有異構物)	十七	
二-正-己基乙二酸酯		十七	
鄰苯二甲酸二乙酯		十七	
1,3-二氫異丙並呋喃-1,3-二酮	酞酐(熔化的)	十七	
2,3-二羥丁烷	丁二醇	十七	
2,2'-二羥二乙胺	二乙醇胺	十七	
二-(2-羥乙基)胺	二乙醇胺	十七	
二羥乙基醚	二甘醇	十八	
二羥基己烷	1,6-己二醇	十七	
1,2-二羥基丙烷	丙基乙二醇	十八	
二異丁烯	二異丁烯	十七	
二異丁胺		十七	2361
二異丁基甲醇	壬醇(所有異構體)	十七	
二異丁烯		十七	2050
α-二異丁烯	二異丁烯	十七	
β-二異丁烯	二異丁烯	十七	
二異丁基甲酮		十七	
鄰苯二甲酸二異丁酯		十七	
2,4-二異氰酰-1-甲基苯	甲苯二異氰酸酯	十七	
2,4-二異氰酰甲苯	甲苯二異氰酸酯	十七	
酞酸二異癸酯	二羥基(C7-C13)鄰苯二甲酸酯	十七	
二異壬基鄰苯二甲酸酯	二羥基(C7-C13)鄰苯	十七	

索引名稱	貨品名稱	章	UN 編號
	二甲酸酯		
鄰苯二甲酸二異丁酯		十七	
二異丙醇胺		十七	
二異丙基丙酮	二異丁基甲酮	十七	
二異丙醇胺		十七	1158
二異丙苯（所有異構物）		十七	
二異丙醚	異丙醚	十七	
二異丙基氧化物	異丙醚	十七	
N，N-二甲基乙酰胺		十七	
N，N-二甲基乙酰胺溶液（40%或以下）		十七	
二甲基乙炔甲醇	2-甲基-2-羥基-丁炔-（3）	十七	
二甲基己二酸酯		十七	
二甲胺溶液（45%或以下）		十七	1160
二甲胺溶液（45%以上但不超過55%）		十七	1160
二甲胺溶液（55%以上但不超過65%）		十七	1160
二甲基氨基乙醇	二甲基乙醇胺	十七	
2-二甲基氨基乙醇	二甲基乙醇胺	十七	
二甲基苯	三甲苯	十七	
1，3-二甲基丁醇	甲醇	十七	
1，3-二甲基丁-1-醇	甲醇	十七	
1，3-二甲基丁基醋酸酯	乙酸甲烯	十七	
二甲基甲醇	異丙醇	十八	
N，N-二甲基環己胺		十七	2264
二甲基二硫化物		十七	2381
N，N-二甲基十二胺	烷基（C12+）二甲胺	十七	
N，N-二甲基十二-1-胺	N,N-二甲基環己胺	十七	
N,N-二甲基環己胺		十七	
1，1-二甲基乙醇	叔丁醇	十七	
二甲基乙醇胺		十七	2051
1，1-二甲乙基醇	叔丁醇	十七	
二甲乙基甲醇	叔丁醇	十七	



索引名稱	貨品名稱	章	UN 編號
1, 1-二甲乙基甲基醚	甲基戊丁基醚	十七	
二甲基甲醛	丙酮	十八	
二甲基甲酰胺		十七	2265
二甲基戊二酸		十七	
2, 6-二甲基-4-庚酮	二異丁基甲酮	十七	
2, 6-二甲基庚-4-酮	二異丁基甲酮	十七	
N, N-二甲基己胺	烷基 (C12+) 二甲胺	十七	
二甲基亞磷酸氫鹽		十七	
二甲基羧苯	二甲苯酚	十七	
1, 1' - 二甲基-2, 2' - 亞氨基二乙醇	二異丙胺	十七	
二甲基酮縮醇	丙酮	十八	
二甲基酮	丙酮	十八	
二甲基月桂胺	N, N-二甲基環己胺	十七	
N, N-二甲基甲胺	三甲胺溶液 (30% 或以下)	十七	
N, N-二甲基甲基胺	三甲胺溶液 (30% 或以下)	十七	
6, 6-二甲基-2-亞甲基二環 [3.1.1] 庚烷	蒎烯	十七	
二甲基辛酸		十七	
2, 2-二甲基辛酸	新癸酸	十七	
2, 3-二甲基酚	二甲苯酚	十七	
2, 4-二甲基酚	二甲苯酚	十七	
2, 5-二甲基酚	二甲苯酚	十七	
2, 6-二甲基酚	二甲苯酚	十七	
3, 4-二甲基酚	二甲苯酚	十七	
3, 5-二甲基酚	二甲苯酚	十七	
二甲基酚類	二甲苯酚	十七	
二甲基磷酸苯酯 (3:1)	磷酸三乙脂	十七	
鄰苯二甲酸二甲酯		十七	
二甲基聚硅氧烷		十七	
2, 2-二甲基丙烷	戊烷 (所有異構體)	十七	
2, 2-二甲基丙烷-1, 3-二醇 (融化或溶液)		十七	
2, 2-二甲基丙酸	三甲基乙酸	十七	
1, 1-二甲基炔丙酸	2-甲基-2-羥基-丁	十七	

索引名稱	貨品名稱	章	UN 編號
	炔- (3)		
2, 2-二甲基丙酸	三甲基乙酸	十七	
1, 1-二甲基炔丙醇	2-甲基-2-羥基-丁炔- (3)	十七	
二甲基琥珀酸酯		十七	
N, N-二甲基十四烷胺	烷基 (C12+) 二甲胺	十七	
二甲基十四碳烷胺	烷基 (C12+) 二甲胺	十七	
3, 9-二甲三環 [5.2.1.0; 2, 6] 癸-3, 8-二烯	甲基環戊二烯二聚物	十七	
二甲基亞丙基二醇	2, 2-二甲丙烷-1, 3-二醇 (熔融或溶液)	十七	
二甲基乙酰胺醋酸酯	N, N-二甲基乙酰胺	十七	
二硝基甲苯 (熔融)		十七	1600
鄰苯二甲酸二辛酯	二烴基 (C7-C13) 鄰苯二甲酸酯	十七	
3, 6-二正辛烷-1, 8-二醇	三乙二醇	十八	
己二酸二辛酯	二 (2-乙基己基) 己二酸酯	十七	
鄰苯二甲酸二辛酯		十七	
1, 4-二惡烷	1, 4-二惡烷	十七	
1, 4-二惡烷		十七	1165
二氧合酮	碳酸丙烯	十八	
1, 3-二氧合-2-酮	碳酸乙烯酯	十八	
二氧雜環戊二烯酮	碳酸乙烯酯	十八	
1, 1-二氧聚乙烯醇纖維	磺基烷	十七	
二氧乙烯醇	1, 4-二惡烷	十七	
二聚戊烯		十七	2052
聯苯		十七	
聯苯/二苯醚混合物		十七	
聯苯/二苯氧化混合物	聯苯/二苯醚混合物	十七	
二苯醚		十七	
二苯醚/二苯基二苯醚混合物		十七	
二苯丙烷一表氯醇樹脂		十七	

索引名稱	貨品名稱	章	UN 編號
二苯基氧化物	二苯醚	十七	
二苯基氧化物/二苯基二 苯醚混合物	二苯醚/二苯基二苯醚混 合物	十七	
二丙基胺	二-正-丙胺	十七	
二-正-丙胺		十七	2383
正-二丙基胺	二-正-丙胺	十七	
二丙基二醇		十七	
二鈉碳	碳酸鈉溶液	十七	
二硫代氨基甲酸鹽酯 (C7-C35)		十七	
雙十一基甲鄰苯二甲酸 酯		十七	
消旋-乳酸	乳酸	十七	
消旋-孟-1,8-二烯	二聚戊烯	十七	
甘二-1-醇	乙醇 (C13+)	十七	
1-甘二醇	乙醇 (C13+)	十七	
十二烷 (所有異構物)		十七	
叔十二烷硫醇		十七	
二十二烷酸	十二酸	十七	
十二烷-1-醇	十二 (烷) 醇	十七	
1-十二烷醇	十二 (烷) 醇	十七	
正-十二烷	十二 (烷) 醇	十七	
十二 (碳) 烯 (所有異構 物)		十七	
十二 (烷) 醇		十七	
正-十二烷基醇	十二 (烷) 醇	十七	
十二烷基苯		十七	
十二烷基二甲胺	烷基 (C12+) 二甲胺	十七	
十二碳烯	十二 (碳) 烯 (所有異構 物)	十七	
十二烷基羥基丙基硫化 物		十七	
十二烷基酸	十二酸	十七	
叔-十二烷基硫醇	叔十二烷硫醇	十七	
甲基丙烯酸十二酯		十七	
十二烷基-2-甲基-2 -丙烯酸	甲基丙烯酸十二酯	十七	

索引名稱	貨品名稱	章	UN 編號
十二烷基-2-甲基丙-2-烯酸	甲基丙烯酸十二酯	十七	
十二烷基/十八烷基異丁烯酸鹽(混合物)		十七	
甲基丙烯酸十二~十五酯混合物		十七	
十二烷基苯酚		十七	
2-十二烷基硫-1-甲基乙醇	十二烷基羥基丙基硫化物	十七	
1-十二烷基硫丙-2-醇	十二烷基羥基丙基硫化物	十七	
十二烷基二甲苯		十七	
鑽井鹽水(含有鋅鹽)		十七	
鑽井鹽水,包括:溴化鈣溶液,氯化鈣溶液和氯化鈉溶液		十七	
二氯乙烷	二氯化乙烯	十七	
二氯化乙烯	二氯化乙烯	十七	
( $\epsilon$ )-丁-2-烯醛	巴正庚酸豆醛	十七	
庚酸	正庚酸	十七	
庚醇	庚醇(所有異構體)(d)	十七	
庚酸	正庚酸	十七	
硝酸	硝酸(70%及以上)	十七	
$\epsilon$ -1,3-戊二烯	1,3-戊二烯	十七	
表氯醇		十七	2023
1,2-環氧丁烷	1,2-環氧乙烷	十七	
1,4-環氧丁烷	四氫呋喃	十七	
1,2-環氧丙烷	烷氧化丙烯	十七	
2,3-混合三烷基醋酸環氧丙醚	C10 三烷基醋酸縮水甘油酯	十七	
2,3-環氧丙基新癸酸	C10 三烷基醋酸縮水甘油酯	十七	
乙基二丙硫代氨基甲酸酯	S-乙基二丙硫代氨基甲酸酯	十七	
硝基苯	硝基苯	十七	
硝基苯	硝基苯	十七	
乙酰胺溶液,72%或以下	乙胺溶液(72%或以下)	十七	

索引名稱	貨品名稱	章	UN 編號
乙烷腈	丙腈	十七	
乙烷二醛	乙二醛溶液（40%或以 下）	十七	
1, 2-乙二醇	乙二醇	十七	
乙酸	乙酸	十七	
乙酸酐	乙酸酐	十七	
乙醇	乙醇	十八	
乙醇胺		十七	2491
烯醋酸酯	乙酸乙烯	十七	
烯乙酸	乙酸乙烯	十七	
醚	二乙醚	十七	
乙炔三氯化物	三氯乙烯	十七	
2-乙氧乙醇	乙二醇單烷基醚	十七	
2-乙氧基醋酸乙酯		十七	1172
長鏈（C16+）乙氧基化 烷基烷氧基胺		十七	
2-乙氧基-2-甲基丙 烷	乙基·叔丁基醚	十七	
1-乙氧丙烷-2-醇	丙二醇單烷基醚	十七	
乙酸乙酯		十七	
乙酰乙酸乙酯		十七	
乙基丙酮	甲基丙基酮	十七	
丙烯酸乙酯		十七	1917
乙醇		十八	
乙胺		十七	1036
乙胺溶液（72%或以下）		十七	2270
乙氨基環己烷	N-乙基環己胺	十七	
乙苯		十七	1175
乙苯	乙苯	十七	
乙基·叔丁基醚		十七	1993
2-乙基己酸	2-乙基己酸	十七	
乙基甲醇	正丙醇	十七	
乙基氰化物	丙腈	十七	
乙基環己烷		十七	
乙基（環己基）胺	N-乙基環己胺	十七	
N-乙基環己胺		十七	
乙二甲基甲烷	戊烷（所有異構體）	十七	



索引名稱	貨品名稱	章	UN 編號
S-乙基二丙氨基硫化物	S-乙基二丙硫代氨基甲 酸酯	十七	
S-乙基二丙硫氨基甲酸 酯	S-乙基二丙硫代氨基甲 酸酯	十七	
S-乙基二丙硫代氨基甲 酸酯		十七	
乙烯醇	乙二醇	十七	
溴化乙烯	二氯化乙烯	十七	
碳酸乙烯酯		十八	
乙烯羧酸	丙烯酸	十七	
乙烯氯化物	二氯化乙烯	十七	
乙撐氯醇		十七	1135
乙撐氟醇		十七	
乙烯雙醋酸酯	乙二醇丁醚酯	十七	
乙二胺		十七	1604
二溴化乙烯		十七	1605
二氯化乙烯		十七	1184
2,2'-乙炔雙-亞氨基 二(乙胺)	三乙撐四胺	十七	
2,2'-乙炔二氧二乙醇 乙二醇	三乙二醇	十八	
乙二醇丙烯酸酯	2-羥乙基丙烯酸酯	十七	
乙二醇丁基醚	乙二醇單烷基醚	十七	
乙二醇醋酸酯		十七	
乙二醇叔-丁基醚	乙二醇單烷基醚	十七	
乙二醇丁基醚		十七	
乙二醇乙基醚	乙二醇單烷基醚	十七	
乙二醇乙基醚醋酸酯	2-乙氧基醋酸乙酯	十七	
乙二醇異丙醚	乙二醇單烷基醚	十七	
乙二醇甲醚	乙二醇單烷基醚	十七	
乙二醇單烷基醚		十七	
乙二醇一丁基醚	乙二醇單烷基醚	十七	
乙二醇一叔丁基醚	乙二醇單烷基醚	十七	
乙二醇一乙基醚	乙二醇單烷基醚	十七	
乙二醇一乙基醚醋酸酯	2-乙氧基醋酸乙酯	十七	
乙二醇一甲基醚	乙二醇單烷基醚	十七	
環氧乙烷/環氧丙烷混合		十七	2983

索引名稱	貨品名稱	章	UN 編號
物(其中環氧乙烷按重量計含量不超過 30%)			
四氯乙烯	全氯乙烯	十七	
三氯代乙烯	1,1,1-三氯乙烷	十七	
三氯代乙烯	三氯乙烯	十七	
乙基乙酸酯	乙酸乙酯	十七	
乙基醚	二乙醚	十七	
乙基-3-乙氧基丙酸酯		十七	
乙基液	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
乙基甲酸	丙酸	十七	
乙基乙二醇	乙二醇單烷基醚	十七	
2-乙基己醛	辛醛	十七	
2-乙基己醛	辛醛	十七	
2-乙基己酸		十七	
2-乙基己醇	辛醇(所有異構體)	十七	
2-乙基己烯醛	2-乙基-3-丙基丙烯 醛	十七	
2-乙基己-2-烯醛	2-乙基-3-丙基丙烯 醛	十七	
2-乙基己酸	辛酸(所有異構體)	十七	
丙烯酸 2-乙基己酯		十七	
2-乙基己醇	辛醇(所有異構體)	十七	
2-乙基己胺		十七	2276
2-乙基-2-(羥甲基)		十七	
丙烷-1,3-二醇, C8 -C10 酯			
醋酸	乙酸	十七	
5-亞乙基雙環(2,2,1)	乙叉降冰片烯	十七	
庚-2-烯			
乙叉降冰片烯		十七	
甲基丙烯酸乙酯		十七	2277
N-甲基乙基烯丙胺		十七	
正-乙基-2-甲基烯丙 胺	N-甲基乙基烯丙胺	十七	
2-乙基-6-甲基苯胺	2-甲基-5-乙基吡啶	十七	
2-乙基-6-甲基苯胺	2-甲基-6-乙基苯胺	十七	

索引名稱	貨品名稱	章	UN 編號
乙基甲基酮	甲基乙基酮	十七	
5-乙基-2-甲基吡啶	2-甲基-5-乙基吡啶	十七	
乙醚	二乙醚	十七	
磷酸三乙酯	磷酸三乙脂	十七	
酞酸乙酯	二庚基鄰苯二甲酸酯	十七	
5-乙基-2-甲基吡啶	2-甲基-5-乙基吡啶	十七	
3-乙基丙-1-醇	丙二醇單烷基醚	十七	
乙基丙烯	丙烯酸乙酯	十七	
2-乙基-3-丙基丙烯 醛		十七	
乙基硫酸	硫酸二乙酯	十七	
乙基甲苯		十七	
5-乙基-鄰-甲苯胺	2-甲基-5-乙基吡啶	十七	
5-乙基-2-甲苯胺	2-甲基-6-乙基苯胺	十七	
6-乙基-鄰-甲苯胺	2-甲基-6-乙基苯胺	十七	
乙基乙基醚	乙烯基乙基醚	十七	
乙炔基二甲基甲醇	2-甲基-2-羥基-丁 炔-(3)	十七	
脂肪(飽和 C13+)		十七	
脂肪酸, 基本為線形, C6-C18, 2-乙基己基 酯		十七	
糖蜜	糖蜜	十八	
發酵酒精	乙醇	十八	
氯化鐵溶液		十七	2582
硝酸鐵/硝酸溶液		十七	
魚油(含量少於 4%游離 脂肪酸)		十七	
亞麻油	亞麻子油	十七	
甲醛溶液(45%或以下)		十七	1198, 22
甲醛三聚合物	1, 3, 5-三惡烷	十七	
甲醛水	甲醛溶液(45%或以下)	十七	
甲酰胺		十七	
二甲基甲酰胺	二甲基甲酰胺	十七	
甲酸		十七	1779
甲酸醛	甲醛溶液(45%或以下)	十七	
呋喃亞甲基	糠醛	十七	

索引名稱	貨品名稱	章	UN 編號
2-呋喃甲醛	糠醛	十七	
呋喃-2,5-二酮	順丁烯二酐	十七	
2,5-呋喃二酮	順丁烯二酐	十七	
糠醛		十七	1199
2-呋喃甲醛	糠醛	十七	
糠醇		十七	2874
呋喃基甲醇	糠醇	十七	
稠合聚乙烯聚胺烴	聚乙烯聚胺	十七	
白株樹油	水楊酸甲酯	十七	
冰醋酸	乙酸	十七	
D-吡喃葡萄糖苷 C8-C14 烷基	烷基 (C8-C10) / (C12-C14) (40% 或以下 /60% 或以上) 聚葡萄糖苷溶液 (55% 或以下)	十七	
D-吡喃葡萄糖苷 C8-C14 烷基	烷基 (C8-C10) / (C12-C14) (60% 或以上 /40% 或以下) 聚葡萄糖苷溶液 (55% 或以下)	十七	
葡萄糖溶液		十八	
戊二醛溶液 (50% 或以下)		十七	
甘油	甘油	十八	
甘油		十八	
甘油三乙酸酯	甘油三乙酸酯	十七	
甘油甲苯	甘油	十八	
甘油	甘油	十八	
甘油一油酸		十八	
甘油油酸鹽	甘油一油酸	十八	
甘油-1-油酸鹽	甘油一油酸	十八	
甘油三乙酸酯	甘油三乙酸酯	十七	
甘油三乙酸酯		十七	
C10 三烷基醋酸縮水甘油酯		十七	
縮水甘油基新癸酸	C10 三烷基醋酸縮水甘油酯	十七	
甘氨酸碳酸鈉溶液	甘氨酸, 氯化鈉溶液	十七	
甘氨酸, 氯化鈉溶液		十七	

索引名稱	貨品名稱	章	UN 編號
1,2-乙二醇	乙二醇	十七	
乙二醇碳酸酯	碳酸乙烯酯	十八	
乙二醇氯代丙二醇	乙撐氯醇	十七	
乙二醇二氯化物	二氯化乙烯	十七	
乙醇酸溶液（70%或以下）		十七	3265
乙二醇一丁基醚	乙二醇單烷基醚	十七	
氨基乙醚醇	甘油	十八	
乙二醛	乙二醛溶液（40%或以下）	十七	
乙二醛溶液（40%或以下）		十七	
草甘膦	草甘膦溶液（不含表面活性劑）	十七	
草甘膦一單（異丙基銨）	草甘膦溶液（不含表面活性劑）	十七	
草甘膦溶液（不含表面活性劑）		十七	
乙醇	乙醇	十八	
花生油（含量少於4%游離脂肪酸）		十七	
四甲苯	四甲苯（所有異構體）	十七	
十一烷酸	十一烷酸	十七	
1-十一烷醇	十一醇	十七	
環庚烷	環庚烷	十七	
庚烷（所有異構體）		十七	1206
3-庚烷羧酸	辛酸（所有異構體）	十七	
庚酸	正庚酸	十七	
正庚酸		十七	
庚醇（所有異構體）（D）		十七	
庚-2-酮	甲基·戊基（甲）酮	十七	
庚-2-酮	甲基·戊基（甲）酮	十七	
2-庚酮	甲基·戊基（甲）酮	十七	
庚烯（所有異構體）		十七	
庚烯酸	正庚酸	十七	
乙酸庚酯		十七	
庚醇，所有異構體	庚醇（所有異構體）（d）	十七	



索引名稱	貨品名稱	章	UN 編號
庚基甲醇	辛醇（所有異構體）	十七	
庚烯，混合異構體	庚烯（所有異構體）	十七	
庚酸	正庚酸	十七	
正－庚酸	正庚酸	十七	
1－十六碳烯	烯（C13+，所有異構體）	十七	
十六烷基－二十甲基丙 烯酸酯混合物	甲基丙烯酸十六～二十 甘酯混合物	十七	
1－十六烷基萘/1，4－雙 （十六烷基）萘混合物		十七	
十六烷基萘/雙（十六烷 基）萘混合物	1－十六烷基萘/1，4－雙 （十六烷基）萘混合物	十七	
十六烷基/十八醇	乙醇（C13+）	十七	
十六烷基，十八烷基和二 十甲基丙烯酸酯，混合物	甲基丙烯酸十六～二十 甘酯混合物	十七	
六乙二醇	聚乙二醇	十七	
六氫化苯胺	環己胺	十七	
六氫化苯	環己烷	十七	
六氫化－1H－氮雜環庚 三烯	六甲撐亞胺	十七	
六氫化－1-H-氮雜環庚三 烯	六甲撐亞胺	十七	
六氫化酚	環己醇	十七	
六氫化甲苯	甲基環己烷	十七	
環六亞甲基	環己烷	十七	
乙撐二胺己二酸酯（50% 在水中）		十七	
乙撐二胺（熔化的）		十七	
乙撐二胺溶液		十七	1783
1,6-乙撐二胺溶液	乙撐二胺溶液	十七	
乙撐二胺己二酸酯溶液 （50%溶液）	乙撐二胺己二酸酯（50% 在水中）	十七	
1，6－己二異氰酸酯		十七	2281
己二異－1，6－氰酸酯	1，6－己二異氰酸酯	十七	
1，6－己二醇		十七	
六甲撐亞胺		十七	2493
烏洛托品溶液		十八	
烏洛托品	烏洛托品溶液	十八	

索引名稱	貨品名稱	章	UN 編號
環己烷	環己烷	十七	
1, 6-己烷二胺己二酸 (1:1)	乙撐二胺己二酸酯(50% 在水中)	十七	
己烷(所有異構體)		十七	1208
1, 6-己烷二胺	乙撐二胺(熔化的)	十七	
己烷-1, 6-二胺溶液	乙撐二胺溶液	十七	
1, 6-己烷二胺溶液	乙撐二胺溶液	十七	
己二酸, 二(2-乙基己 基)酯	二(2-乙基己基)己二 酸酯	十七	
己烷-1, 6-二醇	1, 6-己二醇	十七	
1, 6-己二醇	1, 6-己二醇	十七	
1, 6-己二醇, 蒸餾塔頂 餾分		十七	1987
正-己烷	己烷(所有異構體)	十七	
己酸		十七	
己醇		十七	2282
己-1-醇	己醇	十七	
己-6-交酯	$\epsilon$ -己內酰胺(熔化的或 水溶液)	十七	
己-2-酮	甲基丁基酮	十七	
2-己酮	甲基丁基酮	十七	
己烷(所有異構體)		十七	2370
己烷-1	己烷(所有異構體)	十七	
己-1-烷	己烷(所有異構體)	十七	
2-己烷	己烷(所有異構體)	十七	
甲基異丁基甲酮	甲基異丁基酮	十七	
醋酸己酯		十七	1233
仲-乙酸己酯	乙酸甲基戊酯	十七	
己醇	己醇	十七	
己基二甲胺	烷基(C12+)二甲胺	十七	
己烯	己烯(所有異構體)	十七	
己二醇		十八	
己基醋酸酯	醋酸己酯	十七	
己醇	己醇	十七	
同氨己環	六甲撐亞胺	十七	
鹽酸		十七	1789
氫化呋喃	四氫呋喃	十七	

索引名稱	貨品名稱	章	UN 編號
氫羧酸	甲酸	十七	
氫氯水	鹽酸	十七	
過氧化氫溶液（60%以上，70%以下）		十七	2015
氫硫酸鹽	硫酸	十七	
$\alpha$ -氫化的- $\omega$ -羥基丙基〔氧（甲基-1-二乙烷基）〕	聚丙二醇	十七	
羥基乙酸	乙醇酸溶液（70%或以下）	十七	
羥苯	苯酚	十七	
4-羥基丁酸內酯	$\gamma$ -丁內酯	十七	
4-羥基丁酸內酯	$\gamma$ -丁內酯	十七	
$\gamma$ -羥基丁酸內酯	$\gamma$ -丁內酯	十七	
羥基二甲基苯	二甲苯酚	十七	
羥基乙酸	乙醇酸溶液（70%或以下）	十七	
2-羥乙基丙烯酸酯		十七	
$\beta$ -羥乙基丙烯酸酯	2-羥乙基丙烯酸酯	十七	
2-羥乙基胺	乙醇胺	十七	
正- $\beta$ -羥乙基乙二胺	氮乙基乙醇胺	十七	
正-（羥乙基）乙二胺三乙酸，三鈉鹽溶液		十七	
2-羥乙基丙烯	2-羥乙基丙烯酸酯	十七	
2-羥乙基-2-丙烯	2-羥乙基丙烯酸酯	十七	
$\alpha$ -羥基異丁腈	丙酮氰醇	十七	
4-羥基-2-酮-甲基戊烷	雙丙酮醇	十七	
4-羥基-4-甲基戊酮-2	雙丙酮醇	十七	
4-羥基-4-甲基戊-2-酮	雙丙酮醇	十七	
2-（羥基甲基）丙烷	異丁醇	十七	
2-羥基-2-甲基丙酰腈	丙酮氰醇	十七	
2-羥基-4-（甲硫基）丁酸		十七	

索引名稱	貨品名稱	章	UN 編號
2-羥基-4-甲硫基丁酸	2-羥基-4-(甲硫基)丁酸	十七	
2-羥基硝基苯(熔化的)	鄰-硝基苯酚(熔化的)	十七	
1-羥基丙酸	乳酸	十七	
2-羥基丙酸	乳酸	十七	
$\alpha$ -羥基丙酸	乳酸	十七	
3-羥基丙酸, 內酯	$\beta$ -丙內脂	十七	
2-羥基丙腈	乳腈溶液(80%或以下)	十七	
$\alpha$ -羥基丙腈	乳腈溶液(80%或以下)	十七	
$\beta$ -羥基丙腈	乙撐氰醇	十七	
2-羥基丙酰基腈	乳腈溶液(80%或以下)	十七	
3-羥基丙酰基腈	乙撐氰醇	十七	
2-[2-(2-羥丙基)丙基]丙-1-醇	三聚丙烯二醇	十七	
2-羥丙基胺	異丙醇胺	十七	
3-羥丙基胺	正丙醇胺	十七	
$\alpha$ -羥基甲苯	苯甲醇	十七	
3-羥基-2,2,4-三甲基戊基異丁酸酯	2,2,4-三甲基-1,3-戊二醇-1-異丁酸酯	十七	
2,2'-[亞氨基雙(亞乙氨基)]二乙胺	四乙撐五胺	十七	
2,2'-亞氨基(二乙胺)	二乙撐三胺	十七	
2,2'-亞氨基二乙醇	二乙醇胺	十七	
1,1'-亞氨基二丙-2-醇	二異丙醇胺	十七	
氯化鐵(III)溶液	氯化鐵溶液	十七	
硝酸鐵(III)/硝酸溶液	硝酸鐵/硝酸溶液	十七	
異乙酰苯酮	異佛爾酮	十七	
醋酸異戊酯	醋酸戊酯(所有異構物)	十七	
異戊醇		十七	
異丁醛	丁醛(所有異構物)	十七	
異丁醛	丁醛(所有異構物)	十七	
異丁醇	異丁醇	十七	
異丁醇胺	2-氨基-2-甲基-1-丙醇	十七	
乙酸異丁酯	乙酸丁酯(所有異構物)	十七	
乙酸異丁酯	乙酸丁酯(所有異構物)	十七	

索引名稱	貨品名稱	章	UN 編號
異丁醇		十七	1212
異丁醛	丁醛（所有異構物）	十七	
異丁胺	丁胺（所有異構物）	十七	
異丁甲醇	異戊醇	十七	
甲酸異丁酯		十七	2393
異丁基甲酮	二異丁基甲酮	十七	
異丁烯酸酯		十七	
異丁基甲基甲醇	甲基戊醇	十七	
異丁基甲基酮	甲基異丁基酮	十七	
異丁基甲基甲醇	甲基戊醇	十七	
異丁醛	丁醛（所有異構物）	十七	
異丁醛	丁醛（所有異構物）	十七	
1-異氰酸根絡-3-異 氰酸根絡甲基-三甲基 環己烯	異佛爾酮二異氰酸酯	十七	
3-異氰酸根絡甲基- 3,5,5-三甲基環己基 異氰酸鹽	異佛爾酮二異氰酸酯	十七	
異癸醇	癸醇（所有異構物）	十七	
異癸醇	癸醇（所有異構物）	十七	
異十二烷	十二烷（所有異構物）	十七	
異四甲苯	四甲苯（所有異構體）	十七	
異壬酸	壬酸（所有異構體）	十七	
異壬醇	壬醇（所有異構體）	十七	
異辛烷	辛醇（所有異構體）	十七	
異辛醇	辛醇（所有異構體）	十七	
異戊烷	戊烷（所有異構體）	十七	
異戊醇	戊醇，伯	十七	
異戊醇	異戊醇	十七	
異戊烯	戊烷（所有異構體）	十七	
異戊基醋酸酯	醋酸戊酯（所有異構物）	十七	
異戊基醇	異戊醇	十七	
異佛爾酮		十七	
異佛爾酮二胺		十七	2289
異佛爾酮二異氰酸酯		十七	2290
異戊二烯		十七	1218
異丙醇	異丙醇	十八	



索引名稱	貨品名稱	章	UN 編號
異丙醇胺		十七	
異丙烯基苯	$\alpha$ -甲基苯乙烯	十七	
2-異丙氧基乙醇	乙二醇單烷基醚	十七	
2-異丙氧基丙烷	異丙醚	十七	
乙酸異丙脂		十七	1220
異丙基丙酮	甲基異丁基酮	十七	
異丙醇		十八	
異丙胺		十七	1221
異丙基銨正-(甲基膦酰基)甘草酸	草甘膦溶液(不含表面活性劑)	十七	
異丙基甲醇	異丁醇	十七	
異丙基甲醇	異丁醇	十七	
異丙基環己烷		十七	
1-異丙基-3,3-二甲基環丙烷二異丁酸酯	2,2,4-三甲基-1,3-戊二醇二異丁酸酯	十七	
異丙醚		十七	1159
異丙基亞基丙酮	異亞丙基丙酮	十七	
異丙基氧化物	異丙醚	十七	
異丙基甲苯	對-散花烴	十七	
4-異丙基甲苯	對-散花烴	十七	
4-異丙基甲苯	對-散花烴	十七	
異戊醛	戊醛(所有異構體)	十七	
異戊醛	戊醛(所有異構體)	十七	
異戊醛	戊醛(所有異構體)	十七	
異戊醛	戊醛(所有異構體)	十七	
異丁基酮	二異丁基甲酮	十七	
高齡土漿	高齡土漿	十八	
高齡石黏土漿	高齡土漿	十八	
高齡土漿		十八	
酮基環己烷	環己酮	十七	
酮丙烷	丙酮	十八	
酮基丙烷	丙酮	十八	
乳酸		十七	
乳腈溶液(80%或以下)		十七	
精練油	橄欖油(含量少於 3.3% 游離脂肪酸)	十七	
豬脂(含量少於 1% 游離		十七	

索引名稱	貨品名稱	章	UN 編號
脂肪酸)			
十二酸		十七	
月桂醇	十二(烷)醇	十七	
月桂基硫醇	叔十二烷硫醇	十七	
月桂基異丁烯酸	甲基丙烯酸十二酯	十七	
烷基鉛，未另列明的	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
四乙基鉛	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
四甲基鉛	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
萘烯	二聚戊烯	十七	
亞麻子油		十七	
液體化學廢物		十七	
長鏈烷芳基聚醚 (C11– C20)		十七	
碱液	氫氧化鈉溶液	十七	
碱液，碳酸鉀	氫氧化鉀溶液	十七	
碱液，碳酸鈉	氫氧化鈉溶液	十七	
碱液溶液	氫氧化鈉溶液	十七	
L-賴氨酸(60%或以下)		十七	
氫氧化鎂	氫氧化鎂漿	十八	
氯化鎂溶液		十七	
氫氧化鎂漿		十八	
玉米油	玉米油(含量少於 10% 游離脂肪酸)	十七	
順丁烯二酐		十七	2215
葡甲胺	葡甲胺溶劑(70%或以 下)	十八	
巯基苯並噻唑鈉鹽溶液		十七	
三甲基苯	三甲基苯(所有異構體)	十七	
異亞丙基丙酮		十七	1229
變甲醛	1,3,5-三惡烷	十七	
變位鈉	變位鈉溶液	十七	
變位鈉溶液		十七	
甲基丙烯酸		十七	2531
α-甲基丙烯酸	甲基丙烯酸	十七	

索引名稱	貨品名稱	章	UN 編號
甲基丙烯酸，十二烷基酯	甲基丙烯酸十二酯	十七	
甲基丙烯酸，正十二烷基酯	甲基丙烯酸十二酯	十七	
二氯化乙烯中的甲基丙烯酸		十七	
甲基丙烯酸		十七	3079
威百畝	變位鈉溶液	十七	
甲醛	甲醛溶液（45%或以下）	十七	
甲酰胺	甲酰胺	十七	
甲胺	甲胺溶液（42%或以下）	十七	
甲烷羧酸	乙酸	十七	
甲烷羧酸	乙酸	十七	
甲酸	甲酸	十七	
甲醇	甲醇	十七	
六亞甲基四胺	烏洛托品溶液	十八	
3-甲氧(基)-1-丁醇		十七	
3-甲氧基丁-1-醇	3-甲氧(基)-1-丁醇	十七	
3-甲氧丁基乙酸鹽		十七	
3-甲氧基乙醇	乙二醇單烷基醚	十七	
2-甲氧基-2-甲基丁烷	叔戊醇甲基醚	十七	
3-甲氧基-3-甲基丁烷-1-醇	3-甲基-3-甲氧基丁醇	十七	
3-甲氧基-3-甲基丁醇	3-甲基-3-甲氧基丁醇	十七	
2-甲氧基-1-甲基乙基醋酸酯	丙二醇甲基醚乙酸鹽	十七	
N-(2-甲氧基-1-甲基乙基)-2-乙基-6-一甲基乙酰氯苯胺		十七	
2-甲氧基-2-甲基丙烷	甲基戊丁基醚	十七	
1-甲氧基丙-2-醇	丙二醇甲基醚乙酸鹽	十七	
1-甲氧基-2-丙醇醋酸酯	丙二醇甲基醚乙酸鹽	十七	
甲基乙醛	丙醛	十七	
乙酸甲烯		十七	

索引名稱	貨品名稱	章	UN 編號
甲基乙酸	丙酸	十七	
乙酰乙酸甲酯		十七	
甲基乙酰乙酸酯	丙烯酸甲酯	十七	
$\beta$ -甲基丙烯醛	巴豆醛	十七	
丙烯酸甲酯		十七	1919
2-甲基丙烯酸	甲基丙烯酸	十七	
2-甲基丙烯酸，十二烷基酯	甲基丙烯酸十二酯	十七	
2-甲基丙烯酸，正十二烷基酯	甲基丙烯酸十二酯	十七	
甲醇		十七	
甲胺溶液（42%或以下）		十七	1235
1-甲基-2-胺苯	鄰甲苯胺	十七	
2-甲基-1-胺苯	鄰甲苯胺	十七	
乙酸甲基戊酯		十七	1233
甲基戊醇		十七	2053
甲基·戊基（甲）酮		十七	1110
甲基正戊基（甲）酮	甲基·戊基（甲）酮	十七	
2-甲基苯胺	鄰甲苯胺	十七	
3-甲基苯胺	鄰甲苯胺	十七	
鄰-甲基苯胺	鄰甲苯胺	十七	
2-甲基苯胺	鄰甲苯胺	十七	
3-甲基苯胺	鄰甲苯胺	十七	
鄰-甲基苯胺	鄰甲苯胺	十七	
甲基苯	甲苯	十七	
甲基苯二胺	甲苯二胺	十七	
甲基苯	甲苯	十七	
2-甲基-1,3-丁二烯	異戊二烯	十七	
3-甲基-1,3-丁二烯	異戊二烯	十七	
2-甲基正丁醛	戊醛（所有異構體）	十七	
3-甲基正丁醛	戊醛（所有異構體）	十七	
1-甲基丁烷	戊烷（所有異構體）	十七	
2-甲基丁烷	戊烷（所有異構體）	十七	
丁酸甲酯	丁酸甲酯	十七	
2-甲基-2-丁醇	叔戊醇	十七	
2-甲基丁-2-醇	叔戊醇	十七	
2-甲基-4-丁醇	異戊醇	十七	

索引名稱	貨品名稱	章	UN 編號
3-甲基-1-丁醇	戊醇，伯	十七	
3-甲基-1-丁醇	異戊醇	十七	
3-甲基丁-1-醇	戊醇，伯	十七	
3-甲基丁-1-醇	叔戊醇	十七	
3-甲基丁-3-醇	叔戊醇	十七	
3-甲基丁-1-烯	戊烷（所有異構體）	十七	
甲基丁烯	戊烷（所有異構體）	十七	
甲基丁醇		十七	
1-甲乙基醋酸酯	醋酸戊酯（所有異構物）	十七	
2-甲基-2-丁基醇	叔戊醇	十七	
2-甲基-4-丁基醇	異戊醇	十七	
3-甲基-1-丁基醇	異戊醇	十七	
3-甲基-3-丁基醇	叔戊醇	十七	
甲基戊丁基醚		十七	
甲基丁基酮		十七	1224
甲基丁炔醇		十七	
2-甲基-3-丁炔-2-醇	2-甲基-2-羥基-丁炔-（3）	十七	
2-甲基-3-丁炔-2-醇	甲基丁炔醇	十七	
2-甲基丁-3-炔-2-醇	2-甲基-2-羥基-丁炔-（3）	十七	
2-甲基丁-3-炔-2-醇	甲基丁炔醇	十七	
2-甲基丁醛	戊醛（所有異構體）	十七	
3-甲基丁醛	戊醛（所有異構體）	十七	
丁酸甲酯		十七	1237
甲基乙二醇乙醚	乙二醇單烷基醚	十七	
甲基三氯甲烷	1,1,1-三氯乙烷	十七	
甲基氰化物	乙腈	十七	
甲基環己烷		十七	2296
甲基環戊二烯二聚物		十七	
甲基-1,3-環戊二烯二聚物	甲基環戊二烯二聚物	十七	
甲基環戊三錳羧		十七	3281
甲基二羥乙基胺		十七	
4-甲基-1,3-二氧戊	碳酸丙烯	十八	



索引名稱	貨品名稱	章	UN 編號
環-2-酮			
甲基二硫化物	二甲基二硫化物	十七	
S.S' - 亞甲基雙〔正-二 二氫基 (C4-C8) 二硫 代氨基甲酸鹽〕	烷基二硫代氨基甲酸鹽 (C19-C35)	十七	
亞甲基溴化物	二溴甲烷	十七	
2-亞甲基丙酸	甲基丙烯酸	十七	
乙酸甲酯	乙酸甲烯	十七	
1-甲基乙基醋酸酯	乙酸異丙脂	十七	
1-甲基乙基胺	乙酸異丙脂	十七	
2-甲基-6-乙基苯胺		十七	
1,4-甲基乙基苯	乙基甲苯	十七	
甲基乙基甲醇	仲-丁醇	十八	
甲基乙二醇	丙基乙二醇	十八	
甲基乙二醇	丙基乙二醇	十八	
甲基環氧乙烷	氧化丙烯	十七	
甲基乙基酮		十七	
正-(1-甲基乙基)丙 烷-2-胺	二異丙醇胺	十七	
2-甲基-5-乙基吡啶		十七	2300
甲酸甲酯		十七	1243
正-甲基-D-葡胺	葡甲胺溶劑 (70%或以 下)	十八	
葡甲胺溶劑 (70%或以 下)		十八	
甲基乙二醇	丙基乙二醇	十八	
5-甲基己-2-酮	甲基·戊基 (甲) 酮	十七	
甲己基甲醇	辛醇 (所有異構體)	十七	
甲基 2-羥基苯酯	水楊酸甲酯	十七	
甲基 鄰-羥基苯酯	水楊酸甲酯	十七	
2-甲基-2-羥基-丁 炔-(3)		十七	
2-甲基-2-羥基-3- 丁炔	甲基丁炔醇	十七	
2,2'-(甲基亞氨基) 二乙醇	甲基二羥乙基胺	十七	
正-甲基-2,2'-亞氮	甲基二羥乙基胺	十七	

索引名稱	貨品名稱	章	UN 編號
基二乙醇			
甲基異戊基甲酮	甲基·戊基(甲)酮	十七	
甲基異丁烯基甲酮	異亞丙基丙酮	十七	
甲基異丁基甲醇	甲基戊醇	十七	
甲基異丁基甲醇酯	乙酸甲基戊酯	十七	
甲基異丁基酮		十七	
2-甲基丙醇腈	丙酮氰醇	十七	
甲硫基丙醛	3-(甲硫基)丙醛	十七	
甲基丙烯酸甲脂		十七	1247
甲酸甲酯	甲酸甲酯	十七	
3-甲基-3-甲氧基丁醇		十七	
甲基 $\alpha$ -甲基丙烯酸	甲基丙烯酸甲脂	十七	
甲基 2-甲基丙-2-烯酯	甲基丙烯酸甲脂	十七	
甲基萘(溶液)		十七	
$\alpha$ -甲基萘	甲基萘(溶液)	十七	
$\beta$ -甲基萘	甲基萘(溶液)	十七	
8-甲基壬-1-醇	癸醇(所有異構物)	十七	
羥甲基丙烷	正-丁醇	十八	
$\alpha$ -甲基- $\omega$ -甲氧基聚(乙烯氧)	聚乙二醇	十七	
$\alpha$ -甲基- $\omega$ -甲氧基聚(氧-1,2-二亞甲基)	聚乙二醇	十七	
$\alpha$ -甲基- $\omega$ -甲氧基聚(氧亞乙基)	聚乙二醇	十七	
甲基環氧乙烷	氧化丙烯 2-甲基	十七	
2-甲基-2,4-戊二醇	己二醇	十八	
2-甲基戊-2,4-二醇	己二醇	十八	
甲基戊-2-醇	甲基戊醇	十七	
4-甲基戊醇-2	甲基戊醇	十七	
4-甲基戊-2-醇	甲基戊醇	十七	
4-甲基-2-戊醇酯	乙酸甲基戊酯	十七	
4-甲基-2-戊酮	甲基異丁基酮	十七	
4-甲基戊-2-酮	甲基異丁基酮	十七	
2-甲基戊烯	己烯(所有異構體)	十七	
2-甲基-1-戊烯	己烯(所有異構體)	十七	

索引名稱	貨品名稱	章	UN 編號
2-甲基戊-1-烯	己烯(所有異構體)	十七	
4-甲基-1-戊烯	己烯(所有異構體)	十七	
4-甲基-3-五乙撐六 胺-2-酮	異亞丙基丙酮	十七	
4-甲基五乙撐-3-六 胺-2-酮	異亞丙基丙酮	十七	
4-甲基-2-戊基醋酸酯	乙酸甲基戊酯	十七	
甲基戊基酯	乙酸甲基戊酯	十七	
甲基叔-戊基醚	叔戊醇甲基醚	十七	
甲基戊基甲酮	甲基·戊基(甲)酮	十七	
甲亞苯基二胺	甲苯二胺	十七	
2-甲基-m-亞苯基二 胺	甲苯二胺	十七	
4-甲基-m-亞苯基二 胺	甲苯二胺	十七	
甲亞苯基二異氰酸酯	甲苯二異氰酸酯	十七	
4-甲基-1,3-亞苯基 二異氰酸酯	甲苯二異氰酸酯	十七	
4-甲基-m-亞苯基二 異氰酸酯	甲苯二異氰酸酯	十七	
2-甲基-2-苯基丙烷	丁苯(所有異構物)	十七	
2-甲基丙醛	丁醛(所有異構物)	十七	
2-甲基-1-丙醇	異丁醇	十七	
2-甲基丙-1-醇	異丁醇	十七	
2-甲基-2-丙醇	叔丁醇	十七	
2-甲基丙-2-醇	叔丁醇	十七	
2-甲基丙-2-烯腈	甲基丙烯腈	十七	
2-甲基丙烯酸	甲基丙烯酸	十七	
$\alpha$ -甲基丙烯酸	甲基丙烯酸	十七	
2-甲基丙-1-烯基甲 基酮	異亞丙基丙酮	十七	
2-甲基丙基丙烯酸酯	正丙烯酸丁酯(所有異構 體)	十七	
2-甲基-1-丙醇	異丁醇	十七	
2-甲基-2-丙醇	叔丁醇	十七	
甲基丙基苯	對-散花烴	十七	
甲基丙基甲醇	仲戊醇	十七	

索引名稱	貨品名稱	章	UN 編號
1-甲基-1-丙基乙烯	己烯(所有異構體)	十七	
2-甲基丙基甲酸	甲酸異丁酯	十七	
甲基丙基酮		十八	1249
2-甲基吡啶		十七	2313
3-甲基吡啶		十七	2313
4-甲基吡啶		十七	2313
$\alpha$ -甲基吡啶	2-甲基吡啶	十七	
1-甲基-2-吡咯酮	N-甲基-2-吡咯烷	十七	
1-甲基吡咯-2-酮	N-甲基-2-吡咯烷	十七	
正-甲基-吡咯酮	N-甲基-2-吡咯烷	十七	
1-甲基-2-吡咯烷酮	N-甲基-2-吡咯烷	十七	
N-甲基-2-吡咯烷		十七	
水楊酸甲酯		十七	
甲基苯乙烯	乙烯基甲苯	十七	
$\alpha$ -甲基苯乙烯		十七	2303
3-(甲硫基)丙醛		十七	
異丙甲草胺	N-(2-甲氧基-1-甲基乙基)-2-乙基-6-甲基乙酰氯苯胺	十七	
乳酸	乳酸	十七	
氧化鎂乳劑	氫氧化鎂漿	十八	
凡士林	礦脂	十七	
礦物蠟	礦脂	十七	
糖蜜		十八	
單氯苯	氯苯	十七	
單氯苯	氯苯	十七	
單乙醇胺	乙醇胺	十七	
單乙基胺	乙胺	十七	
單乙醇胺溶液, 72%或以下	乙胺溶液(72%或以下)	十七	
單異丙醇胺	異丙醇胺	十七	
單異丙胺	異丙胺	十七	
單甲基胺	甲胺溶液(42%或以下)	十七	
單甲基胺溶液 42%或以下	甲胺溶液(42%或以下)	十七	
單丙基胺	正丙胺	十七	

單丙基乙二醇	丙基乙二醇	十八	
嗎啉		十七	2054
內燃機燃料抗爆化合物 (包含鉛烷基)		十七	1649
鹽酸	鹽酸	十七	
萘(熔化的)		十七	2304
新癸酸		十七	
新癸酸, 3-環氧丙基酯	C10 三烷基醋酸縮水甘油酯	十七	
新癸酸, 環氧丙基酯	C10 三烷基醋酸縮水甘油酯	十七	
新癸酸乙烯基酯	新癸酸乙烯基酯	十七	
新戊烷	戊烷(所有異構體)	十七	
新戊酸	三甲基乙酸	十七	
新戊二醇	2,2-二甲基丙烷-1,3-二醇(熔融或溶液)	十七	
硝化酸(硫酸和硝酸混合物)		十七	1796
硝酸(70%及以上)		十七	2031, 20
硝酸(70%及以下)		十七	2031
硝酸, 發煙的	硝酸(70%及以上)	十七	
硝酸, 發紅煙的	硝酸(70%及以上)	十七	
次氨基三乙酸, 三鈉鹽溶液		十七	
氨基-2, 2', 2''-三乙醇	三乙醇胺	十七	
2, 2', 2''-氨基三乙醇	三乙醇胺	十七	
2, 2', 2''-氨基三乙醇	三乙醇胺	十七	
1, 1', 1''-氨基三丙-2-醇	三異丙醇胺	十七	
1, 1', 1''-氨基三-2-丙醇	三異丙醇胺	十七	
1-1', 1''-氨基三丙-2-醇	三異丙醇胺	十七	
硝基苯		十七	1662
硝基苯	硝基苯	十七	



硝基乙烷		十七	2842
硝基乙烷 (80%) / 硝基丙烷 (20%)		十七	
正-硝基苯酚	鄰-硝基苯酚 (熔化的)	十七	
2-硝基苯酚	鄰-硝基苯酚 (熔化的)	十七	
2-硝基苯酚 (熔化的)	鄰-硝基苯酚 (熔化的)	十七	
鄰-硝基苯酚	鄰-硝基苯酚 (熔化的)	十七	
鄰-硝基苯酚 (熔化的)		十七	1663
1-或2-硝基丙烷		十七	2608
硝基丙烷 (60%) / 硝基乙烷 (40%) 混合物		十七	
壬烷 (所有異構體)		十七	1920
正-壬烷	壬烷 (所有異構體)	十七	
壬酸 (所有異構體)		十七	
壬醇	壬醇 (所有異構體)	十七	
壬烯 (所有異構體)		十七	
壬醇 (所有異構體)		十七	
壬基甲醇	癸醇 (所有異構體)	十七	
壬烯	壬烯 (所有異構體)	十七	
壬基氫化物	壬烷 (所有異構體)	十七	
壬基異丁烯酸單體		十七	
壬基苯酚		十七	
諾蒎烯	$\beta$ -蒎烯	十七	
諾蒎烯	$\beta$ -蒎烯	十七	
有毒液體, 不燃, (1) 未另列明 (運輸名稱..., 含...) ST1, Cat.X		十七	
有毒液體, 易燃, (2) 未另列明 (運輸名稱..., 含...) ST1, Cat.X		十七	
有毒液體, 不燃, (3) 未另列明 (運輸名稱..., 含...) ST2, Cat.X		十七	
有毒液體, 易燃, (4) 未另列明 (運輸名稱..., 含...) ST2, Cat.X		十七	
有毒液體, 不燃, (5) 未另列明 (運輸名稱..., 含...)		十七	

含...) ST2, Cat.Y			
有毒液體, 易燃, (6) 未另列明 (運輸名稱..., 含...) ST2, Cat.Y			十七
有毒液體, 不燃, (7) 未另列明 (運輸名稱..., 含...) ST3, Cat.Y			十七
有毒液體, 易燃, (8) 未另列明 (運輸名稱..., 含...) ST3, Cat.Y			十七
有毒液體, 不燃, (9) 未另列明 (運輸名稱..., 含...) ST3, Cat.Z			十七
有毒液體, 易燃, (10) 未另列明 (運輸名稱..., 含...) ST3, Cat.Z			十七
有毒液體, (11) 未另列明 (運輸名稱..., 含...) Cat.Z			十八
無毒液體, (12) 未另列明 (運輸名稱..., 含...) Cat.OS			十八
十八烷-1-醇	乙醇 (C13+)		十七
1-十八烷醇	乙醇 (C13+)		十七
辛醛	辛醛		十七
(正)辛烷(所有異構體)			十七 1262
辛酸 (所有異構體)			十七
辛醇 (所有異構體)			十七
辛-1-醇	辛醇 (所有異構體)		十七
辛烯 (所有異構體)			十七
辛酸	辛酸 (所有異構體)		十七
辛基丙烯酸酯	丙烯酸 2-乙基己酯		十七
辛基己二酸	二(2-乙基己基)己二酸酯		十七
辛醇	辛醇 (所有異構體)		十七
辛醛			十七 1191
辛基甲醇	壬醇 (所有異構體)		十七
辛基鄰苯二酸癸酯	二烷基 (C7-C13) 鄰苯		十七

辛酸	二甲酸酯	
辛基鄰苯二甲酸酯	辛酸（所有異構體）	十七
	二烴基（C7—C13）鄰苯	十七
	二甲酸酯	
庚酸	正庚酸	十七
庚酸	正庚酸	十七
硝基苯	硝基苯	十七
硝基苯	硝基苯	十七
松節油	松節油	十七
濃硫酸	發煙硫酸	十七
濃硫酸	硫酸	十七
水楊酸甲酯	水楊酸甲酯	十七
烯烴—烷基酯共聚物（分子重 2000+）		十七
烯（C13+，所有異構體）		十七
油酸		十七
發煙硫酸		十七
橄欖—蘋果醬油	橄欖油（含量少於 3.3% 游離脂肪酸）	十七
橄欖油（含量少於 3.3% 游離脂肪酸）		十七
正磷酸	磷酸	十七
草酸的	乙二醛溶液（40% 或以下）	十七
草醛	乙二醛溶液（40% 或以下）	十七
3—草酸戊烷—1，5—二醇	二甘醇	十八
1，4—氧雜環丁烷酮	對氧氮乙環	十七
2—丙醇酸內酯	$\beta$ —丙醇酸內酯	十七
2，2'—氧化雙（1—氯丙烷）	2，2—二氯異丙醚	十七
2，2'—氧化雙（氧乙炔）二乙醇	四甘醇	十七
2，2'—氧化雙丙烷	異丙醚	十七
2，2'—二氧乙醇	二甘醇	十七
1，1'—二氧丙—2—醇	二丙基二醇	十八

