標題

MEPC64 の審議結果の紹介

ClassNK
テクニカル
インフォメーション

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各位

2012 年 10 月 1 日から 2012 年 10 月 5 日にかけて開催された IMO の第 64 回海洋環境保護委員会（MEPC64）での情報及び審議結果について次の通りお知らせいたします。

1. バラスト水管理条約関連

2004 年に採択されたバラスト水管理条約は、30 ヶ国以上の批准かつ批准国の合計商船船腹量が世界の商船船腹量の 35%以上となった 12 ヵ月後に発効することとなっています。2012 年 12 月末時点では、36 ヶ国が批准、合計商船船腹量に対する比率は 29.07％であり、現在未発効となっております。

(1) バラスト水処理装置の搭載状況及び装置搭載時期のリスケジュールの検討

バラスト水処理装置の開発状況、当該システムの船舶の搭載に関わる課題に対処するため、MEPC にて処理装置の技術的レビューが継続的に実施されております。

また、前回 MEPC63（2012 年 3 月）において、日本から現時点のバラスト水処理装置の搭載状況に関する資料が提出されたことを受け、処理装置の搭載状況に関する情報を MEPC64 に提出するよう各国に要請されていました。

今回の会合では、日本、中国、韓国及び香港等から、バラスト水処理装置の搭載状況について報告があった結果、当該装置の搭載率が世界的に非常に低いことが認識されました。そのため、バラスト水処理装置の適用時期に関する当面の取り扱いについて、コレスポンデンスグループ（e-mail ベースの検討会）にて検討が進められることとなりました。

(2) 活性物質を用いたバラスト水処理装置の承認

バラスト水管理条約で規定されるバラスト水処理装置は、IMO のガイドラインに基づいて主管庁による承認（型式承認）が必要とされています。なお、同装置に有害水生生物や病原菌を殺傷・滅菌するための「活性物質」が使用される場合は、主管庁による型式承認に先立ち、IMO による活性物質単体の承認（基本承認）、及び処理装置としての総合的な承認（最終承認）が必要となります。

今回の会合において、活性物質を用いたバラスト水処理装置について、5 件の基本承認、及び 3 件の最終承認が与えられました。この結果、IMO によって最終承認が与えられた装置は、合計 28 件となりました。

現時点では、実際に船舶に搭載可能な（主管庁による型式承認が付与された）装置の数は、活性物質を用いない装置も含め、28 件となっています（添付 1 参照）。

（次頁に続く）

(3) 「主要な改造」の定義について
バラスト水管理条約附属書の条文解釈上、既存船へ処理装置の新規搭載が、附属書に規定される「主要な改造」に該当するか否かが不明確となっています。今回の会合では、日本から、バラスト水処理装置の設置に伴う船舶の改造は「主要な改造」として取り扱うべきではないとの提案があり、審議の結果、当該提案は合意され、次回 MEPC65（2013 年 5 月）にて MEPC サーキュラーを作成することとなりました。

2. シップリサイクル条約関連
2009 年 5 月に採択されたシップリサイクル条約は、15 カ国以上の批准、批准国の船腹量合計が世界船腹量の 40%以上、かつ批准国の直近 10 年における最大の年間解体船腹量の合計が批准国の合計船腹量の 3%以上となった後、24 ヶ月後に発効することとなっています。2012 年 12 月末時点では、5 カ国（フランス、イタリア、オランダ、トルコ及びセントキッツ・ネーヴィス）の政府が同条約へ批准する準備を進めていることを表明（署名）していますが、実際の批准には至っておりません。

(1) 条約の実施に必要なガイドライン等の詳細検討
現在 IMO では、同条約の実施に必要な合計 6 本の各種ガイドライン等を開発しており、前回 MEPC63 までに 4 本のガイドラインが採択されていました。今回の会合では、未採択であった「検査と証書に関するガイドライン」（添付 2 参照）及び「PSC に関するガイドライン」（添付 3 参照）の 2 つのガイドライン案が採択されました。これにより、シップリサイクル条約に付随する 6 つのガイドラインのすべてが策定されたことになりました。
なお、ICS（The International Chamber of Shipping）、BIMCO（The Baltic and International Maritime Council）等の海運団体等から、有害物質インベントリの作成に関して、閾値が設定されていない有害物質の閾値を明確にすべきとの指摘、及び船舶全体で合計しても微量となる有害物質（はんだに含まれる鉛等）をインベントリ作成の対象から除外すべきであるとの提案等がありました。これらについては、コレスポンデンスグループにて検討が進められ、次回 MEPC65 にて審議されることとなりました。

3. 温室効果ガス（GHG）関連
温室効果ガス（GHG）の削減を国際的に定めた国連気候変動枠組み条約（UNFCCC）の京都議定書では、外航船舶をその対象外としており、IMO が国際海運からの GHG 排出の抑制対策を検討することとされています。
2011 年 7 月に開催された MEPC62 では、エネルギー効率設計指標（EEDI）の算定及び規制値への適合並びに船舶エネルギー効率管理計画（SEEMP）の船舶への据え置き等を義務化する MARPOL 条約附属書 VI の改正が採択されました（本改正は 2013 年 1 月 1 日に発効）。

(1) 条約の解釈の検討
今回の会合では、発効の迫った改正附属書 VI の実施に必要な条約の解釈について検討が行われました。その結果、以下の統一解釈が合意され、MEPC サーキュラーが承認されました（添付 4 参照）。

(i) EEDI 要件が適用される Phase 1 から 3 における新造船の定義
（改正附属書 VI の 2.23 規則関連）
EEDI の規制値が厳しくなる Phase 1、Phase 2 及び Phase 3 のそれぞれの要件が適用される「新造船」の定義を明確にする内容。

（次頁に続く）

(ii) EEDI 要件における主要な改造の定義（改正附属書 VI の 2.24 規則関連）
「主要な改造」について、幾つかの具体的な例を示すと共に、原則としていかなる改造も「主要な改造」に当たるか否かを主管庁が判断するとの内容。

(iii) SEEMP の所持が要求される時期（改正附属書 VI の 22 規則関連）
既存船（2013 年 1 月 1 日より前に建造契約が交わされる船舶）の SEEMP の船上への搭載は、（当該附属書の発効日である 2013 年 1 月 1 日時点に搭載が要求されるのではなく、）2013 年 1 月 1 日以降の最初の IAPP 証書に関する中間検査又は更新検査のどちらか早い方の時期までに搭載する必要があるとする内容。

(2) 各種ガイドラインの検討等
EEDI の計算に必要となる次のガイドラインについても、今回の会合で審議が行われました。

(i) 荒天下での操船を確保するための最低推進出力ガイドライン
EEDI の導入に伴い、極端な速力低下等を避ける目的で検討されている同ガイドラインについて審議が行われたものの最終化には至らず、今次会合の議論をベースに、2012 年 11 月末に開催の第 91 回海上安全委員会（MSC91）において暫定ガイドラインを作成することになりました。また、これと並行して、次回 MEPC65 までに、本ガイドラインについて更なる詳細検討を進めることになりました。

(ii) 実海域における船舶の速力低下係数を計算するためのガイドライン
EEDI を計算する際に、実海域での影響を考慮した補正係数（*fw*）を計算するための暫定ガイドインが承認されました（添付 5 参照）。

(3) 船舶のエネルギー効率改善についての技術移転・技術協力に関する決議の検討
改正附属書 VI の 23 規則においては、船舶のエネルギー効率改善について、途上国に対する技術移転及び技術協力を促進することが規定されています。
現在 MEPC では、当該技術移転及び技術協力を実施するための決議について継続的に審議が行われています。今回の会合においても、国連気候変動枠組条約の CBDR[*1)]原則の適用や財政的支援の実施等に関する各国間の見解は合意に至らず、次回 MEPC65 にて引き続き審議されることとなりました。

注*1）CBDR: The Common but Differentiated Responsibility 地球温暖化への責任は世界各国に共通するが、今日の大気中の温室効果ガスの大部分は先進国が過去に発生したものであることから、先進国と開発途上国の責任に差異をつけることを謳った概念。

(4) 経済的手法の検討
IMO においては、改正 MARPOL 条約附属書 VI で規定している技術的及び運航的な方法による GHG 削減策を補完する手法として、燃料油課金、排出権取引等の経済的手法（MBM: Market Based Measure）による方法について検討が進められています。
今回の会合では、上述の技術移転及び技術協力に関する決議についての審議に時間を要し、経済的手法の具体的な審議は行われず、次回 MEPC65 にて審議されることとなりました。

（次頁に続く）

4. MARPOL 条約附属書 V（船舶からの廃物による汚染防止）の実施に関するガイドライン
MEPC62 で採択された改正 MARPOL 条約附属書 V（船舶からの廃物による汚染防止）により、2013 年 1 月 1 日以降は、船舶で発生した廃棄物の海洋への投棄は原則的に禁止されることとなります。ただし、貨物残渣については、海洋環境に有害でないものに限り、沿岸から 12 海里以上離れた海域での排出が認められます。
貨物残渣の海洋環境への有害性は、(1)毒性があるもの、(2)長期の健康有害性（発がん性、生殖毒性等）があるもの、及び(3)プラスチック類で分類されますが、(2)長期の健康有害性があるものについては、その評価に時間を要するため、2013 年 1 月 1 日からの実施は困難であるとの指摘が前回 MEPC63 にてあり、継続審議となっていました。
今回の会合では、日本等から提出された、「長期の健康有害性に関する評価ができない貨物残渣については 2013 年 1 月 1 日から 2014 年 12 月 31 日までの 2 年間、海洋環境に有害なものとは分類されない」とする内容が合意され、サーキュラーが承認されました（添付 6 参照）。

5. 強制要件の採択
今回の会合では、危険化学品のばら積み運送のための船舶の構造及び設備に関する国際規則（IBC コード）の第 17 章、第 18 章及び第 19 章の改正が採択されました。同改正は、新たに査定された貨物の取り込み、一部貨物の電気設備グループ要件の見直しによるもので、2014 年 6 月 1 日に発効予定です（添付 7 参照）。

6. その他
(1) 国際油汚染防止（IOPP）証書の追補に関する廃油焼却炉能力の記載の削除
廃油焼却炉を船上に搭載している場合は、当該焼却炉の能力を IOPP 証書の追補に記載することとなっています。しかしながら、その能力の単位が当該焼却炉の型式承認証書に記載の単位と異なることがあり、PSC 等においてたびたび問題となっていました。今回の会合において、焼却炉の単位は IOPP 証書の追補に記載する必要がないことが合意され、同追補の書式の改正が承認されました。（次回 MEPC65 で採択される予定。）
(2) 港湾における高圧陸上電力の供給
停泊時における船舶の居住環境の維持やバラスト水管理等を行うための電力供給は、通常、船内の発電機エンジンが使用されます。しかしながら、発電機エンジンの使用は、停泊中の船舶からの大気汚染や騒音の発生につながります。
これらを解決するため、船舶に陸上電力を供給する設備の運用が 2004 年にロサンゼルス港において開始され、IMO においても MEPC にて検討が行われております。
今回の会合では、現時点では同設備が利用できる港湾が限られているため、同設備に対する規定を MARPOL 条約に設けることは時期尚早であるとの結論に至りました。また、陸上電力を供給する設備が利用可能である港湾及び関連する国際規格に関する情報を、MEPC サーキュラーとして発行することが合意されました（添付 8 参照）。
本サーキュラーには、参考情報として、本会が 2012 年 5 月発行した「高圧陸電設備ガイドライン」等のインダストリーガイドラインのリストが含まれております。

なお、本 MEPC64 の審議概要につきましては IMO ホームページにも掲載されていますのでご参照下さい。(http://www.imo.org)

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なお、本件に関してご不明な点は、以下の部署にお問い合わせください。

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3. PSC に関するガイドライン (Resolution MEPC.223(64))
4. MARPOL 付属書 VI（GHG 関連）の統一解釈 (MEPC.1/Circ.795)
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7. IBC コード第 17 章、第 18 章及び第 19 章の改正 (Resolution MEPC.225(64))
8. 陸上電力を供給する設備が利用可能である港湾及び関連する国際規格に関する情報 (MEPC.1/Circ.794)

バラスト水処理装置の承認状況

メーカー名	製品名	国名	処理方法	活性物質(G9) IMO 承認状況		型式承認(G8)
				基本承認	最終承認	承認国
Alfa-Laval AB	PureBallast	スウェーデン	フィルター＋UV（光触媒）	取得済	取得済	ﾉﾙｳｪｰ
Ocean Saver AS	OceanSaver BWTS Mark I	ノルウェー	フィルター＋キャビテーション＋脱酸素＋電気分解	取得済	取得済	ﾉﾙｳｪｰ
Ocean Saver AS	OceanSaver BWTS Mark I I	ノルウェー	フィルター＋電気分解	取得済	取得済	ﾉﾙｳｪｰ
TECHCROSS INC	Electro-Clean	韓国	電気分解	取得済	取得済	韓国
日立ﾌﾟﾗﾝﾄﾃｸﾉﾛｼﾞｰ	Clear Ballast	日本	凝集磁気分離＋フィルター	取得済	取得済	日本
三井造船	FineBallast OZ	日本	フィルター＋オゾン＋キャビテーション	取得済	取得済	日本
JFE エンジニアリング㈱	JFE Ballast Ace	日本	フィルター＋TG Ballastcleaner（次亜塩素酸ナトリウム）＋ベンチュリ	取得済	取得済	日本
RWO	CleanBallast (Ectosys)	ｽｳｪｰﾃﾞﾝ	フィルター＋電気分解	取得済	取得済	ドイツ
Resource Ballast Technologies Pty	Resource Ballast Water Technologies System	南アフリカ	キャビテーション＋電気分解＋オゾン＋フィルター	取得済	取得済	南ｱﾌﾘｶ
PANASIA CO., LTD.	GloEn-Patrol	韓国	フィルター＋UV	取得済	取得済	韓国
NK CO., LTD.,	NK O3 Blue Ballast System	韓国	オゾン	取得済	取得済	韓国
Hamworthy Greenship B.V.	Greenship's Sedinox Ballast Water Management System	オランダ	遠心分離＋電気分解	取得済	取得済	
Ecochlor Inc.	Ecochlor Ballast Water Treatment System	アメリカ	フィルター＋二酸化塩素	取得済	取得済	ドイツ

メーカー名	製品名	国名	処理方法	活性物質(G9) IMO 承認状況		型式承認(G8)
				基本承認	最終承認	承認国
Hyundai Heavy Industries Co. Ltd.	HHI BWMS（EcoBallast）	韓国	フィルター＋UV	取得済	取得済	韓国
Aquaworx ATC GmbH	AquaTriComb Ballast Water treatment system	ドイツ	フィルター＋UV＋超音波	取得済		
SIEMENS	SiCURE BWMS	ドイツ	フィルター＋電気分解	取得済	取得済	
SunRui Marine Environment Engineering Company	BalClor BWMS	中国	フィルター＋電気分解	取得済	取得済	中国
DESMI Ocean Guard A/S	DESMI Ocean Guard BWMS	デンマーク	フィルター＋オゾン＋UV	取得済	**取得済**	
21st Century Shipbuilding Co., Ltd.	ARA Ballast	韓国	フィルター＋プラズマ＋UV	取得済	取得済	**韓国**
Hyundai Heavy Industries Co. Ltd.	HHI BWMS “HiBallast”	韓国	フィルター＋電気分解	取得済	取得済	韓国
Kwang San Co., Ltd.	KS BWMS “En-Ballast”	韓国	フィルター＋電気分解	取得済		
Qingdao Headway Technology Co., Ltd.	OceanGuard BWMS	中国	フィルター＋電気触媒＋超音波	取得済	取得済	中国
COSCO Shipbuilding Industrial Company	Blue Ocean Shield	中国	フィルター＋UV	取得済	N.A.	中国
Severn Trent DeNora	Severn Trent DeNora BalPure® BWMS	ドイツ	フィルター＋電気分解	取得済	取得済	**ドイツ**
Hamann AG*	SEDNA system	ドイツ	遠心分離器＋フィルター＋Peraclean Ocean（過酢酸/過酸化水素）	取得済	取得済	ドイツ
Samsung Heavy Industries Co., Ltd.	Purimar ™ System	韓国	フィルター＋電気分解	取得済	取得済	韓国
AQUA Eng. Co., Ltd.	AquaStar™ Ballast Water Management System	韓国	フィルター＋電気分解	取得済	取得済	**韓国**

メーカー名	製品名	国名	処理方法	活性物質(G9) IMO 承認状況		型式承認(G8)
				基本承認	最終承認	承認国
Kuraray Co., Ltd	MICROFADE™ Ballast Water Management System	日本	フィルター＋Kuraray AS（次亜塩素酸カルシウム）＋Kuraray NS（亜硫酸ナトリウム（中和剤））	取得済	取得済	**日本**
ERMA FIRST	ERMA FIRST Ballast Water Management System	ギリシャ	フィルター＋遠心分離器＋電気分解	取得済	取得済	**ドイツ**
Envirotech and Consultancy Pte. Ltd.	BlueSeas Ballast Water Management System	シンガポール	フィルター＋電気分解	取得済		
㈱片山化学工業研究所製	Ballast Water Management System with PERACLEAN® OCEAN (SKY-SYSTEM®)	日本	フィルター＋酢酸/過酸化水素	取得済		
JFE エンジニアリング㈱	JFE Ballast Ace (NEO-CHLOP MARINE)	日本	フィルター＋薬剤（ジクロロイソシアヌル酸ナトリウム 2 水塩）	取得済	**取得済**	
GEA Westfalia Separator Group GmbH	GEA Westfalia Separator BallastMaster Ballast Water Management System	ドイツ	フィルター＋次亜塩素酸ナトリウム	取得済		
Envirotech and Consultancy Pte. Ltd.	BlueWorld Ballast Water Management System	シンガポール	フィルター＋次亜塩素酸ナトリウム	取得済		
Samsung Heavy Industries Co., Ltd.	Neo-Purimar™ Ballast Water Management System	韓国	フィルター＋次亜塩素酸ナトリウム	取得済	取得済	
Environment Engineering Institute of Dalian Maritime University	DMU ·OH Ballast Water Management System	中国	フィルター＋チオ硫酸ナトリウム	取得済		
Hanla IMS Co., Ltd.	EcoGuardian™ Ballast Water Management System	韓国	フィルター＋電気分解	取得済		
STX Metal Co., Ltd.	Smart Ballast Ballast Water Management System	韓国	電気分解	取得済	**取得済**	
Korea Top Marine (KT Marine) Co., Ltd.	KTM-BWMS	韓国	Plankill pipe™(円柱ブロック)＋電気分解	**取得済**		
Hamworthy Water Systems Ltd.	Hamworthy Aquarius™-EC BWMS	オランダ	フィルター＋電解滅菌	**取得済**		
HWASEUNG R&A Co. Ltd.	HS-BALLAST	韓国	電気分解	**取得済**		

メーカー名	製品名	国名	処理方法	活性物質(G9) IMO 承認状況		型式承認(G8)
				基本承認	最終承認	承認国
PANASIA Co., Ltd	GloEn-Saver™	韓国	フィルター＋電解滅菌	**取得済**		
Jiujiang Precision Measuring Technology Research Institute	OceanDoctor	中国	フィルター＋光触媒	**取得済**		
住友電気工業㈱	SEI-Ballast Water Management System	日本	フィルター＋UV	**		

（**表中の下線**は、今回承認・審議又は報告されたことを意味する。）

* Hamann AG 社のバラスト水処理装置 SEDNA system 及び Resource Ballast Technologies Pty 社のバラスト水処理装置 Resource Ballast Water Technologies System については、メーカー撤退のため実質入手不可能。

** MEPC63 にて活性物質が使用されない装置であると判断され，基本承認及び最終承認ともに不要となった。

（参考）活性物質が使用されない旗国の G8 ガイドラインに従った型式承認を取得したバラスト水処理装置

メーカー名	製品名	国名	処理方法	活性物質(G9) IMO 承認状況		型式承認(G8)
				基本承認	最終承認	承認国
OptiMarin AS	OptiMar Ballast Systems	ノルウェー	フィルター + UV			ﾉﾙｳｪｰ
NEI Treatment System	Venturi Oxygen Stripping	アメリカ	脱酸素 + キャビテーション			ﾘﾍﾞﾘｱ
Hyde Marine Inc.	Hyde GURDIAN™	アメリカ	フィルター + UV			UK
Wuxi Brightskr Electronic Co., Ltd.,	BSKY™ BWMS	中国	フィルター + UV			中国
MAHLE Industrial Filtration	Ocean Protection System	ドイツ	フィルター + UV			ドイツ
Shanghai Cyeco Environmental Technology Co., Ltd.	Cyeco™ Ballast Water Management System	中国	フィルター + UV			**中国**

（**表中の下線**は、今回報告されたことを意味する。）

ANNEX 2

RESOLUTION MEPC.222(64)

Adopted on 5 October 2012

2012 GUIDELINES FOR THE SURVEY AND CERTIFICATION OF SHIPS UNDER THE HONG KONG CONVENTION

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Safe and Environmentally Sound Recycling of Ships held in May 2009 adopted the *Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009* (the Hong Kong Convention) together with six Conference resolutions,

NOTING that Article 5 of the Hong Kong Convention prescribes that ships subject to survey and certification shall be surveyed and certified in accordance with the regulations in the Annex to the Hong Kong Convention,

NOTING ALSO that regulation 10.2 of the Annex to the Hong Kong Convention requires that surveys of ships for the purpose of enforcement of the provisions of the Hong Kong Convention shall be carried out taking into account the guidelines developed by the Organization,

NOTING FURTHER that regulations 11.1 and 11.11 of the Annex to the Hong Kong Convention require that the International Certificate on Inventory of Hazardous Materials and the International Ready for Recycling Certificate shall be issued taking into account the guidelines developed by the Organization,

HAVING CONSIDERED, at its sixty-fourth session, the draft 2012 Guidelines for the Survey and Certification of Ships under the Hong Kong Convention developed by the Working Group on Ship Recycling,

1. ADOPTS the *2012 Guidelines for the survey and certification of ships under the Hong Kong Convention*, as set out in the annex to this resolution;

2. INVITES Governments to apply the *2012 Guidelines for the survey and certification of ships under the Hong Kong Convention* upon the entry into force of the Convention; and

3. REQUESTS the Committee to keep the Guidelines under review.

* * *

ANNEX

2012 GUIDELINES FOR THE SURVEY AND CERTIFICATION OF SHIPS UNDER THE HONG KONG CONVENTION

1 INTRODUCTION

1.1 Objective of the guidelines

Article 5 of the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, (hereafter referred to as "the Convention") prescribes that each party shall ensure that ships flying its flag or operating under its authority and subject to survey and certification are surveyed and certified in accordance with the regulations in the annex to the Convention. The purpose of this document is to provide guidelines for the survey and certification of ships under the Convention (hereafter referred to as "the guidelines"), covered in "Part C – Survey and certification" of the annex to the Convention (regulations 10 to 14). These guidelines will assist Administrations and recognized organizations in the uniform application of the provisions of the Convention and help shipowners, shipbuilders, suppliers, ship recycling facilities and other interested parties to understand the process of conducting surveys and issuing and endorsing certificates.

1.2 Approach of the guidelines

These guidelines provide the procedures for conducting surveys to ensure that ships comply with the Convention, and the requirements for issuing and endorsing an International Certificate on Inventory of Hazardous Materials and issuing an International Ready for Recycling Certificate.

1.3 These guidelines apply to surveys of ships of 500 gross tonnage and above, as specified in article 3 of the Convention.

1.4 In the event that a new survey method is developed, or in the event that the use of a certain Hazardous Material is prohibited and/or restricted, or in the light of any other relevant experience gained, these guidelines may need to be revised in the future.

2 DEFINITIONS

The terms used in these guidelines have the same meaning as those defined in article 2 of the Convention and regulation 1 of the annex to the Convention, unless expressly provided otherwise.

2.1 "Date of Construction", as referred to in the forms of the International Certificate on Inventory of Hazardous Materials and the International Ready for Recycling Certificate, means the date used by the Administration to determine whether the ship is a "new ship" or an "existing ship" in accordance with the relevant provisions of regulations 1.3 and 1.4 of the Annex to the Convention.

3 SURVEYS

3.1 Initial survey

The aim of the initial survey is to verify whether part I of the Inventory of Hazardous Materials has been prepared in accordance with the Convention requirements. There are different requirements for the initial surveys of new ships and for those of existing ships.

