INTERNATIONAL MARITIME ORGANIZATION

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Agenda item 3

PPR 2/3
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SAFETY AND POLLUTION HAZARDS OF CHEMICALS AND PREPARATION OF CONSEQUENTIAL AMENDMENTS TO THE IBC CODE, TAKING INTO ACCOUNT RECOMMENDATIONS OF GESAMP-EHS

Report of the twentieth session of the Working Group on the Evaluation and Safety of Pollution Hazards of Chemicals

SUMMARY

Executive summary:	This document reports on the outcome of the twentieth session of the Working Group on the Evaluation of the Safety and Pollution Hazards of Chemicals (ESPH 20) which was held from 29 September to 3 October 2014
Strategic direction:	7.2
High-level action:	7.2.2
Planned output:	7.2.2.1
Action to be taken:	Paragraph 9.1
Related documents:	None

1 INTRODUCTION

1.1 The working group met from 29 September to 3 October 2014 under the chairmanship of Mr. David MacRae (United Kingdom).

1.2 The meeting was attended by delegates from the following Member Governments:

BELGIUM
FINLAND
FRANCE
GERMANY
JAPAN
MARSHALL ISLANDS
NETHERLANDS
NIGERIA
NORWAY
PHILIPPINES
SINGAPORE
SPAIN
SOUTH AFRICA
SWEDEN
UNITED KINGDOM
UNITED STATES

and observers from the following non-governmental organizations in consultative status:

INTERNATIONAL CHAMBER OF SHIPPING (ICS)
INTERNATIONAL ASSOCIATION OF CLASSIFICATION SOCIETIES (IACS)
EUROPEAN CHEMICAL INDUSTRY COUNCIL (CEFIC)
INTERNATIONAL ASSOCIATION OF INDEPENDENT TANKER OWNERS (INTERTANKO)
DANGEROUS GOODS ADVISORY COUNCIL (DGAC)
INTERNATIONAL PARCEL TANKERS ASSOCIATION (IPTA)
INTERNATIONAL SPILL CONTROL ORGANIZATION (ISCO)

1.3 The group adopted its provisional agenda and annotated agenda for the meeting, as set out in documents ESPH 20/1 and ESPH 20/1/1.

2 OUTCOME OF OTHER BODIES

2.1 The group had one document for its consideration under this agenda item: ESPH 20/2 (Secretariat), containing information on the outcome of GESAMP-EHS 51, MEPC 66 and MSC 93 on matters of relevance to the work of the ESPH Working Group.

Outcome of GESAMP-EHS 51

2.2 The group noted the outcome of the matters it had referred to GESAMP-EHS 51, as contained in the report of GESAMP-EHS 51 (PPR.1/Circ.1).

2.3 The group, recalling its request for clarification on how solubility classification was considered within the GESAMP Hazard Profile (GHP) for cases where a solvent system may dissolve readily in water, but other product components may not disperse, noted the guidance provided on this matter.

2.4 GESAMP-EHS had advised that, where appropriate, if multiple dispersion behaviour was anticipated for a product, this was usually recorded in the E2 column of the GESAMP EHS Composite List, in line with the European Behaviour Classification System, developed within the framework of the Bonn Agreement. Such behaviour may sometimes be displayed by pure substances or substance mixtures, with typical examples being:

Pure substance:	Butylene Glycol Methyl Ether Acetate – FED
Mixtures:	Cresols (mixed isomers) – SD
	Dialkyl (C8-C9) diphenylamines – FD

2.5 Whilst the GESAMP hazard evaluation procedure uses only the F (floater), Fp (persistent floater) and S (sinker) ratings, other standard behaviour categories and combinations are included in column E2 for the benefit of other users of GHPs. If a combination of floater and sinker behaviour is anticipated, as this is not a standard combination used in the European system, the group's practice is generally to assign an F or Fp rating, since this can be a contributory property for the assignment of a rating for the E3 rating related to interference with coastal amenities. An example of this is the rating given for Napthalenes, crude (molten), which was determined to be Fp, given that it is a complex mixture containing Naphthalene (a sinker), together with other components which have floater characteristics.

2.6 The group also noted that, further to its request at PPR 1 with regard to the contains name for Pentylol, GESAMP-EHS 51 had agreed that the product should be renamed as Alkyl/cyclo (C4-C5) alcohols, in order to ensure the substance name and trade name were not the same.

2.7 The group noted that, owing to time constraints, GESAMP-EHS 51 had been unable to address the request by the ESPH Working Group to review the profile for Calcium long chain phenate sulphide (C8-C40) and Calcium alkyl (C10-C28) salicylate, and that, consequently, this would instead be addressed at GESAMP-EHS 52.

2.8 As part of its regular work, GESAMP-EHS 51 had considered the following ten substances and assigned GESAMP Hazard Profiles accordingly for each one. These substances were subsequently added to the GESAMP Composite List:

.1 Cyclohexane oxidation products, sodium salts solution;

.2 Naphthalene crude (molten);

.3 n-Octyl mercaptan;

.4 n-Dodecyl mercaptan;

.5 Alkanes (C10-C17), linear and branched;

.6 Alkanes (C5-C7), linear and branched;

.7 Potassium carbonate solution;

.8 Diethylenetriamine pentaacetic acid, pentapotassium salt (40% solution);

.9 Diethylenetriamine pentamethylene phosphonic acid, pentasodium salt (47% solution); and

.10 Poly N-alkylmethacrylamide ammonium acrylate copolymer (20% solution in DEGME).

2.9 GESAMP-EHS 51 had also reviewed the following substances, based on new data received, and had amended the hazard ratings accordingly, with the exception of sodium hydroxide, and had included these in the updated GESAMP Composite List:

.1 Glucitol/glycerol blend propoxylated (containing 10% or more amines);

.2 n-Alkanes (C9-C11);

.3 Allyl alcohol;

.4 Sodium hydroxide;

.5 tert-Dodecanethiol; and

.6 Fluorosilicic acid 20-30% in water.

2.10 With regard to sodium hydroxide, GESAMP-EHS 51 had confirmed the existing C3 rating of 3, with removal of the brackets, given that this was no longer based on estimation, but on the actual study data. It had also decided that the entry in the Composite List should be amended to "sodium hydroxide solution", for purposes of precision and to ensure consistency with the IBC Code entry for sodium hydroxide. While it had reached a decision on the C3 rating, GESAMP-EHS had noted that it had not fully concluded its consideration of the product during the session and therefore had agreed to revisit the matter at GESAMP-EHS 52.

2.11 With regard to the GESAMP-EHS Working Group's ongoing review of its existing files, GESAMP Hazard Profiles were modified for the following substances:

.1 Polyethylene amines / paraffin mixtures;

.2 Iso-and cyclo-alkanes (C12+);

.3 Cyclopentene;

.4 Fatty acids saturated, C8-C10; and

.5 Fatty acids, linear C12+ saturated with C12+ unsaturated.

2.12 The group noted GESAMP-EHS' intention to review the family of alkenes and alkanes as a whole and noted the invitation to Member States to submit new data to contribute to this exercise.

2.13 The group also noted that GESAMP-EHS had, for some products, the full complement of data available to assign and a full GESAMP Hazard Profile, but had assigned short or partial profiles, as had been requested by the manufacturer. This raised the question as to whether a full profile should be assigned to a product if the full data was available, noting that this information may be used more broadly, notably for the purposes of spill response.

2.14 The group noted that GESAMP-EHS 51 had undertaken a final comprehensive revision of the final draft of the revised GESAMP Reports and Studies No.64 and had requested the Secretariat to incorporate the changes and proceed with publishing of the document as soon as possible. It is expected that this will be published in late 2014.

Outcome of MEPC 66 and MSC 93

2.15 The group noted that amendments to the IBC Code had been adopted by MEPC 66 and MSC 93 as resolutions MEPC.250(66) and MSC.369(93), respectively, and that these should be deemed to have been accepted on 1 July 2015 and should enter into force on 1 January 2016.

2.16 Having noted the outcome of MSC 93 on this matter, the delegation of Norway expressed concern with how the amendments were presented in the MSC 93 report, which stated that MSC "had agreed that the revised sub-paragraph 11.1.1.1 of chapter 11 of the IBC Code applies to chemical tankers constructed after 1 January 2016" and was of the view that this may be misleading and interpreted as exempting existing chemical tankers from the SOLAS inert gas requirements. In its view, the revision to sub-paragraph 11.1.1.1 was solely to correct a persistent error in the IBC Code and that SOLAS was still the governing instrument which requires inert gas for chemical tankers, independent of the ship's construction date, with the possibility of more relaxed requirements for existing ships, depending on tank size and tank cleaning machine throughput.

2.17 The group noted that MEPC 66, having noted that C/ES.27 had referred output 7.2.2.1 (Safety and pollution hazards of chemicals and preparation of consequential amendments to MARPOL Annex II and the IBC Code taking into account recommendations of GESAMP-EHS) of the High-level Action Plan to it for review and consideration of scope, had amended the title of the output to: "Safety and pollution hazards of chemicals and preparation of consequential amendments to the IBC Code, taking into account recommendations of GESAMP-EHS" and to amend the biennial agenda of the PPR Sub-Committee, accordingly.

2.18 In this connection, the group further noted that all matters relating to amendments to MARPOL Annex II may no longer be considered directly by the ESPH Working Group and would henceforth need to be submitted first to MEPC for action, as appropriate.

2.19 The group noted that MSC 93, in considering the outcome of PPR 1 on matters related to maritime safety, had noted that a significant number of questions had been received by Member Governments, international organizations and the Secretariat on the application of new SOLAS regulation VI/5-2 related to the prohibition of the blending of bulk liquid cargoes and production processes during sea voyages, which had entered into force on 1 January 2014, and that PPR 1 had invited interested Member Governments and international organizations to submit proposals to MSC 93.

2.20 The group further noted that MSC 93 had considered document MSC 93/20/8 (Liberia, Marshall Islands, Norway, Panama, ICS, BIMCO and INTERTANKO), proposing to develop guidance on the application of SOLAS regulation VI/5-2, and had agreed to instruct PPR 2, under its existing output on "Unified interpretation to provisions of IMO environmental related Conventions (1.1.2.3)", to consider the questions contained in paragraph 8 of the aforementioned document and advise MSC 95 accordingly. The group further noted that interested Member Governments and international organizations had been invited to submit relevant information and proposals to PPR 2 and that this matter was likely to be included in the terms of reference for the ESPH Working Group at PPR 2.

3 EVALUATION OF NEW PRODUCTS

3.1 The group recalled that under this agenda item, it considered submissions of pure or technically pure products for inclusion in list 1 of the MEPC.2/Circular as entries for "all countries with no expiry date".

3.2 The group further recalled that document submissions for the evaluation of products for inclusion in the MEPC.2/Circular should always be done using the PPR Data Reporting Form, noting that this was being revised and would be further discussed at this session, and must include the appropriate outputs as identified in the Strategic and High-level Action Plans, in line with the *Guidelines on the Organization and method of work of the Maritime Safety Committee and the Marine Environment Protection Committee and their subsidiary bodies* (MSC-MEPC.1/Circ.4/Rev.2).

3.3 In this regard, the group noted that the following outputs should be utilized in document submissions to ESPH: strategic direction: 7.2; high-level action: 7.2; and planned output: 7.2.2.1, as defined in Assembly resolution A.1061(28), *High-level Action Plan of the Organization and priorities for the 2014-2015 biennium*.

3.4 The group recalled that for the evaluation of new products, it was important to ensure that all required data had been submitted and that the proposed classification and carriage requirements were commensurate with the data provided.

3.5 The group further noted that if data submitted for a substance were inconsistent or incomplete, it would not have sufficient information to assign the appropriate minimum carriage requirements and that, for such cases arising, it had been directed by the PPR Sub-Committee to reject such submissions.

3.6 As a further point, the group recalled that any GESAMP ratings placed in brackets, indicating that the assignment was not based on an actual test result but on an estimation, should be interpreted in the same manner as an unbracketed result for the purposes of assigning carriage conditions.

3.7 The group noted that there were seven new product submissions for evaluation as list 1 substances. The group also noted that one document, for the re-evaluation of fluorosilicic acid (20-30%), had been erroneously processed under agenda item 5 and therefore agreed to consider it under this agenda item. The group agreed to consider the documents in the following order:

.1 Naphthalene crude (molten), submitted by Germany (ESPH 20/3);

.2 Cyclohexane oxidation products, sodium salts solution, submitted by Belgium (ESPH 20/3/1);

.3 tert-Dodecanethiol, submitted by the United States (ESPH 20/3/2);

.4 n-Dodecyl mercaptan, submitted by Belgium (ESPH 20/3/3);

.5 n-Octyl mercaptan, submitted by Belgium (ESPH 20/3/4);

.6 Alkanes (C5-C7), linear and branched, submitted by Finland (ESPH 20/3/5);

.7 Alkanes (C10-C17), linear and branched, submitted by Finland (ESPH 20/3/6); and

.8 Fluorosilicic acid solution (20-30%), submitted by Finland (ESPH 20/5/10).

3.8 The results of the group's evaluation are set out in the ensuing paragraphs and the full carriage requirements for each product are included in annex 1. Where reference is made to the addition of products to list 1, this refers to their inclusion in MEPC.2/Circ.20 as entries for all countries, without an expiry date.

3.9 In considering the submission for Naphthalene crude (molten), the group agreed to modify the iii' rating from yes to no, noting the flash point value, and consequently modified the i' and ii' ratings to a dash (--). The group also agreed to an amendment to the information for TOST on the PPR Reporting from no to yes, to ensure consistency with the assigned GHP ratings. The group agreed that the proposed synonyms should be removed and confirmed the carriage requirements for the product, as amended, for entry into list 1.

3.10 Having considered the submission for Cyclohexane oxidation products, sodium salts solution, the group agreed to modify column l from "yes" to "no" and confirmed two synonyms for the product. The group concluded by confirming the carriage requirements, as amended, for inclusion of the product in list 1.

3.11 The group, having considered the information submitted for tert-Dodecanethiol, agreed to modify the ship type from 2 to 3 and column l to ABC. The group also confirmed one synonym for the product. In concluding, the group agreed to the product, as amended, for inclusion in list 1.

3.12 The group, having noted that an entry for tert-Dodecanethiol was already present in chapter 17 of the IBC Code, recalled that in such cases the IBC Code entry took precedence, pending any new amendments, further to which the chapter 17 information in the IBC Code would be updated with all new products and any amendments to existing products that had been agreed for inclusion in list 1.

3.13 Noting that the cycle for IBC Code amendments was, on average, approximately five years, the group considered options for addressing this issue, notably so that shippers could benefit from relaxed carriage requirements, for products with amendments that had resulted in lower carriage requirements and to ensure that products with more stringent carriage requirements, as a consequence of an amendment to the product, equally would not wait up to five years for these to become mandatory.

3.14 Having reviewed the submission for n-Dodecyl mercaptan, the group confirmed the carriage requirements, as submitted, and agreed on one synonym for the substance, and to include the substance as a list 1 entry.

3.15 The group considered the submission for n-Octyl mercaptan and confirmed the carriage requirements, as submitted, and to include the product as a list 1 entry. The group further agreed to one synonym for the product.

3.16 The group, having considered the submission for Alkanes (C5-C7), linear and branched, agreed to the carriage requirements, as submitted, for inclusion in list 1. Noting that the product was being submitted as a bio-fuel, the group further agreed to its inclusion in annex 11 of the MEPC.2/Circular and also concurred that MEPC.1/Circ.761/Rev.1 be revised to include "Bio-fuel blends of Gasolines and Alkanes (C5-C7), linear and branched (>25% but <99% by volume)" to the list of agreed bio-fuel blends set out in the circular. The group could not agree, however, to include the proposed naphtha blend in this circular, given that there was currently no GHP for naphtha.

3.17 In considering the data submitted for Alkanes (C10-C17), linear and branched, the group agreed to modify the rating for column j from C to R and its inclusion as a list 1 entry. The group further concurred to the inclusion of the product as a bio-fuel in annex 11 of the MEPC.2/Circular. The group could not, however, concur with the proposal for inclusion of this product as a jet fuel blend in MEPC.1/Circ.761/Rev.1, given that there was no GHP for jet fuel.

3.18 Given the above decisions, the delegation of Finland indicated that it would provisionally establish tripartite agreements for the naphtha and jet fuel bio-fuel blends and that it would submit data to GESAMP-EHS 52 for the assessment of these products and assignment of GHPs.

3.19 The group considered the new data submitted for Fluorosilicic acid solution (20-30%), with a view to amending the carriage requirements, based on the revised GHP assigned by GESAMP EHS 52. The group concurred with the carriage requirements, as submitted, and its entry into list 1 for all countries, without an expiry date. Three synonyms for the product were also agreed.

3.20 The group's decisions on the classification and assignment of carriage requirements for the products reviewed are set out in annex 1.

3.21 During its evaluation of list 3 products, the group highlighted a number of issues that would require action going forward, as follows:

.1 noting that many list 3 submissions were for a distillation fraction or a cut from a process stream, rather than a pure mixture, the group questioned whether these should continue to be evaluated using the established approach for list 3 products, i.e. mixture calculations, or would these be more appropriately evaluated using a different approach;

.2 noting the preponderance of submissions for lube oil additives and the significant number of such products present in list 3, the group reflected as to whether consideration should be given to establishing generic entries in order to group these products, which were of a similar nature and formulation. One suggestion, as a way forward, was to establish a generic entry or entries covering lube additives, rather than undertaking individual assessments for each new lube oil additive, which were then added as individual entries in the MEPC.2/Circular. The group discussed the possible development of a "nos" entry (or several nos entries), similar to those in list 4, which would also address safety concerns that could be captured in a new list, e.g. list 3*bis*, as one way forward, but with no decision taken; and

.3 with regard to partial GHPs assigned to components for the purposes of mixture calculations, the group noted the difficulty in assessing the safety aspects with partial GHPs, noting that in some cases the full data has been submitted to GESAMP. Having also noted that GESAMP had a policy of assigning only a partial profile in such cases, as requested by the manufacturer, the group agreed that it should invite GESAMP to consider changing this practice and to assign a full hazard profile, where a full data set had been submitted.

4 EVALUATION OF CLEANING ADDITIVES

4.1 The group recalled that MARPOL Annex II, regulation 13, "Provisions on the control of discharge of Noxious Liquid Substances", imposes restrictions on the cleaning additives permitted for use in tank washing operations.

4.2 The group further recalled that, as a consequence, cleaning additives must be assessed and included in the MEPC.2/Circular before they can be used in tank cleaning operations.

4.3 The group was informed that 21 cleaning additives had been submitted for evaluation, in accordance with the provisions of the Revised tank cleaning additives guidance note and reporting form (MEPC.1/Circ.590). In line with normal practice, in order to preserve the confidentiality of the composition of such additives, the products were evaluated by a subgroup made up of representatives of Member States only.

4.4 The delegations of Belgium, France, Germany, the Netherlands, South Africa, Singapore and the United States were represented in the subgroup. Despite the increasing number of Administrations involved, the group requested further representatives of Member States to consider joining the subgroup, so that decisions can be made based on a broader pool of expertise.

4.5 The subgroup reported that the composition and documentation for 17 cleaning additives submitted met the criteria set out in MEPC.1/Circ.590. Other products were rejected due to the lack of information on the biodegradability of an ingredient. The list of approved cleaning additives meeting the assessment criteria is set out in annex 2.

4.6 The subgroup noted that Safety Data Sheets for the product and its components had been provided as background information for all of cleaning additive submissions. Whilst not formally required, the subgroup considered this information to be helpful and recommended that submissions should, if possible, include Safety Data Sheets for the products.

4.7 The group recalled that Member States that had submitted cleaning additives for evaluation according to MEPC.1/Circ.590 were advised to retain records of the information submitted, as no files are retained by the Secretariat, in order to preserve formulation confidentiality.

4.8 The group expressed its appreciation to the members of the subgroup for its work in evaluating the cleaning additives submitted.

5 REVIEW OF MEPC.2/CIRCULAR – PROVISIONAL CLASSIFICATION OF LIQUID SUBSTANCES TRANSPORTED IN BULK AND OTHER RELATED MATTERS

5.1 The group recalled that this was a regular item on its agenda under which it considered a draft of the MEPC.2/Circular, which included all new tripartite agreements that had been reported to the Organization since the previous issue of the MEPC.2/Circular, in this case MEPC.2/Circ.19 that was issued in December 2013, and a review submissions of trade-named mixtures to be included in list 3 of the MEPC.2/Circular as entries with validity for all countries, without an expiry date.

