

BULK CARGO TANK WASH WATER DISCHARGE AND CARGO DECLARATIONS UNDER MARPOL ANNEX V

1. INTRODUCTION

As of 1st January 2013, amendments to MARPOL Annex V^{1,2}, mean that shippers have new responsibilities regarding cargo classification (crew responsibilities are outlined separately within Appendix 1) and how it affects the ability of the crew to discharge hold wash water into the marine environment. From this date shippers will need to consider whether or not the cargo residues present in the water are harmful to the marine environment (HME), as illustrated in Figure 1. The following document sets out the requirements as well as the concept and process of classification of cargoes as HME.

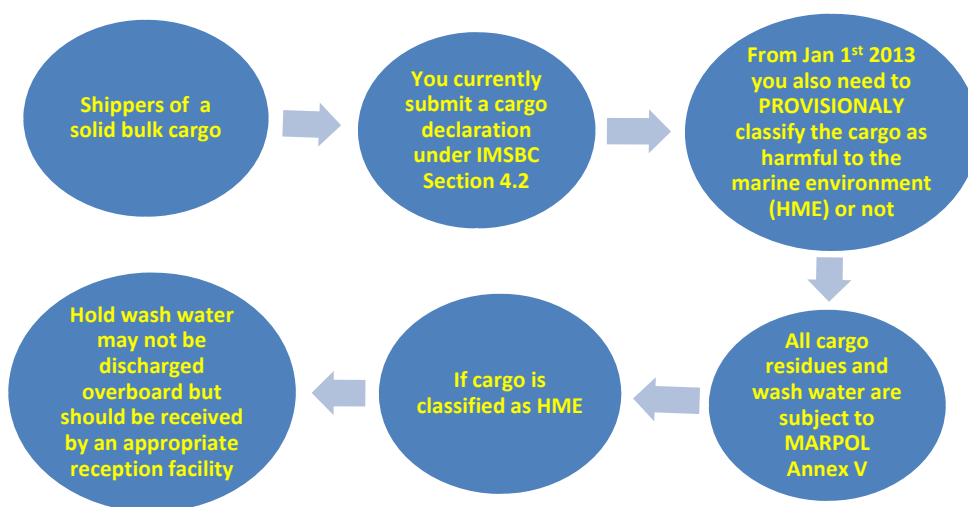


Fig 1. How the HME classification affects wash water discharge at sea.

1.1 MARPOL ANNEX V

The discharge of hold wash water and any non-recoverable cargo residues contained therein is primarily controlled through MARPOL Annex V, where it is classed as garbage and therefore subject to the controls specified within Regulations 4.1.3 and 6.1.2 of the recent amendments to MARPOL². In essence the discharge of cargo residues within hold wash water is governed by the following criteria:

- No discharge of cargo residues should occur less than 12 nautical miles from the nearest land, an ice shelf or within port limits.
- No discharge of cargo residues should occur within the six³ MARPOL defined “Special Areas²” (the Mediterranean, the “Gulfs” area, the wider Caribbean including the Gulf of Mexico, the Baltic Sea, the North Sea and the Antarctic). The disposal of garbage at sea is heavily restricted

¹ MEPC.219(63). Annex 24. 2012 Guidelines for the implementation of MARPOL Annex V. Adopted 2nd March 2012.

² MEPC.201(62). Annex 13. Amendments to the protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships, 1973. Adopted 15th July 2011.

³ The other two Special Areas of the Black Sea and the Red Sea have not yet come into force. MEPC.1/CIRC.778 26/1/2012.

in these areas unless both the destination and departure ports are within the Special Area and provided that no adequate reception facilities exist. In such instances discharge should take place as far out to sea as is practicable and, in any event, no less than 12 nautical miles from the nearest land.

- No discharge of any cargo residues specified as HME. Hold wash water should be discharged to a suitable reception facility.

Under the timeframe stipulated under MARPOL Annex V by MEPC.1/Circ.791⁴ (i.e. from 1st January 2013 until 31st December 2014) the shipper must take all reasonable measures to provisionally classify cargoes as HME or not. From 1st January 2015 the shipper should provide a complete classification for the cargo to be shipped. The shipper must also declare whether the cargo is HME or not to the port state authorities in the port of loading and unloading.

1.2 INTERNATIONAL MARITIME SOLID BULK CARGOES CODE (IMSBC)

All vessels carrying solid bulk cargoes are already required to comply with the IMSBC Code. The cargo declaration form as required in Section 4.2 of the Code should now contain a provisional declaration stating whether the cargo is HME or not (an example of which is illustrated in Appendix 2). This declaration could additionally be provided in a material or product Safety Data Sheet (SDS) or a letter of declaration regarding HME. As cargoes must already be tested by the shipper for the IMSBC physical parameters listed in the example declaration, it would be sensible to carry out any additional testing required for determination of HME at the same time.