3.1.1 Initial survey for new ships[1]

3.1.1.1 In the case of a new ship, an initial survey should be conducted before the ship is put in service.

3.1.1.2 Prior to the initial survey for a new ship, a request for the initial survey should be submitted by the shipowner or shipyard to the Administration or to a recognized organization along with the ship data required for the International Certificate on Inventory of Hazardous Materials, as follows:

.1 name of ship;
.2 distinctive number or letters;
.3 port of registry;
.4 gross tonnage;
.5 IMO number;
.6 name and address of shipowner;
.7 IMO registered owner identification number;
.8 IMO company identification number; and
.9 date of construction.

3.1.1.3 The request for an initial survey for a new ship should be supplemented by Part I of the Inventory of Hazardous Materials – which identifies Hazardous Materials contained in ship structure and equipment, their location and approximate quantities – along with the Material Declaration and Supplier's Declaration of Conformity in accordance with the *2011 Guidelines for the Development of the Inventory of Hazardous Materials* (resolution MEPC.197(62), as amended), and all other documents used to develop the Inventory of Hazardous Materials.

3.1.1.4 The survey should verify that part I of the Inventory of Hazardous Materials identifies the Hazardous Materials contained in the ship structure and equipment, their location and approximate quantities, by checking the Material Declaration and Supplier's Declaration of Conformity, and should clarify that the ship complies with regulations 4 and 5 of the annex to the Convention. The survey should also verify that the Inventory of Hazardous Materials, especially the location of Hazardous Materials, is consistent with the arrangements, structure and equipment of the ship, through onboard visual inspection.

3.1.1.5 The International Certificate on Inventory of Hazardous Materials should be issued either by the Administration or by any person or organization authorized by it, after successful completion of the initial survey, to any new ships to which regulation 10 of the annex to the Convention applies.

3.1.2 Initial survey for existing ships

3.1.2.1 In the case of an existing ship, an initial survey should be conducted before the International Certificate on Inventory of Hazardous Materials is issued and not later than five years after the entry into force of the Convention. The initial survey should be harmonized with the renewal surveys required by other applicable statutory instruments of the Organization, in line with regulations 5.2 and 10.5 of the annex to the Convention and with the principles established in resolution A.1053(27), as amended (*Survey Guidelines under the Harmonized System of Survey and Certification (HSSC), 2011*).

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[1] In ascertaining whether a ship is a "new ship" or an "existing ship" according to the Convention, the term "a similar stage of construction" in regulation 1.4.2 of the annex to the Convention means the stage at which:

.1 construction identifiable with a specific ship begins; and
.2 assembly of that ship has commenced comprising at least 50 tonnes or one per cent of the estimated mass of all structural material, whichever is less.

3.1.2.2 Prior to the initial survey for an existing ship, a request for the initial survey should be submitted by the shipowner to the Administration or to a recognized organization along with the ship data required for the International Certificate on Inventory of Hazardous Materials as listed in paragraph 3.1.1.2 above.

3.1.2.3 The request for an initial survey for an existing ship should be supplemented by Part I of the Inventory of Hazardous Materials, and/or the visual/sampling check plan developed in accordance with the *2011 Guidelines for the development of the inventory of hazardous materials*.

3.1.2.4 Part I of the Inventory of Hazardous Materials – which identifies Hazardous Materials contained and/or potentially contained in ship structure and equipment, their location and approximate quantities – should be developed through a visual check and/or sampling check on board the ship, based on the visual/sampling check plan in accordance with the *2011 Guidelines for the development of the inventory of hazardous materials*. It should then be submitted by the shipowner to the Administration or a recognized organization along with supporting information such as the report of the visual/sampling check and/or any Material Declaration and Supplier's Declaration of Conformity.

3.1.2.5 The visual/sampling check plan and Part I of the Inventory of Hazardous Materials should be prepared by personnel with the requisite knowledge and experience to conduct the assigned task, in accordance with the *2011 Guidelines for the development of the inventory of hazardous materials*, as may be amended.

3.1.2.6 The survey should verify that Part I of the Inventory of Hazardous Materials identifies the Hazardous Materials contained and/or potentially contained in the ship structure and equipment, their location and approximate quantities, by checking supporting information such as the report of the visual check and/or sampling check and/or any Material Declaration and Supplier's Declaration of Conformity. The survey should also clarify that the ship complies with regulations 4 and 5 of the annex to the Convention. Classification as "potentially containing hazardous materials" should be noted in the remarks column of the Inventory of Hazardous Materials. The survey should further verify that the Inventory of Hazardous Materials, especially the location of Hazardous Materials, is consistent with the arrangements, structure and equipment of the ship, through onboard visual inspection.

3.1.2.7 The International Certificate on Inventory of Hazardous Materials should be issued either by the Administration or by any person or organization authorized by it, after successful completion of the initial survey, to any existing ships to which regulation 10 of the annex to the Convention applies, except for existing ships for which an initial and a final survey are conducted at the same time; in such cases, only an International Ready for Recycling Certificate should be issued.

3.2 Renewal survey

3.2.1 A renewal survey should be carried out at intervals specified by the Administration not exceeding five years.

3.2.2 Prior to the renewal survey, a request for the renewal survey should be submitted by the shipowner to the Administration or to a recognized organization along with the ship data required for the International Certificate on Inventory of Hazardous Materials as listed in paragraph 3.1.1.2 above.

3.2.3 The request for a renewal survey should be supplemented by the latest version of part I of the Inventory of Hazardous Materials, and Material Declaration and Supplier's Declaration of Conformity regarding any change, replacement or significant repair of structure, equipment, systems, fittings, arrangements and material since the last survey.

3.2.4 The survey should verify that part I of the Inventory of Hazardous Materials is properly maintained and updated to reflect changes in ship structure and equipment, by checking Material Declaration and Supplier's Declaration of Conformity, and should clarify that the ship complies with regulations 4 and 5 of the annex to the Convention. The survey should also verify that the Inventory of Hazardous Materials, especially the location of Hazardous Materials, is consistent with the arrangements, structure and equipment of the ship, through on-board visual inspection. The survey should further verify that any decision by the shipowner to delete equipment, system and/or area previously classed as "potentially containing hazardous materials" from Part I of the Inventory of Hazardous Materials is based on clear grounds for believing that the equipment, system and/or area in question contain no Hazardous Materials.

3.2.5 A new International Certificate on Inventory of Hazardous Materials should be issued either by the Administration or by any person or organization authorized by it after successful completion of the renewal survey, in accordance with regulation 11 of the annex to the Convention.

3.3 Additional survey

3.3.1 An additional survey, either general or partial according to the circumstances, may be conducted at the request of the shipowner after change, replacement or significant repair of the structure, equipment, systems, fittings, arrangements and material, which has an impact on the Inventory of Hazardous Materials.

3.3.2 Prior to the additional survey, a request for the additional survey should be submitted by the shipowner to the Administration or to a recognized organization along with the ship data required for the International Certificate on Inventory of Hazardous Materials as listed in paragraph 3.1.1.2 above.

3.3.3 The request for an additional survey should be supplemented by the latest version of part I of the Inventory of Hazardous Materials, and Material Declaration and Supplier's Declaration of Conformity regarding any change, replacement or significant repair of structure, equipment, systems, fittings, arrangements and material since the last survey.

3.3.4 The survey should verify that Part I of the Inventory of Hazardous Materials is properly maintained and updated to reflect changes in ship structure and equipment, by checking Material Declaration and Supplier's Declaration of Conformity, and should clarify that the ship complies with regulations 4 and 5 of the annex to the Convention. The survey should also verify that the Inventory of Hazardous Materials, especially the location of Hazardous Materials, is consistent with the arrangements, structure and equipment of the ship, through on-board visual inspection. The survey should further verify that any decision by the owner to delete equipment, system and/or area previously classed as "potentially containing hazardous materials" from Part I of the Inventory of Hazardous Materials is based on clear grounds for believing that the equipment, system and/or area in question contain no Hazardous Materials.

3.3.5 The International Certificate on Inventory of Hazardous Materials should be endorsed either by the Administration or by any person or organization authorized by it after successful completion of the additional survey, in accordance with regulation 11 of the annex to the Convention.

3.4 Final survey

3.4.1 A final survey should be conducted before a ship is taken out of service and before the recycling of the ship has started.

3.4.2 Prior to the final survey, a request for the final survey should be submitted by the shipowner to the Administration or to a recognized organization along with the ship data listed in paragraph 3.1.1.2 above and the Ship Recycling Facility data required for the International Ready for Recycling Certificate as follows:

.1 name of the Ship Recycling Facility(ies);

.2 distinctive Recycling Company identity number (as listed on the Document of Authorization to conduct Ship Recycling (DASR));

.3 full address; and

.4 date of expiry of DASR.

In cases where multiple Ship Recycling Facilities are involved, the appropriate information for all the Facilities should be provided prior to the final survey.

3.4.3 The request for a final survey should be supplemented by:

.1 the International Certificate on Inventory of Hazardous Materials, the Inventory of Hazardous Materials, and Material Declaration and Supplier's Declaration of Conformity regarding any change, replacement or significant repair of the structure, equipment, systems, fittings, arrangements and/or material since the last survey;

.2 the approved Ship Recycling Plan; and

.3 a copy of the DASR.

3.4.4 Prior to the final survey:

.1 Part I of the Inventory of Hazardous Materials should be properly maintained and updated to reflect changes in ship structure and equipment, and Part II for operationally generated wastes and Part III for stores should be developed by the shipowner taking account of planned or expected operations before the arrival at the Ship Recycling Facility, and of the *2011 Guidelines for the development of the inventory of hazardous materials*, as may be amended; and

.2 the Ship Recycling Plan should be developed by the authorized Ship Recycling Facility, taking account of information including the Inventory of Hazardous Materials provided by the shipowner; as required by regulation 9 of the annex to the Convention, the Ship Recycling Plan should be either explicitly or tacitly approved by the Competent Authority authorizing the Ship Recycling Facility.

3.4.5 The survey should verify the following:

.1 that the Inventory of Hazardous Materials as required by regulation 5.4 of the annex to the Convention is in accordance with the requirements of the Convention, including that part I of the Inventory of Hazardous Materials is properly maintained and updated to reflect changes in ship structure and equipment since the last survey, and that parts II and III of the Inventory of Hazardous Materials identify the Hazardous Materials on board the ship, their location and approximate quantities; planned or expected operations during the period between the final survey and the arrival at the Ship Recycling Facility should be taken into consideration;

.2 that the Ship Recycling Plan, as required by regulation 9 of the annex to the Convention, properly reflects the information contained in the Inventory of Hazardous Materials as required by regulation 5.4 and contains information concerning the establishment, maintenance and monitoring of Safe-for-entry and Safe-for-hot-work conditions; in the case of tacit approval of the Ship Recycling Plan, the written acknowledgement of receipt of the Ship Recycling Plan sent by the Competent Authority in accordance with regulation 9.4 and the end date of the 14-day review period should also be verified;

.3 that the Ship Recycling Facility(ies) where the ship is to be recycled holds a valid DASR in accordance with the Convention; and

.4 that any decision by the shipowner to delete equipment, system and/or area previously classed as "potentially containing hazardous materials" from the Part I of the Inventory of Hazardous Materials is based on clear grounds for believing that the equipment, system and/or area in question contain no Hazardous Materials.

3.4.6 The International Ready for Recycling Certificate should be issued either by the Administration or by any person or organizations authorized by it, after successful completion of the final survey, to any ships to which regulation 10 of the annex to the Convention applies.

3.5 Flag transfer

3.5.1 The certificates cease to be valid when a ship transfers to the flag of another State and the Government of the State to which the ship transfers should not issue new certificates until it is fully satisfied that the Inventory of Hazardous Materials is being properly maintained and that there have been no unauthorized changes to the structure, machinery or equipment. When so requested, the Government of the State whose flag the ship was formerly entitled to fly is obliged to forward as soon as possible to the new Administration a copy of the certificate carried by the ship before the transfer and, if available, copies of the relevant survey reports and records. When fully satisfied by an inspection that the Inventory of Hazardous Materials is being properly maintained and that there have been no unauthorized changes, the new Administration may, in order to maintain harmonization of the surveys, give due recognition to initial and subsequent surveys carried out by or on behalf of the former Administration and issue new certificates having the same expiry date as the certificates that ceased to be valid because of the change of flag.

3.5.2 The Government of the State to which the ship transfers should also make sure that the Inventory of Hazardous Materials complies with the legislation, guidelines and any additional requirements of this State.

3.5.3 If the flag transfer takes place after the final survey and after the International Ready for Recycling Certificate has been issued, the Government of the State to which the ship transfers should not issue the new certificate until fully satisfied that the conditions on the basis of which the International Ready for Recycling Certificate had been issued remain valid.

4 SURVEYS OF SHIPS PRIOR TO ENTRY INTO FORCE OF THE CONVENTION

4.1 Prior to the entry into force of the Convention, an Administration may conduct surveys of ships in accordance with these guidelines, and may then issue a statement of compliance to that effect.

4.2 Ships capable of documenting full compliance with the Convention through such a statement of compliance may be issued with a certificate on that basis upon entry into force of the Convention, subject to any additional requirements by the Administration. For the certificate to be issued, it may not be necessary for the ships to prepare the visual/sampling check plan required by regulation 5.2 of the annex to the Convention if the Inventory of Hazardous Materials has been developed in accordance with the process stipulated in either paragraph 4.1 or 4.2 of the *2011 Guidelines for the Development of the Inventory of Hazardous Materials* and has been verified through the process of issuing the statement of compliance.

5 MARKET SURVEILLANCE

5.1 Each party may undertake market surveillance whereby sample analyses are conducted on equipment or materials which are on their market complete with Material Declaration and Supplier's Declaration of Conformity and which have not yet been placed on board, in order to ensure the appropriate enforcement of article 9 of the Convention and the accuracy of the Material Declaration and Supplier's Declaration of Conformity.

5.2 Where Material Declaration and Supplier's Declaration of Conformity are detected by market surveillance to be inaccurate, each party and the Organization should take the necessary measures by applying articles 10 and 12 of the Convention.

5.3 When conducting market surveillance and taking the necessary measures under these guidelines, all possible efforts should be made not to impose an excessive burden on suppliers, ships and ship recycling facilities.

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ANNEX 3

RESOLUTION MEPC.223(64)

Adopted on 5 October 2012

2012 GUIDELINES FOR THE INSPECTION OF SHIPS UNDER THE HONG KONG CONVENTION

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by the international conventions for the prevention and control of marine pollution,

RECALLING ALSO that the International Conference on the Safe and Environmentally Sound Recycling of Ships held in May 2009 adopted the *Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009* (the Hong Kong Convention) together with six Conference resolutions,

NOTING that article 8 of the Hong Kong Convention prescribes that a ship to which the Hong Kong Convention applies may, in any port or offshore terminal of another Party, be subject to inspection by officers duly authorized by that Party for the purpose of determining whether the ship is in compliance with the Convention, taking into account the guidelines developed by the Organization,

HAVING CONSIDERED, at its sixty-fourth session, the draft 2012 Guidelines for Inspection of Ships under the Hong Kong Convention developed by the Working Group on Ship Recycling,

1. ADOPTS the *2012 Guidelines for the inspection of ships under the Hong Kong Convention*, as set out in the annex to this resolution;

2. INVITES Governments to apply the *2012 Guidelines for the inspection of ships under the Hong Kong Convention* upon the entry into force of the Convention; and

3. REQUESTS the Committee to keep the Guidelines under review.

* * *

ANNEX

2012 GUIDELINES FOR THE INSPECTION OF SHIPS UNDER THE HONG KONG CONVENTION

1 GENERAL

1.1 This document is intended to provide basic guidance for conducting port State control inspections in compliance with the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, (hereafter referred to as "the Convention") and to afford consistency in conducting these inspections, recognizing deficiencies and applying control procedures.

1.2 The regulations of the Convention contain the following compliance provisions:

.1 an International Certificate on Inventory of Hazardous Materials is required for all ships, except ships of less than 500 gross tonnage, ships operating throughout their life only in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly, and existing ships for which both an initial survey and a final survey are conducted at the same time, in which case the International Ready for Recycling Certificate is issued after the survey;

.2 Administrations may establish appropriate alternative measures to demonstrate compliance by ships of less than 500 gross tonnage and/or ships operating throughout their life only in waters subject to the sovereignty or jurisdiction of the State whose flag the ship is entitled to fly; and

.3 an International Ready for Recycling Certificate is required for all ships of 500 gross tonnage or above being taken out of service and before the recycling of the ship has started.

1.3 Article 8 of the Convention provides for control procedures to be followed by a State party with regard to foreign ships visiting its ports. The *Procedures for Port State Control, 2011*, adopted through Assembly resolution A.1052(27), apply in addition to these guidelines.

2 INSPECTIONS OF SHIPS REQUIRED TO CARRY AN INTERNATIONAL CERTIFICATE ON INVENTORY OF HAZARDOUS MATERIALS OR INTERNATIONAL READY FOR RECYCLING CERTIFICATE

2.1 Initial inspections

2.1.1 After boarding and having been introduced to the master or responsible ship's officer, the port State control officer (PSCO) should verify that there is on board the International Certificate on Inventory of Hazardous Materials (regulation 11.1)[1] or the International Ready for Recycling Certificate (regulation 11.11), both supplemented by the Inventory of Hazardous Materials, and examine reports of previous port State control inspections.

[1] As required by regulations 5.2 and 11.1, for existing ships, an International Certificate on Inventory of Hazardous Materials, accompanied by the verified Inventory of Hazardous Materials, shall be issued not later than five years after the entry into force of the Convention, except for those ships for which both an initial survey and a final survey are conducted at the same time.

2.1.2 The validity of the International Certificate on Inventory of Hazardous Materials or International Ready for Recycling Certificate should also be confirmed by verifying that the certificate is properly completed and signed and that the required surveys have been performed, and that the identification/verification number on the Inventory of Hazardous Materials corresponds to that shown on the certificate(s).

2.1.3 If the certificate and the Inventory of Hazardous Materials are valid and appropriate, and the PSCO's general impressions and visual observations on board confirm compliance with the Convention, the PSCO should generally confine the inspection to any reported deficiencies.

2.1.4 If, however, the PSCO's general impressions or observations on board reveal clear grounds (see paragraph 2.1.5) for believing that the condition of the ship, or its structure or equipment, do not correspond substantially with the particulars of the certificate or with the Inventory of Hazardous Materials, the PSCO may proceed to a more detailed inspection.

2.1.5 Clear grounds to conduct a more detailed inspection include:

.1 evidence that a certificate required by the Convention is missing or clearly invalid;

.2 evidence that the Inventory of Hazardous Materials required by the Convention is missing or clearly invalid;

.3 the absence of structure or equipment identified in part I of the Inventory of Hazardous Materials;

.4 the absence of an entry in part I of the Inventory of Hazardous Materials for structure or equipment that the PSCO believes to contain Hazardous Materials listed in appendices 1 and 2 to the Convention[2]; and

.5 no evidence of implementation of a procedure on board the ship for maintaining part I of the Inventory of Hazardous Materials.

2.2 More detailed inspections

The PSCO should verify that controls of Hazardous Materials listed in appendix 1 to the Convention are effectively implemented, referring to relevant certificates[3] or documents that may specify structure or equipment presumed to contain these Hazardous Materials. The PSCO should note that detailed inspections are limited to confirming whether effective controls of Hazardous Materials listed in appendix 1 to the Convention are in place. Failure to update the Inventory of Hazardous Materials should not, therefore, constitute a detainable deficiency, but any inconsistencies in the Inventory should be reported to the flag Administration of that ship, and should be redressed at the time of the next survey.

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[2] For this purpose, a reference should be made to the indicative list that identifies any equipment, system and/or area on board that is presumed to contain Hazardous Materials, as noted in section 2.2 of appendix 5 of the *2011 Guidelines for the Development of the Inventory of Hazardous Materials* (resolution MEPC.197(62), as amended).

[3] For example, the International Air Pollution Prevention (IAPP) Certificate should be referred to for ozone-depleting substances.

2.3 Detainable deficiencies

2.3.1 In exercising its functions, the PSCO should use professional judgment to determine whether to detain a ship until any noted deficiencies are corrected or to allow it to sail with certain deficiencies that do not pose an unreasonable threat to the safe and environmentally sound recycling of ships. In doing so, the PSCO should be guided by the principles and requirements of the Convention.

2.3.2 In order to assist the PSCO in the use of these guidelines, there follows a list of deficiencies which are considered to be of such a serious nature that they may warrant the detention of the ship involved:

.1 failure to carry a valid International Certificate on Inventory of Hazardous Materials, or, if appropriate, a valid International Ready for Recycling Certificate;

.2 non-compliance with the control measures for Hazardous Materials listed in appendix 1 to the Convention.

3 INSPECTIONS OF NON-PARTY SHIPS

3.1 Ships of non-Parties to the Convention are not entitled to be issued with an International Certificate on Inventory of Hazardous Materials or an International Ready for Recycling Certificate. Therefore, the PSCO should ask for documentation that contains the same information as in the above certificates supplemented by the Inventory of Hazardous Materials and take this into account in determining compliance with the relevant requirements of the Convention.

3.2 In all other aspects the PSCO should be guided by the procedures for ships required to carry a certificate.

3.3 The PSCO should ensure that, in accordance with article 3.4 of the Convention, no more favourable treatment is applied to ships of non-Parties to the Convention.

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INTERNATIONAL MARITIME ORGANIZATION

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4 ALBERT EMBANKMENT
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MEPC.1/Circ.795
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UNIFIED INTERPRETATIONS TO MARPOL ANNEX VI

1 The Marine Environment Protection Committee, at its sixty-fourth session (1 to 5 October 2012), approved Unified Interpretations to MARPOL Annex VI (MEPC 64/23, paragraphs 4.25 and 4.112.5).

2 The Unified Interpretations, as approved by the Committee, are set out in the annex hereto.

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ANNEX

UNIFIED INTERPRETATIONS TO MARPOL ANNEX VI

Regulation 2
Definitions

Regulation 2.23 reads as follows:

"23 *New ships* means a ship:

.1 for which building contract is placed on or after 1 January 2013; or

.2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013; or

.3 the delivery of which is on or after 1 July 2015."

***Interpretation*:**

For application of the definition "new ships" specified in regulation 2.23 of MARPOL Annex VI to each Phase specified in table 1 of regulation 21 of MARPOL Annex VI, it should be interpreted as follows:

.1 the date specified in regulation 2.23.1 of MARPOL Annex VI should be replaced with the start date of each Phase;

.2 the date specified in regulation 2.23.2 of MARPOL Annex VI should be replaced with the date six months after the start date of each Phase; and

.3 the date specified in regulation 2.23.3 of MARPOL Annex VI, should for Phase 1, 2 and 3 be replaced with the date 48 months after the start date of each Phase.

With the above interpretations, the required EEDI of each Phase is applied to the following new ship which falls into one of the categories defined in regulations 2.25 to 2.31 of MARPOL Annex VI and to which chapter 4 of MARPOL Annex VI is applicable.

(a) The required EEDI of Phase 0 is applied to the following new ship:

.1 for which the building contract is placed in Phase 0, and the delivery is before 1 January 2019; or

.2 the building contract of which is placed before Phase 0, and the delivery is on or after 1 July 2015 and before 1 January 2019; or

in the absence of a building contract,

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2013 and before 1 July 2015, and the delivery is before 1 January 2019; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2013, and the delivery is on or after 1 July 2015 and before 1 January 2019.

(b) The required EEDI of Phase 1 is applied to the following new ship:

.1 for which the building contract is placed in Phase 1, and the delivery is before 1 January 2024; or

.2 the building contract of which is placed before Phase 1, and the delivery is on or after 1 January 2019 and before 1 January 2024; or

in the absence of a building contract,

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2015 and before 1 July 2020, and the delivery is before 1 January 2024; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2015, and the delivery is on or after 1 January 2019 and before 1 January 2024.

(c) The required EEDI of Phase 2 is applied to the following new ship:

.1 for which the building contract is placed in Phase 2, and the delivery is before 1 January 2029; or

.2 the building contract of which is placed before Phase 2, and the delivery is on or after 1 January 2024 and before 1 January 2029; or

in the absence of a building contract,

.3 the keel of which is laid or which is at a similar stage of construction on or after 1 July 2020 and before 1 July 2025, and the delivery is before 1 January 2029; or

.4 the keel of which is laid or which is at a similar stage of construction before 1 July 2020, and the delivery is on or after 1 January 2024 and before 1 January 2029.