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氧乙酸	乙醇酸溶液（70%或以下）	十七	
氧亞甲基	甲醛溶液（45%或以下）	十七	
棕櫚仁油（含量少於5%游離脂肪酸）		十七	
棕櫚油（含量少於5%游離脂肪酸）		十七	
棕櫚油精（含量少於5%游離脂肪酸）		十七	
棕櫚硬脂精（含量少5%游離脂肪酸）		十七	
石蠟	石蠟	十七	
凡士林	礦脂	十七	
粗石蠟	石蠟	十七	
正-烷屬烴（C10-C20）	正-烷烴（C10+）	十七	
石蠟		十七	
仲醛		十七	
仲醛-氨反應產物		十七	1264
花生油	花生油（含量少於4%游離脂肪酸）	十七	2920
醋酸戊酯	醋酸戊酯（所有異構物）	十七	
壬酸	壬酸（所有異構體）	十七	
壬醇	壬醇（所有異構體）	十七	
五氯乙烷		十七	1669
十五烷酮	乙醇（C13+）	十七	
十五碳-1-烯	烯（C13+，所有異構體）	十七	
1-十五碳烯	烯（C13+，所有異構體）	十七	
戊-1，3-二烯	1，3-戊二烯	十七	
1，3-戊二烯		十七	
五亞乙基二醇	聚乙二醇	十七	
五氯乙烷	五氯乙烷	十七	
戊亞甲基	環戊烷	十七	
2，2，4，6，6-戊甲基-4-庚二醇	叔十二烷硫醇	十七	
戊醛	戊醛（所有異構體）	十七	
戊烷	戊烷（所有異構體）	十七	
戊烷（所有異構體）		十七	1265
戊二醇溶液，50%或以下	戊二醛溶液（50%或以	十七	

	下)		
正—戊烷	戊烷（所有異構體）	十七	
戊酸		十七	
正戊酸（64%）/2—甲基		十七	
丁酸（36%）混合物			
叔—戊酸	三甲基乙酸	十七	
戊—1—醇	正戊醇	十七	
戊—2—醇	仲戊醇	十七	
戊—3—醇	仲戊醇	十七	
1—戊醇	正戊醇	十七	
2—戊醇	仲戊醇	十七	
3—戊醇	仲戊醇	十七	
1—戊醇醋酸酯	醋酸戊酯（所有異構物）	十七	
正—戊醇	正戊醇	十七	
仲—戊醇	仲戊醇	十七	
叔—戊醇	仲戊醇	十七	
戊—2—酮	甲基丙基酮	十八	
2—戊酮	甲基丙基酮	十八	
戊烯（所有異構體）		十七	
戊—1—烯	戊烯（所有異構體）	十七	
1—戊烯	戊烯（所有異構體）	十七	
戊烯類	戊烯（所有異構體）	十七	
戊基醋酸酯	醋酸戊酯（所有異構物）	十七	
仲—戊基醋酸酯	醋酸戊酯（所有異構物）	十七	
戊醇	正戊醇	十七	
仲—戊醇	仲戊醇	十七	
叔—戊醇	仲戊醇	十七	
戊基丙酸酯	正戊基丙酸	十七	
正戊基丙酸		十七	1993
全氯乙烯		十七	1897
全氯甲烷	四氯化碳	十七	
全氫氮雜環庚三烯	六甲撐亞胺	十七	
礦酯		十七	
礦酯	礦酯	十七	
苯	苯和含 10%或以上苯的 混合物（i）	十七	
苯酚	苯酚	十七	
苯酚		十七	2312



苯烷烴磺酸鹽	酚的烷基磺酸酯	十七	
苯胺	苯胺	十七	
1-苯基丁烷	丁苯（所有異構物）	十七	
2-苯基丁烷	丁苯（所有異構物）	十七	
苯甲醇	苯甲醇	十七	
氯苯	氯苯	十七	
1-苯基癸烷	烷基（C9+）苯	十七	
1-苯基十二烷	烷基（C9+）苯	十七	
苯基乙烷	乙苯	十七	
苯醚	二苯醚	十七	
1-苯乙基二甲苯	1-苯基-1-二甲苯基乙烷	十七	
苯基氫化物	苯和含 10%或以上苯的混合物（i）	十七	
苯基氫氧化物	苯酚	十七	
苯酚	苯酚	十七	
苯甲烷	甲苯	十七	
苯甲醇	苯甲醇	十七	
苯甲基醋酸酯	乙酸苄酯	十七	
1-苯丙烷	丙苯（所有異構體）	十七	
2-苯丙烷	丙苯（所有異構體）	十七	
2-苯丙烯	α-甲基苯乙烯	十七	
1-苯基十四碳烷	烷基（C9+）苯	十七	
1-苯基十三碳烷	烷基（C9+）苯	十七	
1-苯基十一碳烷	烷基（C9+）苯	十七	
苯基二甲苯基乙烷	1-苯基-1-二甲苯基乙烷	十七	
1-苯基-1-二甲苯基乙烷		十七	
1-苯基-1-(2,5-二甲苯基)乙烷	1-苯基-1-二甲苯基乙烷	十七	
1-苯基-1-(3,4-二甲苯基)乙烷	1-苯基-1-二甲苯基乙烷	十七	
正-(膦羥基甲基)氨基乙酸	乙酸苄酯	十七	
磷酸		十七	1805
磷，黃的或白的		十七	1381, 24
鄰苯二甲酸	酞酐（熔化的）	十七	

苯二甲酸酐	酞酐 (熔化的)	十七	
苯二甲酸, 雙十一基酯	雙十一基甲鄰苯二甲酸酯	十七	
酞酐 (熔化的)		十七	2214
2-甲基吡啶	2-甲基吡啶	十七	
3-甲基吡啶	3-甲基吡啶	十七	
4-甲基吡啶	4-甲基吡啶	十七	
$\alpha$ -甲基吡啶	2-甲基吡啶	十七	
$\beta$ -甲基吡啶	3-甲基吡啶	十七	
$\gamma$ -甲基吡啶	4-甲基吡啶	十七	
環己酮	環己酮	十七	
2(10)-蒎烯	$\beta$ -蒎烯	十七	
2-蒎烯	$\alpha$ -蒎烯	十七	
$\alpha$ -蒎烯		十七	2368
$\beta$ -蒎烯		十七	2368
松油		十七	1272
戊間二烯	1,3-戊二烯	十七	
三甲基乙酸	三甲基乙酸	十七	
聚(丙烯氧化物)	聚丙二醇	十七	
二甲苯中聚烷(C18-C22)丙烯酸鹽(或酯)		十七	
二甲苯中聚烷(C10-C20)異丁烯酸鹽(或酯)		十七	
二甲苯中聚烷(C10-C18)異丁烯酸鹽/乙烯-丙烯共聚物混合物		十七	3257
聚氯化多鋁溶液		十八	
聚乙烯聚胺		十七	
聚乙二醇		十七	
聚乙二醇二甲醚		十七	
聚硫酸鐵溶液		十七	
脂族中聚異丁烯胺(C10-C14)溶劑		十七	
聚異丁烯基酞加合物		十七	
聚異丁烯	聚(4+)異丁烯	十七	
聚(4+)異丁烯		十七	
聚烯酰胺烯胺(C17+)		十七	
聚烯酰胺烯胺硼酸鹽		十七	

( C28 – C250 )		
聚烯烴胺 ( C28 – C250 )		十七
烷基 ( C2 – C4 ) 苯中聚 烯烴胺		十七
芳香溶劑中聚烯烴胺		十七
聚烯烴酞		十七
聚烯烴酯 ( C28 – C250 )		十七
聚烯烴苯酚胺 ( C28 – C250 )		十七
聚烯烴偶磷硫化鋇衍生 物 ( C28 – C250 )		十七
聚 ( 20 ) 氧乙炔脫水山梨 醇一油酸		十七
聚丙二醇		十七
聚硅氧烷		十七
甲酸鹽溶劑		十八
氫氧化鉀溶液		十七
油酸鉀		十七
硫代硫酸鹽鉀 ( 50% 或更 少 )		十七
丙醛	丙醛	十七
丙酰 – 1 – 胺	正丙胺	十七
2 – 丙酰胺	異丙胺	十七
丙烷 – 1, 2 – 二醇	丙基乙二醇	十八
1, 2 – 丙烷二醇	丙基乙二醇	十八
1, 2 – 丙烷二醇環化碳酸 酯	碳酸丙烯	十八
丙烷腈	丙腈	十七
丙烷 – 1, 2, 3 – 三醇	甘油	十八
1, 2, 3 – 丙烷三醇	甘油	十八
1, 2, 3 – 丙烷三醇三醋 酸酯	甘油三乙酸酯	十七
丙酸	丙酸	十七
丙酸酞	丙酸酞	十七
丙醇	正丙醇	十七
丙 – 1 – 醇	正丙醇	十七
丙 – 2 – 醇	異丙醇	十八
1 – 丙醇	正丙醇	十七

2-丙醇	異丙醇	十八	
正丙醇胺		十七	
3-丙醇交酯	$\beta$ -丙內脂	十七	
正丙醇	正丙醇	十七	
丙酮	丙酮	十八	
丙-2-酮	丙酮	十八	
2-丙酮	丙酮	十八	
丙烯腈	丙烯腈	十七	
氧化丙烯	氧化丙烯	十七	
丙烯酸	丙烯酸	十七	
丙-2-烯-1-醇	丙烯醇	十七	
1-丙烯醇-3	丙烯醇	十七	
2-丙烯-1-醇	丙烯醇	十七	
丙烯醇	丙烯醇	十七	
丙內酯	$\beta$ -丙內脂	十七	
$\beta$ -丙內脂		十七	
丙醛		十七	1275
丙酸		十七	1848
丙醛	丙醛	十七	
丙酸酐		十七	2496
丙腈		十七	2404
$\beta$ -丙酰基內酯	$\beta$ -丙內脂	十七	
丙酰腈	丙腈	十七	
氧化丙酰	丙酸酐	十七	
1-丙氧基丙-2-醇	丙二醇單烷基醚	十七	
丙基醋酸酯	正乙酸丙脂	十七	
正乙酸丙脂		十七	
丙基丙酮	甲基丁基酮	十七	
丙醇	正丙醇	十七	
2-丙醇	異丙醇	十八	
正丙醇		十七	1274
仲丙醇	異丙醇	十八	
丙醛	丙醛	十七	
丙胺	正丙胺	十七	
正丙胺		十七	1277
丙苯(所有異構體)		十七	
正丙苯	丙苯(所有異構體)	十七	
丙基甲醇	正-丁醇	十八	

丙烯醛	巴豆醛	十七	
2, 2-〔丙烯基雙(氨基亞甲基)聯苯酚〕	烷基(C8-C9)芳香劑中的苯胺	十七	
碳酸丙烯		十八	
丙烯氯化物	1, 2-二氯丙烷	十七	
丙烯二氯化物	1, 2-二氯丙烷	十七	
$\alpha, \alpha'$ - (丙烯二氨基)二-鄰-甲氧甲酚	烷基(C8-C9)芳香劑中的苯胺	十七	
丙烯基環氧化物	氧化丙烯	十七	
丙烯乙二醇		十八	
1, 2-丙烯乙二醇	丙烯乙二醇	十八	
丙烯乙二醇正-丁基醚	丙二醇單烷基醚	十七	
丙烯乙二醇乙基醚	丙二醇單烷基醚	十七	
丙烯乙二醇甲基醚	丙二醇單烷基醚	十七	
丙烯二醇甲基醚乙酸鹽		十七	
丙烯二醇單烷基醚		十七	
丙烯乙二醇單丁基醚	丙二醇單烷基醚	十七	
丙烯乙二醇單甲基醚	丙二醇單烷基醚	十七	
丙烯二醇苯基醚		十七	
丙烯乙二醇丙基醚	丙二醇單烷基醚	十七	
丙烯乙二醇三聚物	三聚丙烯二醇	十七	
1, 2-丙烯乙二醇三聚物	三聚丙烯二醇	十七	
丙烯乙二醇 $\beta$ -單乙基醚	丙二醇單烷基醚	十七	
氧化丙烯		十七	1280
丙烯四聚物		十七	2850
丙烯三聚物		十七	2057
丙乙烯	戊烯(所有異構體)	十七	
丙甲基酮	甲基丙基酮	十八	
正-丙基-1-丙胺	二-正-丙胺	十七	
假丁烯乙二醇	丁二醇	十七	
假枯烯	三甲苯(所有異構體)	十七	
假蒎烯	$\beta$ -蒎烯	十七	
假蒎烯	$\beta$ -蒎烯	十七	
吡啶		十七	1282
焦木酸	丙酮	十八	
焦木醚	丙酮	十八	
裂解汽油(蒸汽-裂化石)	苯和含 10%或以上苯的	十七	



腦油)	混合物 (i)	
裂解汽油, 含 10%或以上 上苯	苯和含 10%或以上苯的 混合物 (i)	十七
呋喃醛	糠醛	十七
菜籽油 (低芥酸, 含量少 於 4%游離脂肪酸)		十七
蓖麻油	蓖麻油 (含量少於 2%游 離脂肪酸)	十七
松香		十七
摩擦用醇	異丙醇	十八
飽和脂肪酸 (C13 和以 上)	脂肪酸 (飽和 C13+)	十七
淤渣酸	廢硫酸	十七
碳酸鈉	碳酸鈉溶液	十七
氫氧化鈉	氫氧化鈉溶液	十七
乙酸鈉溶液		十八
亞硫酸鹽酸鈉	亞硫酸氫鈉溶液 (45%或 以下)	十七
硅鋁酸鈉生料		十七
鈉氨醋酸酯溶液	甘氨酸, 氯化鈉溶液	十七
苯甲酸鈉		十七
鈉 1,3-苯並噻唑-2- 硫醇鹽溶液	巰基苯並噻唑鈉鹽溶液	十七
鈉 1,3-苯並噻唑-2- 基硫化物溶液	巰基苯並噻唑鈉鹽溶液	十七
重鉻酸鈉	重鉻酸鈉溶液 (70%或以 下)	十七
二硫化鈉	亞硫酸氫鈉溶液 (45%或 以下)	十七
氫硼化鈉 (15%或以下) /氫氧化鈉溶液		十七
碳酸鈉溶液		十七
氯化鈉溶液 (50%或以 下)		十七 2428
重鉻酸鈉溶液 (70%或以 下)		十七
甘氨酸鹽鈉溶液	甘氨酸, 氯化鈉溶液	十七

氫氧化鈉	氫氧化鈉溶液	十七	
硫化氫鈉	亞硫酸氫鈉溶液(45%或以下)	十七	
氫亞硫酸鈉(60%或以下)/碳酸鈉(3%或以下)溶液		十七	
亞硫酸氫鈉溶液(45%或以下)		十七	2693
氫硫化鈉/硫化胺溶液		十七	
氫硫化鈉溶液(45%或以下)		十七	2949
氫氧化鈉溶液		十七	1824
次氯酸鈉溶液(15%或以下)		十七	1791
硫醇鈉	氫硫化鈉溶液(45%或以下)	十七	
鈉硫醇鹽	氫硫化鈉溶液(45%或以下)	十七	
甲基鈉氨基甲酰二硫酯	變位鈉溶液	十七	
正一甲基鈉二硫氨基甲酸酯	變位鈉溶液	十七	
甲基鈉二硫氨基甲酸酯溶液	變位鈉溶液	十七	
亞硝酸鈉溶液		十七	1500
硫氰酸鈉	硫氰酸鈉溶液(56%或以下)	十七	
硫氰酸鈉酯	硫氰酸鈉溶液(56%或以下)	十七	
硅酸鈉溶液		十七	
硫化鈉溶液		十八	
硫化鈉溶液(15%或以下)		十七	1385
硫化鈉溶液(25%或以下)		十七	
硫氰酸鈉酯	硫氰酸鈉溶液(56%或以下)	十七	
硫氰化鈉	硫氰酸鈉溶液(56%或以下)	十七	

硫化鈉水合物	氫硫化鈉溶液(45%或以下)	十七	
氫硼化鈉(15%或以下) /氫氧化鈉溶液	氫硼化鈉(15%或以下) /氫氧化鈉溶液	十七	
硫氰酸鈉溶液(56%或以下)		十七	
‘D-D 土壤熏蒸劑’	二氯丙烯/二氯丙烷混合物	十七	
大豆油(含量少於0.5% 游離脂肪酸)		十七	
松節油	松節油	十七	
乙醇	乙醇	十八	
環庚烷	環庚烷	十七	
磺酸, 烷烴(C10-C21) 苯酯	酚的烷基磺酸酯	十七	
磺基烷		十七	
磺酸鹽聚丙烯酸酯溶液		十七	
硫(熔化的)		十七	2448
硫酸		十七	1830
硫酸, 發煙的	發煙硫酸	十七	
廢硫酸		十七	1832
硫氯代丙二醇	氯磺酸	十七	
乙醚	乙醚	十七	
硫化脂肪(C14-C20)		十七	
向日葵籽油(含量少於 7%游離脂肪酸)		十七	
水楊酸甲酯	水楊酸甲酯	十七	
均-二氯乙烷	二氯化乙烯	十七	
均-二氯乙醚	二氯乙醚	十七	
均-二甲基乙烯乙二醇	丁二醇	十七	
均-四氯乙烷	四氯乙烷	十七	
均-三氯苯	1, 2, 4-三氯苯	十七	
均-三惡烷	1, 3, 5-三惡烷	十七	
脂(含量少於15%游離 脂肪酸)		十七	
焦油酸	甲酚(所有異構物)	十七	
萘	萘(熔化的)	十七	

松節油	$\beta$ -蒎烯	十七	
1, 3, 5, 7-四氫雜三環 〔3.3.1.13, 7〕癸烷	烏洛托品溶液	十八	
四氯乙烷		十七	1702
1, 1, 2, 2-四氯乙烷	四氯乙烷	十七	
四氯乙烯	全氯乙烯	十七	
1, 1, 2, 2-四氯乙烯	全氯乙烯	十七	
四氯甲烷	四氯化碳	十七	
十四烷-1-醇	乙醇 (C13+)	十七	
1-十四烷醇	乙醇 (C13+)	十七	
十四碳烯	烯 (C13+, 所有異構體)	十七	
十四烷基苯	烷基 (C9+) 苯	十七	
四甘醇		十七	
四乙撐五胺		十七	2320
四乙鉛	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
四乙鉛	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
四乙基硅酸單體/低聚體 (20%乙醇溶劑)		十八	
3a, 4, 7, 7a-四氫化- 二甲基-4, 7-甲撐- 1H-茛	甲基環戊二烯二聚物	十七	
四氫呋喃		十七	2056
四氫化-2H-1, 4-氧 氮雜芑	嗎啉	十七	
四氫化萘		十七	
1, 2, 3, 4-四氫化萘	四氫化萘	十七	
四氫化-1, 4-氧氮雜芑	嗎啉	十七	
四氫化噻吩-1-二氧化 物	磺基烷	十七	
四氫化噻吩 1, 1-二氧 化物	磺基烷	十七	
四氫化萘	四氫化萘	十七	
四甲苯 (所有異構體)		十七	
1, 2, 3, 4-四甲苯	四甲苯 (所有異構體)	十七	
1, 2, 3, 5-四甲苯	四甲苯 (所有異構體)	十七	

1, 2, 4, 5-四甲苯	四甲苯 (所有異構體)	十七	
四亞甲基氰化物	丙烯腈	十七	
四亞甲基二氰化物	丙烯腈	十七	
丁二醇	丁二醇	十七	
四亞甲基氧化物	四氫呋喃	十七	
四亞甲基砷	磺基烷	十七	
四甲鉛	內燃機燃料抗爆化合物 (包含鉛烷基)	十七	
四丙基苯	烷基 (C9+) 苯	十七	
四丙烯苯	十二烷基苯	十七	
甲硝胺甲酸酯	甲酸異丁酯	十七	
硫雜環戊烷-1,1-二氧 化物	磺基烷	十七	
4-硫雜戊醛	3-(甲硫基)丙醛	十七	
硫環戊烷-1,1-二氧化 物	磺基烷	十七	
四氫噻吩砷	磺基烷	十七	
硫代硫酸, 二鉀鹽	硫代硫酸鹽鉀(50%或更 少)	十七	
氧化鈦(IV)	二氧化鈦生料	十七	
二氧化鈦生料		十七	
甲苯		十七	1294
甲苯二胺		十七	1709
2, 4-甲苯二胺	甲苯二胺	十七	
2, 6-甲苯二胺	甲苯二胺	十七	
甲苯二異氰酸酯		十七	2078
2-甲苯胺	鄰甲苯胺	十七	
鄰甲苯胺		十七	1708
甲苯	甲苯	十七	
鄰-甲苯基胺	鄰甲苯胺	十七	
2, 4-甲次苯基二胺	甲苯二胺	十七	
2, 6-甲次苯基二胺	甲苯二胺	十七	
甲次苯基二異氰酸酯	甲苯二異氰酸酯	十七	
2, 4-甲次苯基二異氰酸 酯	甲苯二異氰酸酯	十七	
m-甲次苯基二異氰酸 酯	甲苯二異氰酸酯	十七	
馬來酐	順丁烯二酐	十七	



馬來酐	順丁烯二酐	十七	
轉-1,3-戊二烯	1,3-戊二烯	十七	
糖蜜	糖蜜	十八	
甘油三醋酸酯	乙二醛溶液(40%或以下)	十七	
3,6,9-三氮十一亞甲基二胺	四乙撐五胺	十七	
3,6,9-三氮十一烷-1,11-二胺	四乙撐五胺	十七	
磷酸三丁脂		十七	
1,2,3-三氯苯(熔化的)		十七	
1,2,4-三氯苯		十七	2321
1,2,3-三氯苯	1,2,3-三氯苯(熔化的)	十七	
1,1,1-三氯乙烷		十七	2831
1,1,2-三氯乙烷		十七	
β-三氯乙烷	1,1,2-三氯乙烷	十七	
三氯乙烯	三氯乙烯	十七	
三氯乙烯		十七	1710
三氯甲烷	氯仿	十七	
1,2,3-三氯丙烷		十七	
1,1,2-三氯-1,2,2-三氟乙烷		十七	
磷酸三甲苯脂(含有1%或以上的原異構體)		十七	2574
十三(碳)烷		十七	
十三(烷)酸		十七	
十三(烷)醇	乙醇(C13+)	十七	
十三烯	烯(C13+,所有異構體)	十七	
十三(烷)酸	十三(烷)酸	十七	
十三烷基乙酸酯		十七	
十三烷基醇	乙醇(C13+)	十七	
十三烷基苯	烷基(C9+)苯	十七	
十三烷酸	脂肪酸(飽和C13+)	十七	
十三烷酸	十三(烷)酸	十七	
三(二甲基苯基)磷酸酯	磷酸(三)二甲苯酯	十七	
三乙醇胺		十七	

三乙胺		十七	1296
三乙基苯		十七	
三乙二醇		十八	
三乙撐四胺		十七	2259
磷酸三乙脂		十七	
亞磷酸三乙脂		十七	2323
三聚甲醛	1, 3, 5-三惡烷	十七	
三甘醇	三乙二醇	十八	
三(2-羥乙基)胺	三乙醇胺	十七	
三〔2-羥乙基〕胺	三乙醇胺	十七	
三羥基丙烷	甘油	十八	
三羥基三乙基胺	三乙醇胺	十七	
三異丙醇胺		十七	
三異丙基苯磺酰磷酸鹽		十七	
三甲基乙酸		十七	
三甲胺溶液(30%或以下)		十七	1297
三甲基氨基甲烷	丁胺(所有異構物)	十七	
三甲苯(所有異構體)		十七	
1, 2, 3-三甲苯	三甲苯(所有異構體)	十七	
1, 2, 4-三甲苯	三甲苯(所有異構體)	十七	
1, 3, 5-三甲苯	三甲苯(所有異構體)	十七	
2, 6, 6-三甲基雙環〔3.1.1〕庚-2-烯	α-蒎烯	十七	
三甲基甲醇	叔丁醇	十七	
1, 1, 3-三甲基-3-環己烯-5-酮	異佛爾酮	十七	
3, 3, 5-三甲基環己-2-烯酮	異佛爾酮	十七	
3, 5, 5-三甲基環-2-己-1-酮	異佛爾酮	十七	
3, 3'-三亞甲基二氧二丙-1-醇	三聚丙烯二醇	十七	
2, 2, 4-三甲基戊烷	(正)辛烷(所有異構體)	十七	
2, 2, 4-三甲基-1, 3-戊二醇二異丁酸酯		十七	
2, 2, 4-三甲基戊烷-2, 2, 4-三甲基-1, 3		十七	

1, 3-二醇二異丁酸酯	- 戊乙醇二異丁酸酯	
2, 2, 4-三甲基-1, 3		十七
- 戊乙醇-1-異丁酸酯		
2, 4, 4-三甲基戊烯-1	二異丁烯	十七
2, 4, 4-三甲基戊-1	二異丁烯	十七
- 烯		
2, 4, 4-三甲基戊烯-2	二異丁烯	十七
2, 4, 4-三甲基戊-2	二異丁烯	十七
- 烯		
2, 4, 6-三甲基-1, 3,	仲醛	十七
5-三氧雜環己烷		
2, 4, 6-三甲基-s-三	仲醛	十七
氧雜環己烷		
三氧雜環己烷	1, 3, 5-三惡烷	十七
1, 3, 5-三惡烷		十七
三惡英	1, 3, 5-三惡烷	十七
三氧代亞甲基	1, 3, 5-三惡烷	十七
三聚丙烯	丙烯三聚物	十七
三聚丙烯二醇		十七
三(二甲基苯基)磷酸酯	磷酸(三)二甲苯酯	十七
N, N, N-三(2-羥乙	三乙醇胺	十七
基)胺		
三(2-羥丙基)胺	三異丙醇胺	十七
三(2-羥基-1-丙基)	三異丙醇胺	十七
胺		
三鈉 2-[羧酸酯甲基(2	正-(羥乙基)乙二胺三	十七
-羥甲基)氨基]乙亞氮	乙酸, 三鈉鹽溶液	
基二(醋酸酯)		
三鈉正-(羧甲基)-	正-(羥乙基)乙二胺三	十七
N'- (2-羥乙基)-	乙酸, 三鈉鹽溶液	
N, N'- 乙烯二氨基乙		
酸		
三鈉正-(羧乙基)乙烯	正-(羥乙基)乙二胺三	十七
二胺-N, N, N'- 三醋	乙酸, 三鈉鹽溶液	
酸酯		
三鈉氨基三醋酸酯溶液	次氨基三乙酸, 三鈉鹽溶	十七

		液	
磷酸三甲酚酯，(含有 1% 或以上的原異構體)	磷酸三甲苯脂 (含有 1% 或以上的原異構體)	十七	
磷酸二甲苯酯	磷酸 (三) 二甲苯酯	十七	
磷酸 (三) 二甲苯酯		十七	
桐油 (含量少於 2.5% 游離脂肪酸)		十七	
松節油		十七	1299
松節油	松節油	十七	
松節油	松節油	十七	
A 型沸石	硅鋁酸鈉生料	十七	
十一 (碳) 烷	正 - 烷烴 (C10+)	十七	
1-十一 (碳) 烷羧酸	十二酸	十七	
十一烷酸		十七	
十一烷 - 1 - 醇	十一醇	十七	
十一碳 - 1 - 烯	1-十一碳烯	十七	
1-十一碳烯		十七	
十一醇		十七	
十一 (烷) 基苯	烷基 (C9+) 苯	十七	
十一 (烷) 基酸	十一烷酸	十七	
正 - 十一 (烷) 基酸	十一烷酸	十七	
偏 - 三甲基苯	三甲苯 (所有異構體)	十七	
尿素, 氨溶液	尿素/硝酸銨溶液 (含氨水)	十七	
尿素, 銨氨基甲酸酯	尿素/硝酸銨溶液 (含氨水)	十七	
尿素/硝酸銨溶液		十七	
尿素/硝酸銨溶液 (含氨水)		十七	
尿素/磷酸銨溶液		十七	
尿素溶液		十七	
戊醛	戊醛 (所有異構體)	十七	
戊醛 (所有異構體)		十七	2058
正 - 戊醛	戊醛 (所有異構體)	十七	
戊酸	戊酸	十七	
戊酸	戊酸	十七	
正 - 戊酸	戊酸	十七	

戊醛	戊醛（所有異構體）	十七	
二異丁基（甲）酮	二異丁基甲酮	十七	
植物蛋白溶液（水解的）		十七	
醋酸	乙酸	十七	
醋石腦油	乙酸乙酯	十七	
乙酸乙烯		十七	1301
乙烯甲醇	丙烯醇	十七	
乙烯氰化物	丙烯腈	十七	
乙烯乙酸酯	乙酸乙烯	十七	
乙烯基乙基醚		十七	1302
乙烯甲酸	丙烯酸	十七	
二氯乙烯		十七	1303
新癸酸乙烯酯		十七	
乙烯基甲苯		十七	2618
三氯化乙烯	1，1，2－三氯乙烷	十七	
三氯化乙烯	1，1，2－三氯乙烷	十七	
硫酸鹽棕色油	發煙硫酸	十七	
水		十八	
硅酸鈉	硅酸鈉溶液	十七	
蠟		十七	
高齡土	高齡土漿	十八	
白苛性的	氫氧化鈉溶液	十七	
白焦油	萘（熔化的）	十七	
葡萄酒	含酒精飲料，未另外說明的	十八	
水楊酸甲酯	水楊酸甲酯	十七	
甲醇	甲醇	十七	
木揮發油	甲醇	十七	
甲醇	甲醇	十七	
二甲苯		十七	1307
二甲苯酚		十七	2261
2，3－二甲苯酚	二甲苯酚	十七	
2，4－二甲苯酚	二甲苯酚	十七	
2，5－二甲苯酚	二甲苯酚	十七	
2，6－二甲苯酚	二甲苯酚	十七	
3，4－二甲苯酚	二甲苯酚	十七	
3，5－二甲苯酚	二甲苯酚	十七	

二甲苯	二甲苯	十七
黃潤滑油	脂（含量少於 15% 游離 脂肪酸）	十七
烷基鋅二硫代磷酸鹽 （C7—C16）		十七
烷基鋅甲酰胺		十七
烷基鋅二硫代磷酸鹽 （C3—C14）		十七
溴化鋅鑽井鹽水	鑽井鹽水（含有鋅鹽）	十七
（Z）—十八—9—烷酸	油酸	十七
Z—十八—9—烷酸	油酸	十七
Z—1，3—戊二烯	1，3—戊二烯	十七

## 第二十章

### 液體化學廢物的運輸

#### 20.1 前言

20.1.1 海上運輸液體化學廢物可能會對人類健康和環境構成威脅。

20.1.2 因此，液體化學廢物的運輸應按照有關的國際公約和建議，特別是在海上散裝運輸時，應符合本規則的要求。

#### 20.2 定義

就本章而言：

20.2.1 液體化學廢物係指託運的含有一種或多種受本規則的要求約束的成分或被該一種或多種成分污染的物質，並且該物質無直接的預期用途，只是為了傾倒、焚燒或用其他海上以外的方法進行處理而載運。

20.2.2 跨境運輸係指從一個國家管轄的區域駛往或通過另一個國家



管轄的區域，或者駛往或通過沒有任何國家管轄的區域的海上廢物運輸，但此種運輸至少應涉及兩個國家。

### **20.3 適用範圍**

20.3.1 本章的要求適用於使用海船以散裝形式對液體化學廢物進行的跨境運輸，同時，對本規則的所有其他要求也應一併考慮；

20.3.2 本章的要求不適用於：

- .1 《73/78 MARPOL 公約》的要求所涵蓋的船上操作所產生的廢物；以及
- .2 含有或沾染了放射性材料的物質、溶液或混合物，它們受放射性材料的適用要求的約束。

### **20.4 經許可的運輸**

20.4.1 僅在下述情況下才允許對廢物進行跨境運輸：

- .1 始發國主管當局，或者廢物的產生者或出口者通過始發國主管當局，已向最終目的地國發出了通知；並且
- .2 始發國主管當局在獲得最終目的地國的書面同意，聲明該廢物將被安全地焚燒或將由其他方式處理後，才可批准這種運輸。

### **20.5 單證**

20.5.1 除本規則第 16.2 段中所規定的文件外，從事液體化學廢物跨境運輸的船上應備有始發國主管當局簽發的廢物運輸文件。

### **20.6 液體化學廢物的分類**

20.6.1 為保護海洋環境，對於所有散裝運輸的液體化學廢物，無論實際評估的類別如何，均應作為 X 類有毒液體物質處理。

## 20.7 液體化學廢物的載運和裝卸

20.7.1 應按本規則第十七章中規定的對液體化學廢物的最低要求，在船舶及液貨艙中載運液體化學品廢物，除非有明確的理由說明廢物的危害性可以使其：

- .1 按 1 型船舶的要求進行載運；或
- .2 按本規則中適用於該物質或混合物中構成主要危害性的成分的任何附加要求進行運輸。

## 第二十一章

### 為受 IBC 規則約束的產品確定運輸要求的指標

#### 21.1 簡介

21.1.1 下列指標是為那些正在審議是否歸入《IBC 規則》或 MEPC.2/Circ 通函附件 1、3 或 4 中的散裝液體貨物確定污染等級和規定運輸要求的指南。

21.1.2 在制定這些指標時，已盡一切努力遵循根據《全球協調系統 (GHS)》制定的指標和截止點。

21.1.3 儘管曾試圖將指標規定得準確，以便取得統一性，但必須強調，它們僅僅是指南，如果人們的經驗或其他因素表明有必要作出替代性安排，也總是要考慮到這些指標。如果認識到出現偏離指標的情況，應連同其理由予以妥善記錄。

## 21.2 內容

### 21.2.1 本章包含下列內容：

- .1 受《IBC 規則》第十七章約束的貨品的最低安全和污染指標；
- .2 用於為那些符合使其受《IBC 規則》第十七章約束的安全和污染指標的貨品確定最低載運要求的指標；
- .3 用於將《IBC 規則》第十五章中的特殊要求納入到《IBC 規則》第十七章的“o”欄的指標；
- .4 用於將《IBC 規則》第十六章中的特殊要求納入到《IBC 規則》第十七章的“o”欄的指標；
- .5 本章中使用的貨物特性的定義。

### 21.3 受《IBC 規則》第十七章約束的貨品的最低安全和污染指標

#### 21.3.1 如果貨品滿足下述一項或多項指標，應被視為具有危害性並受到《IBC 規則》第十七章的約束：

- .1 吸入劑量  $LC_{50} \leq 20 \text{ mg/l/4 h}$ （見第 21.7.1.1 段的定義）；
- .2 皮膚接觸劑量  $LD_{50} \leq 2000 \text{ mg/kg}$ （見第 21.7.1.2 段的定義）；
- .3 口腔吸收劑量  $LD_{50} \leq 2000 \text{ mg/kg}$ （見第 21.7.1.3 段的定義）；
- .4 長期接觸對哺乳動物的毒性（見第 21.7.2 段的定義）；
- .5 造成皮膚過敏（見第 21.7.3 段的定義）；

- .6 造成呼吸道過敏（見第 21.7.4 段的定義）；
- .7 灼傷皮膚（見第 21.7.5 段的定義）；
- .8 遇水反應指數（WRI） $\geq 1$ （見第 21.7.6 段的定義）；
- .9 為防止危險反應必須進行惰化、抑制、穩定、溫度控制或液艙環境控制（見第 21.7.10 段的定義）；
- .10 閃點  $< 23^{\circ}\text{C}$ ，且爆炸/着火範圍（空氣中體積百分比） $\geq 20\%$ ；
- .11 自燃溫度  $\leq 200^{\circ}\text{C}$ ；
- .12 污染類別屬 X 或 Y 類，或者符合第 21.4.5.1 段中的標度 11 至 13 的指標。

#### 21.4 用於為那些符合使其受《IBC 規則》第十七章約束的安全和污染指標的貨品確定最低載運要求的指標

##### 21.4.1 a 欄—產品名稱

21.4.1.1 儘可能使用國際理論化學和應用化學聯盟（IUPAC）的名稱，但如果這樣過於複雜，也可使用一個技術上正確而且明晰的替代化學名稱。

##### 21.4.2 b 欄—已刪除。

##### 21.4.3 c 欄—污染類別

21.4.3.1 c 欄確定了根據《73/78 MARPOL 公約》附則 II 為各貨品規定的污染類別。

##### 21.4.4 d 欄—危險品

21.4.4.1 如果貨品符合第 21.3.1.1 至 21.3.1.11 段中所述的安全指標，則在 *d* 欄中為 “S”。

21.4.4.2 如果貨品符合第 21.4.5 段標度 1 至 14 所定義的確定 1 至 3 型船的指標，則在 *d* 欄中為 “P”。

21.4.5 *e* 欄-船型

21.4.5.1 下表給出了基於 GESAMP 危險性資料分確定船型的基本指標。對各欄中的詳細說明在《73/78MARPOL 公約》附則 II 的附錄 I 中。本表中的選擇標度在關於確定具體船型的第 21.4.5.2 節中規定。

標度號	A1	A2	B1	B2	D3	E2	船型
1			≥5				1
2	≥4	NR	4		CMRTNI		
3	≥4	NR			CMRTNI		2
4			4				
5	≥4		3				
6		NR	3				
7				≥1			
8						Fp	
9					CMRTNI	F	
10			≥2			S	
11	≥4						3
12		NR					
13			≥1				
14	所有其他Y 類物質						無
15	所有其他Z 類物質 所有“其他物質” (OS)						

21.4.5.2 船型根據以下指標進行確定：

1 型船舶：

吸入劑量  $LC_{50} \leq 0.5 \text{ mg/l/4 h}$ ；和/或

皮膚接觸劑量  $LD_{50} \leq 50$  mg/kg；和/或

口腔吸收劑量  $LD_{50} \leq 5$  mg/kg；和/或

自燃溫度  $\leq 65^{\circ}\text{C}$ ；和/或

爆炸範圍  $\geq 50\%$  空氣濃度，且閃點  $< 23^{\circ}\text{C}$ ；和/或

第 21.4.5.1 段表格中的標度 1 或標度 2

## 2 型船舶：

吸入劑量  $LC_{50} > 0.5$  mg/l/4h 但  $\leq 2$  mg/l/4h；和/或

皮膚接觸劑量  $LD_{50} > 50$  mg/kg 但  $\leq 1000$  mg/kg；和/或

口腔吸收劑量  $LD_{50} > 5$  mg/kg 但  $\leq 300$  mg/kg；和/或

WRI=2；

自燃溫度  $\leq 200^{\circ}\text{C}$ ；和/或

爆炸範圍  $\geq 40\%$  空氣濃度，且閃點  $< 23^{\circ}\text{C}$ ；和/或

第 21.4.5.1 段表格中的標度 3 至標度 10

## 3 型船舶：

任何不符合 1 或 2 型船的要求並且不符合第 21.4.5.1 段表格中的標度 15 的受《IBC 規則》第十七章約束的散裝液體貨物的最低安全或污染指標。

### 21.4.6 *f* 欄—液貨艙類型

#### 21.4.6.1 槽罐類型根據以下指標確定：



1G 型液貨艙： 吸入劑量  $LC_{50} \leq 0.5 \text{ mg/l/4h}$ ；和/或

皮膚接觸劑量  $LD_{50} \leq 200 \text{ mg/kg}$ ；和/或

自燃溫度  $\leq 65^\circ\text{C}$ ；和/或

爆炸範圍  $\geq 40\%$  空氣濃度，且閃點  $< 23^\circ\text{C}$ ；

和/或

WRI=2

2G 型液貨艙： 任何不符合 1G 型液貨艙的要求的受《IBC 規則》第十七章約束的散裝液體貨物的最低安全或污染指標。

#### 21.4.7 g 欄 – 液貨艙透氣

21.4.7.1 液貨艙透氣裝置根據以下指標確定：

控制式透氣： 吸入劑量  $LC_{50} \leq 10 \text{ mg/l/4h}$ ；和/或

長期接觸對哺乳類動物的毒性；和/或

導致呼吸道過敏；和/或

需要特殊載運控制；和/或

閃點  $\leq 60^\circ\text{C}$

皮膚腐蝕（暴露  $\leq 4$  小時）

開放式透氣： 任何不符合控制式透氣要求的受《IBC 規則》第十七章約束的散裝液體貨物的最低安全或污染指標。

#### 21.4.8 *h* 欄 — 液貨艙環境控制

21.4.8.1 液貨艙環境控制條件根據以下指標確定：

惰化：	自燃溫度 $\leq 200^{\circ}\text{C}$ ；和/或 與空氣反應產生危害；和/或 爆炸範圍 $\geq 40\%$ 空氣濃度，且閃點 $< 23^{\circ}\text{C}$ 。
乾燥：	$\text{WRI} \geq 1$
襯墊：	視具體情況而定，僅適用於特殊貨品。
通風：	視具體情況而定，僅適用於特殊貨品。
無：	以上指標均不適用（根據《SOLAS 公約》 可能有惰化要求）

#### 21.4.9 *i* 欄 — 電氣設備

21.4.9.1 如果產品的閃點為  $\leq 60^{\circ}\text{C}$ ，或產品被加熱至距閃點在  $15^{\circ}\text{C}$  的範圍內，則所要求的電氣設備根據下列指標確定，其他情況在“*i*”欄和“*i'*”欄中為“—”：

##### .1 *i'* 欄 — 溫度等級：

- T1 自燃溫度  $\geq 450^{\circ}\text{C}$
- T2 自燃溫度  $\geq 300^{\circ}\text{C}$  但  $< 450^{\circ}\text{C}$
- T3 自燃溫度  $\geq 200^{\circ}\text{C}$  但  $< 300^{\circ}\text{C}$
- T4 自燃溫度  $\geq 135^{\circ}\text{C}$  但  $< 200^{\circ}\text{C}$
- T5 自燃溫度  $\geq 100^{\circ}\text{C}$  但  $< 135^{\circ}\text{C}$

T6 自燃溫度  $\geq 85^{\circ}\text{C}$  但  $< 100^{\circ}\text{C}$

.2 *i''*欄 – 設備組：

設備組	20°C 的 MESG (毫米)	MIC 率 貨品/甲烷
IIA	$\geq 0.9$	$> 0.8$
IIB	$> 0.5$ 但 $< 0.9$	$\geq 0.45$ 但 $\leq 0.8$
IIC	$\leq 0.5$	$< 0.45$

.2.1 測試應根據 IEC60079-1-1:2002 和 IEC 79-3 規定的程序進行。

.2.2 對於氣體和蒸氣，只要符合以下情況，只需確定試驗最大安全間隙 (MESG) 或最小點火電流 (MIC) 之一即可：

對於 IIA 組：MESG  $> 0.9$  mm 或 MIC 率  $> 0.9$

對於 IIB 組：MESG  $\geq 0.55$  mm 且  $\leq 0.9$  mm；或 MIC 率  $\geq 0.5$  且  $\leq 0.8$

對於 IIC 組：MESG  $< 0.5$  mm 或 MIC 率  $< 0.45$ 。

.2.3 在以下情況必須確定 MESG 和 MIC 率兩項數值：

.1 如果只確定了 MIC 率，且該比值在 0.8 到 0.9 之間，則要求進行 MESG 確定；

.2 如果只確定了 MIC 率，且該比值在 0.45 到 0.5 之間，則要求進行 MESG 確定；或者

.3 只得出了 MESG，且其數值在 0.5 mm 到 0.55 mm 之間，則要求確定 MIC 率。

.3 *i'''*欄 – 閃點：  $> 60^{\circ}\text{C}$  ；是

$\leq 60^{\circ}\text{C}$  : 否

不燃 : 無

#### 21.4.10 *j* 欄 — 測量

21.4.10.1 測量設備的類型根據下列指標確定：

封閉式：吸入劑量  $\text{LC}_{50} \leq 2\text{mg}/\text{l}/4\text{h}$ ；和/或

皮膚接觸劑量  $\text{LD}_{50} \leq 1000\text{mg}/\text{kg}$ ；和/或

長期接觸對哺乳類動物有害；和/或

導致呼吸道過敏；和/或

皮膚腐蝕（暴露  $\leq 3$  分鐘）

限制式：吸入劑量  $\text{LC}_{50} > 2\text{mg}/\text{l}/4\text{h}$  至  $\leq 10\text{mg}/\text{l}/4\text{h}$ ；和/或

需要特殊運輸控制進行惰化；和/或

皮膚腐蝕（暴露  $> 3$  分鐘至  $\leq 1$  小時）；和/或

閃點  $\leq 60^{\circ}\text{C}$

開放式：任何不符合封閉式或限制式透氣要求的受《IBC 規則》第十七章約束的散裝液體貨物的最低安全或污染指標。

#### 21.4.11 *k* 欄 — 氣體探測

21.4.11.1 所要求的氣體探測設備根據下列指標確定：

毒性（T）：吸入劑量  $\text{LC}_{50} \leq 10\text{mg}/\text{l}/4\text{h}$ ；和/或

導致呼吸道過敏；和/或

長期接觸會中毒。

可燃性 (F) : 閃點  $\leq 60^{\circ}\text{C}$

無 : 上述指標不適用的情況。

#### 21.4.12 l 欄 – 消防設備

21.4.12.1 根據下述與貨品特性有關的指標，確定適當的滅火劑是否合適：

可溶性  $> 10\%$  ( $> 100000 \text{ mg/l}$ ) : A 耐醇性泡沫

可溶性  $< 10\%$  ( $< 100000 \text{ mg/l}$ ) : A 耐醇性泡沫；和/或

: B 常規泡沫。

WRI = 0 : C 灑水（通常作為冷卻劑，並可在 WRI=0 時與 A 和、或 B 一起使用）

WRI  $\geq 1$  : D 化學乾粉

無 : 本規則無要求

註：應列出所有適當的滅火劑。

#### 21.4.13 m 欄 – 已刪除

#### 21.4.14 n 欄 – 應急防護設備

21.4.14.1 根據下列指標，對 n 列中確定船上應急個人應急設備的要求列為“是”：

吸入劑量  $\text{LC}_{50} \leq 2 \text{ mg/l/4h}$ ；和/或

導致呼吸道過敏；和/或

灼傷皮膚（暴露 ≤3 分鐘）；和/或

WRI = 2

無：表示上述標準不適用。

## 21.5 將第十五章的特殊要求列入 o 欄的指標

21.5.1 在 o 欄中規定特殊要求通常應遵循以報告表格中提供的數據為基礎的明確指標。如果認為偏離這些指標是合適的，應作出明確的記錄，並且記錄應能夠在要求時查閱。

21.5.2 用於參照第十五章和第十六章確定的特殊要求的指標確定如下，在相關時有評論。

### 21.5.3 第 15.2 至 15.10 段和第 15.20 段

21.5.3.1 第 15.2 至 15.10 段和第 15.20 段以名稱確定了那些不能通過任何其他方式來滿足其特殊載運要求的特殊貨品。

### 21.5.4 第 15.11 段—酸類

21.5.4.1 第 15.11 段適用於所有酸類，但下列除外：

- .1 有機酸—當適用第 15.11.2 至 15.11.4 段以及第 15.11.6 至 15.11.8 段時；或者
- .2 不產生氫氣的酸—不必適用第 15.11.5 段時。

### 21.5.5 第 15.12 段—有毒貨品

21.5.5.1 根據下列指標將第 15.12 段全部增加到 o 欄中：

吸入劑量  $LC_{50} \leq 2$  mg/l/4h；和/或



導致呼吸道過敏；和/或

長期接觸對哺乳類動物有害。

21.5.5.2 根據下列指標將第 15.12.3 段增加到 o 欄中：

吸入劑量  $LC_{50} > 2 \text{ mg/l/4h}$  至  $\leq 10 \text{ mg/l/4h}$ ；和/或

皮膚接觸劑量  $LD_{50} \leq 1000 \text{ mg/kg}$ ；和/或

口腔吸收劑量  $LD_{50} \leq 300 \text{ mg/kg}$ 。

21.5.5.3 根據下列指標將第 15.12.4 段增加到 o 欄中：

吸入劑量  $LC_{50} > 2 \text{ mg/l/4h}$  至  $\leq 10 \text{ mg/l/4h}$ 。

#### **21.5.6 第 15.13 段 – 由添加劑保護的貨物**

21.5.6.1 將第 15.13 段列入 o 欄的要求所依據的信息為：產品容易聚合、分解、氧化或因其他化學變化可能在正常運輸條件下產生危害，而該危害可通過加入適當添加劑的方式來防止。

#### **21.5.7 第 15.14 段 – 37.8°C 時蒸汽壓力大於壓力的貨物**

21.5.7.1 根據將第 15.14 段列入 o 欄的要求以下列指標為基礎：

沸點  $\leq 37.8^\circ\text{C}$

#### **21.5.8 第 15.16 段 – 貨物黏染**

21.5.8.1 第 15.16.1 段已刪除。

21.5.8.2 根據下列指標將第 15.16.2 段增加到 o 欄中：

$WRI \geq 1$

**21.5.9 第 15.17 段—增加通風的要求**

21.5.9.1 根據下列指標將第 15.17 段增加到 o 欄中：

吸入劑量  $LC_{50} > 0.5 \text{ mg/l/4h}$  至  $\leq 2 \text{ mg/l/4h}$ ；和/或

導致呼吸道過敏；和/或

長期接觸對哺乳類動物有毒；和/或

腐蝕皮膚（暴露  $\leq 1$  小時）。

**21.5.10 第 15.18 段—專用貨泵艙的要求**

21.5.10.1 根據下列指標將第 15.18 段增加到 o 欄中：

吸入劑量  $LC_{50} \leq 0.5 \text{ mg/l/4h}$

**21.5.11 第 15.19 段—溢流控制**

21.5.11.1 根據下列指標將第 15.19 段增加到 o 欄中：

吸入劑量  $LC_{50} \leq 2 \text{ mg/l/4h}$ ；和/或

皮膚接觸劑量  $LD_{50} \leq 1000 \text{ mg/kg}$ ；和/或

口腔吸收劑量  $LD_{50} \leq 300 \text{ mg/kg}$ ；和/或

導致呼吸道過敏；和/或

灼傷皮膚（暴露  $\leq 3$  分鐘）；和/或

自燃溫度  $\leq 200^\circ\text{C}$ ；和/或

爆炸範圍  $\geq 40\%$  空氣濃度，閃點  $< 23^\circ\text{C}$ ；和/或

根據污染確定為 1 型船舶。

21.5.11.2 如果貨品有任何下列特性之一，則僅適用第 15.19.6 段：

吸入劑量  $LC_{50} > 2 \text{ mg/l/4h}$  至  $\leq 10 \text{ mg/l/4h}$ ；和/或

皮膚接觸劑量  $LD_{50} > 1000 \text{ mg/kg}$  至  $\leq 2000 \text{ mg/kg}$ ；和/或

口腔吸收劑量  $LD_{50} > 300 \text{ mg/kg}$  至  $\leq 2000 \text{ mg/kg}$ ；和/或

皮膚過敏；和/或

灼傷皮膚（暴露  $> 3$  分鐘至  $\leq 1$  小時）；和/或

閃點  $\leq 60^\circ\text{C}$ ；和/或

根據污染確定為 2 型船舶；和/或

污染類別為 X 或 Y。

#### 21.5.12 第 15.21 段

21.5.12.1 根據貨品的熱敏感性將第 15.21 段增加到 *o* 欄中。此項要求僅涉及到貨泵艙內的泵。

#### 21.6 將第十六章的特殊要求列入 *o* 欄的指標

##### 21.6.1 第 16.1 至 16.2.5 段和第 16.3 至 16.5 段

21.6.1.1 這些規定適用於所有貨物，因此在 *o* 欄中沒有專門列出。

##### 21.6.2 第 16.2.6 段

21.6.2.1 對於符合下列指標的貨品，將第 16.2.6 段增加到 *o* 欄：

污染類別為 X 或 Y 類，且在  $20^\circ\text{C}$  時黏度  $\geq 50 \text{ mPa}\cdot\text{s}$

##### 21.6.3 第 16.2.9 段

21.6.3.1 對於符合下列指標的貨品，將第 16.2.9 段增加到 o 欄：

熔點  $\geq 0^{\circ}\text{C}$

21.6.4 第 16.6 段—不應過度受熱的貨品

21.6.4.1 對於已確定在運輸過程中需要溫度控制的貨品，將第 16.6.2 至 16.6.4 段增加到 o 欄。

21.7 定義

21.7.1 哺乳動物急性中毒

21.7.1.1 急性吸入中毒\*

吸入毒性 (LC <sub>50</sub> )	
危險程度	mg/l/4h
高	$\leq 0.5$
較高	$> 0.5 - \leq 2$
中等	$> 2 - \leq 10$
輕微	$> 10 - \leq 20$
可忽略	$> 20$

21.7.1.2 急性皮膚中毒

皮膚接觸毒性 (LD <sub>50</sub> )	
危險程度	mg/kg
高	$\leq 50$
較高	$> 50 - \leq 200$
中等	$> 200 - \leq 1000$
輕微	$> 1000 - \leq 2000$
可忽略	$> 2000$

21.7.1.3 誤食急性中毒

口服毒性 (LD <sub>50</sub> )
--------------------------

\* 註：除非另行註明，假定所有吸入毒性數據是就蒸氣而言，而非汽霧或噴霧。

危險程度	mg/kg
高	≤5
較高	> 5 – ≤50
中等	> 50 – ≤300
輕微	> 300 – ≤2000
可忽略	> 2000

### 21.7.2 長期接觸對哺乳動物的毒性

21.7.2.1 如果某貨品符合下列指標，則被確定為長期接觸毒性類型：已知或疑似為致癌物、誘導突變物、對繁殖有毒性作用、對神經有毒性作用、對免疫系統有毒性或已知暴露於非致命劑量下引起具體的器質性系統毒性（TOST）或其他有關影響。

21.7.2.2 這種影響可通過 GESAMP 危險品檔案或其他已知認可的信息來源確定。

### 21.7.3 皮膚過敏

21.7.3.1 有下列情況的貨品被確定為皮膚過敏劑：

- .1 如果人類有證據證明相當數量的人在與該貨品進行皮膚接觸後誘發過敏；或
- .2 通過適當的動物試驗結果呈陽性。

21.7.3.2 如果採用佐劑型測試皮膚過敏的方法，至少有 30%的動物的反應可認定為陽性。如果採用無佐劑型試驗方法，至少 15%的動物的反應可認定為陽性。

21.7.3.3 如果從鼠耳腫大試驗（MEST）或局部淋巴結化驗（LLNA）中取得陽性結果，即有充分根據可將該產品確定為皮膚過敏劑。

## 21.7.4 呼吸道過敏

21.7.4.1 有下列情況的產品被確定為呼吸道過敏劑：

- .1 如果人類有證據證明該物質會導致具體的呼吸道過敏症狀；和/或
- .2 如果適當的動物試驗結果呈陽性；和/或
- .3 如果貨品被確定為皮膚過敏劑並且沒有能表明其不是呼吸道過敏劑的證據。

## 21.7.5 灼傷皮膚\*

危險程度	造成皮膚完全壞死的接觸時間	觀察時間
嚴重灼傷皮膚	≤3 分鐘	≤1 小時
高度灼傷皮膚	> 3 分鐘 – ≤1 小時	≤14 天
輕度灼傷皮膚	> 1 小時 – ≤4 小時	≤14 天

## 21.7.6 遇水反應的物質

21.7.6.1 這些物質分為以下三類：

遇水反應指數 (WRI)	定義
2	接觸水後可能產生有毒、易燃或有腐蝕性氣體或氣霧的任何化學品。
1	接觸水後可能發熱或產生無毒、不易燃或無腐蝕性氣體的任何化學品。
0	接觸水後不發生上述 1 和 2 的反應的化學品。

## 21.7.7 空氣反應物質

21.7.7.1 空氣反應物質是指與空氣發生反應並造成潛在危險的貨品，例如形成可能會引起爆炸反應的過氧化物。

\* 註：就確定相關的載運要求而言，會灼傷皮膚的貨品同樣被視作會灼傷呼吸道。



**21.7.8 電氣設備－溫度等級**（閃點 $\leq 60^{\circ}\text{C}$ 或被加熱至距閃點 $15^{\circ}\text{C}$ 內的貨品）

21.7.8.1 國際電工委員會（IEC）定義的溫度等級如下：

在設備額定功率（或有關的任何已知過載）的實際工作狀態下，任何表面的任何部位達到的最高溫度，如果暴露於爆炸性空氣可能產生危險。

21.7.8.2 電氣裝置溫度等級的確定通過選擇最接近但低於貨品自燃溫度的最大表面溫度（見 21.4.9.1.1 段）

**21.7.9 電氣設備－設備組**（閃點 $\leq 60^{\circ}\text{C}$ 的貨品）

21.7.9.1 此處指固有安全和在爆炸氣體空氣中使用的相關電氣裝置，IEC 將其分為以下兩組：

第 I 組： 容易產生甲烷的礦物（IMO 不使用）；

第 II 組： 其他行業用的裝置設備－根據最大試驗安全上限（MESG）和/或氣體/蒸氣的最小引燃電流（MIC）進一步分為 IIA、IIB 和 IIC 組。

21.7.9.2 該特性無法從該貨品的其他相關數據中獲取；必須經過測量或經過同一系列相關貨品的歸類來確定。

**21.7.10 特殊載運控制條件**

21.7.10.1 特殊載運控制條件係指為了避免危險反應而採取的特殊措施，包括：

- .1 抑制：加入某種化合物（通常為有機物）來延緩或阻止一種不良化學反應，如腐蝕、氧化或聚合；

- .2 **穩定**：加入某種物質（穩定劑）來避免化合物、混合物或溶劑改變形態或化學特性。這種穩定劑可延緩反應速率、保持化學平衡、防止氧化、保持顏料和其他成分的乳化狀態或防止膠體顆粒沉澱；
- .3 **惰化**：在液艙的液面以上空間加入一種氣體（通常是氮氣），以防止形成可燃性貨物/氣體混合物；
- .4 **溫度控制**：將貨物溫度保持在特定範圍內，以避免有害反應或者使液體保持低黏度，以便由泵輸送貨物；  
以及
- .5 **襯墊和透氣**：僅適用於具體情況下的具體貨物。

### 21.7.11 易燃貨物

21.7.11.1 根據以下指標將貨物確定為易燃：

IBC 規則的表述	閃點（攝氏度）
高易燃	< 23
易燃	≤60 但 ≥23

21.7.11.2 應該注意到，需要測量混合物和水溶液的閃點，除非其所有成分均為非易燃物質。

21.7.11.3 應該注意到，閃點低於或等於 60°C 散裝液體貨物的載運要受《SOLAS 公約》其他規定的約束。

附錄

《國際散裝運輸危險化學品適裝證書》示範格式

國際散裝運輸危險化學品適裝證書

(官方印鑑)

根據《國際散裝運輸危險化學品船舶構造和設備規則》(第 MSC.176  
(79) 和 MEPC.119 (52) 號決議) 的規定，

由.....政府授權

(國家全名)

由.....簽發。

(經主管機關認可的主管人員或組織的正式名稱)

船舶細節<sup>1</sup>

船名.....