Review of draft MEPC.2/Circ.20

5.2 The group considered document ESPH 20/5, containing the draft list to be included in MEPC.2/Circ.20, (Secretariat), which included new entries for all tripartite agreements communicated to the Secretariat since MEPC.2/Circ.19 was issued in December 2013; all new products or amendments to existing entries, as agreed at PPR 1; and other amendments to entries communicated to the Secretariat over the year. The group noted that any changes that have been introduced in the lists since MEPC.2/Circ.19 were highlighted for easy reference.

5.3 The group recalled that products that are under the provisions of a tripartite agreement and have reached their expiry date, without having been assessed by the ESPH Working Group, would be duly removed from the circular. The group noted that those products set to expire in December 2014 may not be shipped beyond their expiry date, and may not be shipped again until they are fully assessed by the ESPH Working Group.

5.4 In this connection, the group noted that tripartite agreements for 33 products, as set out below, were set to expire in December 2014 and that those marked with an asterisk had been submitted to this session for evaluation by the group.

List 1

.1 Bis(2-propylheptyl)phthalate (Sweden);

.2 Disulphide oil (United States);

.3 n-Dodecyl mercaptan (Belgium)*;

.4 Lauric acid methyl ester/myristic acid methyl ester mixture (United States);

.5 2-Methyl-1,5-pentanediamine (United States);

.6 n-Octyl mercaptan (Belgium)*;

.7 Phosphorus containing polyamine acid (United Kingdom);

.8 Renewable naphtha (Finland)*, submitted to this session as Alkanes (C5 - C7), linear and branched;

.9 Salt of polyamino carboxylic acid (United Kingdom);

.10 Sodium aluminate solution (United States); and

.11 Sodium carboxylate solution (Belgium)*, submitted to this session as Cyclohexane oxidation products, sodium salts solution.

List 3

.12 Antifreeze preparation (Brazil);

.13 EC 1575A (United Kingdom);

.14 EC6671A (United Kingdom)*;

.15 EC9360A (United Kingdom);

.16 EC9378A (United Kingdom);

.17 EC9398A (United Kingdom);

.18 EC9660A (United Kingdom);

.19 EEHC1 (United Kingdom)*;

.20 Ethanol/Bitrex Fuel (Norway)*;

.21 Gyptron SA3070 (Norway);

.22 Heavy aromatics HVA 9B (United Kingdom)*;

.23 Heavy aromatics HVA 9C (United Kingdom)*;

.24 Heavy aromatics HVA 9K (United Kingdom)*;

.25 Heavy aromatics HVA 9V (United Kingdom)*;

.26 Heavy aromatics HVA 9W (United Kingdom);

.27 Heavy aromatics HVA 9Y (United Kingdom);

.28 Heavy aromatics HVA 9Z (United Kingdom)*;

.29 Lubrizol 70179 (United States);

.30 Lubrizol FM2600TL (United States);

.31 Lubrizol PV1023 (United States)*;

.32 Petroscreen SC 16D (United Kingdom); and

.33 Vertiscreen 052R (NOR)*.

5.5 To provide the notification to manufacturers to ensure sufficient lead time to have their products assessed by GESAM-EHS 52, the group also noted that the following products would expire in 2015:

List 1

.1 Methyl cyclopentane (Republic of Korea);

.2 Parachlorobenzotrifluoride (United States);

.3 Renewable Aviation Fuel (Finland)*, submitted to this session as Alkanes (C10-C17), linear and branched; and

.4 Salt of polyamino carboxylic acid (70% or less) in KCL Brine Solution (4% or less) (United Kingdom).

List 3

.5 AP 13246 (United States);

.6 C5 Raffinate (Brazil);

.7 EC1602A (United Kingdom);

.8 Gyptron SD250 (Norway);

.9 Gyptron SD250 in KCl solution (Norway);

.10 Lubrizol 16005 (United States);

.11 Lubrizol CV2301 (United States);

.12 Lubrizol CV6503 (United States);

.13 Lubrizol CV7050 (United States);

.14 Octimise G10 (Belgium);

.15 OLOA 65747 (France);

.16 Propanol 98 (United States);

.17 SAFETHERM EG (United Kingdom);

.18 Scaletreat SD 12392 (Norway)*, submitted to this session;

.19 Secure SC2020 (Norway); and

.20 SOLVTREAT 12093 (Norway).

List 4

.21 MCP Solvent (Republic of Korea); and

.22 Used Cooking Oil of Vegetable Origin (Netherlands).

5.6 Having noted the products that would expire in 2014 and 2015, respectively, the group invited delegations to take action, as appropriate. The group further noted that if new GESAMP Hazard Profiles were required for any of these products, or their components, these would need to be submitted to GESAMP-EHS 52 that is scheduled to take place from 13 to 17 April 2015.

5.7 The group further recalled that with respect to list 2 entries (pollutant only mixtures containing at least 99% by weight of components already assessed by IMO), a number of the mixtures listed specified substances in the "contains name" that have safety hazards based on their latest GHPs. Unless it could be clearly established that a mixture containing such components did not have any resultant safety concerns, it was agreed that such products should be reassessed and assigned to list 3. As a result, delegations were once again encouraged to revisit their submissions and to effect any changes, as necessary.

5.8 The group noted that all entries corresponding to new tripartite agreements were highlighted in full in the product lists of the draft MEPC.2/Circ.20. A summary of the amendments to existing product entries are as follows:

List 1:
- Fish Silage: Addition of Denmark to list of countries for the tripartite.
- Fresh grinded fish by-products: Addition of Denmark to list of countries for the tripartite.
- Glucitol/glycerol blend propoxylated (containing 10% or more amines): new entry created based on agreement at ESPH 19, which was erroneously exluded from MEPC.2/Circ.19.
- Glucitol/glycerol blend propoxylated (containing less than 10% amines): Old data restored, after accidental deletion from MEPC.2/Circ.19.
- n-Dodecyl mercaptan: Additon of China, Norway, Liberia, Panama, Cayman Islands, Hong Kong and the Marshall Islands and United States to the list of countries.
- n-Octyl mercaptan: Additon of China, Norway, Liberia, Panama, Cayman Islands, Hong Kong and the Marshall Islands to the list of countries.
- Piperazine, 68% solution: name change from piperazine, 68% aqueous by PPR 1.

List 2:
- Exxsol D100: contains name modified, based on new formulation.
- Exxsol D100 ULA: the trade name for Exxsol D100 S has been changed to Exxsol D100 ULA.
- ISOPAR L: n.o.s. category has been modified to 7.

List 3:
- BK Gasoline: company name change and change to columns i', i'', l, and o. Changed to 'all countries, with no expiry, as agreed at PPR 1.
- Emulsotron: amendment to column k.
- Fraction C7: company name change and change to columns l and o. Changed to 'all countries, with no expiry, as agreed at PPR 1.
- Fraction C6: company name change and change to columns l and o. Changed to 'all countries, with no expiry, as agreed at PPR 1.
- Fraction TX: company name change and change to columns l and o. Changed to 'all countries, with no expiry, as agreed at PPR 1.
- Pentylol: Changed to 'all countries, with no expiry' as agreed at PPR 1.

- SASC2013: Addition of Qatar to list of countries.
- Scaletreat TP8385: new tripartite agreement.
- Scaletreat TP8441: modified venting and fire protection requirements.
- Ucarsol: changed to 'all countries, with no expiry', as agreed at PPR 1.

List 4: Polyalkene polyol blend: eliminated from list 4.

List 5: no change.

5.9 The group also noted that a large number of products still present in the draft list 1, as set out in annex 1 of ESPH 20/5, would be removed from the MEPC.2/Circ.20, given the recent entry into force of the IBC Code amendments in June 2014.

5.10 In reviewing the draft list 4 of the MEPC.2/Circular, the group noted that the entry for used cooking oil would expire in 2015. The delegation of the Netherlands, as the reporting country for the tripartite agreement, informed the group that the shipper no longer shipped the product and had therefore requested the entry be removed from list 4 of MEPC.2/Circ.20, rather than awaiting the expiry of the tripartite agreement in 2015.

5.11 Recalling its previous discussions on the matter at ESPH 19 (PPR 1/3), the group reconfirmed the need to address this issue, noting that the shipment of used cooking oil was on the increase, as it was being used as a feedstock for biodiesels, and concurred that the best approach would be to the establishment of a single generic entry, covering all used cooking oils, with carriage requirements assigned based on a worst case version of the product. The group noted that several interested delegations agreed to make a submission to PPR 2 for the development of a generic entry for this product.

5.12 The group highlighted a number of amendments and corrections to be made to the draft lists that will be included in the circular, and noted that these would be taken on board by the Secretariat prior to its dissemination.

Evaluation of trade-named mixtures

5.13 With regard to the evaluation of trade-named mixtures, the group recalled that there was a need to maintain confidentiality with respect to formulation details. Correspondingly, it had agreed that it would not be appropriate to have such submissions treated as regular document submissions and posted to IMODOCS.

5.14 The group also recalled that, as a consequence, it had agreed to the following procedures for document submissions to serve the interests of all parties and to protect the proprietary information associated with trade-named products:

.1 document submissions need not incorporate detailed compositional data, if a degree of commercial sensitivity had been identified. However, it was necessary to include in the covering note and associated PPR Data Reporting Form the main components contributing to the safety and/or pollution hazards;

.2 the covering note should also reflect the total number of components present in the mixture, as well as the "contains name", including a justification for its choice, based on the latest GESAMP Hazard Profile; and

.3 the rationale for assigning the pollution category and ship type, in accordance with MEPC.1/Circ.512.

5.15 The group further recalled that it had also agreed that for the review of the products at the ESPH Working Group meeting, a complete and detailed PPR Data Reporting Form should be made available to Member States, in order to ensure that sufficient information is available to fully assess the mixture and that, following the review, the data forms should be returned to the reporting country, in order to maintain control over commercially sensitive formulation details.

5.16 The group had further agreed that, if the full information contained in the PPR Data Reporting Form for list 3 products was needed by a Member State in advance of the meeting, this could be made available upon request to the submitting Member State, under confidential terms.

5.17 The group, recalling that the submission for fluorosilicic acid solution (20-30%) (MEPC/5/10) had been considered under agenda item 3, noted that 13 trade-named mixtures had been submitted for evaluation by the group for inclusion in list 3 of the MEPC.2/Circ.20, as entries for all countries, without an expiry date, as follows:

.1 OLOA 65747, France (ESPH 20/5/1);

.2 Lubrizol PV1023, United States (ESPH 20/5/2);

.3 EC6475A, United Kingdom (ESPH 20/5/3);

.4 EC6671A,United Kingdom (ESPH 20/5/4);

.5 EEHC1, United Kingdom (ESPH 20/5/5);

.6 EC6660A, United Kingdom (ESPH 20/5/6);

.7 Linealene 124, Japan (ESPH 20/5/9);

.8 Ethanol/Bitrex Fuel, Norway (ESPH 20/5/11);

.9 Gyptron SA3070, Norway (ESPH 20/5/12);

.10 Scaletreat SD 12392, Norway (ESPH 20/5/13);

.11 Vertiscreen 052R, Norway (ESPH 20/5/14);

.12 Ethylol 75, South Africa (ESPH 20/5/15); and

.13 Heavy Aromatics HVA 9B, 9C, 9E, 9K, 9V and 9Z, United Kingdom (ESPH 20/5/16).

5.18 In addition, the group agreed to review the entry for Pentylol, based on the reply received form GESAMP-EHS 51, further to its query with regard to the contains name for this product. Having noted that GESAMP-EHS 51 had renamed the Pentylol entry in the GESAMP Composite List to 'alkyl/cyclo(C4-C5) alcohols', the group decided that, based on the percentage concentration, the contains name of n-amyl alcohol and sec-amyl alcohol would be retained and that the square brackets removed in the MEPC.2/Circular, given that both present toxicity by inhalation properties. The group, noting that the product had been assessed by GESAMP-EHS as a total mixture therefore agreed to include an entry for alkyl/cyclo(C4-C5) alcohols in list 1, with the same carriage requirements as Pentylol.

5.19 In line with its usual practice, the group agreed that the evaluation of these substances would be carried out in a closed session, involving only Member States, and that no notes on the products would be taken during this session, other than by the Secretariat for the purposes of recording the outcome of the discussions and the relevant carriage requirements, as agreed by the group.

5.20 The group confirmed that manufacturers could be present in the closed session, but only for the segment where their specific products were addressed, in order to be able to respond to any technical queries raised by the group.

5.21 The results of the group's evaluation of the trade-named mixtures are set out in the ensuing paragraphs and the full carriage requirements for each product are included in annex 3.

5.22 In considering the submission for OLOA 65747, the group confirmed the carriage requirements, without modification, and agreed to the inclusion of the product in list 3.

5.23 The group, having considered the submission for Lubrizol PV1023, concurred with the proposed carriage requirements, as submitted, and inclusion of the product as an entry in list 3.

5.24 The group, having considered the data submitted for EC6475A, EC6671A and EC6660A, determined that the partial profiles assigned to the components used to determine the carriage requirements for these products did not provide sufficient information to assess the safety aspects. As a consequence the group could not agree to their inclusion in list 3 at this session.

5.25 To resolve the matter, the delegation of the United Kingdom proposed that a tripartite agreement be established for the three products for inclusion in list 3, which would include all countries present, and that it would resubmit the products, together with the required data, for consideration at ESPH 21. The countries that had agreed to join the tripartite agreement are as follows: Belgium, Finland, France, Germany, Japan, the Marshall Islands, the Netherlands, Nigeria, Norway, the Philippines, South Africa, Spain, Sweden, and the United States. The group concurred with the proposed way forward and the products, with the agreed carriage requirements, are included in annex 3.

5.26 Having considered the submission for EEHC1, the group agreed to its inclusion in list 3, with the carriage requirements, as proposed.

5.27 The group considered the submission for Linealene 124 and, having concurred with the proposed carriage requirements, as submitted, agreed to its inclusion in list 3.

5.28 The group, in considering the information submitted for Ethanol/Bitrex, noted the formulation of the product and that ethanol, as the primary component, was listed in chapter 18 of the IBC Code. The group therefore agreed that a list 3 entry for the product would not be required. As a consequence, the delegation of Norway requested that the document be withdrawn.

5.29 Further to this, the group reconfirmed that products listed in chapters 17 and 18 of the IBC Code and list 1 of the MEPC.2/Circular could be shipped under their pure or technically pure product name, if they contained less than 1% of unassessed components.

5.30 The group, having confirmed the carriage requirements for Gyptron SA3070 with the addition of an P to column d, agreed to its inclusion as an entry in list 3, with carriage requirements, as amended.

5.31 The group, having considered the submission for Scaletreat SD 12392, concurred with the proposed carriage requirements and inclusion of the product as an entry in list 3.

5.32 Having considered the submission for Vertiscreen 052R, the group agreed with the proposed carriage requirements and inclusion of the product in list 3.

5.33 In considering the information submitted for Ethylol 75, the group agreed that isopropyl ether should be added to the contains name and concurred with the carriage requirements as proposed, for inclusion in list 3.

5.34 Having considered the submission for Heavy Aromatics HVA 9B, 9C, 9E, 9K, 9V and 9Z, the group was of the view that these were products from a single chemical family and very similar in formulation. As a consequence, the group agreed that these should be covered by a single list 1 entry as Alkylbenzenes mixtures (containing naphthalene), rather than as list 3 entries, and confirmed the carriage requirements, as submitted.

5.35 Having noted that a number of products submitted for entry into list 3 had been assigned trade names that were similar, or the same as, associated chemical names, the group reconfirmed the need for Member States to ensure that, in accordance with MEPC.1/Circ.512 (paragraph 5.7), trade-named products submitted for assessment were not assigned names that could be confused with generally used chemical descriptions and urged Member States to convey this information to their respective manufacturers.

Proposed template for the submission of list 3 products to the ESPH Working Group

5.36 The group considered document ESPH 20/5/7 submitted by the United Kingdom, containing proposed draft guidance and a template aimed at standardizing submissions for list 3 products, to facilitate the assessment of these mixtures by the ESPH Working Group.

5.37 The group, having considered the proposal, concurred that the proposed template was a useful resource, but should not be considered mandatory.

5.38 Having agreed on the format of the standard template, as amended during the session, the group recommended its use for submission of list 3 products to future sessions of the ESPH Working Group. The group further agreed that when making these submissions, a complete secondary paper should also be submitted to the IMO Secretariat, setting out the full component details and percentage values in the mixture. The agreed template is set out in annex 4.

5.39 The group, having noted that the United Kingdom had also developed an Excel tool to automate the mixture calculation for identification of the pollution category and ship type, agreed that this would also serve as a useful resource and requested the Secretariat to include this on the IMO website alongside the GESAMP and PPR Data Reporting Forms, where it could be downloaded for use by end users. The format of the Excel tool is included in annex 5.

Proposed modifications to the issue date and effective date of the Provisional Categorization of Liquid Substances (MEPC.2/Circular)

5.40 The group recalled that the *Provisional Categorization of Liquid Substances* was issued annually by the Organization on 17 December of each year, in accordance with regulation 6.3 of MARPOL Annex II, disseminated as a MEPC.2/Circular. The group also recalled that the circular becomes effective on the date of issue, superseding the previous version of the circular from the previous year.

5.41 The group considered document ESPH 20/5/8 (Secretariat), proposing modifications to the issue date and effective date of the MEPC.2/Circular, as well as a modification to the title of the circular.

5.42 The group agreed in principle with the proposal, but proposed alternative language be used to describe the changeover date between the preceding and current circulars, in order to avoid the use of 'effective date'.

5.43 The group concluded its discussions on the matter by agreeing:

.1 that the new date of issue for the MEPC.2/Circular would be 1 December of each year;

.2 that, further to this, the expiry dates for all existing tripartite agreements would be extended from 17 to 31 December of the respective year of expiry, taking on board the modified dates, and all new tripartite agreements would henceforth be given an expiry date of 31 December;

.3 to include text in the circular to reflect that if a tripartite expires, will a shipment is in transit, or there is a change in carriage requirements for a product from the preceding to the new circular, that the carriage requirements at time of loading will apply.

.4 to rename the MEPC.2/Circular to 'Provisional categorization of liquid substances in accordance with MARPOL Annex II and the IBC Code'; and

.5 that these changes would come into effect in 2015, subject to concurrence by PPR 1 and approval by MEPC 68.

6 PRODUCTS REQUIRING OXYGEN-DEPENDENT INHIBITORS

6.1 The group recalled that it had discussed the topic of cargoes requiring oxygen-dependent inhibitors in relation to inert gas controls over a number of sessions and, having concurred that new guidance was needed, agreed on a finalized draft of the guidance at PPR 1, based on a document submitted by INTERTANKO (PPR 1/1/11), which was subsequently approved by MEPC 66 and MSC 93 and disseminated as MSC-MEPC.2/Circ.14.

6.2 The group also recalled that it had noted the information provided by DGAC at PPR 1 regarding the behaviour and impacts of various substances requiring oxygen-dependent inhibitors under different conditions and related concerns with regard to the need for oxygen during discharge.

6.3 The group further recalled that it had requested the Sub-Committee to retain this item on the agenda of the group for one more session, to allow for the consideration of any additional forthcoming information from industry in connection with the issues related to

products requiring oxygen during discharge, noting that the group expected to complete this work at ESPH 20 and that the item subsequently would be removed from its agenda.

6.4 The group considered document ESPH 20/6 (United Kingdom and DGAC), which proposed amendments to the recently issued MEPC.2/Circ.14, to expand its scope to include monomers that require protection by oxygen-dependent inhibitors to prevent violent polymerization.

6.5 The proposed revision set out procedures for maintaining the oxygen content in the tank at a level that permits the inhibitor to be effective. The group also reconsidered the data provided by DGAC at PPR 1 concerning potentially affected cargoes, the inhibitors used and the minimum oxygen level needed to ensure effectiveness.

6.6 The group recalled that the 2014 amendments to SOLAS require inert gas for new tankers over 8000 DWT built after 1 January 2016, at an oxygen content not to exceed 5%, to be applied during the unloading of these cargoes. However, if the inhibitors for these cargoes require oxygen content in the vapour space of the tank to be at a level of 5% or higher, failure to maintain the oxygen at this level could result in the violent polymerization of the monomer leading to tank rupture, fire and explosion.