(d) The required EEDI of Phase 3 is applied to the following new ship:

.1 for which the building contract is placed in Phase 3; or

.2 in the absence of a building contract, the keel of which is laid or which is at a similar stage of construction on or after 1 July 2025; or

.3 the delivery of which is on or after 1 January 2029.

Regulation 2.24 reads as follows:

"24 *Major Conversion* means in relation to chapter 4 of this Annex a conversion of a ship:

.1 which substantially alters the dimensions, carrying capacity or engine power of the ship; or

.2 which changes the type of the ship; or

.3 the intent of which in the opinion of the Administration is substantially to prolong the life of the ship; or

.4 which otherwise so alters the ship that, if it were a new ship, it would become subject to relevant provisions of the present Convention not applicable to it as an existing ship; or

.5 which substantially alters the energy efficiency of the ship and includes any modifications that could cause the ship to exceed the applicable required EEDI as set out in regulation 21 of this Annex."

***Interpretation*:**

1 For regulation 2.24.1 of MARPOL Annex VI, any substantial change in hull dimensions and/or capacity (e.g. change of length between perpendiculars (L_{PP}) or change of assigned freeboard) should be considered a major conversion. Any substantial increase of total engine power for propulsion (e.g. 5 per cent or more) should be considered a major conversion. In any case, it is the Administration's authority to evaluate and decide whether an alteration should be considered as major conversion, consistent with chapter 4 of MARPOL Annex VI.

2 Notwithstanding paragraph 1, for regulation 2.24.5 of MARPOL Annex VI, the effect on attained EEDI as a result of any change of ship's parameters, particularly any increase in total engine power for propulsion, should be investigated. In any case, it is the Administration's authority to evaluate and decide whether an alteration should be considered as major conversion, consistent with chapter 4 of MARPOL Annex VI.

3 A company may, at any time, voluntarily request re-certification of EEDI with IEE Certificate reissuance on the basis of any new improvements to the ship efficiency that are not considered to be major conversion.

4 In regulation 2.24.4 of MARPOL Annex VI, terms "new ship" and "existing ship" should be understood as they are used in MARPOL Annex I regulation 1.9.1.4, rather than as the defined terms in regulations 2.22 and 2.23.

5 The term "a ship" referred to in regulation 5.4.2 of MARPOL Annex VI is interpreted as "new ship."

Regulation 2.30 reads as follows:

"30 *Refrigerated cargo carrier* means a ship designed exclusively for the carriage of refrigerated cargoes in holds."

***Interpretation*:**

Ships dedicated to the carriage of fruit juice in refrigerated cargo tanks should be categorized as refrigerated cargo carrier.

Regulation 5
Surveys

Regulation 5.4.4 reads as follows:

".4 For existing ships, the verification of the requirement to have a SEEMP on board according to regulation 22 shall take place at the first intermediate or renewal survey identified in paragraph 1 of this regulation, whichever is the first, on or after 1 January 2013."

Regulation 6
Issue or endorsement of a Certificates

Regulation 6.4 reads as follows:

"4 An International Energy Efficiency Certificate for the ship shall be issued after a survey in accordance with the provisions of regulation 5.4 of this Annex to any ship of 400 gross tonnage and above before that ship may engage in voyages to ports or offshore terminals under the jurisdiction of other Parties."

Regulation 22
Ship Energy Efficiency Management Plan (SEEMP)

Regulation 22.1 reads as follows:

"1 Each ship shall keep on board a ship specific Ship Energy Efficiency Management Plan (SEEMP). This may form part of the ship's Safety Management System (SMS)."

***Interpretation*:**

1 The International Energy Efficiency Certificate (IEEC) shall be issued for both new and existing ships to which chapter 4 of MARPOL Annex VI applies.

2 The SEEMP required by regulation 22.1 of MARPOL Annex VI is not required to be placed on board an existing ship to which this regulation applies until such time as the verification survey specified in regulation 5.4.4 of MARPOL Annex VI is carried out.

3 For existing ships, a Ship Energy Efficiency Management Plan (SEEMP) required in accordance with regulation 22 shall be verified on board according to regulation 5.4.4, and an IEEC shall be issued, not later than the first intermediate or renewal MARPOL Annex VI chapter 2 survey, whichever is the sooner, on or after 1 January 2013, i.e. a survey connected to an intermediate/renewal survey of the IAPP Certificate.

4 The intermediate or renewal survey referenced in 2 relates solely to the timing for the verification of the SEEMP on board, i.e. these IAPPC survey windows will also become the IEEC initial survey date for existing ships. The SEEMP is however a survey item solely under the new MARPOL Annex VI, chapter 4, and is not a survey item relating to IAPPC surveys.

5 In the event that the SEEMP is not found on board during the first intermediate/renewal survey of the IAPP Certificate on or after 1 January 2013, then the RO should seek the advice of the Administration concerning the issuance of an IEEC and be

guided accordingly. However, the validity of the IAPP Certificate is not impacted by the lack of a SEEMP as the SEEMP is a survey item solely under the new MARPOL Annex VI, chapter 4, and not under the IAPPC surveys.

6 With respect to ships required to keep on board a SEEMP, such ships exclude platforms (including FPSOs and FSUs) and drilling rigs, regardless of their propulsion.

7 SEEMP should be established in a working language or languages understood by ship's personnel.

Regulation 8
Form of Certificates

Regulation 8.1 reads as follows:

> "1 The International Air Pollution Prevention Certificate shall be drawn up in a form corresponding to the model given in appendix I to this Annex and shall be at least in English, French or Spanish. If an official language of the issuing country is also used, this shall prevail in case of a dispute or discrepancy."

Appendix 1
Form of International Air Pollution Prevention (IAPP) Certificate (Regulation 8)

Section 2.3 of supplement to International Air Pollution Prevention Certificate reads as follows:

"2.3 Sulphur oxides (SO_x) and particulate matter (regulation 14)

2.3.1 When the ship operates outside of an Emission Control Area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of:

- 4.50% m/m (not applicable on or after 1 January 2012); or ☐
- 3.50% m/m (not applicable on or after 1 January 2020); or ☐
- 0.50% m/m, and/or ☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of:

- 4.50% m/m (not applicable on or after 1 January 2012); or ☐
- 3.50% m/m (not applicable on or after 1 January 2020); or ☐
- 0.50% m/m ☐

2.3.2 When the ship operates inside an Emission Control Area specified in regulation 14.3, the ship uses:

.1 fuel oil with a sulphur content as documented by bunker delivery notes that does not exceed the limit value of:

- 1.00% m/m (not applicable on or after 1 January 2015); or ☐
- 0.10% m/m, and/or ☐

.2 an equivalent arrangement approved in accordance with regulation 4.1 as listed in 2.6 that is at least as effective in terms of SO_x emission reductions as compared to using a fuel oil with a sulphur content limit value of:

- 1.00% m/m (not applicable on or after 1 January 2015); or ☐
- 0.10% m/m ☐

"

***Interpretation*:**

Section 2.3 of the supplement ("as documented by bunker delivery notes") allows for an "x" to be entered in advance of the dates indicated in all of the relevant check boxes recognizing that the bunker delivery notes, required to be retained on board for a minimum period of three years, provide the subsequent means to check that a ship is actually operating in a manner consistent with the intent as given in section 2.3.

Regulation 16.9
Shipboard incineration

Regulation 16.9 reads as follows:

For incinerators installed in accordance with the requirements of paragraph 6.1 of this regulation the combustion chamber gas outlet temperature shall be monitored at all times the unit is in operation. Where that incinerator is of the continuous-feed type, waste shall not be fed into the unit when the combustion chamber gas outlet temperature is below 850°C. Where that incinerator is of the batch-loaded type, the unit shall be designed so that the combustion chamber gas outlet temperature shall reach 600°C within five minutes after start-up and will thereafter stabilize at a temperature not less than 850°C.

***Interpretation*:**

For application of this regulation the term "waste shall not be fed into the unit" should be interpreted as follows:

The introduction of sludge oil, generated during normal operation of a ship, into a continuous-feed type incinerator during the warm-up process at combustion chamber temperatures above 500°C* in order to achieve the normal operation combustion chamber temperature of 850°C is allowed. The combustion chamber flue gas outlet temperature should reach 850°C within the period of time specified in the manufacturer's operations manual but should not be more than five minutes.

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* For the introduction of sludge oil into the incinerator, two conditions need to be fulfilled to secure smokeless and complete combustion:

.1 the combustion chamber flue gas outlet temperature has to be above 850°C as required by regulation 16.9 of MARPOL Annex VI to ensure smokeless combustion; and

.2 the combustion chamber temperature (material temperature of the fire brickwork) has to be above 500°C to ensure a sufficient evaporation of the burnable components of the sludge oil.

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INTERIM GUIDELINES FOR THE CALCULATION OF THE COEFFICIENT f_w FOR DECREASE IN SHIP SPEED IN A REPRESENTATIVE SEA CONDITION FOR TRIAL USE

1 The Marine Environment Protection Committee, at its sixty-fourth session (1 to 5 October 2012), recognizing the need to develop guidelines for calculating the coefficient f_w contained in paragraph 2.9 of the *2012 Guidelines on the method of calculation of the attained Energy Efficiency Design Index for new ships* (resolution MEPC.212(63)), agreed to circulate the interim Guidelines for the calculation of the coefficient f_w for decrease in ship speed in a representative sea condition for trial use, as set out in the annex.

2 Member Governments are invited to bring the annexed interim Guidelines to the attention of their Administration, industry, relevant shipping organizations, shipping companies and other stakeholders concerned for trial use on a voluntary basis.

2 Member Governments and observer organizations are also invited to provide information of the outcome and experiences in applying the interim Guidelines to future sessions of the Committee.

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ANNEX

INTERIM GUIDELINES FOR THE CALCULATION OF THE COEFFICIENT f_w FOR DECREASE IN SHIP SPEED IN A REPRESENTATIVE SEA CONDITION FOR TRIAL USE

CONTENTS

INTRODUCTION

The purpose of these guidelines is to provide guidance on calculating the coefficient f_w, which is contained in the Energy Efficiency Design Index, in paragraph 2.9 in the *2012 Guidelines on the method of calculation of the attained Energy Efficiency Design Index for new ships (EEDI)*, adopted by MEPC.212(63).

f_w is a non-dimensional coefficient indicating the decrease in speed in a representative sea conditions of wave height, wave frequency and wind speed.

f_w should be determined by conducting the ship specific simulation on its performance at representative sea condition following the procedure specified in part 1: *Guidelines for the simulation for the coefficient f_w for decrease in ship speed in a representative sea condition*.

In cases where a simulation is not conducted, f_w should be determined based on the standard f_w curves following the procedure specified in part 2: *Guidelines for calculating the coefficient f_w from the standard f_w curves*.

Sample simulation and calculation of the coefficient f_w are shown in respective appendices to part 1 and part 2, and the procedures for deriving standard f_w curves are shown in appendix 2 of part 2.

PART 1: GUIDELINES FOR THE SIMULATION FOR THE COEFFICIENT F_W FOR DECREASE IN SHIP SPEED IN A REPRESENTATIVE SEA CONDITION

1 General

1.1 Application

1.1.1 The purpose of these guidelines is to provide guidance on conducting the simulation to obtain the coefficient f_w for an individual ship, which is contained in the EEDI.

1.1.2 These guidelines apply to ships of which ship resistance as well as brake power in a calm sea condition (no wind and no waves) is evaluated by tank tests, which mean model towing tests, model self-propulsion tests and model propeller open water tests. Numerical calculations may be accepted as equivalent to model propeller open water tests or used to complement the tank tests conducted (e.g. to evaluate the effect of additional hull features such as fins, etc., on ship's performance), with approval of the verifier for the EEDI.

1.1.3 The design parameters and the assumed conditions in the simulation to obtain the coefficient f_w should be consistent with those used in calculating the other components in the EEDI.

1.1.4 f_w may also be determined by the verifier's acceptance of the tank test and/or simulated data from the ship of the same type's performance in representative sea condition.

1.2 Method of calculation

1.2.1 Symbols

P_B : Brake power
R_T : Total resistance in a calm sea condition (no wind and no waves)
V_{ref} : Design ship speed when the ship is in operation in a calm sea condition (no wind and no waves)
V_w : Design ship speed when the ship is in operation under the representative sea condition
ΔR_{wave} : Added resistance due to waves
ΔR_{wind} : Added resistance due to wind
η_D : Propulsion efficiency
η_S : Transmission efficiency

Subscript w refers to wind and wave sea conditions.

1.2.2 The basic procedures in calculating decrease in ship speed is shown in figure 1.1. (See section 4 for more information.)

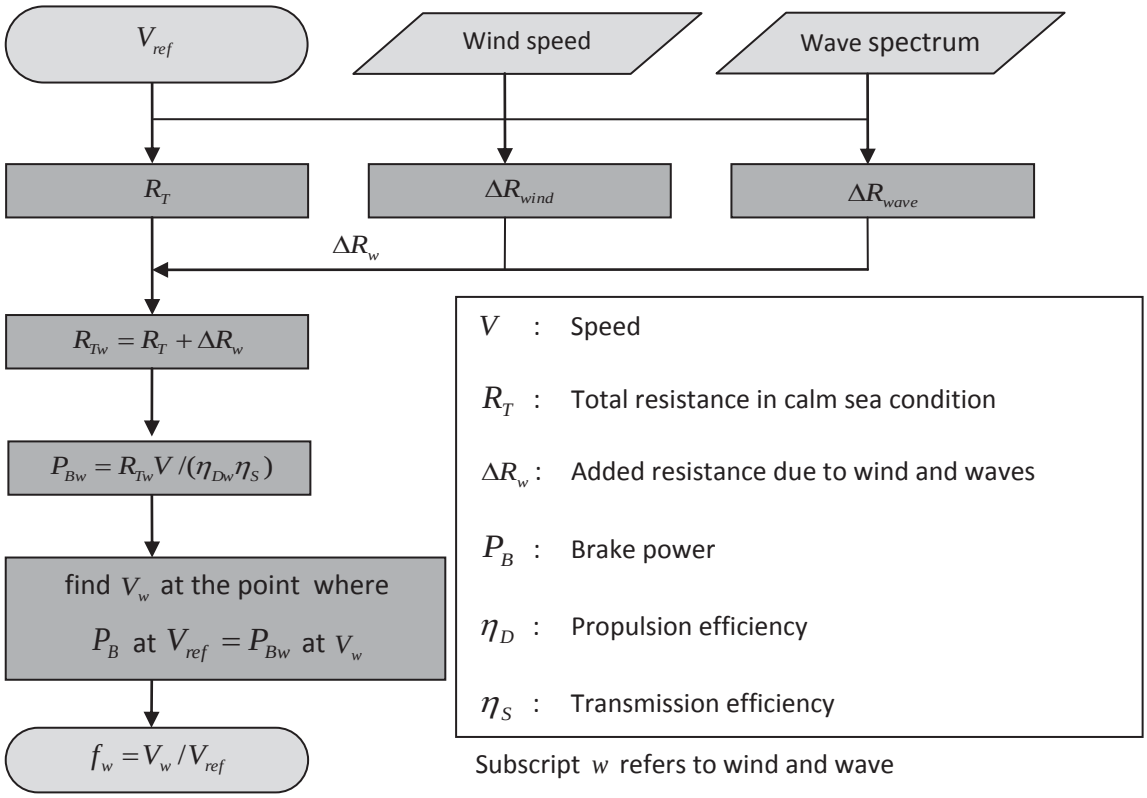


Figure 1.1: Flow chart of calculation for the decrease in ship speed

1.2.3 Relation between the power and the decrease of ship speed is shown in figure 1.2

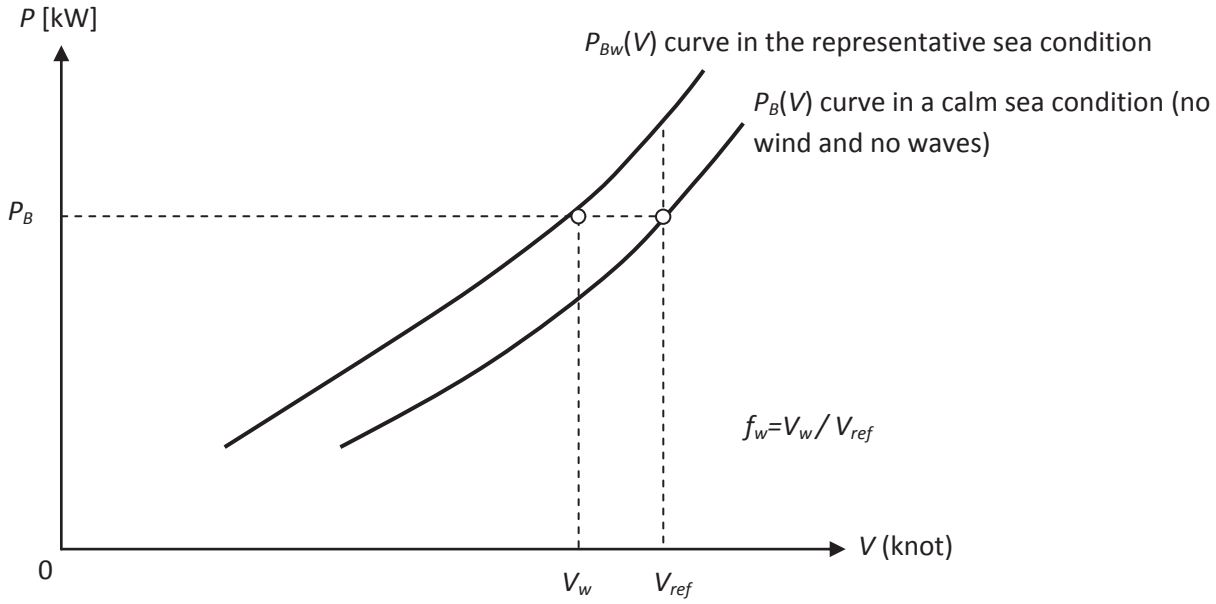


Figure 1.2: Relation between power and the decrease in ship speed

2 Representative sea condition

2.1 Representative sea condition

2.1.1 The representative sea condition for all ships is Beaufort 6, listed in table 2.1.

Table 2.1: Representative sea condition for all ships

	Mean wind speed U_{wind} (m/s)	Mean wind direction γ (deg)	Significant wave height H (m)	Mean wave period T (s)	Mean wave direction θ (deg)
BF6	12.6	0	3.0	6.7	0

2.1.2 The direction of wind and waves are defined as heading direction, which has the most significant effect on the speed reduction.

2.2 Wind condition

2.2.1 The mean wind speed and wind direction are given in table 2.1.

2.3 Wave condition

2.3.1 Symbols

D : Angular distribution function
E : Directional spectrum
H : Significant wave height
S : Frequency spectrum
T : Mean wave period
α : Angle between ship course and regular waves (angle 0(deg.) is defined as the head waves direction)
θ : Mean wave direction (θ = 0 (deg.))
ω : Circular frequency of incident regular waves

2.3.2 As ocean waves are characterized as irregular ones, the directional spectrum should be considered.

2.3.3 The significant wave height, mean wave period and mean wave direction are given in table 2.1. To obtain the mean wave period from the Beaufort scale, the following formula derived from a frequency spectrum for fully-developed wind waves is used.

$$T = 3.86\sqrt{H}$$

where, H is the significant wave height in metres and T is the mean wave period in seconds.

2.3.4 The directional spectrum (E) is composed of frequency spectrum (S) and angular distribution function (D).

$$E(\omega,\alpha;H,T,\theta) = S(\omega;H,T)D(\alpha;\theta)$$

$$S(\omega;H,T) = \frac{A_S}{\omega^5}\mathrm{e}^{-\frac{B_S}{\omega^4}}$$

where,

$$A_S = \frac{H^2}{4\pi}\left(\frac{2\pi}{T_z}\right)^4, \quad B_S = \frac{1}{\pi}\left(\frac{2\pi}{T_z}\right)^4, \quad T_z = 0.920T$$

$$D(\alpha,\theta) = \begin{cases} \frac{2}{\pi}\cos^2(\theta-\alpha) & \left(|\theta-\alpha| \le \frac{\pi}{2}\right) \\ 0 & (\text{others}) \end{cases}$$

3 Ship condition

3.1 The assumed ship conditions yield to the *2012 Guidelines on the method of calculation of the attained energy efficiency design index for new ships (EEDI)*, adopted by MEPC.212(63) (EEDI calculation guidelines, hereafter), constant main engine output (75 per cent of MCR, to be consistent with the one used in the EEDI calculation guidelines), and operation in steady navigating conditions on the fixed course.

3.2 The current effect is not considered.

4 Method of calculation

4.1 General

4.1.1 The total resistance in the representative sea condition, R_{Tw}, is calculated by adding ΔR_w, which is the added resistance due to wind and waves derived at 4.3, to the resistance R_T derived following the procedure specified in paragraph 1.1.2.

4.1.2 The ship speed V_w is the value of V where the brake power in the representative sea condition P_{Bw} equals to P_B, which is the brake power required for achieving the speed of V_{ref} in a calm sea condition.

4.1.3 Where P_{Bw} can be derived from the total resistance in the representative sea condition R_{Tw}, the properties for propellers and propulsion efficiency (η_D) should be derived from the formulas obtained from tank tests or an alternative method equivalent in terms of accuracy, and transmission efficiency (η_S) should be the proven value as verifiable as possible.

The brake power can also be obtained from the reliable self-propulsion tests.

$$P_B = R_T V / (\eta_D \eta_S)$$

4.1.4 The coefficient for decrease of ship speed f_w is calculated by dividing V_w by V_{ref} as follows:

$f_w = V_w / V_{ref}$ at the point where P_B at $V_{ref} = P_{Bw}$ at V_w

4.2 Total resistance in a calm sea condition: R_T

4.2.1 The total resistance in a calm sea condition is derived following the procedure specified in paragraph 1.1.2 as the function of speed.

4.3 Total resistance in the representative sea condition: R_{Tw}

4.3.1 The total resistance in the representative sea condition, R_{Tw}, is calculated by adding ΔR_{wind}, which is the added resistance due to wind, and ΔR_{wave}, which is the added resistance due to waves, to the total resistance in a calm sea condition R_T.

$$\begin{aligned} R_{Tw} &= R_T + \Delta R_w \\ &= R_T + \Delta R_{wind} + \Delta R_{wave} \end{aligned}$$

4.3.2 Added resistance due to wind: ΔR_{wind}

4.3.2.1 Symbols

A_L : Projected lateral area above the designated load condition
A_T : Projected transverse area above the designated load condition
B : Ship breadth
C : Distance from the midship section to the centre of the projected lateral area (A_L); a positive value of C means that the centre of the projected lateral area is located ahead of the midship section
C_{Dwind} : Drag coefficient due to wind
L_{OA} : Length overall
U_{wind} : Mean wind speed
ρ_a : Air density (1.226(kg/m^3))

4.3.2.2 Added resistance due to wind is calculated by the following formula on the basis of the mean wind speed and wind direction given in table 2.1.

$$\Delta R_{wind} = \frac{1}{2}\rho_a A_T C_{Dwind}\left\{\left(U_{wind} + V_w\right)^2 - V_{ref}{}^2\right\}$$

4.3.2.3 C_{Dwind} should be calculated by a formula with considerable accuracy, which has been confirmed by model tests in a wind tunnel. The following formula is known for the expression of C_{Dwind}, for example:

$$C_{Dwind} = 0.922 - 0.507\frac{A_L}{L_{OA}B} - 1.162\frac{C}{L_{OA}}$$

4.3.3 Added resistance due to waves: ΔR_{wave}

4.3.3.1 Symbols

H : Significant wave height
T : Mean wave period
V : Ship speed
α : Angle between ship course and regular waves (angle 0(deg.) is defined as the head waves direction)
θ : Mean wave direction
ζ_a : Amplitude of incident regular waves
ω : Circular frequency of incident regular waves

4.3.3.2 Irregular waves can be represented as linear superposition of the components of regular waves. Therefore added resistance due to waves ΔR_{wave} is also calculated by linear superposition of the directional spectrum (E) and added resistance in regular waves (R_{wave}).

$$\Delta R_{wave} = 2\int_0^{2\pi}\int_0^{\infty} \frac{R_{wave}(\omega,\alpha;V)}{\zeta_a{}^2} E(\omega,\alpha;H,T,\theta)\,d\omega\,d\alpha$$

4.3.3.3 Added resistance in irregular waves ΔR_{wave} should be determined by tank tests or a formula equivalent in terms of accuracy. In cases of applying the theoretical formula, added resistance in regular waves R_{wave} is calculated from the components of added resistance primary induced by ship motion in regular waves, R_{wm} and added resistance due to wave reflection in regular waves R_{wr} as an example.

$$R_{wave} = R_{wm} + R_{wr}$$

As an example, R_{wm} and R_{wr} are calculated by the method in 4.3.3.4 and 4.3.3.5.