船舶編號或呼號.....

IMO 編號<sup>2</sup>.....

船籍港.....

總噸位.....

船型(規則第 2.1.2 段).....

安放龍骨或船舶處於相應建造階段的日期或

<sup>1</sup> 船舶詳情也可水平排列於表格內。

<sup>2</sup> 根據本組織以 A.600 (15) 決議通過的 IMO 船舶識別編碼制度。



下接另經簽署並註明日期的附件 1<sup>3</sup>。  
本表所指液貨艙編號見經簽署並註明日期的附件 2 液艙平面圖。

5 按照第 1.4 和 2.8.2<sup>3</sup> 段的規定，該規則的要求對本船作了以下方面的修改：

.....

6 本船的裝載應符合：

- .1 經批准的裝載手冊中規定的裝載條件，該手冊經主管機關的負責官員或其認可的組織<sup>3</sup> 簽署、蓋章，日期為.....；
- .2 本證書所附的裝載限制<sup>3</sup>。

如果要求不按上述規定條件裝船，應將證明所擬裝載條件的必要計算情況提交給發證主管機關，該機關可以書面批准所建議的裝載條件<sup>4</sup>。

此證書有效期至（日/月/年）.....止<sup>5</sup>，但取決於根據本規則第 1.5 段的檢驗。

此證書基於檢驗的完成日期：.....

（日/月/年）

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<sup>3</sup> 不適用者劃去。  
<sup>4</sup> 該文件如經正式簽署或蓋印後可以附於證書後，而不必合併到證書裏。  
<sup>5</sup> 根據本規則 1.5.6.1 段插入主管機關規定的有效期限。除非根據本規則 1.5.6.8 的規定進行修訂，該日期的日和月應與本規則 1.3.3 定義的周年日相一致。

簽發於.....

(發證地點)

.....  
(發證日期)

.....  
(經授權的發證官員簽名)

(主管機關的公章或鋼印)

填寫證書的註釋：

- 1 此證書只可簽發給有權懸掛既為《1974年 SOLAS 公約》締約國又為《73/78 MARPOL 公約》當事國旗幟的船舶。
- 2 船型：本欄的任何條目必須與所有有關的建議相關聯，例如：“2型”指 2 型船舶在該規則中的所有方面。
- 3 貨品：應填寫本規則第十七章所列貨品或主管機關按本規則第 1.1.6 段經過評定的貨品。關於後來的“新”貨品，應註明臨時規定的任何特殊要求。
- 4 貨品：船舶適於載運的貨品清單應包括本規則沒有覆蓋的 Z 類有毒液體物質，並應標示為“第十八章 Z 類”。



### 年度/中間檢驗的簽註

茲證明，按規則第 1.5.2 段的要求進行的檢驗表明本船符合規則的有關規定。

年度檢驗： 簽字： .....

(經授權的官員簽字)

地點： .....

日期 (日/月/年)： .....

(主管機關的公章或鋼印)

年度/中間<sup>3</sup>檢驗： 簽字： .....

(經授權的官員簽字)

地點： .....

日期 (日/月/年)： .....

(主管機關的公章或鋼印)

年度/中間<sup>3</sup>檢驗： 簽字： .....

(經授權的官員簽字)

地點： .....

日期 (日/月/年)： .....

(主管機關的公章或鋼印)

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<sup>3</sup> 不適用者劃去。

年度檢驗：

簽字：.....

(經授權的官員簽字)

地點：.....

日期 (日/月/年)：.....

(主管機關的公章或鋼印)

### 按 1.5.6.8.3 段進行的年度/中間檢驗

茲證明，按本規則第 1.5.6.8.3 段進行的年度/中間<sup>3</sup>檢驗表明本船符合公約的有關規定。

簽字：.....

(經授權的官員簽字)

地點：.....

日期(日/月/年)：.....

(主管機關的公章或鋼印)

### 適用第 1.5.6.3 段的有效期限少於 5 年的證書展期簽註

本船舶符合本公約的相關規定，且本證書按規則第 1.5.6.3 段的規定將有效期限長至(日/月/年).....止。

簽字：.....

(經授權的官員簽字)

地點：.....

日期(日/月/年)：.....

(主管機關的公章或鋼印)

### 完成換證檢驗並適用第 1.5.6.4 段的簽註

本船符合公約的相關規定，且此證書按規則第 1.5.6.4 段的規定將有效期限長至(日/月/年).....止。

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<sup>3</sup> 不適用者劃去。

年度檢驗：

簽字：.....

(經授權的官員簽字)

地點：.....

日期 (日/月/年)：.....

(主管機關的公章或鋼印)

**適用第 1.5.6.5 或 1.5.6.6 段將證書有效期展期至駛抵檢驗港口**

**或給與寬限期的簽註**

本證書按規則第 1.5.6.5/1.5.6.6<sup>3</sup> 段的規定將有效期限至（日/月/年）.....止。

簽字：.....

（經授權的官員簽字）

地點：.....

日期（日/月/年）：.....

（主管機關的公章或鋼印）

**適用第 1.5.6.8 段將周年日提前的簽註**

按本規則第 1.5.6.8 段的規定，新的周年日為（日/月/年）.....

簽字：.....

（經授權的官員簽字）

地點：.....

日期（日/月/年）：.....

（主管機關的公章或鋼印）

按照第 1.5.6.8 段的規定，新的周年日為（日/月/年）.....

簽字：.....

（經授權的官員簽字）

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<sup>3</sup> 不適用者劃去。

地點：.....

日期（日/月/年）：.....

（主管機關的公章或鋼印）



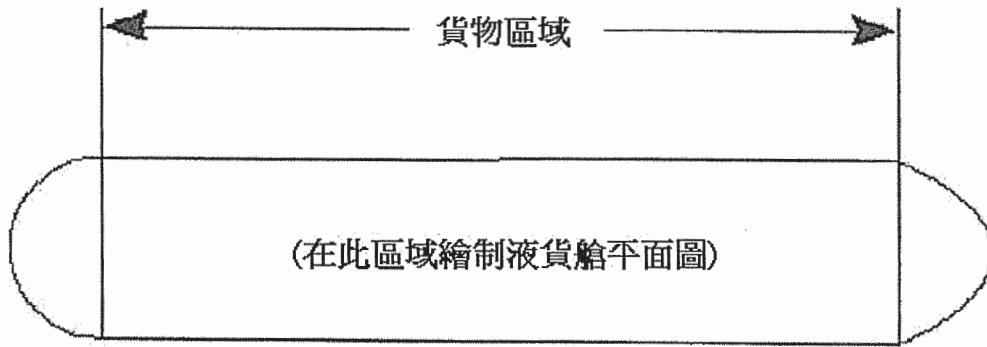


《國際散裝運輸危險化學品適裝證書》附件 2

液艙平面圖（樣本）

船名： .....

船舶編號或呼號： .....



日期.....

(日/月/年)發證日期 (發證官員簽字和/或發證主管機關印章)

**RESOLUTION MSC.176(79)**  
**(adopted on 10 December 2004)**

**2004 AMENDMENTS TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION  
AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK  
(IBC CODE)**

THE MARITIME SAFETY COMMITTEE,

RECALLING Article 28(b) of the Convention on the International Maritime Organization concerning the functions of the Committee,

NOTING resolution MSC.4(48), by which it adopted the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (hereinafter referred to as “the IBC Code”), which has become mandatory under chapter VII of the International Convention for the Safety of Life at Sea (SOLAS), 1974 (hereinafter referred to as “the Convention”),

NOTING ALSO article VIII(b) and regulation VII/8.1 of the Convention concerning the procedure for amending the IBC Code,

BEING DESIROUS of keeping the IBC Code up to date,

HAVING CONSIDERED, at its seventy-ninth session, amendments to the IBC Code proposed and circulated in accordance with article VIII(b)(i) of the Convention,

CONSIDERING that it is highly desirable for the provisions of the IBC Code, which are mandatory under both the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and the 1974 SOLAS Convention, to remain identical,

1. ADOPTS, in accordance with article VIII(b)(iv) of the Convention, amendments to the IBC Code, the text of which is set out in the Annex to the present resolution;
2. DETERMINES, in accordance with article VIII(b)(vi)(2)(bb) of the Convention, that the amendments shall be deemed to have been accepted on 1 July 2006 unless, prior to that date, more than one third of the Contracting Governments to the Convention or Contracting Governments the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world’s merchant fleet, have notified their objections to the amendments;
3. INVITES Contracting Governments to note that, in accordance with article VIII(b)(vii)(2) of the Convention, the amendments shall enter into force on 1 January 2007 upon their acceptance in accordance with paragraph 2 above;
4. REQUESTS the Secretary-General, in conformity with article VIII(b)(v) of the Convention, to transmit certified copies of the present resolution and the text of the amendments contained in the Annex to all Contracting Governments to the Convention;
5. FURTHER REQUESTS the Secretary-General to transmit copies of this resolution and its Annex to Members of the Organization, which are not Contracting Governments to the Convention.

**ANNEX****2004 AMENDMENTS TO THE INTERNATIONAL CODE FOR THE  
CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS  
CHEMICALS IN BULK (IBC CODE)**

The complete text of the IBC Code is replaced by the following:

**“Preamble**

1 The purpose of this Code is to provide an international standard for the safe carriage, in bulk by sea, of dangerous chemicals and noxious liquid substances listed in chapter 17 of the Code. The Code prescribes the design and construction standards of ships, regardless of tonnage, involved in such carriage and the equipment they shall carry to minimize the risk to the ship, its crew and the environment, having regard to the nature of the products involved.

2 The basic philosophy of the Code is to assign, to each chemical tanker, one of the ship types according to the degree of the hazards of the products carried by such ships. Each of the products may have one or more hazardous properties, including flammability, toxicity, corrosivity and reactivity, as well as the hazard they may present to the environment.

3 Throughout the development of the Code it was recognized that it must be based upon sound naval architectural and engineering principles and the best understanding available as to the hazards of the various products covered. Furthermore, chemical tanker design technology is not only a complex technology, but is rapidly evolving and therefore the Code should not remain static. Thus, the Organization will periodically review the Code, taking into account both experience and technical developments.

4 Amendments to the Code involving requirements for new products and their conditions of carriage will be circulated as recommendations, on an interim basis, when adopted by the Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC) of the Organization, in accordance with the provisions of article VIII of the International Convention for the Safety of Life at Sea, 1974 (SOLAS 74), and article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), respectively, pending the entry into force of these amendments.

5 The Code primarily deals with ship design and equipment. In order to ensure the safe transport of the products, the total system must, however, be appraised. Other important facets of the safe transport of the products, such as training, operation, traffic control and handling in port, are being, or will be, examined further by the Organization.

6 The development of the Code has been greatly assisted by a number of organizations in consultative status such as the Association of Classification Societies (IACS) and the International Electrotechnical Commission (IEC).

7 Chapter 16 of the Code, dealing with operational requirements of chemical tankers, highlights the regulations in other chapters that are operational in nature and mentions those other important safety features that are peculiar to chemical tanker operation.

8 The layout of the Code is in line with the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), adopted by the Maritime Safety Committee at its forty-eighth session. Gas carriers may also carry in bulk liquid chemicals covered by this Code, as prescribed in the IGC Code.

9 The 1998 edition of the Code was based on the original text as adopted by MSC resolution MSC.4(48). In response to resolution 15 of the International Conference on Marine Pollution, 1973, the MEPC, at its twenty-second session, adopted, by resolution MEPC.19(22), the IBC Code extended to cover marine pollution prevention aspects for the implementation of Annex II to MARPOL 73/78.

10 This edition of the Code includes amendments adopted by the following resolutions:

	<b>Resolution</b>	<b>Adoption</b>	<b>Deemed acceptance</b>	<b>Entry into force</b>
1	MSC.10(54)	29 April 1987	29 April 1988	30 October 1988
2	MSC.14(57)	11 April 1989	12 April 1990	13 October 1990
	MEPC.32(27)	17 March 1989	12 April 1990	13 October 1990
3	MSC.28(61)	11 December 1992	1 January 1994	1 July 1994
	MEPC.55(33)	30 October 1992	1 January 1994	1 July 1994
4	MSC.50(66)	4 June 1996	1 January 1998	1 July 1998
	MEPC.69(38)	10 July 1996	1 January 1998	1 July 1998
5	MSC.58(67)	5 December 1996	1 January 1998	1 July 1998
	MEPC.73(39)	10 March 1997	10 January 1998	10 July 1998
6	MSC.102(73)	5 December 2000	1 January 2002	1 July 2002
7	MSC.176(79)	9 December 2004	1 July 2006	1 January 2007
	MEPC.119(52)	15 October 2004	1 July 2006	1 January 2007

11 As from the date of entry into force of the 1983 amendments to SOLAS 74 (i.e. 1 July 1986) and the date of implementation of Annex II of MARPOL 73/78 (i.e. 6 April 1987), this Code became subject to mandatory requirements under these Conventions. Amendments to the Code, whether from the point of view of safety or of marine pollution, must therefore be adopted and brought into force in accordance with the procedures laid down in article VIII of SOLAS 74 and article 16 of MARPOL 73/78 respectively.



## Chapter 1

### General

#### 1.1 Application

1.1.1 The Code applies to ships regardless of size, including those of less than 500 gross tonnage, engaged in the carriage of bulk cargoes of dangerous chemicals or noxious liquid substances (NLS), other than petroleum or similar flammable products as follows:

- .1 products having significant fire hazards in excess of those of petroleum products and similar flammable products;
- .2 products having significant hazards in addition to or other than flammability.

1.1.2 Products that have been reviewed and determined not to present safety and pollution hazards to such an extent as to warrant the application of the Code are found in chapter 18.

1.1.3 Liquids covered by the Code are those having a vapour pressure not exceeding 0.28 MPa absolute at a temperature of 37.8°C.

1.1.4 For the purpose of the 1974 SOLAS Convention, the Code applies to ships which are engaged in the carriage of products included in chapter 17 on the basis of their safety characteristics and identified as such by an entry of S or S/P in *column d*.

1.1.5 For the purposes of MARPOL 73/78, the Code applies only to NLS tankers, as defined in regulation 1.16.2 of Annex II thereof, which are engaged in the carriage of Noxious Liquid Substances identified as such by an entry of X, Y or Z in *column c* of chapter 17.

1.1.6 For a product proposed for carriage in bulk, but not listed in chapters 17 or 18, the Administration and port Administrations involved in such carriage shall prescribe the preliminary suitable conditions for the carriage, having regard to the criteria for hazard evaluation of bulk chemicals. For the evaluation of the pollution hazard of such a product and assignment of its pollution category, the procedure specified in regulation 6.3 of Annex II of MARPOL 73/78 must be followed. The Organization shall be notified of the conditions for consideration for inclusion of the product in the Code.

1.1.7 Unless expressly provided otherwise, the Code applies to ships, the keels of which are laid or which are at the stage where:

- .1 construction identifiable with the ship begins; and
- .2 assembly has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less;

on or after 1 July 1986.

1.1.8 A ship, irrespective of the date of construction, which is converted to a chemical tanker on or after 1 July 1986 shall be treated as a chemical tanker constructed on the date on which such conversion commences. This conversion provision does not apply to the modification of a ship referred to in regulation 1.14 of Annex II of MARPOL 73/78.



1.1.9 Where reference is made in the Code to a paragraph, all the provisions of the subparagraphs of that designation shall apply.

## 1.2 Hazards

Hazards of products covered by the Code include:

1.2.1 *Fire hazard*, defined by flashpoint, explosive/flammability limits/range and autoignition temperature of the chemical.

1.2.2 *Health hazard*, defined by:

.1 corrosive effects on the skin in the liquid state; or

.2 acute toxic effect, taking into account values of:

LD<sub>50</sub> (oral): a dose, which is lethal to 50% of the test subjects when administered orally;

LD<sub>50</sub> (dermal): a dose, which is lethal to 50% of the test subjects when administered to the skin;

LC<sub>50</sub> (inhalation): the concentration which is lethal by inhalation to 50% of the test subjects; or

.3 Other health effects such as carcinogenicity and sensitization.

1.2.3 *Reactivity hazard*, defined by reactivity:

.1 with water;

.2 with air;

.3 with other products; or

.4 of the product itself (e.g. polymerization).

1.2.4 *Marine pollution hazard*, as defined by:

.1 bioaccumulation;

.2 lack of ready biodegradability;

.3 acute toxicity to aquatic organisms;

.4 chronic toxicity to aquatic organisms;

.5 long term human health effects; and

.6 physical properties resulting in the product floating or sinking and so adversely affecting marine life.

### 1.3 Definitions

The following definitions apply unless expressly provided otherwise. (Additional definitions are given in individual chapters).

1.3.1 *Accommodation spaces* are those spaces used for public spaces, corridors, lavatories, cabins, offices, hospitals, cinemas, games and hobbies rooms, barber shops, pantries containing no cooking appliances and similar spaces. *Public spaces* are those portions of the accommodation spaces which are used for halls, dining rooms, lounges and similar permanently enclosed spaces.

1.3.2 *Administration* means the Government of the State whose flag the ship is entitled to fly. For *Administration (Port)* see *Port Administration*.

1.3.3 *Anniversary date* means the day and the month of each year, which will correspond to the date of expiry of the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.

1.3.4 *Boiling point* is the temperature at which a product exhibits a vapour pressure equal to the atmospheric pressure.

1.3.5 *Breadth (B)* means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material. The breadth (B) shall be measured in metres.

1.3.6 *Cargo area* is that part of the ship that contains cargo tanks, slop tanks, cargo pump-rooms including pump-rooms, cofferdams, ballast or void spaces adjacent to cargo tanks or slop tanks and also deck areas throughout the entire length and breadth of the part of the ship over the above-mentioned spaces. Where independent tanks are installed in hold spaces, cofferdams, ballast or void spaces at the after end of the aftermost hold space or at the forward end of the forward-most hold space are excluded from the cargo area.

1.3.7 *Cargo pump-room* is a space containing pumps and their accessories for the handling of the products covered by the Code.

1.3.8 *Cargo service spaces* are spaces within the cargo area used for workshops, lockers and store-rooms of more than 2 m<sup>2</sup> in area, used for cargo-handling equipment.

1.3.9 *Cargo tank* is the envelope designed to contain the cargo.

1.3.10 *Chemical tanker* is a cargo ship constructed or adapted and used for the carriage in bulk of any liquid product listed in chapter 17.

1.3.11 *Cofferdam* is the isolating space between two adjacent steel bulkheads or decks. This space may be a void space or a ballast space.

1.3.12 *Control stations* are those spaces in which ship's radio or main navigating equipment or the emergency source of power is located or where the fire-recording or fire-control equipment is centralized. This does not include special fire-control equipment which can be most practically located in the cargo area.

1.3.13 *Dangerous chemicals* means any liquid chemicals designated as presenting a safety hazard, based on the safety criteria for assigning products to chapter 17.

1.3.14 *Density* is the ratio of the mass to the volume of a product, expressed in terms of kilograms per cubic metre. This applies to liquids, gases and vapours.

1.3.15 *Explosive/flammability limits/range* are the conditions defining the state of fuel-oxidant mixture at which application of an adequately strong external ignition source is only just capable of producing flammability in a given test apparatus.

1.3.16 *Flashpoint* is the temperature in degrees Celsius at which a product will give off enough flammable vapour to be ignited. Values given in the Code are those for a “closed-cup test” determined by an approved flashpoint apparatus.

1.3.17 *Hold space* is the space enclosed by the ship’s structure in which an independent cargo tank is situated.

1.3.18 *Independent* means that a piping or venting system, for example, is in no way connected to another system and that there are no provisions available for the potential connection to other systems.

1.3.19 *Length (L)* means 96% of the total length on a waterline at 85% of the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that be greater. In ships designed with a rake of keel, the waterline on which this length is measured shall be parallel to the designed waterline. The length (L) shall be measured in metres.

1.3.20 *Machinery spaces of category A* are those spaces and trunks to such spaces which contain:

- .1 internal-combustion machinery used for main propulsion; or
- .2 internal-combustion machinery used for purposes other than main propulsion where such machinery has in the aggregate a total power output of not less than 375 kW; or
- .3 any oil-fired boiler or oil fuel unit or any oil fired equipment other than boilers, such as inert gas generators, incinerators etc.

1.3.21 *Machinery spaces* are all machinery spaces of category A and all other spaces containing propelling machinery, boilers, oil fuel units, steam and internal-combustion engines, generators and major electrical machinery, oil filling station, refrigerating, stabilizing, ventilation and air-conditioning machinery, and similar spaces, and trunks to such spaces.

1.3.22 *MARPOL* means the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended.

1.3.23 *Noxious Liquid Substance* means any substance indicated in the Pollution Category column of chapters 17 or 18 of the International Bulk Chemical Code, or the current MEPC.2/Circular or provisionally assessed under the provisions of regulation 6.3 of MARPOL Annex II as falling into categories X, Y or Z.

1.3.24 *Oil fuel unit* is the equipment used for the preparation of oil fuel for delivery to an oil-fired boiler, or equipment used for the preparation for delivery of heated oil to an internal-combustion engine, and includes any oil pressure pumps, filters and heaters dealing with oil at a gauge pressure of more than 0.18 MPa.

1.3.25 *Organization* is the International Maritime Organization (IMO).

1.3.26 *Permeability* of a space means the ratio of the volume within that space which is assumed to be occupied by water to the total volume of that space.

1.3.27 *Port administration* means the appropriate authority of the country in the port of which the ship is loading or unloading.

1.3.28 *Products* is the collective term used to cover both Noxious Liquid Substances and Dangerous Chemicals.

1.3.29 *Pump-room* is a space, located in the cargo area, containing pumps and their accessories for the handling of ballast and oil fuel.

1.3.30 *Recognized standards* are applicable international or national standards acceptable to the Administration or standards laid down and maintained by an organization which complies with the standards adopted by the Organization and which is recognized by the Administration.

1.3.31 *Reference temperature* is the temperature at which the vapour pressure of the cargo corresponds to the set pressure of the pressure-relief valve.

1.3.32 *Separate* means that a cargo piping system or cargo vent system, for example, is not connected to another cargo piping or cargo vent system.

1.3.33 *Service spaces* are those spaces used for galleys, pantries containing cooking appliances, lockers, mail and specie rooms, store-rooms, workshops other than those forming part of the machinery spaces and similar spaces and trunks to such spaces.

1.3.34 *SOLAS* means the International Convention for the Safety of Life at Sea, 1974, as amended.

1.3.35 *Vapour pressure* is the equilibrium pressure of the saturated vapour above a liquid expressed in Pascals (Pa) at a specified temperature.

1.3.36 *Void space* is an enclosed space in the cargo area external to a cargo tank, other than a hold space, ballast space, oil fuel tank, cargo pump-room, pump-room, or any space in normal use by personnel.

#### 1.4 Equivalentents

1.4.1 Where the Code requires that a particular fitting, material, appliance, apparatus, item of equipment or type thereof shall be fitted or carried in a ship, or that any particular provision shall be made, or any procedure or arrangement shall be complied with, the Administration may allow any other fitting, material, appliance, apparatus, item of equipment or type thereof to be fitted or carried, or any other provision, procedure or arrangement to be made in that ship, if it is satisfied by trial thereof or otherwise that such fitting, material, appliance, apparatus, item of equipment or type thereof or that any particular provision, procedure or arrangement is at least as effective as that required by the Code. However, the Administration may not allow operational methods or



procedures to be made an alternative to a particular fitting, material, appliance, apparatus, item of equipment, or type thereof, which are prescribed by the Code, unless such substitution is specifically allowed by the Code.

1.4.2 When the Administration allows any fitting, material, appliance, apparatus, item of equipment, or type thereof, or provision, procedure, or arrangement, or novel design or application to be substituted, it shall communicate to the Organization the particulars thereof, together with a report on the evidence submitted, so that the Organization may circulate the same to other Contracting Governments to SOLAS and Parties to MARPOL for the information of their officers.

## 1.5 Surveys and certification

### 1.5.1 Survey procedure

1.5.1.1 The survey of ships, so far as regards the enforcement of the provisions of the regulations and granting of exemptions therefrom, shall be carried out by officers of the Administration. The Administration may, however, entrust the surveys either to surveyors nominated for the purpose or to organizations recognized by it.

1.5.1.2 The recognized organization, referred to in regulation 8.2.1 of MARPOL Annex II shall comply with the guidelines adopted by the Organization by resolution A.739(18), as may be amended by the Organization, and the specification adopted by the Organization by resolution A.789(19), as may be amended by the Organization, provided that such amendments are adopted, brought into force and take effect in accordance with the provisions of article 16 of MARPOL and article VIII of SOLAS concerning the amendment procedures applicable to this Code.

1.5.1.3 The Administration nominating surveyors or recognizing organizations to conduct surveys shall, as a minimum, empower any nominated surveyor or recognized organization to:

- .1 require repairs to a ship; and
- .2 carry out surveys if requested by the appropriate authorities of a port State.

The Administration shall notify the Organization of the specific responsibilities and conditions of the authority delegated to nominated surveyors or recognized organizations for circulation to the Contracting Governments.

1.5.1.4 When a nominated surveyor or recognized organization determines that the condition of a ship or its equipment does not correspond substantially with the particulars of the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, or is such that the ship is not fit to proceed to sea without danger to the ship, or persons on board, or without presenting unreasonable threat of harm to the marine environment, such surveyor or organization shall immediately ensure that corrective action is taken and shall, in due course, notify the Administration. If such corrective action is not taken the Certificate shall be withdrawn and the Administration shall be notified immediately. If the ship is in a port of another Contracting Government, the appropriate authorities of the port State shall also be notified immediately. When an officer of the Administration, a nominated surveyor or a recognized organization has notified the appropriate authorities of the port State, the Government of the port State concerned shall give such officer, surveyor or organization any necessary assistance to carry out their obligations under this paragraph. When applicable, the Government of the port State concerned shall take such steps as will ensure that the ship does not sail until it can proceed to sea or leave

the port for the purpose of proceeding to the nearest appropriate repair yard available without danger to the ship or persons on board or without presenting an unreasonable threat of harm to the marine environment.

1.5.1.5 In every case, the Administration shall guarantee the completeness and efficiency of the survey, and shall undertake to ensure the necessary arrangements to satisfy this obligation.

#### 1.5.2 Survey requirements

1.5.2.1 The structure, equipment, fittings, arrangements and material (other than items in respect of which a Cargo Ship Safety Construction Certificate, Cargo Ship Safety Equipment Certificate and Cargo Ship Safety Radio Certificate or Cargo Ship Safety Certificate are issued) of a chemical tanker shall be subjected to the following surveys:

- .1 An initial survey before the ships is put in service or before the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk is issued for the first time, which shall include a complete examination of its structure, equipment, fittings, arrangements and material in so far as the ship is covered by the Code. This survey shall be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.
- .2 A renewal survey at intervals specified by the Administration, but not exceeding 5 years, except where 1.5.6.2.2, 1.5.6.5, 1.5.6.6 or 1.5.6.7 is applicable. The renewal survey shall be such as to ensure that the structure, equipment, fittings, arrangements and material fully comply with the applicable provisions of the Code.
- .3 An intermediate survey within 3 months before or after the second anniversary date or within 3 months before or after the third anniversary date of the Certificate, which shall take the place of one of the annual surveys specified in 1.5.2.1.4. The intermediate survey shall be such as to ensure that the safety equipment, and other equipment, and associate pump and piping systems fully comply with the applicable provisions of the Code and are in good working order. Such intermediate surveys shall be endorsed on the Certificate issued under 1.5.4 or 1.5.5.
- .4 An annual survey within 3 months before or after each anniversary date of the Certificate, including a general inspection of the structure, equipment, fittings, arrangements and material referred to in 1.5.2.1.1 to ensure that they have been maintained in accordance with 1.5.3 and that they remain satisfactory for the service for which the ship is intended. Such annual surveys shall be endorsed on the Certificate issued under 1.5.4 or 1.5.5.
- .5 An additional survey, either general or partial according to the circumstances, shall be made when required after an investigation prescribed in 1.5.3.3, or whenever any important repairs or renewals are made. Such a survey shall ensure that the necessary repairs or renewals have been effectively made, that the material and workmanship of such repairs or renewals are satisfactory; and that the ship is fit to proceed to sea without danger to the ship or persons on board or without presenting unreasonable threat of harm to the marine environment.



### 1.5.3 Maintenance of conditions after survey

1.5.3.1 The conditions of the ship and its equipment shall be maintained to conform with the provisions of the Code to ensure that the ship will remain fit to proceed to sea without danger to the ship or persons on board or without presenting an unreasonable threat of harm to the marine environment.

1.5.3.2 After any survey of the ship under 1.5.2 has been completed, no change shall be made in the structure, equipment, fittings, arrangements and material covered by the survey, without the sanction of the Administration, except by direct replacement.

1.5.3.3 Whenever an accident occurs to a ship or a defect is discovered, either of which affects the safety of the ship or the efficiency or completeness of its life-saving appliances or other equipment covered by the Code, the master or owner of the ship shall report at the earliest opportunity to the Administration, the nominated surveyor or recognized organization responsible for issuing the Certificate, who shall cause investigations to be initiated to determine whether a survey, as required by 1.5.2.1.5, is necessary. If the ship is in a port of another Contracting Government, the master or owner shall also report immediately to the appropriate authorities of the port State and the nominated surveyor or recognized organization shall ascertain that such a report has been made.

### 1.5.4 Issue or endorsement of International Certificate of Fitness

1.5.4.1 An International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk shall be issued after an initial or renewal survey to a chemical tanker engaged in international voyages which complies with the relevant provisions of the Code.

1.5.4.2 Such a Certificate shall be drawn up in the form corresponding to the model given in the appendix. If the language used is not English, French or Spanish, the text shall include the translation into one of these languages.

1.5.4.3 The Certificate issued under provisions of this section shall be available on board for examination at all times.

### 1.5.5 Issue or endorsement of International Certificate of Fitness by another Government

1.5.5.1 A Government that is both a Contracting Government to the 1974 SOLAS Convention and a Party to MARPOL 73/78 may, at the request of another such Government, cause a ship entitled to fly the flag of the other State to be surveyed and, if satisfied that the provisions of the Code are complied with, issue or authorize the issue of the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk to the ship, and, where appropriate, endorse or authorize the endorsement of the Certificate on board the ship in accordance with the Code. Any Certificate so issued shall contain a statement to the effect that it has been issued at the request of the Government of the State whose flag the ship is entitled to fly.

### 1.5.6 Duration and validity of International Certificate of Fitness

1.5.6.1 An International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk shall be issued for a period specified by the Administration which shall not exceed 5 years.

1.5.6.2.1 Notwithstanding the provisions of 1.5.6.1, when the renewal survey is completed within 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

1.5.6.2.2 When the renewal survey is completed after the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of expiry of the existing Certificate.

1.5.6.2.3 When the renewal survey is completed more than 3 months before the expiry date of the existing Certificate, the new Certificate shall be valid from the date of completion of the renewal survey to a date not exceeding 5 years from the date of completion of the renewal survey.

1.5.6.3 If a Certificate is issued for a period of less than 5 years, the Administration may extend the validity of the Certificate beyond the expiry date to the maximum period specified in 1.5.6.1, provided that the surveys referred to in 1.5.2.1.3 and 1.5.2.1.4, applicable when a Certificate is issued for a period of 5 years, are carried out as appropriate.

1.5.6.4 If a renewal survey has been completed and a new Certificate cannot be issued or placed on board the ship before the expiry date of the existing Certificate, the person or organization authorized by the Administration may endorse the existing Certificate. Such a Certificate shall be accepted as valid for a further period which shall not exceed 5 months from the expiry date.

1.5.6.5 If a ship, at the time when a Certificate expires, is not in a port in which it is to be surveyed, the Administration may extend the period of validity of the Certificate but this extension shall be granted only for the purpose of allowing the ship to complete its voyage to the port in which it is to be surveyed, and then only in cases where it appears proper and reasonable to do so.

1.5.6.6 A Certificate, issued to a ship engaged on short voyages which has not been extended under the foregoing provisions of this section, may be extended by the Administration for a period of grace of up to one month from the date of expiry stated on it. When the renewal survey is completed, the new Certificate shall be valid to a date not exceeding 5 years from the date of expiry of the existing Certificate before the extension was granted.

1.5.6.7 In special circumstances, as determined by the Administration, a new Certificate need not be dated from the date of expiry of the existing Certificate as required by 1.5.6.2.2, 1.5.6.5 or 1.5.6.6. In these special circumstances, the new Certificate shall be valid to a date not exceeding 5 years from the date of completion of the renewal survey.

1.5.6.8 If an annual or intermediate survey is completed before the period specified in 1.5.2, then:

- .1 the anniversary date shown on the Certificate shall be amended by endorsement to a date which shall not be more than 3 months later than the date on which the survey was completed;
- .2 the subsequent annual or intermediate survey required by 1.5.2 shall be completed at the intervals prescribed by that section using the new anniversary date; and
- .3 the expiry date may remain unchanged provided one or more annual or intermediate surveys, as appropriate, are carried out so that the maximum intervals between the surveys prescribed by 1.5.2 are not exceeded.

1.5.6.9 A Certificate issued under 1.5.4 or 1.5.5 shall cease to be valid in any of the following cases:

- .1 if the relevant surveys are not completed within the periods specified under 1.5.2;
- .2 if the Certificate is not endorsed in accordance with 1.5.2.1.3 or 1.5.2.1.4;
- .3 upon transfer of the ship to the flag of another State. A new certificate shall only be issued when the Government issuing the new Certificate is fully satisfied that the ship is in compliance with the requirements of 1.5.3.1 and 1.5.3.2. In the case of a transfer between Governments that are both a Contracting Government to the 1974 SOLAS Convention and a Party to MARPOL 73/78, if requested within 3 months after the transfer has taken place, the Government of the State whose flag the ship was formerly entitled to fly shall, as soon as possible, transmit to the Administration copies of the Certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports.

## Chapter 2

### Ship survival capability and location of cargo tanks

#### 2.1 General

2.1.1 Ships, subject to the Code, shall survive the normal effects of flooding following assumed hull damage caused by some external force. In addition, to safeguard the ship and the environment, the cargo tanks of certain types of ships shall be protected from penetration in the case of minor damage to the ship resulting, for example, from contact with a jetty or tug, and given a measure of protection from damage in the case of collision or stranding, by locating them at specified minimum distances inboard from the ship's shell plating. Both the assumed damage and the proximity of the cargo tanks to the ship's shell shall be dependent upon the degree of hazard presented by the products to be carried.

2.1.2 Ships subject to the Code shall be designed to one of the following standards:

- .1 A type 1 ship is a chemical tanker intended to transport chapter 17 products with very severe environmental and safety hazards which require maximum preventive measures to preclude an escape of such cargo.
- .2 A type 2 ship is a chemical tanker intended to transport chapter 17 products with appreciably severe environmental and safety hazards which require significant preventive measures to preclude an escape of such cargo.
- .3 A type 3 ship is a chemical tanker intended to transport chapter 17 products with sufficiently severe environmental and safety hazards which require a moderate degree of containment to increase survival capability in a damaged condition.

Thus, a type 1 ship is a chemical tanker intended for the transportation of products considered to present the greatest overall hazard and type 2 and type 3 for products of progressively lesser hazards. Accordingly, a type 1 ship shall survive the most severe standard of damage and its cargo tanks shall be located at the maximum prescribed distance inboard from the shell plating.

2.1.3 The ship type required for individual products is indicated in *column e* in the table of chapter 17.

2.1.4 If a ship is intended to carry more than one product listed in chapter 17, the standard of damage shall correspond to that product having the most stringent ship type requirement. The requirements for the location of individual cargo tanks, however, are those for ship types related to the respective products intended to be carried.

#### 2.2 Freeboard and intact stability

2.2.1 Ships subject to the Code may be assigned the minimum freeboard permitted by the International Convention on Load Lines in force. However, the draught associated with the assignment shall not be greater than the maximum draught otherwise permitted by this Code.

2.2.2 The stability of the ship in all seagoing conditions shall be to a standard which is acceptable to the Administration.



2.2.3 When calculating the effect of free surfaces of consumable liquids for loading conditions it shall be assumed that, for each type of liquid, at least one transverse pair or a single centre tank has a free surface and the tank or combination of tanks to be taken into account shall be those where the effect of free surfaces is the greatest. The free surface effect in undamaged compartments shall be calculated by a method acceptable to the Administration.

2.2.4 Solid ballast shall not normally be used in double-bottom spaces in the cargo area. Where, however, because of stability considerations, the fitting of solid ballast in such spaces becomes unavoidable, then its disposition shall be governed by the need to ensure that the impact loads resulting from bottom damage are not directly transmitted to the cargo tank structure.

2.2.5 The master of the ship shall be supplied with a loading and stability information booklet. This booklet shall contain details of typical service and ballast conditions, provisions for evaluating other conditions of loading and a summary of the ship's survival capabilities. In addition, the booklet shall contain sufficient information to enable the master to load and operate the ship in a safe and seaworthy manner.

### **2.3 Shiplside discharges below the freeboard deck**

2.3.1 The provision and control of valves fitted to discharges led through the shell from spaces below the freeboard deck or from within the super-structures and deck-houses on the freeboard deck fitted with weathertight doors shall comply with the requirements of the relevant regulation of the International Convention on Load Lines in force, except that the choice of valves shall be limited to:

- .1 one automatic non-return valve with a positive means of closing from above the freeboard deck; or
- .2 where the vertical distance from the summer load waterline to the inboard end of the discharge pipe exceeds  $0.01L$ , two automatic non-return valves without positive means of closing, provided that the inboard valve is always accessible for examination under service conditions.

2.3.2 For the purpose of this chapter, "summer load line" and "freeboard deck" have the meanings as defined in the International Convention on Load Lines in force.

2.3.3 The automatic non-return valves referred to in 2.3.1.1 and 2.3.1.2 shall be fully effective in preventing admission of water into the ship, taking into account the sinkage, trim and heel in survival requirements in 2.9, and shall comply with recognized standards.

### **2.4 Conditions of loading**

Damage survival capability shall be investigated on the basis of loading information submitted to the Administration for all anticipated conditions of loading and variations in draught and trim. Ballast conditions where the chemical tanker is not carrying products covered by the Code, or is carrying only residues of such products, need not be considered.

## 2.5 Damage assumptions

### 2.5.1 The assumed maximum extent of damage shall be:

<b>.1</b>	<b>Side damage:</b>		
.1.1	Longitudinal extent:	$1/3L^{2/3}$ or 14.5 m, whichever is less	
.1.2	Transverse extent	B/5 or 11.5 m, whichever is less (measured inboard from the ship's side at right angles to the centreline at the level of the summer load line)	
.1.3	Vertical extent:	upwards without limit (measured from the moulded line of the bottom shell plating at centreline)	
<b>.2</b>	<b>Bottom damage:</b>	<b>For 0.3L from the forward perpendicular of the ship</b>	<b>Any other part of the ship</b>
.2.1	Longitudinal extent:	$1/3L^{2/3}$ or 14.5 m, whichever is less	$1/3L^{2/3}$ or 5 m, whichever is less
.2.2	Transverse extent:	B/6 or 10 m, whichever is less	B/6 or 5 m, whichever is less
.2.3	Vertical extent:	B/15 or 6 m, whichever is less [measured from the moulded line of the bottom shell plating at centreline (see 2.6.2)]	B/15 or 6 m, whichever is less [measured from the moulded line of the bottom shell plating at centreline (see 2.6.2)]

2.5.2 If any damage of a lesser extent than the maximum damage specified in 2.5.1 would result in a more severe condition, such damage shall be considered.

## 2.6 Location of cargo tanks

### 2.6.1 Cargo tanks shall be located at the following distances inboard:

- .1 Type 1 ships: from the side shell plating, not less than the transverse extent of damage specified in 2.5.1.1.2, and from the moulded line of the bottom shell plating at centreline, not less than the vertical extent of damage specified in 2.5.1.2.3, and nowhere less than 760 mm from the shell plating. This requirement does not apply to the tanks for diluted slops arising from tank washing.
- .2 Type 2 ships: from the moulded line of the bottom shell plating at centreline, not less than the vertical extent of damage specified in 2.5.1.2.3, and nowhere less than 760 mm from the shell plating. This requirement does not apply to the tanks for diluted slops arising from tank washing.
- .3 Type 3 ships: no requirement.



2.6.2 Except for type 1 ships, suction wells installed in cargo tanks may protrude into the vertical extent of bottom damage specified in 2.5.1.2.3 provided that such wells are as small as practicable and the protrusion below the inner bottom plating does not exceed 25% of the depth of the double bottom or 350 mm, whichever is less. Where there is no double bottom, the protrusion of the suction well of independent tanks below the upper limit of bottom damage shall not exceed 350 mm. Suction wells installed in accordance with this paragraph may be ignored in determining the compartments affected by damage.

**2.7 Flooding assumptions**

2.7.1 The requirements of 2.9 shall be confirmed by calculations which take into consideration the design characteristics of the ship; the arrangements, configuration and contents of the damaged compartments; the distribution, relative densities and the free surface effects of liquids; and the draught and trim for all conditions of loading.

2.7.2 The permeabilities of spaces assumed to be damaged shall be as follows:

Spaces	Permeabilities
Appropriated to stores	0.60
Occupied by accommodation	0.95
Occupied by machinery	0.85
Voids	0.95
Intended for consumable liquids	0 to 0.95*
Intended for other liquids	0 to 0.95*

2.7.3 Wherever damage penetrates a tank containing liquids it shall be assumed that the contents are completely lost from that compartment and replaced by salt water up to the level of the final plane of equilibrium.

2.7.4 Every watertight division within the maximum extent of damage defined in 2.5.1 and considered to have sustained damage in positions given in 2.8.1 shall be assumed to be penetrated. Where damage less than the maximum is being considered in accordance with 2.5.2, only watertight divisions or combinations of watertight divisions within the envelope of such lesser damage shall be assumed to be penetrated.

2.7.5 The ship shall be so designed as to keep unsymmetrical flooding to the minimum consistent with efficient arrangements.

2.7.6 Equalization arrangements requiring mechanical aids such as valves or cross-levelling pipes, if fitted, shall not be considered for the purpose of reducing an angle of heel or attaining the minimum range of residual stability to meet the requirements of 2.9 and sufficient residual stability shall be maintained during all stages where equalization is used. Spaces which are linked by ducts of large cross-sectional area may be considered to be common.

2.7.7 If pipes, ducts, trunks or tunnels are situated within the assumed extent of damage penetration, as defined in 2.5, arrangements shall be such that progressive flooding cannot thereby extend to compartments other than those assumed to be flooded for each case of damage.

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\* The permeability of partially filled compartments shall be consistent with the amount of liquid carried in the compartment.

2.7.8 The buoyancy of any superstructure directly above the side damage shall be disregarded. The unflooded parts of superstructures beyond the extent of damage, however, may be taken into consideration provided that:

- .1 they are separated from the damaged space by watertight divisions and the requirements of 2.9.3 in respect of these intact spaces are complied with; and
- .2 openings in such divisions are capable of being closed by remotely operated sliding watertight doors and unprotected openings are not immersed within the minimum range of residual stability required in 2.9; however, the immersion of any other openings capable of being closed weathertight may be permitted.

## 2.8 Standard of damage

2.8.1 Ships shall be capable of surviving the damage indicated in 2.5 with the flooding assumptions in 2.7 to the extent determined by the ship's type according to the following standards:

- .1 A type 1 ship shall be assumed to sustain damage anywhere in its length.
- .2 A type 2 ship of more than 150 m in length shall be assumed to sustain damage anywhere in its length.
- .3 A type 2 ship of 150 m in length or less shall be assumed to sustain damage anywhere in its length except involving either of the bulkheads bounding a machinery space located aft.
- .4 A type 3 ship of more than 225 m in length shall be assumed to sustain damage anywhere in its length.
- .5 A type 3 ship of 125 m in length or more but not exceeding 225 m in length shall be assumed to sustain damage anywhere in its length except involving either of the bulkheads bounding a machinery space located aft.
- .6 A type 3 ship below 125 m in length shall be assumed to sustain damage anywhere in its length except involving damage to the machinery space when located aft. However, the ability to survive the flooding of the machinery space shall be considered by the Administration.

2.8.2 In the case of small type 2 and type 3 ships which do not comply in all respects with the appropriate requirements of 2.8.1.3 and 2.8.1.6, special dispensation may only be considered by the Administration provided that alternative measures can be taken which maintain the same degree of safety. The nature of the alternative measures shall be approved and clearly stated and be available to the port Administration. Any such dispensation shall be duly noted on the International Certificate of Fitness referred to in 1.5.4.

## 2.9 Survival requirements

2.9.1 Ships subject to the Code shall be capable of surviving the assumed damage specified in 2.5 to the standard provided in 2.8 in a condition of stable equilibrium and shall satisfy the following criteria.

### 2.9.2 In any stage of flooding:

- .1 the waterline, taking into account sinkage, heel and trim, shall be below the lower edge of any opening through which progressive flooding or downflooding may take place. Such openings shall include air pipes and openings which are closed by means of weathertight doors or hatch covers and may exclude those openings closed by means of watertight manhole covers and watertight flush scuttles, small watertight cargo tank hatch covers which maintain the high integrity of the deck, remotely operated watertight sliding doors, and sidescuttles of the non-opening type;
- .2 the maximum angle of heel due to unsymmetrical flooding shall not exceed 25°, except that this angle may be increased to 30° if no deck immersion occurs;
- .3 the residual stability during intermediate stages of flooding shall be to the satisfaction of the Administration. However, it shall never be significantly less than that required by 2.9.3.

### 2.9.3 At final equilibrium after flooding:

- .1 the righting-lever curve shall have a minimum range of 20° beyond the position of equilibrium in association with a maximum residual righting lever of at least 0.1 m within the 20° range; the area under the curve within this range shall not be less than 0.0175 m radians. Unprotected openings shall not be immersed within this range unless the space concerned is assumed to be flooded. Within this range, the immersion of any of the openings listed in 2.9.2.1 and other openings capable of being closed weathertight may be permitted; and
- .2 the emergency source of power shall be capable of operating.

## Chapter 3

### Ship arrangements

#### 3.1 Cargo segregation

3.1.1 Unless expressly provided otherwise, tanks containing cargo or residues of cargo subject to the Code shall be segregated from accommodation, service and machinery spaces and from drinking water and stores for human consumption by means of a cofferdam, void space, cargo pump-room, pump-room, empty tank, oil fuel tank or other similar space.

3.1.2 Cargo piping shall not pass through any accommodation, service or machinery space other than cargo pump-rooms or pump-rooms.

3.1.3 Cargoes, residues of cargoes or mixtures containing cargoes, which react in a hazardous manner with other cargoes, residues or mixtures, shall:

- .1 be segregated from such other cargoes by means of a cofferdam, void space, cargo pump-room, pump-room, empty tank, or tank containing a mutually compatible cargo;
- .2 have separate pumping and piping systems which shall not pass through other cargo tanks containing such cargoes, unless encased in a tunnel; and
- .3 have separate tank venting systems.

3.1.4 If cargo piping systems or cargo ventilation systems are to be separated. This separation may be achieved by the use of design or operational methods. Operational methods shall not be used within a cargo tank and shall consist of one of the following types:

- .1 removing spool-pieces or valves and blanking the pipe ends;
- .2 arrangement of two spectacle flanges in series, with provisions for detecting leakage into the pipe between the two spectacle flanges.

3.1.5 Cargoes subject to the Code shall not be carried in either the fore or aft peak tank.

#### 3.2 Accommodation, service and machinery spaces and control stations

3.2.1 No accommodation or service spaces or control stations shall be located within the cargo area except over a cargo pump-room recess or pump-room recess that complies with SOLAS regulations II-2/4.5.1 to 4.5.2.4 and no cargo or slop tank shall be aft of the forward end of any accommodation.

3.2.2 In order to guard against the danger of hazardous vapours, due consideration shall be given to the location of air intakes and openings into accommodation, service and machinery spaces and control stations in relation to cargo piping and cargo vent systems.



3.2.3 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations shall not face the cargo area. They shall be located on the end bulkhead not facing the cargo area and/or on the outboard side of the superstructure or deck-house at a distance of at least 4% of the length (L) of the ship but not less than 3 m from the end of the superstructure or deck-house facing the cargo area. This distance, however, need not exceed 5 m. No doors shall be permitted within the limits mentioned above, except that doors to those spaces not having access to accommodation and service spaces and control stations, such as cargo control stations and store-rooms, may be fitted. Where such doors are fitted, the boundaries of the space shall be insulated to “A-60” standard. Bolted plates for removal of machinery may be fitted within the limits specified above. Wheelhouse doors and wheelhouse windows may be located within the limits specified above so long as they are so designed that a rapid and efficient gas- and vapour-tightening of the wheelhouse can be ensured. Windows and sidescuttles facing the cargo area and on the sides of the superstructures and deck-houses within the limits specified above shall be of the fixed (non-opening) type. Such sidescuttles in the first tier on the main deck shall be fitted with inside covers of steel or equivalent material.

### 3.3 Cargo pump-rooms

3.3.1 Cargo pump-rooms shall be so arranged as to ensure:

- .1 unrestricted passage at all times from any ladder platform and from the floor; and
- .2 unrestricted access to all valves necessary for cargo handling for a person wearing the required personnel protective equipment.

3.3.2 Permanent arrangements shall be made for hoisting an injured person with a rescue line while avoiding any projecting obstacles.

3.3.3 Guard railings shall be installed on all ladders and platforms.

3.3.4 Normal access ladders shall not be fitted vertical and shall incorporate platforms at suitable intervals.

3.3.5 Means shall be provided to deal with drainage and any possible leakage from cargo pumps and valves in cargo pump-rooms. The bilge system serving the cargo pump-room shall be operable from outside the cargo pump-room. One or more slop tanks for storage of contaminated bilge water or tank washings shall be provided. A shore connection with a standard coupling or other facilities shall be provided for transferring contaminated liquids to onshore reception facilities.