2. HOW TO CLASSIFY CARGOES AS HME (OR NOT)

In order to classify the cargo the 2012 guidelines¹ stipulate the use of the UN Globally Harmonized System of Classification and Labelling of Chemicals (UN GHS). Under the guidelines a cargo is considered HME if it fails any of seven criteria (acute toxicity, chronic toxicity, carcinogenicity, mutagenicity, reproductive toxicity, repeated exposure of specific target organ toxicity [STOT] and the presence of plastics, rubber or synthetic polymers).

There are three main stages in the classification of a cargo using the 7 UN GHS criteria:

1. A literature search of available information,
2. Laboratory testing for toxicity, biodegradation and bioaccumulation,
3. The comparison of the biodegradation and bioaccumulation data with published carcinogenicity, mutagenicity and reproductive toxicity (collectively known as CMR) as well as STOT studies, if necessary.

Please see Appendix 3 for the specific data requirements for each criterion. When conducting laboratory testing the methods approved by the Organisation for Economic Co-operation and Development (OECD) are recommended. Once an assessment of all seven criteria is complete it may be useful to complete a summary table (as illustrated in Figure 2). An example of the process of classification has been illustrated in Figure 3.

UN GHS Criteria	Met	Not Met*
1	X	
2		X
3		X
4	X	
5	X	
6	X	
7	X	

Fig. 2. An example summary box.

*Any one of the 7 UN GHS criteria not met = cargo is classed as harmful to the marine environment (HME)

⁴ MEPC.1/circ.791. 25/10/2012. Provisional classification of solid bulk cargoes under the revised MARPOL Annex V between 1 January 2013 and 31 December 2014.