4.3.3.4 Added resistance primary induced by ship motion in regular waves

(1) Symbols

g : Gravitational acceleration
$H(m)$: Function to be determined by the distribution of singularities which represent periodical disturbance by the ship
V : Ship speed
α : Angle between ship course and regular waves (angle 0(deg.) is defined as the head waves direction)
ρ : Fluid density
ω : Circular frequency of incident regular waves

(2) Added resistance primary induced by ship motion in regular waves R_{wm} is calculated as follows:

$$R_{wm} = \begin{cases} 4\pi\rho\left(-\int_{-\infty}^{m_3} + \int_{m_4}^{\infty}\right)\left|H_1(m)\right|^2 \frac{(m+K_0\Omega_e)^2(m+K\cos\alpha)}{\sqrt{(m+K_0\Omega_e)^4 - m^2K_0{}^2}}\,dm & \left(\Omega_e \le \frac{1}{4}\right) \\ 4\pi\rho\left(-\int_{-\infty}^{m_3} + \int_{m_4}^{m_2} + \int_{m_1}^{\infty}\right)\left|H_1(m)\right|^2 \frac{(m+K_0\Omega_e)^2(m+K\cos\alpha)}{\sqrt{(m+K_0\Omega_e)^4 - m^2K_0{}^2}}\,dm & \left(\Omega_e > \frac{1}{4}\right) \end{cases}$$

$$\Omega_e = \frac{\omega_e V}{g} \quad , \quad K = \frac{\omega^2}{g} \quad , \quad K_0 = \frac{g}{V^2}$$

$$\omega_e = \omega + KV\cos\alpha$$

$$m_1 = \frac{K_0\left(1 - 2\Omega_e + \sqrt{1-4\Omega_e}\right)}{2}$$

$$m_2 = \frac{K_0\left(1 - 2\Omega_e - \sqrt{1-4\Omega_e}\right)}{2}$$

$$m_3 = -\frac{K_0\left(1 + 2\Omega_e + \sqrt{1+4\Omega_e}\right)}{2}$$

$$m_4 = -\frac{K_0\left(1 + 2\Omega_e - \sqrt{1+4\Omega_e}\right)}{2}$$

4.3.3.5 Added resistance due to wave reflection in regular waves

(1) Symbols

B : Ship breadth
B_f : Bluntness coefficient, which is derived from the shape of water plane and wave direction
C_U : Coefficient of advance speed, which is determined on the basis of the guidance for tank tests
d : Ship draft
$F_n = V/\sqrt{L_{pp}g}$: Froude number (non-dimensional number in relation to ship speed)
g : Gravitational acceleration
I_1 : Modified Bessel function of the first kind of order 1
K : Wave number of regular waves
K_1 : Modified Bessel function of the second kind of order 1
L_{pp} : Ship length between perpendiculars
V : Ship speed
α : Angle between ship course and regular waves (angle 0(deg.) is defined as the head waves direction)
α_d : Effect of draft and frequency
ρ : Fluid density
ζ_a : Amplitude of incident regular waves
ω : Circular frequency of incident regular waves

(2) Added resistance due to wave reflection in regular waves is calculated as follows:

$$R_{wr} = \frac{1}{2}\rho g \zeta_a{}^2 B B_f (1 + C_U F_n)\alpha_d$$

$$\alpha_d = \frac{\pi^2 I_1^2(K_e d)}{\pi^2 I_1^2(K_e d) + K_1^2(K_e d)}$$

$$K_e = K\left(1 + \Omega \cos\alpha\right)^2$$

$$\Omega = \frac{\omega V}{g}$$

$$B_f = \frac{1}{B}\left\{\int_I \sin^2(\alpha + \beta_w)\sin\beta_w dl + \int_{II} \sin^2(\alpha - \beta_w)\sin\beta_w dl\right\}$$

where, dl is a line element along the water plane, β_w is the slope of line element along the waterline, and domains of integration are shown in the following figure.

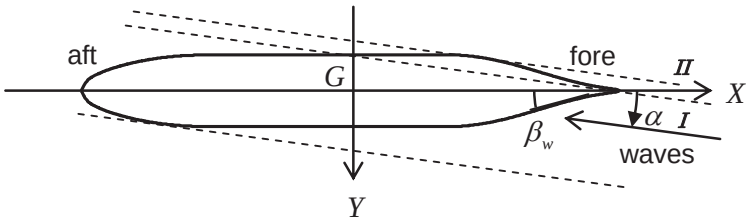


Figure 4.1: Coordinate system for wave reflection

(3) Effect of advance speed α_U is determined as follows:

$$\alpha_U = C_U(\alpha) F_n$$

(4) The coefficient of advance speed in oblique waves $C_U(\alpha)$ is calculated as follows:

$$C_U(\alpha) = \mathrm{Max}\left[F_S, F_C\right]$$

(i) $B_f(\alpha = 0) < B_{fc}$ or $B_f(\alpha = 0) < B_{fs}$

$$F_S = C_U(\alpha = 0) - 310\left\{B_f(\alpha) - B_f(\alpha = 0)\right\}$$

$$F_C = \mathrm{Min}\left[C_U(\alpha = 0), 10\right]$$

(ii) $B_f(\alpha = 0) \geq B_{fc}$ and $B_f(\alpha = 0) \geq B_{fs}$

$$F_S = 68 - 310 B_f(\alpha)$$

$$F_C = C_U(\alpha = 0)$$

where, $B_{fc} = \frac{58}{310}$, $B_{fs} = \frac{68 - C_U(\alpha = 0)}{310}$.

(5) The aforementioned coefficient $C_U(\alpha = 0)$ is determined by tank tests. The tank tests should be carried out in short waves since R_{wr} mainly works in short waves. The length of short waves should be 0.5 L_{pp} or less.

(6) Effect of advance speed in regular head waves α_U is calculated by the following equation where R_{wave}^{EXP} is added resistance obtained by the tank tests in regular head waves, and R_{wm} is added resistance due to ship motion in regular waves calculated by 4.3.3.4.

$$\alpha_U(F_n) = C_U F_n = \frac{R_{wave}^{EXP}(F_n) - R_{wm}(F_n)}{\frac{1}{2}\rho g \zeta_a{}^2 B B_f \alpha_d} - 1$$

(7) Effect of advance speed α_U is obtained for each speed of the experiment by the aforementioned equation. Thereafter the coefficient of advance speed $C_U(\alpha = 0)$ is determined by the least square method against F_n; see figure below. The tank tests should be conducted under at least three different points of F_n. The range of F_n should include the F_n corresponding to the speed in a representative sea condition.

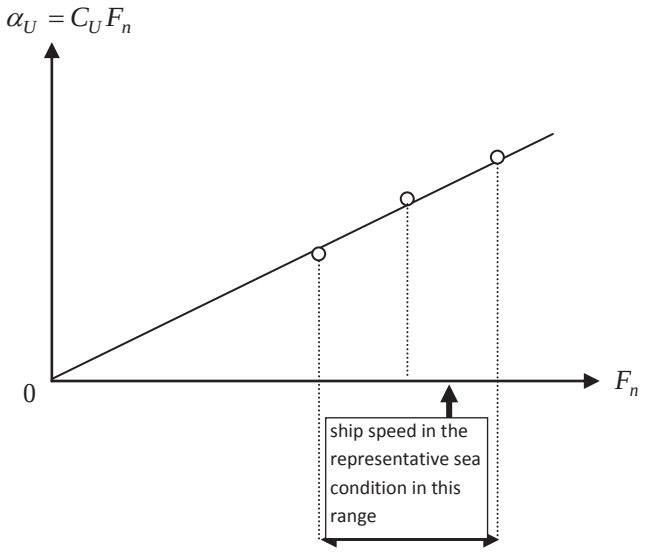


Figure 4.2: Determination of the coefficient of advance speed

* * *

APPENDIX

SAMPLE SIMULATION OF THE COEFFICIENT f_w

Sample: Bulk carrier

The subject ship is a bulk carrier shown in the following figure and the following table.

Figure 1: Subject ship

Table 1: Dimensions of the subject ship

Dimensions	Value	
Length between perpendiculars	217	m
Breadth	32.26	m
Draft	14	m
Ship speed	14.5	knot
Output power at MCR	9,070	kW
Deadweight	73,000	ton

Calculation of f_w from the ship specific simulation

The definition of symbols and paragraph number are followed by the *Guidelines for the simulation for the coefficient f_w for decrease in ship speed in a representative sea condition*.

1 The total resistance in a calm sea condition R_T is derived from tank tests* in a calm sea condition as the function of speed following paragraph 4.2 as shown in the following figure.

* The tank tests are conducted in the conventional ship design process for the evaluation of ship performance in a calm sea condition.

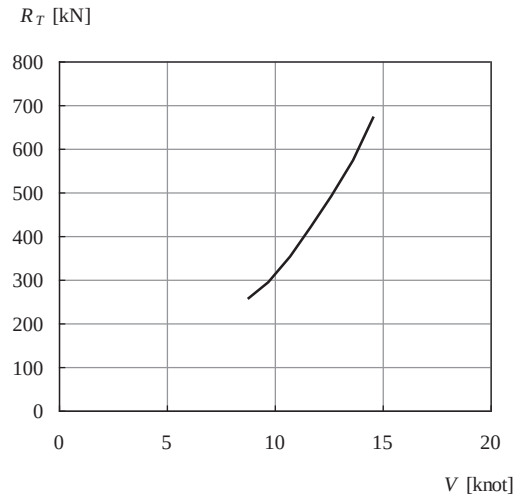


Figure 2: Resistance in a calm sea condition

2 The added resistance due to wind ΔR_{wind} is calculated following paragraph 4.3.2. For the subject ship, the drag coefficient due to wind C_{Dwind} is calculated as 0.853.

3 In the guidelines, the added resistance in regular waves R_{wave} is calculated from the components of added resistance primary induced by ship motion in regular waves R_{wm} and the added resistance due to wave reflection in regular waves R_{wr}.

R_{wm} and R_{wr} are calculated in accordance with paragraphs 4.3.3.4 and 4.3.3.5, respectively.

Here C_U in head waves is determined following the paragraphs from 4.3.3.5 (5) to (7).* For the subject ship, effect of advance speed α_U in head waves is obtained as shown in the following figure, and C_U is determined as 10.0.

* C_U is determined by tank tests in short waves. Since the ship motion is very small in short waves, the tests can be simply conducted with the same setting as the conventional resistance test, and the required time is about four hours.

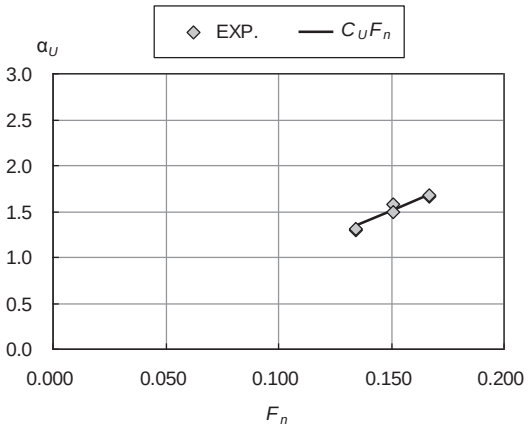
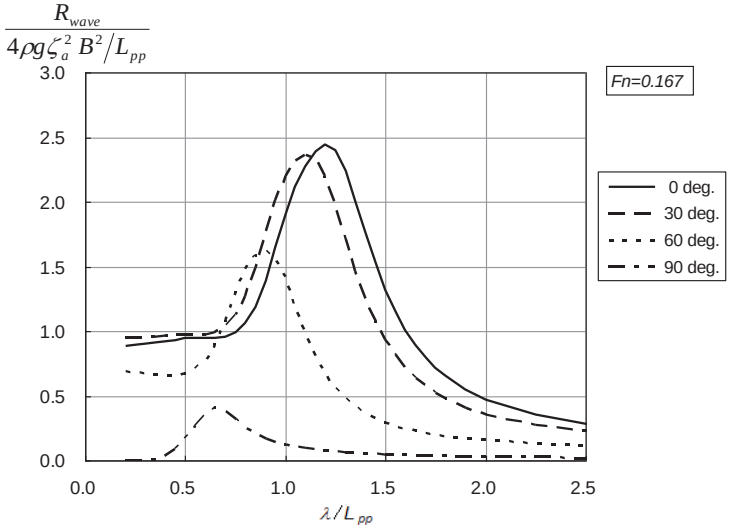


Figure 3: Effect of advance speed

4 With the obtained C_U, the added resistance in regular waves R_{wave} is calculated following the paragraph 4.3.3.3. For example, in the case of F_n=0.167, the non-dimensional value of the added resistance in regular waves is expressed as shown in the following figure.



0 deg. means head waves

Figure 4: Added resistance in regular waves

5 The added resistance due to waves in head waves ΔR_{wave} is calculated following paragraph 4.3.3.2. ΔR_{wave} in head waves at T = 6.7 (s) (BF6) is expressed as shown in the following figure. For obtaining the power curve, ΔR_{wave} is expressed as a function of ship speed from the calculated ΔR_{wave} at several ship speeds. In the sample calculation, ΔR_{wave} is expressed as a quartic function of ship speed.

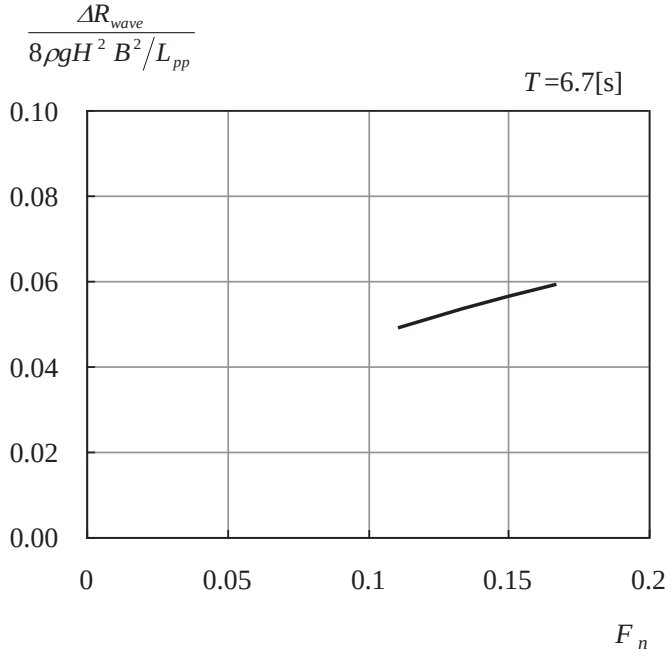


Figure 5: Added resistance due to waves

6 The total resistance in the representative sea condition R_{TW} is calculated following paragraph 4.3, and the brake power in the representative sea condition P_{BW} is calculated following paragraph 4.1.3. That is, R_{TW} is calculated as a sum of R_T, ΔR_{wind}, and ΔR_{wave} as shown in the following figure and P_{BW} is calculated by dividing $R_{TW}V$ by the propulsion efficiency in the representative sea condition η_{Dw} and the transmission efficiency η_S.

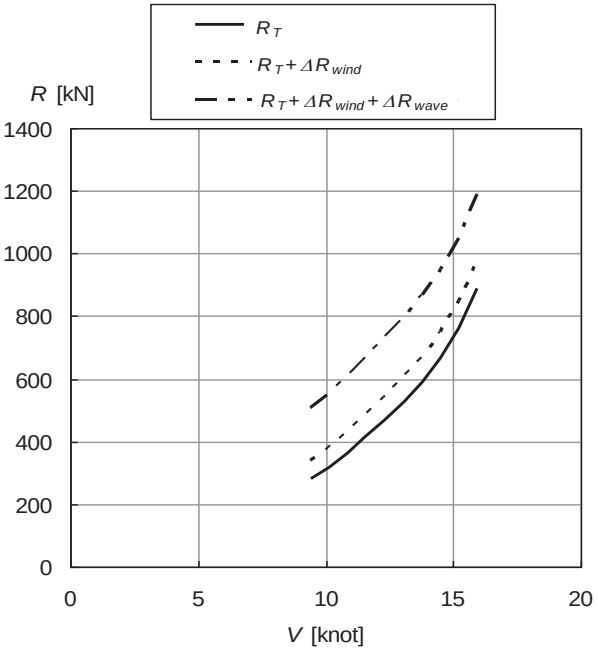


Figure 6: Total resistance in the representative sea condition

7 The self-propulsion factors and the propeller characteristics for the subject ship are shown in the following figures. Here $(1-w)$ is the wake coefficient in full scale, $(1-t)$ is the thrust deduction fraction, η_R is the propeller rotative efficiency, $J = V_a/(nD)$ is the advance coefficient, V_a is the advance speed of the propeller, n is the propeller revolutions, D is the propeller diameter, K_T is the propeller thrust coefficient, and K_Q is the propeller torque coefficient.

8 The propulsion efficiency η_D is expressed as follows:

$$\eta_D = \frac{1-t}{1-w}\eta_R\eta_o$$

where η_O is the propeller efficiency in open water obtained by the propeller characteristics.

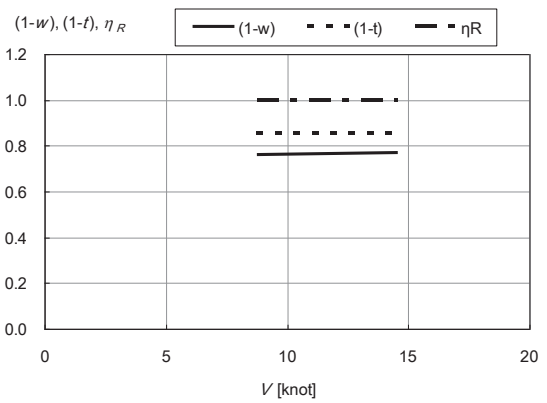


Figure 7: Self-propulsion factors

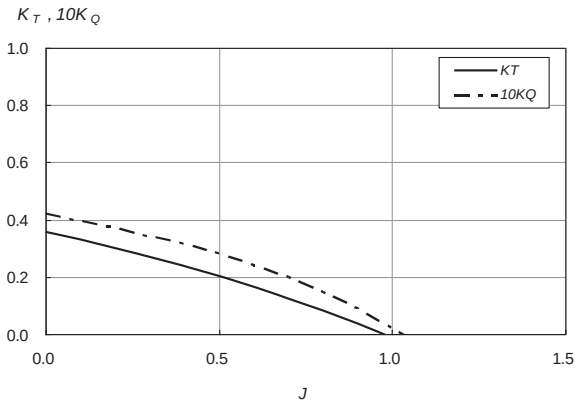


Figure 8: Propeller characteristics

9 The power curve in the representative sea condition is obtained by solving the equilibrium equation on a force in the longitudinal direction numerically.

The representative sea condition is BF6. The brake power in a calm sea condition (BF0) and that in the representative sea condition (BF6) are calculated as shown in the following figure.

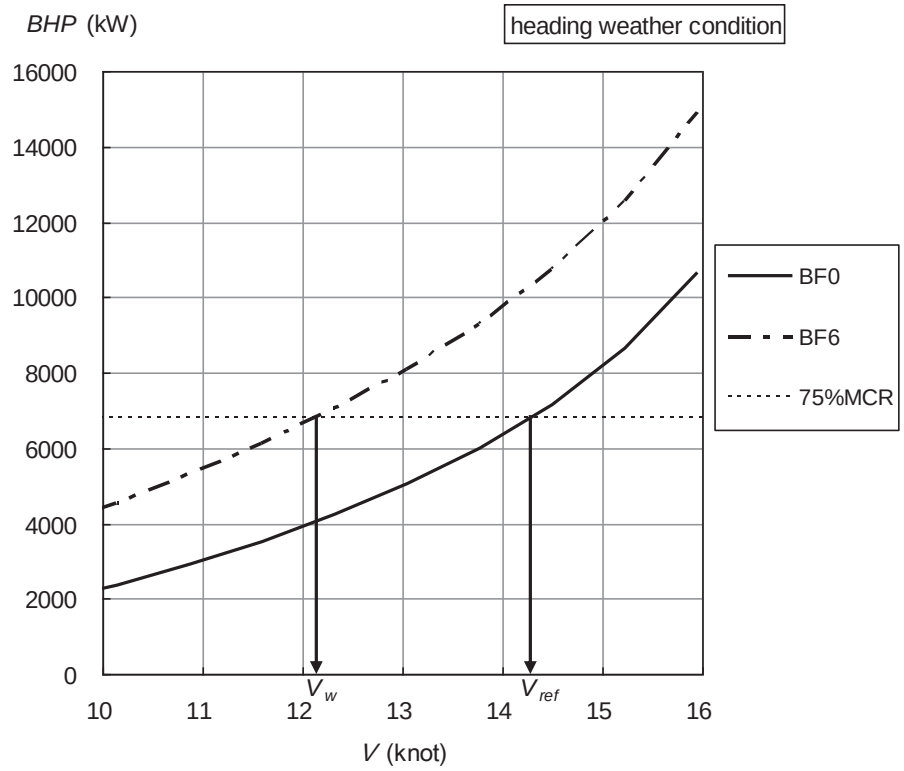


Figure 9: Power curves

10 Following paragraph 4.1.4, the coefficient of the decrease of ship speed f_w is calculated as 0.846 from V_w = 12.10(knot) and V_{ref} = 14.31(knot) at the output power of 75 per cent MCR: 6802.5(kW).

In the EEDI Technical File, f_w is listed as follows:

7.2 Calculated weather factor, f_w

f_w	0.846

PART 2: GUIDELINES FOR CALCULATING THE COEFFICIENT f_w FROM THE STANDARD f_w CURVES

1 Application

1.1 The purpose of these guidelines is to provide guidance on calculating the coefficient f_w from the standard f_w curves, which is contained in the EEDI.

1.2 These guidelines apply to ships for which a simulation is not conducted to obtain the coefficient f_w following *Guidelines for the simulation for the coefficient f_w for decrease in ship speed in a representative sea condition*.

1.3 The representative sea condition for each ship is defined in paragraph 2.1 in the *Guidelines for the simulation for the coefficient f_w for decrease in ship speed in a representative sea condition*.

1.4 The design parameters in the calculation of f_w from the standard f_w curves should be consistent with those used in the calculation of the other components in the EEDI.

2 Method of calculation

2.1 Three kinds of standard f_w curves are provided for bulk carriers, tankers and containerships, and expressed as a function of *Capacity* defined in the *2012 Guidelines on the method of calculation of the attained Energy Efficiency Design Index for new ships (EEDI)*, adopted by MEPC.212(63). Ship types are defined in regulation 2 in Annex VI to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended by resolution MEPC.203(62).

2.2 Each standard f_w curve has been obtained on the basis of data of actual speed reduction of existing ships under the representative sea condition in accordance with procedure for deriving standard f_w curves. (see appendix 2.)