3.3.6 Pump discharge pressure gauges shall be provided outside the cargo pump-room.

3.3.7 Where machinery is driven by shafting passing through a bulkhead or deck, gastight seals with efficient lubrication or other means of ensuring the permanence of the gas seal shall be fitted in way of the bulkhead or deck.

### 3.4 Access to spaces in the cargo area

3.4.1 Access to cofferdams, ballast tanks, cargo tanks and other spaces in the cargo area shall be direct from the open deck and such as to ensure their complete inspection. Access to double-bottom spaces may be through a cargo pump-room, pump-room, deep cofferdam, pipe tunnel or similar compartments, subject to consideration of ventilation aspects.

3.4.2 For access through horizontal openings, hatches or manholes, the dimensions shall be sufficient to allow a person wearing a self-contained air-breathing apparatus and protective equipment to ascend or descend any ladder without obstruction and also to provide a clear opening to facilitate the hoisting of an injured person from the bottom of the space. The minimum clear opening shall be not less than 600 mm by 600 mm.

3.4.3 For access through vertical openings, or manholes providing passage through the length and breadth of the space, the minimum clear opening shall be not less than 600 mm by 800 mm at a height of not more than 600 mm from the bottom shell plating unless gratings or other footholds are provided.

3.4.4 Smaller dimensions may be approved by the Administration in special circumstances, if the ability to traverse such openings or to remove an injured person can be proved to the satisfaction of the Administration.

### **3.5 Bilge and ballast arrangements**

3.5.1 Pumps, ballast lines, vent lines and other similar equipment serving permanent ballast tanks shall be independent of similar equipment serving cargo tanks and of cargo tanks themselves. Discharge arrangements for permanent ballast tanks sited immediately adjacent to cargo tanks shall be outside machinery spaces and accommodation spaces. Filling arrangements may be in the machinery spaces provided that such arrangements ensure filling from tank deck level and non-return valves are fitted.

3.5.2 Filling of ballast in cargo tanks may be arranged from deck level by pumps serving permanent ballast tanks, provided that the filling line has no permanent connection to cargo tanks or piping and that non-return valves are fitted.

3.5.3 Bilge pumping arrangements for cargo pump-rooms, pump-rooms, void spaces, slop tanks, double-bottom tanks and similar spaces shall be situated entirely within the cargo area except for void spaces, double-bottom tanks and ballast tanks where such spaces are separated from tanks containing cargo or residues of cargo by a double bulkhead.

### **3.6 Pump and pipeline identification**

Provisions shall be made for the distinctive marking of pumps, valves and pipelines to identify the service and tanks which they serve.

### **3.7 Bow or stern loading and unloading arrangements**

3.7.1 Cargo piping may be fitted to permit bow or stern loading and unloading. Portable arrangements shall not be permitted.

3.7.2 Bow or stern loading and unloading lines shall not be used for the transfer of products required to be carried in type 1 ships. Bow and stern loading and unloading lines shall not be used for the transfer of cargoes emitting toxic vapours required to comply with 15.12.1, unless specifically approved by the Administration.



3.7.3 In addition to 5.1, the following provisions apply:

- .1 The piping outside the cargo area shall be fitted at least 760 mm inboard on the open deck. Such piping shall be clearly identified and fitted with a shutoff valve at its connection to the cargo piping system within the cargo area. At this location, it shall also be capable of being separated by means of a removable spool-piece and blank flanges when not in use.
- .2 The shore connection shall be fitted with a shutoff valve and a blank flange.
- .3 The piping shall be full-penetration butt-welded, and fully radiographed. Flange connections in the piping shall only be permitted within the cargo area and at the shore connection.
- .4 Spray shields shall be provided at the connections specified in 3.7.3.1 as well as collecting trays of sufficient capacity, with means for the disposal of drainage.
- .5 The piping shall be self-draining to the cargo area and preferably into a cargo tank. Alternative arrangements for draining the piping may be accepted by the Administration.
- .6 Arrangements shall be made to allow such piping to be purged after use and maintained gas-safe when not in use. The vent pipes connected with the purge shall be located in the cargo area. The relevant connections to the piping shall be provided with a shutoff valve and blank flange.

3.7.4 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations shall not face the cargo shore-connection location of bow or stern loading and unloading arrangements. They shall be located on the outboard side of the superstructure or deck-house at a distance of at least 4% of the length of the ship but not less than 3 m from the end of the house facing the cargo shore-connection location of the bow or stern loading and unloading arrangements. This distance, however, need not exceed 5 m. Sidescuttles facing the shore-connection location and on the sides of the superstructure or deck-house within the distance mentioned above shall be of the fixed (non-opening) type. In addition, during the use of the bow or stern loading and unloading arrangements, all doors, ports and other openings on the corresponding superstructure or deck-house side shall be kept closed. Where, in the case of small ships, compliance with 3.2.3 and this paragraph is not possible, the Administration may approve relaxations from the above requirements.

3.7.5 Air pipes and other openings to enclosed spaces not listed in 3.7.4 shall be shielded from any spray which may come from a burst hose or connection.

3.7.6 Escape routes shall not terminate within the coamings required by 3.7.7 or within a distance of 3 m beyond the coamings.

3.7.7 Continuous coamings of suitable height shall be fitted to keep any spills on deck and away from the accommodation and service areas.

3.7.8 Electrical equipment within the coamings required by 3.7.7 or within a distance of 3 m beyond the coamings shall be in accordance with the requirements of chapter 10.

3.7.9 Fire-fighting arrangements for the bow or stern loading and unloading areas shall be in accordance with 11.3.16.

3.7.10 Means of communication between the cargo control station and the cargo shore-connection location shall be provided and certified safe, if necessary. Provision shall be made for the remote shutdown of cargo pumps from the cargo shore-connection location.

## Chapter 4

### Cargo containment

#### 4.1 Definitions

4.1.1 *Independent tank* means a cargo-containment envelope, which is not contiguous with, or part of, the hull structure. An independent tank is built and installed so as to eliminate whenever possible (or in any event to minimize) its stressing as a result of stressing or motion of the adjacent hull structure. An independent tank is not essential to the structural completeness of the ship's hull.

4.1.2 *Integral tank* means a cargo-containment envelope which forms part of the ship's hull and which may be stressed in the same manner and by the same loads which stress the contiguous hull structure and which is normally essential to the structural completeness of the ship's hull.

4.1.3 *Gravity tank* means a tank having a design pressure not greater than 0.07 MPa gauge at the top of the tank. A gravity tank may be independent or integral. A gravity tank shall be constructed and tested according to recognized standards, taking account of the temperature of carriage and relative density of the cargo.

4.1.4 *Pressure tank* means a tank having a design pressure greater than 0.07 MPa gauge. A pressure tank shall be an independent tank and shall be of a configuration permitting the application of pressure-vessel design criteria according to recognized standards.

#### 4.2 Tank type requirements for individual products

Requirements for both installation and design of tank types for individual products are shown in *column f* in the table of chapter 17.

## Chapter 5

### Cargo transfer

#### 5.1 Piping scantlings

5.1.1 Subject to the conditions stated in 5.1.4 the wall thickness (t) of pipes shall not be less than:

$$t = \frac{t_0 + b + c}{1 - \frac{a}{100}} \text{ (mm)}$$

where:

$t_0$  = theoretical thickness

$$t_0 = PD/(2Ke+P) \text{ (mm)}$$

with

P = design pressure (MPa) referred to in 5.1.2

D = outside diameter (mm)

K = allowable stress (N/mm<sup>2</sup>) referred to in 5.1.5

e = efficiency factor equal to 1.0 for seamless pipes and for longitudinally or spirally welded pipes, delivered by approved manufacturers of welded pipes, which are considered equivalent to seamless pipes when non-destructive testing on welds is carried out in accordance with recognized standards. In other cases, an efficiency factor of less than 1.0, in accordance with recognized standards, may be required depending on the manufacturing process.

b = allowance for bending (mm). The value of b shall be chosen so that the calculated stress in the bend, due to internal pressure only, does not exceed the allowable stress. Where such justification is not given, b shall be not less than:

$$b = \frac{Dt_0}{2.5r} \text{ (mm)}$$

with

r = mean radius of the bend (mm).

c = corrosion allowance (mm). If corrosion or erosion is expected, the wall thickness of piping shall be increased over that required by the other design requirements.

a = negative manufacturing tolerance for thickness (%).

5.1.2 The design pressure P in the formula for  $t_0$  in 5.1.1 is the maximum gauge pressure to which the system may be subjected in service, taking into account the highest set pressure on any relief valve on the system.

5.1.3 Piping and piping-system components which are not protected by a relief valve, or which may be isolated from their relief valve, shall be designed for at least the greatest of:

- .1 for piping systems or components, which may contain some liquid, the saturated vapour pressure at 45°C;
- .2 the pressure setting of the associated pump discharge relief valve;
- .3 the maximum possible total pressure head at the outlet of the associated pumps when a pump discharge relief valve is not installed.

5.1.4 The design pressure shall not be less than 1 MPa gauge except for open-ended lines, where it shall be not less than 0.5 MPa gauge.

5.1.5 For pipes, the allowable stress K to be considered in the formula for  $t_0$  in 5.1.1 is the lower of the following values:

$$\frac{R_m}{A} \text{ or } \frac{R_e}{B}$$

where:

$R_m$  = specified minimum tensile strength at ambient temperature (N/mm<sup>2</sup>)

$R_e$  = specified minimum yield stress at ambient temperature (N/mm<sup>2</sup>). If the stress-strain curve does not show a defined yield stress, the 0.2% proof stress applies.

A and B shall have values of at least A = 2.7 and B = 1.8.

5.1.6.1 The minimum wall thickness shall be in accordance with recognized standards.

5.1.6.2 Where necessary for mechanical strength to prevent damage, collapse, excessive sag or buckling of pipes due to weight of pipes and content and to superimposed loads from supports, ship deflection or other causes, the wall thickness shall be increased over that required by 5.1.1 or, if this is impracticable or would cause excessive local stresses, these loads shall be reduced, protected against or eliminated by other design methods.

5.1.6.3 Flanges, valves and other fittings shall be in accordance with recognized standards, taking into account the design pressure defined under 5.1.2.

5.1.6.4 For flanges not complying with a standard, the dimensions for flanges and associated bolts shall be to the satisfaction of the Administration.

## 5.2 Piping fabrication and joining details

5.2.1 The requirements of this section apply to piping inside and outside the cargo tanks. However, relaxations from these requirements may be accepted in accordance with recognized standards for open-ended piping and for piping inside cargo tanks except for cargo piping serving other cargo tanks.

### 5.2.2 Cargo piping shall be joined by welding except:

- .1 for approved connections to shutoff valves and expansion joints; and
- .2 for other exceptional cases specifically approved by the Administration.

### 5.2.3 The following direct connections of pipe lengths without flanges may be considered:

- .1 Butt-welded joints with complete penetration at the root may be used in all applications.
- .2 Slip-on welded joints with sleeves and related welding having dimensions in accordance with recognized standards shall only be used for pipes with an external diameter of 50 mm or less. This type of joint shall not be used when crevice corrosion is expected to occur.
- .3 Screwed connections, in accordance with recognized standards, shall only be used for accessory lines and instrumentation lines with external diameters of 25 mm or less.

### 5.2.4 Expansion of piping shall normally be allowed for by the provision of expansion loops or bends in the piping system.

- .1 Bellows, in accordance with recognized standards, may be specially considered.
- .2 Slip joints shall not be used.

### 5.2.5 Welding, post-weld heat treatment and non-destructive testing shall be performed in accordance with recognized standards.

## 5.3 Flange connections

5.3.1 Flanges shall be of the welded-neck, slip-on or socket-welded type. However, socket-welded-type flanges shall not be used in nominal size above 50 mm.

5.3.2 Flanges shall comply with recognized standards as to their type, manufacture and test.

## 5.4 Test requirements for piping

5.4.1 The test requirements of this section apply to piping inside and outside cargo tanks. However, relaxations from these requirements may be accepted in accordance with recognized standards for piping inside tanks and open-ended piping.

5.4.2 After assembly, each cargo piping system shall be subject to a hydrostatic test to at least 1.5 times the design pressure. When piping systems or parts of systems are completely manufactured and equipped with all fittings, the hydrostatic test may be conducted prior to installation aboard the ship. Joints welded on board shall be hydrostatically tested to at least 1.5 times the design pressure.

5.4.3 After assembly on board, each cargo piping system shall be tested for leaks to a pressure depending on the method applied.



## 5.5 Piping arrangements

5.5.1 Cargo piping shall not be installed under deck between the out-board side of the cargo-containment spaces and the skin of the ship unless clearances required for damage protection (see 2.6) are maintained; but such distances may be reduced where damage to the pipe would not cause release of cargo provided that the clearance required for inspection purposes is maintained.

5.5.2 Cargo piping located below the main deck may run from the tank it serves and penetrate tank bulkheads or boundaries common to longitudinally or transversally adjacent cargo tanks, ballast tanks, empty tanks, pump-rooms or cargo pump-rooms provided that inside the tank it serves it is fitted with a stop-valve operable from the weather deck and provided cargo compatibility is assured in the event of piping failure. As an exception, where a cargo tank is adjacent to a cargo pump-room, the stop valve operable from the weather deck may be situated on the tank bulkhead on the cargo pump-room side, provided an additional valve is fitted between the bulkhead valve and the cargo pump. A totally enclosed hydraulically operated valve located outside the cargo tank may, however, be accepted, provided that the valve is:

- .1 designed to preclude the risk of leakage;
- .2 fitted on the bulkhead of the cargo tank which it serves;
- .3 suitably protected against mechanical damage;
- .4 fitted at a distance from the shell as required for damage protection; and
- .5 operable from the weather deck.

5.5.3 In any cargo pump-room where a pump serves more than one tank, a stop valve shall be fitted in the line to each tank.

5.5.4 Cargo piping installed in pipe tunnels shall also comply with the requirements of 5.5.1 and 5.5.2. Pipe tunnels shall satisfy all tank requirements for construction, location and ventilation and electrical hazard requirements. Cargo compatibility shall be assured in the event of a piping failure. The tunnel shall not have any other openings except to the weather deck and cargo pump-room or pump-room.

5.5.5 Cargo piping passing through bulkheads shall be so arranged as to preclude excessive stresses at the bulkhead and shall not utilize flanges bolted through the bulkhead.

## 5.6 Cargo-transfer control systems

5.6.1 For the purpose of adequately controlling the cargo, cargo-transfer systems shall be provided with:

- .1 one stop-valve capable of being manually operated on each tank filling and discharge line, located near the tank penetration; if an individual deepwell pump is used to discharge the contents of a cargo tank, a stop-valve is not required on the discharge line of that tank;
- .2 one stop valve at each cargo-hose connection;
- .3 remote shutdown devices for all cargo pumps and similar equipment.

5.6.2 The controls necessary during transfer or transport of cargoes covered by the Code other than in cargo pump-rooms which have been dealt with elsewhere in the Code shall not be located below the weather deck.

5.6.3 For certain products, additional cargo-transfer control requirements are shown in *column o* in the table of chapter 17.

## **5.7 Ship's cargo hoses**

5.7.1 Liquid and vapour hoses used for cargo transfer shall be compatible with the cargo and suitable for the cargo temperature.

5.7.2 Hoses subject to tank pressure or the discharge pressure of pumps shall be designed for a bursting pressure not less than 5 times the maximum pressure the hose will be subjected to during cargo transfer.

5.7.3 For cargo hoses installed on board ships on or after 1 July 2002, each new type of cargo hose, complete with end-fittings, shall be prototype-tested at a normal ambient temperature with 200 pressure cycles from zero to at least twice the specified maximum working pressure. After this cycle pressure test has been carried out, the prototype test shall demonstrate a bursting pressure of at least 5 times its specified maximum working pressure at the extreme service temperature. Hoses used for prototype testing shall not be used for cargo service. Thereafter, before being placed in service, each new length of cargo hose produced shall be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure but not more than two-fifths of its bursting pressure. The hose shall be stencilled or otherwise marked with the date of testing, its specified maximum working pressure and, if used in services other than the ambient temperature services, its maximum and minimum service temperature, as applicable. The specified maximum working pressure shall not be less than 1 MPa gauge.

## Chapter 6

### Materials of construction, protective linings and coatings

6.1 Structural materials used for tank construction, together with associated piping, pumps, valves, vents and their jointing materials, shall be suitable at the temperature and pressure for the cargo to be carried in accordance with recognized standards. Steel is assumed to be the normal material of construction.

6.2 The shipyard is responsible for providing compatibility information to the ship operator and/or master. This must be done in a timely manner before delivery of the ship or on completion of a relevant modification of the material of construction.

6.3 Where applicable, the following should be taken into account in selecting the material of construction:

- .1 notch ductility at the operating temperature;
- .2 corrosive effect of the cargo; and
- .3 possibility of hazardous reactions between the cargo and the material of construction.

6.4 The shipper of the cargo is responsible for providing compatibility information to the ship operator and/or master. This must be done in a timely manner before transportation of the product. The cargo shall be compatible with all materials of construction such that:

- .1 no damage to the integrity of the materials of construction is incurred; and/or
- .2 no hazardous, or potentially hazardous reaction is created.

6.5 When a product is submitted to IMO for evaluation, and where compatibility of the product with materials referred to in paragraph 6.1 renders special requirements, the BLG Product Data Reporting form shall provide information on the required materials of construction. These requirements shall be reflected in chapter 15 and consequentially be referred to in *column o* of chapter 17. The reporting form shall also indicate if no special requirements are necessary. The producer of the product is responsible for providing the correct information.

## Chapter 7

### Cargo temperature control

#### 7.1 General

7.1.1 When provided, any cargo heating or cooling systems shall be constructed, fitted and tested to the satisfaction of the Administration. Materials used in the construction of temperature-control systems shall be suitable for use with the product intended to be carried.

7.1.2 Heating or cooling media shall be of a type approved for use with the specific cargo. Consideration shall be given to the surface temperature of heating coils or ducts to avoid dangerous reactions from localized overheating or overcooling of cargo. (See also 15.13.6.)

7.1.3 Heating or cooling systems shall be provided with valves to isolate the system for each tank and to allow manual regulation of flow.

7.1.4 In any heating or cooling system, means shall be provided to ensure that, when in any condition other than empty, a higher pressure can be maintained within the system than the maximum pressure head that could be exerted by the cargo tank contents on the system.

7.1.5 Means shall be provided for measuring the cargo temperature.

- .1 The means for measuring the cargo temperature shall be of restricted or closed type, respectively, when a restricted or closed gauging device is required for individual substances, as shown in *column j* in the table of chapter 17.
- .2 A restricted temperature-measuring device is subject to the definition for a restricted gauging device in 13.1.1.2 (e.g. a portable thermometer lowered inside a gauge tube of the restricted type).
- .3 A closed temperature-measuring device is subject to the definition for a closed gauging device in 13.1.1.3 (e.g. a remote-reading thermometer of which the sensor is installed in the tank).
- .4 When overheating or overcooling could result in a dangerous condition, an alarm system which monitors the cargo temperature shall be provided. (See also operational requirements in 16.6.)

7.1.6 When products for which 15.12, 15.12.1 or 15.12.3 are listed in *column o* in the table of chapter 17 are being heated or cooled, the heating or cooling medium shall operate in a circuit:

- .1 which is independent of other ship's services, except for another cargo heating or cooling system, and which does not enter the machinery space; or
- .2 which is external to the tank carrying toxic products; or

- .3 where the medium is sampled to check for the presence of cargo before it is recirculated to other services of the ship or into the machinery space. The sampling equipment shall be located within the cargo area and be capable of detecting the presence of any toxic cargo being heated or cooled. Where this method is used, the coil return shall be tested not only at the commencement of heating or cooling of a toxic product, but also on the first occasion the coil is used subsequent to having carried an unheated or uncooled toxic cargo.

## 7.2 Additional requirements

For certain products, additional requirements contained in chapter 15 are shown in *column o* in the table of chapter 17.



## Chapter 8

### Cargo tank venting and gas-freeing arrangements

#### 8.1 Application

8.1.1 Unless expressly provided otherwise, this chapter applies to ships constructed on or after 1 January 1994.

8.1.2 Ships constructed before 1 January 1994 shall comply with the requirements of chapter 8 of this Code which were in force prior to the said date.

8.1.3 For the purpose of this regulation, the term “ship constructed” is as defined in SOLAS regulation II-1/1.3.1.

8.1.4 Ships constructed on or after 1 July 1986 but before 1 January 1994 which fully comply with the requirements of the Code applicable at that time may be regarded as complying with the requirements of SOLAS regulations II-2/4.5.3, 4.5.6 to 4.5.8, 4.5.10 and 11.6.

8.1.5 For ships to which the Code applies, the requirements of this chapter shall apply in lieu of SOLAS regulations II-2/4.5.3 and 4.5.6.

8.1.6 Ships constructed on or after 1 July 1986, but before 1 July 2002 shall comply with the requirements of 8.3.3.

#### 8.2 Cargo tank venting

8.2.1 All cargo tanks shall be provided with a venting system appropriate to the cargo being carried and these systems shall be independent of the air pipes and venting systems of all other compartments of the ship. Tank venting systems shall be designed so as to minimize the possibility of cargo vapour accumulating about the decks, entering accommodation, service and machinery spaces and control stations and, in the case of flammable vapours, entering or collecting in spaces or areas containing sources of ignition. Tank venting systems shall be arranged to prevent entrance of water into the cargo tanks and, at the same time, vent outlets shall direct the vapour discharge upwards in the form of unimpeded jets.

8.2.2 The venting systems shall be connected to the top of each cargo tank and as far as practicable the cargo vent lines shall be self-draining back to the cargo tanks under all normal operational conditions of list and trim. Where it is necessary to drain venting systems above the level of any pressure/vacuum valve, capped or plugged drain cocks shall be provided.

8.2.3 Provision shall be made to ensure that the liquid head in any tank does not exceed the design head of the tank. Suitable high-level alarms, overflow control systems or spill valves, together with gauging and tank filling procedures, may be accepted for this purpose. Where the means of limiting cargo tank overpressure includes an automatic closing valve, the valve shall comply with the appropriate provisions of 15.19.

8.2.4 Tank venting systems shall be designed and operated so as to ensure that neither pressure nor vacuum created in the cargo tanks during loading or unloading exceeds tank design parameters. The main factors to be considered in the sizing of a tank venting system are as follows:



- .1 design loading and unloading rate;
- .2 gas evolution during loading: this shall be taken account of by multiplying the maximum loading rate by a factor of at least 1.25;
- .3 density of the cargo vapour mixture;
- .4 pressure loss in vent piping and across valves and fittings; and
- .5 pressure/vacuum settings of relief devices.

8.2.5 Tank vent piping connected to cargo tanks of corrosion-resistant material, or to tanks which are lined or coated to handle special cargoes as required by the Code, shall be similarly lined or coated or constructed of corrosion-resistant material.

8.2.6 The master shall be provided with the maximum permissible loading and unloading rates for each tank or group of tanks consistent with the design of the venting systems.

### 8.3 Types of tank venting systems

8.3.1 An open tank venting system is a system which offers no restriction except for friction losses to the free flow of cargo vapours to and from the cargo tanks during normal operations. An open venting system may consist of individual vents from each tank, or such individual vents may be combined into a common header or headers, with due regard to cargo segregation. In no case shall shutoff valves be fitted either to the individual vents or to the header.

8.3.2 A controlled tank venting system is a system in which pressure- and vacuum-relief valves or pressure/vacuum valves are fitted to each tank to limit the pressure or vacuum in the tank. A controlled venting system may consist of individual vents from each tank or such individual vents on the pressure side only as may be combined into a common header or headers, with due regard to cargo segregation. In no case shall shut-off valves be fitted either above or below pressure- or vacuum-relief valves or pressure/vacuum valves. Provision may be made for bypassing a pressure- or vacuum-relief valve or pressure/vacuum valve under certain operating conditions provided that the requirement of 8.3.6 is maintained and that there is suitable indication to show whether or not the valve is bypassed.

8.3.3 Controlled tank venting systems shall consist of a primary and a secondary means of allowing full flow relief of vapour to prevent over-pressure or under-pressure in the event of failure of one means. Alternatively, the secondary means may consist of pressure sensors fitted in each tank with a monitoring system in the ship's cargo control room or position from which cargo operations are normally carried out. Such monitoring equipment shall also provide an alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank.

8.3.4 The position of vent outlets of a controlled tank venting system shall be arranged:

- .1 at a height of not less than 6 m above the weather deck or above a raised walkway if fitted within 4 m of the raised walkway; and
- .2 at a distance of at least 10 m measured horizontally from the nearest air intake or opening to accommodation, service and machinery spaces and ignition sources.

8.3.5 The vent outlet height referred to in 8.3.4.1 may be reduced to 3 m above the deck or a raised walkway, as applicable, provided that high-velocity venting valves of an approved type, directing the vapour/air mixture upwards in an unimpeded jet with an exit velocity of at least 30 m/s, are fitted.

8.3.6 Controlled tank venting systems fitted to tanks to be used for cargoes having a flashpoint not exceeding 60°C (closed-cup test) shall be provided with devices to prevent the passage of flame into the cargo tanks. The design, testing and locating of the devices shall comply with the requirements of the Administration, which shall contain at least the standards adopted by the Organization.

8.3.7 In designing venting systems and in the selection of devices to prevent the passage of flame for incorporation into the tank venting system, due attention shall be paid to the possibility of the blockage of these systems and fittings by, for example, the freezing of cargo vapour, polymer build-up, atmospheric dust or icing up in adverse weather conditions. In this context it shall be noted that flame arresters and flame screens are more susceptible to blockage. Provisions shall be made such that the system and fittings may be inspected, operationally checked, cleaned or renewed as applicable.

8.3.8 Reference in 8.3.1 and 8.3.2 to the use of shutoff valves in the venting lines shall be interpreted to extend to all other means of stoppage, including spectacle blanks and blank flanges.

#### 8.4 Venting requirements for individual products

Venting requirements for individual products are shown in *column g*, and additional requirements in *column o* in the table of chapter 17.

#### 8.5 Cargo tank gas-freeing

8.5.1 The arrangements for gas-freeing cargo tanks used for cargoes other than those for which open venting is permitted shall be such as to minimize the hazards due to the dispersal of flammable or toxic vapours in the atmosphere and to flammable or toxic vapour mixtures in a cargo tank. Accordingly, gas-freeing operations shall be carried out such that vapour is initially discharged:

- .1 through the vent outlets specified in 8.3.4 and 8.3.5; or
- .2 through outlets at least 2 m above the cargo tank deck level with a vertical exit velocity of at least 30 m/s maintained during the gas-freeing operation; or
- .3 through outlets at least 2 m above the cargo tank deck level with a vertical exit velocity of at least 20 m/s which are protected by suitable devices to prevent the passage of flame.

When the flammable vapour concentration at the outlets has been reduced to 30% of the lower flammable limit and, in the case of a toxic product, the vapour concentration does not present a significant health hazard, gas-freeing may thereafter be continued at cargo tank deck level.

8.5.2 The outlets referred to in 8.5.1.2 and 8.5.1.3 may be fixed or portable pipes.

8.5.3 In designing a gas-freeing system in conformity with 8.5.1, particularly in order to achieve the required exit velocities of 8.5.1.2 and 8.5.1.3, due consideration shall be given to the following:

- .1 materials of construction of system;
- .2 time to gas-free;
- .3 flow characteristics of fans to be used;
- .4 the pressure losses created by ducting, piping, cargo tank inlets and outlets;
- .5 the pressure achievable in the fan driving medium (e.g. water or compressed air);  
and
- .6 the densities of the cargo vapour/air mixtures for the range of cargoes to be carried.

## Chapter 9

### Environmental control

#### 9.1 General

9.1.1 Vapour spaces within cargo tanks and, in some cases, spaces surrounding cargo tanks may require to have specially controlled atmospheres.

9.1.2 There are four different types of control for cargo tanks, as follows:

- .1 *Inerting*: by filling the cargo tank and associated piping systems and, where specified in chapter 15, the spaces surrounding the cargo tanks, with a gas or vapour which will not support combustion and which will not react with the cargo, and maintaining that condition.
- .2 *Padding*: by filling the cargo tank and associated piping systems with a liquid, gas or vapour which separates the cargo from the air, and maintaining that condition.
- .3 *Drying*: by filling the cargo tank and associated piping systems with moisture-free gas or vapour with a dewpoint of  $-40^{\circ}\text{C}$  or below at atmospheric pressure, and maintaining that condition.
- .4 *Ventilation*: forced or natural.

9.1.3 Where inerting or padding of cargo tanks is required:

- .1 An adequate supply of inert gas for use in filling and discharging the cargo tanks shall be carried or shall be manufactured on board unless a shore supply is available. In addition, sufficient inert gas shall be available on the ship to compensate for normal losses during transportation.
- .2 The inert gas system on board the ship shall be able to maintain a pressure of at least 0.007 MPa gauge within the containment system at all times. In addition, the inert gas system shall not raise the cargo tank pressure to more than the tank's relief-valve setting.
- .3 Where padding is used, similar arrangements for supply of the padding medium shall be made as required for inert gas in 9.1.3.1 and 9.1.3.2.
- .4 Means shall be provided for monitoring ullage spaces containing a gas blanket to ensure that the correct atmosphere is being maintained.
- .5 Inerting or padding arrangements or both, where used with flammable cargoes, shall be such as to minimize the creation of static electricity during the admission of the inerting medium.

9.1.4 Where drying is used and dry nitrogen is used as the medium, similar arrangements for supply of the drying agent shall be made to those required in 9.1.3. Where drying agents are used as the drying medium on all air inlets to the tank, sufficient medium shall be carried for the duration of the voyage, taking into consideration the diurnal temperature range and the expected humidity.

## **9.2 Environmental control requirements for individual products**

The required types of environmental control for certain products are shown in *column h* in the table of chapter 17.

## Chapter 10

### Electrical installations

#### 10.1 General

10.1.1 The provisions of this chapter are applicable to ships carrying cargoes which are inherently, or due to their reaction with other substances, flammable or corrosive to the electrical equipment, and shall be applied in conjunction with applicable electrical requirements of part D of chapter II-1 of SOLAS.

10.1.2.1 Electrical installations shall be such as to minimize the risk of fire and explosion from flammable products.

10.1.2.2 Where the specific cargo is liable to damage the materials normally used in electrical apparatus, due consideration shall be given to the particular characteristics of the materials chosen for conductors, insulation, metal parts, etc. As far as necessary, these components shall be protected to prevent contact with gases or vapours liable to be encountered.

10.1.3 The Administration shall take appropriate steps to ensure uniformity in the implementation and the application of the provisions of this chapter in respect of electrical installations.

10.1.4 Electrical equipment, cables and wiring shall not be installed in the hazardous locations unless it conforms with the standards not inferior to those acceptable to the Organization\*. However, for locations not covered by such standards, electrical equipment, cables and wiring which do not conform to the standards may be installed in hazardous locations based on a risk assessment to the satisfaction of the Administration, to ensure that an equivalent level of safety is assured.

10.1.5 Where electrical equipment is installed in hazardous locations, as permitted in this chapter, it shall be to the satisfaction of the Administration and certified by the relevant authorities recognized by the Administration for operation in the flammable atmosphere concerned, as indicated in *column i* in the table of chapter 17.

10.1.6 For guidance, indication is given if the flashpoint of a substance is in excess of 60°C. In the case of a heated cargo, carriage conditions might need to be established and the requirements for cargoes having a flashpoint not exceeding 60°C applied.

#### 10.2 Bonding

Independent cargo tanks shall be electrically bonded to the hull. All gasketed cargo-pipe joints and hose connections shall be electrically bonded.

#### 10.3 Electrical requirements for individual products

Electrical requirements for individual products are shown in *column i* in the table of chapter 17.



## Chapter 11

### Fire protection and fire extinction

#### 11.1 Application

11.1.1 The requirements for tankers in SOLAS chapter II-2 shall apply to ships covered by the Code, irrespective of tonnage, including ships of less than 500 tons gross tonnage, except that:

- .1 regulations 4.5.5, 10.8 and 10.9 shall not apply;
- .2 regulation 4.5.1.2 (i.e. the requirements for location of the main cargo control station) need not apply;
- .3 regulations 10.2, 10.4, and 10.5 shall apply as they would apply to cargo ships of 2,000 tons gross tonnage and over;
- .4 the provisions of 11.3 shall apply in lieu of regulation 10.8; and
- .5 the provisions of 11.2 shall apply in lieu of regulation 10.9.

11.1.2 Notwithstanding the provisions of 11.1.1, ships engaged solely in the carriage of products which are non-flammable (entry NF in *column i* of the table of minimum requirements) need not comply with requirements for tankers specified in SOLAS chapter II-2, provided that they comply with the requirements for cargo ships of that chapter, except that regulation 10.7 need not apply to such ships and 11.2 and 11.3, hereunder, need not apply.

11.1.3 For ships engaged solely in the carriage of products with a flashpoint of 60°C and above (entry “Yes” in *column i* of the table of minimum requirements), the requirements of SOLAS chapter II-2 may apply as specified in regulation II-2/1.6.4 in lieu of the provisions of this chapter.

#### 11.2 Cargo pump-rooms

11.2.1 The cargo pump-room of any ship shall be provided with a fixed carbon dioxide fire-extinguishing system as specified in SOLAS regulation II-2/10.9.1.1. A notice shall be exhibited at the controls stating that the system is only to be used for fire-extinguishing and not for inerting purposes, due to the electrostatic ignition hazard. The alarms referred to in SOLAS regulation II-2/10.9.1.1.1 shall be safe for use in a flammable cargo vapour/air mixture. For the purpose of this requirement, an extinguishing system shall be provided which would be suitable for machinery spaces. However, the amount of gas carried shall be sufficient to provide a quantity of free gas equal to 45% of the gross volume of the cargo pump-room in all cases.

11.2.2 Cargo pump-rooms of ships which are dedicated to the carriage of a restricted number of cargoes shall be protected by an appropriate fire-extinguishing system approved by the Administration.

11.2.3 If cargoes are to be carried which are not suited to extinguishment by carbon dioxide or equivalent media, the cargo pump-room shall be protected by a fire extinguishing system consisting of either a fixed pressure water spray or high expansion foam system. The International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk shall reflect this conditional requirement.

### 11.3 Cargo area

11.3.1 Every ship shall be provided with a fixed deck foam system in accordance with the requirements of 11.3.2 to 11.3.12.

11.3.2 Only one type of foam concentrate shall be supplied, and it shall be effective for the maximum possible number of cargoes intended to be carried. For other cargoes for which foam is not effective or is incompatible, additional arrangements to the satisfaction of the Administration shall be provided. Regular protein foam shall not be used.

11.3.3 The arrangements for providing foam shall be capable of delivering foam to the entire cargo tanks deck area as well as into any cargo tank, the deck of which is assumed to be ruptured.

11.3.4 The deck foam system shall be capable of simple and rapid operation. The main control station for the system shall be suitably located outside of the cargo area, adjacent to the accommodation spaces and readily accessible and operable in the event of fires in the areas protected.

11.3.5 The rate of supply of foam solution shall be not less than the greatest of the following:

- .1 2 l/min per square metre of the cargo tanks deck area, where cargo tanks deck area means the maximum breadth of the ship times the total longitudinal extent of the cargo tank spaces;
- .2 20 l/min per square metre of the horizontal sectional area of the single tank having the largest such area;
- .3 10 l/min per square metre of the area protected by the largest monitor, such area being entirely forward of the monitor, but not less than 1,250 l/min. For ships less than 4,000 tonnes deadweight, the minimum capacity of the monitor shall be to the satisfaction of the Administration.

11.3.6 Sufficient foam concentrate shall be supplied to ensure at least 30 min of foam generation when using the highest of the solution rates stipulated in 11.3.5.1, 11.3.5.2 and 11.3.5.3.

11.3.7 Foam from the fixed foam system shall be supplied by means of monitors and foam applicators. At least 50% of the foam rate required in 11.3.5.1 or 11.3.5.2 shall be delivered from each monitor. The capacity of any monitor shall be at least 10 l/min of foam solution per square metre of deck area protected by that monitor, such area being entirely forward of the monitor. Such capacity shall be not less than 1,250 l/min. For ships less than 4,000 tonnes deadweight, the minimum capacity of the monitor shall be to the satisfaction of the Administration.

11.3.8 The distance from the monitor to the farthest extremity of the protected area forward of that monitor shall be not more than 75% of the monitor throw in still air conditions.

11.3.9 A monitor and hose connection for a foam applicator shall be situated both port and starboard at the poop front or accommodation spaces facing the cargo area.

11.3.10 Applicators shall be provided for flexibility of action during fire-fighting operations and to cover areas screened from the monitors. The capacity of any applicator shall be not less than 400 l/min and the applicator throw in still air conditions shall be not less than 15 m. The number of foam applicators provided shall be not less than four. The number and disposition of foam

main outlets shall be such that foam from at least two applicators can be directed to any part of the cargo tanks deck area.

11.3.11 Valves shall be provided in the foam main, and in the fire main where this is an integral part of the deck foam system, immediately forward of any monitor position to isolate damaged sections of those mains.

11.3.12 Operation of a deck foam system at its required output shall permit the simultaneous use of the minimum required number of jets of water at the required pressure from the fire main.

11.3.13 Ships which are dedicated to the carriage of a restricted number of cargoes shall be protected by alternative provisions to the satisfaction of the Administration when they are just as effective for the products concerned as the deck foam system required for the generality of flammable cargoes.

11.3.14 Suitable portable fire-extinguishing equipment for the products to be carried shall be provided and kept in good operating order.

11.3.15 Where flammable cargoes are to be carried, all sources of ignition shall be excluded from hazardous locations unless such sources conform with 10.1.4.

11.3.16 Ships fitted with bow or stern loading and unloading arrangements shall be provided with one additional foam monitor meeting the requirements of 11.3.7 and one additional applicator meeting the requirements of 11.3.10. The additional monitor shall be located to protect the bow or stern loading and unloading arrangements. The area of the cargo line forward or aft of the cargo area shall be protected by the above-mentioned applicator.

#### **11.4 Special requirements**

All fire-extinguishing media determined to be effective for each product are listed in *column l* in the table of chapter 17.

## Chapter 12

### Mechanical ventilation in the cargo area

For ships to which the Code applies, the requirements of this chapter replace the requirements of SOLAS regulations II-2/4.5.2.6 and 4.5.4.

However, for products addressed under paragraphs 11.1.2 and 11.1.3, except acids and products for which paragraph 15.17 applies, SOLAS regulations II-2/4.5.2.6 and 4.5.4 may apply in lieu of the provisions of this chapter.

#### 12.1 Spaces normally entered during cargo-handling operations

12.1.1 Cargo pump-rooms and other enclosed spaces which contain cargo-handling equipment and similar spaces in which work is performed on the cargo shall be fitted with mechanical ventilation systems, capable of being controlled from outside such spaces.

12.1.2 Provision shall be made to ventilate such spaces prior to entering the compartment and operating the equipment and a warning notice requiring the use of such ventilation shall be placed outside the compartment.

12.1.3 Mechanical ventilation inlets and outlets shall be arranged to ensure sufficient air movement through the space to avoid the accumulation of toxic or flammable vapours or both (taking into account their vapour densities) and to ensure sufficient oxygen to provide a safe working environment, but in no case shall the ventilation system have a capacity of less than 30 changes of air per hour, based upon the total volume of the space. For certain products, increased ventilation rates for cargo pump-rooms are prescribed in 15.17.

12.1.4 Ventilation systems shall be permanent and shall normally be of the extraction type. Extraction from above and below the floor plates shall be possible. In rooms housing motors driving cargo pumps, the ventilation shall be of the positive-pressure type.

12.1.5 Ventilation exhaust ducts from spaces within the cargo area shall discharge upwards in locations at least 10 m in the horizontal direction from ventilation intakes and openings to accommodation, service and machinery spaces and control stations and other spaces outside the cargo area.

12.1.6 Ventilation intakes shall be so arranged as to minimize the possibility of recycling hazardous vapours from any ventilation discharge opening.

12.1.7 Ventilation ducts shall not be led through accommodation, service and machinery spaces or other similar spaces.

12.1.8 Electric motors driving fans shall be placed outside the ventilation ducts if the carriage of flammable products is intended. Ventilation fans and fan ducts, in way of fans only, for hazardous locations referred to in chapter 10 shall be of non-sparking construction, defined as:

- .1 impellers or housing of non-metallic construction, due regard being paid to the elimination of static electricity;
- .2 impellers and housing of non-ferrous materials;



- .3 impellers and housing of austenitic stainless steel; and
- .4 ferrous impellers and housing with not less than 13 mm design tip clearance.

Any combination of an aluminium or a magnesium alloy fixed or rotating component and a ferrous fixed or rotating component, regardless of tip clearance, is considered a sparking hazard and shall not be used in these places.

12.1.9 Sufficient spare parts shall be carried for each type of fan on board required by this chapter.

12.1.10 Protection screens of not more than 13 mm square mesh shall be fitted in outside openings of ventilation ducts.

## **12.2 Pump-rooms and other enclosed spaces normally entered**

Pump-rooms and other enclosed spaces normally entered which are not covered by 12.1.1 shall be fitted with mechanical ventilation systems, capable of being controlled from outside such spaces and complying with the requirements of 12.1.3, except that the capacity shall not be less than 20 changes of air per hour, based upon the total volume of the space. Provision shall be made to ventilate such spaces prior to personnel entering.

## **12.3 Spaces not normally entered**

Double bottoms, cofferdams, duct keels, pipe tunnels, hold spaces and other spaces where cargo may accumulate shall be capable of being ventilated to ensure a safe environment when entry into the spaces is necessary. Where a permanent ventilation system is not provided for such spaces, approved means of portable mechanical ventilation shall be provided. Where necessary, owing to the arrangement of spaces, for instance hold spaces, essential ducting for ventilation shall be permanently installed. For permanent installations the capacity of eight air changes per hour shall be provided and for portable systems the capacity of 16 air changes per hour. Fans or blowers shall be clear of personnel access openings, and shall comply with 12.1.8.

## Chapter 13

### Instrumentation

#### 13.1 Gauging

13.1.1 Cargo tanks shall be fitted with one of the following types of gauging devices:

- .1 *Open device*: which makes use of an opening in the tanks and may expose the gauger to the cargo or its vapour. An example of this is the ullage opening.
- .2 *Restricted device*: which penetrates the tank and which, when in use, permits a small quantity of cargo vapour or liquid to be exposed to the atmosphere. When not in use, the device is completely closed. The design shall ensure that no dangerous escape of tank contents (liquid or spray) can take place in opening the device.
- .3 *Closed device*: which penetrates the tank, but which is part of a closed system and keeps tank contents from being released. Examples are the float-type systems, electronic probe, magnetic probe and protected sight-glass. Alternatively, an *indirect device* which does not penetrate the tank shell and which is independent of the tank may be used. Examples are weighing of cargo, pipe flow meter.

13.1.2 Gauging devices shall be independent of the equipment required under 15.19.

13.1.3 Open gauging and restricted gauging shall be allowed only where:

- .1 open venting is allowed by the Code; or
- .2 means are provided for relieving tank pressure before the gauge is operated.

13.1.4 Types of gauging for individual products are shown in *column j* in the table of chapter 17.

#### 13.2 Vapour detection

13.2.1 Ships carrying toxic or flammable products or both shall be equipped with at least two instruments designed and calibrated for testing for the specific vapours in question. If such instruments are not capable of testing for both toxic concentrations and flammable concentrations, then two separate sets of instruments shall be provided.

13.2.2 Vapour-detection instruments may be portable or fixed. If a fixed system is installed, at least one portable instrument shall be provided.

13.2.3 When toxic-vapour-detection equipment is not available for some products which require such detection, as indicated in *column k* in the table of chapter 17, the Administration may exempt the ship from the requirement, provided an appropriate entry is made on the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk. When granting such an exemption, the Administration shall recognize the necessity for additional breathing-air supply and an entry shall be made on the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk drawing attention to the provisions of 14.2.4 and 16.4.2.2.

13.2.4 Vapour-detection requirements for individual products are shown in *column k* in the table of chapter 17.



## Chapter 14

### Personnel protection

#### 14.1 Protective equipment

14.1.1 For the protection of crew members who are engaged in loading and discharging operations, the ship shall have on board suitable protective equipment consisting of large aprons, special gloves with long sleeves, suitable footwear, coveralls of chemical-resistant material, and tight-fitting goggles or face shields or both. The protective clothing and equipment shall cover all skin so that no part of the body is unprotected.

14.1.2 Work clothes and protective equipment shall be kept in easily accessible places and in special lockers. Such equipment shall not be kept within accommodation spaces, with the exception of new, unused equipment and equipment which has not been used since undergoing a thorough cleaning process. The Administration may, however, approve storage rooms for such equipment within accommodation spaces if adequately segregated from living spaces such as cabins, passageways, dining rooms, bathrooms, etc.

14.1.3 Protective equipment shall be used in any operation, which may entail danger to personnel.

#### 14.2 Safety equipment

14.2.1 Ships carrying cargoes for which 15.12, 15.12.1 or 15.12.3 is listed in *column o* in the table of chapter 17 shall have on board sufficient but not less than three complete sets of safety equipment, each permitting personnel to enter a gas-filled compartment and perform work there for at least 20 min. Such equipment shall be in addition to that required by SOLAS regulation II-2/10.10.

14.2.2 One complete set of safety equipment shall consist of:

- .1 one self-contained air-breathing apparatus (not using stored oxygen);
- .2 protective clothing, boots, gloves and tight-fitting goggles;
- .3 fireproof lifeline with belt resistant to the cargoes carried; and
- .4 explosion-proof lamp.

14.2.3 For the safety equipment required in 14.2.1, all ships shall carry either:

- .1 one set of fully charged spare air bottles for each breathing apparatus;
- .2 a special air compressor suitable for the supply of high-pressure air of the required purity;
- .3 a charging manifold capable of dealing with sufficient spare air bottles for the breathing apparatus; or

- .4 fully charged spare air bottles with a total free air capacity of at least 6,000 l for each breathing apparatus on board in excess of the requirements of SOLAS regulation II-2/10.10.

14.2.4 A cargo pump-room on ships carrying cargoes which are subject to the requirements of 15.18 or cargoes for which in *column k* in the table of chapter 17 toxic-vapour-detection equipment is required but is not available shall have either:

- .1 a low-pressure line system with hose connections suitable for use with the breathing apparatus required by 14.2.1. This system shall provide sufficient high-pressure air capacity to supply, through pressure-reduction devices, enough low-pressure air to enable two men to work in a gas-dangerous space for at least 1 h without using the air bottles of the breathing apparatus. Means shall be provided for recharging the fixed air bottles and the breathing apparatus air bottles from a special air compressor suitable for the supply of high-pressure air of the required purity; or
- .2 an equivalent quantity of spare bottled air in lieu of the low-pressure air line.

14.2.5 At least one set of safety equipment as required by 14.2.2 shall be kept in a suitable clearly marked locker in a readily accessible place near the cargo pump-room. The other sets of safety equipment shall also be kept in suitable, clearly marked, easily accessible places.

14.2.6 The breathing apparatus shall be inspected at least once a month by a responsible officer, and the inspection recorded in the ship's log-book. The equipment shall be inspected and tested by an expert at least once a year.

### 14.3 Emergency equipment

14.3.1 Ships carrying cargoes, for which "Yes" is indicated in *column n* of chapter 17, shall be provided with suitable respiratory and eye protection sufficient for every person on board for emergency escape purposes, subject to the following:

- .1 filter-type respiratory protection is unacceptable;
- .2 self-contained breathing apparatus shall have at least a duration of service of 15 min;
- .3 emergency escape respiratory protection shall not be used for fire-fighting or cargo-handling purposes and shall be marked to that effect.

14.3.2 The ship shall have on board medical first-aid equipment, including oxygen resuscitation equipment and antidotes for cargoes to be carried, based on the guidelines developed by the Organization.

14.3.3 A stretcher which is suitable for hoisting an injured person up from spaces such as the cargo pump-room shall be placed in a readily accessible location.

14.3.4 Suitably marked decontamination showers and an eyewash shall be available on deck in convenient locations. The showers and eyewash shall be operable in all ambient conditions.

## Chapter 15

### Special requirements

#### 15.1 General

15.1.1 The provisions of this chapter are applicable where specific reference is made in *column o* in the table of chapter 17. These requirements are additional to the general requirements of the Code.

#### 15.2 Ammonium nitrate solution (93% or less)

15.2.1 The ammonium nitrate solution shall contain at least 7% by weight of water. The acidity (pH) of the cargo when diluted with ten parts of water to one part of cargo by weight shall be between 5.0 and 7.0. The solution shall not contain more than 10 ppm chloride ions, 10 ppm ferric ions and shall be free of other contaminants.

15.2.2 Tanks and equipment for ammonium nitrate solution shall be independent of tanks and equipment containing other cargoes or combustible products. Equipment which may, in service or when defective, release combustible products into the cargo (e.g. lubricants), shall not be used. Tanks shall not be used for seawater ballast.

15.2.3 Except where expressly approved by the Administration, ammonium nitrate solutions shall not be transported in tanks which have previously contained other cargoes unless tanks and associated equipment have been cleaned to the satisfaction of the Administration.

15.2.4 The temperature of the heat-exchanging medium in the tank heating system shall not exceed 160°C. The heating system shall be provided with a control system to keep the cargo at a bulk mean temperature of 140°C. High-temperature alarms at 145°C and 150°C and a low-temperature alarm at 125°C shall be provided. Where the temperature of the heat-exchanging medium exceeds 160°C, an alarm shall also be given. Temperature alarms and controls shall be located on the navigating bridge.

15.2.5 If the bulk mean cargo temperature reaches 145°C, a cargo sample shall be diluted with ten parts of distilled or demineralized water to one part of cargo by weight and the pH shall be determined by means of a narrow-range indicator paper or stick. Acidity measurements shall then be taken every 24 hours. If the pH is found to be below 4.2, ammonia gas shall be injected into the cargo until the pH of 5.0 is reached.

15.2.6 A fixed installation shall be provided to inject ammonia gas into the cargo. Controls for this system shall be located on the navigation bridge. For this purpose, 300 kg of ammonia per 1,000 tonnes of ammonium nitrate solution shall be available on board.

15.2.7 Cargo pumps shall be of the centrifugal deepwell type or of the centrifugal type with water-flushed seals.

15.2.8 Vent piping shall be fitted with approved weatherhoods to prevent clogging. Such weatherhoods shall be accessible for inspection and cleaning.

15.2.9 Hot work on tanks, piping and equipment which have been in contact with ammonium nitrate solution shall only be done after all traces of ammonium nitrate have been removed, inside as well as outside.

### 15.3 Carbon disulphide

Carbon disulphide may be carried either under a water pad or under a suitable inert gas pad as specified in the following paragraphs.

#### *Carriage under water pad*

15.3.1 Provision shall be made to maintain a water pad in the cargo tank during loading, unloading and transit. In addition, an inert-gas pad shall be maintained in the ullage space during transit.

15.3.2 All openings shall be in the top of the tank, above the deck.

15.3.3 Loading lines shall terminate near the bottom of the tank.

15.3.4 A standard ullage opening shall be provided for emergency sounding.

15.3.5 Cargo piping and vent lines shall be independent of piping and vent lines used for other cargo.

15.3.6 Pumps may be used for discharging cargo, provided they are of the deepwell or hydraulically driven submersible types. The means of driving a deepwell pump shall not present a source of ignition for carbon disulphide and shall not employ equipment that may exceed a temperature of 80°C.

15.3.7 If a cargo discharge pump is used, it shall be inserted through a cylindrical well extending from the tank top to a point near the tank bottom. A water pad shall be formed in this well before attempting pump removal unless the tank has been certified as gas-free.

15.3.8 Water or inert-gas displacement may be used for discharging cargo, provided the cargo system is designed for the expected pressure and temperature.

15.3.9 Safety relief valves shall be of stainless steel construction.

15.3.10 Because of its low ignition temperature and close clearances required to arrest its flame propagation, only intrinsically safe systems and circuits are permitted in the hazardous locations.

#### *Carriage under suitable inert gas pad*

15.3.11 Carbon disulphide shall be carried in independent tanks with a design pressure of not less than 0.06 MPa gauge.

15.3.12 All openings shall be located on the top of the tank, above the deck.

15.3.13 Gaskets used in the containment system shall be of a material which does not react with, or dissolve in, carbon disulphide.

15.3.14 Threaded joints shall not be permitted in the cargo containment system, including the vapour lines.



15.3.15 Prior to loading, the tank(s) shall be inerted with suitable inert gas until the oxygen level is 2% by volume or lower. Means shall be provided to automatically maintain a positive pressure in the tank using suitable inert gas during loading, transport and discharge. The system shall be able to maintain this positive pressure between 0.01 and 0.02 MPa, and shall be remotely monitored and fitted with over/underpressure alarms.

15.3.16 Hold spaces surrounding an independent tank carrying carbon disulphide shall be inerted by a suitable inert gas until the oxygen level is 2% or less. Means shall be provided to monitor and maintain this condition throughout the voyage. Means shall also be provided to sample these spaces for carbon disulphide vapour.

15.3.17 Carbon disulphide shall be loaded, transported and discharged in such a manner that venting to the atmosphere does not occur. If carbon disulphide vapour is returned to shore during loading or to the ship during discharge, the vapour return system shall be independent of all other containment systems.

15.3.18 Carbon disulphide shall be discharged only by submerged deepwell pumps or by a suitable inert gas displacement. The submerged deepwell pumps shall be operated in a way that prevents heat build-up in the pump. The pump shall also be equipped with a temperature sensor in the pump housing with remote readout and alarm in the cargo control room. The alarm shall be set at 80°C. The pump shall also be fitted with an automatic shut-down device to be activated if the tank pressure falls below atmospheric pressure during the discharge.

15.3.19 Air shall not be allowed to enter the cargo tank, cargo pump or lines while carbon disulphide is contained in the system.

15.3.20 No other cargo handling, tank cleaning or deballasting shall take place concurrent with loading or discharge of carbon disulphide.

15.3.21 A water spray system of sufficient capacity shall be provided to blanket effectively the area surrounding the loading manifold, the exposed deck piping associated with product handling and the tank domes. The arrangement of piping and nozzles shall be such as to give an uniform distribution rate of 10 l/m<sup>2</sup>/min. Remote manual operation shall be arranged such that remote starting of pumps supplying the water-spray system and remote operation of any normally closed valves in the system can be carried out from a suitable location outside the cargo area adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected. The water-spray system shall be capable of both local and remote manual operation, and the arrangement shall ensure that any spilled cargo is washed away. Additionally, a water hose with pressure to the nozzle when atmospheric temperature permits, shall be connected ready for immediate use during loading and unloading operations.