6.7 The group, whilst recognizing the identified safety issues as a result of the new SOLAS requirements, could not agree with the draft guidance as presented, noting, in particular, that it would create a conflict with the provisions of the new SOLAS regulation II-2/16.3.3.3 and that the procedures outlined in the proposal could not be implemented by a circular. The group further noted that, in all likelihood, an amendment to SOLAS and/or the IBC Code would be required to address this matter.

6.8 The group agreed that further consideration was needed and having noted the intention of DGAC to submit a document outlining the issues to PPR 2, agreed to invite the Sub-Committee to retain this item on its agenda for one more session.

6.9 On the matter of the example of the Certificate of Protection, set out in the annex to document ESPH 20/6, the group agreed that this would indeed be useful and to request the concurrence of PPR 2 to disseminate this as a PPR Circular. The model Certificate of Protection is included in annex 6.

7 ANY OTHER BUSINESS

Proposed revision to the Guidelines for the provisional assessment of liquid substances transported in bulk (MEPC.1/Circ.512)

7.1 The group recalled that, having considered the outcome of the restructuring of the IMO Sub-Committees at ESPH 19, it had agreed to rename the "BLG Product Data Reporting Form" accordingly to "PPR Product Data Reporting Form", and had also agreed on a number of amendments to capture the new data requirements identified as part of its review of chapter 21 of the IBC Code.

7.2 The group further recalled that it had also requested the Secretariat to prepare a revision to MEPC.1/Circ.512, incorporating the updated form and revising the guidance for completing the form accordingly, and to submit this for consideration by the group at a future session.

7.3 The group considered document ESPH 20/7 (Secretariat), containing a revision of the *Guidelines for the provisional assessment of liquid substances transported in bulk* (MEPC.1/Circ.512) and noted that the Secretariat had undertaken a substantial revision of the text to provide greater clarity and detail on the process for assessing products and establishing provisional assessments by tripartite agreement, in addition to the amendments requested by the group.

7.4 Further to its discussions related to the assignment of trade-names under agenda item 5 (paragraph 5.34), the group agreed that the language regarding the assignment of trade-names contained in the circular should be strengthened to avoid trade-names that were similar or could be confused with chemical names or generic product names.

7.5 With regard to the examples sections of the guidance, as contained in appendices 6 and 7 of the annex, the group concurred that updated examples, based on real substances with full hazard profiles were needed.

7.6 The group also discussed the use of partial GESAMP hazard profiles for substances not shipped in pure form, but as components in mixtures for the purposes of mixture calculations. In considering the issue, the group debated whether partial profiles were sufficient, or whether the guidelines should be amended to require full GHPs for all mixture components. The group concluded that full GHPs for mixture components should henceforth be required and that MEPC.1/Circ.512 should be updated accordingly to reflect this. In the interim period, the group agreed that if full data was submitted then a full GHP should be given and agreed to invite GESAMP-EHS to take action accordingly.

7.7 In considering the PPR Data reporting form, as set out in appendix 3 of the annex to ESPH 20/7, the group, having noted that the updated form was needed now and that a full revision of the MEPC.1/Circ.512 was likely to take some time, agreed that the form, together with the guidelines for its completion, set out in appendix 5 of the annex, should be extracted and prepared as an independent circular. Consequently, the group requested the Secretariat to prepare the form and guidelines as a draft MEPC circular, for consideration at PPR 2.

7.8 Having noted that the *References to related information and recommendations for ascertaining the carriage requirements for products shipped in bulk*, agreed at BLG 17 for inclusion on the IMO website, had been incorporated in the revised draft guidelines (appendix 2), the group agreed that this information could be eliminated from the IMO website, once the guidelines were finalized and approved by MEPC.

7.9 The group, having concurred that more work was needed on the revision of the circular, requested the Secretariat to circulate the draft revision for comment during the intersessional period, with a view to continuing its work on the circular at PPR 2.

Review of chapters 17, 18 and 21 of the IBC Code

7.10 The group recalled that at ESPH 19 it had considered a session document prepared by the Chairman, setting out the proposed amendments to chapter 21 of the IBC Code, and a preliminary analysis of the consequential impacts to the carriage requirements of the substances included in chapter 17 of the IBC Code and the MEPC.2/Circular.

7.11 The group also recalled that, having finalized the draft text of chapter 21, which was agreed by PPR 1, it had concurred that this would be used as the basis for the review of the carriage requirements for all products set out in chapters 17 and 18 of the IBC Code.

7.12 The group further recalled that it had noted the information presented by the Chairman at PPR 1, providing a summary of the results of the application of the draft revised chapter 21 of the IBC Code to the list of products agreed at ESPH 19 and had confirmed the way forward with regard to finalization of the work.

7.13 The group considered document ESPH 20/7/1 and Corr.1 (Norway), which contained a preliminary draft of possible new carriage requirements for the products listed in chapters 17 and 18 of the IBC Code, based on application of the revised draft of chapter 21 of the IBC Code agreed at PPR 1.

7.14 In considering the results of the analysis, the group reviewed those products with ship types and tank types that would move up or down based on the application of the revised chapter 21 and those products requiring additional data, in order to assign carriage requirements. Whilst significant work was undertaken during the session, the group recognized that more work was needed to ensure a consistent approach, confirm data sources, and address some of the issues that arose during the discussions that may need further consideration to confirm the carriage requirements for some products.

7.15 The group noted that a further detailed review was needed, in particular, for those products where expert judgement was used to modify the carriage requirements, based on parameters other than the assigned GHP ratings, and that any such decisions would need to be fully substantiated and recorded. The group agreed that once complete, that BLG.1/Circ.33 should be updated accordingly.

7.16 The preliminary revisions to chapters 17 and 18 of the IBC Code, as set out in annex 7, are included with a view to providing a status report on progress and to allow industry the opportunity to comment and/or submit data to assist in the review process.

7.17 The group agreed to the updated draft of the revised chapter 21, incorporating a number of corrections, and concurred that the amended version, as set out in annex 8, should henceforth be used for assessing products for inclusion in the revised chapters 17 and 18 of the IBC Code, as part of the group's ongoing review of these product lists.

7.18 The delegation of Germany raised, having noted that in accordance with both the current chapter 21 and revised chapter 21 of the IBC Code, controlled venting under column g was only triggered if the GHP rating of D1= 3A, 3B or 3C, but was not triggered when D1=3, raised concerns regarding this practice. It further highlighted that, according to the GESAMP and Globally Harmonized System (GHS) Guidelines, a D1=3 rating is given to those products that are corrosive to the skin, but where there is no detailed information regarding exposure times of 3 minutes, 1 hour and 4 hours in skin corrosion testing (for the 3A, 3B, and 3C assignment). In this delegation's view, a D1=3 rating should be considered at least equivalent to a rating of D1=3A be given to those products tested for all exposure times showing destruction of the skin after 4 hours. It was pointed out that scientific proof for the correct exposure time will often not be available without specifically performed new animal testing that, in some regions, is severely restricted based on animal protection legislation.

7.19 The group also agreed that, further to its review of chapters 17 and 18 of the IBC Code, it would request PPR 2 to issue a circular with the results and to provide information to fill any identified data gaps or more up-to-date product data that may substantiate a change to carriage requirements.

7.20 The Group reconfirmed the way forward, deciding that the amended chapter 21 would be put forward first for adoption and that the adoption of amendments to chapters 17 and 18 would be sought at a later stage.

Discussion on developing guidance/procedures for assessing products classified under Annexes I and II of MARPOL

7.21 The group considered document ESPH 20/7/2 submitted by the United Kingdom, with regard to the possible development of guidance for the assessment of petroleum-based products currently assessed as chemicals under MARPOL Annex II and listed in the MEPC.2/Circular. The group noted that when considering these substances, it had become clear that no guidance for determining whether these substances should be addressed under Annex I or Annex II of MARPOL existed.

7.22 The group supported the document in general and recognized the need to raise the issues being encountered by the working group with regard to the submission of petrochemical mixtures for assessment as chemical mixtures in accordance with MARPOL Annex II as chemicals, but which are technically MARPOL Annex I products.

7.23 The group agreed to raise this matter to the attention of PPR 2 and MEPC 68 for guidance on how such products should be handled by the ESPH Working Group going forward.

8 FUTURE PLANNED OUTPUT AND AGENDA FOR ESPH 21

8.1 The group agreed on its future planned out as set out in annex 8, for consideration by PPR 2 and proposed that ESPH 21 should be held from [19 to 23 October 2015].

8.2 Having considered the meeting schedules for the PPR Sub-Committee and the GESAMP-EHS Working Group, the group agreed to request PPR 2 to agree to the scheduling of an intersessional meeting in late 2016 and to request the approval of MEPC 68 and MSC 95, accordingly, for this meeting.

9 ACTION REQUESTED OF THE SUB-COMMITTEE

9.1 The Sub-Committee is invited to approve the report in general and, in particular, to:

.1 agree with the evaluation of new products and their inclusion in list 1 of the MEPC.2/Circular with validity for all countries and with no expiry date, subject to endorsement by MEPC 68 (paragraphs 3.7 to 3.21 and annex 1);

.2 concur with the evaluation of cleaning additives, subject to endorsement by MEPC 68 (paragraphs 4.3 to 4.8 and annex 2);

.3 concur with the amendments to the information contained in the draft of MEPC.2/Circ.20 and note the 33 products that would reach their expiry dates on 17 December 2014 and the 22 products that would reach their expiry dates in December 2015 (paragraphs 5.4 to 5.11);

.4 agree with the evaluation of trade-named mixtures and their inclusion in list 3 of the MEPC.2/Circular with validity for all countries and no expiry date, subject to endorsement by MEPC 68 (paragraphs 5.16 to 5.34 and annex 3);

.5 note the standard draft template developed for the submission of list 3 products and the Excel tool for automation of mixture calculations (paragraphs 5.35 to 5.38 and annexes 4 and 5);

.6 concur with the proposed modifications to the issue date of the MEPC.2/Circular and to the expiry dates of tripartite agreements and agree that these changes would be implemented in 2015, subject to endorsement by MEPC 68 (paragraphs 5.40 to 5.42).

.7 concur with the example of the Certificate of Protection for products requiring oxygen-dependent in inhibitors and its dissemination as a PPR Circular (paragraphs 6.4 to 6.9 and annex 6);

.8 note the progress made on the revision to the Guidelines for the provisional assessment of liquid substances transported in bulk (MEPC.1/Circ.512) and that this work expected to continue at PPR 2 (paragraphs 7.3 to 7.9);

.9 concur with the group's decision to require full GESAMP hazard profiles for components of mixtures and to include this requirement in the revision of the MEPC.1/Circ.512 (paragraph 7.6);

.10 note the progress made on the revision of chapters 17,18 and 21 of the IBC Code and the provisional revised draft chapter 17 of the IBC Code (paragraphs 7.13 to 7.20 and annexes 7 and 8);

.11 note the discussions of the group with regard to petrochemical mixtures submitted to it for assessment under MARPOL Annex II, but which are technically MARPOL Annex I substances, and seek the guidance of MEPC on how such products should be addressed by the ESPH Working Group (paragraph 7.21 to 7.23);

.12 approve the planned output of the ESPH Working Group (paragraph 8.1 and annex 9); and

.13 agree to request MEPC 68 and MSC 95 to approve the scheduling of an intersessional meeting of the ESPH Working Group in the latter part of 2016 (paragraph 8.2).

***

ANNEX 1

EVALUATION OF LIST 1 PURE OR TECHICALLY PURE PRODUCTS

Naphthalene crude (molten) (ESPH 20/3)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Naphthalene crude (molten)
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12, 15.17, 15.19.6, 16.2.6, 16.2.9
	Reporting Country:	Germany
	Chapter 19 Synonyms:	None

Cyclohexane oxidation products, sodium salts solution (ESPH 20/3/1)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Cyclohexane oxidation products, sodium salts solution
c.	Pollution Category:	Z
d.	Safety/Pollution Properties:	P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Open
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	-
i"	Electrical Equipment – Group:	-
i"'	Electrical Equipment – Flashpoint >60°C:	NF
j.	Gauging:	O
k.	Vapour Detection:	No
l.	Fire Protection:	No
n.	Emergency Equipment:	No
o.	Special Requirements:	-
	Reporting Country:	Belgium
	Chapter 19 Synonyms:	Sodium carboxylate solution
		Cyclohexane, oxidized, aqueous extraction, sodium salt

tert-Dodecanethiol (ESPH 20/3/2)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	tert-Dodecanethiol
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	-
i"	Electrical Equipment – Group:	-
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.12, 15.17, 15.19
	Reporting Country:	United States
	Chapter 19 Synonyms:	tert-Dodecyl mercaptan

n-Dodecyl mercaptan (ESPH 20/3/3)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	n-Dodecyl mercaptan
c.	Pollution Category:	X
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	1
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	-
i"	Electrical Equipment – Group:	-
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.12, 15.17,15.19
	Reporting Country:	Belgium
	Chapter 19 Synonyms:	1-Dodecanethiol

n-Octyl mercaptan (ESPH 20/3/4)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	n-Octyl mercaptan
c.	Pollution Category:	X
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	1
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	-
i"	Electrical Equipment – Group:	-
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.12, 15.17, 15.19
	Reporting Country:	Belgium
	Chapter 19 Synonyms:	1- Octanethiol

Alkanes (C5-C7), linear and branched (ESPH 20/3/5)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Alkanes (C5-C7), linear and branched
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	T3
i"	Electrical Equipment – Group:	IIA
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	C
k.	Vapour Detection:	FT
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12, 15.17, 15.19.6
	Reporting Country:	Finland
	Chapter 19 Synonyms:	None

Notes:

The group agreed that the product be added to annex 11 of the MEPC.2/Circular, Bio-fuels recognized under the *2011 Guidelines for the carriage of blends of petroleum oil and bio-fuels (MEPC.1/Circ.761.Rev.1)*. The group also agreed that an entry for 'Bio-fuel blends of gasolines and alkanes (C5-C7), linear and branched (>25% but <99% by volume), would be added to the list of agreed biofuel blends set out in MEPC.1/Circ.761/Rev.1.

Alkanes (C10-C17), linear and branched (ESPH 20/3/6)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Alkanes (C10-C17), linear and branched
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	Inert
i'.	Electrical Equipment – Class:	T3
i"	Electrical Equipment – Group:	IIB
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	R
k.	Vapour Detection:	F
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.19
	Reporting Country	Finland
	Chapter 19 Synonyms:	none

Notes:
The group agreed that the product be added to annex 11 of the MEPC.2/Circular, Bio-fuels recognized under the *2011 Guidelines for the carriage of blends of petroleum oil and bio-fuels* (MEPC.1/Circ.761.Rev.1).

Fluorosilicic acid solution (20-30%) (ESPH 20/5/10)

In considering the information provided the group agreed the following revision to the carriage requirements be assigned to the product:

a.	Product name	Fluorosilicic acid solution (20-30%)
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	NF
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	No
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.11, 15.12, 15.17, 15.19
	Reporting country:	Finland
	Chapter 19 Synonyms:	Hexafluorosilicate solution (20-30%) Hydrofluorosilicic acid solution (20-30%) Silicofluoric acid solution (20-30%)

Alkylbenzenes mixtures (containing naphthalene) (ESPH 20/5/16)

The group noted that this document had been submitted to the session under agenda item 5 as a group of trade-named products (Heavy Aromatics HVA 9B, 9C, 9E, 9K, 9V and 9Z) for inclusion in list 3. The group decided that the products would be more appropriately covered by the following list 1 entry with the carriage requirements assigned to the product, as follows:

a.	Product name	Alkylbenzenes mixtures (containing naphthalene)
c.	Pollution Category:	X
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12, 15.17, 15.19.6
	Reporting country:	United Kingdom
	Chapter 19 Synonyms:	none

Alkyl/cyclo (C4-C5) alcohols

Noting that Pentylol had been agreed for inclusion in list 3 at PPR 1, was assessed as a mixture by GESAMP-EHS and assigned the chemical name in caption, the group agreed to include this in list 1, with carriage requirements as follows (the same as those for Pentylol):

a.	Product name	Alkyl/cyclo (C4-C5) alcohols
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	T2
i"	Electrical Equipment – Group:	IIB
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	R
k.	Vapour Detection:	FT
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12.3, 15.12.4, 15.19.6
	Reporting country:	South Africa
	Chapter 19 Synonyms:	none

***

ANNEX 2

CARGO TANK CLEANING ADDITIVES EVALUATED AND FOUND TO MEET THE REQUIREMENTS OF REGULATION 13.5.2 OF ANNEX II OF MARPOL[1]

Name of cleaning additive	Name of manufacturer	Reporting Country
AA118 SAFETY NON-CAUSTIC	VANCE CHEMICALS PTE. LTD.	Singapore
AA128 MULTI-DUTY	VANCE CHEMICALS PTE. LTD.	Singapore
AA138 HEAVY-DUTY	VANCE CHEMICALS PTE. LTD.	Singapore
AA158 ACIDIC	VANCE CHEMICALS PTE. LTD.	Singapore
APEX-5 MULTI POL	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-101 ECO ACID	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-120 METAL BRITE HD	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-182 PASSIVE CLEAN	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-195 TANK CLEAN BUFFER	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-303 ECOCLEAN	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-418 ALKACLEAN HD	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-304 CHLOR CLEAN	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-228 SANI CLEAN	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-460 ALKACLEAN SAFETY LIQUID	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-550 SEACLEAN VOYAGE	APEX CHEMICALS (S) PTE LTD	Singapore
APEX-280 NEUTRAL HCF	APEX CHEMICALS (S) PTE LTD	Singapore
CARECLEAN TANK-BRIGHT	MARINE CARE B.V.	Netherlands

***

[1] All products evaluated in accordance with MEPC.1/Circ.590.

