



# ST KITTS & NEVIS INTERNATIONAL SHIP REGISTRY

## MARITIME CIRCULAR – MC 111 22

### EC DIRECTIVE ON PORT RECEPTION FACILITIES

#### 1. **Purpose**

1.1. The purpose of this Maritime Circular is to inform Maritime Registrars, Ship Owners and Ship Operators that the European Commission has adopted four implementing regulations for the Directive on Port Reception Facilities, three of which apply to shipping.

#### 2. **Introduction**

2.1. The Directive on port reception facilities for the delivery of waste was adopted in 2019.

2.2. The Directive (EU) 2019/883 of the European parliament and of the Council on port reception facilities for the delivery of waste from prevents marine pollution from ships by ensuring that waste generated on ships are returned to land and adequately managed was adopted on 17<sup>th</sup> of April 2019.

2.3. The European Commission has adopted four implementing regulations for this Directive, three of which apply to shipping.

#### 3. **Application**

##### **Storage capacity for waste in a ship**

3.1. When calling at an EU port, ships must deliver all waste to the port facilities. An exemption to this rule is applied for ships with sufficient capacity to store the waste accumulated during their intended voyage until they reach the next port of call. This Implementing Regulation (EU) 2022/89 of 21<sup>st</sup> January 2022, attached to this Maritime Circular, defines how to determine whether a ship has sufficient storage capacity for this exemption to apply.

##### **Ships that produce reduced quantities of waste and manage it sustainably**

3.2. In order to reduce the amount of waste produced on board a ship this, the Directive requires that port fees are lower for ships that produce reduced quantities of waste, and manage it in a sustainable and environmentally sound manner. This Implementing Regulation (EU) 2022/91 of 21<sup>st</sup> January 2022, attached to this Maritime Circular, defines the criteria for determining when a ship is entitled to a reduced fee for producing less waste and managing it well.

##### **Selecting which ships to inspect**

3.3. Member States are required to inspect 15% of ships calling in their ports to verify compliance with waste rules. When doing so, Member States must target those ships for which the risk of non-compliance is highest. This Implementing Regulation (EU) 2022/90 of 21<sup>st</sup> January 2022, attached to this Maritime Circular, defines a mechanism for the selection of ships for inspection, based on common criteria, so that the selection is made in the same way across the EU.

#### 4. **Entry into force**

4.1. These Regulations shall enter into force on the twentieth day following that of its publication in the Official Journal of the European Union (24<sup>th</sup> of January 2022). They shall be binding in their entirety and directly applicable in all Member States.

This Administration advises to familiarise yourself with the content of the implemented regulations by the European Commission.

More information on the subject can be found on the website of the European Commission following this link [https://transport.ec.europa.eu/news/commission-adopts-rules-delivery-waste-ships-eu-ports-2022-01-24\\_en](https://transport.ec.europa.eu/news/commission-adopts-rules-delivery-waste-ships-eu-ports-2022-01-24_en)

If you have any questions, please contact this office.

Yours truly,



Liam Ryan  
*International Registrar of Shipping and Seamen*

**COMMISSION IMPLEMENTING REGULATION (EU) 2022/91****of 21 January 2022****defining the criteria for determining that a ship produces reduced quantities of waste and manages its waste in a sustainable and environmentally sound manner in accordance with Directive (EU) 2019/883 of the European Parliament and of the Council****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC <sup>(1)</sup>, and in particular Article 8(5) thereof,

Whereas:

- (1) For the purposes of the reduction of fees provided for in Article 8(4) of Directive (EU) 2019/883, the criteria in the Annex should be used.
- (2) The criteria set out in Section 1 of the Annex reflect essential efforts in reducing waste. Therefore they should be mandatory.
- (3) The additional criteria set out in Section 2 of the Annex can be applied to incentivise specific practises and equipment, which may also be useful for reducing waste. Therefore those criteria should be optional.
- (4) In order to provide for uniform conditions for the application of the fee reduction set out in Article 8(5) of Directive (EU) 2019/883, it is indispensable that Member States apply a harmonized methodology. Implementing acts adopted pursuant to Directive (EU) 2019/883 should therefore take the form of implementing regulations.
- (5) The measures provided for in this Regulation are in accordance with the opinion of the Committee on Safe Seas and the Prevention of Pollution from Ships,

HAS ADOPTED THIS REGULATION:

*Article 1*

1. The criteria set out in Section 1 of the Annex shall be taken into account by port reception facilities or port authorities when calculating the reduction of the fee in accordance with Article 8(5), first subparagraph, point (b) of Directive (EU) 2019/883.
2. The criteria set out in Section 2 of the Annex may be taken into account by port reception facilities or port authorities when calculating the reduction of the fee in accordance with Article 8(5), first subparagraph, point (b) of Directive (EU) 2019/883.