15.3.22 No cargo tanks shall be more than 98% liquid-full at the reference temperature (R).

15.3.23 The maximum volume ( $V_L$ ) of cargo to be loaded in a tank shall be:

$$V_L = 0.98 V \frac{\rho_R}{\rho_L}$$

where:

- V = volume of the tank
- $\rho_R$  = density of cargo at the reference temperature (R)
- $\rho_L$  = density of cargo at the loading temperature
- R = reference temperature

15.3.24 The maximum allowable tank filling limits for each cargo tank shall be indicated for each loading temperature which may be applied, and for the applicable maximum reference temperature, on a list approved by the Administration. A copy of the list shall be permanently kept on board by the master.

15.3.25 Zones on open deck, or semi-enclosed spaces on open deck within three metres of a tank outlet, gas or vapour outlet, cargo pipe flange or cargo valve of a tank certified to carry carbon disulphide, shall comply with the electrical equipment requirements specified for carbon disulphide in *column i*, chapter 17. Also, within the specified zone, no other heat sources, like steam piping with surface temperatures in excess of 80°C shall be allowed.

15.3.26 Means shall be provided to ullage and sample the cargo without opening the tank or disturbing the positive suitable inert gas blanket.

15.3.27 The product shall be transported only in accordance with a cargo handling plan that has been approved by the Administration. Cargo handling plans shall show the entire cargo piping system. A copy of the approved cargo handling plan shall be available on board. The International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk shall be endorsed to include reference to the approved cargo handling plan.

#### 15.4 Diethyl ether

15.4.1 Unless inerted, natural ventilation shall be provided for the voids around the cargo tanks while the vessel is under way. If a mechanical ventilation system is installed, all blowers shall be of non-sparking construction. Mechanical ventilation equipment shall not be located in the void spaces surrounding the cargo tanks.

15.4.2 Pressure-relief-valve settings shall not be less than 0.02 MPa gauge for gravity tanks.

15.4.3 Inert-gas displacement may be used for discharging cargo from pressure tanks provided the cargo system is designed for the expected pressure.

15.4.4 In view of the fire hazard, provision shall be made to avoid any ignition source or heat generation or both in the cargo area.

15.4.5 Pumps may be used for discharging cargo, provided that they are of a type designed to avoid liquid pressure against the shaft gland or are of a hydraulically operated submerged type and are suitable for use with the cargo.

15.4.6 Provision shall be made to maintain the inert-gas pad in the cargo tank during loading, unloading and transit.

#### 15.5 Hydrogen peroxide solutions

15.5.1 *Hydrogen peroxide solutions over 60% but not over 70% by mass*

15.5.1.1 Hydrogen peroxide solutions over 60% but not over 70% by mass shall be carried in dedicated ships only and no other cargoes shall be carried.



15.5.1.2 Cargo tanks and associated equipment shall be either pure aluminium (99.5%) or solid stainless steel (304L, 316, 316L or 316Ti), and passivated in accordance with approved procedures. Aluminium shall not be used for piping on deck. All nonmetallic materials of construction for the containment system shall neither be attacked by hydrogen peroxide nor contribute to its decomposition.

15.5.1.3 Pump-rooms shall not be used for cargo-transfer operations.

15.5.1.4 Cargo tanks shall be separated by cofferdams from oil fuel tanks or any other space containing flammable or combustible materials.

15.5.1.5 Tanks intended for the carriage of hydrogen peroxide shall not be used for seawater ballast.

15.5.1.6 Temperature sensors shall be installed at the top and bottom of the tank. Remote temperature readouts and continuous monitoring shall be located on the navigating bridge. If the temperature in the tanks rises above 35°C, visible and audible alarms shall be activated on the navigating bridge.

15.5.1.7 Fixed oxygen monitors (or gas-sampling lines) shall be provided in void spaces adjacent to tanks to detect leakage of the cargo into these spaces. Remote readouts, continuous monitoring (if gas-sampling lines are used, intermittent sampling is satisfactory) and visible and audible alarms similar to those for the temperature sensors shall also be located on the navigating bridge. The visible and audible alarms shall be activated if the oxygen concentration in these void spaces exceeds 30% by volume. Two portable oxygen monitors shall also be available as back-up systems.

15.5.1.8 As a safeguard against uncontrolled decomposition, a cargo-jettisoning system shall be installed to discharge the cargo overboard. The cargo shall be jettisoned if the temperature rise of the cargo exceeds a rate of 2°C per hour over a 5-hour period or when the temperature in the tank exceeds 40°C.

15.5.1.9 Cargo tank venting systems shall have pressure/vacuum-relief valves for normal controlled venting, and rupture discs or a similar device for emergency venting, should tank pressure rise rapidly as a result of uncontrolled decomposition. Rupture discs shall be sized on the basis of tank design pressure, tank size and anticipated decomposition rate.

15.5.1.10 A fixed water-spray system shall be provided for diluting and washing away any concentrated hydrogen peroxide solution spilled on deck. The areas covered by the water-spray shall include the manifold/hose connections and the tank tops of those tanks designated for carrying hydrogen peroxide solutions. The minimum application rate shall satisfy the following criteria:

- .1 The product shall be diluted from the original concentration to 35% by mass within 5 minutes of the spill.
- .2 The rate and estimated size of the spill shall be based upon maximum anticipated loading and discharge rates, the time required to stop flow of cargo in the event of tank overflow or a piping/hose failure, and the time necessary to begin application of dilution water with actuation at the cargo control location or on the navigating bridge.

15.5.1.11 Only those hydrogen peroxide solutions which have a maximum decomposition rate of 1% per year at 25°C shall be carried. Certification from the shipper that the product meets this standard shall be presented to the master and kept on board. A technical representative of the manufacturer shall be on board to monitor the transfer operations and have the capability to test the stability of the hydrogen peroxide. He shall certify to the master that the cargo has been loaded in a stable condition.

15.5.1.12 Protective clothing that is resistant to hydrogen peroxide solutions shall be provided for each crew member involved in cargo-transfer operations. Protective clothing shall include nonflammable coveralls, suitable gloves, boots and eye protection.

15.5.2 *Hydrogen peroxide solutions over 8% but not over 60% by mass*

15.5.2.1 The ship's shell plating shall not form any boundaries of tanks containing this product.

15.5.2.2 Hydrogen peroxide shall be carried in tanks thoroughly and effectively cleaned of all traces of previous cargoes and their vapours or ballast. Procedures for inspection, cleaning, passivation and loading of tanks shall be in accordance with MSC/Circ.394. A certificate shall be on board the vessel indicating that the procedures in the circular have been followed. The passivation requirement may be waived by an Administration for domestic shipments of short duration. Particular care in this respect is essential to ensure the safe carriage of hydrogen peroxide:

- .1 When hydrogen peroxide is carried no other cargoes shall be carried simultaneously.
- .2 Tanks which have contained hydrogen peroxide may be used for other cargoes after cleaning in accordance with the procedures outlined in MSC/Circ.394.
- .3 Consideration in design shall provide minimum internal tank structure, free draining, no entrapment and ease of visual inspection.

15.5.2.3 Cargo tanks and associated equipment shall be either pure aluminium (99.5%) or solid stainless steel of types suitable for use with hydrogen peroxide (e.g. 304, 304L, 316, 316L, 316Ti). Aluminium shall not be used for piping on deck. All non-metallic materials of construction for the containment system shall neither be attacked by hydrogen peroxide nor contribute to its decomposition.

15.5.2.4 Cargo tanks shall be separated by a cofferdam from fuel oil tanks or any other space containing materials incompatible with hydrogen peroxide.

15.5.2.5 Temperature sensors shall be installed at the top and bottom of the tank. Remote temperature readouts and continuous monitoring shall be located on the navigating bridge. If the temperature in the tank rises above 35°C, visible and audible alarms shall activate on the navigating bridge.

15.5.2.6 Fixed oxygen monitors (or gas-sampling lines) shall be provided in void spaces adjacent to tanks to detect leakage of the cargo into these spaces. The enhancement of flammability by oxygen enrichment shall be recognized. Remote readouts, continuous monitoring (if gas-sampling lines are used, intermittent sampling is satisfactory) and visible and audible alarms similar to those for the temperature sensors shall also be located on the navigating bridge. The visible and audible alarms shall activate if the oxygen concentration in these void

spaces exceeds 30% by volume. Two portable oxygen monitors shall also be available as back-up systems.

15.5.2.7 As a safeguard against uncontrolled decomposition, a cargo-jettisoning system shall be installed to discharge the cargo overboard. The cargo shall be jettisoned if the temperature rise of the cargo exceeds a rate of 2°C per hour over a 5-hour period or when the temperature in the tank exceeds 40°C.

15.5.2.8 Cargo tank venting systems with filtration shall have pressure/vacuum-relief valves for normal controlled venting, and a device for emergency venting, should tank pressure rise rapidly as a result of an uncontrolled decomposition rate, as stipulated in 15.5.2.7. These venting systems shall be designed in such a manner that there is no introduction of seawater into the cargo tank even under heavy sea conditions. Emergency venting shall be sized on the basis of tank design pressure and tank size.

15.5.2.9 A fixed water-spray system shall be provided for diluting and washing away any concentrated solution spilled on deck. The areas covered by the water-spray shall include the manifold/hose connections and the tank tops of those tanks designated for the carriage of hydrogen peroxide solutions. The minimum application rate shall satisfy the following criteria:

- .1 The product shall be diluted from the original concentration to 35% by mass within 5 minutes of the spill.
- .2 The rate and estimated size of the spill shall be based upon maximum anticipated loading and discharge rates, the time required to stop flow of the cargo in the event of tank overfill or a piping/hose failure, and the time necessary to begin application of dilution water with actuation at the cargo control location or on the navigating bridge.

15.5.2.10 Only those hydrogen peroxide solutions which have a maximum decomposition rate of 1% per year at 25°C shall be carried. Certification from the shipper that the product meets this standard shall be presented to the master and kept on board. A technical representative of the manufacturer shall be on board to monitor the transfer operations and have the capability to test the stability of the hydrogen peroxide. He shall certify to the master that the cargo has been loaded in a stable condition.

15.5.2.11 Protective clothing that is resistant to hydrogen peroxide shall be provided for each crew member involved in cargo-transfer operations. Protective clothing shall include coveralls that are nonflammable, suitable gloves, boots and eye protection.

15.5.2.12 During transfer of hydrogen peroxide the related piping system shall be separated from all other systems. Cargo hoses used for transfer of hydrogen peroxide shall be marked "FOR HYDROGEN PEROXIDE TRANSFER ONLY".

15.5.3 *Procedures for inspection, cleaning, passivation and loading of tanks for the carriage of hydrogen peroxide solutions 8-60%, which have contained other cargoes, or for the carriage of other cargoes after the carriage of hydrogen peroxide*

15.5.3.1 Tanks having contained cargoes other than hydrogen peroxide shall be inspected, cleaned and passivated before re-use for the transport of hydrogen peroxide solutions. The procedures for inspection and cleaning, as given in paragraphs 15.5.3.2 to 15.5.3.8 below, apply to both stainless steel and pure aluminium tanks (see paragraph 15.5.2.2). Procedures for passivation are given in paragraph 15.5.3.9 for stainless steel and 15.5.3.10 for aluminium.



Unless otherwise specified, all steps apply to the tanks and to all associated equipment having been in contact with the other cargo.

15.5.3.2 After unloading the previous cargo the tank shall be rendered safe and inspected for any residues, scale and rust.

15.5.3.3 Tanks and associated equipment shall be washed with clean filtered water. The water to be used shall at least have the quality of potable water with a low chlorine content.

15.5.3.4 Trace residues and vapours of the previous cargo shall be removed by steaming of tank and equipment.

15.5.3.5 Tank and equipment are washed again with clean water (quality as above) and dried, using filtered, oil-free air.

15.5.3.6 The atmosphere in the tank shall be sampled and investigated for the presence of organic vapours and oxygen concentration.

15.5.3.7 The tank shall be checked again by visual inspection for residues of the previous cargo, scale and rust as well as for any smell of the previous cargo.

15.5.3.8 If inspection or measurements indicate the presence of residues of the previous cargo or its vapours, actions described in paragraphs 15.5.3.3 to 15.5.3.5 shall be repeated.

15.5.3.9 Tank and equipment made from stainless steel which have contained other cargoes than hydrogen peroxide or which have been under repair shall be cleaned and passivated, regardless of any previous passivation, according to the following procedure:

- .1 New welds and other repaired parts shall be cleaned and finished using stainless steel wire brush, chisel, sandpaper or buff. Rough surfaces shall be given a smooth finish. A final polishing is necessary.
- .2 Fatty and oily residues shall be removed by the use of appropriate organic solvents or detergent solutions in water. The use of chlorine-containing compounds shall be avoided as they can seriously interfere with passivation.
- .3 The residues of the degreasing agent shall be removed, followed by a washing with water.
- .4 In the next step, scale and rust shall be removed by the application of acid (e.g. a mixture of nitric and hydrofluoric acids), followed again by a washing with clean water.
- .5 All the metal surfaces which can come into contact with hydrogen peroxide shall be passivated by the application of nitric acid of a concentration between 10 and 35% by mass. The nitric acid must be free from heavy metals, other oxidizing agents or hydrogen fluoride. The passivation process shall continue for 8 to 24 h, depending upon the concentration of acid, the ambient temperature and other factors. During this time a continuous contact between the surfaces to be passivated and the nitric acid shall be ensured. In the case of large surfaces this may be achieved by recirculating the acid. Hydrogen gas may be evolved in the passivation process, leading to the presence of an explosive atmosphere in the

tanks. Therefore, appropriate measures must be taken to avoid the build-up or the ignition of such an atmosphere.

- .6 After passivation the surfaces shall be thoroughly washed with clean filtered water. The washing process shall be repeated until the effluent water has the same pH value as the incoming water.
- .7 Surfaces treated according to the above steps may cause some decomposition when coming into contact with hydrogen peroxide for the first time. This decomposition will cease after a short time (usually within two or three days). Therefore an additional flushing with hydrogen peroxide for a period of at least two days is recommended.
- .8 Only degreasing agents and acid cleaning agents which have been recommended for this purpose by the manufacturer of the hydrogen peroxide shall be used in the process.

15.5.3.10 Tanks and equipment made from aluminium and which have contained cargoes other than hydrogen peroxide, or which have been under repair, shall be cleaned and passivated. The following is an example of a recommended procedure:

- .1 The tank shall be washed with a solution of a sulphonated detergent in hot water, followed by a washing with water.
- .2 The surface shall then be treated for 15 to 20 min with a solution of sodium hydroxide of a concentration of 7% by mass or treated for a longer period with a less concentrated solution (e.g. for 12 h with 0.4 to 0.5% sodium hydroxide). To prevent excessive corrosion at the bottom of the tank when treating with more concentrated solutions of sodium hydroxide, water shall be added continuously to dilute the sodium hydroxide solution which collects there.
- .3 The tank shall be thoroughly washed with clean, filtered water. As soon as possible after washing, the surface shall be passivated by the application of nitric acid of a concentration between 30 and 35% by mass. The passivation process shall continue for 16 to 24 h. During this time a continuous contact between the surfaces to be passivated and the nitric acid shall be ensured.
- .4 After passivation the surfaces shall be thoroughly washed with clean, filtered water. The washing process shall be repeated until the effluent water has the same pH value as the incoming water.
- .5 A visual inspection shall be made to ensure that all surfaces have been treated. It is recommended that an additional flushing is carried out for a minimum of 24 h with dilute hydrogen peroxide solution of a concentration approximately 3% by mass.

15.5.3.11 The concentration and stability of the hydrogen peroxide solution to be loaded shall be determined.

15.5.3.12 The hydrogen peroxide is loaded under intermittent visual supervision of the interior of the tank from an appropriate opening.

15.5.3.13 If substantial bubbling is observed which does not disappear within 15 min after the completion of loading, the contents of the tank shall be unloaded and disposed of in an environmentally safe manner. The tank and equipment shall then be repassivated as described above.

15.5.3.14 The concentration and stability of the hydrogen peroxide solution shall be determined again. If the same values are obtained within the limits of error as in paragraph 15.5.3.10, the tank is considered to be properly passivated and the cargo ready for shipment.

15.5.3.15 Actions described in paragraphs 15.5.3.2 to 15.5.3.8 shall be carried out under the supervision of the master or shipper. Actions described in paragraphs 15.5.3.9 to 15.5.3.15 shall be carried out under the on-site supervision and responsibility of a representative of the hydrogen peroxide manufacturer or under supervision and responsibility of another person familiar with the safety-relevant properties of hydrogen peroxide.

15.5.3.16 The following procedure shall be applied when tanks having contained hydrogen peroxide solution are to be used for other products (unless otherwise specified, all steps apply to the tanks and to all associated equipment having been in contact with hydrogen peroxide):

- .1 Hydrogen peroxide cargo residue shall be drained as completely as possible from tanks and equipment.
- .2 Tanks and equipment shall be rinsed with clean water, and subsequently thoroughly washed with clean water.
- .3 The interior of the tank shall be dried and inspected for any residues.

Steps .1 to .3, in 15.5.3.16, shall be carried out under the supervision of the master or the shipper. Step .3 in paragraph 15.5.3.16 shall be carried out by a person familiar with the safety-relevant properties of the chemical to be transported and of hydrogen peroxide.

- SPECIAL CAUTIONS :
- 1 Hydrogen peroxide decomposition may enrich the atmosphere with oxygen and appropriate precautions shall be observed.
  - 2 Hydrogen gas may be evolved in the passivation processes described in paragraphs 15.5.3.9.5, 15.5.3.10.2 and 15.5.3.10.4, leading to the presence of an explosive atmosphere in the tank. Therefore, appropriate measures must be taken to avoid the build-up or the ignition of such an atmosphere.

## 15.6 Motor fuel anti-knock compounds (containing lead alkyls)

15.6.1 Tanks used for these cargoes shall not be used for the transportation of any other cargo except those commodities to be used in the manufacture of motor fuel anti-knock compounds containing lead alkyls.

15.6.2 If a cargo pump-room is located on deck level according to 15.18, the ventilation arrangements shall be in compliance with 15.17.

15.6.3 Entry into cargo tanks used for the transportation of these cargoes is not permitted unless approved by the Administration.



15.6.4 Air analysis shall be made for lead content to determine if the atmosphere is satisfactory prior to allowing personnel to enter the cargo pump-room or void spaces surrounding the cargo tank.

### **15.7 Phosphorus, yellow or white**

15.7.1 Phosphorus shall, at all times, be loaded, carried and discharged under a water pad of 760 mm minimum depth. During discharge operations, arrangements shall be made to ensure that water occupies the volume of phosphorus discharged. Any water discharged from a phosphorus tank shall be returned only to a shore installation.

15.7.2 Tanks shall be designed and tested to a minimum equivalent water head of 2.4 m above the top of the tank, under designed loading conditions, taking into account the depth, relative density and method of loading and discharge of the phosphorus.

15.7.3 Tanks shall be so designed as to minimize the interfacial area between the liquid phosphorus and its water pad.

15.7.4 A minimum ullage space of 1% shall be maintained above the water pad. The ullage space shall be filled with inert gas or naturally ventilated by two cowled standpipes terminating at different heights but at least 6 m above the deck and at least 2 m above the pump-house top.

15.7.5 All openings shall be at the top of cargo tanks, and fittings and joints attached thereto shall be of materials resistant to phosphorus pentoxide.

15.7.6 Phosphorus shall be loaded at a temperature not exceeding 60°C.

15.7.7 Tank heating arrangements shall be external to tanks and have a suitable method of temperature control to ensure that the temperature of the phosphorus does not exceed 60°C. A high-temperature alarm shall be fitted.

15.7.8 A water drench system acceptable to the Administration shall be installed in all void spaces surrounding the tanks. The system shall operate automatically in the event of an escape of phosphorus.

15.7.9 Void spaces referred to in 15.7.8 shall be provided with effective means of mechanical ventilation which shall be capable of being sealed off quickly in an emergency.

15.7.10 Loading and discharge of phosphorus shall be governed by a central system on the ship which, in addition to incorporating high-level alarms, shall ensure that no overflow of tanks is possible and that such operations can be stopped quickly in an emergency from either ship or shore.

15.7.11 During cargo transfer, a water hose on deck shall be connected to a water supply and kept flowing throughout the operation so that any spillage of phosphorus may be washed down with water immediately.

15.7.12 Ship-to-shore loading and discharge connections shall be of a type approved by the Administration.

## **15.8 Propylene oxide or ethylene oxide/propylene oxide mixtures with an ethylene oxide content of not more than 30% by mass**

15.8.1 Products transported under the provisions of this section shall be acetylene-free.

15.8.2 Unless cargo tanks are properly cleaned, these products shall not be carried in tanks which have contained as one of the three previous cargoes any products known to catalyse polymerization, such as:

- .1 mineral acids (e.g. sulphuric, hydrochloric, nitric);
- .2 carboxylic acids and anhydrides (e.g. formic, acetic);
- .3 halogenated carboxylic acids (e.g. chloroacetic);
- .4 sulphonic acids (e.g. benzenesulphonic);
- .5 caustic alkalis (e.g. sodium hydroxide, potassium hydroxide);
- .6 ammonia and ammonia solutions;
- .7 amines and amine solutions; and
- .8 oxidizing substances.

15.8.3 Before loading, tanks shall be thoroughly and effectively cleaned, to remove all traces of previous cargoes from tanks and associated pipework, except where the immediately prior cargo has been propylene oxide or ethylene oxide/propylene oxide mixtures. Particular care shall be taken in the case of ammonia in tanks made of steel other than stainless steel.

15.8.4 In all cases, the effectiveness of cleaning procedures for tanks and associated pipework shall be checked by suitable testing or inspection, to ascertain that no traces of acidic or alkaline materials remain that might create a hazardous situation in the presence of these products.

15.8.5 Tanks shall be entered and inspected prior to each initial loading of these products to ensure freedom from contamination, heavy rust deposits and visible structural defects. When cargo tanks are in continuous service for these products, such inspections shall be performed at intervals of not more than two years.

15.8.6 Tanks for the carriage of these products shall be of steel or stainless steel construction.

15.8.7 Tanks for the carriage of these products may be used for other cargoes after thorough cleaning of tanks and associated pipework systems by washing or purging.

15.8.8 All valves, flanges, fittings and accessory equipment shall be of a type suitable for use with the products and shall be constructed of steel or stainless steel in accordance with recognized standards. Discs or disc faces, seats and other wearing parts of valves shall be made of stainless steel containing not less than 11% chromium.

15.8.9 Gaskets shall be constructed of materials which do not react with, dissolve in, or lower the autoignition temperature of these products and which are fire-resistant and possess adequate mechanical behaviour. The surface presented to the cargo shall be polytetrafluoroethylene (PTFE), or materials giving a similar degree of safety by their inertness. Spirally wound stainless steel, with a filler of PTFE or similar fluorinated polymer, may be accepted.

15.8.10 Insulation and packing, if used, shall be of a material which does not react with, dissolve in, or lower the autoignition temperature of these products.

15.8.11 The following materials are generally found unsatisfactory for gaskets, packing and similar uses in containment systems for these products and would require testing before being approved by the Administration:

- .1 neoprene or natural rubber, if it comes into contact with the products.
- .2 asbestos, or binders used with asbestos.
- .3 materials containing oxides of magnesium, such as mineral wools.

15.8.12 Threaded joints shall not be permitted in the cargo liquid and vapour lines.

15.8.13 Filling and discharge piping shall extend to within 100 mm of the bottom of the tank or any sump pit.

15.8.14.1 The containment system for a tank containing these products shall have a valved vapour-return connection.

15.8.14.2 The products shall be loaded and discharged in such a manner that venting of the tanks to atmosphere does not occur. If vapour return to shore is used during tank loading, the vapour-return system connected to a containment system for the product shall be independent of all other containment systems.

15.8.14.3 During discharge operations, the pressure in the cargo tank must be maintained above 0.007 MPa gauge.

15.8.15 The cargo may be discharged only by deepwell pumps, hydraulically operated submerged pumps, or inert-gas displacement. Each cargo pump shall be arranged to ensure that the product does not heat significantly if the discharge line from the pump is shut off or otherwise blocked.

15.8.16 Tanks carrying these products shall be vented independently of tanks carrying other products. Facilities shall be provided for sampling the tank contents without opening the tank to atmosphere.

15.8.17 Cargo hoses used for transfer of these products shall be marked "FOR ALKYLENE OXIDE TRANSFER ONLY".

15.8.18 Cargo tanks, void spaces and other enclosed spaces adjacent to an integral gravity cargo tank carrying propylene oxide shall either contain a compatible cargo (those cargoes specified in 15.8.2 are examples of substances considered incompatible) or be inerted by injection of a suitable inert gas. Any hold space in which an independent cargo tank is located shall be inerted. Such inerted spaces and tanks shall be monitored for these products and oxygen. The oxygen



content of these spaces shall be maintained below 2%. Portable sampling equipment is satisfactory.

15.8.19 In no case shall air be allowed to enter the cargo pump or piping system while these products are contained within the system.

15.8.20 Prior to disconnecting shore-lines, the pressure in liquid and vapour lines shall be relieved through suitable valves installed at the loading header. Liquid and vapour from these lines shall not be discharged to atmosphere.

15.8.21 Propylene oxide may be carried in pressure tanks or in independent or integral gravity tanks. Ethylene oxide/propylene oxide mixtures shall be carried in independent gravity tanks or pressure tanks. Tanks shall be designed for the maximum pressure expected to be encountered during loading, conveying and discharging cargo.

15.8.22.1 Tanks for the carriage of propylene oxide with a design pressure less than 0.06 MPa gauge and tanks for the carriage of ethylene oxide/propylene oxide mixtures with a design pressure of less than 0.12 MPa gauge shall have a cooling system to maintain the cargo below the reference temperature.

15.8.22.2 The refrigeration requirement for tanks with a design pressure less than 0.06 MPa gauge may be waived by the Administration for ships operating in restricted areas or on voyages of restricted duration, and account may be taken in such cases of any insulation of the tanks. The area and times of year for which such carriage would be permitted shall be included in the conditions of carriage of the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.

15.8.23.1 Any cooling system shall maintain the liquid temperature below the boiling temperature at the containment pressure. At least two complete cooling plants, automatically regulated by variations within the tanks, shall be provided. Each cooling plant shall be complete with the necessary auxiliaries for proper operation. The control system shall also be capable of being manually operated. An alarm shall be provided to indicate malfunctioning of the temperature controls. The capacity of each cooling system shall be sufficient to maintain the temperature of the liquid cargo below the reference temperature of the system.

15.8.23.2 An alternative arrangement may consist of three cooling plants, any two of which shall be sufficient to maintain the liquid temperature below the reference temperature.

15.8.23.3 Cooling media which are separated from the products by a single wall only shall be nonreactive with the products.

15.8.23.4 Cooling systems requiring compression of the products shall not be used.

15.8.24 Pressure-relief-valve settings shall not be less than 0.02 MPa gauge and for pressure tanks not greater than 0.7 MPa gauge for the carriage of propylene oxide and not greater than 0.53 MPa gauge for the carriage of propylene oxide/ethylene oxide mixtures.

15.8.25.1 The piping system for tanks to be loaded with these products shall be separated (as defined in 3.1.4) from piping systems for all other tanks, including empty tanks. If the piping system for the tanks to be loaded is not independent (as defined in 1.3.18), the required piping separation shall be accomplished by the removal of spool-pieces, valves, or other pipe section and the installation of blank flanges at these locations. The required separation applies to all

liquid and vapour piping, liquid and vapour vent lines and any other possible connections, such as common inert-gas supply lines.

15.8.25.2 These products may be transported only in accordance with cargo-handling plans that have been approved by the Administration. Each intended loading arrangement shall be shown on a separate cargo-handling plan. Cargo-handling plans shall show the entire cargo piping system and the locations for installation of blank flanges needed to meet the above piping separation requirements. A copy of each approved cargo-handling plan shall be maintained on board the ship. The International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk shall be endorsed to include reference to the approved cargo-handling plans.

15.8.25.3 Before each initial loading of these products and before every subsequent return to such service, certification verifying that the required piping separation has been achieved shall be obtained from a responsible person acceptable to the port Administration and carried on board the ship. Each connection between a blank flange and a pipeline flange shall be fitted with a wire and seal by the responsible person to ensure that in-advertent removal of the blank flange is impossible.

15.8.26.1 No cargo tanks shall be more than 98% liquid-full at the reference temperature.

15.8.26.2 The maximum volume to which a cargo tank shall be loaded is:

$$V_L = 0.98V \frac{\rho_R}{\rho_L}$$

Where  $V_L$  = maximum volume to which the tank may be loaded

$V$  = volume of the tank

$\rho_R$  = density of cargo at the reference temperature

$\rho_L$  = density of cargo at the loading temperature and pressure

15.8.26.3 The maximum allowable tank filling limits for each cargo tank shall be indicated for each loading temperature which may be applied and for the applicable maximum reference temperature, on a list to be approved by the Administration. A copy of the list shall be permanently kept on board by the master.

15.8.27 The cargo shall be carried under a suitable protective padding of nitrogen gas. An automatic nitrogen make-up system shall be installed to prevent the tank pressure falling below 0.007 MPa gauge in the event of product temperature fall due to ambient conditions or maloperation of refrigeration systems. Sufficient nitrogen shall be available on board to satisfy the demand of the automatic pressure control. Nitrogen of commercially pure quality (99.9% by volume) shall be used for padding. A battery of nitrogen bottles connected to the cargo tanks through a pressure-reduction valve satisfies the intention of the expression “automatic” in this context.

15.8.28 The cargo tank vapour space shall be tested prior to and after loading to ensure that the oxygen content is 2% by volume or less.



15.8.29 A water-spray system of sufficient capacity shall be provided to blanket effectively the area surrounding the loading manifold, the exposed deck piping associated with product handling, and the tank domes. The arrangement of piping and nozzles shall be such as to give a uniform distribution rate of 10 l/m<sup>2</sup>/min. Remote manual operation shall be arranged such that remote starting of pumps supplying the water-spray system and remote operation of any normally closed valves in the system can be carried out from a suitable location outside the cargo area, adjacent to the accommodation spaces and readily accessible and operable in the event of fire in the areas protected. The water-spray system shall be capable of both local and remote manual operation, and the arrangement shall ensure that any spilled cargo is washed away. Additionally, a water hose with pressure to the nozzle, when atmospheric temperatures permit, shall be connected ready for immediate use during loading and unloading operations.

15.8.30 A remotely operated, controlled closing-rate, shutoff valve shall be provided at each cargo-hose connection used during cargo transfer.

### **15.9 Sodium chlorate solution (50% or less by mass)**

15.9.1 Tanks and associated equipment, which have contained this product may be used for other cargoes after thorough cleaning by washing or purging.

15.9.2 In the event of spillage of this product, all spilled liquid shall be thoroughly washed away without delay. To minimize fire risk, spillage shall not be allowed to dry out.

### **15.10 Sulphur (molten)**

15.10.1 Cargo tank ventilation shall be provided to maintain the concentration of hydrogen sulphide below one half of its lower explosive limit through-out the cargo tank vapour space for all conditions of carriage (i.e. below 1.85% by volume).

15.10.2 Where mechanical ventilation systems are used for maintaining low gas concentrations in cargo tanks, an alarm system shall be provided to give warning if the system fails.

15.10.3 Ventilation systems shall be so designed and arranged as to preclude depositing of sulphur within the system.

15.10.4 Openings to void spaces adjacent to cargo tanks shall be so designed and fitted as to prevent the entry of water, sulphur or cargo vapour.

15.10.5 Connections shall be provided to permit sampling and analysing of vapour in void spaces.

15.10.6 Cargo temperature controls shall be provided to ensure that the temperature of the sulphur does not exceed 155°C.

15.10.7 Sulphur (molten) has a flashpoint above 60°C ; however, electrical equipment shall be certified safe for gases evolved.

### **15.11 Acids**

15.11.1 The ship's shell plating shall not form any boundaries of tanks containing mineral acids.

15.11.2 Proposals for lining steel tanks and related piping systems with corrosion-resistant materials may be considered by the Administration. The elasticity of the lining shall not be less than that of the supporting boundary plating.

15.11.3 Unless constructed wholly of corrosion-resistant materials or fitted with an approved lining, the plating thickness shall take into account the corrosivity of the cargo.

15.11.4 Flanges of the loading and discharge manifold connections shall be provided with shields, which may be portable, to guard against the danger of the cargo being sprayed; and in addition, drip trays shall also be provided to guard against leakage on to the deck.

15.11.5 Because of the danger of evolution of hydrogen when these substances are being carried, the electrical arrangements shall comply with 10.1.4. The certified safe type equipment shall be suitable for use in hydrogen/air mixtures. Other sources of ignition shall not be permitted in such spaces.

15.11.6 Substances subjected to the requirements of this section shall be segregated from oil fuel tanks, in addition to the segregation requirements in 3.1.1.

15.11.7 Provision shall be made for suitable apparatus to detect leakage of cargo into adjacent spaces.

15.11.8 The cargo pump-room bilge pumping and drainage arrangements shall be of corrosion-resistant materials.

## 15.12 Toxic products

15.12.1 Exhaust openings of tank vent systems shall be located:

- .1 at a height of  $B/3$  or 6 m, whichever is greater, above the weather deck or, in the case of a deck tank, the access gangway;
- .2 not less than 6 m above the fore-and-aft gangway, if fitted within 6 m of the gangway;
- .3 15 m from any opening or air intake to any accommodation and service spaces; and
- .4 the vent height may be reduced to 3 m above the deck or fore-and-aft gangway, as applicable, provided high-velocity vent valves of an approved type, directing the vapour/air mixture upwards in an unimpeded jet with an exit velocity of at least 30 m/s, are fitted.

15.12.2 Tank venting systems shall be provided with a connection for a vapour-return line to the shore installation.

15.12.3 Products shall:

- .1 not be stowed adjacent to oil fuel tanks;
- .2 have separate piping systems; and

- .3 have tank vent systems separate from tanks containing non-toxic products.

15.12.4 Cargo tank relief-valve settings shall be a minimum of 0.02 MPa gauge.

### 15.13 Cargoes protected by additives

15.13.1 Certain cargoes with a reference in *column o* in the table of chapter 17, by the nature of their chemical make-up, tend, under certain conditions of temperature, exposure to air or contact with a catalyst, to undergo polymerization, decomposition, oxidation or other chemical changes. Mitigation of this tendency is carried out by introducing small amounts of chemical additives into the liquid cargo or controlling the cargo tank environment.

15.13.2 Ships carrying these cargoes shall be so designed as to eliminate from the cargo tanks and cargo-handling system any material of construction or contaminants which could act as a catalyst or destroy the inhibitor.

15.13.3 Care shall be taken to ensure that these cargoes are sufficiently protected to prevent deleterious chemical change at all times during the voyage. Ships carrying such cargoes shall be provided with a certificate of protection from the manufacturer, and kept during the voyage, specifying:

- .1 the name and amount of additive present;
- .2 whether the additive is oxygen-dependent;
- .3 date additive was put in the product and duration of effectiveness;
- .4 any temperature limitations qualifying the additives' effective lifetime; and
- .5 the action to be taken shall the length of voyage exceed the effective lifetime of the additives.

15.13.4 Ships using the exclusion of air as the method of preventing oxidation of the cargo shall comply with 9.1.3.

15.13.5 A product containing an oxygen-dependent additive shall be carried without inertion (in tanks of a size not greater than 3,000 m<sup>3</sup>). Such cargoes shall not be carried in a tank requiring inertion under the requirements of SOLAS chapter II-2\*.

15.13.6 Venting systems shall be of a design that eliminates blockage from polymer build-up. Venting equipment shall be of a type that can be checked periodically for adequacy of operation.

15.13.7 Crystallization or solidification of cargoes normally carried in the molten state can lead to depletion of inhibitor in parts of the tank's contents. Subsequent remelting can thus yield pockets of uninhibited liquid, with the accompanying risk of dangerous polymerization. To prevent this, care shall be taken to ensure that at no time are such cargoes allowed to crystallize or solidify, either wholly or partially, in any part of the tank. Any required heating arrangements shall be such as to ensure that in no part of the tank does cargo become overheated to such an extent that any dangerous polymerization can be initiated. If the temperature from steam coils would induce overheating, an indirect low-temperature heating system shall be used.

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\* For equivalency arrangements for the carriage of styrene monomer, see MSC/Circ.879 and MSC/Circ.879/Corr.1

**15.14 Cargoes with a vapour pressure greater than 0.1013 MPa absolute at 37.8°C**

15.14.1 For a cargo referenced in *column o* in the table of chapter 17 to this section, a mechanical refrigeration system shall be provided unless the cargo system is designed to withstand the vapour pressure of the cargo at 45°C. Where the cargo system is designed to withstand the vapour pressure of the cargo at 45°C, and no refrigeration system is provided, a notation shall be made in the conditions of carriage on the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk to indicate the required relief-valve setting for the tanks.

15.14.2 A mechanical refrigeration system shall maintain the liquid temperature below the boiling temperature at the cargo tank design pressure.

15.14.3 When ships operate in restricted areas and at restricted times of the year, or on voyages of limited duration, the Administration involved may agree to waive requirements for a refrigeration system. A notation of any such agreement, listing geographic area restrictions and times of the year, or voyage duration limitations, shall be included in the conditions of carriage on the International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk.

15.14.4 Connections shall be provided for returning expelled gases to shore during loading.

15.14.5 Each tank shall be provided with a pressure gauge which indicates the pressure in the vapour space above the cargo.

15.14.6 Where the cargo needs to be cooled, thermometers shall be provided at the top and bottom of each tank.

15.14.7.1 No cargo tanks shall be more than 98% liquid-full at the reference temperature (R).

15.14.7.2 The maximum volume ( $V_L$ ) of cargo to be loaded in a tank shall be:

$$V_L = 0.98V \frac{\rho_R}{\rho_L}$$

Where V = volume of the tank

$\rho_R$  = density of cargo at the reference temperature (R)

$\rho_L$  = density of cargo at the loading temperature

15.14.7.3 The maximum allowable tank filling limits for each cargo tank shall be indicated for each loading temperature which may be applied, and for the applicable maximum reference temperature, on a list approved by the Administration. A copy of the list shall be permanently kept on board by the master.

**15.15 Cargoes with low ignition temperature and wide flammability range**

Deleted.

**15.16 Cargo contamination**

15.16.1 Deleted.



15.16.2 Where *column o* in the table of chapter 17 refers to this section, water shall not be allowed to contaminate this cargo. In addition, the following provisions apply:

- .1 Air inlets to pressure/vacuum-relief valves of tanks containing the cargo shall be situated at least 2 m above the weather deck.
- .2 Water or steam shall not be used as the heat-transfer media in a cargo temperature control system required by chapter 7.
- .3 The cargo shall not be carried in cargo tanks adjacent to permanent ballast or water tanks unless the tanks are empty and dry.
- .4 The cargo shall not be carried in tanks adjacent to slop tanks or cargo tanks containing ballast or slops or other cargoes containing water which may react in a dangerous manner. Pumps, pipes or vent lines serving such tanks shall be separate from similar equipment serving tanks containing the cargo. Pipelines from slop tanks or ballast lines shall not pass through tanks containing the cargo unless encased in a tunnel.

### 15.17 Increased ventilation requirements

For certain products, the ventilation system as described in 12.1.3 shall have a minimum capacity of at least 45 changes of air per hour, based upon the total volume of space. The ventilation system exhaust ducts shall discharge at least 10 m away from openings into accommodation spaces, work areas or other similar spaces, and intakes to ventilation systems, and at least 4 m above the tank deck.

### 15.18 Special cargo pump-room requirements

For certain products, the cargo pump-room shall be located on the deck level or cargo pumps shall be located in the cargo tank. The Administration may give special consideration to cargo pump-rooms below deck.

### 15.19 Overflow control

15.19.1 The provisions of this section are applicable where specific reference is made in *column o* in the table of chapter 17, and are in addition to the requirements for gauging devices.

15.19.2 In the event of a power failure on any system essential for safe loading, an alarm shall be given to the operators concerned.

15.19.3 Loading operations shall be terminated at once in the event of any system essential for safe loading becoming inoperative.

15.19.4 Level alarms shall be capable of being tested prior to loading.

15.19.5 The high-level alarm system required under 15.19.6 shall be independent of the overflow-control system required by 15.19.7 and shall be independent of the equipment required by 13.1.



15.19.6 Cargo tanks shall be fitted with a visual and audible high-level alarm which complies with 15.19.1 to 15.19.5 and which indicates when the liquid level in the cargo tank approaches the normal full condition.

15.19.7 A tank overflow-control system required by this section shall:

- .1 come into operation when the normal tank loading procedures fail to stop the tank liquid level exceeding the normal full condition;
- .2 give a visual and audible tank-overflow alarm to the ship's operator; and
- .3 provide an agreed signal for sequential shutdown of onshore pumps or valves or both and of the ship's valves. The signal, as well as the pump and valve shutdown, may be dependent on operator's intervention. The use of shipboard automatic closing valves shall be permitted only when specific approval has been obtained from the Administration and the port State authority concerned.

15.19.8 The loading rate (LR) of the tank shall not exceed:

$$LR = \frac{3600U}{t} \text{ (m}^3 \text{ / h)}$$

where U = ullage volume (m<sup>3</sup>) at operating signal level;

t = time(s) needed from the initiating signal to fully stopping the cargo flow into the tank, being the sum of times needed for each step in sequential operations such as operator's responses to signals, stopping pumps and closing valves;

and shall also take into account the pipeline system design pressure.

## 15.20 Alkyl (C<sub>7</sub>-C<sub>9</sub>) nitrates, all isomers

15.20.1 The carriage temperature of the cargo shall be maintained below 100°C to prevent the occurrence of a self-sustaining, exothermic decomposition reaction.

15.20.2 The cargo may not be carried in independent pressure vessels permanently affixed to the vessel's deck unless:

- .1 the tanks are sufficiently insulated from fire; and
- .2 the vessel has a water deluge system for the tanks such that the cargo temperature is maintained below 100°C and the temperature rise in the tanks does not exceed 1.5°C per hour for a fire of 650°C.

## 15.21 Temperature sensors

Temperature sensors shall be used to monitor the cargo pump temperature to detect overheating due to pump failures.

## Chapter 16

### Operational requirements

#### 16.1 Maximum allowable quantity of cargo per tank

16.1.1 The quantity of a cargo required to be carried in a type 1 ship shall not exceed 1,250 m<sup>3</sup> in any one tank.

16.1.2 The quantity of cargo required to be carried in a type 2 ship shall not exceed 3,000 m<sup>3</sup> in any one tank.

16.1.3 Tanks carrying liquids at ambient temperatures shall be so loaded as to avoid the tank becoming liquid-full during the voyage, having due regard to the highest temperature which the cargo may reach.

#### 16.2 Cargo information

16.2.1 A copy of this Code, or national regulations incorporating the provisions of this Code, shall be on board every ship covered by this Code.

16.2.2 Any cargo offered for bulk shipment shall be indicated in the shipping documents by the product name, under which it is listed in chapter 17 or 18 of the Code or the latest edition of MEPC.2/Circ. or under which it has been provisionally assessed. Where the cargo is a mixture, an analysis indicating the dangerous components contributing significantly to the total hazard of the product shall be provided, or a complete analysis if this is available. Such an analysis shall be certified by the manufacturer or by an independent expert acceptable to the Administration.

16.2.3 Information shall be on board, and available to all concerned, giving the necessary data for the safe carriage of the cargo in bulk. Such information shall include a cargo stowage plan, to be kept in an accessible place, indicating all cargo on board, including each dangerous chemical carried:

- .1 a full description of the physical and chemical properties, including reactivity, necessary for the safe containment of the cargo;
- .2 action to be taken in the event of spills or leaks;
- .3 countermeasures against accidental personal contact;
- .4 fire-fighting procedures and fire-fighting media;
- .5 procedures for cargo transfer, tank cleaning, gas-freeing and ballasting; and
- .6 for those cargoes required to be stabilized or inhibited, the cargo shall be refused if the certificate required by these paragraphs is not supplied.

16.2.4 If sufficient information, necessary for the safe transportation of the cargo, is not available, the cargo shall be refused.

16.2.5 Cargoes which evolve highly toxic imperceptible vapours shall not be transported unless perceptible additives are introduced into the cargo.

16.2.6 Where *column o* in the table of chapter 17 refers to this paragraph, the cargo's viscosity at 20°C shall be specified on a shipping document, and if the cargo's viscosity exceeds 50 mPa.s at 20°C, the temperature at which the cargo has a viscosity of 50 mPa.s shall be specified in the shipping document.

16.2.7 Deleted.

16.2.8 Deleted.

16.2.9 Where *column o* in the table of chapter 17 refers to this paragraph, the cargo's melting point shall be indicated in the shipping document.

### **16.3 Personnel training**

16.3.1 All personnel shall be adequately trained in the use of protective equipment and have basic training in the procedures appropriate to their duties necessary under emergency conditions.

16.3.2 Personnel involved in cargo operations shall be adequately trained in handling procedures.

16.3.3 Officers shall be trained in emergency procedures to deal with conditions of leakage, spillage or fire involving the cargo and a sufficient number of them shall be instructed and trained in essential first aid for cargoes carried, based on the guidelines developed by the Organization.

### **16.4 Opening of and entry into cargo tanks**

16.4.1 During handling and carriage of cargoes producing flammable and/or toxic vapours or when ballasting after the discharge of such cargo, or when loading or unloading cargo, cargo tank lids shall always be kept closed. With any hazardous cargo, cargo tank lids, ullage and sighting ports and tank washing access covers shall be open only when necessary.

16.4.2 Personnel shall not enter cargo tanks, void spaces around such tanks, cargo-handling spaces or other enclosed spaces unless:

- .1 the compartment is free of toxic vapours and not deficient in oxygen; or
- .2 personnel wear breathing apparatus and other necessary protective equipment, and the entire operation is under the close supervision of a responsible officer.

16.4.3 Personnel shall not enter such spaces when the only hazard is of a purely flammable nature, except under the close supervision of a responsible officer.

### **16.5 Stowage of cargo samples**

16.5.1 Samples which have to be kept on board shall be stowed in a designated space situated in the cargo area or, exceptionally, elsewhere, subject to the approval of the Administration.

16.5.2 The stowage space shall be:

- .1 cell-divided in order to avoid shifting of the bottles at sea;
- .2 made of material fully resistant to the different liquids intended to be stowed; and
- .3 equipped with adequate ventilation arrangements.

16.5.3 Samples which react with each other dangerously shall not be stowed close to each other.

16.5.4 Samples shall not be retained on board longer than necessary.

## 16.6 Cargoes not to be exposed to excessive heat

16.6.1 Where the possibility exists of a dangerous reaction of a cargo, such as polymerization, decomposition, thermal instability or evolution of gas, resulting from local overheating of the cargo in either the tank or associated pipelines, such cargo shall be loaded and carried adequately segregated from other products whose temperature is sufficiently high to initiate a reaction of such cargo (see 7.1.5.4).

16.6.2 Heating coils in tanks carrying this product shall be blanked off or secured by equivalent means.

16.6.3 Heat-sensitive products shall not be carried in deck tanks, which are not insulated.

16.6.4 In order to avoid elevated temperatures, this cargo shall not be carried in deck tanks.

## Chapter 17

### Summary of minimum requirements

Mixtures of noxious liquid substances presenting pollution hazards only, and which are assessed or provisionally assessed under regulation 6.3 of MARPOL Annex II, may be carried under the requirements of the Code applicable to the appropriate position of the entry in this chapter for Noxious Liquid Substances, not otherwise specified (n.o.s.).