ANNEX 3

EVALUATION OF LIST 3 TRADE-NAMED MIXTURES

OLOA 65747 (ESPH 20/5/1)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	OLOA 65747
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.12, 15.17, 15.19, 16.2.6
	Contains	Alkyl(C18-C28) toluenesulphonic acid, calcium salts, low overbase, Zinc alkyl dithiophosphate (C3-C14) and mineral oil
	Company	Chevron Oronite
	Reporting Country	France

Lubrizol PV1023 (ESPH 20/5/2)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Lubrizol PV1023
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	C
k.	Vapour Detection:	T
l.	Fire Protection:	A, B, C
n.	Emergency Equipment:	Yes
o.	Special Requirements:	15.12, 15.17, 15.19, 16.2.6
	Contains:	Calcium alkaryl sulphonate (C11-C50), Alkenyl (C11+) amide and mineral oil
	Company:	Lubrizol
	Reporting Country:	United States

EC6475A (ESPH 20/5/3)

In considering the information provided, the group decided that it did not have sufficient information to include this product in list 3 as an entry for all countries, without an expiry date. Consequently, the United Kingdom established a tripartite agreement, supported by the countries set out in paragraph 5.25, with carriage requirements as follows:

a.	Product name	EC6475A
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Open
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	O
k.	Vapour Detection:	No
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.19.6
	Contains:	Sodium hydroxide and Diethylenetriaminepentaacetic acid, pentapotassium salt (40% solution)
	Company:	Nalco Champion Ltd
	Reporting country:	United Kingdom

EC6671A (ESPH 20/5/4)

In considering the information provided, the group decided that it did not have sufficient information to include this product in list 3 as an entry for all countries, without an expiry date. Consequently, the United Kingdom established a tripartite agreement, supported by the countries set out in paragraph 5.25, with carriage requirements as follows:

a.	Product name	EC6671A
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	T1
i"	Electrical Equipment – Group:	IIA
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	C
k.	Vapour Detection:	FT
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12, 15.19.6
	Contains:	Methyl alcohol and Poly N-alkylmethacrylamide ammonium acrylate copolymer (20% solution in DEGME)
	Company:	Nalco Champion Ltd
	Reporting country:	United Kingdom

EEHC1 (ESPH 20/5/5)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	EEHC1
c.	Pollution Category:	Z
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Open
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	O
k.	Vapour Detection:	No
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.19.6
	Contains:	Triethylene glycol
	Company:	Nalco Champion Ltd
	Reporting country:	United Kingdom

EC6660A (ESPH 20/5/6)

In considering the information provided, the group decided that it did not have sufficient information to include this product in list 3 as an entry for all countries, without an expiry date. Consequently, the United Kingdom established a tripartite agreement, supported by the countries set out in paragraph 5.25, with carriage requirements as follows:

a.	Product name	EC6660A
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Open
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	O
k.	Vapour Detection:	No
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.19.6
	Contains:	Drilling brines, including: calcium bromide solution, calcium chloride solution and sodium chloride solution
	Company:	Nalco Champion Ltd
	Reporting country:	United Kingdom

Linealene 124 (ESPH 20/5/9)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Linealene 124
c.	Pollution Category:	X
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	2
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	–
i"	Electrical Equipment – Group:	–
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	R
k.	Vapour Detection:	T
l.	Fire Protection:	ABC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.12.3, 15.12.4, 15.19.6
	Contains:	Dodecene (all isomers)
	Company:	Idemitsu Kosan
	Reporting country:	Japan

Gyptron SA3070 (ESPH 20/5/12)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Gyptron SA3070
c.	Pollution Category:	Z
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Open
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	NF
j.	Gauging:	O
k.	Vapour Detection:	--
l.	Fire Protection:	No
n.	Emergency Equipment:	No
o.	Special Requirements:	--
	Contains:	Ethylene glycol
	Company:	Champion Technologies
	Reporting country:	Norway

Scaletreat SD 12392 (ESPH 20/5/13)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Scaletreat SD 12392
c.	Pollution Category:	Z
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	--
i"	Electrical Equipment – Group:	--
i"'	Electrical Equipment – Flashpoint >60°C:	Yes
j.	Gauging:	R
k.	Vapour Detection:	No
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.17, 15.19.6, 16.2.9
	Contains:	Acetic acid
	Company:	Clariant Oil Services Scandinavia AS
	Reporting country:	Norway

Vertiscreen 052R (ESPH 20/5/14)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Vertiscreen 052R
c.	Pollution Category:	Z
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	T2
i"	Electrical Equipment – Group:	IIA
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	R
k.	Vapour Detection:	F
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	--
	Contains:	Ethyl alcohol
	Company:	Vertical
	Reporting country:	Norway

Ethylol 75 (ESPH 20/5/15)

In considering the information provided the group agreed that the following carriage requirements be assigned to the product:

a.	Product name	Ethylol 75
c.	Pollution Category:	Y
d.	Safety/Pollution Properties:	S/P
e.	Ship Type:	3
f.	Tank Type:	2G
g.	Tank Vents:	Cont
h.	Tank Environmental Control:	No
i'.	Electrical Equipment – Class:	T2
i"	Electrical Equipment – Group:	IIB
i"'	Electrical Equipment – Flashpoint >60°C:	No
j.	Gauging:	R
k.	Vapour Detection:	F
l.	Fire Protection:	AC
n.	Emergency Equipment:	No
o.	Special Requirements:	15.19.6
	Contains:	Ethyl alcohol
	Company:	Sasol
	Reporting country:	South Africa

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ANNEX 4

DRAFT TEMPLATE FOR THE SUBMISSION OF LIST 3 PRODUCTS TO THE ESPH WORKING GROUP

PPR WORKING GROUP ON THE
EVALUATION OF SAFETY AND
POLLUTION HAZARDS OF CHEMICALS
**th session
Agenda item *

[PPR]/[ESPH] **/*/**
Date 2013
ENGLISH ONLY

EVALUATION OF PRODUCTS

[Product Name]

Submitted by [Country]

SUMMARY

Executive summary:	The document contains information for the classification of **[Product Name]** in list 3 of the MEPC.2/Circular, for all countries with no expiry date
Strategic direction:	5.2
High-level action:	5.2.3
Planned output:	5.2.3.6
Action to be taken:	Paragraph [xx]
Related documents:	MEPC.1/Circ.512; PPR.1/Circ.[xx] and MEPC.2/Circ.[xx]

Background

1 The product is manufactured by **[Manufacturers Name]** in the **[Country of Manufacturer]** and has been assessed in accordance with MEPC.1/Circ.512 and is currently included in list 3 of the MEPC.2/Circular under a tripartite agreement. All the components of the mixture have been assessed, have complete GESAMP hazard profiles and are listed in the GESAMP-EHS Composite List (PPR.1/Circ.[**]).

Details of the assessment

2 The component that poses the major safety hazard, based on its GESAMP Hazard Profile, is considered to be "**[Name of product]**", and should be included in the "contains name" for the product.

Product Name												
A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3

3 The component that poses the major pollution hazard, based on its GESAMP Hazard Profile, is considered to be "[**Name of product**]", and should be included in the "contains name" for the product.

Product Name												
A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3

4 Based on the information supplied by the manufacturer and the information available for the components, the following assessment was completed in accordance with MEPC.1/Circ.512 for inclusion of the product in list 3 of the MEPC.2/Circular. Based on this, the following carriage requirements are proposed:

Column	**Property**	**Proposed carriage requirements**
a.	Product name	**[Product Name]**
c.	Pollution Category:	**[Safety/Pollution/Mineral oil]**
d.	Safety/Pollution Properties:	**[X/Y/Z]**
e.	Ship Type:	**S/P**
f.	Tank Type:	**[1/2/3]**
g.	Tank Vents:	**[1G/1P/2G/2P]**
h.	Tank Environmental Control:	**[Cont. or Open]**
i'.	Electrical Equipment – Class:	**[Inert/Pad/Dry/Vent/No]**
i"	Electrical Equipment – Group:	**[T1 to T6/Blank or -]**
i"'	Electrical Equipment – Flashpoint >60°C:	**[IIA/IIB/IIC/Blank or -]**
j.	Gauging:	**[Yes/No/NF]**
k.	Vapour Detection:	**[Open/Restricted/Closed]**
l.	Fire Protection:	**[Flammable/Toxic/No]**
n.	Emergency Equipment:	**[A/B/C/D/No]**
o.	Special Requirements:	**[Yes/No]**
	Contains	**[Chapter 15 and/or 16]**
	Company	**[Manufacturer]**

5 The PPR Data Reporting Form containing the relevant data is included at annex. It was agreed at BLG 13 that, when submitting documents containing confidential details for evaluation as MEPC.2/Circular entries, the procedure as set out in paragraph 4.16 of document BLG 17/3 should be followed. Formulation details have therefore been omitted, but a complete PPR Data Reporting Form will be available during the meeting and is available for Administrations on request. All data available for the mixture will be distributed to Administrations at the ESPH meeting, due to the need to respect confidentiality on formulation details.

Action requested of the working group

6 The working group is invited to consider the information provided and assign carriage requirements, as appropriate.

***

ANNEX

Partial PPR Product Data Reporting Form (for list 3 submissions)

1 – Product Identity

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 parentheses after the product name.

1.1 Other Names and Identification Numbers

Main Trade Name:	
Main Chemical Name:	
Chemical Formula:	
CAS Number:	
GESAMP EHS Number:	
Molecular structure:	

1.3 Composition

Component Name	**%**	**Type**

***

ANNEX 5

FORMAT OF EXCEL TOOL FOR MIXTURE CALCULATIONS OF LIST 3 PRODUCTS

ASSIGNMENT OF POLLUTANT MIXTURES WITH SAFETY HAZARDS CONTAINING PRODUCTS ALREADY ASSESSED BY IMO

Trade name: **Heavy Aromatic HVA 9Z**

Component/Family	Cat	S/P	Ship Type	A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3	row Table 1	Comp. factor (Cp)	%	Sp	ST1 * %	ST2 * %	ST3 * %	Mineral oil	IBC Carriage Requirements based on latest GHP and Chapter 21 f	g	h	i'	i"	i'"	j	k	l	n	Specific and Operational requirements
																		100		0	0	0	0													
																		1000		0	0	0	0													
																		1		0	0	0	0													
																		1000		0	0	0	0													
																		1000		0	0	0	0													
																		25000		0	0	0	0													
																				0	0	0	0													
Mineral Oil																		100		0				0												
unknown (if "SUM" < 100%)	X		1															100000	**100.00**	10000000	100000															
Sp																				10000000	0															
Ss																					100000	0	0	0												

Pollution Category	X
ShipType	1

X	TRUE	1
0	0	2
0	0	2
	0	3
	0	3
	0	3
	0	NA

Flash point (°C)	70	(min.)
Melting or pour point (°C)	-30	(below)
Viscosity (mPas @ 20°C)	4	(calc.)

Data Sources used:

MEPC.1/Circ.512

PPR.1/Circ.xx

***

ANNEX 6

EXAMPLE OF A CERTIFICATE OF PROTECTION
(As required by paragraph 15.13.3 of the IBC Code)

INHIBITED CARGO **CERTIFICATE of PROTECTION**	
Shipper/Manufacturer	
Contact details	
Load Port/Berth	
Date/Time	
Ship Name	
Trade Name of Cargo	
IBC Code Product Name	
Inhibitor Details	
Name of Inhibitor	
Amount added/Concentration	
Inhibitor added Date	
Duration of effectiveness	
Is Inhibitor Oxygen–Dependent	Yes / No (Circle one)
If yes, the minimum level of oxygen required in the vapour space for the inhibitor to be effective. (Include any preferred oxygen ranges)	
Temperature limitation qualifying the inhibitors effective lifetime.	
Expected Duration of Voyage	
Extra inhibitor supplied	
Action to be taken should the length of the voyage exceed the effective lifetime of the inhibitor	
Comments	
Date:	
Signature: Shipper/Manufacturer	

***

ANNEX 7

PRELIMINARY DRAFT IBC CODE CHAPTER 17 BASED ON THE APPLICATION OF THE CRITERIA SET OUT IN THE DRAFT REVISED CHAPTER 21 OF THE IBC CODE

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Acetic acid	Z	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	F	No	Yes	15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.17, 15.19, 16.2.9
Acetic anhydride	Z	S/P	2	2	2G	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, 15.17, 15.19
Acetochlor	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Acetone cyanohydrin	Y	S/P	2	1	2G	1G	Cont	No	T1	IIA	Yes	C	T	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2, 16.6.3
Acetonitrile	Z	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Acetonitrile (Low purity grade)	Y	S/P	3	3	2G	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	2	2G	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	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.13, 15.17, 15.19, 16.2.9, 16.6.1
Acrylic acid	Y	S/P	2	2	2G	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
Acrylic acid / ethenesulfonic acid copolymer with phosphonate groups, sodium salt solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
Acrylonitrile	Y	S/P	2	2	2G	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	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Adiponitrile	Z	S/P	3	2	2G	2G	Cont	No		IIB	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Alachlor technical (90% or more)	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19, 16.2.9
Alcohol (C9-C11) poly (2.5-9) ethoxylate	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Alcohol (C6-C17) (secondary) poly(3-6)ethoxylates	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Alcohol (C6-C17) (secondary) poly(7-12)ethoxylates	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Alcohol (C12-C16) poly(1-6)ethoxylates	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Alcohol (C12-C16) poly(20+)ethoxylates	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9

Note: column e and f = requirements based on current chapter 21 of the IBC Code
column e* and f* = proposed requirements under revised chaper 21 of the IBC Code

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Alcohol (C12-C16) poly(7-19)ethoxylates	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Alcohols (C13+)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Alcohols (C12+), primary, linear	Y	S/P	2	2	2G	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	2	2G	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	2	2G	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	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Alkanes (C6-C9)	X	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
Iso- and cyclo-alkanes (C10-C11)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Iso- and cyclo-alkanes (C12+)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	
Alkanes(C10-C26), linear and branched, (flashpoint >60°C)	Y	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6
n-Alkanes (C10+)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Alkaryl polyethers (C9-C20)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.6
Alkenoic acid, polyhydroxy ester borated	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Alkenyl (C11+) amide	X	S/P	2	2	2G	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	3	2G	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19
Alkyl acrylate-vinylpyridine copolymer in toluene	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	C	FT	A	No	15.12, 15.17, 15.19.6, 16.2.9
Alkylaryl phosphate mixtures (more than 40% Diphenyl tolyl phosphate, less than 0.02% ortho-	X	S/P	1	2	2G	2G	Open	No	T1	IIA	Yes	O	No	ABC	No	15.19
Alkylated (C4-C9) hindered phenols	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	BD	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Alkylbenzene, alkylindane, alkylindene mixture (each C12-C17)	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Alkyl benzene distillation bottoms	Y	S/P	2	2	2G	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	3	2G	2G	Cont	No	T1	IIA	No	C	FT	ABC	No	15.12, 15.17, 15.19.6
Alkyl (C3-C4) benzenes	Y	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Alkyl (C5-C8) benzenes	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Alkyl(C9+)benzenes	Y	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	AB	No	
Alkyl (C11-C17) benzene sulphonic acid	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Alkylbenzene sulphonic acid, sodium salt solution	Y	S/P	2	2	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Alkyl (C12+) dimethylamine	X	S/P	1	1	2G	2G	Cont	No	-	-	Yes	C	T	BCD	Yes	15.12, 15.17, 15.19
Alkyl dithiocarbamate (C19-C35)	Y	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Alkyldithiothiadiazole (C6-C24)	Y	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Alkyl ester copolymer (C4-C20)	Y	P	2	2	2G	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	S/P	3	#VALUE!	2G	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Alkyl (C8-C10)/(C12-C14):(60% or more/40% or less) polyglucoside solution(55% or less)	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	No	No	15.12.3, 15.12.4, 16.2.6, 16.2.9
Alkyl (C7-C9) nitrates	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 15.20, 16.6.1, 16.6.2, 16.6.3
Alkyl(C7-C11)phenol poly(4-12) ethoxylate	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Alkyl (C8-C40) phenol sulphide	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Alkyl (C8-C9) phenylamine in aromatic solvents	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Alkyl (C9-C15) phenyl propoxylate	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6
Alkyl (C8-C10) polyglucoside solution (65% or less)	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	No	No	15.12.3, 15.12.4, 15.19.6, 16.2.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Alkyl (C8-C10)/(C12-C14):(50%/50%) polyglucoside solution (55% or less)	Y	S/P	3	#VALUE!	2G	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Alkyl (C12-C14) polyglucoside solution (55% or less)	Y	S/P	3	#VALUE!	2G	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
Alkyl(C12-C16) propoxyamine ethoxylate	X	S/P	2	2	2G	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	2	2G	2G	Open	No			Yes	O	No	A	No	16.2.9
Alkyl sulphonic acid ester of phenol	Y	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Alkyl (C18+) toluenes	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.9
Alkyl(C18-C28)toluenesulphonic acid	Y	S/P	2	2	2G	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)toluenesulphonic acid, calcium salts, borated	Y	S/P	3	3	2G	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	2	2G	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	3	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6
Allyl alcohol	Y	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Allyl chloride	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12, 15.17, 15.19
Aluminium chloride/Hydrogen chloride solution	Y	S/P	2	2	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Aluminium hydroxide, sodium hydroxide, sodium carbonate solution (40% or less)	Y	S/P	2	2	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12, 15.17, 15.19
Aluminium sulphate solution	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
2-(2-Aminoethoxy) ethanol	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.19
Aminoethyldiethanolamine/Aminoethylethanolamine solution	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Aminoethyl ethanolamine	Z	S/P	3	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19
N-Aminoethylpiperazine	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
2-Amino-2-methyl-1-propanol	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Ammonia aqueous (28% or less)	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19
Ammonium chloride solution (less than 25%) (*)	Z	S/P	3	3	2G	2G	Cont	No	-	-	NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6
Ammonium hydrogen phosphate solution	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Ammonium lignosulphonate solutions	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Ammonium nitrate solution (93% or less)	Z	S/P	2	2	1G	1G	Cont	No			NF	R	T	No	No	15.2, 15.11.4, 15.11.6, 15.12.3, 15.12.4, 15.18, 15.19.6, 16.2.9
Ammonium polyphosphate solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Ammonium sulphate solution	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Ammonium sulphide solution (45% or less)	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	C	FT	A	No	15.12, 15.17, 15.19, 16.6.1, 16.6.2, 16.6.3
Ammonium thiosulphate solution (60% or less)	Z	S/P	3	3	2G	2G	Open	No			NF	O	No	No	No	16.2.9
Amyl acetate (all isomers)	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
n-Amyl alcohol	Z	S/P	3	2	2G	2G	Cont	No	T2	IIA	No	C	FT	AB	Yes	15.12, 15.17, 15.19
Amyl alcohol, primary	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
sec-Amyl alcohol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
tert-Amyl alcohol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
tert-Amyl ethyl ether	Z	P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	ABC	No	15.19.6
tert-Amyl methyl ether	X	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Aniline	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Aryl polyolefins (C11-C50)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Aviation alkylates (C8 paraffins and iso-paraffins BPT 95 - 120°C)	X	P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	B	No	15.19.6
Barium long chain (C11-C50) alkaryl sulphonate	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AD	No	15.12.3, 15.12.4, 15.19, 16.2.6, 16.2.9
Benzene and mixtures having 10% benzene or more (i)	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19, 16.2.9
Benzene sulphonyl chloride	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.9
Benzenetricarboxylic acid, trioctyl ester	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Benzyl acetate	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Benzyl alcohol	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Benzyl chloride	Y	S/P	2	2	2G	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	X	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	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	X	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	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	2	2G	2G	Open	No	-	-	Yes	O	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	2	2G	2G	Open	No	-	-	Yes	O	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	2	2G	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.12, 15.17, 15.19.6
Bis(2-ethylhexyl) terephthalate	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Brake fluid base mix: Poly(2-8)alkylene (C2-C3) glycols/Polyalkylene (C2-C10) glycols monoalkyl	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Bromochloromethane	Z	P	3	3	2G	2G	Open	No			NF	O	No	No	No	
Butene oligomer	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Butyl acetate (all isomers)	Y	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Butyl acrylate (all isomers)	Y	S/P	2	3	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
tert-Butyl alcohol	Z	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	
Butylamine (all isomers)	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19.6
Butylbenzene (all isomers)	X	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Butyl benzyl phthalate	X	S/P	2	2	2G	2G	Cont	No			Yes	C	No	A	No	c
Butyl butyrate (all isomers)	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Butyl/Decyl/Cetyl/Eicosyl methacrylate mixture	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
Butylene glycol	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
1,2-Butylene oxide	Y	S/P	3	3	2G	2G	Cont	Inert	T2	IIB	No	C	FT	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, 15.12, 15.17, 15.19.6
n-Butyl ether	Y	S/P	3	3	2G	2G	Cont	Inert	T4	IIB	No	R	F	A	No	15.4.6, 15.19.6
Butyl methacrylate	Z	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT	AD	Yes	15.12, 15.13, 15.17, 15.19.6, 16.6.1, 16.6.2
n-Butyl propionate	Y	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Butyraldehyde (all isomers)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Butyric acid	Y	P	3	3	2G	2G	Cont	No			Yes	O	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	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AB	No	15.12, 15.17, 15.19.6
Calcium alkaryl sulphonate (C11-C50)	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19
Calcium alkyl (C10-C28) salicylate	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Calcium hydroxide slurry	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6,16.2.9
Calcium hypochlorite solution (15% or less)	Y	S/P	2	2	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Calcium hypochlorite solution (more than 15%)	X	S/P	1	1	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19, 16.2.9
Calcium lignosulphonate solutions	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Calcium long-chain alkyl(C5-C10) phenate	Y	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Calcium long-chain alkyl(C11-C40) phenate	Y	S/P	2	2	2G	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	2	2G	2G	Open	No			Yes	O	No	ABC	No	15.19.6, 16.2.6
Calcium long-chain alkyl salicylate (C13+)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.6
Calcium long-chain alkyl (C18-C28) salicylate	Y	S/P	2	2	2G	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	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Camelina oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
epsilon-Caprolactam (molten or aqueous solutions)	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Carbolic oil	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	FT	A	Yes	15.12, 15.17, 15.19, 16.2.9
Carbon disulphide	Y	S/P	2	1	1G	1G	Cont	Pad+inert	T6	IIC	No	C	FT	C	Yes	15.3, 15.12, 15.17, 15.18, 15.19
Carbon tetrachloride	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	No	15.12, 15.17, 15.19.6
Cashew nut shell oil (untreated)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Castor oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Cesium formate solution (*)	Y	S/P	3	3	2G	2G	Cont	No	-	-	NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6
Cetyl/Eicosyl methacrylate mixture	Y	S/P	2	2	2G	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	S/P	1	1	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19, 16.2.6
Chlorinated paraffins (C14-C17) (with 50% chlorine or more, and less than 1% C13 or	X	S/P	1	1	2G	2G	Cont	No	-	-	Yes	C	T	A	No	15.12, 15.17, 15.19