*Article 2*

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

<sup>(1)</sup> OJ L 151, 7.6.2019, p. 116.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 21 January 2022.

*For the Commission*  
*The President*  
Ursula VON DER LEYEN

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## ANNEX

## SECTION 1

**List of mandatory criteria referred to in Article 1(1)**

Criteria	Related elements	Related Annex of the MARPOL Convention	Possible means of verification <sup>(1)</sup>
On-board segregation in accordance with Resolution MEPC.295(71) and ensured delivery to adequate port reception facilities that comply with Article 4(2)(d) of Directive (EU) 2019/883.	Operation and management	Annex V	Green Award, ISO 21070, Blue Angel, Green Marine, Waste Delivery Receipt, Vessel Specific Garbage Management Plan approved by vessel's classification society, ISO 14001 Environmental Management System.
Environmentally sustainable purchasing policies (reduction of packaging materials such as bulk packaging and avoiding single use plastic)	Management	Annex V	Green Award, ISO 21070, Blue Angel, Green Marine, Vessel Specific Garbage Management Plan approved by vessel's classification society, ISO 14001 Environmental Management System.

<sup>(1)</sup> Additional schemes may be accepted by which ships can demonstrate that they comply with the criteria.

## SECTION 2

**List of optional criteria referred to in Article 1(2)**

Criteria	Related elements	Related Annex of the MARPOL Convention	Possible means of verification <sup>(1)</sup>
Use of alternative fuels <sup>(2)</sup> and other energy sources during voyage to port of call or at berth (e.g. shore side electricity, wind, solar)	Ship design, technology and operation	Annex I	Green Award, bunker delivery notes, oil record book, class or statutory certification, Ship Energy Efficiency Management Plan (SEEMP).
Use of a White Box System < 5ppm (to control and monitor the bilge water discharge from the vessel)	Technology and operation	Annex I	Class certificate, type approval documentation
Oily water separator (OWS) < 5 ppm	Technology and operation	Annex I	Class certificate, type approval documentation, Green Award, Clean Shipping Index (CSI), Green Marine, Blue Angel
OWS < 5 ppm + alarm system and automatic stop for ships < 10 000 GT	Technology and operation	Annex I	Class certificate, type approval documentation, Green Award, CSI, Green Marine, Blue Angel

Ship does not use oil filtering equipment for discharges, but segregates all bilge water and sludge and subsequently discharges them to port reception facilities	Operation	Annex I	Oil record book, waste receipts
Sewage treatment system in compliance with International Maritime Organisation Resolution MEPC.227(64) for all vessels, except for passenger ships when operating in Special Areas covered by Annex IV to the MARPOL Convention	Technology, operation and management	Annex IV	EU declaration of conformity in accordance with Directive 2014/90/EU of the European Parliament and of the Council <sup>(2)</sup> or class certificate. In addition, regular in use verification by independent verifier.
Ship does not discharge any sewage into the sea and delivers all of its untreated and/or treated sewage and/or sewage sludge to port reception facilities	Operation	Annex IV	Waste receipts
On-board reuse and recycling	Operation and management	Annex V	ISO 21070, Green Marine, ISO 14001 Environmental Management System.

<sup>(1)</sup> Additional schemes may be accepted by which ships can demonstrate that they comply with the criteria.

<sup>(2)</sup> As defined in Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure (OJ L 307, 28.10.2014, p. 1).

<sup>(3)</sup> Directive 2014/90/EU of the European Parliament and of the Council of 23 July 2014 on marine equipment and repealing Council Directive 96/98/EC (OJ L 257, 28.8.2014, p. 146).