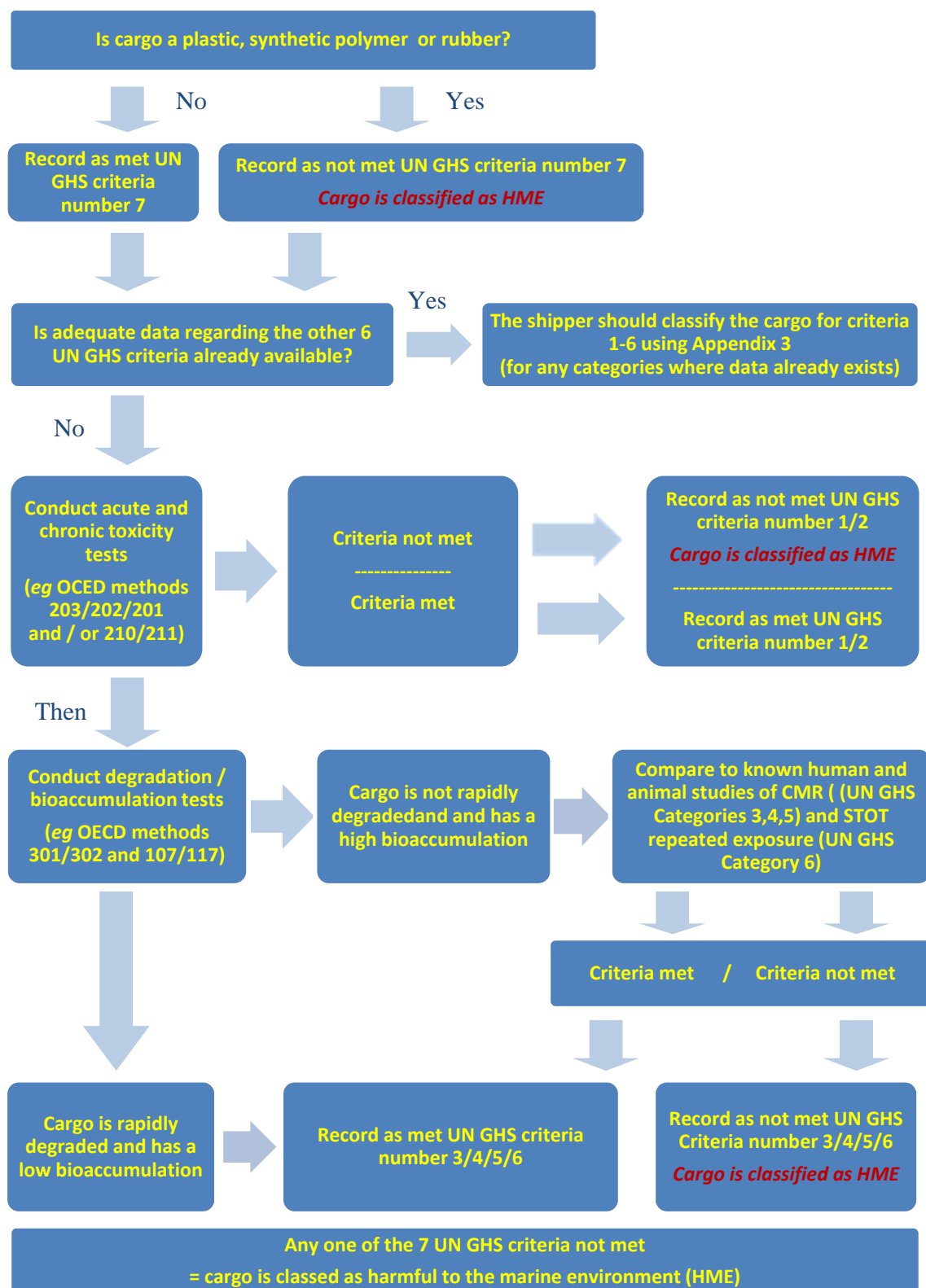


Fig 3. Flow diagram illustrating an example of how to gather data required for HME classification.

3. COMMON QUESTIONS

- **What Testing facilities can I use?**

There are no known “approved” laboratories, however the following conditions are strongly recommended:

- a) The facility should be familiar with eco-toxicity testing for the UN GHS system and the IMSBC Code physical hazard tests.
- b) Studies should be carried out to internationally standardised guidelines such as OECD or the International Standards Organisation (ISO) documents. In certain cases national standards derived from the OECD tests guidelines may also be applicable.
- c) Care should be taken to ensure that laboratories carrying out such studies are compliant with OECD and Good Lab Practice (GLP).
- d) Reports created should contain a statement of quality assurance.

- **How do I classify metals?**

When looking to classify inorganic compounds, minerals and metals the concept of degradability has limited or no meaning and the rate of dissolution becomes the key to toxicity. Within the UN GHS guidelines part 4⁵ there is a section devoted to the testing of metals. A good guide has also been published by the International Council on Mining and Metals – ‘Ore and concentrates an industry approach to EU hazard classification’⁶. This organisation has also published a document entitled ‘Metals Environmental Risk Assessment Guidance (MERAG)’, which may be helpful.

- **How do I classify mixtures, blends and batches?**

When looking to classify mixtures or blends when test results for the mixture itself are not available, data on individual substances may be used to determine the classification, making use of factors such as dilution and batching. These factors are termed “bridging principles” and further detail on their use can be obtained from the UN GHS guidelines part 4⁵. Of most interest is the fact that if a diluent is the same toxicity or lower, then the classification is based on the original compound. In all cases of two or more classifications the most stringent classification will apply. When batches of cargo are known to be produced by, or under the control of, the same manufacturer they can be presumed to be largely equivalent and only one classification is required (unless there is reason to believe there is significant variation). This may help avoid some unnecessary extra testing. Note: Re-testing is recommended if the blending of cargoes has the potential to cause a change in the toxicity of its constituent compounds.

- **What about cargo dust on deck?**

Regulation 1.2 of MARPOL Annex V stipulates that the term “cargo residues” does not include cargo dust remaining on the deck after sweeping or dust on the external surfaces of the ship and thus this dust is excluded from the definition of “garbage” within the Annex.

- **What is the definition of wash water?**

When discussing wash water the regulations are referring to the waste water created from the cleaning of cargo holds after discharge and any non recoverable cargo residues and small quantities of cleaning agents contained within it.

- **Are there adequate reception facilities?**

The use and provision of adequate Port Reception Facilities (PRFs) is seen as fundamental to the overall success of MARPOL Annex V. Adequacy is defined in the MARPOL Annexes by the fact that the

⁵ UN GHS 2011. http://www.unece.org/trans/danger/publi/ghs/ghs_rev04/04files_e.html

⁶ ICMM documents <http://www.icmm.com/library/oresandconcentrates>

PRF should meet the needs of vessels using the port without causing them due delay, that it does not provide mariners with a disincentive to use and that it should contribute to the improvement of the marine environment⁷.

At present the availability of suitable reception facilities is known to be fairly low. The ability of shippers to comply with the regulations may therefore be limited by the lack of facilities at some major ports or in particular regions.