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Chloroacetic acid (80% or less)	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11.2, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12, 15.17, 15.18, 15.19, 16.2.9
Chlorobenzene	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
Chloroform	Y	S/P	3	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19
Chlorohydrins (crude)	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt solution	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
o-Chloronitrobenzene	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	ABD	No	15.12.3, 15.12.4, 15.19, 16.2.6, 16.2.9
1-(4-Chlorophenyl)-4,4- dimethyl-pentan-3-one	Y	S/P	2	2	2G	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	2	2G	2G	Cont	No			Yes	C	T	A	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, 16.2.9
Chlorosulphonic acid	Y	S/P	1	1	2G	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, 15.17, 15.18, 15.19
m-Chlorotoluene	Y	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19
o-Chlorotoluene	Y	P	2	2	2G	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.19.6
p-Chlorotoluene	Y	P	2	2	2G	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.19.6, 16.2.9
Chlorotoluenes (mixed isomers)	Y	P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	AB	No	15.19.6
Choline chloride solutions	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Citric acid (70% or less)	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Coal tar	X	S/P	2	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	BD	No	15.12, 15.17, 15.19.6, 16.2.6, 16.2.9
Coal tar naphtha solvent	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	AD	No	15.12, 15.17, 15.19.6, 16.2.9
Coal tar pitch (molten)	X	S/P	2	2	1G	1G	Cont	No	T2	IIA	Yes	C	T	BD	No	15.12, 15.17, 15.19.6, 16.2.6, 16.2.9
Cocoa butter	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Coconut oil	Y	S/P	2(k)	2(k)	2G	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	2	2G	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	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Copper salt of long chain (C17+) alkanoic acid	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Corn Oil	Y	S/P	2(k)	2(k)	2G	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)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Creosote (coal tar)	X	S/P	2	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	AD	No	15.12, 15.17, 15.19.6, 16.2.6, 16.2.9
Cresols (all isomers)	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	AB	Yes	15.12, 15.18, 15.19, 16.2.9
Cresylic acid, dephenolized	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19
Cresylic acid, sodium salt solution	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
Crotonaldehyde	Y	S/P	2	1	2G	1G	Cont	No	T3	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.18, 15.19
1,5,9-Cyclododecatriene	X	S/P	1	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
Cycloheptane	X	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Cyclohexane	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6, 16.2.9
Cyclohexanol	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Cyclohexanone	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Cyclohexanone, Cyclohexanol mixture	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	F	A	No	15.19.6
Cyclohexyl acetate	Y	S/P	3	3	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Cyclohexylamine	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	C	FT	AC	Yes	15.12, 15.17, 15.19

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
1,3-Cyclopentadiene dimer (molten)	Y	S/P	2	2	2G	2G	Cont	No	T1	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19, 16.2.6, 16.2.9
Cyclopentane	Y	P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Cyclopentene	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
p-Cymene	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Decahydronaphthalene	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
Decanoic acid	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Decene	X	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Decyl acrylate	X	S/P	1	1	2G	2G	Cont	No	T3	IIA	Yes	R	T	ACD	No	15.12.3, 15.12.4, 15.13, 15.19, 16.6.1, 16.6.2
Decyl alcohol (all isomers)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9(e)
Decyl/Dodecyl/Tetradecyl alcohol mixture	Y	S/P	2	2	2G	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	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Diacetone alcohol	Z	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Dialkyl (C8-C9) diphenylamines	Z	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Dialkyl (C7-C13) phthalates	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	No	15.12, 15.17, 15.19.6, 16.2.6
Dialkyl (C9 - C10) phthalates	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Dialkyl thiophosphates sodium salts solution	Y	S/P	2	2	2G	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	2	2G	2G	Open	No			NF	O	T	No	No	15.19.6
Dibutylamine	Y	S/P	3	2	2G	2G	Cont	No	T2	IIA	No	C	FT	ACD	Yes	15.12, 15.17, 15.19
Dibutyl hydrogen phosphonate	Y	S/P	3	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
2,6-Di-tert-butylphenol	X	S/P	1	2	2G	2G	Open	No	-	-	Yes	O	No	ABC D	No	15.19, 16.2.9
Dibutyl phthalate	X	S/P	2	2	2G	2G	Cont	No			Yes	C	No	A	No	15.19.6
Dibutyl terephthalate	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.9
Dichlorobenzene (all isomers)	X	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	ABD	No	15.12, 15.17, 15.19.6
3,4-Dichloro-1-butene	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	R	FT	ABC	No	15.12.3, 15.12.4, 15.19.6
1,1-Dichloroethane	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Dichloroethyl ether	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.18, 15.19
1,6-Dichlorohexane	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6
2,2'-Dichloroisopropyl ether	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	ACD	No	15.12.3, 15.12.4, 15.19
Dichloromethane	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	Yes	C	T	No	No	15.12, 15.17, 15.19.6
2,4-Dichlorophenol	Y	S/P	2	2	2G	2G	Cont	Dry			Yes	C	T	A	Yes	15.12, 15.16.2, 15.17, 15.19, 16.2.6, 16.2.9
2,4-Dichlorophenoxyacetic acid, diethanolamine salt solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
2,4-Dichlorophenoxyacetic acid, dimethylamine salt solution (70% or less)	Y	S/P	3	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
2,4-Dichlorophenoxyacetic acid, triisopropanolamine salt solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
1,1-Dichloropropane	Y	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	AB	No	15.19.6
1,2-Dichloropropane	Y	S/P	2	3	2G	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
1,3-Dichloropropene	X	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	AB	Yes	15.12, 15.17, 15.19
Dichloropropene/Dichloropropane mixtures	X	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	ABD	Yes	15.12, 15.17, 15.19
2,2-Dichloropropionic acid	Y	S/P	3	3	2G	2G	Cont	Dry			Yes	C	T	A	Yes	15.11.2, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12, 15.16.2, 15.17, 15.19, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Dicyclopentadiene, Resin Grade, 81-89%	Y	S/P	2	2	2G	2G	Cont	Inert	T2	IIB	No	C	FT	ABC	Yes	15.12, 15.13, 15.17, 15.19
Diethanolamine	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	Yes	C	T	A	No	15.12, 15.17, 15.19.6, 16.2.6, 16.2.9
Diethylamine	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
Diethylaminoethanol	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	FT	AC	No	15.12.3, 15.12.4, 15.19.6
2,6-Diethylaniline	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	BCD	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Diethylbenzene	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Diethylene glycol	Z	S/P	NA	3	NA	2G	Cont	No			Yes	R	T	AC	No	15.12.3, 15.12.4, 15.19.6
Diethylene glycol dibutyl ether	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Diethylene glycol diethyl ether	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Diethylene glycol phthalate	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Diethylenetriamine	Y	S/P	3	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Diethylenetriaminepentaacetic acid, pentasodium salt solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Diethyl ether	Z	S/P	2	2	1G	1G	Cont	Inert	T4	IIB	No	R	F	A	No	15.4, 15.14, 15.19
Di-(2-ethylhexyl) adipate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	No	15.12, 15.17, 15.19.6
Di-(2-ethylhexyl) phosphoric acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AD	No	15.12.3, 15.12.4, 15.19.6
Diethyl phthalate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Diethyl sulphate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Diglycidyl ether of bisphenol A	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Diglycidyl ether of bisphenol F	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Diheptyl phthalate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
Di-n-hexyl adipate	X	S/P	1	1	2G	2G	Open	No			Yes	O	No	A	No	15.19
Dihexyl phthalate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	No	15.12, 15.17, 15.19.6
Diisobutylamine	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	C	FT	ACD	No	15.12.3, 15.12.4, 15.19.6
Diisobutylene	Y	P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Diisobutyl ketone	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Diisobutyl phthalate	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6
Diisononyl adipate	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Diisooctyl phthalate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Diisopropanolamine	Z	P	3	3	2G	2G	Open	No	T2	IIA	Yes	O	No	A	No	16.2.9
Diisopropylamine	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Diisopropylbenzene (all isomers)	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Diisopropylnaphthalene	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
N,N-Dimethylacetamide	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	ACD	No	15.12.3, 15.12.4, 15.19.6
N,N-Dimethylacetamide solution (40% or less)	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	B	No	15.12.3, 15.12.4, 15.19.6
Dimethyl adipate	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Dimethylamine solution (45% or less)	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	ACD	Yes	15.12, 15.17, 15.19
Dimethylamine solution (greater than 45% but not greater than 55%)	Y	S/P	2	3	2G	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	3	2G	2G	Cont	No	T2	IIB	No	C	FT	ACD	Yes	15.12, 15.14, 15.17, 15.19

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
N,N-Dimethylcyclohexylamine	Y	S/P	2	2	2G	2G	Cont	No	T3	IIB	No	C	FT	AC	Yes	15.12, 15.17, 15.19
Dimethyl disulphide	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	FT	B	No	15.12.3, 15.12.4, 15.19
N,N-Dimethyldodecylamine	X	S/P	1	2	2G	2G	Cont	No			Yes	C	T	B	Yes	15.12, 15.17, 15.19
Dimethylethanolamine	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	FT	AD	No	15.12.3, 15.12.4, 15.19.6
Dimethylformamide	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AD	No	15.12, 15.17, 15.19.6
Dimethyl glutarate	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Dimethyl hydrogen phosphite	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	AD	No	15.19.6
Dimethyl octanoic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Dimethyl phthalate	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Dimethylpolysiloxane	Y	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
2,2-Dimethylpropane-1,3-diol (molten or solution)	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	AB	No	16.2.9
Dimethyl succinate	Y	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	16.2.9
Dinitrotoluene (molten)	X	S/P	2	2	2G	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	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Dioctyl phthalate	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
1,4-Dioxane	Y	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	C	FT	A	No	15.12, 15.17, 15.19, 16.2.9
Dipentene	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
Diphenyl	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	B	No	15.19.6, 16.2.6, 16.2.9
Diphenylamine (molten)	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	BD	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Diphenylamine, reaction product with 2,2,4-Trimethylpentene	Y	S/P	1	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6
Diphenylamines, alkylated	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Diphenyl/Diphenyl ether mixtures	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	B	No	15.19.6, 16.2.9
Diphenyl ether	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Diphenyl ether/Diphenyl phenyl ether mixture	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Diphenylmethane diisocyanate	Y	S/P	2	2	2G	2G	Cont	Dry	-	-	Yes(a)	C	T(a)	ABC(b)D	Yes	15.12, 15.16.2, 15.17, 15.19, 16.2.6, 16.2.9
Diphenylol propane-epichlorohydrin resins	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Di-n-propylamine	Y	S/P	2	2	2G	2G	Cont	No	T3	IIB	No	C	FT	A	Yes	15.12.3, 15.12.4, 15.17, 15.19.6
Dipropylene glycol	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Dithiocarbamate ester (C7-C35)	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	AD	No	15.19.6, 16.2.9
Ditridecyl adipate	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6
Ditridecyl phthalate	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Diundecyl phthalate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Dodecane (all isomers)	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	AB	No	15.19.6
tert-Dodecanethiol	Y	S/P	1	3	2G	2G	Cont	No	-	-	Yes	C	T	ABD	Yes	15.12, 15.17, 15.19.6
Dodecene (all isomers)	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Dodecyl alcohol	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Dodecylamine/Tetradecylamine mixture	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.9
Dodecylbenzene	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Dodecyl diphenyl ether disulphonate solution	X	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6
Dodecyl hydroxypropyl sulphide	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Dodecyl methacrylate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.13
Dodecyl/Octadecyl methacrylate mixture	Y	S/P	2	2	2G	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	2	2G	2G	Open	No			Yes	O	No	AD	No	15.13, 15.19.6, 16.6.1, 16.6.2
Dodecyl phenol	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6
Dodecyl Xylene	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Drilling brines (containing zinc salts)	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	No	Yes	15.19.6
Drilling brines, including:calcium bromide solution, calcium chloride solution and sodium	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Epichlorohydrin	Y	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Ethanolamine	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	Yes	C	FT	A	Yes	15.12, 15.17, 15.19, 16.2.9
2-Ethoxyethyl acetate	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
Ethoxylated long chain (C16+) alkyloxyalkylamine	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.9
Ethoxylated tallow amine (> 95%)	X	S/P	2	2	2G	2G	Cont	Inert	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Ethyl acetate	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Ethyl acetoacetate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Ethyl acrylate	Y	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.13, 15.17 , 15.19, 16.6.1, 16.6.2
Ethylamine	Y	S/P	2	2	1G	1G	Cont	No	T2	IIA	No	C	FT	CD	No	15.12.3, 15.14, 15.19
Ethylamine solutions (72% or less)	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	AC	No	15.12.3, 15.14, 15.19

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Ethyl amyl ketone	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Ethylbenzene	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
Ethyl tert-butyl ether	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Ethyl butyrate	Y	S/P	3	3	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Ethylcyclohexane	Y	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
N-Ethylcyclohexylamine	Y	S/P	2	2	2G	2G	Cont	No	T3	IIB	No	C	FT	A	No	15.12.3, 15.12.4, 15.19
S-Ethyl dipropylthiocarbamate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6, 16.2.9
Ethylene carbonate	Z	S/P	NA	3	NA	2G	Cont	No			Yes	R	T	AC	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Ethylene chlorohydrin	Y	S/P	2	1	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.18, 15.19
Ethylene cyanohydrin	Y	S/P	3	3	2G	2G	Cont	No		IIB	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Ethylenediamine	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19, 16.2.9
Ethylenediaminetetraacetic acid, tetrasodium salt solution	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Ethylene dibromide	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	No	15.12, 15.17, 15.19, 16.2.9
Ethylene dichloride	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19
Ethylene glycol	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol acetate	Y	S/P	3	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Ethylene glycol butyl ether acetate	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol diacetate	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Ethylene glycol methyl ether acetate	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Ethylene glycol monoalkyl ethers	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	C	FT	A	No	15.12.3, 15.12.4, 15.19, 16.2.9
Ethylene glycol phenyl ether	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Ethylene glycol phenyl ether/Diethylene glycol phenyl ether mixture	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Ethylene oxide/Propylene oxide mixture with an ethylene oxide content of not more than 30% by	Y	S/P	2	2	1G	1G	Cont	Inert	T2	IIB	No	C	FT	AC	Yes	15.8, 15.12, 15.14, 15.17, 15.19
Ethylene-vinyl acetate copolymer (emulsion)	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Ethyl-3-ethoxypropionate	Y	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	No	A	No	15.19.6
2-Ethylhexanoic acid	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6
2-Ethylhexyl acrylate	Y	S/P	3	3	2G	2G	Cont	No	T3	IIB	Yes	C	T	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
2-Ethylhexylamine	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19.6
2-Ethyl-2-(hydroxymethyl) propane-1,3-diol (C8-C10) ester	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Ethylidene norbornene	Y	S/P	2	2	2G	2G	Cont	No	T3	IIB	No	R	FT	AD	No	15.12.3, 15.12.4, 15.19.6
Ethyl methacrylate	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AD	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
N-Ethylmethylallylamine	Y	S/P	2	2	2G	2G	Cont	No	T2	IIB	No	C	FT	AC	No	15.12.3, 15.12.4, 15.19
Ethyl propionate	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
2-Ethyl-3-propylacrolein	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6, 16.2.9
Ethyl toluene	Y	P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Fatty acid (saturated C13+)	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Fatty acid methyl esters (m)	Y	S/P	2	2	2G	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	2	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Fatty acids, (C12+)	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Fatty acids, (C16+)	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Fatty acids, essentially linear (C6-C18) 2-ethylhexyl ester	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
Ferric chloride solutions	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19, 16.2.9
Ferric nitrate/Nitric acid solution	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Fish oil	Y	S/P	2(k)	2(k)	2G	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	2	1G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Formaldehyde solutions (45% or less)	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19, 16.2.9
Formamide	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6, 16.2.9
Formic acid (85% or less acid)	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	C	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, 15.17, 15.19, 16.2.9
Formic acid (over 85%)	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT(g)	A	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, 15.17, 15.19, 16.2.9
Formic acid mixture (containing up to 18% propionic acid and up to 25% sodium formate)	Z	S/P	3	3	2G	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	2	2G	2G	Cont	No	T2	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Furfuryl alcohol	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Glucitol/glycerol blend propoxylated (containing less than 10% amines)	Z	S/P	3	3	2G	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	1	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.18, 15.19
Glycerine	Z	S/P	NA	3	NA	2G	Open	No			Yes	O	No	AC	No	16.2.9
Glycerol monooleate	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Glycerol propoxylated	Z	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Glycerol, propoxylated and ethoxylated	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
Glycerol/sucrose blend propoxylated and ethoxylated	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
Glyceryl triacetate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
Glycidyl ester of C10 trialkylacetic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Glycine, sodium salt solution	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Glycolic acid solution (70% or less)	Z	S/P	3	3	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12.3, 15.12.4, 15.17, 15.19, 16.2.9
Glyoxal solution (40% or less)	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Glyoxylic acid solution (50 % or less)	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	C	T	ACD	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, 16.2.9, 16.6.1, 16.6.2, 16.6.3
Glyphosate solution (not containing surfactant)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Grape Seed Oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Groundnut oil	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Heptane (all isomers)	X	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6, 16.2.9
n-Heptanoic acid	Z	S/P	3	3	2G	2G	Cont	No			Yes	O	No	AB	No	15.19.6
Heptanol (all isomers) (d)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Heptene (all isomers)	Y	P	3	3	2G	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6
Heptyl acetate	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
1-Hexadecylnaphthalene / 1,4-bis(hexadecyl)naphthalene mixture	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Hexamethylenediamine (molten)	Y	S/P	2	3	2G	2G	Cont	No	-	-	Yes	C	T	AC	Yes	15.12, 15.17, 15.19, 16.2.9
Hexamethylenediamine adipate (50% in water)	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Hexamethylenediamine solution	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12.3, 15.12.4, 15.19
Hexamethylene diisocyanate	Y	S/P	2	2	1G	2G	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	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Hexamethyleneimine	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	AC	No	15.12.3, 15.12.4, 15.19
Hexamethylenetetramine solutions	Z	S	NA	3	NA	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19
Hexane (all isomers)	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
1,6-Hexanediol, distillation overheads	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Hexanoic acid	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19
Hexanol	Y	S/P	3	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19
Hexene (all isomers)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Hexyl acetate	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Hexylene glycol	Z	S	NA	3	NA	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19
Hydrochloric acid	Z	S/P	3	2	1G	1G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Hydrogen peroxide solutions (over 60% but not over 70% by mass)	Y	S/P	2	2	2G	2G	Cont	No			NF	R	T	No	No	15.5.1, 15.12.3, 15.12.4, 15.19.6
Hydrogen peroxide solutions (over 8% but not over 60% by mass)	Y	S/P	3	3	2G	2G	Cont	No			NF	R	T	No	No	15.5.2, 15.18, 15.12.3, 15.12.4, 15.19.6
2-Hydroxyethyl acrylate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
N-(Hydroxyethyl)ethylenediaminetriacetic acid, trisodium salt solution	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6
2-Hydroxy-4-(methylthio)butanoic acid	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Illipe oil	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Isoamyl alcohol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
Isobutyl alcohol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	AB	No	
Isobutyl formate	Z	P	3	3	2G	2G	Cont	No	T4	IIA	No	R	F	AB	No	
Isobutyl methacrylate	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
Isophorone	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Isophoronediamine	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Isophorone diisocyanate	X	S/P	2	2	2G	2G	Cont	Dry			Yes	C	T	ABD	Yes	15.12, 15.16.2, 15.17, 15.19
Isoprene	Y	S/P	3	3	2G	2G	Cont	No	T3	IIB	No	C	FT	B	No	15.12, 15.13, 15.14, 15.17, 15.19.6, 16.6.1, 16.6.2
Isopropanolamine	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	Yes	R	F	A	No	15.19.6, 16.2.6, 16.2.9
Isopropyl acetate	Z	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	AB	No	
Isopropylamine	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	CD	No	15.12.3, 15.14, 15.19
Isopropylamine (70% or less) solution	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	C	FT	CD	No	15.12.3, 15.19.6, 16.2.9
Isopropylcyclohexane	Y	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	A	No	15.19.6, 16.2.9
Isopropyl ether	Y	S/P	3	3	2G	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)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6
Lactic acid	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Lactonitrile solution (80% or less)	Y	S/P	2	1	1G	1G	Cont	No			NF	C	T	No	Yes	15.12, 15.13, 15.18, 15.19, 16.6.1, 16.6.2, 16.6.3
Lard	Y	S/P	2(k)	2(k)	2G	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	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Latex: Carboxylated styrene-Butadiene copolymer; Styrene-Butadiene rubber	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Lauric acid	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Ligninsulphonic acid, magnesium salt solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	AC	No	
Ligninsulphonic acid, sodium salt solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Linseed oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Liquid chemical wastes	X	S/P	2	2	2G	2G	Cont	No			No	C	FT	A	No	15.12, 15.19.6, 20.5.1
Long-chain alkaryl polyether (C11-C20)	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Long-chain alkaryl sulphonic acid (C16-C60)	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Long-chain alkylphenate/Phenol sulphide mixture	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
L-Lysine solution (60% or less)	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Magnesium chloride solution	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Magnesium long-chain alkaryl sulphonate (C11-C50)	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Magnesium long-chain alkyl salicylate (C11+)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Maleic anhydride	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AC(f)	Yes	15.12, 15.17, 15.19, 16.2.9
Maleic anhydride–sodium allylsulfonate copolymer solution	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
Mango kernel oil	Y	P	2(k)	2(k)	2G	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	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
Mesityl oxide	Z	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Metam sodium solution	X	S/P	2	2	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12, 15.17, 15.19