#### EXPLANATORY NOTES

Product name (column a)	The product name shall be used in the shipping document for any cargo offered for bulk shipments. Any additional name may be included in brackets after the product name. In some cases, the product names are not identical with the names given in previous issues of the Code.
UN Number (column b)	Deleted
Pollution Category (column c)	The letter X, Y, Z means the Pollution Category assigned to each product under MARPOL Annex II
Hazards (column d)	“S” means that the product is included in the Code because of its safety hazards; “P” means that the product is included in the Code because of its pollution hazards; and “S/P” means that the product is included in the Code because of both its safety and pollution hazards.
Ship type (column e)	1: ship type 1 (2.1.2.1) 2: ship type 2 (2.1.2.2) 3: ship type 3 (2.1.2.3)
Tank type (column f)	1: independent tank (4.1.1) 2: integral tank (4.1.2) G: gravity tank (4.1.3) P: pressure tank (4.1.4)
Tank vents (column g)	Cont.: controlled venting Open: open venting
Tank environmental control (column h)	Inert: inerting (9.1.2.1) Pad: liquid or gas padding (9.1.2.2) Dry: drying (9.1.2.3) Vent: natural or forced ventilation (9.1.2.4) No: no special requirements under this Code
Electrical equipment (column i)	Temperature classes (i') T1 to T6 - indicates no requirements blank no information  Apparatus group (i'') IIA, IIB or IIC: - indicates no requirements blank no information  Flash point (i''') Yes: flashpoint exceeding 60°C (10.1.6) No: flashpoint not exceeding 60°C (10.1.6) NF: nonflammable product (10.1.6)
Gauging (column j)	O: open gauging (13.1.1.1) R: restricted gauging (13.1.1.2) C: closed gauging (13.1.1.3)



Vapour detection (column k)	F: flammable vapours T: toxic vapours No: indicates no special requirements under this Code
Fire protection (column l)	A: alcohol-resistant foam or multi-purpose foam B: regular foam; encompasses all foams that are not of an alcohol-resistant type, including fluoro-protein and aqueous-film-forming foam (AFFF) C: water-spray D: dry chemical No: no special requirements under this Code
Materials of construction (column m)	Deleted
Emergency equipment (column n)	Yes: see 14.3.1 No: no special requirements under this Code
Specific and operational requirements (column o)	When specific reference is made to chapters 15 and/or 16, these requirements shall be additional to the requirements in any other column

Chapter 17

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Acetic acid	Z	SP	3	2G	Cont	No	T1 IIA	No	R	F	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6, 16.2.9	
Acetic anhydride	Z	SP	2	2G	Cont	No	T2 IIA	No	R	F-T	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6	
Acetone cyanohydrin	Y	SP	2	2G	Cont	No	T1 IIA	Yes	C	T	A	Yes	15.13, 15.12, 15.17, 15.18, 15.19, 16.6.1, 16.6.2, 16.6.3	
Acetonitrile	Z	SP	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	15.12, 15.19.6	
Acrylic acid	Y	SP	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	15.13, 15.19.6, 16.6.1, 16.2.9	
Acrylonitrile	Y	SP	2	2G	Cont	No	T1 IIB	No	C	F-T	A	Yes	15.12, 15.13, 15.17, 15.19	
Acrylonitrile-Styrene copolymer dispersion in polyether polyol	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6	
Adiponitrile	Z	SP	3	2G	Cont	No	IIB	Yes	R	T	A	No	16.2.9	
Alachlor technical (90% or more)	X	SP	2	2G	Open	No		Yes	O	No	AC	No	15.19.6, 16.2.9	
Alcohol (C9-C11) poly(2.5-9) ethoxylate	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9	
Alcohol (C6-C17) (secondary) poly(3-6)ethoxylates	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9	
Alcohol (C6-C17) (secondary) poly(7-12)ethoxylates	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9	
Alcohol (C12-C16) poly(1-6)ethoxylates	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9	
Alcohol (C12-C16) poly(20+)ethoxylates	Y	P	3	2G	Open	No		Yes	O	No	A	No	16.2.9	
Alcohol (C12-C16) poly(7-19)ethoxylates	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9	
Alcohols (C13+)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.9	
Alkanes (C6-C9)	X	P	2	2G	Cont	No		No	R	F	A	No	15.19.6	
Iso- and cyclo-alkanes (C10-C11)	Z	P	3	2G	Cont	No		No	R	F	A	No		
Iso- and cyclo-alkanes (C12+)	Z	P	3	2G	Cont	No		No	R	F	A	No		
n-Alkanes (C10+)	Z	P	3	2G	Cont	No		No	R	F	AB	No		
Alkenyl (C16-C20) succinic anhydride	Z	SP	3	2G	Cont	No		Yes	C	T	No	Yes	15.12, 15.17, 15.19	
Alkylaryl phosphate mixtures (more than 40% Diphenyl tolyl phosphate, less than 0.02% ortho-isomers)	X	SP	1	2G	Cont	No	T1 IIA	Yes	C	T	ABC	No	15.12, 15.17, 15.19	
Alkylated (C4-C9) hindered phenols	Y	SP	2	2G	Open	No	-	Yes	O	No	BD	No	15.19.6, 16.2.6, 16.2.9	
Alkylbenzene, alkylindane, alkylindene mixture (each C12-C17)	Z	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6	
Alkyl (C5-C8) benzenes	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6	

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Alkyl(C9+)benzenes	Z	P	3	2G	Open	No		Yes	O	No	AB	No	
Alkyl (C12+) dimethylamine	X	SP	1	2G	Cont	No	-	Yes	C	T	BCD	Yes	15.12, 15.17, 15.19
Alkyl dithiocarbamate (C19-C35)	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Alkyl/dithiothiazole (C6-C24)	Z	P	3	2G	Open	No		Yes	O	No	AB	No	
Alkyl ester copolymer (C4-C20)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Alkyl (C8-C10)/(C12-C14):(40% or less/60% or more) polyglucoside solution (55% or less)	Y	P	3	2G	Open	No		Yes	O	No	No	No	15.19.6, 16.2.6, 16.2.9
Alkyl (C8-C10)/(C12-C14):(60% or more/40% or less) polyglucoside solution(55% or less)	Y	P	3	2G	Open	No		Yes	O	No	No	No	16.2.9, 16.2.6
Alkyl (C8-C40) phenol sulphide	Z	P	3	2G	Open	No		Yes	O	No	AB	No	
Alkyl (C8-C9) phenylamine in aromatic solvents	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6
Alkyl (C9-C15) phenyl propoxylate	Z	P	3	2G	Open	No		Yes	O	No	AB	No	
Alkyl (C8-C10)/(C12-C14):(50%/50%) polyglucoside solution (55% or less)	Y	P	3	2G	Open	No		Yes	O	No	No	No	16.2.9, 16.2.6
Alkyl (C12-C14) polyglucoside solution (55% or less)	Y	P	3	2G	Open	No		Yes	O	No	No	No	15.19.6, 16.2.9
Alkyl (C8-C10) polyglucoside solution (65% or less).	Y	P	3	2G	Open	No		Yes	O	No	No	No	16.2.6
Alkyl(C10-C20, saturated and unsaturated) phosphite	Y	P	2	2G	Open	No		Yes	O	No	A	No	16.2.9
Alkyl sulphonic acid ester of phenol	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6
Allyl alcohol	Y	SP	2	2G	Cont	No	T2 IIB	No	C	F-T	A	Yes	15.12, 15.17, 15.19
Allyl chloride	Y	SP	2	2G	Cont	No	T2 IIA	No	C	F-T	A	Yes	15.12, 15.17, 15.19
Aluminium sulphate solution	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6
Aminoethyl ethanalamine	Z	SP	3	2G	Open	No	T2 IIA	Yes	O	No	A	No	
2-Amino-2-methyl-1-propanol	Z	P	3	2G	Open	No		Yes	O	No	A	No	
Ammonia aqueous (28% or less)	Y	SP	2	2G	Cont	No		NF	R	T	ABC	Yes	
Ammonium hydrogen phosphate solution	Z	P	3	2G	Open	No		Yes	O	No	A	No	
Ammonium nitrate solution (93% or less)	Z	SP	2	1G	Open	No		NF	O	No	No	No	15.2, 15.11.4, 15.11.6, 15.18, 15.19.6, 16.2.9
Ammonium polyphosphate solution	Z	P	3	2G	Open	No		Yes	O	No	A	No	
Ammonium sulphate solution	Z	P	3	2G	Open	No		Yes	O	No	A	No	
Ammonium sulphide solution (45% or less)	Y	SP	2	2G	Cont	No		No	C	F-T	A	Yes	15.12, 15.17, 15.19, 16.6.1, 16.6.2, 16.6.3
Amyl acetate (all isomers)	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6

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n-Amyl alcohol	Z	P	3	2G	Cont	No			No	R	F	AB	No	
Amyl alcohol, primary	Z	P	3	2G	Cont	No			No	R	F	AB	No	
sec-Amyl alcohol	Z	P	3	2G	Cont	No			No	R	F	AB	No	
tert-Amyl alcohol	Z	P	3	2G	Cont	No			No	R	F	A	No	
tert-Amyl methyl ether	X	P	2	2G	Cont	No	T3		No	R	F	A	No	15.19.6
Aniline	Y	SP	2	2G	Cont	No	T1 IIA	Yes	C	T	A		No	15.12, 15.17, 15.19
Aryl polyolefins (C11-C50)	Y	P	2	2G	Open	No		Yes	O	No	AB		No	15.19.6, 16.2.6, 16.2.9
Aviation alkylates (C8 paraffins and iso-paraffins BPT 95 - 120°C)	X	P	2	2G	Cont	No		No	R	F	B		No	15.19.6
Barium long chain (C11-C50) alkaryl sulphonate	Y	SP	2	2G	Open	No		Yes	O	No	AD		No	15.12.3, 15.19, 16.2.6, 16.2.9
Benzene and mixtures having 10% benzene or more (i)	Y	SP	3	2G	Cont	No	T1 IIA	No	C	F-T	AB		No	15.12.1, 15.17, 15.19.6, 16.2.9
Benzenetricarboxylic acid, trioctyl ester	Y	P	2	2G	Open	No		Yes	O	No	AB		No	15.19.6, 16.2.6
Benzyl acetate	Y	P	2	2G	Open	No		Yes	O	No	A		No	
Benzyl alcohol	Y	P	3	2G	Open	No		Yes	O	No	A		No	
Bromochloromethane	Z	SP	3	2G	Cont	No		NF	R	T	No		No	
Butyl acetate (all isomers)	Y	P	3	2G	Cont	No		No	R	F	A		No	15.19.6
Butyl acrylate (all isomers)	Y	SP	2	2G	Cont	No	T2 IIB	No	R	F-T	A		No	15.13, 15.19.6, 16.6.1, 16.6.2
tert-Butyl alcohol	Z	P	3	2G	Cont	No		No	R	F	A		No	
Butylamine (all isomers)	Y	SP	2	2G	Cont	No		No	R	F-T	A		Yes	15.12, 15.17, 15.19.6
Butylbenzene (all isomers)	X	P	2	2G	Cont	No		No	R	F	A		No	15.19.6
Butyl benzyl phthalate	X	P	2	2G	Open	No		Yes	O	No	A		No	15.19.6
Butyl butyrate (all isomers)	Y	P	3	2G	Cont	No		No	R	F	A		No	15.19.6
Butyl/Decyl/Cetyl/Eicosyl methacrylate mixture	Y	SP	2	2G	Cont	No		Yes	R	No	AD		No	15.13, 16.6.1, 16.6.2, 15.19.6
Butylene glycol	Z	P	3	2G	Open	No		Yes	O	No	A		No	
1,2-Butylene oxide	Y	SP	3	2G	Cont	Inert	T2 IIB	No	R	F	AC		No	15.8.1 to 15.8.7, 15.8.12, 15.8.13, 15.8.16, 15.8.17, 15.8.18, 15.8.19, 15.8.21, 15.8.25, 15.8.27, 15.8.29, 15.19.6
n-Butyl ether	Y	SP	3	2G	Cont	Inert	T4 IIB	No	R	F-T	A		No	15.4.6, 15.12, 15.19.6
Butyl methacrylate	Z	SP	3	2G	Cont	No	IIA	No	R	F-T	AD		No	15.13, 15.19.6, 16.6.1, 16.6.2
n-Butyl propionate	Y	P	3	2G	Cont	No		No	R	F	A		No	15.19.6



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Butyraldehyde (all isomers)	Y	SP	3	2G	Cont	No	T3 IIA	No	R	F-T	A	No	15.19.6	
Butyric acid	Y	SP	3	2G	Cont	No		Yes	R	No	A	No	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6	
gamma-Butyrolactone	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6	
Calcium carbonate shurry	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
Calcium hypochlorite solution (15% or less)	Y	SP	2	2G	Cont	No		NF	R	No	No	No	15.19.6	
Calcium hypochlorite solution (more than 15%)	X	SP	1	2G	Cont	No		NF	R	No	No	No	15.19, 16.2.9	
Calcium long-chain alkyl(C5-C10) phenate	Y	P	3	2G	Open	No		Yes	O	No	A	No		
Calcium long-chain alkyl(C11-C40) phenate	Z	P	3	2G	Open	No		Yes	O	No	A	No		
Calcium long-chain alkyl phenate sulphide (C8-C40)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
epsilon-Caprolactam (molten or aqueous solutions)	Z	P	3	2G	Open	No		Yes	O	No	A	No		
Carbon disulphide	Y	SP	2	1G	Cont	Pad+inert	T6 IIC	No	C	F-T	C	Yes	15.3, 15.12, 15.19	
Carbon tetrachloride	Y	SP	2	2G	Cont	No		NF	C	T	No	Yes	15.12, 15.17, 15.19.6	
Castor oil (containing less than 2% free fatty acids)	Y	P	2(k)	2G	Open	No	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6	
Cetyl/Eicosyl methacrylate mixture	Y	SP	2	2G	Open	No		Yes	O	No	AD	No	15.13, 16.6.1, 16.6.2, 15.19.6, 16.2.9	
Chlorinated paraffins (C10-C13)	X	P	1	2G	Open	No		Yes	O	No	A	No	15.19, 16.2.6	
Chloroacetic acid (80% or less)	Y	SP	2	2G	Cont	No		NF	C	No	No	No	15.11.2, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.19, 16.2.9	
Chlorobenzene	Y	SP	2	2G	Cont	No	T1 IIA	No	R	F-T	AB	No	15.19.6	
Chloroform	Y	SP	3	2G	Cont	No		NF	R	T	No	Yes	15.12, 15.19.6	
Chlorohydrins (crude)	Y	SP	2	2G	Cont	No	IIA	No	C	F-T	A	No	15.12, 15.19	
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt solution	Y	P	2	2G	Open	No		NF	O	No	No	No	16.2.9	
1-(4-Chlorophenyl)-4,4-dimethyl-pentan-3-one	Y	P	2	2G	Open	No		Yes	O	No	ABD	No	15.19.6, 16.2.6, 16.2.9	
2- or 3-Chloropropionic acid	Z	SP	3	2G	Open	No		Yes	O	No	A	No	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 16.2.9	
Chlorosulphonic acid	Y	SP	1	2G	Cont	No		NF	C	T	No	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.5, 15.11.6, 15.11.7, 15.11.8, 15.12, 15.16.2, 15.19	
m-Chlorotoluene	Y	SP	2	2G	Cont	No		No	R	F-T	AB	No	15.19.6	
o-Chlorotoluene	Y	SP	2	2G	Cont	No		No	R	F-T	AB	No	15.19.6	
p-Chlorotoluene	Y	SP	2	2G	Cont	No		No	R	F-T	AB	No	15.19.6, 16.2.9	



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Chlorotoluenes (mixed isomers)	Y	SP	2	2G	Cont	No			No	R	F-T	AB	No	15.19.6
Choline chloride solutions	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Citric acid (70% or less)	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Coconut oil (containing less than 5% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Corn Oil (containing less than 10% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6
Cotton seed oil (containing less than 12% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Cresols (all isomers)	Y	SP	2	2G	Open	No	T1	IIA	Yes	O	No	AB	No	15.19.6, 16.2.9
Cresylic acid, dephenolized	Y	SP	2	2G	Open	No			Yes	O	No	AB	No	15.19.6
Crotonaldehyde	Y	SP	2	2G	Cont	No	T3	IIB	No	R	F-T	A	Yes	15.12, 15.17, 15.19.6
1,5,9-Cyclododecatriene	X	SP	1	2G	Cont	No			Yes	R	T	A	No	15.13, 15.19, 16.6.1, 16.6.2
Cycloheptane	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Cyclohexane	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6, 16.2.9
Cyclohexanol	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Cyclohexanone	Z	SP	3	2G	Cont	No	T2	IIA	No	R	F-T	A	No	15.19.6
Cyclohexanone, Cyclohexanol mixture	Y	SP	3	2G	Cont	No			Yes	R	F-T	A	No	
Cyclohexyl acetate	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6
Cyclohexylamine	Y	SP	3	2G	Cont	No	T3	IIA	No	R	F-T	AC	No	15.19.6
1,3-Cyclopentadiene dimer (molten)	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Cyclopentane	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Cyclopentene	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
p-Cymene	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Decahydronaphthalene	Y	P	2	2G	Cont	No			No	R	F	AB	No	15.19.6
Decanoic acid	X	P	2	2G	Open	No			Yes	O	No	A	No	16.2.9
Decyl acrylate	X	SP	1	2G	Open	No	T3	IIA	Yes	O	No	ACD	No	15.13, 15.19, 16.6.1, 16.6.2
Decyl alcohol (all isomers)	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9(e)
Diacetone alcohol	Z	P	3	2G	Cont	No			No	R	F	A	No	
Dialkyl (C8-C9) diphenylamines	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Dialkyl (C7-C13) phthalates	X	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6

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Dibromomethane	Y	S/P	2	2G	Cont	No	No	NF	R	T	No	No	No	15.12.3, 15.19
Dibutylamine	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	ACD	No	No	15.19.6
Dibutyl hydrogen phosphate	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	No	15.19.6, 16.2.9
Dibutyl phthalate	X	P	2	2G	Open	No	No	Yes	O	No	A	No	No	15.19.6
Dichlorobenzene (all isomers)	X	S/P	2	2G	Cont	No	T1 IIA	Yes	R	T	ABD	No	No	15.19.6
3,4-Dichloro-1-butene	Y	S/P	2	2G	Cont	No	No	No	C	F-T	ABC	Yes	Yes	15.12.3, 15.17, 15.19.6
Dichloroethyl ether	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	A	No	No	15.19.6
2,2'-Dichloroisopropyl ether	Y	S/P	2	2G	Cont	No	No	Yes	R	T	ACD	No	No	15.12, 15.17, 15.19
2,4-Dichlorophenol	Y	S/P	2	2G	Cont	Dry	No	Yes	R	T	A	No	No	15.19.6, 16.2.6, 16.2.9
1,1-Dichloropropane	Y	S/P	2	2G	Cont	No	No	No	R	F-T	AB	No	No	15.12, 15.19.6
1,2-Dichloropropane	Y	S/P	2	2G	Cont	No	T1 IIA	No	R	F-T	AB	No	No	15.12, 15.19.6
1,3-Dichloropropene	X	S/P	2	2G	Cont	No	T2 IIA	No	C	F-T	AB	Yes	Yes	15.12, 15.17, 15.18, 15.19
Dichloropropene/Dichloropropane mixtures	X	S/P	2	2G	Cont	No	No	No	C	F-T	ABD	Yes	Yes	15.12, 15.17, 15.18, 15.19
Diethanolamine	Y	S/P	3	2G	Open	No	T1 IIA	Yes	O	No	A	No	No	16.2.6, 16.2.9
Diethylamine	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	A	Yes	Yes	15.12, 15.19.6
Diethylaminoethanol	Y	S/P	2	2G	Cont	No	T2 IIA	No	R	F-T	AC	No	No	15.19.6
Diethylbenzene	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
Diethylenetriamine	Y	S/P	3	2G	Open	No	T2 IIA	Yes	O	No	A	No	No	
Diethyl ether	Z	S/P	2	1G	Cont	Inert	T4 IIB	No	C	F-T	A	Yes	Yes	15.4, 15.14, 15.19
Di-(2-ethylhexyl) adipate	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	No	15.19.6
Diethyl phthalate	Y	P	2	2G	Open	No	No	Yes	O	No	A	No	No	
Diethyl sulphate	Y	S/P	2	2G	Cont	No	No	Yes	C	T	A	No	No	15.19.6
Dihexyl phthalate	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	No	15.19.6
Di-n-hexyl adipate	X	P	1	2G	Open	No	No	Yes	O	No	A	No	No	15.19
Dihexyl phthalate	Y	P	2	2G	Open	No	No	Yes	O	No	AB	No	No	15.19.6
Diisobutylamine	Y	S/P	2	2G	Cont	No	No	No	R	F-T	ACD	No	No	15.12.3, 15.19.6
Diisobutylene	Y	P	2	2G	Cont	No	No	No	R	F	A	No	No	15.19.6
Diisobutyl ketone	Y	P	3	2G	Cont	No	No	No	R	F	A	No	No	15.19.6

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Diisobutyl phthalate	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6
Diisooctyl phthalate	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6
Diisopropanolamine	Z	S/P	3	2G	Open	No	T2 IIA	Yes	O	No	A	No	16.2.9
Diisopropylamine	Y	S/P	2	2G	Cont	No	T2 IIA	No	C	F-T	A	Yes	15.12, 15.19
Diisopropylbenzene (all isomers)	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6
N,N-Dimethylacetamide	Z	S/P	3	2G	Cont	No	-	Yes	C	T	ACD	No	15.12, 15.17
N,N-Dimethylacetamide solution (40% or less)	Z	S/P	3	2G	Cont	No		Yes	R	T	B	No	15.12.1, 15.17
Dimethyl adipate	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9
Dimethylamine solution (45% or less)	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	ACD	No	15.12, 15.19.6
Dimethylamine solution (greater than 45% but not greater than 55%)	Y	S/P	2	2G	Cont	No		No	C	F-T	ACD	Yes	15.12, 15.17, 15.19
Dimethylamine solution (greater than 55% but not greater than 65%)	Y	S/P	2	2G	Cont	No		No	C	F-T	ACD	Yes	15.12, 15.14, 15.17, 15.19
N,N-Dimethylcyclohexylamine	Y	S/P	2	2G	Cont	No		No	R	F-T	AC	No	15.12, 15.17, 15.19.6
Dimethyl disulphide	Y	S/P	2	2G	Cont	No	T3 IIA	No	R	F-T	B	No	15.12.3, 15.12.4, 15.19.6
N,N-Dimethyldodecylamine	X	S/P	1	2G	Open	No		Yes	O	No	B	No	15.19
Dimethylethanolamine	Y	S/P	3	2G	Cont	No	T3 IIA	No	R	F-T	AD	No	15.19.6
Dimethylformamide	Y	S/P	3	2G	Cont	No	T2 IIA	No	R	F-T	AD	No	15.19.6
Dimethyl glutarate	Y	P	3	2G	Open	No		Yes	O	No	A	No	
Dimethyl hydrogen phosphite	Y	S/P	3	2G	Cont	No		Yes	R	T	AD	No	15.12.1, 15.19.6
Dimethyl octanoic acid	Y	P	2	2G	Open	No		Yes	O	No	A	No	16.2.6, 16.2.9
Dimethyl phthalate	Y	P	3	2G	Open	No		Yes	O	No	A	No	16.2.9
Dimethylpolysiloxane	Y	P	3	2G	Open	No		Yes	O	No	AB	No	15.19.6
2,2-Dimethylpropane-1,3-diol (molten or solution)	Z	P	3	2G	Open	No		Yes	O	No	AB	No	
Dimethyl succinate	Y	P	3	2G	Open	No		Yes	O	No	A	No	16.2.9
Dinitrotoluene (molten)	X	S/P	2	2G	Cont	No		Yes	C	T	A	No	15.12, 15.17, 15.19, 15.21, 16.2.6, 16.2.9, 16.6.4
Dioctyl phthalate	X	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6
1,4-Dioxane	Y	S/P	2	2G	Cont	No	T2 IIB	No	C	F-T	A	No	15.12, 15.19, 16.2.9
Dipentene	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6

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Diphenyl	X	P	2	2G	Open	No		Yes	O	No	B	No	15.19.6, 16.2.6, 16.2.9			
Diphenyl/Diphenyl ether mixtures	X	P	2	2G	Open	No		Yes	O	No	B	No	15.19.6, 16.2.9			
Diphenyl ether	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9			
Diphenyl ether/Diphenyl phenyl ether mixture	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9			
Diphenylol propane-epichlorohydrin resins	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9			
Di-n-propylamine	Y	SP	2	2G	Cont	No		No	R	F-T	A	No	15.12.3, 15.19.6			
Dipropylene glycol	Z	P	3	2G	Open	No		Yes	O	No	A	No				
Dithiocarbamate ester (C7-C35)	X	P	2	2G	Open	No		Yes	O	No	AD	No	15.19.6, 16.2.9			
Diundecyl phthalate	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9			
Dodecane (all isomers)	Y	P	2	2G	Cont	No		No	R	F	AB	No	15.19.6			
tert-Dodecanethiol	X	SP	1	2G	Cont	No	-	Yes	C	T	ABD	Yes	15.12, 15.17, 15.19			
Dodecene (all isomers)	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6			
Dodecyl alcohol	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.9			
Dodecylbenzene	Z	P	3	2G	Open	No		Yes	O	No	AB	No				
Dodecyl hydroxypropyl sulphide	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6			
Dodecyl methacrylate	Z	SP	3	2G	Open	No		Yes	O	No	A	No	15.13			
Dodecyl/Octadecyl methacrylate (mixture)	Z	SP	3	2G	Open	No		Yes	R	No	AD	No	15.13, 16.6.1, 16.6.2			
Dodecyl/Pentadecyl methacrylate mixture	Y	SP	2	2G	Open	No		Yes	O	No	AD	No	15.13, 16.6.1, 16.6.2, 15.19.6			
Dodecyl phenol	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.6			
Dodecyl Xylene	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6			
Drilling brines (containing zinc salts)	X	P	2	2G	Open	No		Yes	O	No	No	No	15.19.6			
Drilling brines, including:calcium bromide solution, calcium chloride solution and sodium chloride solution	Z	P	3	2G	Open	No		Yes	O	No	A	No				
Epichlorohydrin	Y	SP	2	2G	Cont	No			IIB	No	C	F-T	A	Yes	15.12, 15.17, 15.19	
Ethanolamine	Y	SP	3	2G	Open	No			T2	IIA	Yes	O	F-T	A	No	16.2.9
2-Ethoxyethyl acetate	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6		
Ethoxylated long chain (C16+) alkyloxyalkylamine	Z	P	3	2G	Open	No		Yes	O	No	AB	No				
Ethyl acetate	Z	P	3	2G	Cont	No		No	R	F	AB	No				



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Ethyl acetate	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Ethyl acrylate	Y	SP	2	2G	Cont	No	T2 IIB	No	No	R	F-T	A	Yes	15.13, 15.19.6, 16.6.1, 16.6.2
Ethylamine	Y	SP	2	1G	Cont	No	T2 IIA	No	No	C	F-T	CD	Yes	15.12, 15.14, 15.19.6
Ethylamine solutions (72% or less)	Y	SP	2	2G	Cont	No		No	No	C	F-T	AC	Yes	15.12, 15.14, 15.17, 15.19
Ethylbenzene	Y	P	2	2G	Cont	No		No	No	R	F	A	No	15.19.6
Ethyl tert-butyl ether	Y	P	3	2G	Cont	No		No	No	R	F	A	No	15.19.6
Ethylcyclohexane	Y	P	2	2G	Cont	No		No	No	R	F	A	No	15.19.6
N-Ethylcyclohexylamine	Y	SP	2	2G	Cont	No		No	No	R	F-T	A	No	15.19.6
S-Ethyl dipropylthiocarbamate	Y	P	2	2G	Open	No		Yes	O	No	A	A	No	16.2.9
Ethylene chlorohydrin	Y	SP	2	2G	Cont	No	T2 IIA	No	No	C	F-T	AD	Yes	15.12, 15.17, 15.19
Ethylene cyanohydrin	Y	SP	3	2G	Open	No		IIB	Yes	O	No	A	No	
Ethylenediamine	Y	SP	2	2G	Cont	No	T2 IIA	No	No	R	F-T	A	No	15.19.6, 16.2.9
Ethylene dibromide	Y	SP	2	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.19.6, 16.2.9
Ethylene dichloride	Y	SP	2	2G	Cont	No	T2 IIA	No	No	R	F-T	AB	No	15.19
Ethylene glycol	Y	P	3	2G	Open	No		Yes	O	No	A	A	No	15.19.6
Ethylene glycol butyl ether acetate	Y	P	3	2G	Open	No		Yes	O	No	A	A	No	
Ethylene glycol diacetate	Y	P	3	2G	Open	No		Yes	O	No	A	A	No	
Ethylene glycol monoalkyl ethers	Y	SP	3	2G	Cont	No		No	No	R	F	A	No	15.19.6, 16.2.9
Ethylene oxide/Propylene oxide mixture with an ethylene oxide content of not more than 30% by mass	Y	SP	2	1G	Cont	Inert	T2 IIB	No	No	C	F-T	AC	No	15.8, 15.12, 15.14, 15.19
Ethyl-3-ethoxypropionate	Y	P	3	2G	Cont	No		No	No	R	No	A	No	15.19.6
2-Ethylhexanoic acid	Y	P	3	2G	Open	No		Yes	O	No	AB	No	No	15.19.6
2-Ethylhexyl acrylate	Y	SP	3	2G	Open	No	T3 IIB	Yes	O	No	A	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
2-Ethylhexylamine	Y	SP	2	2G	Cont	No		No	No	R	F-T	A	No	15.12, 15.19.6
2-Ethyl-2-(hydroxymethyl) propane-1,3-diol (C8-C10) ester	Y	P	2	2G	Open	No		Yes	O	No	AB	No	No	15.19.6, 16.2.6, 16.2.9
Ethylidene norbornene	Y	SP	2	2G	Cont	No		No	No	R	F-T	AD	No	15.12.1, 15.19.6
Ethyl methacrylate	Y	SP	3	2G	Cont	No	T2 IIA	No	No	R	F-T	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
N-Ethylmethylallylamine	Y	SP	2	2G	Cont	No	T2 IIB	No	No	C	F	AC	Yes	15.12.3, 15.17, 15.19



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2-Ethyl-3-propylacrolein	Y	S/P	3	2G	Cont	No		IIA	No	R	F-T	A	No	15.19.6, 16.2.9	
Ethyl toluene	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6	
Fatty acid (saturated C13+)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9	
Fatty acids, essentially linear, C6-C18, 2-ethylhexyl ester.	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6	
Ferric chloride solutions	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.11, 15.19.6, 16.2.9	
Ferric nitrate/Nitric acid solution	Y	S/P	2	2G	Cont	No			NF	R	T	No	Yes	15.11, 15.19	
Fish oil (containing less than 4% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9	
Formaldehyde solutions (45% or less)	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	Yes	15.19.6, 16.2.9	
Formamide	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9	
Formic acid	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	T(g)	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6, 16.2.9	
Furfural	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	No	15.19.6	
Furfuryl alcohol	Y	P	3	2G	Open	No			Yes	O	No	A	No		
Glutaraldehyde solutions (50% or less)	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6	
Glyceryl triacetate	Z	P	3	2G	Open	No			Yes	O	No	AB	No		
Glycidyl ester of C10 triallylacetate acid	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6	
Glycine, sodium salt solution	Z	P	3	2G	Open	No			Yes	O	No	A	No		
Glycolic acid solution (70% or less)	Z	S/P	3	2G	Open	No	-	-	NF	O	No	No	No	15.19.6, 16.2.9	
Glyoxal solution (40% or less)	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9	
Glyphosate solution (not containing surfactant)	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9	
Groundnut oil (containing less than 4% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9	
Heptane (all isomers)	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6, 16.2.9	
n-Heptanoic acid	Z	P	3	2G	Open	No			Yes	O	No	AB	No		
Heptanol (all isomers) (d)	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6	
Heptene (all isomers)	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6	
Heptyl acetate	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6	
1-Hexadecyl/naphthalene / 1,4-bis(hexadecyl)naphthalene mixture	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6	
Hexamethylenediamine adipate (50% in water)	Z	P	3	2G	Open	No			Yes	O	No	A	No		

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Hexamethylenediamine (molten)	Y	S/P	2	2G	Cont	No	No		Yes	C	T	C		Yes	15.12, 15.17, 15.18, 15.19.6, 16.2.9	
Hexamethylencdiamine solution	Y	S/P	3	2G	Cont	No	No		Yes	R	T	A		No	15.19.6	
Hexamethylene diisocyanate	Y	S/P	2	1G	Cont	Dry	Dry	T1	IIB	Yes	C	T	AC(b)	Yes	15.12, 15.17, 15.16.2, 15.18, 15.19	
Hexamethylene glycol	Z	P	3	2G	Open	No	No		Yes	O	No	A		No		
Hexamethylenimine	Y	S/P	2	2G	Cont	No	No		No	R	F-T	AC		No	15.19.6	
Hexane (all isomers)	Y	P	2	2G	Cont	No	No		No	R	F	A		No	15.19.6	
1,6-Hexanediol, distillation overheads	Y	S/P	3	2G	Cont	No	No	-	Yes	R	T	ABCD		No	15.12.3, 15.12.4, 15.19.6, 16.2.9	
Hexanoic acid	Y	P	3	2G	Open	No	No		Yes	O	No	AB		No	15.19.6	
Hexanol	Y	P	3	2G	Open	No	No		Yes	O	No	AB		No	15.19.6	
Hexene (all isomers)	Y	P	3	2G	Cont	No	No		No	R	F	A		No	15.19.6	
Hexyl acetate	Y	P	2	2G	Cont	No	No		No	R	F	A		No	15.19.6	
Hydrochloric acid	Z	S/P	3	1G	Cont	No	No		NF	R	T	No		Yes	15.11	
Hydrogen peroxide solutions (over 60% but not over 70% by mass)	Y	S/P	2	2G	Cont	No	No		NF	C	No	No		No	15.5.1, 15.19.6	
2-Hydroxyethyl acrylate	Y	S/P	2	2G	Cont	No	No		Yes	C	T	A		No	15.12, 15.13, 15.19.6, 16.6.1, 16.6.2	
N-(Hydroxyethyl)ethylenediaminetriacetic acid, trisodium salt solution	Y	P	3	2G	Open	No	No		Yes	O	No	A		No	15.19.6	
2-Hydroxy-4-(methylthio)butanoic acid	Z	P	3	2G	Open	No	No		Yes	O	No	A		No		
Isoamyl alcohol	Z	P	3	2G	Cont	No	No		No	R	F	AB		No		
Isobutyl alcohol	Z	P	3	2G	Cont	No	No		No	R	F	AB		No		
Isobutyl formate	Z	P	3	2G	Cont	No	No		No	R	F	AB		No		
Isobutyl methacrylate	Z	S/P	3	2G	Cont	No	No	IIA	No	C	F-T	BD		Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2	
Isophorone	Y	S/P	3	2G	Cont	No	No		Yes	R	No	A		No		
Isophoronediamine	Y	S/P	3	2G	Cont	No	No		Yes	R	T	A		No	16.2.9	
Isophorone diisocyanate	X	S/P	2	2G	Cont	Dry	Dry		Yes	C	T	ABD		No	15.12, 15.16.2, 15.17, 15.19.6	
Isoprene	Y	S/P	3	2G	Cont	No	No	T3	IIB	No	R	F	B	No	15.13, 15.14, 15.19.6, 16.6.1, 16.6.2	
Isopropanolamine	Y	S/P	3	2G	Open	No	No	T2	IIA	Yes	O	F-T	A	No	16.2.9, 15.19.6, 16.2.6	
Isopropyl acetate	Z	P	3	2G	Cont	No	No		No	R	F	AB		No		
Isopropylamine	Y	S/P	2	2G	Cont	No	No	T2	IIA	No	C	F-T	CD	Yes	15.12, 15.14, 15.19	

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Isopropylcyclohexane	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6, 16.2.9
Isopropyl ether	Y	SP	3	2G	Cont	Inert			No	R	F	A	No	15.4.6, 15.13.3, 15.19.6
Lactic acid	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Lactonitrile solution (80% or less)	Y	SP	2	1G	Cont	No			Yes	C	T	ACD	Yes	15.1, 15.12, 15.17, 15.18, 15.19, 16.6.1, 16.2.2, 16.6.3
Lard (containing less than 1% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Lauroic acid	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Linsced oil (containing less than 2% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6
Liquid chemical wastes	X	SP	2	2G	Cont	No			No	C	F-T	A	Yes	15.12, 15.19.6, 20.5.1
Long-chain alkaryl polyether (C11-C20)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	16.2.6, 16.2.9
L-Lysine solution (60% or less)	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Magnesium chloride solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Maleic anhydride	Y	SP	3	2G	Cont	No			Yes	R	No	AC(f)	No	16.2.9
Mercaptobenzothiazol, sodium salt solution	X	SP	2	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Mesityl oxide	Z	SP	3	2G	Cont	No	T2	IIB	No	R	F-T	A	No	15.19.6
Metam sodium solution	X	SP	1	2G	Open	No			NF	O	No	No	No	15.19, 16.2.9
Methacrylic acid	Y	SP	3	2G	Cont	No			Yes	R	T	A	No	15.13, 16.6.1, 15.19.6, 16.2.9
Methacrylic resin in Ethylene dichloride	Y	SP	2	2G	Cont	No	T2	IIA	No	R	F-T	AB	No	15.19, 16.2.9
Methacrylonitrile	Y	SP	2	2G	Cont	No			No	C	F-T	A	Yes	15.12, 15.13, 15.17, 15.19
3-Methoxy-1-butanol	Z	P	3	2G	Cont	No			No	R	F	A	No	
3-Methoxybutyl acetate	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetamide	X	P	1	2G	Open	No			Yes	O	No	A	No	15.19, 16.2.6
Methyl acetate	Z	P	3	2G	Cont	No			No	R	F	A	No	
Methyl acetoacetate	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Methyl acrylate	Y	SP	2	2G	Cont	No	T1	IIB	No	R	F-T	A	Yes	15.13, 15.19.6, 16.6.1, 16.6.2
Methyl alcohol	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6
Methylamine solutions (42% or less)	Y	SP	2	2G	Cont	No			No	C	F-T	ACD	Yes	15.12, 15.17, 15.19
Methylamyl acetate	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6

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Methylamyl alcohol	Z	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6		
Methyl amyl ketone	Z	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6		
Methylbutanol	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6, 16.2.9		
Methyl tert-butyl ether	Z	P	3	2G	Cont	No	No	No	R	F	AB	No			
Methyl butyl ketone	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6		
Methylbutynol	Z	P	3	2G	Cont	No	No	No	R	F	A	No			
Methyl butyrate	Y	P	3	2G	Cont	No	No	No	R	F	A	No	15.19.6		
Methylcyclohexane	Y	P	2	2G	Cont	No	No	No	R	F	A	No	15.19.6		
Methylcyclopentadiene dimer	Y	P	2	2G	Cont	No	No	No	R	F	B	No	15.19.6		
Methylcyclopentadienyl manganese tricarbonyl	X	SP	1	1G	Cont	No	-	Yes	C	T	ABCD	Yes	15.12, 15.18, 15.19, 16.2.9		
Methyl diethanolamine	Y	SP	3	2G	Open	No	No	Yes	O	No	A	No	16.2.6		
2-Methyl-6-ethyl aniline	Y	SP	3	2G	Open	No	No	Yes	O	No	AD	No			
Methyl ethyl ketone	Z	P	3	2G	Cont	No	No	No	R	F	A	No			
2-Methyl-5-ethyl pyridine	Y	SP	3	2G	Open	No	No	IIA	Yes	O	No	AD	No	15.19.6	
Methyl formate	Z	SP	2	2G	Cont	No	No	No	R	F-T	A	Yes	15.12, 15.14, 15.19		
2-Methyl-2-hydroxy-3-butyne	Z	SP	3	2G	Cont	No	No	IIA	No	R	F-T	ABD	No	15.19.6, 16.2.9	
Methyl isobutyl ketone	Z	P	3	2G	Cont	No	No	No	R	F	AB	No			
Methyl methacrylate	Y	SP	2	2G	Cont	No	No	T2	IIA	No	R	F-T	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
3-Methyl-3-methoxybutanol	Z	P	3	2G	Open	No	No	Yes	O	No	A	No			
Methyl naphthalene (molten)	X	SP	2	2G	Cont	No	No	Yes	R	No	AD	No	15.19.6		
2-Methylpyridine	Z	SP	2	2G	Cont	No	No	No	C	F	A	No	15.12.3, 15.19.6		
3-Methylpyridine	Z	SP	2	2G	Cont	No	No	No	C	F	AC	No	15.12.3, 15.19		
4-Methylpyridine	Z	SP	2	2G	Cont	No	No	No	C	F-T	A	No	15.12.3, 15.19, 16.2.9		
N-Methyl-2-pyrrolidone	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	15.19.6		
Methyl salicylate	Y	P	3	2G	Open	No	No	Yes	O	No	A	No	15.19.6		
alpha-Methylstyrene	Y	SP	2	2G	Cont	No	No	T1	IIB	No	R	F-T	AD(j)	No	15.13, 15.19.6, 16.6.1, 16.6.2
3-(methylthio)propionaldehyde	Y	SP	2	2G	Cont	No	No	T3	IIA	Yes	C	T	BC	Yes	15.12, 15.17, 15.19
Morpholine	Y	SP	3	2G	Cont	No	No	T2	IIA	No	R	F	A	No	15.19.6



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Motor fuel anti-knock compounds (containing lead alkyls)	X	S/P	1	1G	Cont	No	T4	IIA	No	C	F-T	AC	Yes	15.6, 15.12, 15.18, 15.19
Naphthalene (molten)	X	S/P	2	2G	Cont	No	T1	IIA	Yes	R	No	AD	No	15.19.6, 16.2.9
Neodecanoic acid	Y	P	2	2G	Open	No			Yes	O	No	A	No	
Nitrating acid (mixture of sulphuric and nitric acids)	Y	S/P	2	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.16.2, 15.17, 15.19
Nitric acid (70% and over)	Y	S/P	2	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.19
Nitric acid (less than 70%)	Y	S/P	2	2G	Cont	No			NF	R	T	No	Yes	15.11, 15.19
Nitritric acid, trisodium salt solution	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Nitrobenzene	Y	S/P	2	2G	Cont	No	T1	IIA	Yes	C	T	AD	No	15.12, 15.17, 15.18, 15.19, 16.2.9
Nitroethane	Y	S/P	3	2G	Cont	No	IIB	No	No	R	F-T	A(f)	No	15.19.6, 16.6.1, 16.6.2, 16.6.4
Nitroethane(80%)/ Nitropropane(20%)	Y	S/P	3	2G	Cont	No	IIB	No	No	R	F-T	A(f)	No	15.19.6, 16.6.1, 16.6.2, 16.6.3
o-Nitrophenol (molten)	Y	S/P	2	2G	Cont	No			Yes	C	T	AD	No	15.12, 15.19.6, 16.2.6, 16.2.9
1- or 2-Nitropropane	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F-T	A	No	15.19.6
Nitropropane (60%)/Nitroethane (40%) mixture	Y	S/P	3	2G	Cont	No			No	R	F-T	A(f)	No	15.19.6
Nonane (all isomers)	X	P	2	2G	Cont	No			No	R	F	BC	No	15.19.6
Nonanoic acid (all isomers)	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Nonene (all isomers)	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Nonyl alcohol (all isomers)	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Nonyl methacrylate monomer	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Nonylphenol	X	P	1	2G	Open	No			Yes	O	No	A	No	15.19, 16.2.6, 16.2.9
Noxious liquid, NF, (1) n.o.s. (trade name ..., contains ...) ST1, Cat. X	X	P	1	2G	Open	No	-	-	Yes	O	No	A	No	15.19, 16.2.6
Noxious liquid, F, (2) n.o.s. (trade name ..., contains ...) ST1, Cat. X	X	P	1	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19, 16.2.6
Noxious liquid, NF, (3) n.o.s. (trade name ..., contains ...) ST2, Cat. X	X	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19, 16.2.6
Noxious liquid, F, (4) n.o.s. (trade name ..., contains ...) ST2, Cat. X	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19, 16.2.6
Noxious liquid, NF, (5) n.o.s. (trade name ..., contains ...) ST2, Cat. Y	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19, 16.2.6, 16.2.9(I)
Noxious liquid, F, (6) n.o.s. (trade name ..., contains ...) ST2, Cat. Y	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19, 16.2.6, 16.2.9(I)
Noxious liquid, NF, (7) n.o.s. (trade name ..., contains ...) ST3, Cat. Y	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19, 16.2.6, 16.2.9(I)
Noxious liquid, F, (8) n.o.s. (trade name ..., contains ...) ST3, Cat. Y	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19, 16.2.6, 16.2.9(I)
Noxious liquid, NF, (9) n.o.s. (trade name ..., contains ...) ST3, Cat. Z	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	



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	Z	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	No
Noxious liquid, F. (10) n.o.s. (trade name ....., contains .....) ST3, Cat. Z	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Octane (all isomers)	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Octanoic acid (all isomers)	Y	P	2	2G	Open	No			Yes	O	No	A	No	
Octanol (all isomers)	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Octene (all isomers)	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6, 16.2.9
Octyl aldehydes	Y	P	2	2G	Open	No			Yes	O	No	AB	No	
Olefin-Alkyl ester copolymer (molecular weight 2000+)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Olefins (C13+, all isomers)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Oleic acid	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Oleum	Y	SP	2	2G	Cont	No			NF	C	T	No	Yes	15.11.2 to 15.11.8, 15.12.1, 15.16.2, 15.17.15.19, 16.2.6
Olive oil (containing less than 3.3% free fatty acids)	Y	P	2	(k) 2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Palm kernel oil (containing less than 5% free fatty acids)	Y	P	2	(k) 2G	Open	No	-	-	Yes	Open	No	AB	No	15.19.6, 16.2.6, 16.2.9
Palm oil (containing less than 5% free fatty acids)	Y	P	2	(k) 2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Palm olein (containing less than 5% free fatty acids)	Y	P	2	(k) 2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Palm stearin (containing less than 5% free fatty acids)	Y	P	2	(k) 2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Paraffin wax	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Paraldehyde	Z	SP	3	2G	Cont	No	T3	IIB	No	R	F	A	No	15.19.6, 16.2.9
Paraldehyde-ammonia reaction product	Y	SP	2	2G	Cont	No			No	C	F-T	A	No	15.12.3, 15.19
Pentachloroethane	Y	SP	2	2G	Cont	No			NF	R	T	No	No	15.12, 15.17, 15.19.6
1,3-Pentadiene	Y	SP	3	2G	Cont	No			No	R	F-T	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2, 16.6.3
Pentane (all isomers)	Y	P	3	2G	Cont	No			No	R	F	A	No	15.14, 15.19.6
Pentanoic acid	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
n-Pentanoic acid (64%/2-Methyl butyric acid (36%) mixture)	Y	SP	2	2G	Open	No	T2		Yes	C	No	AD	No	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.19
Pentene (all isomers)	Y	P	3	2G	Cont	No			No	R	F	A	No	15.14, 15.19.6
n-Pentyl propionate	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6
Perchloroethylene	Y	SP	2	2G	Cont	No			NF	R	T	No	No	15.12.1, 15.12.2, 15.19.6
Petrolatum	Z	P	3	2G	Open	No			Yes	O	No	AB	No	16.2.6, 16.2.9

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Phenol	Y	SP	2	2G	Cont	No	T1 IIA	Yes	C	T	A	No	15.12, 15.19, 16.2.9	
1-Phenyl-1-xylyl ethane	Y	P	3	2G	Open	No		Yes	O	No	AB	No		
Phosphoric acid	Z	SP	3	2G	Open	No		NF	O	No	No	No	15.11.1, 15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 16.2.9	
Phosphorus, yellow or white	X	SP	1	1G	Cont	Pad+(vent or inert)		No(c)	C	No	C	Yes	15.7, 15.19, 16.2.9	
Phthalic anhydride (molten)	Y	SP	2	2G	Cont	No	T1 IIA	Yes	R	No	AD	No	16.2.9, 15.19.6, 16.2.6	
alpha-Pinene	X	P	2	2G	Cont	No		No	R	F	A	No	15.19.6	
beta-Pinene	X	P	2	2G	Cont	No		No	R	F	A	No	15.19.6	
Pine oil	X	P	2	2G	Open	No		Yes	O	No	A	No	16.2.6, 16.2.9	
Polyalkyl (C18-C22) acrylate in Xylene	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6, 16.2.6, 16.2.9	
Polyalkyl (C10-C20) methacrylate	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Polyalkyl (C10-C18) methacrylate/ethylene-propylene copolymer mixture	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Poly(2+)cyclic aromatics	X	P	1	2G	Cont	No		Yes	R	No	AD	No	15.19, 16.2.6, 16.2.9	
Polyethylene glycol	Z	P	3	2G	Open	No		Yes	O	No	A	No		
Polyethylene glycol dimethyl ether	Z	P	3	2G	Open	No		Yes	O	No	A	No		
Polyferric sulphate solution	Y	SP	3	2G	Open	No		NF	O	No	No	No		
Polyisobutene in aliphatic (C10-C14) solvent	Y	P	3	2G	Open	No	T3 IIA	Yes	O	No	A	No		
Polyisobutenyl anhydride adduct	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
Poly(4+)isobutylene	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.9	
Polyolefin amide alkeneamine (C17+)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6	
Polyolefin amide alkeneamine borate (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Polyolefinamine (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	A	No	16.2.9	
Polyolefinamine in alkyl (C2-C4) benzenes	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6, 16.2.6, 16.2.9	
Polyolefinamine in aromatic solvent	Y	P	2	2G	Cont	No		No	R	F	A	No	15.19.6, 16.2.6, 16.2.9	
Polyolefin anhydride	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Polyolefin ester (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Polyolefin phenolic amine (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9	
Polyolefin phosphorusulphide, barium derivative (C28-C250)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	16.2.6, 16.2.9	

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Poly(20)oxyethylene sorbitan monooleate	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Polypropylene glycol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Polysiloxane	Y	P	3	2G	Cont	No			No	R	F	AB	No	15.19.6, 16.2.9
Potassium hydroxide solution	Y	SP	3	2G	Open	No			NF	O	No	No	No	15.19.6
Potassium oleate	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Potassium thiosulphate (50% or less)	Y	P	3	2G	Open	No			NF	O	No	No	No	16.2.9
n-Propanolamine	Y	SP	3	2G	Open	No			Yes	O	No	AD	No	16.2.9, 15.19.6
beta-Propiolactone	Y	SP	2	2G	Cont	No		IIA	Yes	R	T	A	No	
Propionaldehyde	Y	SP	3	2G	Cont	No			No	R	F-T	A	Yes	15.17, 15.19.6
Propionic acid	Y	SP	3	2G	Cont	No	T1 IIA		No	R	F	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6
Propionic anhydride	Y	SP	3	2G	Cont	No	T2 IIA		Yes	R	T	A	No	
Propionitrile	Y	SP	2	1G	Cont	No	T1 IIB		No	C	F-T	AD	Yes	15.12, 15.17, 15.18, 15.19
n-Propyl acetate	Y	P	3	2G	Cont	No			No	R	F	AB	No	15.19.6
n-Propyl alcohol	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6
n-Propylamine	Z	SP	2	2G	Cont	Inert	T2 IIA		No	C	F-T	AD	Yes	15.12, 15.19
Propylbenzene (all isomers)	Y	P	3	2G	Cont	No			No	R	F	A	No	15.19.6
Propylene glycol methyl ether acetate	Z	P	3	2G	Cont	No			No	R	F	A	No	
Propylene glycol monoalkyl ether	Z	P	3	2G	Cont	No			No	R	F	AB	No	
Propylene glycol phenyl ether	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Propylene oxide	Y	SP	2	2G	Cont	Inert	T2 IIB		No	C	F-T	AC	No	15.8, 15.12.1, 15.14, 15.19
Propylene tetramer	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Propylene trimer	Y	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Pyridine	Y	SP	2	2G	Cont	No	T1 IIA		No	R	F	A	No	15.19.6
Rapeseed oil (low erucic acid, containing less than 4% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Rosin	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Sodium aluminosilicate slurry	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Sodium benzoate	Z	P	3	2G	Open	No			Yes	O	No	A	No	



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Sodium borohydride (15% or less)/Sodium hydroxide solution	Y	SP	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.6, 16.2.9
Sodium carbonate solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Sodium chlorate solution (50% or less)	Z	SP	3	2G	Open	No			NF	O	No	No	No	15.9, 15.19.6, 16.2.9
Sodium dichromate solution (70% or less)	Y	SP	2	2G	Open	No			NF	C	No	No	No	15.12.3, 15.19
Sodium hydrogen sulphide (6% or less)/Sodium carbonate (3% or less) solution	Z	P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Sodium hydrogen sulphite solution (45% or less)	Z	SP	3	2G	Open	No			NF	O	No	No	No	16.2.9
Sodium hydrosulphide/Ammonium sulphide solution	Y	SP	2	2G	Cont	No			No	C	F-T	A	Yes	15.12, 15.14, 15.17, 15.19, 16.6.1, 16.6.2, 16.6.3
Sodium hydrosulphide solution (45% or less)	Z	SP	3	2G	Cont	Vent or pad (gas)			NF	R	T	No	No	15.19.6, 16.2.9
Sodium hydroxide solution	Y	SP	3	2G	Open	No			NF	O	No	No	No	16.2.6, 16.2.9
Sodium hypochlorite solution (15% or less)	Y	SP	2	2G	Cont	No	-	-	NF	R	No	No	No	15.19.6
Sodium nitrite solution	Y	SP	2	2G	Open	No			NF	O	No	No	No	15.12.3.1, 15.12.3.2, 15.19, 16.2.9
Sodium silicate solution	Y	P	3	2G	Open	No			NF	O	No	No	No	16.2.9
Sodium sulphide solution (15% or less)	Y	SP	3	2G	Cont	No			NF	C	T	No	No	15.19.6, 16.2.9
Sodium sulphite solution (25% or less)	Y	P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Sodium thiocyanate solution (56% or less)	Y	P	3	2G	Open	No			Yes	O	No	No	No	15.19.6, 16.2.9
Soyabean oil (containing less than 0.5% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6
Sulpholane	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Sulphonated polyacrylate solution	Z	P	3	2G	Cont	No			No	R	F	A	No	
Sulphur (molten)	Z	S	3	1G	Open	Vent or pad (gas)		T3	Yes	O	F-T	No	No	15.10, 16.2.9
Sulphuric acid	Y	SP	3	2G	Open	No			NF	O	No	No	No	15.11, 15.16.2, 15.19.6
Sulphuric acid, spent	Y	SP	3	2G	Open	No			NF	O	No	No	No	15.11, 15.16.2, 15.19.6
Sulphurized fat (C14-C20)	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Sunflower seed oil (containing less than 7% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6
Tallow (containing less than 15% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Tetrachloroethane	Y	SP	2	2G	Cont	No			NF	R	T	No	No	15.12, 15.17, 15.19.6
Tetraethylene glycol	Z	P	3	2G	Open	No			Yes	O	No	A	No	

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Tetraethylene pentamine	Y	SP	2	2G	Open	No			Yes	O	No	A	No	
Tetrahydrofuran	Z	S	3	2G	Cont	No	T3 IIB	No	R	F-T	A	No	15.19.6	
Tetrahydronaphthalene	Y	P	2	2G	Open	No		Yes	O	No	A	No		
Tetramethylbenzene (all isomers)	X	P	2	2G	Open	No		Yes	O	No	A	No	16.2.9	
Titanium dioxide slurry	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
Toluene	Y	P	3	2G	Cont	No		No	R	F	A	No	15.19.6	
Tolucendiamine	Y	SP	2	2G	Cont	No		Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.9, 16.2.6	
Toluene diisocyanate	Y	SP	2	2G	Cont	Dry	T1 IIA	Yes	C	F-T	AC(b) D	Yes	15.12, 15.16.2, 15.17, 15.19, 16.2.9	
o-Toluidine	Y	SP	2	2G	Cont	No		Yes	C	T	A	No	15.12, 15.17, 15.19	
Tributyl phosphate	Y	P	3	2G	Open	No		Yes	O	No	A	No	15.19.6	
1,2,3-Trichlorobenzene (molten)	X	SP	1	2G	Cont	No		Yes	C	T	ACD	Yes	15.12.1, 15.17, 15.19, 16.2.9, 16.2.6	
1,2,4-Trichlorobenzene	X	SP	1	2G	Cont	No		Yes	R	T	AB	No	15.19, 16.2.9	
1,1,1-Trichloroethane	Y	P	3	2G	Open	No		Yes	O	No	A	No		
1,1,2-Trichloroethane	Y	SP	3	2G	Cont	No		NF	R	T	No	No	15.12.1, 15.19.6	
Trichloroethylene	Y	SP	2	2G	Cont	No	T2 IIA	Yes	R	T	No	No	15.12, 15.17, 15.19.6	
1,2,3-Trichloropropane	Y	SP	2	2G	Cont	No		Yes	C	T	ABD	No	15.12, 15.17, 15.19	
1,1,2-Trichloro-1,2,2-Trifluoroethane	Y	P	2	2G	Open	No		NF	O	No	No	No		
Tricresyl phosphate (containing 1% or more ortho-isomer)	Y	SP	1	2G	Cont	No	T2 IIA	Yes	C	No	AB	No	15.12.3, 15.19, 16.2.6	
Tridecane	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6	
Tridecanoic acid	Y	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9	
Tridecyl acetate	Z	P	3	2G	Open	No		Yes	O	No	AB	No		
Trichloroamine	Z	SP	3	2G	Open	No		IIA	Yes	O	No	A	No	16.2.9
Triethylamine	Y	SP	2	2G	Cont	No	T2 IIA	No	R	F-T	AC	Yes	15.12, 15.19.6	
Triethylbenzene	X	P	2	2G	Open	No		Yes	O	No	A	No	15.19.6	
Triethylenetetramine	Y	SP	2	2G	Open	No	T2 IIA	Yes	O	No	A	No		
Triethyl phosphate	Z	P	3	2G	Open	No		Yes	O	No	A	No		
Triethylphosphite	Z	SP	3	2G	Cont	No		No	R	F-T	AB	No	15.12.1, 15.19.6, 16.2.9	



## Chapter 17

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Triisopropanolamine	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Triisopropylated phenyl phosphates	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
Trimethylacetic acid	Y	SP	3	2G	Cont	No			Yes	R	No	A	No	15.11.2, 15.11.3, 15.11.4, 15.11.5, 15.11.6, 15.11.7, 15.11.8, 15.19.6, 16.2.6, 16.2.9
Trimethylamine solution (30% or less)	Z	SP	2	2G	Cont	No			No	C	F-T	AC	Yes	15.12, 15.14, 15.19, 16.2.9
Trimethylbenzene (all isomers)	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
2,2,4-Trimethyl-1,3-pentanediol-1-isobutyrate	Y	P	2	2G	Open	No			Yes	O	No	A	No	
1,3,5-Trioxane	Y	SP	3	2G	Cont	No			No	R	F	AD	No	15.19.6, 16.2.9
Tripropylene glycol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Trixylyl phosphate	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
Tung oil (containing less than 2.5% free fatty acids)	Y	P	2(k)	2G	Open	No	-	-	Yes	Open	No	ABCD	No	15.19.6, 16.2.6, 16.2.9
Turpentine	X	P	2	2G	Cont	No			No	R	F	A	No	15.19.6
Undecanoic acid	Y	P	2	2G	Open	No			Yes	O	No	A	No	16.2.6, 16.2.9
1-Undecene	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Undecyl alcohol	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Urea/Ammonium nitrate solution (containing aqua ammonia)	Z	SP	3	2G	Cont	No			NF	R	T	A	No	16.2.9
Urea/Ammonium nitrate solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Urea/Ammonium phosphate solution	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Urea solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Valeraldehyde (all isomers)	Y	SP	3	2G	Cont	Inert	T3	IIB	No	R	F-T	A	No	15.4.6, 15.19.6
Vegetable protein solution (hydrolysed)	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Vinyl acetate	Y	SP	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
Vinyl ethyl ether	Z	SP	2	1G	Cont	Inert	T3	IIB	No	C	F-T	A	Yes	15.4, 15.13, 15.14, 15.19, 16.6.1, 16.6.2
Vinylidene chloride	Y	SP	2	2G	Cont	Inert	T2	IIA	No	R	F-T	B	Yes	15.13, 15.14, 15.19.6, 16.6.1, 16.6.2
Vinyl neodecanoate	Y	SP	2	2G	Open	No			Yes	O	No	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2
Vinyltoluene	Y	SP	2	2G	Cont	No	IIA		No	R	F	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2
Waxes	Z	P	3	2G	Open	No			Yes	O	No	AB	No	16.2.6, 16.2.9

Chapter 17

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	m	n	o
Xylenes	Y	P	2	2G	Cont	No	No	No	No	R	F	A	No	15.19.6, 16.2.9 (h)	
Xylenol	Y	SP	3	2G	Open	No	IIA	Yes	O	No	AB	No	15.19.6, 16.2.9		
Zinc alkaryl dithiophosphate (C7-C16)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	16.2.6, 16.2.9		
Zinc alkenyl carboxamide	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6		
Zinc alkyl dithiophosphate (C3-C14)	Y	P	2	2G	Open	No		Yes	O	No	AB	No	15.19.6, 16.2.6		

- a If the product to be carried contains flammable solvents such that the flashpoint does not exceed 60°C, then special electrical systems and a flammable-vapour detector shall be provided.
- b Although water is suitable for extinguishing open-air fires involving chemicals to which this footnote applies, water shall not be allowed to contaminate closed tanks containing these chemicals because of the risk of hazardous gas generation.
- c Phosphorus, yellow or white is carried above its autoignition temperature and therefore flashpoint is not appropriate. Electrical equipment requirements may be similar to those for substances with a flashpoint above 60°C.
- d Requirements are based on those isomers having a flashpoint of 60°C, or less; some isomers have a flashpoint greater than 60°C, and therefore the requirements based on flammability would not apply to such isomers.
- e Applies to n-decyl alcohol only.
- f Dry chemical shall not be used as fire extinguishing media
- g Confined spaces shall be tested for both formic acid vapours and carbon monoxide gas, a decomposition product.
- h Applies to p-xylene only.
- i For mixtures containing no other components with safety hazards and where the pollution category is Y or less
- j only certain alcohol-resistant foams are effective
- k Requirements for Ship Type identified in *column e* might be subject to regulation 4.1.3 of Annex II of MARPOL 73/78
- l Applicable when the melting point is equal to or greater than 0°C.