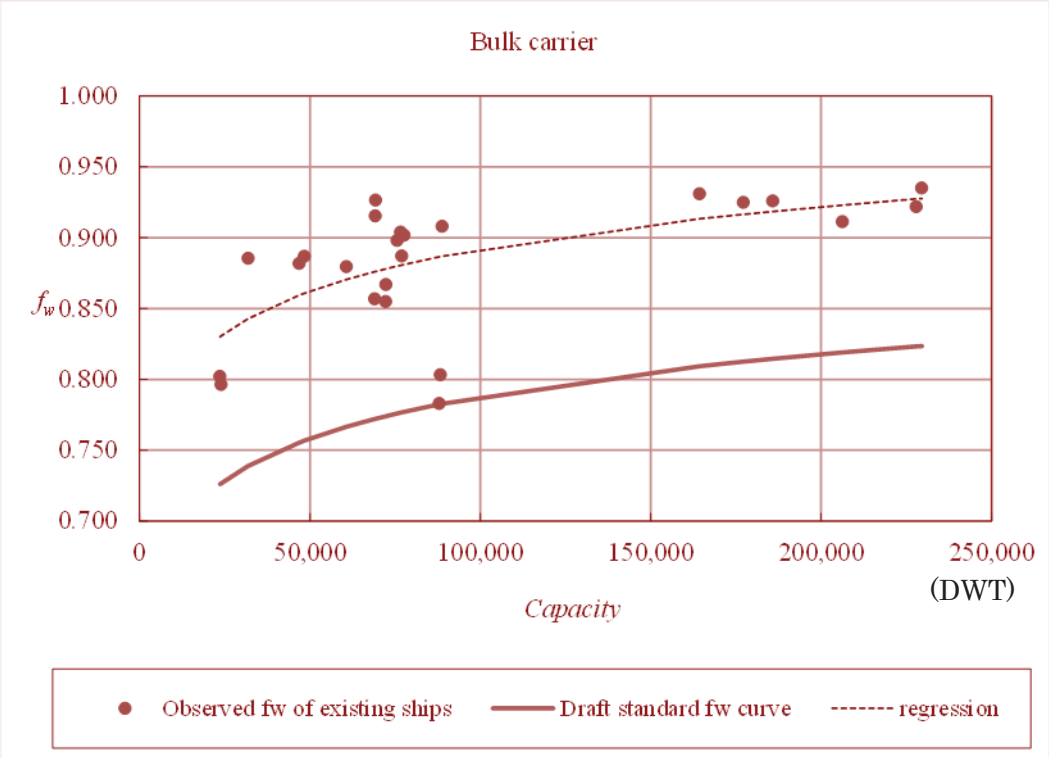
2.3 Each standard f_w curve is shown from figure 1 to figure 3, and the standard f_w value is expressed as follows:

$$\text{standard } f_w \text{ value} = a \times \ln(\textit{Capacity}) + b$$

where a and b are the parameters given in table 1.

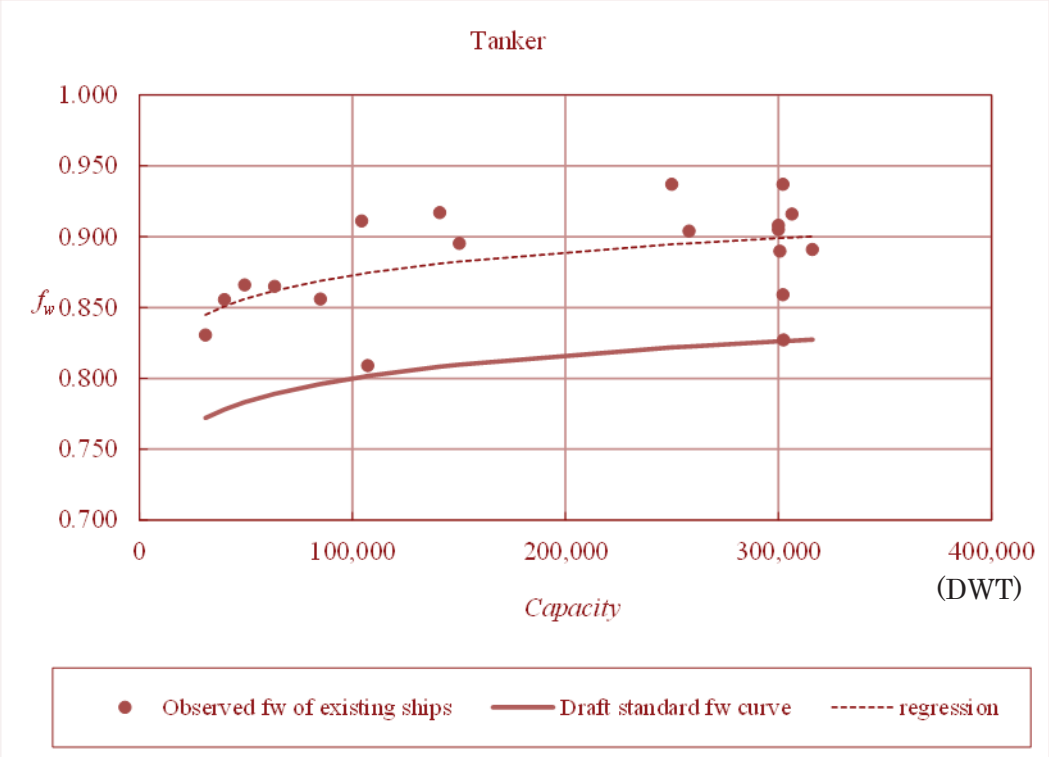
Table 1: Parameters for determination of standard f_w value

Ship type	***a***	***b***
Bulk carrier	0.0429	0.294
Tanker	0.0238	0.526
Containership	0.0208	0.633



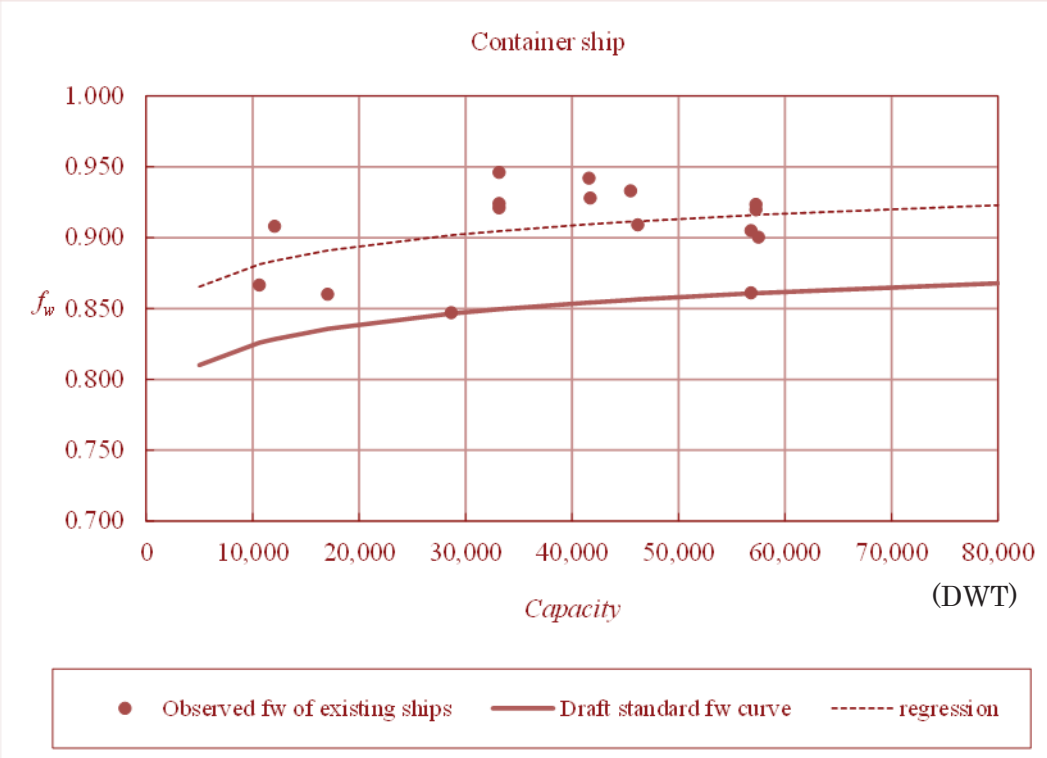
f_w = 0.0429ln(*Capacity*)+0.294

Figure 1: Standard f_w curve for bulk carrier



f_w = 0.0238ln(*Capacity*)+0.526

Figure 2: Standard f_w curve for tanker



$f_w = 0.0208\ln(Capacity)+0.633$

Figure 3: Standard f_w curve for containership

* * *

APPENDIX 1

SAMPLE CALCULATION OF THE COEFFICIENT f_w FROM THE STANDARD f_w CURVES

Sample: Bulk carrier

The subject ship is a bulk carrier shown in the following figure and the following table.

Figure 1: Subject ship

Table 1: Dimensions of the subject ship

Dimensions	Value	
Length between perpendiculars	217	m
Breadth	32.26	m
Draft	14	m
Ship speed	14.5	knot
Output power at MCR	9,070	kW
Deadweight	73,000	ton

Calculation of f_w from the standard f_w curves

The paragraph numbers are followed by guidelines for calculating the coefficient f_w from the standard f_w curves.

1 The standard f_w value is calculated following paragraph 2.3. Since the subject ship is a bulk carrier, the standard f_w value is obtained from the following equation.

$$\text{Standard } f_w \text{ value} = 0.0429 \times \ln(\textit{Capacity}) + 0.294$$

2 Since the *Capacity* for the bulk carriers is deadweight, the *Capacity* for the subject ship is determined as 73,000 (ton). By substitution of 73,000 to the above equation, the standard f_w value is obtained as 0.774.

In the EEDI Technical File, f_w is listed as follows:

7.2 Calculated weather factor, f_w

f_w	0.774

APPENDIX 2

PROCEDURES FOR DERIVING STANDARD f_w CURVES

1.	This document provides the procedures for deriving the standard f_w curves on the basis of main ship particulars and operation data of approximately 180 existing ships in operation.
2.	The coefficient f_w has been obtained for individual existing ships, by selecting the data that meet certain conditions as explained below.
3.	The derivation resulted in three standard f_w curves for bulk carriers, tankers and containerships.

The procedures for calculating the standard f_w curves comprise the following five steps:

Step 1: To extract data from the ship's particulars

The data needed for calculation are Displacement, Speed, Main Engine Output as well as RPM at *NOR*(normal rating). In case the necessary data for f_w are not obtained, the data of the ship is not used for deriving the standard f_w curves.

Step 2: To extract data from the abstract log

The data required are Displacement, Wind Direction (WDIR), Observed Beaufort Scale (WFOR), Measuring duration of Distlog and DistOG (HP (hours)), Distance Log (Distlog), Distance over the Ground (DistOG), Rotational Speed per minute (RPM) and Shaft Horse Power (SHP) for every 24 hours.

The data for calculation of f_w of individual ships are subject to screening, by following the procedures provided from (i) to (vi). The data meeting all the criteria provided from (i) to (vi) are to be used. In case the data are not extracted in the following process, the data of the ship is not used for deriving the standard f_w curves.

(i) Displacement should be within ±15 per cent of average displacement of the voyages which have been reported to be close to the fully loaded condition or to the 70 per cent DWT condition in the case of a containership.[1] In cases where displacement is not available, the average of draft may be used instead of the displacement.

(ii) Wind direction (WDIR): Heading (relative wind direction not exceeding ±67.5 degree).

(iii) Beaufort Scale (WFOR) for the selected data should be 2, 3 or 6.
The data under WFOR 2 and 3 are used to represent the calm sea condition (no wind and no waves), and the data under WFOR 6 are used to represent the representative sea condition.

(iv) The RPM (Rotational speed per minute) should be within ±5 per cent of the average RPM on the voyage.[2]

[1] In reality, it is impossible to collect only the data which are under completely full load conditions. Data deviated too much from the object displacement cannot be calibrated by the method described in step 3-1.

[2] Data with RPM deviated from the average RPM may not be on the normal operational condition.

(v) SHP should be within ±20 per cent of the 75 per cent of the rated installed power (*MCR*). In case where SHP is not available, the fuel oil consumption may be used instead of the SHP.[3]

(vi) Distlog should be used under the conditions that the difference between DistOG and Distlog is within ±10 per cent of whichever is smaller.[4]

Step 3: Data correction

3.1 Calibration of the data to reflect the difference between the object condition specified in EEDI calculation guidelines and the actual operation.

Distlog data selected in step 2 are calibrated by the following equation, in order to take into account the difference between the object condition and the actual operation in terms of displacement and SHP[5]:

$$V_1 = V_0\left[\left(\frac{\nabla_0}{\nabla_{average}}\right)^{\frac{2}{3}}\right]^{\frac{1}{3}}, \qquad V_2 = V_1\left(\frac{75\%MCR}{SHP_0}\right)^{\frac{1}{3}}$$

where:

$75\%MCR$: 75 per cent of the rated installed power (*MCR*)
$\nabla_{average}$: Average displacement on the reported voyages,
∇_0 : Displacement in measurement
HP : Running time (Hours propelling)
SHP_0 : Output in measurement
V_0 : Measured ship speed relative to water (Distlog/HP)
V_1 : Calibrated velocity based on displacement
V_2 : Calibrated velocity based on output

3.2 Calculation of V_2 corresponding to calm sea:
30 per cent largest values of V_2 under Beaufort 2 and 3 are extracted to represent the calm sea condition.

[3] Data deviated too much from 75 per cent MCR cannot be calibrated by the method described in step 3.1.

[4] Data with a large difference between Distlog and DistOG may be affected by the tidal current and the ocean current.

[5] Since *SHP* is approximately proportional to the wetted surface and the cube of ship speed, ship speed is calibrated with two thirds of the displacement, which has the same dimension as the wetted surface, and one third of the *SHP*.

Step 4: Calculation of f_w for individual existing ships

f_w = average of V_2 corresponding to BF6 / average of V_2 corresponding to calm sea for all ships.

In cases calculated f_w is larger than 1.0, the data shall be removed for the averaging.

Step 5: Development of "standard f_w" curves

Run the regression, based on the natural logarithmic function, on those f_w values obtained by Step 4.

Regression line, in the form of natural logarithmic line, is obtained from the observed f_w values calculated in the above steps and the *Capacity* of each ship. The standard f_w curves should be determined so that we can avoid f_w by the standard curves would be much higher than the actual f_w value. Then the standard f_w curves are set to pass the lower limit of the observed f_w values by changing the intercept of the regression line in the form of natural logarithmic line.

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MEPC.1/Circ.791
18 October 2012

IMPLEMENTATION OF MARPOL ANNEX V

Provisional classification of solid bulk cargoes under the revised MARPOL Annex V between 1 January 2013 and 31 December 2014

1 The Marine Environment Protection Committee, at its sixty-fourth session (1 to 5 October 2012), having considered the challenges associated with the classification of solid bulk cargoes and discharge of associated cargo residues in accordance with the requirements of the revised MARPOL Annex V which will enter into force on 1 January 2013; having taken into account paragraph 3.2 of the *2012 Guidelines for the implementation of MARPOL Annex V* (2012 Guidelines); and further recognizing that a transitional period for the implementation of this aspect of MARPOL Annex V would greatly facilitate maritime trade of solid bulk cargoes with minimal additional risk to the marine environment, decided that (MEPC 64/23, paragraphs 7.29 to 7.31):

.1 for the purposes of complying with regulations 4.1.3 and 6.1.2 of the revised MARPOL Annex V, shippers of solid bulk cargoes should classify those cargoes using the seven criteria in paragraph 3.2 of the *2012 Guidelines for the implementation of MARPOL Annex V*. Shippers should notify the competent authorities of the port State of loading and unloading of the basis for the provisional classification. As stated in paragraph 3.4 of the 2012 Guidelines, solid bulk cargoes should be classified and declared by the shipper as to whether or not they are harmful to the marine environment. Such declaration as to whether or not the cargo is harmful to the marine environment should be included in the information required in section 4.2 of the International Maritime Solid Bulk Cargoes Code;

.2 between 1 January 2013 and 31 December 2014, if adequate and reliable data on a solid bulk cargoes carcinogenicity, mutagenicity, reproductive toxicity, or specific target organ toxicity – repeated exposure are not available, shippers of solid bulk cargoes should still make every effort to ensure that their solid bulk cargoes are classified to the extent possible using the seven criteria in paragraph 3.2 of the 2012 Guidelines;

.3 also, between 1 January 2013 and 31 December 2014, while shippers are acquiring adequate and reliable data on a solid bulk cargoes carcinogenicity, mutagenicity, reproductive toxicity or specific target organ toxicity – repeated exposure, Administrations should accept provisional classifications of solid bulk cargoes that are based on the other criteria as contained in paragraphs 3.2.1, 3.2.2 and 3.2.7 of the 2012 Guidelines:

- data concerning acute aquatic toxicity; and/or
- data concerning chronic aquatic toxicity; and/or

- data concerning the synthetic polymer, rubber, plastic or plastic feedstock content of the solid bulk cargoes; and

.4 as of 1 January 2015, shippers' classifications of solid bulk cargoes should be made using the seven criteria listed in paragraph 3.2 of the 2012 Guidelines.

2 Parties to MARPOL Annex V are requested to ensure the provision of adequate facilities at ports and terminals for the reception of solid bulk cargo residues including those entrained in the wash water.

3 Member Governments are invited to bring the content of this circular to the attention of those interested, including port State control authorities and coastguard and maritime surveillance services, as appropriate.

ANNEX 12

RESOLUTION MEPC.225(64)

Adopted on 5 October 2012

2012 AMENDMENTS TO THE INTERNATIONAL CODE FOR THE CONSTRUCTION AND EQUIPMENT OF SHIPS CARRYING DANGEROUS CHEMICALS IN BULK (IBC CODE)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee (the Committee) conferred upon it by international conventions for the prevention and control of marine pollution,

RECALLING ALSO resolution MEPC.19(22) by which the Committee adopted the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code),

NOTING article 16 of the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1973 Convention") and article VI of the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973 (hereinafter referred to as the "1978 Protocol") which together specify the amendment procedure of the 1978 Protocol and confer upon the appropriate body of the Organization the function of considering and adopting amendments to the 1973 Convention, as modified by the 1978 Protocol (MARPOL),

CONSIDERING that it is highly desirable for the provisions of the IBC Code, which are mandatory under both MARPOL and the 1974 SOLAS Convention, to remain identical,

HAVING CONSIDERED the proposed amendments to the IBC Code,

1. ADOPTS, in accordance with article 16(2)(b), (c) and (d) of the 1973 Convention, the 2012 amendments to the IBC Code, the text of which is set out at the annex to the present resolution;

2. DETERMINES, in accordance with article 16(2)(f)(iii) of the 1973 Convention, that the 2012 amendments to the IBC Code shall be deemed to have been accepted on 1 December 2013 unless, prior to that date, not less than one-third of the Parties or Parties, the combined merchant fleets of which constitute not less than 50 per cent of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3. INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of the 1973 Convention, the 2012 amendments to the IBC Code shall enter into force on 1 June 2014 upon their acceptance in accordance with paragraph 2 above;

4. REQUESTS the Secretary-General, in conformity with article 16(2)(e) of the 1973 Convention, to transmit to all Parties to MARPOL certified copies of the present resolution and the text of the 2012 amendments to the IBC Code contained in the annex; and

5. REQUESTS FURTHER the Secretary-General to transmit copies of the present resolution and its annex to the Members of the Organization which are not Parties to MARPOL.

ANNEX

The existing text of chapters 17, 18 and 19 of the IBC Code is replaced by the following:

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 Flashpoint (i''') Yes: flashpoint exceeding 60°C (10.1.6) No: flashpoint not exceeding 60°C (10.1.6) NF: non-flammable 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

Note: The following pages are numbered according to the database generation.

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Acetic acid	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, 15.19.6, 16.2.9
Acetic anhydride	Z	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6
Acetochlor	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Acetone cyanohydrin	Y	S/P	2	2G	Cont	No	T1	IIA	Yes	C	T	A	Yes	15.12, 15.13,15.17, 15.18, 15.19, 16.6.1, 16.6.2, 16.6.3
Acetonitrile	Z	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12, 15.19.6
Acetonitrile (Low purity grade)	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	FT	AC	No	15.12.3, 15.12.4, 15.19.6
Acid oil mixture from soyabean, corn (maize) and sunflower oil refining	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Acrylamide solution (50% or less)	Y	S/P	2	2G	Open	No			NF	C	No	No	No	15.12.3, 15.13, 15.19.6, 16.2.9, 16.6.1
Acrylic acid	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.12.4, 15.13, 15.17, 15.19, 16.2.9, 16.6.1
Acrylonitrile	Y	S/P	2	2G	Cont	No	T1	IIB	No	C	FT	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	S/P	3	2G	Cont	No		IIB	Yes	R	T	A	No	16.2.9
Alachlor technical (90% or more)	X	S/P	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	15.19.6, 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
Alcohols (C12+), primary, linear	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Alcohols (C8-C11), primary, linear and essentially linear	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Alcohols (C12-C13), primary, linear and essentially linear	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Alcohols (C14-C18), primary, linear and essentially linear	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Alkanes (C6-C9)	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Iso- and cyclo-alkanes (C10-C11)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Iso- and cyclo-alkanes (C12+)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	
Alkanes(C10-C26), linear and branched, (flashpoint >60°C)	Y	S/P	3	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6

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n-Alkanes (C10+)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Alkaryl polyethers (C9-C20)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Alkenoic acid, polyhydroxy ester borated	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Alkenyl (C11+) amide	X	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Alkenyl (C16-C20) succinic anhydride	Z	S/P	3	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19
Alkyl acrylate-vinylpyridine copolymer in toluene	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.9
Alkylaryl phosphate mixtures (more than 40% Diphenyl tolyl phosphate, less than 0.02% ortho-isomers)	X	S/P	1	2G	Cont	No	T1	IIA	Yes	C	T	ABC	No	15.12, 15.17, 15.19
Alkylated (C4-C9) hindered phenols	Y	S/P	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 benzene distillation bottoms	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Alkylbenzene mixtures (containing at least 50% of toluene)	Y	S/P	3	2G	Cont	No	T1	IIA	No	C	FT	ABC	No	15.12, 15.17, 15.19.6
Alkyl (C3-C4) benzenes	Y	P	2	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Alkyl (C5-C8) benzenes	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Alkyl(C9+)benzenes	Y	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	
Alkyl (C11-C17) benzene sulphonic acid	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Alkylbenzene sulphonic acid, sodium salt solution	Y	S/P	2	2G	Open	No	-	-	NF	O	No	No	No	15.19.6, 16.2.6, 16.2.9
Alkyl (C12+) dimethylamine	X	S/P	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
Alkyldithiothiadiazole (C6-C24)	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
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	16.2.6, 16.2.9
Alkyl (C7-C9) nitrates	Y	S/P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 15.20, 16.6.1, 16.6.2, 16.6.3
Alkyl(C7-C11)phenol poly(4-12) ethoxylate	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
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	T4	IIB	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) polyglucoside solution (65% or less)	Y	P	3	2G	Open	No			Yes	O	No	No	No	16.2.6
Alkyl (C8-C10)/(C12-C14):(50%/50%) polyglucoside solution (55% or less)	Y	P	3	2G	Open	No			Yes	O	No	No	No	16.2.6, 16.2.9

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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(C12-C16) propoxyamine ethoxylate	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	AC	Yes	15.12, 15.17, 15.19, 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
Alkyl (C18+) toluenes	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.9
Alkyl(C18-C28)toluenesulfonic acid	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12, 15.17, 15.19, 16.2.6, 16.2.9
Alkyl(C18-C28)toluenesulfonic acid, calcium salts, borated	Y	S/P	3	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6
Alkyl (C18-C28) toluenesulfonic acid, calcium salts, low overbase	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6
Alkyl (C18-C28) toluenesulphonic acid, calcium salts, high overbase	Y	S/P	3	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6
Allyl alcohol	Y	S/P	2	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Allyl chloride	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
Aluminium chloride/Hydrogen chloride solution	Y	S/P	2	2G	Cont	No	-	-	NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Aluminium sulphate solution	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
2-(2-Aminoethoxy) ethanol	Z	S/P	3	2G	Open	No			Yes	O	No	AD	No	15.19.6
Aminoethyldiethanolamine/Aminoethylethanolamine solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Aminoethyl ethanolamine	Z	S/P	3	2G	Open	No	T2	IIA	Yes	O	No	A	No	
N-Aminoethylpiperazine	Z	S/P	3	2G	Cont	No			Yes	R	T	A	No	15.19.6, 16.2.9
2-Amino-2-methyl-1-propanol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Ammonia aqueous (28% or less)	Y	S/P	2	2G	Cont	No			NF	R	T	ABC	Yes	15.19.6
Ammonium chloride solution (less than 25%) (*)	Z	S/P	3	2G	Open	No	-	-	NF	O	No	No	No	
Ammonium hydrogen phosphate solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Ammonium lignosulphonate solutions	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Ammonium nitrate solution (93% or less)	Z	S/P	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	S/P	2	2G	Cont	No	T4	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19, 16.6.1, 16.6.2, 16.6.3
Ammonium thiosulphate solution (60% or less)	Z	P	3	2G	Open	No			NF	O	No	No	No	16.2.9
Amyl acetate (all isomers)	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
n-Amyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Amyl alcohol, primary	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	