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Methacrylic acid	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.13, 15.12.3, 15.12.4, 15.19, 16.2.9, 16.6.1
Methacrylic acid - alkoxypoly (alkylene oxide) methacrylate copolymer, sodium salt aqueous	Z	S/P	3	3	2G	2G	Open	No	-	-	NF	O	No	No	No	16.2.9
Methacrylic resin in ethylene dichloride	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19, 16.2.9
Methacrylonitrile	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19
3-Methoxy-1-butanol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	
3-Methoxybutyl acetate	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
N-(2-Methoxy-1-methyl ethyl)-2-ethyl-6-methyl chloroacetanilide	X	S/P	1	1	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6
Methyl acetate	Z	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	
Methyl acetoacetate	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Methyl acrylate	Y	S/P	2	3	2G	2G	Cont	No	T1	IIB	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
Methyl alcohol	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT	A	No	15.12, 15.17, 15.19
Methylamine solutions (42% or less)	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	C	FT	ACD	Yes	15.12, 15.17, 15.19
Methylamyl acetate	Y	P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Methylamyl alcohol	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Methyl amyl ketone	Z	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
N-Methylaniline	Y	S/P	2	2	2G	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	2	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Methylbutenol	Y	S/P	3	3	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Methyl tert-butyl ether	Z	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	AB	No	

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Methyl butyl ketone	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19.6
Methylbutynol	Z	S/P	3	3	2G	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6
Methyl butyrate	Y	S/P	3	3	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Methylcyclohexane	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Methylcyclopentadiene dimer	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	B	No	15.12.3, 15.12.4, 15.19.6
Methylcyclopentadienyl manganese tricarbonyl	X	S/P	1	2	1G	2G	Cont	No	-	-	Yes	C	T	ABC D	Yes	15.12, 15.18, 15.19, 16.2.9
Methyl diethanolamine	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
2-Methyl-6-ethyl aniline	Y	S/P	3	3	2G	2G	Cont	No			Yes	R	T	AD	No	15.12.3, 15.12.4, 15.19.6
Methyl ethyl ketone	Z	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	
2-Methyl-5-ethyl pyridine	Y	S/P	3	2	2G	2G	Cont	No		IIA	Yes	C	T	AD	Yes	15.12, 15.17, 15.19
Methyl formate	Z	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.14, 15.19
2-Methylglutaronitrile with 2-Ethylsuccinonitrile (12% or less)	Z	S/P	2	3	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19
2-Methyl-2-hydroxy-3-butyne	Z	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	ABD	No	15.19.6, 16.2.9
Methyl isobutyl ketone	Z	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6
Methyl methacrylate	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
3-Methyl-3-methoxybutanol	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Methyl naphthalene (molten)	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AD	No	15.12.3, 15.12.4, 15.19.6
N-Methylglucamine solution (70% or less)	Z	S	NA	3	NA	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19, 16.2.9
2-Methyl-1,3-propanediol	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
2-Methylpyridine	Z	S/P	2	3	2G	2G	Cont	No	T1	IIA	No	C	FT	A	No	15.12.3, 15.19
3-Methylpyridine	Z	S/P	2	3	2G	2G	Cont	No	T1	IIA	No	C	FT	AC	No	15.12.3, 15.12.4, 15.19
4-Methylpyridine	Z	S/P	2	3	2G	2G	Cont	No	T1	IIA	No	C	FT	A	No	15.12.3, 15.12.4, 15.19, 16.2.9
N-Methyl-2-pyrrolidone	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6
Methyl propyl ketone	Z	S	NA	3	NA	2G	Cont	No	T1	IIA	No	R	FT	ABC	No	15.12.3, 15.12.4, 15.19.6
Methyl salicylate	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6
alpha-Methylstyrene	Y	S/P	2	2	2G	2G	Cont	No	T1	IIB	No	C	FT	AD(j)	No	15.12, 15.13, 15.17, 15.19.6, 16.6.1, 16.6.2
3-(methylthio)propionaldehyde	Y	S/P	2	2	2G	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	2	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Morpholine	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12.3, 15.12.4, 15.19
Motor fuel anti-knock compound (containing lead alkyls)	X	S/P	1	1	1G	1G	Cont	No	T4	IIA	No	C	FT	AC	Yes	15.6, 15.12, 15.17, 15.18, 15.19
Myrcene	X	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Naphthalene (molten)	X	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	AD	No	15.12, 15.17, 15.19.6, 16.2.9
Naphthalenesulphonic acid-Formaldehyde copolymer, sodium salt solution	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Neodecanoic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Nitrating acid (mixture of sulphuric and nitric acids)	Y	S/P	2	1	2G	1G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.16.2, 15.17, 15.18, 15.19
Nitric acid (70% and over)	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Nitric acid (less than 70%)	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.17, 15.19
Nitrilotriacetic acid, trisodium salt solution	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Nitrobenzene	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	AD	No	15.12, 15.17, 15.19, 16.2.9
Nitroethane	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	R	FT	A(f)	No	15.12.3, 15.12.4, 15.19.6, 16.6.1, 16.6.2, 16.6.4
Nitroethane(80%)/ Nitropropane(20%)	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	R	FT	A(f)	No	15.12.3, 15.12.4, 15.19.6, 16.6.1, 16.6.2, 16.6.3
Nitroethane, 1-Nitropropane (each 15% or more) mixture	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.6.1, 16.6.2, 16.6.3
o-Nitrophenol (molten)	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AD	No	15.19.6, 16.2.6, 16.2.9
1- or 2-Nitropropane	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	C	FT	A	No	15.12, 15.17, 15.19
Nitropropane (60%)/Nitroethane (40%) mixture	Y	S/P	3	3	2G	2G	Cont	No	T4	IIB	No	C	FT	A(f)	No	15.12, 15.17, 15.19.6
o- or p-Nitrotoluenes	Y	S/P	2	2	2G	2G	Cont	No		IIB	Yes	C	T	AB	No	15.12, 15.17, 15.19.6
Nonane (all isomers)	X	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	F	BC	No	15.19.6
Nonanoic acid (all isomers)	Y	S/P	3	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.9
Non-edible industrial grade palm oil	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Nonene (all isomers)	Y	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Nonyl alcohol (all isomers)	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Nonyl methacrylate monomer	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Nonylphenol	X	S/P	1	1	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Nonylphenol poly(4+)ethoxylate	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6
Noxious liquid, NF, (1) n.o.s. (trade name ...., contains ....) ST1, Cat. X	X	P	1	1	2G	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	1	2G	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	2	2G	2G	Open	No	-		Yes	O	No	A	No	15.19, 16.2.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Noxious liquid, F, (4) n.o.s. (trade name ...., contains ....) ST2, Cat. X	X	P	2	2	2G	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	2	2G	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	2	2G	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	3	2G	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	3	2G	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	3	2G	2G	Open	No	-		Yes	O	No	A	No	
Noxious liquid, F, (10) n.o.s. (trade name ...., contains ....) ST3, Cat. Z	Z	P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	
Octamethylcyclotetrasiloxane	Y	P	2	2	2G	2G	Cont	No	T2	IIA	No	R	F	AC	No	15.19.6, 16.2.9
Octane (all isomers)	X	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Octanoic acid (all isomers)	Y	S/P	3	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Octanol (all isomers)	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Octene (all isomers)	Y	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
n-Octyl acetate	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Octyl aldehydes	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	F	A	No	15.19.6, 16.2.9
Octyl decyl adipate	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Olefin-Alkyl ester copolymer (molecular weight 2000+)	Y	P	2	2	2G	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	P	2	2	2G	2G	Cont	No	T3	IIB	No	R	F	ABC	No	15.13, 15.19.6
Olefin mixtures (C5-C7)	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Olefin mixtures (C5-C15)	X	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Olefins (C13+, all isomers)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
alpha-Olefins (C6-C18) mixtures	X	S/P	2	2	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Oleic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Oleum	Y	S/P	2	2	2G	2G	Cont	Dry			NF	C	T	No	Yes	15.11.2 to 15.11.8, 15.12, 15.16.2, 15.17, 15.19, 16.2.6
Oleylamine	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Olive oil	Y	S/P	2(k)	2(k)	2G	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	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
Palm acid oil	Y	S/P	2	2	2G	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	2	2G	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	2	2G	2G	Cont	No			Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Palm kernel fatty acid distillate	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	ABC	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Palm kernel oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel olein	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm kernel stearin	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm mid-fraction	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm oil	Y	P	2(k)	2(k)	2G	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	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Palm olein	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Palm stearin	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Paraffin wax	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Paraldehyde	Z	S/P	3	3	2G	2G	Cont	No	T3	IIB	No	R	F	A	No	15.19.6, 16.2.9
Paraldehyde-ammonia reaction product	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Pentachloroethane	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	No	15.12, 15.17, 15.19.6
1,3-Pentadiene	Y	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	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	2	2G	2G	Cont	Inert	T3	IIB	No	C	FT	ABC	Yes	15.12, 15.13, 15.17, 15.19
Pentaethylenehexamine	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	B	Yes	15.12, 15.17, 15.19
Pentane (all isomers)	Y	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.14, 15.19.6
Pentanoic acid	Y	S/P	3	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.17, 15.19
n-Pentanoic acid (64%)/2-Methyl butyric acid (36%) mixture	Y	S/P	2	2	2G	2G	Cont	No	T2		Yes	C	T	AD	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
Pentene (all isomers)	Y	P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.14, 15.19.6
n-Pentyl propionate	Y	S/P	3	3	2G	2G	Cont	No	T4	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Perchloroethylene	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	No	15.12, 15.17, 15.19.6
Petrolatum	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Phenol	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
1-Phenyl-1-xylyl ethane	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
Phosphate esters, alkyl (C12-C14) amine	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Phosphoric acid	Z	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.11.1, 15.11.2, 15.11.3, 15.11.4, 15.11.6, 15.11.7, 15.11.8, 15.12, 15.17, 15.19, 16.2.9
Phosphorus, yellow or white	X	S/P	1	1	1G	1G	Cont	Pad+(vent or inert)			No(c)	C	No	C	No	15.7, 15.19, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Phthalic anhydride (molten)	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
alpha-Pinene	X	P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
beta-Pinene	X	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	C	FT	A	Yes	15.12, 15.17, 15.19
Pine oil	X	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Polyacrylic acid solution (40% or less)	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	AC	No	
Polyalkyl (C18-C22) acrylate in xylene	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	AB	No	15.12.3, 15.12.4, 15.19.6, 16.2.6,16.2.9
Polyalkylalkenaminesuccinimide, molybdenum oxysulphide	Y	P	2	2	2G	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	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Poly(2-8)alkylene glycol monoalkyl (C1-C6) ether acetate	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Polyalkyl (C10-C20) methacrylate	Y	P	2	2	2G	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	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Polyaluminium chloride solution	Z	S	NA	3	NA	2G	Open	No			NF	O	No	No	No	
Polybutene	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Polybutenyl succinimide	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Poly(2+)cyclic aromatics	X	S/P	1	1	2G	2G	Cont	No			Yes	C	T	AD	No	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Polyether (molecular weight 1350+)	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6
Polyethylene glycol	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Polyethylene glycol dimethyl ether	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Poly(ethylene glycol) methylbutenyl ether (MW>1000)	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	AC	No	16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Polyethylene polyamines	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Polyethylene polyamines (more than 50% C5 - C20 paraffin oil)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.9
Polyferric sulphate solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19
Poly(iminoethylene)-graft-N-poly(ethyleneoxy) solution (90% or less)	Z	S/P	3	3	2G	2G	Open	No	-	-	NF	O	No	No	No	16.2.9
Polyisobutenamine in aliphatic (C10-C14) solvent	Y	S/P	3	3	2G	2G	Cont	No	T3	IIA	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Polyisobutenyl anhydride adduct	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Polyisobutylene (MW≤224)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.9
Polyglycerin, sodium salt solution (containing less than 3% sodium hydroxide)	Z	S	NA	3	NA	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19. 16.2.9
Polymethylene polyphenyl isocyanate	Y	S/P	2	2	2G	2G	Cont	Dry			Yes(a)	C	T(a)	A	Yes	15.12, 15.16.2, 15.17, 15.19.6, 16.2.9
Polyolefin (molecular weight 300+)	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Polyolefin amide alkeneamine (C17+)	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Polyolefin amide alkeneamine borate (C28-C250)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Polyolefin amide alkeneamine polyol	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Polyolefinamine (C28-C250)	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Polyolefinamine in alkyl (C2-C4) benzenes	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Polyolefinamine in aromatic solvent	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Polyolefin aminoester salts (molecular weight 2000+)	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Polyolefin anhydride	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	AB	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Polyolefin ester (C28-C250)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Polyolefin phenolic amine (C28-C250)	Y	S/P	2	2	2G	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	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Poly(20)oxyethylene sorbitan monooleate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Poly(5+)propylene	Y	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.9
Polypropylene glycol	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	ABC	No	15.19.6
Polysiloxane	Y	P	3	3	2G	2G	Cont	No	T4	IIB	No	R	F	AB	No	15.19.6, 16.2.9
Potassium chloride solution	Z	P	3	3	2G	2G	Open	No	-	-	NF	O	No	No	No	16.2.9
Potassium hydroxide solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19
Potassium formate solutions	Z	S	NA	3	NA	2G	Open	No			NF	O	No	No	No	
Potassium oleate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Potassium thiosulphate (50% or less)	Y	S/P	3	3	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
n-Propanolamine	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.19, 16.2.9
2-Propene-1-aminium, N,N-dimethyl-N-2-propenyl-, chloride, homopolymer solution	Y	P	3	3	2G	2G	Open	No	-	-	NF	O	No	No	No	15.19.6
beta-Propiolactone	Y	S/P	2	1	2G	2G	Cont	No		IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.18, 15.19
Propionaldehyde	Y	S/P	3	3	2G	2G	Cont	No	T4	IIB	No	R	FT	A	No	15.19.6
Propionic acid	Y	S/P	3	3	2G	2G	Cont	No	T1	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, 15.17, 15.19
Propionic anhydride	Y	S/P	3	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Propionitrile	Y	S/P	2	1	1G	1G	Cont	No	T1	IIB	No	C	FT	AD	Yes	15.12, 15.17, 15.18, 15.19
n-Propyl acetate	Y	P	3	3	2G	2G	Cont	No	T1	IIA	No	R	F	AB	No	15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
n-Propyl alcohol	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
n-Propylamine	Z	S/P	2	2	2G	2G	Cont	Inert	T2	IIA	No	C	FT	AD	Yes	15.12, 15.17, 15.19
Propylbenzene (all isomers)	Y	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	15.19.6
Propylene carbonate	Z	S	NA	3	NA	2G	Cont	No			Yes	C	T	AC	Yes	15.12, 15.17, 15.19
Propylene glycol	Z	S	NA	3	NA	2G	Open	No			Yes	O	No	AC	No	
Propylene glycol methyl ether acetate	Z	P	3	3	2G	2G	Cont	No	T2	IIA	No	R	F	A	No	
Propylene glycol monoalkyl ether	Z	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	R	F	AB	No	15.19.6
Propylene glycol phenyl ether	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Propylene oxide	Y	S/P	2	2	2G	2G	Cont	Inert	T2	IIB	No	C	FT	AC	No	15.8, 15.12, 15.14, 15.17, 15.19
Propylene tetramer	X	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Propylene trimer	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	F	A	No	15.19.6
Pyridine	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Pyrolysis gasoline (containing benzene)	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	C	FT	AB	No	15.12, 15.17, 15.19.6
Rapeseed oil	Y	P	2(k)	2(k)	2G	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	P	2(k)	2(k)	2G	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	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6
Resin oil, distilled	Y	S/P	2	2	2G	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)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Rosin	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Safflower oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Shea butter	Y	S/P	2(k)	2(k)	2G	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	S/P	2	2	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Sodium aluminosilicate slurry	Z	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Sodium benzoate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Sodium borohydride (15% or less)/Sodium hydroxide solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.6, 16.2.9
Sodium bromide solution (less than 50%) (*)	Y	S/P	3	3	2G	2G	Cont	No	-	-	NF	C	T	No	No	15.12, 15.17, 15.19
Sodium carbonate solution	Z	S/P	3	3	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Sodium chlorate solution (50% or less)	Z	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.9, 15.12, 15.17, 15.19, 16.2.9
Sodium dichromate solution (70% or less)	Y	S/P	2	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19
Sodium hydrogen sulphide (6% or less)/Sodium carbonate (3% or less) solution	Z	S/P	3	3	2G	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Sodium hydrogen sulphite solution (45% or less)	Z	P	3	3	2G	2G	Open	No			NF	O	No	No	No	16.2.9
Sodium hydrosulphide/Ammonium sulphide solution	Y	S/P	2	2	2G	2G	Cont	No	T4	IIB	No	R	F	A	No	15.14, 15.19, 16.6.1, 16.6.2, 16.6.3
Sodium hydrosulphide solution (45% or less)	Z	S/P	3	3	2G	2G	Cont	Vent or pad (gas)			NF	R	No	No	No	15.19.6, 16.2.9
Sodium hydroxide solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	No	No	Yes	15.17, 15.19, 16.2.6, 16.2.9
Sodium hypochlorite solution (15% or less)	Y	S/P	2	2	2G	2G	Cont	No	-	-	NF	C	T	No	Yes	15.12, 15.17, 15.19
Sodium methylate 21-30% in methanol	Y	S/P	2	2	2G	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	3	2G	2G	Cont	No			NF	C	T	No	No	15.12.3, 15.12.4, 15.19, 16.2.9
Sodium petroleum sulphonate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19, 16.2.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Sodium poly(4+)acrylate solutions	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	16.2.9
Sodium silicate solution	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
Sodium sulphate solutions	Z	S	NA	3	NA	2G	Open	No			NF	O		No	No	
Sodium sulphide solution (15% or less)	Y	S/P	3	3	2G	2G	Cont	No			NF	C	T	No	Yes	15.12, 15.17, 15.19, 16.2.9
Sodium sulphite solution (25% or less)	Y	S/P	3	3	2G	2G	Open	No			NF	O	No	No	No	15.19.6, 16.2.9
Sodium thiocyanate solution (56% or less)	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	No	No	15.19.6, 16.2.9
Soyabean oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Styrene monomer	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT	AB	No	15.12, 15.13, 15.17, 15.19.6, 16.6.1, 16.6.2
Sulphohydrocarbon (C3-C88)	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Sulpholane	Y	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Sulphur (molten)	Z	S/P	3	3	1G	1G	Cont	Vent or pad (gas)	T3		Yes	R	F	No	No	15.10, 16.2.9
Sulphuric acid	Y	S/P	3	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.16.2, 15.17, 15.19
Sulphuric acid, spent	Y	S/P	3	2	2G	2G	Cont	No			NF	C	T	No	Yes	15.11, 15.12, 15.16.2, 15.17, 15.19
Sulphurized fat (C14-C20)	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Sulphurized polyolefinamide alkene (C28-C250) amine	Z	P	3	3	2G	2G	Open	No	-	-	Yes	O	No	A	No	
Sunflower seed oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Tall oil, crude	Y	S/P	2	2	2G	2G	Cont	No	-	-	Yes	C	T	ABC	Yes	15.12, 15.17, 15.19, 16.2.6
Tall oil, distilled	Y	P	2	2	2G	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	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Tall oil pitch	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6,16.2.6
Tallow	Y	P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Tallow fatty acid	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Tetrachloroethane	Y	S/P	2	2	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19
Tetraethylene glycol	Z	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Tetraethylene pentamine	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
Tetrahydrofuran	Z	P	3	3	2G	2G	Cont	No	T3	IIB	No	R	F	A	No	15.19.6
Tetrahydronaphthalene	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Tetramethylbenzene (all isomers)	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.9
Titanium dioxide slurry	Z	P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
Toluene	Y	S/P	3	3	2G	2G	Cont	No	T1	IIA	No	C	FT	A	No	15.12, 15.17, 15.19.6
Toluenediamine	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AD	Yes	15.12, 15.17, 15.18, 15.19, 16.2.6, 16.2.9
Toluene diisocyanate	Y	S/P	2	2	2G	2G	Cont	Dry	T1	IIA	Yes	C	FT	AC(b)D	Yes	15.12, 15.16.2, 15.17, 15.18, 15.19, 16.2.9
o-Toluidine	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19
Tributyl phosphate	Y	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	Yes	15.12, 15.17, 15.19
1,2,3-Trichlorobenzene (molten)	X	S/P	1	2	2G	2G	Cont	No			Yes	R	T	ACD	No	15.12.3, 15.12.4, 15.19, 16.2.6, 16.2.9
1,2,4-Trichlorobenzene	X	S/P	1	1	2G	2G	Cont	No			Yes	C	T	AB	No	15.12, 15.17, 15.19, 16.2.9
1,1,1-Trichloroethane	Y	P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
1,1,2-Trichloroethane	Y	S/P	3	3	2G	2G	Open	No			NF	O	No	No	No	15.19.6