**COMMISSION IMPLEMENTING REGULATION (EU) 2022/90****of 21 January 2022****laying down rules for the application of Directive (EU) 2019/883 of the European Parliament and of the Council as regards the detailed elements of the Union risk-based targeting mechanism for selecting ships for inspection****(Text with EEA relevance)**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC<sup>(1)</sup>, and in particular Article 11(2), second subparagraph, thereof,

Whereas:

- (1) Effective enforcement of the obligation to deliver waste to port reception facilities is paramount to effectively address the problem of marine litter and other waste from shipping entering the marine environment.
- (2) A single Union risk-based targeting mechanism should provide for uniform conditions for selecting ships for inspection in accordance with Article 11(2) of Directive (EU) 2019/883.
- (3) By establishing the Union risk-based targeting mechanism, the relevant authorities in the Member States are to have a supporting tool to fulfil the inspection commitment in accordance with Article 11(1) of Directive (EU) 2019/883.
- (4) In order to assess the risk that a ship is not complying with the obligations established in Directive (EU) 2019/883, several parameters should be taken into account, which in conjunction provide a clear indication of such risk. Those parameters should be: the non-compliance or indications of non-compliance with the requirements for the delivery of waste; the period of time elapsed since the last inspection; the existence of previous reports of non-compliance by the relevant port authorities; the previous and the next port of call; the existence of an exemption for that ship; and the information included on SafeSeaNet and in THETIS-EU.
- (5) In order to provide for uniform conditions for the selection of ships for inspection, it is indispensable that Member States apply a harmonized methodology. Implementing acts adopted pursuant Directive (EU) 2019/883 should therefore take the form of implementing regulations.
- (6) The measures provided for in this Regulation are in accordance with the opinion of the Committee on Safe Seas and the Prevention of Pollution from Ships,

HAS ADOPTED THIS REGULATION:

*Article 1*

1. For the purposes of inspections, Member States shall classify the ships referred to in Article 3(1), point (a), of Directive (EU) 2019/883, into the following risk level categories:

- (a) Risk level 1 (high risk);
- (b) Risk level 2 (medium risk);
- (c) Risk level 3 (low risk);

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<sup>(1)</sup> OJ L 151, 7.6.2019, p. 116.

(d) Risk level 4 (minimum risk).

2. The risk level category for each ship shall be determined on the basis of the risk parameters set out in Table 1 of the Annex.

3. The risk level parameters set out in Table 1 of the Annex shall be applied following the methodology referred to in points 1 to 4 of the Annex.

#### *Article 2*

When complying with the inspection commitments set out in Article 11 of Directive (EU) 2019/883, Member States shall comply with the following requirements:

(a) give priority to the inspection of ships with a higher risk level category;

(b) randomly select for inspection at least 1 % of number of ships to be inspected every year.

#### *Article 3*

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 21 January 2022.

*For the Commission*  
*The President*  
Ursula VON DER LEYEN

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## Methodology:

1. The risk parameters set out in Table 1 shall be used to determine the risk level of a vessel.
2. Each risk parameter set out in Table 1 is assigned a different colour code representing a risk level: red (high), orange (medium) or yellow (low).
3. The assignment of the risk level to a ship on the basis of the alerts for the risks parameters in Table 1 shall be based on the criteria set out in Table 2.
4. In order to apply several concurrent active alerts for assigning the risk levels set out in Table 2, the conversion factors set out in Table 3 may be applied.

Table 1

**Risk parameters**

Risk parameter number	Risk level of the alert (Colour code)	Risk parameter description	Criteria for activating an alert for the risk parameter	Criteria for deactivating the alert for the risk parameter
1	Orange	Non-compliance with the advanced waste notification requirements set out in Article 6 of Directive (EU) 2019/883.	The alert is activated if advance waste notification has not been sent or has not contained mandatory information.	The alert is computed to Port A based on the advance waste notification sent to Port A. The alert must be reassessed at each Port.
2	Orange	Information provided by the operator, agent or master in accordance with Article 6 of Directive (EU) 2019/883.	The alert is activated if validity checks of advance waste notification content reveal that the ship might not be compliant with the Directive.	The alert is computed to Port A based on the advance waste notification sent to Port A. The alert must be reassessed at each Port.
3	Orange	Date of the previous inspections carried out in accordance with Article 10 of Directive (EU) 2019/883.	The alert is activated if the ship was not inspected in accordance with Article 10 of Directive (EU) 2019/883 in the previous 12 months.  Note: This alert should only be active after 28 June 2022.	The alert is deactivated after an inspection has been recorded in accordance with Article 14(2), point (a), of Directive (EU) 2019/883.
4	Red	Existing report(s) by Port Reception Facilities inspection authorities, port authorities or other competent bodies indicating that the ship has not complied with Article 7 of Directive (EU) 2019/883.	The alert is activated manually in THETIS-EU by Port Reception Facilities inspectors.	The alert is deactivated after an inspection is concluded (status 'Inspected') without non-compliances.