## Chapter 18

### List of products to which the Code does not apply

18.1 The following are products, which have been reviewed for their safety and pollution hazards and determined not to present hazards to such an extent as to warrant application of the Code.

18.2 Although the products listed in this chapter fall outside the scope of the Code, the attention of Administrations is drawn to the fact that some safety precautions may be needed for their safe transportation. Accordingly, Administrations shall prescribe appropriate safety requirements.

18.3 Some liquid substances are identified as falling into Pollution Category Z and, therefore, subject to certain requirements of Annex II of MARPOL 73/78.

18.4 Liquid mixtures which are assessed or provisionally assessed under regulation 6.3 of MARPOL 73/78 Annex II as falling into Pollution Category Z or OS, and which do not present safety hazards, may be carried under the appropriate entry in this chapter for “Noxious or Non-Noxious Liquid Substances, not otherwise specified (n.o.s.)”.

#### EXPLANATORY NOTES

Product name	The product name shall be used in the shipping document for any cargo offered for bulk shipments. Any additional name may be included in brackets after the product name. In some cases, the product names are not identical with the names given in previous issues of the Code.
Pollution Category	The letter Z means the Pollution Category assigned to each product under Annex II of MARPOL 73/78. OS means the product was evaluated and found to fall outside Categories X, Y, or Z.

## Chapter 18

Product name	Pollution Category
Acetone	Z
Alcoholic beverages, n.o.s.	Z
Apple juice	OS
n-Butyl alcohol	Z
sec-Butyl alcohol	Z
Clay slurry	OS
Coal slurry	OS
Diethylene glycol	Z
Ethyl alcohol	Z
Ethylene carbonate	Z
Glucose solution	OS
Glycerine	Z
Glycerol monooleate	Z
Hexamethylenetetramine solutions	Z
Hexylene glycol	Z
Isopropyl alcohol	Z
Kaolin slurry	OS
Magnesium hydroxide slurry	Z
N-Methylglucamine solution (70% or less)	Z
Methyl propyl ketone	Z
Molasses	OS
Noxious liquid, (11) n.o.s. (trade name ..., contains ...) Cat. Z	Z
Non-noxious liquid, (12) n.o.s. (trade name ..., contains ...) Cat. OS	OS
Polyaluminium chloride solution	Z
Potassium formate solutions	Z
Propylene carbonate	Z
Propylene glycol	Z
Sodium acetate solutions	Z
Sodium sulphate solutions	Z
Tetraethyl silicate monomer/oligomer (20% in ethanol)	Z
Triethylene glycol	Z
Water	OS



## Chapter 19

### Index of Products Carried in Bulk

19.1 The first column of the Index of Products Carried in Bulk (hereafter referred to as “the Index”) provides the so called Index Name. Where the Index Name is in capital and in bold, the Index Name is identical to the Product Name in either chapter 17 or chapter 18. The second column listing the relevant Product Name is therefore empty. Where the Index Name is in non-bold lower case it reflects a synonym for which the Product Name in either chapter 17 or chapter 18 is given in the second column. The relevant chapter of the IBC Code is reflected in the third column. The fourth column gives the UN Numbers of products, which were available up to February 2001.

19.2 The Index has been developed for information purposes only. None of the Index Names indicated in non-bold lower case in the first column shall be used as Product Name on the shipping document.

19.3 Prefixes forming an integral part of the name are shown in ordinary (roman) type and are taken into account in determining the alphabetical order of entries. These include such prefixes as:

Mono Di Tri Tetra Penta Iso Bis Neo Ortho Cyclo

19.4 Prefixes that are disregarded for purposes of alphabetical order are in italics and include the following:

n-	(normal-)
sec-	(secondary-)
tert-	(tertiary-)
o-	(ortho-)
m-	(meta-)
p-	(para-)
N-	
O-	
sym-	(symmetrical)
uns-	(unsymmetrical)
dl-	
cis-	
trans-	
(E)-	
(Z)-	
alpha-	( $\alpha$ -)
beta-	( $\beta$ -)
gamma-	( $\gamma$ -)
epsilon-	( $\epsilon$ -)

Index Name	Product Name	Chapter	UN No.
Abietic anhydride	ROSIN	17	
acedimethylamide	N,N-DIMETHYLACETAMIDE	17	
Acetaldehyde cyanohydrin	LACTONITRILE SOLUTION (80% OR LESS)	17	
Acetaldehyde trimer	PARALDEHYDE	17	
<b>ACETIC ACID</b>		17	
Acetic acid anhydride	ACETIC ANHYDRIDE	17	
Acetic acid, ethenyl ester	VINYL ACETATE	17	
Acetic acid, methyl ester	METHYL ACETATE	17	
Acetic acid, vinyl ester	VINYL ACETATE	17	
<b>ACETIC ANHYDRIDE</b>		17	1715
Acetic ester	ETHYL ACETATE	17	
Acetic ether	ETHYL ACETATE	17	
Acetic oxide	ACETIC ANHYDRIDE	17	
Acetoacetic acid, methyl ester	METHYL ACETOACETATE	17	
Acetoacetic ester	ETHYL ACETOACETATE	17	
<b>ACETONE</b>		18	
<b>ACETONE CYANOHYDRIN</b>		17	1541
<b>ACETONITRILE</b>		17	1648
Acetyl anhydride	ACETIC ANHYDRIDE	17	
Acetylene tetrachloride	TETRACHLOROETHANE	17	
Acetyl ether	ACETIC ANHYDRIDE	17	
Acetyl oxide	ACETIC ANHYDRIDE	17	
Acintene	BETA-PINENE	17	
Acroleic acid	ACRYLIC ACID	17	
<b>ACRYLIC ACID</b>		17	2218
Acrylic acid, 2-hydroxyethyl ester	2-HYDROXYETHYL ACRYLATE	17	
Acrylic resin monomer	METHYL METHACRYLATE	17	
<b>ACRYLONITRILE</b>		17	1093
<b>ACRYLONITRILE-STYRENE COPOLYMER DISPERSION IN POLYETHER POLYOL</b>		17	
Adipic acid, bis(2-ethylhexyl) ester	DI-(2-ETHYLHEXYL) ADIPATE	17	
<b>ADIPONITRILE</b>		17	2205
<b>ALACHLOR TECHNICAL (90% OR MORE)</b>		17	
Alcohol	ETHYL ALCOHOL	18	
Alcohol, C10	DECYL ALCOHOL (ALL ISOMERS)	17	
Alcohol, C11	UNDECYL ALCOHOL	17	
Alcohol, C12	DODECYL ALCOHOL	17	
Alcohol, C7	HEPTANOL (ALL ISOMERS) (D)	17	
Alcohol, C8	OCTANOL (ALL ISOMERS)	17	
Alcohol, C9	NONYL ALCOHOL (ALL ISOMERS)	17	
<b>ALCOHOLIC BEVERAGES, N.O.S.</b>		18	
<b>ALCOHOL (C9-C11) POLY (2,5-9) ETHOXYLATE</b>		17	
<b>ALCOHOL (C6-C17) (SECONDARY) POLY(3-6)ETHOXYLATES</b>		17	
<b>ALCOHOL (C6-C17) (SECONDARY) POLY(7-12)ETHOXYLATES</b>		17	
<b>ALCOHOL (C12-C16) POLY(1-6)ETHOXYLATES</b>		17	
<b>ALCOHOL (C12-C16) POLY(20+)ETHOXYLATES</b>		17	
<b>ALCOHOL (C12-C16) POLY(7-19)ETHOXYLATES</b>		17	
<b>ALCOHOLS (C13+)</b>		17	

Index Name	Product Name	Chapter	UN No.
Alcohols, C13 - C15	ALCOHOLS (C13+)	17	
Aldehyde collidine	2-METHYL-5-ETHYL PYRIDINE	17	
Aldehydine	2-METHYL-5-ETHYL PYRIDINE	17	
ALKANES (C6-C9)		17	
ISO- AND CYCLO-ALKANES (C10-C11)		17	
ISO- AND CYCLO-ALKANES (C12+)		17	
N-ALKANES (C10+)		17	
Alkane(C10-C18)sulfonic acid, phenyl ester	ALKYL SULPHONIC ACID ESTER OF PHENOL	17	
ALKENYL (C16-C20) SUCCINIC ANHYDRIDE		17	
ALKYLARYL PHOSPHATE MIXTURES (MORE THAN 40% DIPHENYL TOLYL PHOSPHATE, LESS THAN 0.02% ORTHO-ISOMERS)		17	
ALKYLATED (C4-C9) HINDERED PHENOLS		17	
ALKYLBENZENE, ALKYLINDANE, ALKYLINDENE MIXTURE (EACH C12-C17)		17	
ALKYL (C5-C8) BENZENES		17	
ALKYL(C9+)BENZENES		17	
ALKYL (C12+) DIMETHYLAMINE		17	2735
ALKYL DITHIOCARBAMATE (C19-C35)		17	
ALKYLDITHIOTHIAZOLE (C6-C24)		17	
ALKYL ESTER COPOLYMER (C4-C20)		17	
ALKYL (C8-C10)/(C12-C14):(40% OR LESS/60% OR MORE) POLYGLUCOSIDE SOLUTION (55% OR LESS)		17	
ALKYL (C8-C10)/(C12-C14):(60% OR MORE/40% OR LESS) POLYGLUCOSIDE SOLUTION(55% OR LESS)		17	
2,2'- [3-(Alkyl(C16-C18)oxy)propylimino]diethanol	ETHOXYLATED LONG CHAIN (C16+) ALKYLOXYALKYLAMINE	17	
ALKYL (C8-C40) PHENOL SULPHIDE		17	
ALKYL (C8-C9) PHENYLAMINE IN AROMATIC SOLVENTS		17	1993
ALKYL (C9-C15) PHENYL PROPOXYLATE		17	
ALKYL (C8-C10)/(C12-C14):(50%/50%) POLYGLUCOSIDE SOLUTION (55% OR LESS)		17	
ALKYL (C12-C14) POLYGLUCOSIDE SOLUTION (55% OR LESS)		17	
ALKYL (C8-C10) POLYGLUCOSIDE SOLUTION (65% OR LESS).		17	
ALKYL(C10-C20, SATURATED AND UNSATURATED) PHOSPHITE		17	
ALKYL SULPHONIC ACID ESTER OF PHENOL		17	
3-Alkyl(C16-C18)oxy-N,N'-bis(2-hydroxyethyl)propan-1-amine	ETHOXYLATED LONG CHAIN (C16+) ALKYLOXYALKYLAMINE	17	
ALLYL ALCOHOL		17	1098
ALLYL CHLORIDE		17	1100
Aluminium silicate hydroxide	KAOLIN SLURRY	18	
ALUMINIUM SULPHATE SOLUTION		17	
Aminoacetic acid, sodium salt solution	GLYCINE, SODIUM SALT SOLUTION	17	
1-Amino-3-aminomethyl-3,5,5-trimethylcyclohexane	ISOPHORONEDIAMINE	17	
Aminobenzene	ANILINE	17	
1-Aminobutane	BUTYLAMINE (ALL ISOMERS)	17	

Index Name	Product Name	Chapter	UN No.
2-Aminobutane	BUTYLAMINE (ALL ISOMERS)	17	
Aminocyclohexane	CYCLOHEXYLAMINE	17	
Aminoethane	ETHYLAMINE	17	
Aminoethane solutions, 72% or less	ETHYLAMINE SOLUTIONS (72% OR LESS)	17	
2-Aminoethanol	ETHANOLAMINE	17	
2-(2-Aminoethylamino)ethanol	AMINOETHYL ETHANOLAMINE	17	
AMINOETHYL ETHANOLAMINE		17	
N-(2-aminoethyl)ethylenediamine	DIETHYLENETRIAMINE	17	
2-Aminoisobutane	BUTYLAMINE (ALL ISOMERS)	17	
Aminomethane	METHYLAMINE SOLUTIONS (42% OR LESS)	17	
Aminomethane solutions, 42% or less	METHYLAMINE SOLUTIONS (42% OR LESS)	17	
1-Amino-2-methylbenzene	O-TOLUIDINE	17	
2-Amino-1-methylbenzene	O-TOLUIDINE	17	
2-AMINO-2-METHYL-1-PROPANOL		17	
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	ISOPHORONEDIAMINE	17	
Aminophen	ANILINE	17	
1-Aminopropane	N-PROPYLAMINE	17	
2-Aminopropane	ISOPROPYLAMINE	17	
1-Amino-2-propanol	ISOPROPANOLAMINE	17	
1-Aminopropan-2-ol	ISOPROPANOLAMINE	17	
3-Aminopropan-1-ol	N-PROPANOLAMINE	17	
2-Aminotoluene	O-TOLUIDINE	17	
o-Aminotoluene	O-TOLUIDINE	17	
5-Amino-1,3,3-trimethylcyclohexylmethylamine	ISOPHORONEDIAMINE	17	
AMMONIA AQUEOUS (28% OR LESS)		17	2672
Ammonia water, 28% or less	AMMONIA AQUEOUS (28% OR LESS)	17	
AMMONIUM HYDROGEN PHOSPHATE SOLUTION		17	
Ammonium hydroxide, 28% or less	AMMONIA AQUEOUS (28% OR LESS)	17	
AMMONIUM NITRATE SOLUTION (93% OR LESS)		17	
AMMONIUM POLYPHOSPHATE SOLUTION		17	
AMMONIUM SULPHATE SOLUTION		17	
AMMONIUM SULPHIDE SOLUTION (45% OR LESS)		17	2683
AMYL ACETATE (ALL ISOMERS)		17	1104
Amyl acetate, commercial	AMYL ACETATE (ALL ISOMERS)	17	
n-Amyl acetate	AMYL ACETATE (ALL ISOMERS)	17	
sec-Amyl acetate	AMYL ACETATE (ALL ISOMERS)	17	
Amylacetic ester	AMYL ACETATE (ALL ISOMERS)	17	
Amyl alcohol	N-AMYL ALCOHOL	17	
N-AMYL ALCOHOL		17	
AMYL ALCOHOL, PRIMARY		17	
SEC-AMYL ALCOHOL		17	
TERT-AMYL ALCOHOL		17	
Amyl aldehyde	VALERALDEHYDE (ALL ISOMERS)	17	
Amyl carbinol	HEXANOL	17	
alpha-n-Amylene	PENTENE (ALL ISOMERS)	17	
Amylene hydrate	TERT-AMYL ALCOHOL	17	
tert-Amylenes	PENTENE (ALL ISOMERS)	17	
Amyl hydrate	N-AMYL ALCOHOL	17	
Amyl hydride	PENTANE (ALL ISOMERS)	17	
TERT-AMYL METHYL ETHER		17	1993

Index Name	Product Name	Chapter	UN No.
n-Amyl methyl ketone	METHYL AMYL KETONE	17	
n-Amyl propionate	N-PENTYL PROPIONATE	17	
Anaesthetic ether	DIETHYL ETHER	17	
<b>ANILINE</b>		17	1547
Aniline oil	ANILINE	17	
Ant oil, artificial	FURFURAL	17	
<b>APPLE JUICE</b>		18	
Aqua fortis	NITRIC ACID (70% AND OVER)	17	
Arachis Oil	GROUNDNUT OIL (CONTAINING LESS THAN 4% FREE FATTY ACIDS)	17	
Argilla	KAOLIN SLURRY	18	
<b>ARYL POLYOLEFINS (C11-C50)</b>		17	
<b>AVIATION ALKYLATES (C8 PARAFFINS AND ISO-PARAFFINS BPT 95 - 120°C)</b>		17	
Azacycloheptane	HEXAMETHYLENEMINE	17	
3-Azapentane-1,5-diamine	DIETHYLENETRIAMINE	17	
Azepane	HEXAMETHYLENEMINE	17	
Azotic acid	NITRIC ACID (70% AND OVER)	17	
Banana oil	AMYL ACETATE (ALL ISOMERS)	17	
<b>BARIUM LONG CHAIN (C11-C50) ALKARYL SULPHONATE</b>		17	2810
Battery acid	SULPHURIC ACID	17	
Behenyl alcohol	ALCOHOLS (C13+)	17	
Benzenamine	2-METHYL-5-ETHYL PYRIDINE	17	
1,2-Benzenedicarboxylic acid, diethyl ester	DIETHYL PHTHALATE	17	
1,2-Benzenedicarboxylic acid, diundecyl ester	DIUNDECYL PHTHALATE	17	
<b>BENZENE AND MIXTURES HAVING 10% BENZENE OR MORE (I)</b>		17	1114
<b>BENZENETRICARBOXYLIC ACID, TRIOCTYL ESTER</b>		17	
Benzenol	PHENOL	17	
Benzol	BENZENE AND MIXTURES HAVING 10% BENZENE OR MORE (I)	17	
Benzole	BENZENE AND MIXTURES HAVING 10% BENZENE OR MORE (I)	17	
Benzophenol	PHENOL	17	
Benzothiazole-2-thiol(, sodium salt)	MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION	17	
2-Benzothiazolethiol(, sodium salt)	MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION	17	
(2-Benzothiazolylthio) sodium solution	MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION	17	
<b>BENZYL ACETATE</b>		17	
<b>BENZYL ALCOHOL</b>		17	
Benzyl butyl phthalate	BUTYL BENZYL PHTHALATE	17	
Betaprone	BETA-PROPIOLACTONE	17	
Betula oil	METHYL SALICYLATE	17	
Biformyl	GLYOXAL SOLUTION (40% OR LESS)	17	
Bihexyl	DODECANE (ALL ISOMERS)	17	
Biphenyl	DIPHENYL	17	
Bis(methylcyclopentadiene)	METHYLCYCLOPENTADIENE DIMER	17	
2,5-Bis(alkyl(C7+)thio)-1,3,4-thiadiazole	ALKYLDITHIOTHIAZOLE (C6-C24)	17	
Bis(2-aminoethyl)amine	DIETHYLENETRIAMINE	17	
N,N'-Bis(2-aminoethyl)ethane-1,2-diamine	TRIETHYLENETETRAMINE	17	
N,N'-Bis(2-aminoethyl)ethylenediamine	TRIETHYLENETETRAMINE	17	
N,N- Bis(carboxymethyl)glycine trisodium salt	NITRILOTRIACETIC ACID, TRISODIUM SALT SOLUTION	17	
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Bis(2-chloroethyl) ether	DICHLOROETHYL ETHER	17	



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Bis(2-chloro-1-methylethyl) ether	2,2'-DICHLOROISOPROPYL ETHER	17	
Bis(2-ethylhexyl) adipate	DI-(2-ETHYLHEXYL) ADIPATE	17	
Bis(2-ethylhexyl) phthalate	DIOCTYL PHTHALATE	17	
Bis(2-hydroxyethyl)amine	DIETHANOLAMINE	17	
Bis(2-hydroxyethyl) ether	DIETHYLENE GLYCOL	18	
Bis(2-hydroxypropyl)amine	DIISOPROPANOLAMINE	17	
Bis(6-methylheptyl) phthalate	DIOCTYL PHTHALATE	17	
Blackstrap molasses	MOLASSES	18	
Bolus alba	KAOLIN SLURRY	18	
Bran oil	FURFURAL	17	
Brimstone	SULPHUR (MOLTEN)	17	
<b>BROMOCHLOROMETHANE</b>		17	
Butaldehyde	BUTYRALDEHYDE (ALL ISOMERS)	17	
Butanal	BUTYRALDEHYDE (ALL ISOMERS)	17	
n-Butanal	BUTYRALDEHYDE (ALL ISOMERS)	17	
Butane-1,3-diol	BUTYLENE GLYCOL	17	
Butane -1,4-diol	BUTYLENE GLYCOL	17	
Butane-2,3-diol	BUTYLENE GLYCOL	17	
1,3-Butanediol	BUTYLENE GLYCOL	17	
1,4-Butanediol	BUTYLENE GLYCOL	17	
2,3-Butanediol	BUTYLENE GLYCOL	17	
Butanoic acid	BUTYRIC ACID	17	
Butanol	N-BUTYL ALCOHOL	18	
Butanol-1	N-BUTYL ALCOHOL	18	
Butan-1-ol	N-BUTYL ALCOHOL	18	
Butan-2-ol	SEC-BUTYL ALCOHOL	18	
1-Butanol	N-BUTYL ALCOHOL	18	
2-Butanol	SEC-BUTYL ALCOHOL	18	
Butanol acetate	BUTYL ACETATE (ALL ISOMERS)	17	
2-Butanol acetate	BUTYL ACETATE (ALL ISOMERS)	17	
Butan-4-olide	GAMMA-BUTYROLACTONE	17	
1,4-Butanolide	GAMMA-BUTYROLACTONE	17	
n-Butanol	N-BUTYL ALCOHOL	18	
sec-Butanol	SEC-BUTYL ALCOHOL	18	
tert-Butanol	TERT-BUTYL ALCOHOL	17	
Butan-2-one	METHYL ETHYL KETONE	17	
2-Butanone	METHYL ETHYL KETONE	17	
2-Butenal	CROTONALDEHYDE	17	
Butene dimer	OCTENE (ALL ISOMERS)	17	
1-Butoxybutane	N-BUTYL ETHER	17	
2-Butoxyethanol	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
2-tert-butoxyethanol	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
2-Butoxyethyl acetate	ETHYLENE GLYCOL BUTYL ETHER ACETATE	17	
1-Butoxypropan-2-ol	PROPYLENE GLYCOL MONOALKYL ETHER	17	
Butyl acetate	BUTYL ACETATE (ALL ISOMERS)	17	
<b>BUTYL ACETATE (ALL ISOMERS)</b>		17	1123
n-Butyl acetate	BUTYL ACETATE (ALL ISOMERS)	17	
sec-Butyl acetate	BUTYL ACETATE (ALL ISOMERS)	17	
tert-Butyl acetate	BUTYL ACETATE (ALL ISOMERS)	17	
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<b>SEC-BUTYL ALCOHOL</b>		18	
<b>TERT-BUTYL ALCOHOL</b>		17	
n-Butyl aldehyde	<b>BUTYRALDEHYDE (ALL ISOMERS)</b>	17	
<b>BUTYLAMINE (ALL ISOMERS)</b>		17	1125, 12
n-Butylamine	<b>BUTYLAMINE (ALL ISOMERS)</b>	17	
sec-Butylamine	<b>BUTYLAMINE (ALL ISOMERS)</b>	17	
tert-Butylamine	<b>BUTYLAMINE (ALL ISOMERS)</b>	17	
<b>BUTYLBENZENE (ALL ISOMERS)</b>		17	2709
tert-Butylbenzene	<b>BUTYLBENZENE (ALL ISOMERS)</b>	17	
<b>BUTYL BENZYL PHTHALATE</b>		17	
Butyl butanoate	<b>BUTYL BUTYRATE (ALL ISOMERS)</b>	17	
<b>BUTYL BUTYRATE (ALL ISOMERS)</b>		17	
n-Butyl butyrate	<b>BUTYL BUTYRATE (ALL ISOMERS)</b>	17	
n-Butylcarbinol	<b>N-AMYL ALCOHOL</b>	17	
Butyl cellosolve	<b>ETHYLENE GLYCOL MONOALKYL ETHERS</b>	17	
Butyl cellosolve acetate	<b>ETHYLENE GLYCOL BUTYL ETHER ACETATE</b>	17	
<b>BUTYL/DECYL/CETYL/EICOSYL METHACRYLATE MIXTURE</b>		17	
Butyl/decyl/hexadecyl/icosyl methacrylate mixt	<b>BUTYL/DECYL/CETYL/EICOSYL METHACRYLATE MIXTURE</b>	17	
<b>BUTYLENE GLYCOL</b>		17	
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beta-Butylene glycol	<b>BUTYLENE GLYCOL</b>	17	
Butylene glycol monomethyl ether	<b>3-METHOXY-1-BUTANOL</b>	17	
Butylene glycol monomethyl ether acetate	<b>3-METHOXYBUTYL ACETATE</b>	17	
Butylene oxide	<b>TETRAHYDROFURAN</b>	17	
<b>1,2-BUTYLENE OXIDE</b>		17	3022
Butyl ester	<b>BUTYL ACETATE (ALL ISOMERS)</b>	17	
Butyl ethanoate	<b>BUTYL ACETATE (ALL ISOMERS)</b>	17	
Butyl ether	<b>N-BUTYL ETHER</b>	17	
<b>N-BUTYL ETHER</b>		17	1149
Butylethylacetic acid	<b>OCTANOIC ACID (ALL ISOMERS)</b>	17	
Butylethylene	<b>HEXENE (ALL ISOMERS)</b>	17	
tert-Butyl ethyl ether	<b>ETHYL TERT-BUTYL ETHER</b>	17	
Butylic ether	<b>BUTYL ACETATE (ALL ISOMERS)</b>	17	
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<b>BUTYL METHACRYLATE</b>		17	
tert-Butyl methyl ether	<b>METHYL TERT-BUTYL ETHER</b>	17	
Butyl methyl ketone	<b>METHYL BUTYL KETONE</b>	17	
Butyl phthalate	<b>DIBUTYL PHTHALATE</b>	17	
<b>N-BUTYL PROPIONATE</b>		17	1914
<b>BUTYRALDEHYDE (ALL ISOMERS)</b>		17	1129
n-Butyraldehyde	<b>BUTYRALDEHYDE (ALL ISOMERS)</b>	17	
<b>BUTYRIC ACID</b>		17	2820
n-Butyric acid	<b>BUTYRIC ACID</b>	17	
Butyric alcohol	<b>N-BUTYL ALCOHOL</b>	18	
Butyric aldehyde	<b>BUTYRALDEHYDE (ALL ISOMERS)</b>	17	
<b>GAMMA-BUTYROLACTONE</b>		17	
Cajeputene	<b>DIPENTENE</b>	17	
Calcium bromide / zinc bromide solution	<b>DRILLING BRINES (CONTAINING ZINC SALTS)</b>	17	
<b>CALCIUM CARBONATE SLURRY</b>		17	
<b>CALCIUM HYPOCHLORITE SOLUTION (15% OR LESS)</b>		17	

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<b>CALCIUM LONG-CHAIN ALKYL(C11-C40) PHENATE</b>		17	
<b>CALCIUM LONG-CHAIN ALKYL PHENATE SULPHIDE (C8-C40)</b>		17	
Cane molasses	<b>MOLASSES</b>	18	
Canola oil	<b>RAPESEED OIL (LOW ERUCIC ACID, CONTAINING LESS THAN 4% FREE FATTY ACIDS)</b>	17	
Capric acid	<b>DECANOIC ACID</b>	17	
Caproic acid	<b>HEXANOIC ACID</b>	17	
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<b>EPSILON-CAPROLACTAM (MOLTEN OR AQUEOUS SOLUTIONS)</b>		17	
Caproyl alcohol	<b>HEXANOL</b>	17	
Capryl alcohol	<b>OCTANOL (ALL ISOMERS)</b>	17	
Caprylic acid	<b>OCTANOIC ACID (ALL ISOMERS)</b>	17	
Carbamide	<b>UREA SOLUTION</b>	17	
Carbinol	<b>METHYL ALCOHOL</b>	17	
Carbolic acid	<b>PHENOL</b>	17	
Carbon bisulphide	<b>CARBON DISULPHIDE</b>	17	
<b>CARBON DISULPHIDE</b>		17	1131
<b>CARBON TETRACHLORIDE</b>		17	1846
Carbonyldiamide	<b>UREA SOLUTION</b>	17	
Carbonyldiamine	<b>UREA SOLUTION</b>	17	
1,3-Carbonyl dioxypropane	<b>PROPYLENE CARBONATE</b>	18	
<b>CASTOR OIL (CONTAINING LESS THAN 2% FREE FATTY ACIDS)</b>		17	
Caustic potash solution	<b>POTASSIUM HYDROXIDE SOLUTION</b>	17	
Caustic soda	<b>SODIUM HYDROXIDE SOLUTION</b>	17	
Caustic soda solution	<b>SODIUM HYDROXIDE SOLUTION</b>	17	
Cellosolve acetate	<b>2-ETHOXYETHYL ACETATE</b>	17	
Cellosolve solvent	<b>ETHYLENE GLYCOL MONOALKYL ETHERS</b>	17	
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Cetyl / stearyl alcohol	<b>ALCOHOLS (C13+)</b>	17	
China Wood Oil	<b>TUNG OIL (CONTAINING LESS THAN 2.5% FREE FATTY ACIDS)</b>	17	
China clay	<b>KAOLIN SLURRY</b>	18	
<b>CHLORINATED PARAFFINS (C10-C13)</b>		17	
<b>CHLOROACETIC ACID (80% OR LESS)</b>		17	1750
alpha-Chloroallyl chloride	<b>1,3-DICHLOROPROPENE</b>	17	
Chloroallylene	<b>ALLYL CHLORIDE</b>	17	
<b>CHLOROBENZENE</b>		17	1134
Chlorobenzol	<b>CHLOROBENZENE</b>	17	
Chlorobromomethane	<b>BROMOCHLOROMETHANE</b>	17	
1-Chloro-2-(beta-chloroethoxy)ethane	<b>DICHLOROETHYL ETHER</b>	17	
1-Chloro-2,3-epoxypropane	<b>EPICHLOROHYDRIN</b>	17	
Chloroethanol-2	<b>ETHYLENE CHLOROXYDRIN</b>	17	
2-Chloroethanol	<b>ETHYLENE CHLOROXYDRIN</b>	17	
2-Chloroethyl alcohol	<b>ETHYLENE CHLOROXYDRIN</b>	17	
beta-Chloroethyl alcohol	<b>ETHYLENE CHLOROXYDRIN</b>	17	

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Chloroethyl ether	DICHLOROETHYL ETHER	17	
2-Chloro-6'-ethyl-N-(2-methoxy-1-methylethyl)acet-o-toluidide	N-(2-METHOXY-1-METHYL ETHYL)-2-ETHYL-6-METHYL CHLOROACETANILIDE	17	
2-Chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl)acetamide	N-(2-METHOXY-1-METHYL ETHYL)-2-ETHYL-6-METHYL CHLOROACETANILIDE	17	
<b>CHLOROFORM</b>		17	1888
<b>CHLOROHYDRINS (CRUDE)</b>		17	
m-Chloromethylbenzene	M-CHLOROTOLUENE	17	
o-Chloromethylbenzene	O-CHLOROTOLUENE	17	
p-Chloromethylbenzene	P-CHLOROTOLUENE	17	
Chloromethylethylene oxide	EPICHLOROHYDRIN	17	
(2-Chloro-1-methylethyl) ether	2,2'-DICHLOROISOPROPYL ETHER	17	
2-Chloro-1-methylethyl ether	2,2'-DICHLOROISOPROPYL ETHER	17	
Chloromethyloxirane	EPICHLOROHYDRIN	17	
<b>4-CHLORO-2-METHYLPHENOXYACETIC ACID, DIMETHYLAMINE SALT SOLUTION</b>		17	
<b>1-(4-CHLOROPHENYL)-4,4- DIMETHYL-PENTAN-3-ONE</b>		17	
2- or 3- Chloropropanoic acid	2- OR 3-CHLOROPROPIONIC ACID	17	
3-Chloropropene	ALLYL CHLORIDE	17	
<b>2- OR 3-CHLOROPROPIONIC ACID</b>		17	2511
alpha- or beta- Chloropropionic acid	2- OR 3-CHLOROPROPIONIC ACID	17	
3-Chloropropylene	ALLYL CHLORIDE	17	
alpha-Chloropropylene	ALLYL CHLORIDE	17	
Chloropropylene oxide	EPICHLOROHYDRIN	17	
<b>CHLOROSULPHONIC ACID</b>		17	1754
Chlorosulphuric acid	CHLOROSULPHONIC ACID	17	
3-Chlorotoluene	M-CHLOROTOLUENE	17	
4-Chlorotoluene	P-CHLOROTOLUENE	17	
<b>M-CHLOROTOLUENE</b>		17	2238
<b>O-CHLOROTOLUENE</b>		17	2238
<b>P-CHLOROTOLUENE</b>		17	2238
<b>CHLOROTOLUENES (MIXED ISOMERS)</b>		17	2238
Choice White Grease	TALLOW (CONTAINING LESS THAN 15% FREE FATTY ACIDS)	17	
<b>CHOLINE CHLORIDE SOLUTIONS</b>		17	
Cinene	DIPENTENE	17	
cis-Butenedioic anhydride	MALEIC ANHYDRIDE	17	
cis-9-Octadecenoic acid	OLEIC ACID	17	
cis-1,3-Pentadiene	1,3-PENTADIENE	17	
cis-trans-1,3-Pentadiene	1,3-PENTADIENE	17	
<b>CITRIC ACID (70% OR LESS)</b>		17	
<b>CLAY SLURRY</b>		18	
<b>COAL SLURRY</b>		18	
Cochin	COCONUT OIL (CONTAINING LESS THAN 5% FREE FATTY ACIDS)	17	
<b>COCONUT OIL (CONTAINING LESS THAN 5% FREE FATTY ACIDS)</b>		17	
Colamine	ETHANOLAMINE	17	
Cologne spirits	ETHYL ALCOHOL	18	
Colonial spirit	METHYL ALCOHOL	17	
Colophony	ROSIN	17	
Columbian spirit	METHYL ALCOHOL	17	
Columbian spirits	METHYL ALCOHOL	17	
Copra Oil	COCONUT OIL (CONTAINING LESS THAN 5% FREE FATTY ACIDS)	17	

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<b>COTTON SEED OIL (CONTAINING LESS THAN 12% FREE FATTY ACIDS)</b>		17	
Creosote salts	<b>NAPHTHALENE (MOLTEN)</b>	17	
<b>CRESOLS (ALL ISOMERS)</b>		17	2076
<b>CRESYLIC ACID, DEPHENOLIZED</b>		17	
Cresylic acids	<b>CRESOLS (ALL ISOMERS)</b>	17	
Cresylols	<b>CRESOLS (ALL ISOMERS)</b>	17	
<b>CROTONALDEHYDE</b>		17	1143
Crotonic aldehyde	<b>CROTONALDEHYDE</b>	17	
Cumene	<b>PROPYLBENZENE (ALL ISOMERS)</b>	17	
Cumol	<b>PROPYLBENZENE (ALL ISOMERS)</b>	17	
Cyanoethylene	<b>ACRYLONITRILE</b>	17	
2-Cyano-2-propanol	<b>ACETONE CYANOHYDRIN</b>	17	
2-Cyanopropan-2-ol	<b>ACETONE CYANOHYDRIN</b>	17	
2-cyanopropene-1	<b>METHACRYLONITRILE</b>	17	
Cyclic propylene carbonate	<b>PROPYLENE CARBONATE</b>	18	
<b>1,5,9-CYCLODODECATRIENE</b>		17	
<b>CYCLOHEPTANE</b>		17	2241
Cyclohexamethylenimine	<b>HEXAMETHYLENIMINE</b>	17	
<b>CYCLOHEXANE</b>		17	1145
<b>CYCLOHEXANOL</b>		17	
<b>CYCLOHEXANONE</b>		17	1915
<b>CYCLOHEXANONE, CYCLOHEXANOL MIXTURE</b>		17	
Cyclohexatriene	<b>BENZENE AND MIXTURES HAVING 10% BENZENE OR MORE (I)</b>	17	
<b>CYCLOHEXYL ACETATE</b>		17	2243
<b>CYCLOHEXYLAMINE</b>		17	2357
Cyclohexyldimethylamine	<b>N,N-DIMETHYLCYCLOHEXYLAMINE</b>	17	
Cyclohexyl(ethyl)amine	<b>N-ETHYLCYCLOHEXYLAMINE</b>	17	
Cyclohexyl ketone	<b>CYCLOHEXANONE</b>	17	
Cyclohexylmethane	<b>METHYLCYCLOHEXANE</b>	17	
<b>1,3-CYCLOPENTADIENE DIMER (MOLTEN)</b>		17	
<b>CYCLOPENTANE</b>		17	1146
<b>CYCLOPENTENE</b>		17	2246
Cyclotetramethylene oxide	<b>TETRAHYDROFURAN</b>	17	
<b>P-CYMENE</b>		17	2046
Cymol	<b>P-CYMENE</b>	17	
Deanol	<b>DIMETHYLETHANOLAMINE</b>	17	
<b>DECAHYDRONAPHTHALENE</b>		17	
<b>DECANOIC ACID</b>		17	
Decan-1-ol	<b>DECYL ALCOHOL (ALL ISOMERS)</b>	17	
n-Decanol	<b>DECYL ALCOHOL (ALL ISOMERS)</b>	17	
Decoic acid	<b>DECANOIC ACID</b>	17	
<b>DECYL ACRYLATE</b>		17	
Decyl alcohol	<b>DECYL ALCOHOL (ALL ISOMERS)</b>	17	
<b>DECYL ALCOHOL (ALL ISOMERS)</b>		17	
Decylbenzene	<b>ALKYL(C9+)BENZENES</b>	17	
Decylic acid	<b>DECANOIC ACID</b>	17	
1-Decoxy-1-methylamino-D-glucitol	<b>N-METHYLGLUCAMINE SOLUTION (70% OR LESS)</b>	18	
Detergent alkylate	<b>ALKYL(C9+)BENZENES</b>	17	



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Diacetic ester	ETHYL ACETOACETATE	17	
Diacetone	DIACETONE ALCOHOL	17	
<b>DIACETONE ALCOHOL</b>		17	
Dialkyl/alkenyl(C10-C20) hydrogen phosphite	ALKYL(C10-C20, SATURATED AND UNSATURATED) PHOSPHITE	17	
<b>DIALKYL (C8-C9) DIPHENYLAMINES</b>		17	
<b>DIALKYL (C7-C13) PHTHALATES</b>		17	
1,2-Diaminoethane	ETHYLENEDIAMINE	17	
1,6-Diaminohexane	HEXAMETHYLENEDIAMINE (MOLTEN)	17	
1,6-Diaminohexane solutions	HEXAMETHYLENEDIAMINE SOLUTION	17	
2,6-Diaminohexanoic acid	L-LYSINE SOLUTION (60% OR LESS)	17	
Diaminotoluene	TOLUENEDIAMINE	17	
2,4-Diaminotoluene	TOLUENEDIAMINE	17	
2,6-Diaminotoluene	TOLUENEDIAMINE	17	
4,6-Diamino-3,5,5-trimethylcyclohex-2-enone	ISOPHORONEDIAMINE	17	
3,6-Diazaoctane-1,8-diamine	TRIETHYLENETETRAMINE	17	
1,2-Dibromoethane	ETHYLENE DIBROMIDE	17	
<b>DIBROMOMETHANE</b>		17	
<b>DIBUTYLAMINE</b>		17	
Dibutylbenzene-1,2-dicarboxylate	DIBUTYL PHTHALATE	17	
Dibutyl carbinol	NONYL ALCOHOL (ALL ISOMERS)	17	
Dibutyl ether	N-BUTYL ETHER	17	
n-Dibutyl ether	N-BUTYL ETHER	17	
Dibutyl hydrogen phosphite	DIBUTYL HYDROGEN PHOSPHONATE	17	
<b>DIBUTYL HYDROGEN PHOSPHONATE</b>		17	
Dibutyl phosphonate	DIBUTYL HYDROGEN PHOSPHONATE	17	
<b>DIBUTYL PHTHALATE</b>		17	
Dibutyl ortho-phthalate	DIBUTYL PHTHALATE	17	
<b>DICHLOROBENZENE (ALL ISOMERS)</b>		17	
1,2-Dichlorobenzene	DICHLOROBENZENE (ALL ISOMERS)	17	
m-Dichlorobenzene	DICHLOROBENZENE (ALL ISOMERS)	17	
o-Dichlorobenzene	DICHLOROBENZENE (ALL ISOMERS)	17	
<b>3,4-DICHLORO-1-BUTENE</b>		17	
3,4-Dichlorobut-1-ene	3,4-DICHLORO-1-BUTENE	17	
2,2'-Dichlorodiethyl ether	DICHLOROETHYL ETHER	17	
Dichlorodiisopropyl ether	2,2'-DICHLOROISOPROPYL ETHER	17	
1,2-Dichloroethane	ETHYLENE DICHLORIDE	17	
1,1-Dichloroethene	VINYLDENE CHLORIDE	17	
Dichloroether	DICHLOROETHYL ETHER	17	
1,1-Dichloroethylene	VINYLDENE CHLORIDE	17	
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2,2'-Dichloroethyl ether	DICHLOROETHYL ETHER	17	
Dichloroethyl oxide	DICHLOROETHYL ETHER	17	
<b>2,2'-DICHLOROISOPROPYL ETHER</b>		17	2490
<b>2,4-DICHLOROPHENOL</b>		17	2021
<b>1,1-DICHLOROPROPANE</b>		17	
<b>1,2-DICHLOROPROPANE</b>		17	1279
Dichloropropane / dichloropropene mixtures	DICHLOROPROPENE/DICHLOROPROPANE MIXTURES	17	
<b>1,3-DICHLOROPROPENE</b>		17	2047
<b>DICHLOROPROPENE/DICHLOROPROPANE MIXTURES</b>		17	
Dichloropropylene	1,3-DICHLOROPROPENE	17	
1,4-Dicyanobutane	ADIPONITRILE	17	

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Dicyclopentadiene	1,3-CYCLOPENTADIENE DIMER (MOLTEN)	17	
Didecyl phthalate	DIALKYL (C7-C13) PHTHALATES	17	
Didodecyl phthalate	DIALKYL (C7-C13) PHTHALATES	17	
DIETHANOLAMINE		17	
DIETHYLAMINE		17	1154
DIETHYLAMINOETHANOL		17	2686
2-Diethylaminoethanol	DIETHYLAMINOETHANOL	17	
DIETHYLBENZENE		17	2049
1,4-Diethylene dioxide	1,4-DIOXANE	17	
Diethylene ether	1,4-DIOXANE	17	
DIETHYLENE GLYCOL		18	
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1,3-Dimethylbutan-1-ol	<b>METHYLAMYL ALCOHOL</b>	17	
1,3-Dimethylbutyl acetate	<b>METHYLAMYL ACETATE</b>	17	
Dimethylcarbinol	<b>ISOPROPYL ALCOHOL</b>	18	
<b>N,N-DIMETHYLCYCLOHEXYLAMINE</b>		17	2264
<b>DIMETHYL DISULPHIDE</b>		17	2381
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<b>N,N-DIMETHYLDODECYLAMINE</b>		17	
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2,6-Dimethylheptan-4-one	<b>DIISOBUTYL KETONE</b>	17	
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Dimethyl ketone	<b>ACETONE</b>	18	
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N,N-Dimethylmethylamine	<b>TRIMETHYLAMINE SOLUTION (30% OR LESS)</b>	17	
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<b>DIMETHYL OCTANOIC ACID</b>		17	
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2,4-Dimethylphenol	<b>XYLENOL</b>	17	
2,5-Dimethylphenol	<b>XYLENOL</b>	17	
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2,2-Dimethylpropionic acid	TRIMETHYLACETIC ACID	17	
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<b>1,4-DIOXANE</b>		17	1165
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1,4-epoxybutane	TETRAHYDROFURAN	17	
1,2-Epoxypropane	PROPYLENE OXIDE	17	
2,3-Epoxy propyl ester of mixed trialkyl acetic acids	GLYCIDYL ESTER OF C10 TRIALKYLACETIC ACID	17	
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Ethanedial	GLYOXAL SOLUTION (40% OR LESS)	17	
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1-Ethoxypropan-2-ol	PROPYLENE GLYCOL MONOALKYL ETHER	17	
<b>ETHYL ACETATE</b>		17	
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2-Ethylcaproic acid	2-ETHYLHEXANOIC ACID	17	
Ethyl carbinol	N-PROPYL ALCOHOL	17	
Ethyl cyanide	PROPIONITRILE	17	
<b>ETHYLCYCLOHEXANE</b>		17	
Ethyl(cyclohexyl)amine	N-ETHYLCYCLOHEXYLAMINE	17	
<b>N-ETHYLCYCLOHEXYLAMINE</b>		17	
Ethyl dimethylmethane	PENTANE (ALL ISOMERS)	17	
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S-Ethyl dipropyl dithiocarbamate	S-ETHYL DIPROPYLTHIOCARBAMATE	17	
<b>S-ETHYL DIPROPYLTHIOCARBAMATE</b>		17	
Ethylene alcohol	ETHYLENE GLYCOL	17	
Ethylene bromide	ETHYLENE DIBROMIDE	17	
<b>ETHYLENE CARBONATE</b>		18	
Ethylenecarboxylic acid	ACRYLIC ACID	17	
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<b>ETHYLENE CHLOROHYDRIN</b>		17	1135
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<b>ETHYLENE DIBROMIDE</b>		17	1605
<b>ETHYLENE DICHLORIDE</b>		17	1184
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2,2'-Ethylenedioxydiethanol	TRIETHYLENE GLYCOL	18	
<b>ETHYLENE GLYCOL</b>		17	
Ethylene glycol acrylate	2-HYDROXYETHYL ACRYLATE	17	
Ethylene glycol butyl ether	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
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<b>ETHYLENE GLYCOL MONOALKYL ETHERS</b>		17	
Ethylene glycol monobutyl ether	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
Ethylene glycol mono tert-butyl ether	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
Ethylene glycol monoethyl ether	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
Ethylene glycol monoethyl ether acetate	2-ETHOXYETHYL ACETATE	17	
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Ethylene trichloride	1,1,1-TRICHLOROETHANE	17	
Ethylene trichloride	TRICHLOROETHYLENE	17	
Ethyl ethanoate	ETHYL ACETATE	17	
Ethyl ether	DIETHYL ETHER	17	
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Ethyl fluid	MOTOR FUEL ANTI-KNOCK COMPOUNDS (CONTAINING LEAD ALKYLs)	17	
Ethylformic acid	PROPIONIC ACID	17	
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2-Ethylhexaldehyde	OCTYL ALDEHYDES	17	
2-Ethylhexanal	OCTYL ALDEHYDES	17	
<b>2-ETHYLHEXANOIC ACID</b>		17	
2-Ethylhexanol	OCTANOL (ALL ISOMERS)	17	
2-Ethylhexenal	2-ETHYL-3-PROPYLACROLEIN	17	
2-Ethylhex-2-enal	2-ETHYL-3-PROPYLACROLEIN	17	
2-Ethylhexoic acid	OCTANOIC ACID (ALL ISOMERS)	17	
<b>2-ETHYLHEXYL ACRYLATE</b>		17	
2-Ethylhexyl alcohol	OCTANOL (ALL ISOMERS)	17	
<b>2-ETHYLHEXYLAMINE</b>		17	2276
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<b>ETHYLIDENE NORBORNENE</b>		17	
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2-Ethyl-6-methylbenzenamine	2-METHYL-6-ETHYL ANILINE	17	
Ethyl methyl ketone	METHYL ETHYL KETONE	17	
5-Ethyl-2-methylpyridine	2-METHYL-5-ETHYL PYRIDINE	17	
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Ethyl phosphate	TRIETHYL PHOSPHATE	17	
Ethyl pthalate	DIETHYL PHTHALATE	17	
5-Ethyl-2-picoline	2-METHYL-5-ETHYL PYRIDINE	17	
3-Ethylpropan-1-ol	PROPYLENE GLYCOL MONOALKYL ETHER	17	
Ethyl propenoate	ETHYL ACRYLATE	17	
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6-Ethyl-o-toluidine	<b>2-METHYL-6-ETHYL ANILINE</b>	17	
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Formaldehyde trimer	<b>1,3,5-TRIOXANE</b>	17	
Formalin	<b>FORMALDEHYDE SOLUTIONS (45% OR LESS)</b>	17	
<b>FORMAMIDE</b>		17	
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<b>FORMIC ACID</b>		17	1779
Formic aldehyde	<b>FORMALDEHYDE SOLUTIONS (45% OR LESS)</b>	17	
Fural	<b>FURFURAL</b>	17	
2-Furaldehyde	<b>FURFURAL</b>	17	
Furan-2,5-dione	<b>MALEIC ANHYDRIDE</b>	17	
2,5-Furandione	<b>MALEIC ANHYDRIDE</b>	17	
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2-Furfuraldehyde	<b>FURFURAL</b>	17	
<b>FURFURYL ALCOHOL</b>		17	2874
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Fused poly(2+)cyclic aromatic hydrocarbons.	<b>POLY(2+)CYCLIC AROMATICS</b>	17	
Gaultheria oil	<b>METHYL SALICYLATE</b>	17	
Glacial acetic acid	<b>ACETIC ACID</b>	17	
D-Glucopyranoside C8-C14 alkyl	<b>ALKYL (C8-C10)/(C12-C14):(40% OR LESS/60% OR MORE) POLYGLUCOSIDE SOLUTION (55% OR LESS)</b>	17	
D-Glucopyranoside C8-C14 alkyl	<b>ALKYL (C8-C10)/(C12-C14):(60% OR MORE/40% OR LESS) POLYGLUCOSIDE SOLUTION(55% OR LESS)</b>	17	
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<b>GLYCERINE</b>		18	
Glycerin triacetate	<b>GLYCERYL TRIACETATE</b>	17	
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Glycerol	<b>GLYCERINE</b>	18	
<b>GLYCEROL MONOOLEATE</b>		18	
Glycerol oleate	<b>GLYCEROL MONOOLEATE</b>	18	
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<b>GLYCINE, SODIUM SALT SOLUTION</b>		17	
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Glycyl alcohol	<b>GLYCERINE</b>	18	
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<b>GLYOXAL SOLUTION (40% OR LESS)</b>		17	
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<b>GLYPHOSATE SOLUTION (NOT CONTAINING SURFACTANT)</b>		17	
Grain alcohol	<b>ETHYL ALCOHOL</b>	18	
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Heptanoic acid	<b>N-HEPTANOIC ACID</b>	17	
<b>N-HEPTANOIC ACID</b>		17	
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Heptan-2-one	<b>METHYL AMYL KETONE</b>	17	
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<b>HEPTYL ACETATE</b>		17	
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Hexadecyl naphthalene/dihexadecyl naphthalene mixture	<b>1-HEXADECYLNAPHTHALENE / 1,4-BIS(HEXADECYL)NAPHTHALENE MIXTURE</b>	17	
Hexadecyl / octadecyl alcohol	<b>ALCOHOLS (C13+)</b>	17	
Hexadecyl, octadecyl and icosyl methacrylates, mixtures	<b>CETYL/EICOSYL METHACRYLATE MIXTURE</b>	17	
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HEXAMETHYLENEIMINE		17	2493
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1,6-Hexanediamine solutions	HEXAMETHYLENEDIAMINE SOLUTION	17	
Hexanedioic acid, bis(2-ethylhexyl) ester	DI-(2-ETHYLHEXYL) ADIPATE	17	
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1,6-Hexanediol	HEXAMETHYLENE GLYCOL	17	
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Hexan-6-olide	EPSILON-CAPROLACTAM (MOLTEN OR AQUEOUS SOLUTIONS)	17	
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Hydrogen sulphate	SULPHURIC ACID	17	
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Hydroxybenzene	PHENOL	17	
4-Hydroxybutanoic acid lactone	GAMMA-BUTYROLACTONE	17	
4-Hydroxybutyric acid lactone	GAMMA-BUTYROLACTONE	17	
gamma-Hydroxybutyric acid lactone	GAMMA-BUTYROLACTONE	17	
Hydroxydimethylbenzenes	XYLENOL	17	
Hydroxyethanoic acid	GLYCOLIC ACID SOLUTION (70% OR LESS)	17	
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N-beta-Hydroxyethylethylenediamine	AMINOETHYL ETHANOLAMINE	17	
N- (HYDROXYETHYL)ETHYLENEDIAMINE TACETIC ACID, TRISODIUM SALT SOLUTION		17	
2-Hydroxyethyl propenoate	2-HYDROXYETHYL ACRYLATE	17	
2-Hydroxyethyl 2-propenoate	2-HYDROXYETHYL ACRYLATE	17	
alpha-Hydroxyisobutyronitrile	ACETONE CYANOHYDRIN	17	
4-Hydroxy-2-keto-4-methylpentane	DIACETONE ALCOHOL	17	
4-Hydroxy-4-methylpentanone-2	DIACETONE ALCOHOL	17	
4-Hydroxy-4-methylpentan-2-one	DIACETONE ALCOHOL	17	
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2-Hydroxy-2-methylpropionitrile	ACETONE CYANOHYDRIN	17	
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2-Hydroxy-4-methylthiobutyric acid	2-HYDROXY-4-(METHYLTHIO)BUTANOIC ACID	17	
2-Hydroxynitrobenzene (molten)	O-NITROPHENOL (MOLTEN)	17	
2-Hydroxypropanoic acid	LACTIC ACID	17	
2-Hydroxypropionic acid	LACTIC ACID	17	
alpha-Hydroxypropionic acid	LACTIC ACID	17	
3-Hydroxypropionic acid, lactone.	BETA-PROPIOLACTONE	17	
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2-Hydroxypropionitrile	LACTONITRILE SOLUTION (80% OR LESS)	17	
3-Hydroxypropionitrile	ETHYLENE CYANOHYDRIN	17	
2-[2-(2-hydroxypropoxy)propoxy]propan-1-ol	TRIPROPYLENE GLYCOL	17	
2-Hydroxypropylamine	ISOPROPANOLAMINE	17	
3-Hydroxypropylamine	N-PROPANOLAMINE	17	
alpha-Hydroxytoluene	BENZYL ALCOHOL	17	
3-Hydroxy-2,2,4-trimethylpentylisobutyrate	2,2,4-TRIMETHYL-1,3-PENTANEDIOL-1-ISOBUTYRATE	17	
2,2'-[Iminobis(ethyleneimino)]diethylamine	TETRAETHYLENE PENTAMINE	17	
2,2'-Iminodi(ethylamine)	DIETHYLENETRIAMINE	17	
2,2'-Iminodiethanol	DIETHANOLAMINE	17	
1,1'-Iminodipropan-2-ol	DIISOPROPANOLAMINE	17	
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<b>ISOBUTYL METHACRYLATE</b>		17	
Isobutylmethylcarbinol	METHYLAMYL ALCOHOL	17	
Isobutyl methyl ketone	METHYL ISOBUTYL KETONE	17	
Isobutylmethylmethanol	METHYLAMYL ALCOHOL	17	
Isobutyraldehyde	BUTYRALDEHYDE (ALL ISOMERS)	17	
Isobutyric aldehyde	BUTYRALDEHYDE (ALL ISOMERS)	17	
1-Isocyanato-3-isocyanatomethyl-trimethylcyclohexane	ISOPHORONE DIISOCYANATE	17	
3-Isocyanatomethyl-3,5,5-trimethylcyclohexyl isocyanate	ISOPHORONE DIISOCYANATE	17	
Isodecanol	DECYL ALCOHOL (ALL ISOMERS)	17	
Isodecyl alcohol	DECYL ALCOHOL (ALL ISOMERS)	17	
Isododecane	DODECANE (ALL ISOMERS)	17	
Isodurene	TETRAMETHYLBENZENE (ALL ISOMERS)	17	
Isononanoic acid	NONANOIC ACID (ALL ISOMERS)	17	
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Isooctane	OCTANE (ALL ISOMERS)	17	
Isooctanol	OCTANOL (ALL ISOMERS)	17	
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Isopentanol	AMYL ALCOHOL, PRIMARY	17	
Isopentanol	ISOAMYL ALCOHOL	17	
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Isopentyl acetate	AMYL ACETATE (ALL ISOMERS)	17	
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Isopropanol	ISOPROPYL ALCOHOL	18	
<b>ISOPROPANOLAMINE</b>		17	
Isopropenylbenzene	ALPHA-METHYLSTYRENE	17	
2-Isopropoxyethanol	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
2-Isopropoxypropane	ISOPROPYL ETHER	17	
<b>ISOPROPYL ACETATE</b>		17	1220
Isopropylacetone	METHYL ISOBUTYL KETONE	17	
<b>ISOPROPYL ALCOHOL</b>		18	
<b>ISOPROPYLAMINE</b>		17	1221
Isopropylammonium N-(phosphonomethyl)glyc	GLYPHOSATE SOLUTION (NOT CONTAINING SURFACTANT)	17	

