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PREVENTION OF AIR POLLUTION FROM SHIPS

Response to IMO Secretariat's invitation to ISO to make recommendations regarding fuel characteristics and parameters addressing air quality, ship safety, engine performance and crew health

Submitted by the International Organisation for Standardization (ISO)

SUMMARY

Executive summary:	ISO was requested by IMO (MEPC 58/23) to consider the list of fuel parameters provided by MEPC. This document contains the response to the enquiry and other relevant information. In addition, the ISO Committee "Classification and Specification of Marine Fuels" is currently working on a revision of the ISO 8217 Specifications of marine fuels.
Strategic direction:	7.3
High-level action:	7.3.1
Planned output:	7.3.1.1
Action to be taken:	Paragraph 12
Related documents:	MEPC 58/23, paragraphs 5.14 and 5.15, and MEPC 57/21, paragraphs 4.47 to 4.52

1 This document answers IMO's enquiry to the ISO Working Group ISO/TC 28/SC 4/WG 6. Classification and Specification of Marine Fuels, to make recommendations regarding fuel oil characteristics and parameters addressing air quality, ship safety, engine performance and crew health.

Background

2 During MEPC 57 the Working Group on MARPOL Annex VI and the NO_x Technical Code considered relevant parts of documents MEPC 57/4/28 (ICS) recommending that fuel oil quality should be specified by ISO.

3 The Working Group considered document MEPC 57/4/37 (Norway) providing comments on MEPC 57/4/23 suggesting an addition to the proposed action to be taken by the Committee regarding the request to ISO on a fuel oil specification. The Working Group also considered relevant parts of documents MEPC 57/4/30 and MEPC 57/4/31 (Finland, Germany and Norway) regarding fuel oil quality.

4 The Working Group agreed that a concise indicative list of fuel characteristics relevant to air quality, ship safety, engine performance and crew health should be forwarded for review and consideration by the ISO (see annex 1).

5 It was further agreed that this list was purely indicative and that the ISO would be invited to review the list and offer their recommendation on what parameters may be appropriate and what limit values would be appropriate for any parameters. Respecting the list as indicative in nature, it was agreed that ISO should be invited to make recommendations concerning the characteristics. ISO was invited to make any recommendations or observations concerning any characteristics as they deem relevant.

6 The Committee requested ISO as follows:

.1 by reviewing the attached characteristics, identify whether they are the appropriate parameters related to air quality and ship safety as well as those affecting engine performance and crew health;

.2 provide recommendations to IMO on whether any characteristics should be removed or added to the list of parameters; and

.3 provide recommendations on the limits for these characteristic and advise to what extent these could be taken into account in any revision of the ISO standards.

7 The ISO Working Group welcomed the conclusions of the Committee to allow ISO to carry out this important work in a practical manner. The ISO Working Group reconvened its activities in 2008.

Response

8 The ISO Working Group considered the IMO list of parameters and has identified both the parameters and current overall limiting values it considers pertinent to air quality, ship safety, engine performance and crew health. These are shown in annex 2 for residual and distillate fuel oils.

9 Additionally, it would be advised that substantial and in-depth work is currently being undertaken by the ISO Working Group on the revision of the ISO 8217:2005 Specifications of marine fuels, taking further due consideration of air quality, ship safety, engine performance and crew health together with commercial, availability and other aspects relevant to the Specification and will advise IMO of the outcome of this work. ISO would reaffirm its commitment to complete this work in 2010 to meet IMO needs.

10 The ISO Working Group is aware that marine fuel oils may now contain bio derived components which could lead to potential storage and handling problems. There are also potential implications on exhaust emissions resulting from the inclusion of such materials in marine fuel oils. The lack of an appropriate international test method to determine the concentration of these bio components, may cause a delay in the revision process for a new

specification as without an appropriate test method, limit values for this parameter cannot be assessed. However, it is the general intention of the ISO Working Group to understand and control the impact of bio components on air quality, ship safety, engine performance and crew health in the revised marine fuel specification.