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sec-Amyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	
tert-Amyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	
tert-Amyl methyl ether	X	P	2	2G	Cont	No	T2	IIB	No	R	F	A	No	15.19.6
Aniline	Y	S/P	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	T4	IIA	No	R	F	B	No	15.19.6
Barium long chain (C11-C50) alkaryl sulphonate	Y	S/P	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	S/P	3	2G	Cont	No	T1	IIA	No	C	FT	AB	No	15.12.1, 15.17, 15.19.6, 16.2.9
Benzene sulphonyl chloride	Z	S/P	3	2G	Cont	No			Yes	R	T	AD	No	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	15.19.6
Benzyl alcohol	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Benzyl chloride	Y	S/P	2	2G	Cont	No	T1	IIA	Yes	C	T	AB	Yes	15.12, 15.13, 15.17, 15.19
Bio-fuel blends of Diesel/gas oil and Alkanes (C10-C26), linear and branched with a flashpoint >60°C (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and Alkanes (C10-C26), linear and branched with a flashpoint ≤ 60°C (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	T3	IIA	No	C	FT	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and FAME (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Diesel/gas oil and vegetable oil (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	No	15.12, 15.17, 15.19.6
Bio-fuel blends of Gasoline and Ethyl alcohol (>25% but <99% by volume)	X	S/P	2	2G	Cont	No	T3	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
Brake fluid base mix: Poly(2-8)alkylene (C2-C3) glycols/Polyalkylene (C2-C10) glycols monoalkyl (C1-C4) ethers and their borate esters	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Bromochloromethane	Z	S/P	3	2G	Cont	No			NF	R	T	No	No	
Butene oligomer	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Butyl acetate (all isomers)	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Butyl acrylate (all isomers)	Y	S/P	2	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
tert-Butyl alcohol	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	
Butylamine (all isomers)	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	Yes	15.12, 15.17, 15.19.6
Butylbenzene (all isomers)	X	P	2	2G	Cont	No	T4	IIA	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	T1	IIA	No	R	F	A	No	15.19.6
Butyl/Decyl/Cetyl/Eicosyl methacrylate mixture	Y	S/P	2	2G	Cont	No			Yes	R	No	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2

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Butylene glycol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
1,2-Butylene oxide	Y	S/P	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	S/P	3	2G	Cont	Inert	T4	IIB	No	R	FT	A	No	15.4.6, 15.12, 15.19.6
Butyl methacrylate	Z	S/P	3	2G	Cont	No	T1	IIA	No	R	FT	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
n-Butyl propionate	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Butyraldehyde (all isomers)	Y	S/P	3	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.19.6
Butyric acid	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, 15.19.6
gamma-Butyrolactone	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
Calcium alkaryl sulphonate (C11-C50)	Z	S/P	3	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19
Calcium alkyl (C10-C28) salicylate	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Calcium hydroxide slurry	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Calcium hypochlorite solution (15% or less)	Y	S/P	2	2G	Cont	No			NF	R	No	No	No	15.19.6
Calcium hypochlorite solution (more than 15%)	X	S/P	1	2G	Cont	No			NF	R	No	No	No	15.19, 16.2.9
Calcium lignosulphonate solutions	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Calcium long-chain alkyl(C5-C10) phenate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Calcium long-chain alkyl(C11-C40) phenate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Calcium long-chain alkyl phenate sulphide (C8-C40)	Y	S/P	2	2G	Open	No			Yes	O	No	ABC	No	15.19.6, 16.2.6
Calcium long-chain alkyl salicylate (C13+)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Calcium long-chain alkyl (C18-C28) salicylate	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Calcium nitrate/Magnesium nitrate/Potassium chloride solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
epsilon-Caprolactam (molten or aqueous solutions)	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Carbolic oil	Y	S/P	2	2G	Cont	No			Yes	C	FT	A	No	15.12, 15.19.6, 16.2.9
Carbon disulphide	Y	S/P	2	1G	Cont	Pad+inert	T6	IIC	No	C	FT	C	Yes	15.3, 15.12, 15.19
Carbon tetrachloride	Y	S/P	2	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19.6
Cashew nut shell oil (untreated)	Y	S/P	2	2G	Cont	No			Yes	R	T	AB	No	15.19.6, 16.2.6, 16.2.9
Castor oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Cesium formate solution (*)	Y	S/P	3	2G	Open	No	-	-	NF	O	No	No	No	15.19.6
Cetyl/Eicosyl methacrylate mixture	Y	S/P	2	2G	Open	No			Yes	O	No	AD	No	15.13, 15.19.6, 16.2.9, 16.6.1, 16.6.2
Chlorinated paraffins (C10-C13)	X	P	1	2G	Open	No			Yes	O	No	A	No	15.19, 16.2.6

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Chlorinated paraffins (C14-C17) (with 50% chlorine or more, and less than 1% C13 or shorter chains)	X	P	1	2G	Open	No	-	-	Yes	O	No	A	No	15.19
Chloroacetic acid (80% or less)	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
Chlorobenzene	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.19.6
Chloroform	Y	S/P	3	2G	Cont	No			NF	R	T	No	Yes	15.12, 15.19.6
Chlorohydrins (crude)	Y	S/P	2	2G	Cont	No	T3	IIA	No	C	FT	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	15.19.6,16.2.9
o-Chloronitrobenzene	Y	S/P	2	2G	Cont	No			Yes	C	T	ABD	No	15.12, 15.17, 15.18, 15.19, 16.2.6, 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	S/P	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	S/P	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	S/P	2	2G	Cont	No	T4	IIA	No	R	FT	AB	No	15.19.6
o-Chlorotoluene	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.19.6
p-Chlorotoluene	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.19.6, 16.2.9
Chlorotoluenes (mixed isomers)	Y	S/P	2	2G	Cont	No	T4	IIA	No	R	FT	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	
Coal tar	X	S/P	2	2G	Cont	No	T2	IIA	Yes	R	No	BD	No	15.19.6, 16.2.6, 16.2.9
Coal tar naphtha solvent	Y	S/P	2	2G	Cont	No	T3	IIA	No	R	FT	AD	No	15.19.6, 16.2.9
Coal tar pitch (molten)	X	S/P	2	1G	Cont	No	T2	IIA	Yes	R	No	BD	No	15.19.6, 16.2.6, 16.2.9
Cocoa butter	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Coconut oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Coconut oil fatty acid	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Coconut oil fatty acid methyl ester	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Copper salt of long chain (C17+) alkanoic acid	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Corn Oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Cotton seed oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Creosote (coal tar)	X	S/P	2	2G	Cont	No	T2	IIA	Yes	R	T	AD	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Cresols (all isomers)	Y	S/P	2	2G	Open	No	T1	IIA	Yes	O	No	AB	No	15.19.6, 16.2.9
Cresylic acid, dephenolized	Y	S/P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Cresylic acid, sodium salt solution	Y	S/P	2	2G	Open	No			Yes	O	No	No	No	15.19.6, 16.2.9
Crotonaldehyde	Y	S/P	2	2G	Cont	No	T3	IIB	No	R	FT	A	Yes	15.12, 15.17, 15.19.6
1,5,9-Cyclododecatriene	X	S/P	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	T4	IIA	No	R	F	A	No	15.19.6
Cyclohexane	Y	P	2	2G	Cont	No	T3	IIA	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	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.19.6
Cyclohexanone, Cyclohexanol mixture	Y	S/P	3	2G	Cont	No			Yes	R	FT	A	No	15.19.6
Cyclohexyl acetate	Y	P	3	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Cyclohexylamine	Y	S/P	3	2G	Cont	No	T3	IIA	No	R	FT	AC	No	15.19.6
1,3-Cyclopentadiene dimer (molten)	Y	P	2	2G	Cont	No	T1	IIB	No	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Cyclopentane	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Cyclopentene	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
p-Cymene	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Decahydronaphthalene	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	AB	No	15.19.6
Decanoic acid	X	P	2	2G	Open	No			Yes	O	No	A	No	16.2.9
Decene	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Decyl acrylate	X	S/P	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)
Decyl/Dodecyl/Tetradecyl alcohol mixture	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Decyloxytetrahydrothiophene dioxide	X	S/P	2	2G	Cont	No			Yes	R	T	A	No	15.19.6, 16.2.9
Diacetone alcohol	Z	P	3	2G	Cont	No	T1	IIA	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
Dialkyl (C9 - C10) phthalates	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Dialkyl thiophosphates sodium salts solution	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	AC	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Dibromomethane	Y	S/P	2	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.19
Dibutylamine	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	ACD	No	15.19.6
Dibutyl hydrogen phosphonate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
2,6-Di-tert-butylphenol	X	P	1	2G	Open	No	-	-	Yes	O	No	ABCD	No	15.19, 16.2.9

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Dibutyl phthalate	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Dibutyl terephthalate	Y	P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.9
Dichlorobenzene (all isomers)	X	S/P	2	2G	Cont	No	T1	IIA	Yes	R	T	ABD	No	15.19.6
3,4-Dichloro-1-butene	Y	S/P	2	2G	Cont	No	T1	IIA	No	C	FT	ABC	Yes	15.12.3, 15.17, 15.19.6
1,1-Dichloroethane	Z	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	A	Yes	15.19.6
Dichloroethyl ether	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.19.6
1,6-Dichlorohexane	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	AB	No	15.19.6
2,2'-Dichloroisopropyl ether	Y	S/P	2	2G	Cont	No			Yes	R	T	ACD	No	15.12, 15.17, 15.19
Dichloromethane	Y	S/P	3	2G	Cont	No	T1	IIA	Yes	R	T	No	No	15.19.6
2,4-Dichlorophenol	Y	S/P	2	2G	Cont	Dry			Yes	R	T	A	No	15.19.6, 16.2.6, 16.2.9
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution (70% or less)	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt solution	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.6, 16.2.9
1,1-Dichloropropane	Y	S/P	2	2G	Cont	No	T4	IIA	No	R	FT	AB	No	15.12, 15.19.6
1,2-Dichloropropane	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.12, 15.19.6
1,3-Dichloropropene	X	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	AB	Yes	15.12, 15.17, 15.18, 15.19
Dichloropropene/Dichloropropane mixtures	X	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	ABD	Yes	15.12, 15.17, 15.18, 15.19
2,2-Dichloropropionic acid	Y	S/P	3	2G	Cont	Dry			Yes	R	No	A	No	15.11.2, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6, 16.2.9
Dicyclopentadiene, Resin Grade, 81-89%	Y	S/P	2	2G	Cont	Inert	T2	IIB	No	C	FT	ABC	Yes	15.12, 15.13, 15.17, 15.19
Diethanolamine	Y	S/P	3	2G	Open	No	T1	IIA	Yes	O	No	A	No	16.2.6, 16.2.9
Diethylamine	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	A	Yes	15.12, 15.19.6
Diethylaminoethanol	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	AC	No	15.19.6
2,6-Diethylaniline	Y	S/P	3	2G	Open	No			Yes	O	No	BCD	No	15.19.6, 16.2.9
Diethylbenzene	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Diethylene glycol dibutyl ether	Z	S/P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Diethylene glycol diethyl ether	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Diethylene glycol phthalate	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Diethylenetriamine	Y	S/P	3	2G	Open	No	T2	IIA	Yes	O	No	A	No	15.19.6
Diethylenetriaminepentaacetic acid, pentasodium salt solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Diethyl ether	Z	S/P	2	1G	Cont	Inert	T4	IIB	No	C	FT	A	Yes	15.4, 15.14, 15.19

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Di-(2-ethylhexyl) adipate	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6
Di-(2-ethylhexyl) phosphoric acid	Y	S/P	2	2G	Open	No			Yes	O	No	AD	No	15.19.6
Diethyl phthalate	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Diethyl sulphate	Y	S/P	2	2G	Cont	No			Yes	C	T	A	No	15.19.6
Diglycidyl ether of bisphenol A	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Diglycidyl ether of bisphenol F	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
Diheptyl phthalate	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6
Di-n-hexyl adipate	X	P	1	2G	Open	No			Yes	O	No	A	No	15.19
Dihexyl phthalate	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6
Diisobutylamine	Y	S/P	2	2G	Cont	No	T4	IIB	No	R	FT	ACD	No	15.12.3, 15.19.6
Diisobutylene	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Diisobutyl ketone	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Diisobutyl phthalate	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Diisononyl adipate	Y	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	FT	A	Yes	15.12, 15.19
Diisopropylbenzene (all isomers)	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Diisopropylnaphthalene	Y	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	FT	ACD	No	15.12, 15.19.6
Dimethylamine solution (greater than 45% but not greater than 55%)	Y	S/P	2	2G	Cont	No	T2	IIB	No	C	FT	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	T2	IIB	No	C	FT	ACD	Yes	15.12, 15.14, 15.17, 15.19
N,N-Dimethylcyclohexylamine	Y	S/P	2	2G	Cont	No	T3	IIB	No	R	FT	AC	No	15.12, 15.17, 15.19.6
Dimethyl disulphide	Y	S/P	2	2G	Cont	No	T3	IIA	No	R	FT	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	FT	AD	No	15.19.6
Dimethylformamide	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	AD	No	15.19.6
Dimethyl glutarate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
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	15.19.6, 16.2.6, 16.2.9
Dimethyl phthalate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 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	16.2.9
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
Dinonyl phthalate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
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	FT	A	No	15.12, 15.19, 16.2.9
Dipentene	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Diphenyl	X	P	2	2G	Open	No			Yes	O	No	B	No	15.19.6, 16.2.6, 16.2.9
Diphenylamine (molten)	Y	P	2	2G	Open	No	-	-	Yes	O	No	BD	No	15.19.6, 16.2.6, 16.2.9
Diphenylamine, reaction product with 2,2,4-Trimethylpentene	Y	S/P	1	2G	Open	No			Yes	O	No	A	No	15.19, 16.2.6
Diphenylamines, alkylated	Y	P	2	2G	Open	No			Yes	O	No	A	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
Diphenylmethane diisocyanate	Y	S/P	2	2G	Cont	Dry	-	-	Yes (a)	C	T(a)	ABC (b)D	No	15.12, 15.16.2, 15.17, 15.19.6, 16.2.6, 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	S/P	2	2G	Cont	No	T3	IIB	No	R	FT	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
Ditridecyl adipate	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Ditridecyl phthalate	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
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	T3	IIA	No	R	F	AB	No	15.19.6
tert-Dodecanethiol	X	S/P	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

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Dodecylamine/Tetradecylamine mixture	Y	S/P	2	2G	Cont	No			Yes	R	T	AD	No	15.19.6, 16.2.9
Dodecylbenzene	Z	P	3	2G	Open	No	-	-	Yes	O	No	AB	No	
Dodecyl diphenyl ether disulphonate solution	X	S/P	2	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.6
Dodecyl hydroxypropyl sulphide	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Dodecyl methacrylate	Z	S/P	3	2G	Open	No			Yes	O	No	A	No	15.13
Dodecyl/Octadecyl methacrylate mixture	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.13, 15.19.6, 16.2.6, 16.6.1, 16.6.2
Dodecyl/Pentadecyl methacrylate mixture	Y	S/P	2	2G	Open	No			Yes	O	No	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
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	S/P	2	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Ethanolamine	Y	S/P	3	2G	Open	No	T2	IIA	Yes	O	FT	A	No	16.2.9
2-Ethoxyethyl acetate	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Ethoxylated long chain (C16+) alkyloxyalkylamine	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6, 16.2.9
Ethoxylated tallow amine (> 95%)	X	S/P	2	2G	Cont	Inert	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Ethyl acetate	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Ethyl acetoacetate	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Ethyl acrylate	Y	S/P	2	2G	Cont	No	T2	IIB	No	R	FT	A	Yes	15.13, 15.19.6, 16.6.1, 16.6.2
Ethylamine	Y	S/P	2	1G	Cont	No	T2	IIA	No	C	FT	CD	Yes	15.12, 15.14, 15.19.6
Ethylamine solutions (72% or less)	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	AC	Yes	15.12, 15.14, 15.17, 15.19
Ethyl amyl ketone	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Ethylbenzene	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Ethyl tert-butyl ether	Y	P	3	2G	Cont	No	T2	IIB	No	R	F	A	No	15.19.6
Ethyl butyrate	Y	P	3	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Ethylcyclohexane	Y	P	2	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
N-Ethylcyclohexylamine	Y	S/P	2	2G	Cont	No	T3	IIB	No	R	FT	A	No	15.19.6
S-Ethyl dipropylthiocarbamate	Y	P	2	2G	Open	No			Yes	O	No	A	No	16.2.9
Ethylene chlorohydrin	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	AD	Yes	15.12, 15.17, 15.19
Ethylene cyanohydrin	Y	S/P	3	2G	Open	No		IIB	Yes	O	No	A	No	15.19.6

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Ethylenediamine	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.19.6, 16.2.9
Ethylenediaminetetraacetic acid, tetrasodium salt solution	Y	S/P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Ethylene dibromide	Y	S/P	2	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.19.6, 16.2.9
Ethylene dichloride	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	AB	No	15.19
Ethylene glycol	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol acetate	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Ethylene glycol butyl ether acetate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol diacetate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol methyl ether acetate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol monoalkyl ethers	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F	A	No	15.19.6, 16.2.9
Ethylene glycol phenyl ether	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Ethylene glycol phenyl ether/Diethylene glycol phenyl ether mixture	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Ethylene oxide/Propylene oxide mixture with an ethylene oxide content of not more than 30% by mass	Y	S/P	2	1G	Cont	Inert	T2	IIB	No	C	FT	AC	No	15.8, 15.12, 15.14, 15.19
Ethylene-vinyl acetate copolymer (emulsion)	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Ethyl-3-ethoxypropionate	Y	P	3	2G	Cont	No	T2	IIA	No	R	No	A	No	15.19.6
2-Ethylhexanoic acid	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
2-Ethylhexyl acrylate	Y	S/P	3	2G	Open	No	T3	IIB	Yes	O	No	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
2-Ethylhexylamine	Y	S/P	2	2G	Cont	No	T3	IIA	No	R	FT	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	15.19.6, 16.2.6, 16.2.9
Ethylidene norbornene	Y	S/P	2	2G	Cont	No	T3	IIB	No	R	FT	AD	No	15.12.1, 15.19.6
Ethyl methacrylate	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	FT	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
N-Ethylmethylallylamine	Y	S/P	2	2G	Cont	No	T2	IIB	No	C	F	AC	Yes	15.12.3, 15.17, 15.19
Ethyl propionate	Y	P	3	2G	Open	No	T1	IIA	No	R	F	A	No	15.19.6
2-Ethyl-3-propylacrolein	Y	S/P	3	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.19.6, 16.2.9
Ethyl toluene	Y	P	2	2G	Cont	No	T4	IIA	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 acid methyl esters (m)	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Fatty acids, (C8-C10)	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19, 16.2.6, 16.2.9
Fatty acids, (C12+)	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Fatty acids, (C16+)	Y	P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6

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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	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Fluorosilicic acid (20-30%) in water solution	Y	S/P	3	1G	Cont	No	-	-	NF	R	T	No	Yes	15.11, 15.19.6
Formaldehyde solutions (45% or less)	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	FT	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 (85% or less acid)	Y	S/P	3	2G	Cont	No	-	-	Yes	R	T(g)	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.12.4, 15.19.6, 16.2.9
Formic acid (over 85%)	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	FT (g)	A	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.12.4, 15.19.6, 16.2.9
Formic acid mixture (containing up to 18% propionic acid and up to 25% sodium formate)	Z	S/P	3	2G	Cont	No	-	-	Yes	R	T(g)	AC	No	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.12.4, 15.19.6
Furfural	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.19.6
Furfuryl alcohol	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Glucitol/glycerol blend propoxylated (containing less than 10% amines)	Z	S/P	3	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6
Glutaraldehyde solutions (50% or less)	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6
Glycerol monooleate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Glycerol propoxylated	Z	S/P	3	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6
Glycerol, propoxylated and ethoxylated	Z	P	3	2G	Open	No	-	-	Yes	O	No	ABC	No	
Glycerol/sucrose blend propoxylated and ethoxylated	Z	P	3	2G	Open	No	-	-	Yes	O	No	ABC	No	
Glyceryl triacetate	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Glycidyl ester of C10 trialkylacetic 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
Glyoxylic acid solution (50 % or less)	Y	S/P	3	2G	Open	No	-	-	Yes	O	No	ACD	No	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.19.6, 16.2.9, 16.6.1, 16.6.2, 16.6.3
Glyphosate solution (not containing surfactant)	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Groundnut oil	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Heptane (all isomers)	X	P	2	2G	Cont	No	T3	IIA	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	T3	IIA	No	R	F	A	No	15.19.6

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Heptene (all isomers)	Y	P	3	2G	Cont	No	T4	IIA	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-Hexadecylnaphthalene / 1,4-bis(hexadecyl)naphthalene mixture	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Hexamethylenediamine (molten)	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	AC	Yes	15.12, 15.17, 15.18, 15.19, 16.2.9
Hexamethylenediamine adipate (50% in water)	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Hexamethylenediamine solution	Y	S/P	3	2G	Cont	No			Yes	R	T	A	No	15.19.6
Hexamethylene diisocyanate	Y	S/P	2	1G	Cont	Dry	T1	IIB	Yes	C	T	AC (b)D	Yes	15.12, 15.16.2, 15.17, 15.18, 15.19
Hexamethylene glycol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Hexamethyleneimine	Y	S/P	2	2G	Cont	No	T4	IIB	No	R	FT	AC	No	15.19.6
Hexane (all isomers)	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
1,6-Hexanediol, distillation overheads	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Hexanoic acid	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
Hexanol	Y	P	3	2G	Open	No			Yes	O	No	AB	No	15.19.6
Hexene (all isomers)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Hexyl acetate	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Hydrochloric acid	Z	S/P	3	1G	Cont	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			NF	C	No	No	No	15.5.1, 15.19.6
Hydrogen peroxide solutions (over 8% but not over 60% by mass)	Y	S/P	3	2G	Cont	No			NF	C	No	No	No	15.5.2, 15.18, 15.19.6
2-Hydroxyethyl acrylate	Y	S/P	2	2G	Cont	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			Yes	O	No	A	No	15.19.6
2-Hydroxy-4-(methylthio)butanoic acid	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Illipe oil	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Isoamyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Isobutyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Isobutyl formate	Z	P	3	2G	Cont	No	T4	IIA	No	R	F	AB	No	
Isobutyl methacrylate	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.12, 15.13, 15.17, 16.6.1, 16.6.2
Isophorone	Y	S/P	3	2G	Cont	No			Yes	R	No	A	No	15.19.6
Isophoronediamine	Y	S/P	3	2G	Cont	No			Yes	R	T	A	No	16.2.9
Isophorone diisocyanate	X	S/P	2	2G	Cont	Dry			Yes	C	T	ABD	No	15.12, 15.16.2, 15.17, 15.19.6
Isoprene	Y	S/P	3	2G	Cont	No	T3	IIB	No	R	F	B	No	15.13, 15.14, 15.19.6, 16.6.1, 16.6.2

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Isopropanolamine	Y	S/P	3	2G	Open	No	T2	IIA	Yes	O	FT	A	No	15.19.6, 16.2.6, 16.2.9
Isopropyl acetate	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	AB	No	
Isopropylamine	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	CD	Yes	15.12, 15.14, 15.19
Isopropylamine (70% or less) solution	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	CD	Yes	15.12, 15.19.6, 16.2.9
Isopropylcyclohexane	Y	P	2	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6, 16.2.9
Isopropyl ether	Y	S/P	3	2G	Cont	Inert	T2	IIA	No	R	F	A	No	15.4.6, 15.13.3, 15.19.6
Jatropha oil	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Lactic acid	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Lactonitrile solution (80% or less)	Y	S/P	2	1G	Cont	No			Yes	C	T	ACD	Yes	15.12, 15,13, 15.17, 15.18, 15.19, 16.6.1, 16.6.2, 16.6.3
Lard	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Latex, ammonia (1% or less)- inhibited	Y	S/P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Latex: Carboxylated styrene-Butadiene copolymer; Styrene-Butadiene rubber	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Lauric acid	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Ligninsulphonic acid, magnesium salt solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	AC	No	
Ligninsulphonic acid, sodium salt solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Linseed oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Liquid chemical wastes	X	S/P	2	2G	Cont	No			No	C	FT	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	15.19.6, 16.2.6, 16.2.9
Long-chain alkaryl sulphonic acid (C16-C60)	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Long-chain alkylphenate/Phenol sulphide mixture	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 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	
Magnesium long-chain alkaryl sulphonate (C11-C50)	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Magnesium long-chain alkyl salicylate (C11+)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Maleic anhydride	Y	S/P	3	2G	Cont	No			Yes	R	No	AC (f)	No	16.2.9
Mango kernel oil	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Mercaptobenzothiazol, sodium salt solution	X	S/P	2	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Mesityl oxide	Z	S/P	3	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.19.6
Metam sodium solution	X	S/P	2	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12, 15.17, 15.19
Methacrylic acid	Y	S/P	3	2G	Cont	No			Yes	R	T	A	No	15.13, 15.19.6, 16.2.9, 16.6.1