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Isopropylcarbinol	ISOBUTYL ALCOHOL	17	
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<b>ISOPROPYL ETHER</b>		17	1159
Isopropylideneacetone	MESITYL OXIDE	17	
Isopropyl oxide	ISOPROPYL ETHER	17	
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4-Isopropyltoluene	P-CYMENE	17	
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Isovaleral	VALERALDEHYDE (ALL ISOMERS)	17	
Isovaleraldehyde	VALERALDEHYDE (ALL ISOMERS)	17	
Isovalerndedehyde	VALERALDEHYDE (ALL ISOMERS)	17	
Isovaleric aldehyde	VALERALDEHYDE (ALL ISOMERS)	17	
Isovalerone	DIISOBUTYL KETONE	17	
Kaolin clay slurry	KAOLIN SLURRY	18	
Kaolinite slurry	KAOLIN SLURRY	18	
<b>KAOLIN SLURRY</b>		18	
Ketohexamethylene	CYCLOHEXANONE	17	
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Ketopropane	ACETONE	18	
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Lampante Oil	OLIVE OIL (CONTAINING LESS THAN 3.3% FREE FATTY ACIDS)	17	
<b>LARD (CONTAINING LESS THAN 1% FREE FATTY ACIDS)</b>		17	
<b>LAURIC ACID</b>		17	
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Lead alkyls, n.o.s.	MOTOR FUEL ANTI-KNOCK COMPOUNDS (CONTAINING LEAD ALKYLs)	17	
Lead tetraethyl	MOTOR FUEL ANTI-KNOCK COMPOUNDS (CONTAINING LEAD ALKYLs)	17	
Lead tetramethyl	MOTOR FUEL ANTI-KNOCK COMPOUNDS (CONTAINING LEAD ALKYLs)	17	
Limonene	DIPENTENE	17	
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Lye solution	SODIUM HYDROXIDE SOLUTION	17	
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METAM SODIUM SOLUTION		17	
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Methanamine	METHYLAMINE SOLUTIONS (42% OR LESS)	17	
Methane carboxylic acid	ACETIC ACID	17	
Methanecarboxylic acid	ACETIC ACID	17	
Methanoic acid	FORMIC ACID	17	
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Methenamine	HEXAMETHYLENETETRAMINE SOLUTIONS	18	
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3-METHOXYBUTYL ACETATE		17	
2-Methoxyethanol	ETHYLENE GLYCOL MONOALKYL ETHERS	17	
2-Methoxy-2-methyl butane	TERT-AMYL METHYL ETHER	17	
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3-Methoxy-3-methylbutyl alcohol	3-METHYL-3-METHOXYBUTANOL	17	
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1-Methoxy-2-propanol acetate	PROPYLENE GLYCOL METHYL ETHER ACETATE	17	
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METHYL ACETATE		17	
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METHYL ACRYLATE		17	1919
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2-Methylacrylic acid, dodecyl ester	DODECYL METHACRYLATE	17	
2-Methylacrylic acid, lauryl ester	DODECYL METHACRYLATE	17	
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2-Methylaniline	<b>O-TOLUIDINE</b>	17	
3-Methylaniline	<b>O-TOLUIDINE</b>	17	
o-Methylaniline	<b>O-TOLUIDINE</b>	17	
2-Methylbenzenamine	<b>O-TOLUIDINE</b>	17	
3-Methylbenzenamine	<b>O-TOLUIDINE</b>	17	
o-Methylbenzenamine	<b>O-TOLUIDINE</b>	17	
Methylbenzene	<b>TOLUENE</b>	17	
Methylbenzenediamine	<b>TOLUENEDIAMINE</b>	17	
Methylbenzol	<b>TOLUENE</b>	17	
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3-Methyl-1,3-butadiene	<b>ISOPRENE</b>	17	
2-Methylbutanal	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
3-Methylbutanal	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
1-Methylbutane	<b>PENTANE (ALL ISOMERS)</b>	17	
2-Methylbutane	<b>PENTANE (ALL ISOMERS)</b>	17	
Methyl butanoate	<b>METHYL BUTYRATE</b>	17	
2-Methyl-2-butanol	<b>TERT-AMYL ALCOHOL</b>	17	
2-Methylbutan-2-ol	<b>TERT-AMYL ALCOHOL</b>	17	
2-Methyl-4-butanol	<b>ISOAMYL ALCOHOL</b>	17	
3-Methyl-1-butanol	<b>AMYL ALCOHOL, PRIMARY</b>	17	
3-Methyl-1-butanol	<b>ISOAMYL ALCOHOL</b>	17	
3-Methylbutan-1-ol	<b>AMYL ALCOHOL, PRIMARY</b>	17	
3-Methylbutan-1-ol	<b>ISOAMYL ALCOHOL</b>	17	
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1-Methylbutyl acetate	<b>AMYL ACETATE (ALL ISOMERS)</b>	17	
2-Methyl-2-butyl alcohol	<b>TERT-AMYL ALCOHOL</b>	17	
2-Methyl-4-butyl alcohol	<b>ISOAMYL ALCOHOL</b>	17	
3-Methyl-1-butyl alcohol	<b>ISOAMYL ALCOHOL</b>	17	
3-Methyl-3-butyl alcohol	<b>TERT-AMYL ALCOHOL</b>	17	
<b>METHYL TERT-BUTYL ETHER</b>		17	
<b>METHYL BUTYL KETONE</b>		17	1224
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2-Methyl-3-butyne-2-ol	<b>2-METHYL-2-HYDROXY-3-BUTYNE</b>	17	
2-Methyl-3-butyne-2-ol	<b>METHYLBUTYNOL</b>	17	
2-Methylbut-3-yn-2-ol	<b>2-METHYL-2-HYDROXY-3-BUTYNE</b>	17	
2-Methylbut-3-yn-2-ol	<b>METHYLBUTYNOL</b>	17	
2-Methylbutyraldehyde	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
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4-Methylpent-3-en-2-one	MESITYL OXIDE	17	
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2-Methyl-2-propanol	TERT-BUTYL ALCOHOL	17	
2-Methylpropan-2-ol	TERT-BUTYL ALCOHOL	17	
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2-Methylpropenoic acid	METHACRYLIC ACID	17	
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2-Methylprop-1-enyl methyl ketone	MESITYL OXIDE	17	
2-Methylpropyl acrylate	BUTYL ACRYLATE (ALL ISOMERS)	17	
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2-Methyl-2-propyl alcohol	TERT-BUTYL ALCOHOL	17	
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Monoisopropylamine	ISOPROPYLAMINE	17	
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Nopinene	BETA-PINENE	17	
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Oil of Myrbane	NITROBENZENE	17	
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OLIVE OIL (CONTAINING LESS THAN 3.3% FREE FATTY ACIDS)		17	
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2-Oxetanone	BETA-PROPIOLACTONE	17	
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2,2'-Oxybis(ethyleneoxy)diethanol	TETRAETHYLENE GLYCOL	17	
2,2'-Oxybispropane	ISOPROPYL ETHER	17	
2,2'-Oxydiethanol	DIETHYLENE GLYCOL	18	
1,1'-Oxydipropan-2-ol	DIPROPYLENE GLYCOL	17	
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PALM OIL (CONTAINING LESS THAN 5% FREE FATTY ACIDS)		17	
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<b>PENTANE (ALL ISOMERS)</b>		17	1265
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tert-Pentanoic acid	TRIMETHYLACETIC ACID	17	
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Pentan-2-ol	SEC-AMYL ALCOHOL	17	
Pentan-3-ol	SEC-AMYL ALCOHOL	17	
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1-Pentanol acetate	AMYL ACETATE (ALL ISOMERS)	17	
n-Pentanol	N-AMYL ALCOHOL	17	
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Phenylmethyl acetate	BENZYL ACETATE	17	
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Sodium mercaptide	<b>SODIUM HYDROSULPHIDE SOLUTION (45% OR LESS)</b>	17	
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Toxilic anhydride	<b>MALEIC ANHYDRIDE</b>	17	
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2,4,4-Trimethylpentene-1	DIISOBUTYLENE	17	
2,4,4-Trimethylpent-1-ene	DIISOBUTYLENE	17	
2,4,4-Trimethylpentene-2	DIISOBUTYLENE	17	
2,4,4-Trimethylpent-2-ene	DIISOBUTYLENE	17	
2,4,6-Trimethyl-1,3,5-trioxane	PARALDEHYDE	17	
2,4,6-Trimethyl-s-trioxane	PARALDEHYDE	17	
Trioxan	1,3,5-TRIOXANE	17	
1,3,5-TRIOXANE		17	
Trioxin	1,3,5-TRIOXANE	17	
Trioxymethylene	1,3,5-TRIOXANE	17	
Tripropylene	PROPYLENE TRIMER	17	
TRIPROPYLENE GLYCOL		17	
Tris(dimethylphenyl) phosphate	TRIXYLYL PHOSPHATE	17	
N,N,N-Tris(2-hydroxyethyl)amine	TRIETHANOLAMINE	17	
Tris(2-hydroxypropyl)amine	TRIISOPROPANOLAMINE	17	
Tris(2-hydroxy-1-propyl)amine	TRIISOPROPANOLAMINE	17	
Trisodium 2-[carboxylatomethyl(2-hydroxyethyl)amino]ethyliminodi(acetate)	N-(HYDROXYETHYL)ETHYLENEDIAMINETRIACETIC ACID, TRISODIUM SALT SOLUTION	17	
Trisodium N-(carboxymethyl)-N'-(2-hydroxyethyl)-N,N'-ethylenediglycine	N-(HYDROXYETHYL)ETHYLENEDIAMINETRIACETIC ACID, TRISODIUM SALT SOLUTION	17	
Trisodium N-(2-hydroxyethyl)ethylenediamine-N,N',N'-triacetate	N-(HYDROXYETHYL)ETHYLENEDIAMINETRIACETIC ACID, TRISODIUM SALT SOLUTION	17	
Trisodium nitrilotriacetate solution	NITRILOTRIACETIC ACID, TRISODIUM SALT SOLUTION	17	
Tritolyl phosphate, containing 1% or more ortho-Isomer	TRICRESYL PHOSPHATE (CONTAINING 1% OR MORE ORTHO-ISOMER)	17	
Trixylenyl phosphate	TRIXYLYL PHOSPHATE	17	

Index Name	Product Name	Chapter	UN No.
<b>TRIXYLYL PHOSPHATE</b>		17	
<b>TUNG OIL (CONTAINING LESS THAN 2.5% FREE FATTY ACIDS)</b>		17	
<b>TURPENTINE</b>		17	1299
Turpentine oil	<b>TURPENTINE</b>	17	
Turps	<b>TURPENTINE</b>	17	
Type A Zeolite	<b>SODIUM ALUMINOSILICATE SLURRY</b>	17	
Undecane	<b>N-ALKANES (C10+)</b>	17	
1-Undecanecarboxylic acid	<b>LAURIC ACID</b>	17	
<b>UNDECANOIC ACID</b>		17	
Undecan-1-ol	<b>UNDECYL ALCOHOL</b>	17	
Undec-1-ene	<b>1-UNDECENE</b>	17	
<b>1-UNDECENE</b>		17	
<b>UNDECYL ALCOHOL</b>		17	
Undecylbenzene	<b>ALKYL(C9+)BENZENES</b>	17	
Undecylic acid	<b>UNDECANOIC ACID</b>	17	
n-Undecylic acid	<b>UNDECANOIC ACID</b>	17	
uns-Trimethylbenzene	<b>TRIMETHYLBENZENE (ALL ISOMERS)</b>	17	
Urea, ammonia liquor	<b>UREA/AMMONIUM NITRATE SOLUTION (CONTAINING AQU. AMMONIA)</b>	17	
Urea, ammonium carbamate solutions	<b>UREA/AMMONIUM NITRATE SOLUTION (CONTAINING AQU. AMMONIA)</b>	17	
<b>UREA/AMMONIUM NITRATE SOLUTION</b>		17	
<b>UREA/AMMONIUM NITRATE SOLUTION (CONTAINING AQUA AMMONIA)</b>		17	
<b>UREA/AMMONIUM PHOSPHATE SOLUTION</b>		17	
<b>UREA SOLUTION</b>		17	
Valeral	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
<b>VALERALDEHYDE (ALL ISOMERS)</b>		17	2058
n-Valeraldehyde	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
Valerianic acid	<b>PENTANOIC ACID</b>	17	
Valeric acid	<b>PENTANOIC ACID</b>	17	
n-Valeric acid	<b>PENTANOIC ACID</b>	17	
Valeric aldehyde	<b>VALERALDEHYDE (ALL ISOMERS)</b>	17	
Valerone	<b>DIISOBUTYL KETONE</b>	17	
<b>VEGETABLE PROTEIN SOLUTION (HYDROLYSED)</b>		17	
Vinegar acid	<b>ACETIC ACID</b>	17	
Vinegar naphtha	<b>ETHYL ACETATE</b>	17	
<b>VINYL ACETATE</b>		17	1301
Vinylcarbinol	<b>ALLYL ALCOHOL</b>	17	
Vinyl cyanide	<b>ACRYLONITRILE</b>	17	
vinyl ethanoate	<b>VINYL ACETATE</b>	17	
<b>VINYL ETHYL ETHER</b>		17	1302
Vinylformic acid	<b>ACRYLIC ACID</b>	17	
<b>VINYLDENE CHLORIDE</b>		17	1303
<b>VINYL NEODECANOATE</b>		17	
<b>VINYLTOLUENE</b>		17	2618
Vinyl trichloride	<b>1,1,2-TRICHLOROETHANE</b>	17	
Vinyltrichloride	<b>1,1,2-TRICHLOROETHANE</b>	17	
Vitriol brown oil	<b>OLEUM</b>	17	
<b>WATER</b>		18	
Water glass	<b>SODIUM SILICATE SOLUTION</b>	17	
<b>WAXES</b>		17	



Index Name	Product Name	Chapter	UN No.
White bole	KAOLIN SLURRY	18	
White caustic	SODIUM HYDROXIDE SOLUTION	17	
White tar	NAPHTHALENE (MOLTEN)	17	
Wine	ALCOHOLIC BEVERAGES, N.O.S.	18	
Wintergreen oil	METHYL SALICYLATE	17	
Wood alcohol	METHYL ALCOHOL	17	
Wood naphtha	METHYL ALCOHOL	17	
Wood spirit	METHYL ALCOHOL	17	
<b>XYLENES</b>		17	1307
<b>XYLENOL</b>		17	2261
2,3-Xylenol	XYLENOL	17	
2,4-Xylenol	XYLENOL	17	
2,5-Xylenol	XYLENOL	17	
2,6-Xylenol	XYLENOL	17	
3,4-Xylenol	XYLENOL	17	
3,5-Xylenol	XYLENOL	17	
Xylols	XYLENES	17	
Yellow Grease	TALLOW (CONTAINING LESS THAN 15% FREE FATTY ACIDS	17	
ZINC ALKARYL DITHIOPHOSPHATE (C7-C16)		17	
ZINC ALKENYL CARBOXAMIDE		17	
ZINC ALKYL DITHIOPHOSPHATE (C3-C14)		17	
Zinc bromide drilling brine	DRILLING BRINES (CONTAINING ZINC SALTS)	17	
(Z)-Octadec-9-enoic acid	OLEIC ACID	17	
Z-Octadec-9-enoic acid	OLEIC ACID	17	
z-1,3-Pentadiene	1,3-PENTADIENE	17	

## Chapter 20

### Transport of liquid chemical wastes

#### 20.1 Preamble

20.1.1 Maritime transport of liquid chemical wastes could present a threat to human health and to the environment.

20.1.2 Liquid chemical wastes shall, therefore, be transported in accordance with relevant international conventions and recommendations and, in particular, where it concerns maritime transport in bulk, with the requirements of this Code.

#### 20.2 Definitions

For the purpose of this chapter:

20.2.1 *Liquid chemical wastes* are substances, solutions or mixtures, offered for shipment, containing or contaminated with one or more constituents which are subject to the requirements of this Code and for which no direct use is envisaged but which are carried for dumping, incineration or other methods of disposal other than at sea.

20.2.2 *Transboundary movement* means maritime transport of wastes from an area under the national jurisdiction of one country to or through an area under the national jurisdiction of another country, or to or through an area not under the national jurisdiction of any country, provided at least two countries are concerned by the movement.

#### 20.3 Applicability

20.3.1 The requirements of this chapter are applicable to the transboundary movement of liquid chemical wastes in bulk by seagoing ships and shall be considered in conjunction with all other requirements of this Code.

20.3.2 The requirements of this chapter do not apply to:

- .1 wastes derived from shipboard operations which are covered by the requirements of MARPOL 73/78; and
- .2 substances, solutions or mixtures containing or contaminated with radioactive materials which are subject to the applicable requirements for radioactive materials.

#### 20.4 Permitted shipments

20.4.1 Transboundary movement of wastes is permitted to commence only when:

- .1 notification has been sent by the competent authority of the country of origin, or by the generator or exporter through the channel of the competent authority of the country of origin, to the country of final destination; and

- .2 the competent authority of the country of origin, having received the written consent of the country of final destination stating that the wastes will be safely incinerated or treated by other methods of disposal, has given authorization to the movement.

## **20.5 Documentation**

20.5.1 In addition to the documentation specified in 16.2 of this Code, ships engaged in transboundary movement of liquid chemical wastes shall carry on board a waste movement document issued by the competent authority of the country of origin.

## **20.6 Classification of liquid chemical wastes**

20.6.1 For the purpose of the protection of the marine environment, all liquid chemical wastes transported in bulk shall be treated as Category X noxious liquid substances, irrespective of the actual evaluated category.

## **20.7 Carriage and handling of liquid chemical wastes**

20.7.1 Liquid chemical wastes shall be carried in ships and cargo tanks in accordance with the minimum requirements for liquid chemical wastes specified in chapter 17, unless there are clear grounds indicating that the hazards of the wastes would warrant:

- .1 carriage in accordance with the ship type 1 requirements; or
- .2 any additional requirements of this Code applicable to the substance or, in case the of a mixture, its constituent presenting the predominant hazard.

## Chapter 21

### Criteria for assigning carriage requirements for products subject to the IBC Code

#### 21.1 Introduction

21.1.1 The following criteria are guidelines for the determination of pollution classification and assignment of appropriate carriage requirements for bulk liquid cargoes being considered as candidates for entry into the IBC Code or annexes 1, 3 or 4 of MEPC.2/Circs.

21.1.2 In developing such criteria, every effort has been made to follow the criteria and cut off points developed under the Global Harmonized System (GHS).

21.1.3 Although the criteria are intended to be closely defined in order to establish a uniform approach, it must be emphasized that these are guidelines only and, where human experience or other factors indicates the need for alternative arrangements, these shall always be taken into account. Where deviations from the criteria have been recognized, they shall be properly recorded with justifications.

#### 21.2 Contents

21.2.1 This chapter contains the following:

- .1 minimum safety and pollution criteria for products subject to chapter 17 of the IBC Code;
- .2 criteria used to assign the minimum carriage requirements for products, which meet the safety or pollution criteria to make them subject to chapter 17 of the IBC Code;
- .3 criteria used for special requirements in chapter 15 of the IBC Code to be included in *column o* of chapter 17 of the IBC Code;
- .4 criteria used for special requirements in chapter 16 of the IBC Code to be included in *column o* of chapter 17 of the IBC Code; and
- .5 definitions of properties used within this chapter.

#### 21.3 Minimum safety and pollution criteria for products subject to chapter 17 of the IBC Code

21.3.1 Products are deemed to be hazardous and subject to chapter 17 of the IBC Code if they meet one or more of the following criteria:

- .1 inhalation  $LC_{50} \leq 20$  mg/l/4 h (see definitions in paragraph 21.7.1.1);
- .2 dermal  $LD_{50} \leq 2000$  mg/kg (see definitions in paragraph 21.7.1.2);
- .3 oral  $LD_{50} \leq 2000$  mg/kg (see definitions in paragraph 21.7.1.3);

- .4 toxic to mammals by prolonged exposure (see definitions in paragraph 21.7.2);
- .5 cause skin sensitization (see definitions in paragraph 21.7.3);
- .6 cause respiratory sensitization (see definitions in paragraph 21.7.4);
- .7 corrosive to skin (see definitions in paragraph 21.7.5);
- .8 have a Water Reactive Index (WRI) of  $\geq 1$  (see definitions in paragraph 21.7.6);
- .9 require inertion, inhibition, stabilization, temperature control or tank environmental control in order to prevent a hazardous reaction (see definitions in paragraph 21.7.10);
- .10 flash point  $< 23^{\circ}\text{C}$ ; and have an explosive/flammability range (expressed as a percentage by volume in air) of  $\geq 20\%$ ;
- .11 autoignition temperature of  $\leq 200^{\circ}\text{C}$ ; and
- .12 classified as pollution category X or Y or meeting the criteria for rules 11 to 13 under paragraph 21.4.5.1.

**21.4 Criteria used to assign the minimum carriage requirements for products, which meet the minimum safety or pollution criteria to make them subject to chapter 17 of the IBC Code**

**21.4.1 Column a - Product Name**

21.4.1.1 The International Union of Pure and Applied Chemistry (IUPAC) name shall be used as far as possible but, where this is unnecessarily complex, then a technically correct and unambiguous alternative chemical name may be used.

**21.4.2 Column b – Deleted.**

**21.4.3 Column c - Pollution Category**

21.4.3.1 *Column c* identifies the pollution category assigned to each product under Annex II of MARPOL 73/78.

**21.4.4 Column d - Hazards**

21.4.4.1 An “S” is assigned to *column d* if any of the safety criteria described in paragraphs 21.3.1.1 to 21.3.1.11 are met.

21.4.4.2 A “P” is assigned to *column d* if the product meets the criteria for assigning Ship Type 1 to 3 as defined by rules 1 to 14 in paragraph 21.4.5.



### 21.4.5 Column e - Ship Type

21.4.5.1 The basic criteria for assigning Ship Types based on the GESAMP Hazard Profile are shown in the table below. An explanation of the details in the columns is provided in appendix 1 of MARPOL 73/78 Annex II. Selected rules, identified in this table, are specified in section 21.4.5.2 for assigning specific Ship Types.

Rule Number	A1	A2	B1	B2	D3	E2	Ship Type
1			$\geq 5$				1
2	$\geq 4$	NR	4		CMRTNI		
3	$\geq 4$	NR			CMRTNI		2
4			4				
5	$\geq 4$		3				
6		NR	3				
7				$\geq 1$			
8						Fp	
9					CMRTNI	F	
10			$\geq 2$			S	
11	$\geq 4$						3
12		NR					
13			$\geq 1$				
14	All other category Y Substances						
15	All other category Z Substances All "Other Substances" (OS)						NA

21.4.5.2 The Ship Type is assigned according to the following criteria:

#### Ship Type 1:

Inhalation  $LC_{50} \leq 0.5 \text{ mg/l/4 h}$ ; and/or  
 Dermal  $LD_{50} \leq 50 \text{ mg/kg}$ ; and/or  
 Oral  $LD_{50} \leq 5 \text{ mg/kg}$ ; and/or  
 Autoignition temperature  $\leq 65^\circ\text{C}$ ; and/or  
 Explosive range  $\geq 50\% \text{ v/v}$  in air and the flash point  $< 23^\circ\text{C}$ ; and/or  
 Rules 1 or 2 of the table shown in 21.4.5.1

#### Ship Type 2:

Inhalation  $LC_{50} > 0.5 \text{ mg/l/4 h} - \leq 2 \text{ mg/l/4 h}$ ; and/or  
 Dermal  $LD_{50} > 50 \text{ mg/kg} - \leq 1000 \text{ mg/kg}$ ; and/or  
 Oral  $LD_{50} > 5 \text{ mg/kg} - \leq 300 \text{ mg/kg}$ ; and/or  
 WRI=2;  
 Autoignition temperature  $\leq 200^\circ\text{C}$ ; and/or  
 Explosive range  $\geq 40\% \text{ v/v}$  in air and the flash point  $< 23^\circ\text{C}$ ; and/or  
 Any of the rules 3 to 10 of the table shown in 21.4.5.1

**Ship Type 3:**

Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 of the IBC Code not meeting the requirements for ship types 1 or 2 and not meeting rule 15 of the table shown in 21.4.5.1.

**21.4.6 Column f - Tank type**

21.4.6.1 The tank type is assigned according to the following criteria:

Tank type 1G: Inhalation  $LC_{50} \leq 0.5$  mg/l/4 h; and/or  
 Dermal  $LD_{50} \leq 200$  mg/kg ; and/or  
 Autoignition temperature  $\leq 65^{\circ}C$ ; and/or  
 Explosive range  $\geq 40\%$  v/v in air and the flash point  $< 23^{\circ}C$ ; and/or  
 WRI=2

Tank type 2G: Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for tank type 1G.

**21.4.7 Column g - Tank vents**

21.4.7.1 The tank venting arrangements are assigned according to the following criteria:

Controlled: Inhalation  $LC_{50} \leq 10$  mg/l/4 h; and/or  
 Toxic to mammals by prolonged exposure; and/or  
 Respiratory sensitizer; and/or  
 Special carriage control needed; and/or  
 Flash point  $\leq 60^{\circ}C$   
 Corrosive to skin ( $\leq 4$  h exposure)

Open: Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for controlled tank vents.

**21.4.8 Column h - Tank environmental control**

21.4.8.1 The Tank environmental control conditions are assigned according to the following criteria:

Inert: Autoignition temperature  $\leq 200^{\circ}C$ ; and/or  
 Reacts with air to cause a hazard; and/or  
 Explosive range  $\geq 40\%$  and the flash point  $< 23^{\circ}C$ .

Dry: WRI $\geq 1$

Pad: Only applies to specific products identified on a case by case basis.

Vent: Only applies to specific products identified on a case by case basis.

No: Where the above criteria do not apply, (inerting requirements may be required under SOLAS)

## 21.4.9 Column i - Electrical equipment

21.4.9.1 If the flash point of the product is  $\leq 60^{\circ}\text{C}$  or the product is heated to within  $15^{\circ}\text{C}$  of its flash point then the electrical equipment required are assigned according to the following criteria, else '-' is assigned in column i' and i''.

### .1 Column i' - Temperature class:

T1	Autoignition temperature $\geq 450^{\circ}\text{C}$
T2	Autoignition temperature $\geq 300^{\circ}\text{C}$ but $< 450^{\circ}\text{C}$
T3	Autoignition temperature $\geq 200^{\circ}\text{C}$ but $< 300^{\circ}\text{C}$
T4	Autoignition temperature $\geq 135^{\circ}\text{C}$ but $< 200^{\circ}\text{C}$
T5	Autoignition temperature $\geq 100^{\circ}\text{C}$ but $< 135^{\circ}\text{C}$
T6	Autoignition temperature $\geq 85^{\circ}\text{C}$ but $< 100^{\circ}\text{C}$

### .2 Column i'' - Apparatus group:

Apparatus group	MESG at $20^{\circ}\text{C}$ (mm)	MIC ratio product/methane
IIA	$\geq 0.9$	$> 0.8$
IIB	$> 0.5$ to $< 0.9$	$\geq 0.45$ to $\leq 0.8$
IIC	$\leq 0.5$	$< 0.45$

.2.1 The tests shall be carried out in accordance with the procedures described in IEC 60079-1-1:2002 and IEC 79-3.

.2.2 For gases and vapours it is sufficient to make only one determination of either the Maximum Experimental Safe Gap (MESG) or the Minimum Igniting Current (MIC) provided that:

for Group IIA: the MESG  $> 0.9$  mm or the MIC ratio  $> 0.9$ .

for Group IIB: the MESG is  $\geq 0.55$  mm and  $\leq 0.9$  mm; or the MIC ratio is  $\geq 0.5$  and  $\leq 0.8$ .

for Group IIC: the MESG is  $< 0.5$  mm or the MIC ratio is  $< 0.45$ .

.2.3 It is necessary to determine both the MESG and the MIC ratio when:

.1 The MIC ratio determination only has been made, and the ratio is between 0.8 and 0.9, when an MESG determination will be required;

.2 The MIC ratio determination only has been made, and the ratio is between 0.45 and 0.5, when an MESG determination will be required;  
or

.3 The MESG only has been found, and is between 0.5 mm and 0.55 mm, when an MIC ratio determination will be required.

.3 Column i''' Flash point:  $> 60^{\circ}\text{C}$  :Yes  
 $\leq 60^{\circ}\text{C}$  :No  
 Non-flammable :NF

**21.4.10 Column j - Gauging**

21.4.10.1 The type of gauging equipment permitted is assigned according to the following criteria:

Closed: Inhalation  $LC_{50} \leq 2 \text{ mg//4hr}$ ; and/or  
 Dermal  $LD_{50} \leq 1000 \text{ mg/kg}$ ; and/or  
 Toxic to mammals by prolonged exposure; and/or  
 Respiratory sensitizer; and/or  
 Corrosive to skin ( $\leq 3 \text{ min}$  exposure).

Restricted: Inhalation  $LC_{50} > 2 - \leq 10 \text{ mg//4h}$ ; and/or  
 Special carriage control indicates Inerting required; and/or  
 Corrosive to skin ( $> 3 \text{ min} - \leq 1 \text{ h}$  exposure); and/or  
 Flash point  $\leq 60^\circ\text{C}$ .

Open: Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for closed or restricted gauging.

**21.4.11 Column k - Vapour detection**

21.4.11.1 The type of vapour detection equipment required is determined by the following criteria:

Toxic (T) : Inhalation  $LC_{50} \leq 10 \text{ mg//4 h}$ , and/or  
 Respiratory sensitizer; and/or  
 Toxic by prolonged exposure.

Flammable (F) : Flash point  $\leq 60^\circ\text{C}$

No : Where the above criteria do not apply.

**21.4.12 Column l - Fire protection equipment**

21.4.12.1 The appropriate fire-fighting media are defined as being appropriate according to the following criteria related to the properties of the product:

Solubility  $> 10\%$  ( $> 100000 \text{ mg/l}$ ) : A Alcohol-resistant foam.

Solubility  $< 10\%$  ( $< 100000 \text{ mg/l}$ ) : A Alcohol-resistant foam; and/or  
 : B Regular foam.

WRI = 0 : C Water spray (generally used as a coolant and can be used with A and/or B providing that the WRI=0).

WRI  $\geq 1$  : D Dry chemical.

No : No requirements under this Code.

Note: all appropriate media shall be listed.

**21.4.13** *Column m* – Deleted.

**21.4.14** *Column n - Emergency Equipment*

21.4.14.1 The requirement to have personnel emergency equipment on board is identified by 'Yes' in *column n* according to the following criteria:

Inhalation  $LC_{50} \leq 2$  mg//4 h; and/or  
Respiratory sensitizer; and/or  
Corrosive to skin ( $\leq 3$  min exposure); and/or  
WRI=2

No: indicates that the above criteria do not apply.

**21.5** **Criteria for special requirements in chapter 15 to be included in *column o***

21.5.1 The assignment of special requirements in *column o* shall normally follow clear criteria based on the data supplied in the reporting form. Where it is considered appropriate to deviate from such criteria, this shall be clearly documented in such a way that it can easily be retrieved on demand.

21.5.2 The criteria for making reference to the special requirements identified in chapters 15 and 16 are defined below with comments where relevant.

**21.5.3** **Paragraphs 15.2 to 15.10 and 15.20**

21.5.3.1 Paragraphs 15.2 to 15.10 and 15.20 identify specific products by name with special carriage requirements that cannot be easily accommodated in any other way.

**21.5.4** **Paragraph 15.11 - Acids**

21.5.4.1 Paragraph 15.11 applies to all acids unless they:

- .1 are organic acids - when only paragraphs 15.11.2 to 15.11.4 and paragraphs 15.11.6 to 15.11.8 apply; or
- .2 do not evolve hydrogen - when paragraph 15.11.5 need not apply.

**21.5.5** **Paragraph 15.12 - Toxic products**

21.5.5.1 All of paragraph 15.12 is added to *column o* according to the following criteria:

Inhalation  $LC_{50} \leq 2$  mg//4 h; and/or  
the product is a respiratory sensitizer; and/or  
the product is toxic to mammals by prolonged exposure.

21.5.5.2 Paragraph 15.12.3 is added to *column o* according to the following criteria:

Inhalation  $LC_{50} > 2 - \leq 10$  mg//4 h; and/or  
Dermal  $LD_{50} \leq 1000$  mg/kg; and/or  
Oral  $LD_{50} \leq 300$  mg/kg.



21.5.5.3 Paragraph 15.12.4 is added to *column o* according to the following criterion:

Inhalation  $LC_{50} >2 - \leq 10$  mg/l/4 h.

**21.5.6 Paragraph 15.13 - Cargoes protected by additives**

21.5.6.1 The requirement to assign paragraph 15.13 to *column o* is based on the information related to the products tendency to polymerise, decompose, oxidise or undergo other chemical changes which may cause a hazard under normal carriage conditions and which would be prevented by the addition of appropriate additives.

**21.5.7 Paragraph 15.14 - Cargoes with a vapour pressure greater than atmospheric at 37.8°C**

21.5.7.1 The requirement to assign paragraph 15.14 to *column o* is based on the following criterion:

Boiling point  $\leq 37.8^\circ\text{C}$

**21.5.8 Paragraph 15.16 - Cargo contamination**

21.5.8.1 Paragraph 15.16.1 is deleted.

21.5.8.2 Paragraph 15.16.2 is added to *column o* according to the following criterion:

$WRI \geq 1$

**21.5.9 Paragraph 15.17 - Increased ventilation requirements**

21.5.9.1 Paragraph 15.17 shall be added to *column o* according to the following criteria:

Inhalation  $LC_{50} >0.5 - \leq 2$  mg/l/4 h; and/or  
Respiratory sensitizer; and/or  
Toxic to mammals by prolonged exposure; and/or  
Corrosive to skin ( $\leq 1$  h exposure time).

**21.5.10 Paragraph 15.18 - Special cargo pump-room requirements**

21.5.10.1 Paragraph 15.18 shall be added to *column o* according to the following criterion:

Inhalation  $LC_{50} \leq 0.5$  mg/l/4 h

**21.5.11 Paragraph 15.19 - Overflow control**

21.5.11.1 Paragraph 15.19 shall be added to *column o* according to the following criteria:

Inhalation  $LC_{50} \leq 2$  mg/l/4 h; and/or  
Dermal  $LD_{50} \leq 1000$  mg/kg; and/or  
Oral  $LD_{50} \leq 300$  mg/kg; and/or  
Respiratory sensitizer; and/or  
Corrosive to skin ( $\leq 3$  min exposure); and/or

Autoignition temperature  $\leq 200^{\circ}\text{C}$ ; and/or  
Explosive range  $\geq 40\%$  v/v in air and flash point  $< 23^{\circ}\text{C}$ ; and/or  
Classified as ship type 1 on pollution grounds.

21.5.11.2 Only paragraph 15.19.6 shall apply if the product has any of the following properties:

Inhalation  $\text{LC}_{50} > 2 \text{ mg/l/4h} - \leq 10 \text{ mg/l/4 h}$ ; and/or  
Dermal  $\text{LD}_{50} > 1000 \text{ mg/kg} - \leq 2000 \text{ mg/kg}$ ; and/or  
Oral  $\text{LD}_{50} > 300 \text{ mg/kg} - \leq 2000 \text{ mg/kg}$ ; and/or  
Skin sensitizer; and/or  
Corrosive to skin ( $> 3 \text{ min} - \leq 1 \text{ h}$  exposure); and/or  
Flash point  $\leq 60^{\circ}\text{C}$ ; and/or  
Classified as ship type 2 on pollution grounds; and/or  
Pollution category X or Y.

#### 21.5.12 Paragraph 15.21 – Temperature sensors

21.5.12.1 Paragraph 15.21 is added to *column o* according to the heat sensitivity of the product. This requirement is related to pumps in cargo pump rooms only.

#### 21.6 Criteria for special requirements in chapter 16 to be included in *column o*

##### 21.6.1 Paragraphs 16.1 to 16.2.5 and 16.3 to 16.5

21.6.1.1 These apply to all cargoes and so are not referenced specifically in *column o*.

##### 21.6.2 Paragraph 16.2.6

21.6.2.1 Paragraph 16.2.6 is added to *column o* for products, which meet the following criteria:

Pollution Category X or Y and viscosity  $\geq 50 \text{ mPa.s}$  at  $20^{\circ}\text{C}$

##### 21.6.3 Paragraph 16.2.9

21.6.3.1 Paragraph 16.2.9 is added to *column o* for products, which meet the following criterion:

Melting point  $\geq 0^{\circ}\text{C}$ .

##### 21.6.4 Paragraph 16.6 – Cargo not to be exposed to excessive heat

21.6.4.1 Paragraphs 16.6.2 to 16.6.4 are added to *column o* for products, which are identified as requiring temperature control during carriage.

**21.7 Definitions****21.7.1 Acute mammalian toxicity****21.7.1.1 Acutely toxic by inhalation\***

Inhalation toxicity (LC <sub>50</sub> )	
Hazard level	mg/l/4 h
High	≤0.5
Moderately high	>0.5 - <2
Moderate	>2 - ≤10
Slight	>10 - <20
Negligible	>20

**21.7.1.2 Acutely toxic in contact with skin**

Dermal toxicity (LD <sub>50</sub> )	
Hazard Level	mg/kg
High	≤50
Moderately high	>50 - <200
Moderate	>200 - <1000
Slight	>1000 - <2000
Negligible	>2000

**21.7.1.3 Acutely toxic if swallowed**

Oral toxicity (LD <sub>50</sub> )	
Hazard Level	mg/kg
High	≤5
Moderately High	>5 - <50
Moderate	>50 - <300
Slight	>300 - <2000
Negligible	>2000

**21.7.2 Toxic to mammals by prolonged exposure**

21.7.2.1 A product is classified as *toxic by prolonged exposure* if it meets any of the following criteria: it is known to be, or suspected of being a carcinogen, mutagen, reprotoxic, neurotoxic, immunotoxic or exposure below the lethal dose is known to cause specific organ oriented systemic toxicity (TOST) or other related effects.

21.7.2.2 Such effects may be identified from the GESAMP Hazard Profile of the product or other recognized sources of such information.

\* All inhalation toxicity data are assumed to be associated with vapours and not mists or sprays, unless indicated otherwise.

**21.7.3 Skin sensitization**

21.7.3.1 A product is classified as a *skin sensitizer*:

- .1 if there is evidence in humans that the substance can induce sensitization by skin contact in a substantial number of persons; or
- .2 where there are positive results from an appropriate animal test.

21.7.3.2 When an adjuvant type test method for skin sensitization is used, a response of at least 30% of the animals is considered as positive. For a non-adjuvant test method a response of at least 15% of the animals is considered positive.

21.7.3.3 When a positive result is obtained from the Mouse Ear Swelling Test (MEST) or the Local Lymph Node Assay (LLNA), this may be sufficient to classify the product as a skin sensitizer.

**21.7.4 Respiratory sensitization**

21.7.4.1 A product is classified as a *respiratory sensitizer*:

- .1 if there is evidence in humans that the substance can induce specific respiratory hypersensitivity; and/or
- .2 where there are positive results from an appropriate animal test; and/or
- .3 where the product is identified as a skin sensitizer and there is no evidence to show that it is not a respiratory sensitizer.

**21.7.5 Corrosive to skin\***

Hazard Level	Exposure time to cause full thickness necrosis of skin	Observation time
Severely corrosive to skin	≤ 3 min	≤ 1 h
Highly corrosive to skin	> 3 min - ≤ 1 h	≤ 14 days
Moderately corrosive to skin	> 1 h - ≤ 4 h	≤ 14 days

\* Products that are corrosive to skin are, for the purpose of assigning relevant carriage requirements, deemed to be corrosive by inhalation.

**21.7.6 Water reactive substances**

21.7.6.1 These are classified into three groups as follows:

Water reactive index (WRI)	Definition
2	Any chemical which, in contact with water, may produce a toxic, flammable or corrosive gas or aerosol.
1	Any chemical which, in contact with water, may generate heat or produce a non-toxic, non-flammable or non corrosive gas.
0	Any chemical which, in contact with water, would not undergo a reaction to justify a value of 1 or 2.

**21.7.7 Air reactive substances**

21.7.7.1 Air reactive substances are products which react with air to cause a potentially hazardous situation, e.g. the formation of peroxides which may cause an explosive reaction.

**21.7.8 Electrical apparatus - Temperature Class** (for products which either have a flashpoint of  $\leq 60^{\circ}\text{C}$  or are heated to within  $15^{\circ}\text{C}$  of their flashpoint)

21.7.8.1 The Temperature Class is defined by the International Electrotechnical Commission (IEC) as:

*The highest temperature attained under practical conditions of operation within the rating of the apparatus (and recognized overloads, if any, associated therewith) by any part of any surface, the exposure of which to an explosive atmosphere may involve a risk.*

21.7.8.2 The Temperature Class of the electrical apparatus is assigned by selecting the Maximum Surface Temperature which is closest to, but less than, the product's autoignition temperature (see 21.4.9.1.1).

**21.7.9 Electrical apparatus - Apparatus group** (for products with a flashpoint of  $\leq 60^{\circ}\text{C}$ )

21.7.9.1 This refers to intrinsically safe and associated electrical apparatus for explosive gas atmospheres which the IEC divide into the following groups:

- Group I: for mines susceptible to firedamp (not used by IMO); and
- Group II: for applications in other industries - further sub-divided according to its Maximum Experimental Safe Gap (MESG) and/or the Minimum Igniting Current (MIC) of the gas/vapour into groups IIA, IIB and IIC.

21.7.9.2 This property cannot be determined from other data associated with the product; it has to be either measured or assigned by assimilation with related products in an homologous series.

**21.7.10 Special carriage control conditions**

21.7.10.1 Special carriage control conditions refer to specific measures that need to be taken in order to either prevent a hazardous reaction. They include:



- .1 **Inhibition:** the addition of a compound (usually organic) that retards or stops an undesired chemical reaction such as corrosion, oxidation or polymerization;
- .2 **Stabilization:** the addition of a substance (stabilizer) that tends to keep a compound, mixture or solution from changing its form or chemical nature. Such stabilizers may retard a reaction rate, preserve a chemical equilibrium, act as antioxidants, keep pigments and other components in emulsion form or prevent the particles in colloidal suspension from precipitating;
- .3 **Inertion:** the addition of a gas (usually nitrogen) in the ullage space of a tank that prevents the formation of a flammable cargo/air mixture;
- .4 **Temperature control:** the maintenance of a specific temperature range for the cargo in order to prevent a hazardous reaction or to keep the viscosity low enough to allow the product to be pumped; and
- .5 **Padding and venting:** only applies to specific products identified on a case by case basis.

#### 21.7.11 Flammable cargoes

21.7.11.1 A cargo is defined as flammable according to the following criteria:

IBC Code descriptor	Flash point (degrees Centigrade)
Highly flammable	< 23
Flammable	≤ 60 but ≥ 23

21.7.11.2 It should be noted that flash points of mixtures and aqueous solutions need to be measured unless all of the components are non-flammable.

21.7.11.3 It should be noted that the carriage of bulk liquid cargoes which have a flash point of ≤60°C is subject to other SOLAS regulations.

**Appendix**

**MODEL FORM OF INTERNATIONAL CERTIFICATE OF FITNESS FOR THE  
CARRIAGE OF  
DANGEROUS CHEMICALS IN BULK**

INTERNATIONAL CERTIFICATE OF FITNESS FOR  
THE CARRIAGE OF DANGEROUS CHEMICALS IN BULK

*(Official seal)*

Issued under the provisions of the

INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS  
CARRYING DANGEROUS CHEMICALS IN BULK  
(resolutions MSC.176(79) and MEPC.119(52))

under the authority of the Government of

.....  
*(full official designation of country)*

by.....  
*(full designation of the competent person or organization recognized by the Administration)*

**Particulars of ship<sup>1</sup>**

Name of ship .....

Distinctive number or letters .....

IMO Number<sup>2</sup> .....

Port of registry .....

Gross tonnage .....

Ship type (Code paragraph 2.1.2) .....

Date on which keel was laid or on which the ship  
was at a similar stage of construction or  
(in the case of a converted ship) date on which  
conversion to chemical tanker was commenced .....

The ship also complies fully with the following amendments to the Code:

.....  
.....

<sup>1</sup> Alternatively, the particulars of the ship may be placed horizontally in boxes.

<sup>2</sup> In accordance with IMO ship identification number scheme adopted by the Organization by resolution A.600(15).

The ship is exempted from compliance with the following provisions of the Code:

.....  
.....

THIS IS TO CERTIFY:

- 1 That the ship has been surveyed in accordance with the provisions of section 1.5 of the Code;
- 2 That the survey showed that the construction and equipment of the ship and the condition thereof are in all respects satisfactory and that the ship complies with the relevant provisions of the Code;
- 3 That the ship has been provided with a Manual in accordance with Appendix 4 of Annex II of MARPOL 73/78 as called for by regulation 14 of Annex II, and that the arrangements and equipment of the ship prescribed in the Manual are in all respects satisfactory;
- 4 That the ship meets the requirements for the carriage in bulk of the following products, provided that all relevant operational provisions of the Code and Annex II of MARPOL 73/78 are observed:

Product	Conditions of carriage (tank numbers etc.)	Pollution Category

Continued on attachment 1, additional signed and dated sheets<sup>3</sup>.  
 Tank numbers referred to in this list are identified on attachment 2, signed and dated tank plan.

- 5 That, in accordance with 1.4 / 2.8.2<sup>3</sup>, the provisions of the Code are modified in respect of the ship in the following manner:

.....

- 6 That the ship must be loaded:
  - .1 in accordance with the loading conditions provided in the approved loading manual, stamped and dated ..... and signed by a responsible officer of the Administration, or of an organization recognized by the Administration<sup>3</sup>;
  - .2 in accordance with the loading limitations appended to this Certificate<sup>3</sup>.

---

<sup>3</sup> Delete as appropriate.

Where it is required to load the ship other than in accordance with the above instruction, then the necessary calculations to justify the proposed loading conditions shall be communicated to the certifying Administration who may authorize in writing the adoption of the proposed loading condition<sup>4</sup>.

This Certificate is valid until (dd/mm/yyyy): .....<sup>5</sup>  
 subject to surveys in accordance with 1.5 of the Code.

Completion date of the survey on which this certificate is based: .....  
 (dd/mm/yyyy)

Issued at .....  
 (Place of issue of certificate)

.....  
 (Date of issue)

.....  
 (Signature of authorized official  
 issuing duly the certificate)

(Seal or stamp of the authority, as appropriate)

Notes on completion of Certificate:

- 1 The Certificate can be issued only to ships entitled to fly the flags of States which are both a Contracting Government to the 1974 SOLAS Convention and a Party to MARPOL 73/78.
- 2 Ship Type: Any entry under this column must relate to all relevant recommendations, e.g. an entry “Type 2” means Type 2 in all respects prescribed by the Code.
- 3 Products: Products listed in chapter 17 of the Code, or which have been evaluated by the Administration in accordance with 1.1.6 of the Code, shall be listed. In respect of the latter “new” products, any special requirements provisionally prescribed shall be noted.
- 4 Products: The list of products the ship is suitable to carry shall include the Noxious Liquid Substances of Category Z which are not covered by the Code and shall be identified as “chapter 18 Category Z”.

<sup>4</sup> Instead of being incorporated in the Certificate, this text may be appended to the Certificate if signed and stamped.

<sup>5</sup> Insert the date of expiry as specified by the Administration in accordance with 1.5.6.1 of the Code. The day and the month of this day correspond to the anniversary date as defined in 1.3.3 of the Code, unless amended in accordance with 1.5.6.8 of the Code.





**ANNUAL/INTERMEDIATE SURVEY IN ACCORDANCE WITH PARAGRAPH 1.5.6.8.3**

THIS IS TO CERTIFY that, at an annual/intermediate<sup>3</sup> survey in accordance with paragraph 1.5.6.8.3 of the Code, the ship was found to comply with the relevant provisions of the Convention:

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

**ENDORSEMENT TO EXTEND THE CERTIFICATE IF VALID  
FOR LESS THAN 5 YEARS WHERE PARAGRAPH 1.5.6.3 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with paragraph 1.5.6.3 of the Code, be accepted as valid until (dd/mm/yyyy): .....

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

**ENDORSEMENT WHERE THE RENEWAL SURVEY HAS BEEN  
COMPLETED AND PARAGRAPH 1.5.6.4 APPLIES**

The ship complies with the relevant provisions of the Convention, and this Certificate shall, in accordance with paragraph 1.5.6.4 of the Code, be accepted as valid until (dd/mm/yyyy): .....

Annual survey:

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

---

<sup>3</sup> Delete as appropriate.

**ENDORSEMENT TO EXTEND THE VALIDITY OF THE CERTIFICATE  
UNTIL REACHING THE PORT OF SURVEY OR FOR A PERIOD  
OF GRACE WHERE PARAGRAPH 1.5.6.5 OR 1.5.6.6 APPLIES**

This Certificate shall, in accordance with paragraph 1.5.6.5/1.5.6.6<sup>3</sup> of the Code, be accepted as valid until (dd/mm/yyyy): .....

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

**ENDORSEMENT FOR ADVANCEMENT OF ANNIVERSARY DATE WHERE  
PARAGRAPH 1.5.6.8 APPLIES**

In accordance with paragraph 1.5.6.8 of the Code, the new anniversary date is (dd/mm/yyyy): .....

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

In accordance with paragraph 1.5.6.8, the new anniversary date is (dd/mm/yyyy): .....

Signed .....  
(Signature of duly authorized official)

Place .....

Date (dd/mm/yyyy) .....

*(Seal or stamp of the Authority, as appropriate)*

---

<sup>3</sup> Delete as appropriate.



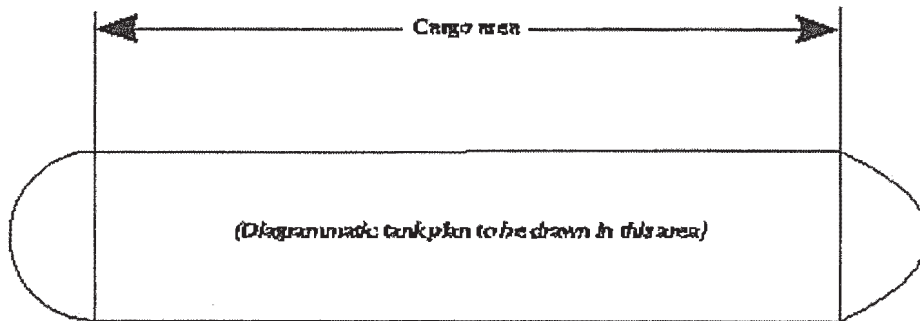
**ATTACHMENT 2  
TO THE  
INTERNATIONAL CERTIFICATE OF FITNESS FOR THE CARRIAGE OF  
DANGEROUS CHEMICALS IN BULK**

**TANK PLAN (specimen)**

Name of ship: .....

Distinctive number or letters: .....

.....



Date .....  
(dd/mm/yyyy)  
(as for Certificate)

.....  
(Signature of official issuing the Certificate  
and/or seal of issuing authority)"

二零一五年八月六日於行政長官辦公室

辦公室主任 柯嵐

Gabinete do Chefe do Executivo, aos 6 de Agosto de 2015.

— A Chefe do Gabinete, O Lam.



印務局  
Imprensa Oficial

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PREÇO DESTE NÚMERO \$ 761,00