5	Orange	Port Reception Facilities Non-Compliances Alert	Alert activated if ship has been identified with Port Reception Facilities non-compliances within the last 6 months, with a relevant report in THETIS-EU.	The alert is deactivated after an inspection is concluded (status 'Inspected') without non-compliances.
6	Orange	Sufficient Dedicated Storage	The alert is activated if the dedicated storage on-board is not considered sufficient according to the criteria used for the application of Article 8(4)(b)	The alert is computed to Port A based on the advance waste notification sent to Port A. The alert must be reassessed at each Port.
7	Yellow	Next Port Of Call	Considered to increase risk level if non-EU or unknown. For the computation of this alert, ports located in Iceland, Norway, United Kingdom (including Isle of Man, Channel Islands and Gibraltar) and Russian ports located in the Baltic Sea are to be treated as EU.	The alert is computed to Port A based on the advance waste notification sent to Port A. The alert must be reassessed at each Port.
8	Yellow	Previous Port Of Call	Considered to increase risk level if non-EU. For the computation of this alert, ports located in Iceland, Norway, United Kingdom (including Isle of Man, Channel Islands and Gibraltar) and Russian ports located in the Baltic Sea are to be treated as EU.	The alert is computed to Port A based on the advance waste notification sent to Port A. The alert must be reassessed at each Port.
9	Yellow	Exemption Alert	The alert is activated if the ship has an exemption and has not been inspected for 12 months, to ensure that these ships will be included in the inspections.	The alert must be reassessed at each Port.
10	Red	Incident Type Waste Alert	The alert is activated if an Incident Report of type 'waste' has been issued in SafeSeaNet for that vessel in a previous port.	The alert is deactivated after an inspection is concluded (status 'Inspected') and has taken place without non-compliances or after the incident is inactive at SafeSeaNet

Table 2

**Assignment of risk levels based on number of active inputs**

Criteria for risk levels	
Risk level 1	One or more red alerts
Risk level 2	One or more <sup>(1)</sup> orange alerts
Risk level 3	One or more <sup>(1)</sup> yellow alerts
Risk level 4	No active alert

<sup>(1)</sup> Up to the number that triggers the application of the conversion factor.

Table 3

**Conversion factors to combine several concurrent active parameters for application of Table 2 risk levels**

Conversion factor	
Three yellow alerts	One orange alert
Three orange alerts	One red alert

## II

(Non-legislative acts)

## REGULATIONS

## COMMISSION IMPLEMENTING REGULATION (EU) 2022/89

of 21 January 2022

**laying down rules for the application of Directive (EU) 2019/883 of the European Parliament and of the Council as regards the method to be used for the calculation of sufficient dedicated storage capacity**

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive (EU) 2019/883 of the European Parliament and of the Council of 17 April 2019 on port reception facilities for the delivery of waste from ships, amending Directive 2010/65/EU and repealing Directive 2000/59/EC <sup>(1)</sup>, and in particular Article 7(4), second subparagraph, thereof,

Whereas:

- (1) Article 7(4), points (a) and (b), of Directive (EU) 2019/883 establishes an exception from the general obligation to deliver all waste carried on board to the port of call for ships that have sufficient dedicated storage capacity for all waste that has been accumulated and will be accumulated during their intended voyage until the next port of call.
- (2) By applying the calculation method defined in this Regulation, Member States should be able to implement the exceptions from the general obligation to deliver all waste carried on board with respect to availability of sufficient storage space in a harmonised way.
- (3) The calculation method should not be applied to waste disposal under Annex II to the International Convention for the Prevention of Pollution from Ships ('MARPOL Convention'). As set out in Annex II to the MARPOL Convention, waste disposal is regulated by the MARPOL Convention and the delivery of such waste is either mandatory at the port where cargo is unloaded before a new cargo is loaded or discharge at sea is permitted under certain conditions. Depending on the substance, delivery of cargo residues regulated by Annex II to the MARPOL Convention is mandatory before departure, subject to the procedures and control established under Regulations 13 and 16 of that Annex. Cargo residues under Annex II to the MARPOL Convention containing category X substances, high-viscosity persistent floating Y substances and high-viscosity or solidifying Y substances, are regulated by mandatory pre-wash and requirements to deliver such waste in a port reception facility set out in Regulations 13 and 16 of Annex II to the MARPOL Convention.
- (4) The calculation method should not be applied to passively fished waste. Dedicated storage for this type of waste on board does not always exist and delivery of all passively fished waste is incentivised by the cost recovery system set out in Article 8(2), point (d), of Directive (EU) 2019/883.