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Methacrylic acid - alkoxypoly (alkylene oxide) methacrylate copolymer, sodium salt aqueous solution (45% or less)	Z	S/P	3	2G	Open	No	-	-	NF	O	No	AC	No	16.2.9
Methacrylic resin in ethylene dichloride	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	AB	No	15.19, 16.2.9
Methacrylonitrile	Y	S/P	2	2G	Cont	No	T1	IIA	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19
3-Methoxy-1-butanol	Z	P	3	2G	Cont	No	T2	IIA	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 chloroacetanilide	X	P	1	2G	Open	No			Yes	O	No	A	No	15.19, 16.2.6
Methyl acetate	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	
Methyl acetoacetate	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Methyl acrylate	Y	S/P	2	2G	Cont	No	T1	IIB	No	R	FT	A	Yes	15.13, 15.19.6, 16.6.1, 16.6.2
Methyl alcohol	Y	P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Methylamine solutions (42% or less)	Y	S/P	2	2G	Cont	No	T2	IIA	No	C	FT	ACD	Yes	15.12, 15.17, 15.19
Methylamyl acetate	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Methylamyl alcohol	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Methyl amyl ketone	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
N-Methylaniline	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6
alpha-Methylbenzyl alcohol with acetophenone (15% or less)	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Methylbutenol	Y	P	3	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6, 16.2.9
Methyl tert-butyl ether	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	AB	No	
Methyl butyl ketone	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	AB	No	15.19.6
Methylbutynol	Z	P	3	2G	Cont	No	T4	IIB	No	R	F	A	No	
Methyl butyrate	Y	P	3	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Methylcyclohexane	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Methylcyclopentadiene dimer	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	B	No	15.19.6
Methylcyclopentadienyl manganese tricarbonyl	X	S/P	1	1G	Cont	No	-	-	Yes	C	T	ABCD	Yes	15.12, 15.18, 15.19, 16.2.9
Methyl diethanolamine	Y	S/P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
2-Methyl-6-ethyl aniline	Y	S/P	3	2G	Open	No			Yes	O	No	AD	No	15.19.6
Methyl ethyl ketone	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	
2-Methyl-5-ethyl pyridine	Y	S/P	3	2G	Open	No		IIA	Yes	O	No	AD	No	15.19.6
Methyl formate	Z	S/P	2	2G	Cont	No	T1	IIA	No	R	FT	A	Yes	15.12, 15.14, 15.19
2-Methylglutaronitrile with 2-Ethylsuccinonitrile (12% or less)	Z	S	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19

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2-Methyl-2-hydroxy-3-butyne	Z	S/P	3	2G	Cont	No	T3	IIA	No	R	FT	ABD	No	15.19.6, 16.2.9
Methyl isobutyl ketone	Z	P	3	2G	Cont	No	T1	IIA	No	R	F	AB	No	
Methyl methacrylate	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.13, 15.19.6, 16.6.1, 16.6.2
3-Methyl-3-methoxybutanol	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Methyl naphthalene (molten)	X	S/P	2	2G	Cont	No			Yes	R	No	AD	No	15.19.6
2-Methyl-1,3-propanediol	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
2-Methylpyridine	Z	S/P	2	2G	Cont	No	T1	IIA	No	C	F	A	No	15.12.3, 15.19.6
3-Methylpyridine	Z	S/P	2	2G	Cont	No	T1	IIA	No	C	F	AC	No	15.12.3, 15.19
4-Methylpyridine	Z	S/P	2	2G	Cont	No	T1	IIA	No	C	FT	A	No	15.12.3, 15.19, 16.2.9
N-Methyl-2-pyrrolidone	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
Methyl salicylate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6
alpha-Methylstyrene	Y	S/P	2	2G	Cont	No	T1	IIB	No	R	FT	AD (j)	No	15.13, 15.19.6, 16.6.1, 16.6.2
3-(methylthio)propionaldehyde	Y	S/P	2	2G	Cont	No	T3	IIA	No	C	FT	BC	Yes	15.12, 15.17, 15.19
Molybdenum polysulfide long chain alkyl dithiocarbamide complex	Y	S/P	2	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Morpholine	Y	S/P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Motor fuel anti-knock compound (containing lead alkyls)	X	S/P	1	1G	Cont	No	T4	IIA	No	C	FT	AC	Yes	15.6, 15.12, 15.18, 15.19
Myrcene	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6, 16.2.9
Naphthalene (molten)	X	S/P	2	2G	Cont	No	T1	IIA	Yes	R	No	AD	No	15.19.6, 16.2.9
Naphthalenesulphonic acid-Formaldehyde copolymer, sodium salt solution	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Neodecanoic acid	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
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
Nitrilotriacetic 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	T2	IIB	No	R	FT	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	T2	IIB	No	R	FT	A(f)	No	15.19.6, 16.6.1, 16.6.2, 16.6.3
Nitroethane, 1-Nitropropane (each 15% or more) mixture	Y	S/P	3	2G	Cont	No	T2	IIB	No	R	F	A	No	15.19.6, 16.2.6, 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	FT	A	No	15.19.6

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Nitropropane (60%)/Nitroethane (40%) mixture	Y	S/P	3	2G	Cont	No	T4	IIB	No	R	FT	A(f)	No	15.19.6
o- or p-Nitrotoluenes	Y	S/P	2	2G	Cont	No		IIB	Yes	C	T	AB	No	15.12, 15.17, 15.19.6
Nonane (all isomers)	X	P	2	2G	Cont	No	T4	IIA	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
Non-edible industrial grade palm oil	Y	S/P	2	2G	Cont	No	-	-	Yes	R	No	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Nonene (all isomers)	Y	P	2	2G	Cont	No	T3	IIA	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
Nonylphenol poly(4+)ethoxylate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
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(l)
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(l)
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(l)
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(l)
Noxious liquid, NF, (9) n.o.s. (trade name ...., contains ....) ST3, Cat. Z	Z	P	3	2G	Open	No	-		Yes	O	No	A	No	
Noxious liquid, F, (10) n.o.s. (trade name ...., contains ....) ST3, Cat. Z	Z	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	
Octamethylcyclotetrasiloxane	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	AC	No	15.19.6, 16.2.9
Octane (all isomers)	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Octanoic acid (all isomers)	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Octanol (all isomers)	Y	P	2	2G	Open	No			Yes	O	No	A	No	
Octene (all isomers)	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
n-Octyl acetate	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Octyl aldehydes	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.9
Octyl decyl adipate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
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
Olefin Mixture (C7-C9) C8 rich, stabilised	X	S/P	2	2G	Cont	No	T3	IIB	No	R	F	ABC	No	15.13, 15.19.6
Olefin mixtures (C5-C7)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6

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Olefin mixtures (C5-C15)	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Olefins (C13+, all isomers)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
alpha-Olefins (C6-C18) mixtures	X	P	2	2G	Cont	No	T4	IIA	No	R	F	A	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	S/P	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
Oleylamine	X	S/P	2	2G	Cont	No			Yes	R	T	A	No	15.19.6, 16.2.9
Olive oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Oxygenated aliphatic hydrocarbon mixture	Z	S/P	3	2G	Open	No	-	-	Yes	O	No	ABC	No	
Palm acid oil	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm fatty acid distillate	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel acid oil	Y	S/P	2	2G	Open	No			Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel fatty acid distillate	Y	S/P	2	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel olein	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel stearin	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm mid-fraction	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm oil fatty acid methyl ester	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Palm olein	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm stearin	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	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	S/P	3	2G	Cont	No	T3	IIB	No	R	F	A	No	15.19.6, 16.2.9
Paraldehyde-ammonia reaction product	Y	S/P	2	2G	Cont	No	T4	IIB	No	C	FT	A	No	15.12.3, 15.19
Pentachloroethane	Y	S/P	2	2G	Cont	No			NF	R	T	No	No	15.12, 15.17, 15.19.6
1,3-Pentadiene	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2, 16.6.3
1,3-Pentadiene (greater than 50%), cyclopentene and isomers, mixtures	Y	S/P	2	2G	Cont	Inert	T3	IIB	No	C	FT	ABC	Yes	15.12, 15.13, 15.17, 15.19
Pentaethylenehexamine	X	S/P	2	2G	Open	No			Yes	O	No	B	Yes	15.19
Pentane (all isomers)	Y	P	3	2G	Cont	No	T2	IIA	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	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

a	c	d	e	f	g	h	i'	i''	i'''	j	k	l	n	o
Pentene (all isomers)	Y	P	3	2G	Cont	No	T3	IIA	No	R	F	A	No	15.14, 15.19.6
n-Pentyl propionate	Y	P	3	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Perchloroethylene	Y	S/P	2	2G	Cont	No			NF	R	T	No	No	15.12.1, 15.12.2, 15.19.6
Petrolatum	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Phenol	Y	S/P	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	
Phosphate esters, alkyl (C12-C14) amine	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Phosphoric acid	Z	S/P	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	S/P	1	1G	Cont	Pad+ (vent or inert)			No (c)	C	No	C	Yes	15.7, 15.19, 16.2.9
Phthalic anhydride (molten)	Y	S/P	2	2G	Cont	No	T1	IIA	Yes	R	No	AD	No	15.19.6, 16.2.6, 16.2.9
alpha-Pinene	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
beta-Pinene	X	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6
Pine oil	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Polyacrylic acid solution (40% or less)	Z	S/P	3	2G	Open	No	-	-	Yes	O	No	AC	No	
Polyalkyl (C18-C22) acrylate in xylene	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	AB	No	15.19.6, 16.2.6,16.2.9
Polyalkylalkenaminesuccinimide, molybdenum oxysulphide	Y	P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Poly(2-8)alkylene glycol monoalkyl(C1-C6) ether	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Poly(2-8)alkylene glycol monoalkyl (C1-C6) ether acetate	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
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
Polybutene	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Polybutenyl succinimide	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	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
Polyether (molecular weight 1350+)	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
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	
Poly(ethylene glycol) methylbutenyl ether (MW>1000)	Z	P	3	2G	Open	No	-	-	Yes	O	No	AC	No	16.2.9
Polyethylene polyamines	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Polyethylene polyamines (more than 50% C5 -C20 paraffin oil)	Y	S/P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9

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Polyferric sulphate solution	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6
Poly(iminoethylene)-graft-N-poly(ethyleneoxy) solution (90% or less)	Z	S/P	3	2G	Open	No	-	-	NF	O	No	AC	No	16.2.9
Polyisobutenamine in aliphatic (C10-C14) solvent	Y	P	3	2G	Open	No	T3	IIA	Yes	O	No	A	No	15.19.6
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
Polymethylene polyphenyl isocyanate	Y	S/P	2	2G	Cont	Dry			Yes (a)	C	T(a)	A	No	15.12, 15.16.2, 15.19.6, 16.2.9
Polyolefin (molecular weight 300+)	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 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
Polyolefin amide alkeneamine polyol	Y	P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Polyolefinamine (C28-C250)	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Polyolefinamine in alkyl (C2-C4) benzenes	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Polyolefinamine in aromatic solvent	Y	P	2	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Polyolefin aminoester salts (molecular weight 2000+)	Y	P	2	2G	Open	No	-	-	Yes	O	No	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 phosphorosulphide, barium derivative (C28-C250)	Y	P	2	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
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
Poly(5+)propylene	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Polypropylene glycol	Z	S/P	3	2G	Cont	No			Yes	O	No	ABC	No	15.19.6
Polysiloxane	Y	P	3	2G	Cont	No	T4	IIB	No	R	F	AB	No	15.19.6, 16.2.9
Potassium chloride solution	Z	S/P	3	2G	Open	No	-	-	NF	O	No	A	No	16.2.9
Potassium hydroxide solution	Y	S/P	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	15.19.6, 16.2.9
n-Propanolamine	Y	S/P	3	2G	Open	No			Yes	O	No	AD	No	15.19.6, 16.2.9
2-Propene-1-aminium, N,N-dimethyl-N-2-propenyl-, chloride, homopolymer solution	Y	S/P	3	2G	Open	No	-	-	NF	O	No	No	No	15.19.6
beta-Propiolactone	Y	S/P	2	2G	Cont	No		IIA	Yes	R	T	A	No	15.19.6
Propionaldehyde	Y	S/P	3	2G	Cont	No	T4	IIB	No	R	FT	A	Yes	15.17, 15.19.6

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Propionic acid	Y	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, 15.19.6
Propionic anhydride	Y	S/P	3	2G	Cont	No	T2	IIA	Yes	R	T	A	No	15.19.6
Propionitrile	Y	S/P	2	1G	Cont	No	T1	IIB	No	C	FT	AD	Yes	15.12, 15.17, 15.18, 15.19
n-Propyl acetate	Y	P	3	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.19.6
n-Propyl alcohol	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
n-Propylamine	Z	S/P	2	2G	Cont	Inert	T2	IIA	No	C	FT	AD	Yes	15.12, 15.19
Propylbenzene (all isomers)	Y	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Propylene glycol methyl ether acetate	Z	P	3	2G	Cont	No	T2	IIA	No	R	F	A	No	
Propylene glycol monoalkyl ether	Z	P	3	2G	Cont	No	T3	IIA	No	R	F	AB	No	
Propylene glycol phenyl ether	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Propylene oxide	Y	S/P	2	2G	Cont	Inert	T2	IIB	No	C	FT	AC	No	15.8, 15.12.1, 15.14, 15.19
Propylene tetramer	X	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Propylene trimer	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Pyridine	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Pyrolysis gasoline (containing benzene)	Y	S/P	2	2G	Cont	No	T3	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19.6
Rapeseed oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Rapeseed oil (low erucic acid containing less than 4% free fatty acids)	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Rape seed oil fatty acid methyl esters	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Resin oil, distilled	Y	S/P	2	2G	Cont	No	T1	IIA	No	C	FT	ABC	No	15.12,15.17, 15.19.6
Rice bran oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	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
Safflower oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Shea butter	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Sodium alkyl (C14-C17) sulphonates (60-65% solution)	Y	P	2	2G	Open	No			NF	O	No	No	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	
Sodium borohydride (15% or less)/Sodium hydroxide solution	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.6, 16.2.9
Sodium bromide solution (less than 50%) (*)	Y	S/P	3	2G	Open	No	-	-	NF	R	No	No	No	15.19.6
Sodium carbonate solution	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Sodium chlorate solution (50% or less)	Z	S/P	3	2G	Open	No			NF	O	No	No	No	15.9, 15.19.6, 16.2.9

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Sodium dichromate solution (70% or less)	Y	S/P	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	S/P	3	2G	Open	No			NF	O	No	No	No	16.2.9
Sodium hydrosulphide/Ammonium sulphide solution	Y	S/P	2	2G	Cont	No	T4	IIB	No	C	FT	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	S/P	3	2G	Cont	Vent or pad (gas)			NF	R	T	No	No	15.19.6, 16.2.9
Sodium hydroxide solution	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.6, 16.2.9
Sodium hypochlorite solution (15% or less)	Y	S/P	2	2G	Cont	No	-	-	NF	R	No	No	No	15.19.6
Sodium methylate 21-30% in methanol	Y	S/P	2	2G	Cont	No	T1	IIA	No	C	FT	AC	Yes	15.12, 15.17, 15.19, 16.2.6(only if >28%), 16.2.9
Sodium nitrite solution	Y	S/P	2	2G	Open	No			NF	O	No	No	No	15.12.3.1, 15.12.3.2, 15.19, 16.2.9
Sodium petroleum sulphonate	Y	S/P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
Sodium poly(4+)acrylate solutions	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Sodium silicate solution	Y	P	3	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Sodium sulphide solution (15% or less)	Y	S/P	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	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Styrene monomer	Y	S/P	3	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2
Sulphohydrocarbon (C3-C88)	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Sulpholane	Y	P	3	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Sulphur (molten)	Z	S	3	1G	Open	Vent or pad (gas)	T3		Yes	O	FT	No	No	15.10, 16.2.9
Sulphuric acid	Y	S/P	3	2G	Open	No			NF	O	No	No	No	15.11, 15.16.2, 15.19.6
Sulphuric acid, spent	Y	S/P	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	
Sulphurized polyolefinamide alkene (C28-C250) amine	Z	P	3	2G	Open	No	-	-	Yes	O	No	A	No	
Sunflower seed oil	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Tall oil, crude	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Tall oil, distilled	Y	P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Tall oil fatty acid (resin acids less than 20%)	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6
Tall oil pitch	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6,16.2.6

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Tallow	Y	P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Tallow fatty acid	Y	P	2	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Tetrachloroethane	Y	S/P	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	
Tetraethylene pentamine	Y	S/P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Tetrahydrofuran	Z	S	3	2G	Cont	No	T3	IIB	No	R	FT	A	No	15.19.6
Tetrahydronaphthalene	Y	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Tetramethylbenzene (all isomers)	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Titanium dioxide slurry	Z	P	3	2G	Open	No			Yes	O	No	AB	No	
Toluene	Y	P	3	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Toluenediamine	Y	S/P	2	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Toluene diisocyanate	Y	S/P	2	2G	Cont	Dry	T1	IIA	Yes	C	FT	AC (b)D	Yes	15.12, 15.16.2, 15.17, 15.19, 16.2.9
o-Toluidine	Y	S/P	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	S/P	1	2G	Cont	No			Yes	C	T	ACD	Yes	15.12.1, 15.17, 15.19, 16.2.6, 16.2.9
1,2,4-Trichlorobenzene	X	S/P	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	15.19.6
1,1,2-Trichloroethane	Y	S/P	3	2G	Cont	No			NF	R	T	No	No	15.12.1, 15.19.6
Trichloroethylene	Y	S/P	2	2G	Cont	No	T2	IIA	Yes	R	T	No	No	15.12, 15.17, 15.19.6
1,2,3-Trichloropropane	Y	S/P	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	15.19.6
Tricresyl phosphate (containing 1% or more ortho-isomer)	Y	S/P	1	2G	Cont	No	T2	IIA	Yes	C	No	AB	No	15.12.3, 15.19, 16.2.6
Tricresyl phosphate (containing less than 1% ortho-isomer)	Y	S/P	2	2G	Open	No			Yes	O	No	A	No	15.19.6, 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	Y	P	3	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Triethanolamine	Z	S/P	3	2G	Open	No		IIA	Yes	O	No	A	No	16.2.9
Triethylamine	Y	S/P	2	2G	Cont	No	T2	IIA	No	R	FT	AC	Yes	15.12, 15.19.6
Triethylbenzene	X	P	2	2G	Open	No			Yes	O	No	A	No	15.19.6
Triethylenetetramine	Y	S/P	2	2G	Open	No	T2	IIA	Yes	O	No	A	No	15.19.6

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Triethyl phosphate	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Triethyl phosphite	Z	S/P	3	2G	Cont	No	T3	IIA	No	R	FT	AB	No	15.12.1, 15.19.6, 16.2.9
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	S/P	2	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	S/P	2	2G	Cont	No	T3	IIB	No	C	FT	AC	Yes	15.12, 15.14, 15.19, 16.2.9
Trimethylbenzene (all isomers)	X	P	2	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Trimethylol propane propoxylated	Z	S/P	3	2G	Open	No	-	-	Yes	O	No	ABC	No	
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	15.19.6
1,3,5-Trioxane	Y	S/P	3	2G	Cont	No	T2	IIB	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	Y	S/P	2(k)	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Turpentine	X	P	2	2G	Cont	No	T1	IIA	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	Z	P	3	2G	Open	No			Yes	O	No	A	No	
Urea/Ammonium nitrate solution (containing less than 1% free ammonia)	Z	S/P	3	2G	Cont	No			NF	R	T	A	No	16.2.9
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	S/P	3	2G	Cont	Inert	T3	IIB	No	R	FT	A	No	15.4.6, 15.19.6
Vegetable acid oils (m)	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Vegetable fatty acid distillates (m)	Y	S/P	2	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Vinyl acetate	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
Vinyl ethyl ether	Z	S/P	2	1G	Cont	Inert	T3	IIB	No	C	FT	A	Yes	15.4, 15.13, 15.14, 15.19.6, 16.6.1, 16.6.2
Vinylidene chloride	Y	S/P	2	2G	Cont	Inert	T2	IIA	No	R	FT	B	Yes	15.13, 15.14, 15.19.6, 16.6.1, 16.6.2
Vinyl neodecanoate	Y	S/P	2	2G	Open	No			Yes	O	No	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2
Vinyltoluene	Y	S/P	2	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.13, 15.19.6, 16.6.1, 16.6.2

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Waxes	Y	P	2	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
White spirit, low (15-20%) aromatic	Y	P	2	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6, 16.2.9
Wood lignin with sodium acetate/oxalate	Z	S/P	3	2G	Open	No	-	-	NF	O	No	No	No	
Xylenes	Y	P	2	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6, 16.2.9 (h)
Xylenes/ethylbenzene (10% or more) mixture	Y	P	2	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Xylenol	Y	S/P	2	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	15.19.6, 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

Chapter 17

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.

m From vegetable oils, animal fats and fish oils specified in the IBC Code.

* Indicates that with reference to chapter 21 of the IBC Code (paragraph 21.1.3), deviations from the normal assignment criteria used for some carriage requirements have been implemented.

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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.

18.4 Liquid mixtures which are assessed or provisionally assessed under regulation 6.3 of MARPOL 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. OS means the product was evaluated and found to fall outside Categories X, Y, or Z.

Chapter 18 of the IBC Code

Product Name	Pollution Category
Acetone	Z
Alcoholic beverages, n.o.s.	Z
Apple juice	OS
n-Butyl alcohol	Z
sec-Butyl alcohol	Z
Calcium carbonate slurry	OS
Calcium nitrate solutions (50% or less)	Z
Clay slurry	OS
Coal slurry	OS
Diethylene glycol	Z
Ethyl alcohol	Z
Ethylene carbonate	Z
Glucose solution	OS
Glycerine	Z
Glycerol ethoxylated	OS
Hexamethylenetetramine solutions	Z
Hexylene glycol	Z
Hydrogenated starch hydrolysate	OS
Isopropyl alcohol	Z
Kaolin slurry	OS
Lecithin	OS
Magnesium hydroxide slurry	Z
Maltitol solution	OS
N-Methylglucamine solution (70% or less)	Z
Methyl propyl ketone	Z
Microsilica slurry	OS
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
Orange juice (concentrated)	OS
Orange juice (not concentrated)	OS
Polyaluminium chloride solution	Z
Polyglycerin, sodium salt solution (containing less than 3% sodium hydroxide)	Z
Potassium chloride solution (less than 26%)	OS
Potassium formate solutions	Z
Propylene carbonate	Z
Propylene glycol	Z
Sodium acetate solutions	Z
Sodium bicarbonate solution (less than 10%)	OS
Sodium sulphate solutions	Z
Sorbitol solution	OS
Sulphonated polyacrylate solution	Z
Tetraethyl silicate monomer/oligomer (20% in ethanol)	Z
Triethylene glycol	Z
Vegetable protein solution (hydrolysed)	OS

Product Name	Pollution Category
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 capitals 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 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.

19.2 Following a review of chapter 19, a column listing UN numbers which was previously included has been removed from the Index. Since UN numbers are only available for a limited number of Index Names and there are inconsistencies between some of the names used in chapter 19 and those linked to UN numbers, it was decided to remove UN number references in order to avoid any confusion.

19.3 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 the Product Name on the shipping document.

19.4 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

19.5 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-	
S-	
sym-	(symmetrical)
uns-	(unsymmetrical)
dl-	
D-	
L-	
cis-	
trans-	
(E)-	
(Z)-	
alpha-	(α-)
beta-	(β-)
gamma-	(γ-)
epsilon	(ε-)
omega	(ω-)

19.6 The Index utilizes a note after the index name for some entries (shown as (a) or (b)) which indicates that the following qualifications apply:

(a) this Index Name represents a subset of the corresponding Product Name.

(b) The Product Name corresponding to this Index Name contains a carbon chain length qualification. Since the Index Name should always represent a subset or be an exact synonym of the corresponding Product Name, the carbon chain length characteristics should be checked for any product identified by this Index Name.