4. FURTHER GUIDANCE

- Where data already exists for the specified criteria (such as impact assessments and health and safety for mineral extraction) this data could potentially be used to begin the classification, provided that the producer may share the data with the shipper. For processed chemical cargoes the manufacturer may also be able to provide additional toxicity information. Common cargoes may be assessed by several shippers and the sharing of data would be beneficial during the provisional classification stage. It is also understood that some cooperation work is being undertaken to pool resources and share information, such as the work by the European Copper Institute (ECI)⁸.
- References such as the GESAMP hazard profiles, country UN GHS databases, the IMSBC Code and the IMDG Code (the latter identifies certain marine pollutant cargoes within its index) may be of use when determining the properties of the cargo or wash water. Looking at previously classified “dangerous goods” safety data sheets, cargoes that are classed as environmental harmful substances (EHS) or have specific UN numbers indicating a harmful cargo, may also provide additional useful information. There are also various chemical databases on-line that may provide preliminary toxicity data for some cargoes.
- For further guidance on the UN GHS criteria and the various categories please see UN GHS 4th Edition (2011)⁵.
- It is not believed that there are any recommended test methods for criteria 7 as it should be relatively simple to classify the cargo as a plastic or not. Test methods for criteria 1 and 2 are commonly available and understood. Criteria 3, 4, 5 and 6 tend to not be tested directly but are examined through bioaccumulation and degradation tests when compared with databases of human and animal studies. For further detail on the testing methods and criteria please see the OECD guidelines document for classification of chemicals that are hazardous to the marine environment (2001)⁹.
- The Port State authorities should be able to compare declarations and clarify any specific requests or queries. A list of designated authorities can be found within the BC.1/circ 66¹⁰.

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⁷ MEPC. 1/Circ.671.20/7/2009. *Guide to good practice for port reception facility providers and users.*

⁸ *Formation of global copper industry “business venture” for IMO-GHS.*

⁹ *OECD series on testing and assessment No 27, 2001. Guidance document on the use of the harmonised system for the classification of chemicals which are hazardous to the marine environment.*

[http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono\(2001\)8&doclanguage=en](http://search.oecd.org/officialdocuments/displaydocumentpdf/?cote=env/jm/mono(2001)8&doclanguage=en)

¹⁰ *List of national authorities:* http://www.imo.org/blast/blastDataHelper.asp?data_id=25143&filename=66.pdf.

MARPOL ANNEX V CREW CHECKLIST

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graph TD
    Q1{Is the vessel >3nm from the nearest land or ice shelf?}
    Q1 -- Yes --> Q2{Is the vessel within a MARPOL designated "Special Area"?}
    Q1 -- No --> A1[No "garbage" of any sort may be discharged overboard]
    
    Q2 -- Yes --> B1[Discharge of "garbage" is more restricted]
    B1 --> B2[Discharge of food waste not ground or crushed through a ≤25mm mesh is prohibited]
    
    Q2 -- No --> B3[Discharge of non recoverable cargo residues and cleaning agents or additives is only permitted in special cases]
    B3 --> B4{Discharge is prohibited}
    
    B3 --> Q3{Is the cargo or cleaning agent classed as harmful to the marine environment (HME)?}
    Q3 -- No --> Q4{Is it within washwater?}
    Q4 -- No --> B5[Discharge of cargo residues is prohibited]
    Q4 -- Yes --> B6[Discharge of cleaning agents and additives in deck and external surface waters is permitted]
    
    Q3 -- Yes --> B7[Wash water retained on board for later disposal outside the Special Area]
    B7 --> B8[Cargo hold washwater may only be discharged ≥12nm from land en route and as far out to sea as feasible only if departure and destination are both within the Special Area and no adequate reception facilities are available at those ports, or in an emergency situation]
    
    Q1 --> Q5{Discharge of "garbage" is less restricted}
    Q5 --> B9[Discharge of ground or crushed food waste permitted ≥3nm from land while en route and as should be as far out to sea as feasible]
    B9 --> B10[Discharge of non ground or crushed food waste permitted ≥12nm from land while en route and should be as far out to sea as feasible]
    
    Q5 --> B11[Discharge of non recoverable cargo residues and cleaning agents or additives]
    B11 --> Q6{Discharge of non ground or crushed food waste permitted ≥12nm from land while en route and should be as far out to sea as feasible}
    
    Q5 --> Q7{Discharge of cleaning agent classed as harmful to the marine environment (HME)?}
    Q7 -- No --> B12[Discharge of non recoverable cargo residues is permitted ≥12nm from land while en route and should be as far out to sea as feasible]
    Q7 -- Yes --> B13[Discharge of cleaning agents and additives is permitted within washwater]
  