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Trichloroethylene	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	No	No	15.12, 15.17, 15.19.6
1,2,3-Trichloropropane	Y	S/P	2	3	2G	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	2	2G	2G	Open	No			NF	O	No	No	No	15.19.6
Tricresyl phosphate (containing 1% or more ortho-isomer)	Y	S/P	1	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	AB	No	15.12, 15.17, 15.19, 16.2.6
Tricresyl phosphate (containing less than 1% ortho-isomer)	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6, 16.2.6
Tridecane	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6
Tridecanoic acid	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6, 16.2.9
Tridecyl acetate	Y	S/P	3	3	2G	2G	Cont	No	-	-	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19
Triethanolamine	Z	S/P	3	3	2G	2G	Cont	No		IIA	Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Triethylamine	Y	S/P	2	3	2G	2G	Cont	No	T2	IIA	No	C	FT	AC	No	15.12.3, 15.12.4, 15.19
Triethylbenzene	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Triethylene glycol	Z	S	NA	3	NA	2G	Open	No			Yes	O	No	AC	No	
Triethylenetetramine	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	Yes	C	T	A	Yes	15.12, 15.17, 15.19
Triethyl phosphate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Triethyl phosphite	Z	S/P	3	3	2G	2G	Cont	No	T3	IIA	No	C	FT	AB	Yes	15.12, 15.17, 15.19, 16.2.9
Triisopropanolamine	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Triisopropylated phenyl phosphates	X	P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6, 16.2.6
Trimethylacetic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.11.2, 15.11.3, 15.11.4, 15.11.5, 15.11.6, 15.11.7, 15.11.8, 15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
Trimethylamine solution (30% or less)	Z	S/P	2	2	2G	2G	Cont	No	T3	IIB	No	R	FT	AC	No	15.12.3, 15.12.4, 15.14, 15.19, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Trimethylbenzene (all isomers)	X	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6
Trimethylol propane propoxylated	Z	S/P	3	3	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	
2,2,4-Trimethyl-1,3-pentanediol diisobutyrate	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	AB	No	
2,2,4-Trimethyl-1,3-pentanediol-1-isobutyrate	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
1,3,5-Trioxane	Y	S/P	3	3	2G	2G	Cont	No	T2	IIB	No	C	FT	AD	No	15.12, 15.17, 15.19.6, 16.2.9
Tripropylene glycol	Z	S/P	3	3	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17
Trixylyl phosphate	X	S/P	2	1	2G	2G	Cont	No			Yes	C	T	A	No	15.12, 15.17, 15.19.6, 16.2.6
Tung oil	Y	S/P	2(k)	2(k)	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Turpentine	X	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	C	FT	A	Yes	15.12, 15.17, 15.19
Undecanoic acid	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.6, 16.2.9
1-Undecene	X	S/P	2	2	2G	2G	Open	No			Yes	O	No	A	No	15.19.6
Undecyl alcohol	X	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Urea/Ammonium nitrate solution	Z	S/P	3	3	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6
Urea/Ammonium nitrate solution (containing less than 1% free ammonia)	Z	S/P	3	3	2G	2G	Cont	No			NF	R	T	No	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Urea/Ammonium phosphate solution	Y	S/P	2	2	2G	2G	Cont	No			Yes	R	T	A	No	15.12.3, 15.12.4, 15.19.6
Urea solution	Z	S/P	3	3	2G	2G	Open	No			Yes	O	No	A	No	
Valeraldehyde (all isomers)	Y	S/P	3	3	2G	2G	Cont	Inert	T3	IIB	No	R	F	A	No	15.4.6, 15.19.6
Vegetable acid oils (m)	Y	S/P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9
Vegetable fatty acid distillates (m)	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	ABC	No	15.19.6, 16.2.6, 16.2.9

a	c	d	e	e*	f	f*	g	h	i'	i''	i'''	j	k	l	n	o
Vinyl acetate	Y	S/P	3	3	2G	2G	Cont	No	T2	IIA	No	C	FT	A	No	15.12, 15.13, 15.17, 15.19.6, 16.6.1, 16.6.2
Vinyl ethyl ether	Z	S/P	2	2	1G	2G	Cont	Inert	T3	IIB	No	R	F	A	No	15.4, 15.13, 15.14, 15.19.6, 16.6.1, 16.6.2
Vinylidene chloride	Y	S/P	2	2	2G	2G	Cont	Inert	T2	IIA	No	C	FT	B	No	15.12, 15.13, 15.14, 15.17, 15.19, 16.6.1, 16.6.2
Vinyl neodecanoate	Y	S/P	2	2	2G	2G	Cont	No			Yes	C	T	AB	Yes	15.12, 15.13, 15.17, 15.19, 16.6.1, 16.6.2
Vinyltoluene	Y	S/P	2	2	2G	2G	Cont	No	T1	IIA	No	C	FT	AB	No	15.12, 15.13, 15.17, 15.19.6, 16.6.1, 16.6.2
Waxes	Y	P	2	2	2G	2G	Open	No	-	-	Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
White spirit, low (15-20%) aromatic	Y	S/P	2	2	2G	2G	Cont	No	T3	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6, 16.2.9
Wood lignin with sodium acetate/oxalate	Z	S/P	3	3	2G	2G	Open	No	-	-	NF	O	No	No	No	
Xylenes	Y	P	2	2	2G	2G	Cont	No	T1	IIA	No	R	F	A	No	15.19.6, 16.2.9 (h)
Xylenes/ethylbenzene (10% or more) mixture	Y	S/P	2	2	2G	2G	Cont	No	T2	IIA	No	R	FT	A	No	15.12.3, 15.12.4, 15.19.6
Xylenol	Y	S/P	2	2	2G	2G	Cont	No		IIA	Yes	C	T	AB	Yes	15.12, 15.17, 15.19, 16.2.9
Zinc alkaryl dithiophosphate (C7-C16)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6, 16.2.9
Zinc alkenyl carboxamide	Y	S/P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6
Zinc alkyl dithiophosphate (C3-C14)	Y	P	2	2	2G	2G	Open	No			Yes	O	No	AB	No	15.19.6, 16.2.6

ANNEX 8

REVISED CHAPTER 21 OF THE IBC CODE

Criteria for assigning carriage requirements for products subject to the IBC Code

21.1 Introduction

21.1.1 The following criteria are used for the determination of pollution classification and assignment of appropriate carriage requirements for bulk liquid cargoes being considered as candidates for entry into the IBC Code or annexes 1, 3 or 4 of MEPC.2/Circulars.

21.1.2 In developing such criteria, every effort has been made to follow the criteria and cut off points developed under the Globally Harmonized System (GHS).

21.1.3 Although the criteria are intended to be closely defined in order to establish a uniform approach, it must be emphasized that where human experience or other factors indicate the need for alternative arrangements, these shall always be taken into account. Where deviations from the criteria have been recognized, they shall be properly recorded with justifications.

21.2 Contents

21.2.1 This chapter contains the following:

.1 minimum safety and pollution criteria for products subject to chapter 17 of the IBC Code;

.2 criteria used to assign the minimum carriage requirements for products, which meet the safety or pollution criteria to make them subject to chapter 17 of the IBC Code;

.3 criteria used for special requirements in chapter 15 of the IBC Code to be included in column o of chapter 17 of the IBC Code;

.4 criteria used for special requirements in chapter 16 of the IBC Code to be included in column o of chapter 17 of the IBC Code;

.5 definitions of properties used within this chapter; and

.6 information on the application of the SVC/LC_{50} ratio method.

21.3 Minimum safety and pollution criteria for products subject to chapter 17 of the IBC Code

21.3.1 Products are deemed to be hazardous and subject to chapter 17 of the IBC Code if they meet one or more of the following criteria:

.1 inhalation $LC_{50} \leq 20$ mg/l/4 h (see definitions in paragraph 21.7.1.1); (C3 = 1, 2, 3, 4)

.2 dermal LD_{50} ≤ 2000 mg/kg (see definitions in paragraph 21.7.1.2); (C2 = 1, 2, 3, 4)

.3 oral LD_{50} ≤ 2000 mg/kg (see definitions in paragraph 21.7.1.3); (C1 = 1, 2, 3, 4)

.4 toxic to mammals by prolonged exposure (see definitions in paragraph 21.7.2); (D3 = C, M, R, N, T, I)

.5 cause skin sensitization (see definitions in paragraph 21.7.3); (D3 = Ss)

.6 cause respiratory sensitization (see definitions in paragraph 21.7.4); (D3 = Sr, Ss, S)

.7 corrosive to skin (see definitions in paragraph 21.7.5); (D1 = 3A, 3B, 3C)

.8 have a Water Reactive Index (WRI) of ≥ 1 (see definitions in paragraph 21.7.6);

.9 require inertion, inhibition, stabilization, temperature control or tank environmental control in order to prevent a hazardous reaction (see definitions in paragraph 21.7.10);

.10 flash point < 23°C; and have an explosive/flammability range (expressed as a percentage by volume in air) of ≥ 20%;

.11 autoignition temperature of ≤ 200°C; and

.12 classified as pollution category X or Y or meeting the criteria for rules 11 to 13 in table 2 in paragraph 21.4.5.2.

21.4 Criteria used to assign the minimum carriage requirements for products, which meet the minimum safety or pollution criteria to make them subject to chapter 17 of the IBC Code

21.4.1 Column a – Product Name

21.4.1.1 The International Union of Pure and Applied Chemistry (IUPAC) name shall be used as far as possible but, where this is unnecessarily complex, then a technically correct and unambiguous alternative chemical name may be used.

21.4.2 Column b – Deleted.

21.4.3 Column c – Pollution Category

21.4.3.1 Column c identifies the pollution category assigned to each product under Annex II in accordance with table 1 below (reproduced from MARPOL Annex II, appendix.

Table 1 – Guidelines for the categorization of noxious liquid substances*

Rule	A1 Bio-accumulation	A2 Bio-degradation	B1 Acute toxicity	B2 Chronic toxicity	D3 Long-term health effects	E2 Effects on marine wildlife and on benthic habitats	Cat
1			≥ 5				X
2	≥ 4		4				
3		NR	4				
4	≥ 4	NR			CMRTNI		
5			4				Y
6			3				
7			2				
8	≥ 4	NR		Not 0			
9				≥ 1			
10						Fp,F or S If not Inorganic	
11					CMRTNI		
12	Any product not meeting the criteria of rules 1 to 11 and 13						Z
13	All products identified as: ≤2 in column A1; R in column A2; blank in column D3; not Fp, F or S (if not organic) in column E2; and 0 (zero) in all other columns of the GESAMP Hazard Profile						OS

* Note: Reference is made to MEPC.1/Circ.512 on the revised Guidelines for the Provisional assessment of liquid substances transported in bulk.

21.4.4 Column d – Hazards

21.4.4.1 An "S" is assigned to column d if any of the safety criteria described in paragraphs 21.3.1.1 to 21.3.1.11 are met.

21.4.4.2 A "P" is assigned to column d if the product meets the criteria for assigning Ship Type 1 to 3 as defined by rules 1 to 14 in the table in paragraph 21.4.5.

21.4.5 Column e – Ship Type

21.4.5.1 Assignment of ship types is carried out from both a pollution and safety perspective. The basic criteria for assigning Ship Types from a pollution perspective is carried out based on the GESAMP Hazard Profile shown in table 2. An explanation of the details in the columns is provided in appendix 1 of MARPOL Annex II.

21.4.5.2 The following criteria are used to assign the Ship Type:

Ship Type 1:

Inhalation LC_{50} ≤ 0.5 mg/l/4 h (C3 = 4) and SVC/LC_{50} ≥ 20; and/or
Dermal LD_{50} ≤ 50 mg/kg (C2 = 4); and/or
WRI = 3; and/or
Autoignition temperature ≤ 65°C; and/or
Explosive range ≥ 50% v/v in air and the flash point <23°C; and/or
Rules 1 or 2 of the table 2 shown in 21.4.5.2 (below).

Ship Type 2:

Inhalation LC_{50} ≤ 0.5 mg/l/4 h (C3 = 4) and SVC/LC_{50} < 20; or
Inhalation* LC_{50} > 0.5 mg/l/4 h – ≤ 2mg/l/4 h (C3 = 3), and SVC/LC_{50} ≥ 2; and/or
Dermal LD_{50} > 50 mg/kg – ≤ 200 mg/kg (C2 = 3); and/or
WRI=2; and/or
Autoignition temperature ≤ 200°C; and/or
Explosive range ≥ 40% v/v in air and the flash point < 23°C; and/or
Any of the rules 3 to 10 of the table shown below

***** Note: Products with a density >1025 kg/m^3 (sinkers) or a water solubility of >50% (dissolvers) that are assigned to Ship Type 2 based on the inhalation toxicity criteria, should be assigned to Ship Type 3.

Ship Type 3:

Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 of the IBC Code not meeting the requirements for ship types 1 or 2 and not meeting rule 15 of table 2 shown in 21.4.5.2 (below).

Table 2 – Assignment of Ship Types based on the GESAMP Hazard Profile

Rule Number	A1	A2	B1	B2	D3	E2	Ship Type
1			≥ 5				**1**
2	≥ 4	NR	4		CMRTNI		
3	≥ 4	NR			CMRTNI		**2**
4			4				
5	≥ 4		3				
6		NR	3				
7				≥1			
8						Fp	
9					CMRTNI	F	
10			≥ 2			S	
11	≥ 4						**3**
12		NR					
13			≥ 1				
14	All other category Y Substances						
15	All other category Z Substances All 'Other Substances' (OS)						**NA**

21.4.6 Column f – Tank type

21.4.6.1 The tank type is assigned according to the following criteria:

Tank type 1G: Inhalation $LC_{50} \leq 0.5$ mg/l/4 h (C3 = 4) and $SVC/LC_{50} \geq 1000$; and/or
Dermal $LD_{50} \leq 50$ mg/kg (C2 = 4); and/or;
WRI=3; and/or
Autoignition temperature ≤ 65°C; and/or
Explosive range ≥ 40% v/v in air and the flash point < 23°C.

Based on expert judgement, tank type 1G may be required for specific products (e.g. for molten sulphur, hydrochloric acid)

Tank type 2G: Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for tank type 1G.

21.4.7 Column g – Tank vents

21.4.7.1 The tank venting arrangements are assigned according to the following criteria:

Controlled: Inhalation LC_{50} ≤ 10 mg/l/4 h (C3 = 2, 3, 4), unless in accordance with 21.7.12; and/or
Toxic to mammals by prolonged exposure (D3 = C, M, R, T, N, I); and/or
Respiratory sensitizer (D3 = Sr, Ss, S); and/or
Special carriage control needed; and/or
Flash point ≤ 60ºC; and
Corrosive to skin (≤ 4 h exposure). (D1 = 3A, 3B, 3C)

Open: Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for controlled tank vents.

21.4.8 Column h – Tank environmental control

21.4.8.1 The Tank environmental control conditions are assigned according to the following criteria:

Inert: Autoignition temperature ≤ 200°C; and/or
Reacts with air to cause a hazard; and/or
Explosive range ≥ 40% and the flash point < 23°C.

Dry WRI>1

Pad: Only applies to specific products identified on a case by case basis.

Vent: Only applies to specific products identified on a case by case basis.

No: Where the above criteria do not apply, (inerting requirements may be required under SOLAS)

21.4.9 Column i - Electrical equipment

21.4.9.1 If the flash point of the product is ≤ 60ºC or the product is heated to within 15ºC of its flash point then the electrical equipment required are assigned according to the following criteria, otherwise '-' is assigned in column i' and i":

.1 Column i' – Temperature class:

T1 Autoignition temperature ≥ 450°C
T2 Autoignition temperature ≥ 300°C but < 450°C
T3 Autoignition temperature ≥ 200°C but < 300°C
T4 Autoignition temperature ≥ 135°C but < 200°C
T5 Autoignition temperature ≥ 100°C but < 135°C
T6 Autoignition temperature ≥ 85°C but < 100°C

.2 Column i'' – Apparatus group:

Apparatus group	MESG at 20°C (mm)	MIC ratio product/methane
IIA	>0.90	> 0.80
IIB	> 0.50 to ≤ 0.90	>0.45 to ≤ 0.80
IIC	≤ 0.50	≤ 0.45

.2.1 The tests shall be carried out in accordance with the procedures described in IEC 60079-1-1:2002 and IEC 79-3.

.2.2 For gases and vapours it is sufficient to make only one determination of either the Maximum Experimental Safe Gap (MESG) or the Minimum Igniting Current (MIC) provided that:

for Group IIA: the MESG > 0.90 mm or the MIC ratio > 0.80
for Group IIB: the MESG is > 0.50 mm and ≤ 0.90 mm; or the MIC ratio is > 0.50 and ≤ 0.80
for Group IIC: the MESG is ≤ 0.50 mm or the MIC ratio is ≤ 0.45

.2.3 It is necessary to determine both the MESG and the MIC ratio when:

.1 The MIC ratio determination only has been made, and the ratio is between 0.80 and 0.90, when an MESG determination will be required;
.2 The MIC ratio determination only has been made, and the ratio is between 0.45 and 0.50, when an MESG determination will be required; or
.3 The MESG only has been found, and is between 0.50 mm and 0.55 mm, when an MIC ratio determination will be required.

.3 Column i"' Flash point:

> 60 °C : Yes
≤ 60 °C : No
Non-flammable : NF

21.4.10 Column j – Gauging

21.4.10.1 The gauging equipment is assigned according to the following criteria:

Closed: Inhalation $LC_{50} \leq 2$ mg/l/4h (C3 = 3, 4), unless in accordance with 21.7.12; and/or
Dermal $LD_{50} \leq 1000$ mg/kg (C2 = 2, 3, 4); and/or
Toxic to mammals by prolonged exposure (D3 = C, M, R, T, N, I); and/or
Respiratory sensitizer (D3 = Sr, Ss, S); and/or
Corrosive to skin (≤ 3 min exposure) (D1= 3C).

Restricted: Inhalation LC_{50} >2 - ≤10 mg/l/4h (C3 = 2), unless in accordance with 21.7.12; and/or
Special carriage control indicates inerting required; and/or
Corrosive to skin (>3 min - ≤1 h exposure) (D1 = 3 B); and/or
Flash point ≤ 60°C.

Open Any of the minimum safety or pollution criteria for bulk liquid cargoes subject to chapter 17 or the IBC Code not meeting the requirements for closed or restricted gauging.

21.4.11 Column k – Vapour detection

21.4.11.1 The vapour detection equipment is assigned according to the following criteria:

Toxic (T):	Inhalation $LC_{50} \leq 10$ mg/l/4 h (C3 = 2, 3, 4), unless in accordance with 21.7.12, and/or Respiratory sensitizer (D3 = Sr, Ss, S); and/or Toxic to mammals by prolonged exposure (D3 = C, M, R, T, N,I).
Flammable (F):	Flash point ≤ 60°C
No:	Where the above criteria do not apply.