Index Name	Product Name	Chapter
Abietic anhydride	**ROSIN**	17
acedimethylamide	**N,N-DIMETHYLACETAMIDE**	17
Acetaldehyde cyanohydrin solution (80% or less)	**LACTONITRILE SOLUTION (80% OR LESS)**	17
Acetaldehyde trimer	**PARALDEHYDE**	17
ACETIC ACID		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
ACETIC ANHYDRIDE		17
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
ACETOCHLOR		17
ACETONE		18
ACETONE CYANOHYDRIN		17
ACETONITRILE		17
ACETONITRILE (LOW PURITY GRADE)		17
Acetyl anhydride	**ACETIC ANHYDRIDE**	17
Acetylene tetrachloride	**TETRACHLOROETHANE**	17
Acetyl ether	**ACETIC ANHYDRIDE**	17
Acetyl oxide	**ACETIC ANHYDRIDE**	17
ACID OIL MIXTURE FROM SOYABEAN, CORN (MAIZE) AND SUNFLOWER OIL REFINING		17
Acroleic acid	**ACRYLIC ACID**	17
ACRYLAMIDE SOLUTION (50% OR LESS)		17
ACRYLIC ACID		17
Acrylic acid, 2-hydroxyethyl ester	**2-HYDROXYETHYL ACRYLATE**	17
Acrylic amide solution, 50% or less	**ACRYLAMIDE SOLUTION (50% OR LESS)**	17
Acrylic resin monomer	**METHYL METHACRYLATE**	17
ACRYLONITRILE		17
ACRYLONITRILE-STYRENE COPOLYMER DISPERSION IN POLYETHER POLYOL		17
Adipic acid, bis(2-ethylhexyl) ester	**DI-(2-ETHYLHEXYL) ADIPATE**	17
ADIPONITRILE		17
ALACHLOR TECHNICAL (90% OR MORE)		17
Alcohol	**ETHYL ALCOHOL**	18
Alcohol, C10	**DECYL ALCOHOL (ALL ISOMERS)**	17
Alcohol, C11	**UNDECYL ALCOHOL**	17
Alcohol, C12	**DODECYL ALCOHOL**	17
Alcohol, C7 (a)	**HEPTANOL (ALL ISOMERS) (D)**	17
Alcohol, C8	**OCTANOL (ALL ISOMERS)**	17
Alcohol, C9	**NONYL ALCOHOL (ALL ISOMERS)**	17
ALCOHOLIC BEVERAGES, N.O.S.		18
ALCOHOL (C9-C11) POLY (2.5-9) ETHOXYLATE		17

Index Name	Product Name	Chapter
ALCOHOL (C6-C17) (SECONDARY) POLY(3-6) ETHOXYLATES		17
ALCOHOL (C6-C17) (SECONDARY) POLY(7-12) ETHOXYLATES		17
ALCOHOL (C12-C16) POLY(1-6)ETHOXYLATES		17
ALCOHOL (C12-C16) POLY(20+)ETHOXYLATES		17
ALCOHOL (C12-C16) POLY(7-19)ETHOXYLATES		17
ALCOHOLS (C13+)		17
Alcohols, C13 - C15	**ALCOHOLS (C13+)**	17
ALCOHOLS (C12+), PRIMARY, LINEAR		17
ALCOHOLS (C8-C11), PRIMARY, LINEAR AND ESSENTIALLY LINEAR		17
ALCOHOLS (C12-C13), PRIMARY, LINEAR AND ESSENTIALLY LINEAR		17
ALCOHOLS (C14-C18), PRIMARY, LINEAR AND ESSENTIALLY LINEAR		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
ALKANES(C10-C26), LINEAR AND BRANCHED, (FLASHPOINT >60°C)		17
N-ALKANES (C10+)		17
Alkane(C10-C18)sulfonic acid, phenyl ester (a)	**ALKYL SULPHONIC ACID ESTER OF PHENOL**	17
ALKARYL POLYETHERS (C9-C20)		17
ALKENOIC ACID, POLYHYDROXY ESTER BORATED		17
ALKENYL (C11+) AMIDE		17
ALKENYL (C16-C20) SUCCINIC ANHYDRIDE		17
ALKYL ACRYLATE-VINYLPYRIDINE COPOLYMER IN TOLUENE		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 BENZENE DISTILLATION BOTTOMS		17
ALKYLBENZENE MIXTURES (CONTAINING AT LEAST 50% OF TOLUENE)		17
ALKYL (C3-C4) BENZENES		17
ALKYL (C5-C8) BENZENES		17
ALKYL(C9+)BENZENES		17
ALKYL (C11-C17) BENZENE SULPHONIC ACID		17
ALKYLBENZENE SULPHONIC ACID, SODIUM SALT SOLUTION		17
ALKYL (C12+) DIMETHYLAMINE		17
ALKYL DITHIOCARBAMATE (C19-C35)		17
ALKYLDITHIOTHIADIAZOLE (C6-C24)		17
ALKYL ESTER COPOLYMER (C4-C20)		17

Index Name	Product Name	Chapter
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
ALKYL (C7-C9) NITRATES		17
2,2'- [3-(Alkyl(C16-C18)oxy)propylimino]diethanol (a)	**ETHOXYLATED LONG CHAIN (C16+) ALKYLOXYALKYLAMINE**	17
ALKYL(C7-C11)PHENOL POLY(4-12) ETHOXYLATE		17
ALKYL (C8-C40) PHENOL SULPHIDE		17
ALKYL (C8-C9) PHENYLAMINE IN AROMATIC SOLVENTS		17
ALKYL (C9-C15) PHENYL PROPOXYLATE		17
ALKYL (C8-C10) POLYGLUCOSIDE SOLUTION (65% OR LESS)		17
ALKYL (C8-C10)/(C12-C14):(50%/50%) POLYGLUCOSIDE SOLUTION (55% OR LESS)		17
ALKYL (C12-C14) POLYGLUCOSIDE SOLUTION (55% OR LESS)		17
ALKYL(C12-C16) PROPOXYAMINE ETHOXYLATE		17
ALKYL(C10-C20, SATURATED AND UNSATURATED) PHOSPHITE		17
ALKYL SULPHONIC ACID ESTER OF PHENOL		17
ALKYL (C18+) TOLUENES		17
ALKYL(C18-C28)TOLUENESULFONIC ACID		17
ALKYL(C18-C28)TOLUENESULFONIC ACID, CALCIUM SALTS, BORATED		17
Alkyltoluenesulfonic acid, calcium salts, high overbase (up to 70% in mineral oil)	**ALKYL (C18-C28) TOLUENESULPHONIC ACID, CALCIUM SALTS, HIGH OVERBASE**	17
ALKYL (C18-C28) TOLUENESULFONIC ACID, CALCIUM SALTS, LOW OVERBASE		17
Alkyl(C18-C28)toluenesulfonic acid,calcium salts, low overbase (up to 60% in mineral oil)	**ALKYL (C18-C28) TOLUENESULFONIC ACID, CALCIUM SALTS, LOW OVERBASE**	17
ALKYL (C18-C28) TOLUENESULPHONIC ACID, CALCIUM SALTS, HIGH OVERBASE		17
3-Alky(C16-C18)oxy-N,N'-bis(2-hydroxyethyl)propan-1-amine (a)	**ETHOXYLATED LONG CHAIN (C16+) ALKYLOXYALKYLAMINE**	17
ALLYL ALCOHOL		17
ALLYL CHLORIDE		17
ALUMINIUM CHLORIDE/HYDROGEN CHLORIDE SOLUTION		17
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 (a)	**BUTYLAMINE (ALL ISOMERS)**	17
2-Aminobutane	**BUTYLAMINE (ALL ISOMERS)**	17
Aminocyclohexane	**CYCLOHEXYLAMINE**	17
Aminoethane	**ETHYLAMINE**	17
Aminoethane solutions, 72% or less	**ETHYLAMINE SOLUTIONS (72% OR LESS)**	17

Index Name	Product Name	Chapter
2-Aminoethanol	**ETHANOLAMINE**	17
2-(2-AMINOETHOXY) ETHANOL		17
2-(2-Aminoethylamino)ethanol	**AMINOETHYL ETHANOLAMINE**	17
AMINOETHYLDIETHANOLAMINE/AMINOETHYLETHANOLAMINE SOLUTION		17
AMINOETHYL ETHANOLAMINE		17
N-(2-aminoethyl)ethylenediamine	**DIETHYLENETRIAMINE**	17
1-(2-Aminoethyl)piperazine	**N-AMINOETHYLPIPERAZINE**	17
N-AMINOETHYLPIPERAZINE		17
2-Aminoisobutane (a)	**BUTYLAMINE (ALL ISOMERS)**	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
2-Aminopropane (70% or less) solution	**ISOPROPYLAMINE (70% OR LESS) SOLUTION**	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
Ammonia water, 28% or less	**AMMONIA AQUEOUS (28% OR LESS)**	17
AMMONIUM CHLORIDE SOLUTION (LESS THAN 25%) (*)		17
AMMONIUM HYDROGEN PHOSPHATE SOLUTION		17
Ammonium hydroxide, 28% or less	**AMMONIA AQUEOUS (28% OR LESS)**	17
AMMONIUM LIGNOSULPHONATE SOLUTIONS		17
AMMONIUM NITRATE SOLUTION (93% OR LESS)		17
AMMONIUM POLYPHOSPHATE SOLUTION		17
AMMONIUM SULPHATE SOLUTION		17
AMMONIUM SULPHIDE SOLUTION (45% OR LESS)		17
AMMONIUM THIOSULPHATE SOLUTION (60% OR LESS)		17
AMYL ACETATE (ALL ISOMERS)		17
Amyl acetate, commercial (a)	**AMYL ACETATE (ALL ISOMERS)**	17
n-Amyl acetate (a)	**AMYL ACETATE (ALL ISOMERS)**	17
sec-Amyl acetate (a)	**AMYL ACETATE (ALL ISOMERS)**	17
Amylacetic ester (a)	**AMYL ACETATE (ALL ISOMERS)**	17
Amyl alcohol	**N-AMYL ALCOHOL**	17
N-AMYL ALCOHOL		17
AMYL ALCOHOL, PRIMARY		17

Index Name	Product Name	Chapter
SEC-AMYL ALCOHOL		17
TERT-AMYL ALCOHOL		17
Amyl aldehyde	**VALERALDEHYDE (ALL ISOMERS)**	17
Amylcarbinol	**HEXANOL**	17
Amylene hydrate	**TERT-AMYL ALCOHOL**	17
Amyl ethyl ketone	**ETHYL AMYL KETONE**	17
TERT-AMYL METHYL ETHER		17
n-Amyl methyl ketone	**METHYL AMYL KETONE**	17
n-Amyl propionate	**N-PENTYL PROPIONATE**	17
Anaesthetic ether	**DIETHYL ETHER**	17
ANILINE		17
Aniline oil	**ANILINE**	17
Anilinobenzene	**DIPHENYLAMINE (MOLTEN)**	17
Anthracene oil (coal tar fraction) (a)	**COAL TAR**	17
Ant oil, artificial	**FURFURAL**	17
APPLE JUICE		18
Aqua fortis	**NITRIC ACID (70% AND OVER)**	17
Argilla	**KAOLIN SLURRY**	18
ARYL POLYOLEFINS (C11-C50)		17
AVIATION ALKYLATES (C8 PARAFFINS AND ISO-PARAFFINS BPT 95 - 120°C)		17
Azacycloheptane	**HEXAMETHYLENEIMINE**	17
3-Azapentane-1,5-diamine	**DIETHYLENETRIAMINE**	17
Azepane	**HEXAMETHYLENEIMINE**	17
Azotic acid	**NITRIC ACID (70% AND OVER)**	17
BARIUM LONG CHAIN (C11-C50) ALKARYL SULPHONATE		17
Basic calcium alkyl salicylate in approximately 30% mineral oil (b)	**CALCIUM LONG-CHAIN ALKYL SALICYLATE (C13+)**	17
Battery acid	**SULPHURIC ACID**	17
Behenyl alcohol (a)	**ALCOHOLS (C13+)**	17
Benzenamine	**ANILINE**	17
1,4-Benzenedicarboxylic acid, butyl ester	**DIBUTYL TEREPHTHALATE**	17
1,2-Benzenedicarboxylic acid, diethyl ester	**DIETHYL PHTHALATE**	17
1,2-Benzenedicarboxylic acid, diundecyl ester	**DIUNDECYL PHTHALATE**	17
BENZENE AND MIXTURES HAVING 10% BENZENE OR MORE (I)		17
BENZENESULPHONYL CHLORIDE	**BENZENE SULPHONYL CHLORIDE**	17
BENZENE SULPHONYL CHLORIDE		17
BENZENETRICARBOXYLIC ACID, TRIOCTYL ESTER		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
2-Benzothiazolethiol, sodium salt solution	**MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION**	17

Index Name	Product Name	Chapter
Benzothiazole-2-thiol, sodium salt solution	**MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION**	17
(2-Benzothiazolylthio) sodium solution	**MERCAPTOBENZOTHIAZOL, SODIUM SALT SOLUTION**	17
BENZYL ACETATE		17
BENZYL ALCOHOL		17
Benzyl butyl phthalate	**BUTYL BENZYL PHTHALATE**	17
BENZYL CHLORIDE		17
Betaprone	**BETA-PROPIOLACTONE**	17
Betula oil	**METHYL SALICYLATE**	17
Biformyl	**GLYOXAL SOLUTION (40% OR LESS)**	17
BIO-FUEL BLENDS OF DIESEL/GAS OIL AND ALKANES (C10-C26), LINEAR AND BRANCHED WITH A FLASHPOINT >60°C (>25% BUT <99% BY VOLUME)		17
BIO-FUEL BLENDS OF DIESEL/GAS OIL AND ALKANES (C10-C26), LINEAR AND BRANCHED WITH A FLASHPOINT Ò60ÁC (>25% BUT <99% BY VOLUME)		17
BIO-FUEL BLENDS OF DIESEL/GAS OIL AND FAME (>25% BUT <99% BY VOLUME)		17
BIO-FUEL BLENDS OF DIESEL/GAS OIL AND VEGETABLE OIL (>25% BUT <99% BY VOLUME)		17
BIO-FUEL BLENDS OF GASOLINE AND ETHYL ALCOHOL (>25% BUT <99% BY VOLUME)		17
Biphenyl	**DIPHENYL**	17
Bis(methylcyclopentadiene)	**METHYLCYCLOPENTADIENE DIMER**	17
2,5-Bis(alkyl(C7+)thio)-1,3,4-thiadiazole	**ALKYLDITHIOTHIADIAZOLE (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(2-(bis(carboxymethyl)amino)ethyl)glycine, pentasodium salt solution	**DIETHYLENETRIAMINEPENTAACETIC ACID, PENTASODIUM SALT SOLUTION**	17
Bis(2-butoxyethyl) ether	**DIETHYLENE GLYCOL DIBUTYL ETHER**	17
N,N- Bis(carboxymethyl)glycine trisodium salt solution	**NITRILOTRIACETIC ACID, TRISODIUM SALT SOLUTION**	17
Bis(chloroethyl) ether	**DICHLOROETHYL ETHER**	17
Bis(2-chloroethyl) ether	**DICHLOROETHYL ETHER**	17
Bis (2-chloroisopropyl) ether	**2,2'-DICHLOROISOPROPYL ETHER**	17
Bis(2-chloro-1-methylethyl) ether	**2,2'-DICHLOROISOPROPYL ETHER**	17
Bis[2-(2,3-epoxypropoxy)phenyl]methane	**DIGLYCIDYL ETHER OF BISPHENOL F**	17
2,2-Bis[4-(2,3-epoxypropoxy)phenyl]propane	**DIGLYCIDYL ETHER OF BISPHENOL A**	17
Bis(2-ethoxyethyl) ether	**DIETHYLENE GLYCOL DIETHYL ETHER**	17
Bis(2-ethylhexyl) adipate	**DI-(2-ETHYLHEXYL) ADIPATE**	17
Bis(2-ethylhexyl) hydrogen phosphate	**DI-(2-ETHYLHEXYL) PHOSPHORIC ACID**	17
Bis(2-ethylhexyl) phthalate	**DIOCTYL PHTHALATE**	17
Bis(2-hydroxyethyl)amine	**DIETHANOLAMINE**	17
Bis(2-hydroxyethyl)ammonium 2,4-dichlorophenoxyacetate solution	**2,4-DICHLOROPHENOXYACETIC ACID, DIETHANOLAMINE SALT SOLUTION**	17
Bis(2-hydroxyethyl) ether	**DIETHYLENE GLYCOL**	18
Bis(2-hydroxypropyl)amine	**DIISOPROPANOLAMINE**	17
Bis(6-methylheptyl) phthalate	**DIOCTYL PHTHALATE**	17

Index Name	Product Name	Chapter
Blackstrap molasses (a)	**MOLASSES**	18
Bolus alba	**KAOLIN SLURRY**	18
BRAKE FLUID BASE MIX: POLY(2-8)ALKYLENE (C2-C3) GLYCOLS/POLYALKYLENE (C2-C10) GLYCOLS MONOALKYL (C1-C4) ETHERS AND THEIR BORATE ESTERS		17
Bran oil	**FURFURAL**	17
BROMOCHLOROMETHANE		17
Butaldehyde (a)	**BUTYRALDEHYDE (ALL ISOMERS)**	17
Butanal (a)	**BUTYRALDEHYDE (ALL ISOMERS)**	17
n-Butanal (a)	**BUTYRALDEHYDE (ALL ISOMERS)**	17
1,3-Butanediol (a)	**BUTYLENE GLYCOL**	17
Butane-1,3-diol (a)	**BUTYLENE GLYCOL**	17
1,4-Butanediol (a)	**BUTYLENE GLYCOL**	17
Butane -1,4-diol (a)	**BUTYLENE GLYCOL**	17
2,3-Butanediol (a)	**BUTYLENE GLYCOL**	17
Butane-2,3-diol (a)	**BUTYLENE GLYCOL**	17
Butanoic acid	**BUTYRIC ACID**	17
Butanol	**N-BUTYL ALCOHOL**	18
1-Butanol	**N-BUTYL ALCOHOL**	18
Butanol-1	**N-BUTYL ALCOHOL**	18
Butan-1-ol	**N-BUTYL ALCOHOL**	18
2-Butanol	**SEC-BUTYL ALCOHOL**	18
Butan-2-ol	**SEC-BUTYL ALCOHOL**	18
Butanol acetate (a)	**BUTYL ACETATE (ALL ISOMERS)**	17
2-Butanol acetate (a)	**BUTYL ACETATE (ALL ISOMERS)**	17
1,4-Butanolide	**GAMMA-BUTYROLACTONE**	17
Butan-4-olide	**GAMMA-BUTYROLACTONE**	17
n-Butanol	**N-BUTYL ALCOHOL**	18
sec-Butanol	**SEC-BUTYL ALCOHOL**	18
tert-Butanol	**TERT-BUTYL ALCOHOL**	17
2-Butanone	**METHYL ETHYL KETONE**	17
Butan-2-one	**METHYL ETHYL KETONE**	17
2-Butenal	**CROTONALDEHYDE**	17
Butene dimer	**OCTENE (ALL ISOMERS)**	17
BUTENE OLIGOMER		17
1-Butoxybutane	**N-BUTYL ETHER**	17
2-Butoxyethanol (a)	**ETHYLENE GLYCOL MONOALKYL ETHERS**	17
2-tert-butoxyethanol (a)	**ETHYLENE GLYCOL MONOALKYL ETHERS**	17
2-(2-Butoxyethoxy)ethanol (a)	**POLY(2-8)ALKYLENE GLYCOL MONOALKYL(C1-C6) ETHER**	17
2-(2-Butoxyethoxy)ethyl acetate (a)	**POLY(2-8)ALKYLENE GLYCOL MONOALKYL (C1-C6) ETHER ACETATE**	17
2-Butoxyethyl acetate	**ETHYLENE GLYCOL BUTYL ETHER ACETATE**	17
1-Butoxypropan-2-ol (a)	**PROPYLENE GLYCOL MONOALKYL ETHER**	17
Butyl acetate (a)	**BUTYL ACETATE (ALL ISOMERS)**	17
BUTYL ACETATE (ALL ISOMERS)		17
n-Butyl acetate (a)	**BUTYL ACETATE (ALL ISOMERS)**	17

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Z-Octadec-9-enoic acid	**OLEIC ACID**	17
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ON-SHORE POWER SUPPLY

General

1 On-shore Power Supply (OPS) technology is known by a variety of names: "Alternative Maritime Power (AMP)", "Cold Ironing", "Shoreside Electricity" and "On-shore Power Supply". OPS is considered a measure to improve air quality in ports and port cities, to reduce emissions of air pollutants and noise and, to a lesser extent, to reduce carbon dioxide through ships at berth replacing onboard generated power from diesel auxiliary engines with electricity supplied by the shore.

2 The International Association of Ports and Harbours (IAPH) provided information to MEPC 61 on the World Ports Climate Initiative (MEPC 61/INF.12) and the establishment in spring 2010 of an On-shore Power Supply (OPS) website (http://www.ops.wpci.nl/) to provide practical information about OPS for seagoing vessels and shore installations. The website is targeted particularly at port authorities, terminal operators and shipping companies considering introduction or expansion of the technology. It provides information on numerous issues connected with OPS such as power generation, voltage and frequency, safety and health, costs, implementation, ports utilizing OPS, etc.

Provision of on-shore power supply

3 The World Ports Climate Initiative (WPCI) website (http://wpci.iaphworldports.org/) identifies that there is an increasing provision of on-shore power systems in North America and Europe for seagoing ships. Information for ports at which on-shore power supply is available or under development is set out in the annex.

International Standard

4 The international standard "ISO/IEC/IEEE 80005-1:2012 Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements" was published on 13 July 2012 and addresses the connection between ship and shore and the procedures for safe operation.

5 This standard revises "IEC/PAS 60092-510:2009 Electrical installations in ships – Special features – High Voltage Shore Connection Systems (HVSC-Systems)".

Industry guidance

6 Noting the development and increasing availability of OPS systems, guidance has been published by classification societies as follows:

Guidelines	Classification Society	can be downloaded at:
High Voltage Shore Connection	American Bureau of Shipping (ABS)	http://www.eagle.org/eagleExternalPortalWEB/ShowProperty/BEA%20Repository/Rules&Guides/Current/182_HighVoltage/Guide
High-Voltage Shore Connection System	Bureau Veritas (BV)	http://www.veristar.com/content/static/veristarinfo/images/4707.21.557NR_2010-01.pdf
Guidelines for High-Voltage Shore Connection System	ClassNK	https://www.classnk.or.jp/account/en/Rules_Guidance/ssl/guidelines.aspx

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ANNEX

CURRENT LIST OF PORTS PROVIDING ON-SHORE POWER SUPPLY

Source: http://wpci.iaphworldports.org/onshore-power-supply/ops-installed/ports-using-ops.html, as at 9 October 2012

Port	Country	High Voltage	Low voltage	Frequency
Antwerp	Belgium	6.6 kV		50 Hz/60 Hz
Goteborg	Sweden	6.6 kV/10 kV	400 V	50 Hz
Helsingborg	Sweden		400 V/440 V	50 HzV
Stockholm	Sweden		400 V/690 V	50 Hz
Piteå	Sweden	6 kV		50 Hz
Kemi	Finland	6.6 kV		50 Hz
Oulu	Finland	6.6 kV		50 Hz
Kotka	Finland	6.6 kV		50 Hz
Lübeck	Germany	6.6 kV		50 Hz
Zeebrugge	Belgium	6.6kV		50 Hz
Los Angeles	U.S.A	6.6 kV/11 kV		60 Hz
Long Beach	U.S.A	6.6 kV	480 V	60 Hz
San Francisco	U.S.A	6.6 kV/11 kV		60 Hz
San Diego	U.S.A	6.6 kV/11 kV		60 Hz
Seattle	U.S.A	6.6 kV/11 kV		60 Hz
Juneau	U.S.A	6.6 kV/11 kV		60 Hz
Pittsburgh	U.S.A		440 V	60 Hz
Vancouver	Canada			
Oslo	Norway	6.6 kV		50 Hz
Rotterdam	Netherlands	6.6 kV		50 HZ

Recent developments

Several ports are currently implementing OPS, thus extending the scope of its application. These include:

- the Port of Le Havre (France)
- the Port of Marseille (France)
- the Port of Civitavecchia (Italy)