<sup>(1)</sup> OJ L 151, 7.6.2019, p. 116.

- (5) In order to provide for uniform conditions for the application of the exemptions to the waste delivery obligation set out in Article 7(4), points (a) and (b), of Directive (EU) 2019/883, it is indispensable that Member States apply a harmonised methodology. Implementing acts adopted pursuant to Directive (EU) 2019/883 should therefore take the form of implementing regulations.
- (6) The measures provided for in this Regulation are in accordance with the opinion of the Committee on Safe Seas and Prevention of Pollution from Ships,

HAS ADOPTED THIS REGULATION:

#### *Article 1*

1. Member States shall calculate the sufficient dedicated storage capacity for the application of Article 7(4), points (a) and (b), and Article 9 of Directive (EU) 2019/883 by using the method set out in Annex I to this Regulation.
2. For the purpose of verifying the information provided in accordance with Annex 2 to Directive (EU) 2019/883, by estimating the on-board generation of different waste types, Member States shall take into account the waste generation rates set out in Annex II to this Regulation.
3. In addition to the waste generation rates set out in Annex II to this Regulation, Member States may use one or both of the following criteria to determine estimates for the on-board generation of different waste types:
  - (a) historic records for generated waste, based on advance waste notification forms and waste delivery receipts available for the ship in question;
  - (b) on-board inspections obtaining information on previous waste generation rates, details of on-board waste management and equipment specific or trading area specific information affecting the actual waste generation rate.

#### *Article 2*

The method for calculating the sufficient dedicated storage capacity, set out in Annex I to this Regulation, shall not be applicable to the following waste types:

- (a) waste types under Annex II to the MARPOL Convention;
- (b) passively fished waste.

#### *Article 3*

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 21 January 2022.

*For the Commission*  
*The President*  
Ursula VON DER LEYEN

## ANNEX I

**Calculation method for sufficient dedicated waste storage capacity**

1. The method uses an arithmetic calculation based on the estimated amounts of waste retained on board in relation to the maximum dedicated storage capacity.
2. The Used Waste Capacity ('UWC'), estimated at the time of sending the advance waste notification to the port of call and expressed as a percentage of the maximum dedicated storage capacity, shall not exceed a predefined threshold.
3. The UWC shall be calculated with the following formula:

$$\text{UWC (\%)} = \frac{A \cdot 100}{M}$$

4. The UWC shall comply with the following condition:

$$\text{UWC (\%)} < \text{Threshold}$$

Where:

A is the estimated amount of waste type to be retained on board at the time of departure from the port of call (expressed in m<sup>3</sup>);

M is the Maximum dedicated storage capacity (expressed in m<sup>3</sup>);

Threshold is the value set out in Table 1, for the corresponding type of waste and next port of call.

Table 1

**Thresholds**

Next port of call	Annex I to the MARPOL Convention	Annex IV to the MARPOL Convention	Annex V to the MARPOL Convention	Annex VI to the MARPOL Convention
Next port of call is an EU-port or is in the 'Group of Additional Selected Ports'	50 %	50 %	25 %	75 %
Next port of call is not an EU-port, nor is in the 'Group of Additional Selected Ports'	25 %	50 %	20 %	25 %

5. For the purpose of using the calculation method for sufficient dedicated waste storage capacity, the following shall apply:
  - (a) Port of call, as indicated in the advance waste notification form set out in Annex 2 to Directive (EU) 2019/883, is the port where the ship is heading and where the advanced waste notification is sent to, in accordance with Article 6 of Directive (EU) 2019/883;
  - (b) Next port of call is the port to be called after departure, as indicated in point 2.5 of the advance waste notification form set out in Annex 2 to Directive (EU) 2019/883;
  - (c) The amount indicated in the sixth column 'Estimated amount of waste to be generated between notification and next port of call' of point 3 of the advance waste notification form set out in Annex 2 to Directive (EU) 2019/883 refers to waste generated and intended to be disposed at a port reception facility. Amounts that may be legally discharged shall not be included in the reported value.
6. The 'Group of Additional Selected Ports' includes those ports that are to be considered as EU-ports for the purpose of the application of the thresholds set out in Table 1. The ports included in this group are all ports located in: Iceland, Norway, United Kingdom (including Isle of Man, Channel Islands and Gibraltar) and Russian ports located in the Baltic Sea.