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*** The Mediterranean, the "Gulfs" area, the wider Caribbean including the Gulf of Mexico, the Baltic Sea, the North Sea and the Antarctic where the disposal of garbage at sea is heavily restricted.**

Example Shippers Declaration

General Information

Cargo Information

Solid Bulk Cargo Information

Declaration

Modified from the Australian Maritime Safety Authority form AMSA 268 (10/12)

Appendix 3. A Summary Of The UN GHS Classification Criteria¹¹

Red category = Criteria not met

N _o	UN GHS CRITERIA		CATEGORY			
1	Acute aquatic toxicity		Category 1. 96hr LC ₅₀ (fish), 48hr EC ₅₀ (crustacean) or 72/96 hr ErC ₅₀ (algae) is ≤ 1.00 mg/l		Category 2. 96hr LC ₅₀ (fish), 48hr EC ₅₀ (crustacean) or 72/96 hr ErC ₅₀ (algae) is > 1.00 but ≤ 10.0 mg/l	Category 3. 96hr LC ₅₀ (fish), 48hr EC ₅₀ (crustacean) or 72/96 hr ErC ₅₀ (algae) is ≥ 10.0 but < 100 mg/l
2	Long term (chronic) aquatic toxicity	Adequate chronic data	Category 1. Not rapidly degradable = chronic NOEC or EC _x (fish), (crustacean) or (algae) is ≤ 0.1 mg/l Rapidly degradable = chronic NOEC or EC _x (fish), (crustacean) or (algae) is ≤ 0.01 mg/l		Category 2. Not rapidly degradable = Chronic NOEC or EC _x (fish), (crustacean) or (algae) is ≤ 1.0 mg/l Rapidly degradable= chronic NOEC or EC _x (fish), (crustacean) or (algae) is ≤ 0.1 mg/l	Category 3. Rapidly degradable = chronic NOEC or EC _x (fish), (crustacean) or (algae) is ≤ 1.0 mg/l
		Inadequate chronic data	Category 1. Acute aquatic toxicity category 1		Category 2. Acute aquatic toxicity category 2	Category 3. Acute aquatic toxicity category 3
3	Carcinogenicity		Category 1A. Known human carcinogen based on largely on human evidence		Category 1B. Presumed human carcinogen based on demonstrated animal carcinogenicity	Category 2. Suspected carcinogen. Limited evidence of human or animal carcinogenicity
4	Mutagenicity		Category 1A. Known mutagens. Positive evidence from human epidemiological studies of mutagenicity		Subcategory 1B. Positive results in: <i>In vivo</i> heritable germ cell tests in mammals or this combined with some evidence of germ cell mutagenicity or mutagenic effects in human germ cell tests without demonstration of progeny	Category 2. Suspected or possible mutagen. Positive evidence from tests in mammals and or in some cases from <i>in-vitro</i> experiments
5	Reproductive toxicity		Category 1A. Known human reproductive toxicant based on human evidence		Category 1B. Presumed human reproductive toxicant largely based on data obtained from animal studies	Category 2. Suspected human reproductive toxicant. Human or animal evidence possibly with other information
6	Repeated exposure STOT		Category 1. Substances that have produced significant toxicity in humans or that, on the basis of evidence from animal studies, have the potential to do so following repeat exposure		Category 2. Substances that are presumed to be harmful to human health at repeated exposure (animal studies with significant toxic effects relevant to humans at generally moderate exposure or human evidence in exceptional cases)	
7	Plastics		Cargo consists of or contains synthetic polymers, rubber, plastics or plastic feedstock pellets			

LC₅₀ = The lethal concentration of the compound that kills 50% of test organisms in a given time

EC₅₀ = Half max effective concentration

ErC₅₀ = The EC₅₀ in terms of reduction of growth rate

NOEC = No observed effect concentration

EC_x = The concentration associated with x % response

¹¹ Further detail can be reviewed in part 3 and 4 of the UN GHS 2011.

¹² Essentially substances are considered rapidly biodegradable in the environment if >70% (based on dissolved organic carbon) or >60% (CO₂ generation or O₂ depletion) of the material is degraded within a 28 day period. If no other data is available then BOD₅/COD₅ ≥ 0.5.

¹³ Bioaccumulation is measured through exposure studies in fish or shellfish and reported as a bioconcentration factor (BCF) where high = ≥500 or an octanol/water partition coefficient (log K_{ow}) where high = ≥4.