Additional information

11 The ISO Working Group agrees that whilst H_2S should not be present in marine fuel oil, the current test methods, which identify the content in the liquid phase cannot guarantee that H_2S gas will not be released during the course of onboard storage and handling and that IMO should consider other (operational or technical) measures to mitigate the risk of any H_2S gas evolved from marine fuel oils.

Action requested of the Committee

12 The Committee is invited to consider the response from the ISO Working Group in paragraphs 8, 9, 10, together with paragraph 11 and annex 2 and take action as appropriate.

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ANNEX 1

INDICATIVE LIST OF PARAMETERS FORWARDED TO ISO

Quality Specification for Marine Heavy Fuel Oil

Density at 15 degrees C
Kinematic Viscosity at 50 degrees C
Pour Point (winter)
Pour Point (summer)
Micro Carbon Residue
Flash Point
Sulphur
Ash
Total Sediment, Potential
Total Sediment, Existent
Water
Aluminium + Silicon
Sodium
Ignition/combustion
Hydrogen Sulphide

Quality Specification for Marine Distillate Fuel Oil

Density at 15 degrees C
Viscosity at 40 degrees C
Flash Point
Pour Point (upper)
Sulphur
Cetane Index
Carbon Residue
Ash
Appearance
Total Sediment, existent
Water

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ANNEX 2

APPROPRIATE PARAMETERS CONSIDERED BY ISO TO BE PERTINENT TO FUEL OIL QUALITY WITH RESPECT TO AIR QUALITY, SHIP SAFETY, CREW HEALTH AND ENGINE PERFORMANCE

The limits do not necessarily take into consideration evolving ship designs and future technological developments

Characteristic	Unit	Limit	Characteristics applicable to[1]	
			Residual Fuel Oil[2]	Distillate Fuel Oil
Density at 15ºC	kg/m^3	Max	1010.0	900.0
Kinematic Viscosity at 50ºC (Dependent on ship capability)	mm^2/s	Max	1200	-
Kinematic Viscosity at 40ºC	mm^2/s		-	1.4 to 11.0
Vanadium	mg/kg	Max	600	-
Aluminium plus Silicon	mg/kg	Max	80	-
Cetane Index	-	Min	-	35
Ignition Quality (CCAI)[3]	-	Max	880	-
Fuel Stability[4]	% (m/m)	Max	0.10 (TSP)	0.10 (TSE)
Flash Point	ºC	Min	60	60
Pour Point	ºC	Max	+40	+6
Water	% (V/V)	Max	1.0	0.3
Sodium[3]	mg/kg	Max	100	30
Acid Number[3]	mg KOH/g	Max	3.0	0.5
Lubricity HFRR[3]	microns	Max	-	520
Micro Carbon Residue	% (m/m)	Max	22	0.30
Ash	% (m/m)	Max	0.15	0.01
Sulphur	% (m/m)	Max	As per Annex VI	As per Annex VI
Appearance (for transparent fuels)	-	-	-	Clear & Bright
Used lubricating oil (ULO)[5] Zinc	mg/kg	Max	15	15
Phosphorus	mg/kg	Max	15	15
Calcium	mg/kg	Max	30	30
Hydrogen Sulphide[3] (This limit reduces the risk of exposure but may not result in a safe ambient working environment for crew health)	mg/kg in liquid	Max	2	2

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1 Where a value is not given it is considered that that characteristic is not applicable for that grade of fuel oil.

2 Values given for viscosity, pour point and water represent overall limit values rather than those given in the current, ISO 8217:2005, Specification.

3 These parameters are not given in the current, ISO 8217:2005, Specification.

4 The parameter 'Fuel Stability' is expressed in terms of Total Sediment Potential (TSP) and Total Sediment Existent (TSE) as appropriate.

5 A fuel shall be considered to be free of used lubricating oils (ULOs) if one or more of the elements zinc, phosphorus and calcium are below or at the specified limits. All three elements shall exceed the respective limits before a fuel shall be deemed to contain ULOs.