7. During the first two years of application of this Regulation, the UWC as calculated in the third paragraph of this Annex may be treated as indicative for the following cargo residues waste types:
- (a) MARPOL Annex I – Oil: Oily tank washings;
  - (b) MARPOL Annex I – Oil: Dirty Ballast Water;
  - (c) MARPOL Annex V – Garbage: Cargo Residues (HME);
  - (d) MARPOL Annex V – Garbage: Cargo Residues (non-HME).
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## ANNEX II

Table 1

**Waste Generation Rates for Annexes I, IV and V to the MARPOL Convention <sup>(1)</sup>**

Type of waste	Generation rate	Driver	On-board treatment
Oily bilge water	0,01-13 m <sup>3</sup> per day, larger ships generate larger quantities.	Condensation and leakages in the engine room; size of the ship.	The amount can be reduced by 65-85 % by using an oil water separator and discharging the water fraction into the sea.
Oily residues (sludge)	0,01 to 0,03 m <sup>3</sup> of sludge per tonne of HFO. 0 and 0,01 m <sup>3</sup> per tonne of MGO.	Type of fuel; fuel consumption.	Evaporation can reduce the amount of sludge by up to 75 % <sup>(2)</sup> . Incineration can reduce the amount of sludge by 99 % or more.
Tank washings (slops)	20 to hundreds of m <sup>3</sup>	Number of tank cleanings; size of loading capacity.	After settling, the water fraction may be discharged at sea.
Sewage	0,01 to 0,06 m <sup>3</sup> per person per day. Sewage is sometimes mixed with other waste water. The total amount ranges from 0,04 to 0,45 m <sup>3</sup> per day per person.	Number of persons on-board; type of toilets; length of voyage; type of treatment: the operation of a sewage treatment plant, or comminuting and disinfection system provides different quantities of waste	Effluent from treatment plants is often discharged at sea where permitted under MARPOL Annex IV.
Plastics	0,001 to 0,008 m <sup>3</sup> of plastics per person per day.	Number of persons on-board.	Often not incinerated. Dirty plastics (plastics that have been in contact with food) are often treated as a separate waste stream.
Food wastes	0,001 to 0,003 m <sup>3</sup> per person per day.	Number of persons on-board; provisions.	Where permitted under MARPOL Annex V, food waste is often discharged at sea.
Domestic wastes	0,001 to 0,02 m <sup>3</sup> per day per person.	Number of persons on-board; type of products used.	
Cooking oil	0,01 to 0,08 litres per person per day.	Number of persons on-board; type of food prepared.	Although not permitted, cooking oil is sometimes still added to the sludge tank.
Incinerator ashes	0,004 and 0,06 m <sup>3</sup> per month.	Use of incinerator; cost of using incinerator.	The incinerator is not used for all types of waste, mostly for paper sometimes for oily sludge.
Operational wastes	0,001 to 0,1 m <sup>3</sup> per person per day.	Size of the ship; type of cargo.	
Cargo residues	0,001-2 % of cargo load.	Type of cargo. Size of ship.	

<sup>(1)</sup> Extracted from EMSA's study 'The Management of Ship-Generated Waste On-board Ships', January 2017.

<sup>(2)</sup> Evaporation of the water fraction in oil sludge is a process that must be carefully managed and should only be done to the extent to allow combustibility of the sludge intended for incineration.



Table 2

**Waste Generation Rates for Annex VI to the MARPOL Convention on waste (exhaust gas cleaning systems, 'EGCS')**

Type of EGCS	Coefficient	Unit	Examples (10 MW engine or HFO consumption 40 t/day)
<b>Manufacturer 1</b>			
Open loop sludge amount	0,1	kg/MWh	$0,1 \times 10 \text{ MW} \times 24 = 24 \text{ kg/day}$
Closed loop sludge amount (DAF-BOTU)	3,5-7,0	kg/MWh, depending on SFOC, MCR and fuel quality	$3,5 \times 10 \text{ MW} \times 24 = 840 \text{ kg/day}$
Closed loop sludge amount (BOTU-M)	3,0	l/MWh/S%, depending on SFOC, MCR and fuel quality	$3,0 \times 10 \text{ MW} \times 24 \times S2,5 \% = 1800 \text{ l/day}$
<b>Manufacturer 2</b>			
Closed loop sludge amount	2,5-3,0	kg/consumed HFO t	$2,5 \times 40 \text{ t/day} = 100 \text{ kg/day}$

NB: The amount of exhaust gas cleaning system sludge generated depends ultimately also on the individual installation specifics: the exhaust gas cleaning system manual provided by the manufacturer should therefore be consulted. Information in the tables provided by stakeholder companies.