21.4.12 Column l – Fire protection equipment

21.4.12.1 The appropriate fire-fighting media are defined as being appropriate according to the following criteria related to the properties of the product:

Solubility > 10% (> 100000 mg/l)	A Alcohol-resistant foam
Solubility ≤ 10% (≤ 100000 mg/l)	A Alcohol-resistant foam; and/or B Regular foam
WRI = 0	C Water spray (generally used as a coolant and can be used with A and/or B providing that the WRI = 0)
WRI ≥1	D Dry chemical
No	No requirements under this Code

Note: all appropriate media shall be listed.

21.4.13 Column m – Deleted.

21.4.14 Column n – Emergency Equipment

21.4.14.1 The requirement to have personnel emergency equipment on board is identified by 'Yes' in column n according to the following criteria:

Inhalation $LC_{50} \leq 2$ mg/l/4 h (C3 = 3, 4); and/or
Respiratory sensitizer (D3 = Sr, Ss, S); and/or
Corrosive to skin (≤ 3 min exposure) (D1 = 3C); and/or
WRI = 2.

No: indicates that the above criteria do not apply.

21.5 Column o – Criteria for Special requirements in chapter 15.

21.5.1 The assignment of special requirements in column o shall normally follow clear criteria based on the data supplied in the reporting form. Where it is considered appropriate to deviate from such criteria, this shall be clearly documented in such a way that it can easily be retrieved on demand.

21.5.2 The criteria for making reference to the special requirements identified in chapters 15 and 16 are defined below with comments where relevant.

21.5.3 Paragraphs 15.2 to 15.10 and 15.20

21.5.3.1 Paragraphs 15.2 to 15.10 and 15.20 identify specific products by name with special carriage requirements that cannot be easily accommodated in any other way.

21.5.4 Paragraph 15.11 – Acids

21.5.4.1 Paragraph 15.11 applies to all acids unless they:

.1 are organic acids – when only paragraphs 15.11.2 to 15.11.4 and paragraphs 15.11.6 to 15.11.8 apply; or
.2 do not evolve hydrogen – when paragraph 15.11.5 need not apply.

21.5.5 Paragraph 15.12 – Toxic products

21.5.5.1 All of paragraph 15.12 is added to column o according to the following criteria:

Inhalation $LC_{50} \leq 2$ mg/l/4 h (C3 = 3, 4), unless in accordance with 21.7.12; and/or
the product is a respiratory sensitizer (D3 = Sr, Ss, S); and/or
the product is toxic to mammals by prolonged exposure (D3 = C, M, R, T, N, I).

21.5.5.2 Paragraph 15.12.3 is added to column o according to the following criteria:

Inhalation $LC_{50} > 2 – \leq 10$ mg/l/4 h (C3 = 2), unless in accordance with 21.7.12; and/or
Dermal $LD_{50} \leq 1000$ mg/kg (C2 = 2, 3, 4); and/or
Oral $LD_{50} \leq 300$ mg/kg (C1 = 2, 3, 4).

21.5.5.3 Paragraph 15.12.4 is added to column o according to the following criterion:

Inhalation $LC_{50} > 2 - \leq 10$ mg/l/4 h (C3 = 2), unless in accordance with 21.7.12.

21.5.6 Paragraph 15.13 – Cargoes protected by additives

21.5.6.1 The requirement to assign paragraph 15.13 to column o is based on the information related to the products tendency to polymerize, decompose, oxidize or undergo other chemical changes which may cause a hazard under normal carriage conditions and which would be prevented by the addition of appropriate additives.

21.5.7 Paragraph 15.14 – Cargoes with a vapour pressure greater than atmospheric at 37.8°C

21.5.7.1 The requirement to assign paragraph 15.14 to column o is based on the following criterion:

Boiling point ≤ 37.8ºC

21.5.8 Paragraph 15.16 – Cargo contamination

21.5.8.1 Paragraph 15.16.1 is deleted.

21.5.8.2 Paragraph 15.16.2 is added to column o according to the following criterion:

WRI>1

21.5.9 Paragraph 15.17 – Increased ventilation requirements

21.5.9.1 Paragraph 15.17 shall be added to column o according to the following criteria:

Inhalation LC_{50} > 0.5 – ≤ 2 mg/l/4 h (C3 = 3), unless in accordance with 21.7.12; and/or
Respiratory sensitizer (D3 = Sr, Ss, S); and/or
Toxic to mammals by prolonged exposure (D3 = C, M, R, T, N, I); and/or
Corrosive to skin (≤ 1 h exposure time) (D1 = 3B, 3C).

21.5.10 Paragraph 15.18 – Special cargo pump-room requirements

21.5.10.1 Paragraph 15.18 shall be added to column o according to the following criterion:
Inhalation LC_{50} ≤ 0.5 mg/l/4 h (C3 = 4), unless in accordance with 21.7.12

21.5.11 Paragraph 15.19 – Overflow control

21.5.11.1 Paragraph 15.19 shall be added to column o according to the following criteria:

Inhalation LC_{50} ≤ 2 mg/l/4 h (C3 = 3, 4), unless in accordance with 21.7.12; and/or
Dermal LD_{50} ≤ 1000 mg/kg (C2 = 2, 3, 4); and/or
Oral LD_{50} ≤ 300 mg/kg (C1 = 2, 3, 4); and/or
Respiratory sensitizer (D3 = Sr, Ss, S); and/or
Corrosive to skin (≤ 3 min exposure) (D1 = 3C); and/or
Autoignition temperature ≤ 200ºC; and/or
Explosive range ≥ 40% v/v in air and flash point < 23°C; and/or
Classified as ship type 1 on pollution grounds.

21.5.11.2 Only paragraph 15.19.6 shall apply if the product has any of the following properties:
Inhalation LC_{50} > 2 mg/l/4h - ≤10 mg/l/4 h (C3 = 2), unless in accordance with 21.7.12; and/or
Dermal LD_{50} > 1000 mg/kg - ≤ 2000 mg/kg (C2 = 1); and/or
Oral LD_{50} > 300 mg/kg - ≤ 2000 mg/kg (C1 = 1); and/or
Skin sensitizer (D3=Ss); and/or
Corrosive to skin (> 3 min - ≤ 1 h exposure) (D1 = 3B); and/or
Flash point ≤ 60°C; and/or
Classified as ship type 2 on pollution grounds; and/or
Pollution category X or Y.

21.5.12 Paragraph 15.21 –Temperature sensors

21.5.12.1 Paragraph 15.21 is added to column o according to the heat sensitivity of the product. This requirement is related to pumps in cargo pump rooms only.

21.6 Column o – Criteria for special requirements in chapter 16.

21.6.1 **Paragraphs 16.1 to 16.2.5 and 16.3 to 16.5**

21.6.1.1 These apply to all cargoes and so are not referenced specifically in column o.

21.6.2 Paragraph 16.2.6

21.6.2.1 Paragraph 16.2.6 is added to column o for products, which meet the following criteria: Pollution Category X or Y and viscosity ≥ 50 mPa.s at 20°C

21.6.3 Paragraph 16.2.9

21.6.3.1 Paragraph 16.2.9 is added to column o for products, which meet the following criterion: Melting point ≥ 0°C.

21.6.4 Paragraph 16.6 – Cargo not to be exposed to excessive heat

21.6.4.1 Paragraphs 16.6.2 to 16.6.4 are added to column o for products, which are identified as requiring temperature control during carriage.

21.7 Definitions

21.7.1 Acute mammalian toxicity 21.7.1.1 Acutely toxic by inhalation[2]

Inhalation toxicity (LC_{50})		GESAMP Hazard Profile rating C3
Hazard level	**mg/l/4 h**	
High	≤ 0.5	4
Moderately high	> 0.5 - ≤ 2	3
Moderate	> 2 - ≤ 10	2
Slight	> 10 - ≤ 20	1
Negligible	> 20	0

21.7.1.2 Acutely toxic in contact with skin

Dermal toxicity (LD_{50})		GESAMP Hazard Profile rating C2
Hazard Level	**mg/kg**	
High	≤ 50	4
Moderately high	> 50 - ≤ 200	3
Moderate	> 200 - ≤ 1000	2
Slight	> 1000 - ≤ 2000	1
Negligible	> 2000	0

21.7.1.3 Acutely toxic if swallowed

Oral toxicity (LD_{50})		GESAMP Hazard Profile rating C1
Hazard Level	**mg/kg**	
High	≤ 5	4
Moderately High	> 5 - ≤ 50	3
Moderate	> 50 - ≤ 300	2
Slight	> 300 - ≤ 2000	1
Negligible	> 2000	0

21.7.2 Toxic to mammals by prolonged exposure

21.7.2.1 A product is classified as toxic by prolonged exposure if it meets any of the following criteria: it is known to be, or suspected of being a carcinogen, mutagen, reprotoxic, neurotoxic, immunotoxic or exposure below the lethal dose is known to cause Specific Target Organ Toxicity (STOT) or other related effects.

21.7.2.2 Such effects may be identified from the GESAMP Hazard Profile of the product (D3 = C, M, R, T, N, I) or other recognized sources of such information.

21.7.3 Skin sensitization

21.7.3.1 A product is classified as a skin sensitizer:

.1 if there is evidence in humans that the substance can induce sensitization by skin contact in a substantial number of persons; or

.2 where there are positive results from an appropriate animal test.

[2] All inhalation toxicity data are assumed to be associated with vapours and not mists or sprays, unless indicated otherwise.

21.7.3.2 When an adjuvant type test method for skin sensitization is used, a response of at least 30% of the animals is considered as positive. For a non-adjuvant test method a response of at least 15% of the animals is considered positive.

21.7.3.3 When a positive result is obtained from the Mouse Ear Swelling Test (MEST) or the Local Lymph Node Assay (LLNA), this may be sufficient to classify the product as a skin sensitizer.

21.7.3.4 Such effects may be identified from the GESAMP Hazard Profile of the product (D3 = Ss) or other recognized sources of such information.

21.7.4 Respiratory sensitization

21.7.4.1 A product is classified as a respiratory sensitizer:

.1 if there is evidence in humans that the substance can induce specific respiratory hypersensitivity; and/or

.2 where there are positive results from an appropriate animal test; and/or

.3 where the product is identified as a skin sensitizer and there is no evidence to show that it is not a respiratory sensitizer.

21.7.4.2 Such effects may be identified from the GESAMP Hazard Profile of the product (D3 = Sr) or other recognized sources of such information.

21.7.5 Corrosive to skin[3]

Hazard Level	Exposure time to cause full thickness necrosis of skin	Observation time	GESAMP Hazard Profile Rating (D1)
Severely corrosive to skin	≤ 3 min	≤ 1 h	3C
Highly corrosive to skin	> 3 min - ≤ 1 h	≤ 14 days	3B
Moderately corrosive to skin	> 1 h - ≤ 4 h	≤ 14 days	3A

21.7.6 Water reactive substances

21.7.6.1 These are classified as follows:

Water reactive Index (WRI)	Definition
3	Any chemical which is extremely reactive with water and produces large quantities of flammable, toxic or corrosive gas or aerosol
2	Any chemical which, in contact with water, may produce a toxic, flammable or corrosive gas or aerosol
1	Any chemical which, in contact with water, may generate heat or produce a non-toxic, non-flammable or non-corrosive gas
0	Any chemical which, in contact with water, would not undergo a reaction to justify a value of 1 or 2

[3] Products that are corrosive to skin are, for the purpose of assigning relevant carriage requirements, deemed to be corrosive by inhalation.

21.7.7 Air reactive substances

21.7.7.1 Air reactive substances are products which react with air to cause a potentially hazardous situation, e.g. the formation of peroxides which may cause an explosive reaction.

21.7.8 Electrical apparatus – Temperature Class (for products which either have a flashpoint of ≤ 60ºC or are heated to within 15°C of their flashpoint)

21.7.8.1 The Temperature Class is defined by the International Electrotechnical Commission (IEC) as:

The highest temperature attained under practical conditions of operation within the rating of the apparatus (and recognized overloads, if any, associated therewith) by any part of any surface, the exposure of which to an explosive atmosphere may involve a risk.

21.7.8.2 The Temperature Class of the electrical apparatus is assigned by selecting the Maximum Surface Temperature which is closest to, but less than, the product's autoignition temperature (see 21.4.9.1.1).

21.7.9 Electrical apparatus – Apparatus group (for products with a flashpoint of ≤ 60ºC)

21.7.9.1 This refers to intrinsically safe and associated electrical apparatus for explosive gas atmospheres which the IEC divide into the following groups:

Group I: for mines susceptible to firedamp (not used by IMO); and

Group II: for applications in other industries – further subdivided according to its Maximum Experimental Safe Gap (MESG) and/or the Minimum Igniting Current (MIC) of the gas/vapour into groups IIA, IIB and IIC.

21.7.9.2 This property cannot be determined from other data associated with the product; it has to be either measured or assigned by assimilation with related products in a homologous series.

21.7.10 Special carriage control conditions

21.7.10.1 Special carriage control conditions refer to specific measures that need to be taken in order to prevent a hazardous reaction. They include:

.1 **Inhibition:** the addition of a compound (usually organic) that retards or stops an undesired chemical reaction such as corrosion, oxidation or polymerization;

.2 **Stabilization:** the addition of a substance (stabilizer) that tends to keep a compound, mixture or solution from changing its form or chemical nature. Such stabilizers may retard a reaction rate, preserve a chemical equilibrium, act as antioxidants, keep pigments and other components in emulsion form or prevent the particles in colloidal suspension from precipitating;

.3 **Inertion:** the addition of a gas (usually nitrogen) in the ullage space of a tank that prevents the formation of a flammable cargo/air mixture;

.4 **Temperature control:** the maintenance of a specific temperature range for the cargo in order to prevent a hazardous reaction or to keep the viscosity low enough to allow the product to be pumped; and

.5 **Padding and venting:** only applies to specific products identified on a case by case basis.

21.7.11 Flammable cargoes

21.7.11.1 A cargo is defined as flammable according to the following criteria:

IBC Code descriptor	Flash point (degrees Centigrade)
Highly flammable	< 23
Flammable	≤ 60 but ≥ 23

21.7.11.2 It should be noted that flash points of mixtures and aqueous solutions need to be measured unless all of the components are non-flammable.

21.7.11.3 It should be noted that the carriage of bulk liquid cargoes that have a flash point of ≤ 60°C is subject to other SOLAS regulations.

21.7.12 Application of the SVC/LC_{50} ratio method

21.7.12.1 If the vapour pressure and the molecular weight of a substance are known, an estimate can be calculated of the vapour concentration in a closed compartment (e.g. a tank). This is called the Saturated Vapour Concentration (SVC).

21.7.12.2 The hazard quotient SVC/LC_{50} is a substance specific value for the velocity of a vapour for achieving a hazardous concentration when emerging from a liquid source (e.g. leak, spillage or tank ventilation), and can be used in the assignment of specific carriage requirements related to inhalation toxicity.

21.7.12.3 If a solid substance is transported in an aqueous solution, the vapour pressure[4] of this solid rather than that of water may be used in the calculation of the SVC/LC_{50} ratio.

21.7.12.4 Application of the SVC/LC_{50} ratio for assigning Ship Type and Tank type

21.7.12.4.1 For the assignment of ship type (21.4.5) and tank type (21.4.6) the vapour pressure at 20°C shall be used when calculating the SVC/LC_{50} ratio.

[4] If this data is not available, an estimate may be used.

21.7.12.4.2 The SVC mg/l of a substance should be calculated as follows:

$$SVC\left(mg/l\right) = \left(\frac{Vapour\ \ pressure\,@\ 20^{0}\ C\ (Pa)}{101300\ (Pa)} \quad x\,10^{6}\right) x\ \frac{M_{w}\left(g/mol\right)}{24\left(l/mol\right) x\,1000}$$

where M_W is the molecular weight of the substance.

21.7.12.4.3 The SVC/LC_{50} ratio should be calculated as follows:

$$\mathrm{SVC/LC_{50}} = \frac{\mathrm{SVC\ [mg/l]}}{\mathrm{LC_{50}\ mg/l/4h}}$$

21.7.12.5 Application of the SVC/LC_{50} ratio for assigning carriage requirements

21.7.12.5.1 For the carriage requirements as listed in 21.7.12.5.5 the application of the SVC/LC_{50} ratio method is optional. If the SVC/LC_{50} ratio method is used in the assignment of these other carriage requirements, the vapour pressure at 40°C shall be used when calculating the SVC/LC_{50} ratio. If the carriage temperature is higher than 40°C, then the SVC/LC_{50} should be calculated at that temperature.

21.7.12.5.2 The SVC mg/l of a substance should be calculated as follows:

$$\mathrm{SVC}\left[\frac{\mathrm{mg}}{\mathrm{l}}\right] = \left(\frac{\mathrm{Vapour\ pressure@40^{0}C\ [Pa]}}{\mathrm{[101300]\ Pa}} \times 10^{6}\right) \mathrm{x}\ \frac{\mathrm{M_W[g/mol]}}{\mathrm{[26]\ l/mol\ x\ 1000}}$$

where M_W is the molecular weight of the substance.

21.7.12.5.3 The SVC/LC_{50} ratio should be calculated as follows:

$$\mathrm{SVC/LC_{50}} = \frac{\mathrm{SVC\ [mg/l]}}{\mathrm{LC_{50}\ mg/l/4h}}$$

21.7.12.5.4 Note that the SVC (mg/l) formula described in 21.7.12.5.2 is standardized for calculations at 40°C. When using the vapour pressure at elevated temperatures in the calculations, the formula will have to be amended accordingly.

21.7.12.5.5 For the following carriage requirements the SVC/LC_{50} ratio method calculated at 40°C or higher may be used as an alternative to the acute inhalation toxicity criteria given in paragraph 21.4 and 21.5.

.1 **Column g – Tank vents**

Assignment of controlled venting is not required if:
Inhalation LC_{50} ≤ 10 mg/l/4 h (C3 = 2, 3, 4) and SVC/LC_{50} < 0.2

.2 **Column j – Gauging**

Closed gauging is not required if:

Inhalation LC_{50} ≤ 2 mg/l/4 h (C3 = 3, 4) and SVC/LC_{50} < 0.2; but restricted gauging is required.

Restricted gauging is not required if:

Inhalation LC_{50} > 2 - ≤ 10 mg/l/4 h (C3 = 2) and SVC/LC_{50} < 0.2

.3 **Column k – Vapour detection**

Assignment of Toxic vapour detection is not required if:
InhalationLC_{50} ≤ 10 mg/l/4h (C3 = 2, 3, 4) and SVC/LC_{50} < 0.2

.4 **Column o – Special requirements in chapter 15**

15.12.1 and 15.12.2 are not required if:
Inhalation LC_{50} ≤ 2 mg/l/4 h (C3 = 3, 4) and SVC/LC_{50} < 0.2

15.12.3 and 15.12.4 are not required if:
Inhalation LC_{50} >2 - ≤ 10 mg/l/4 h (C3 = 2) and SVC/LC_{50} < 0.2

15.17 is not required if:
Inhalation LC_{50} ≤ 0.5 mg/l/4 h (C3 = 4) and SVC/LC_{50} < 0.2

15.18 is not required if:
Inhalation LC_{50} ≤ 0.5 mg/l/4 h (C3 = 4) and SVC/LC_{50} < 0.2

15.19 is not required if:
Inhalation LC_{50} ≤ 2 mg/l/4 h (C3 = 3, 4) and SVC/LC_{50} < 0.2,
but 15.19.6 applies

15.19.6 is not required if:
Inhalation LC_{50} > 2 - ≤ 10 mg/l/4 h (C3 = 2) and SVC/LC_{50} < 0.2

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ANNEX 9

PROPOSED FUTURE PLANNED OUTPUT OF THE ESPH WORKING GROUP

1	Decisions of other bodies	Ongoing
2	Evaluation of new products	Ongoing
3	Evaluation of new cleaning additives	Ongoing
4	Review of MEPC.2/Circular – Provisional classification of liquid substances transported in bulk and other related matters	Ongoing
[5	Revision of MEPC.1/Circ.512 – Guidelines for the provisional assessment of liquid substances transported in bulk	2016]
6	Review of products requiring oxygen-dependent inhibitors	2015
7	Revision of IBC Code – chapters 17, 18 and 21	[2016]
8	Any other business	