

Table 1 — Distillate marine fuels

Characteristics	Unit	Limit	Category ISO-F-				Test method reference	
			DMX	DMA	DMZ	DMB		
Kinematic viscosity at 40 °C <sup>a</sup>	mm <sup>2</sup> /s	max.	5,500	6,000	6,000	11,00	ISO 3104	
		min.	1,400	2,000	3,000	2,000		
Density at 15 °C	kg/m <sup>3</sup>	max.	—	890,0	890,0	900,0	see 7.1 ISO 3675 or ISO 12185	
Cetane index	—	min.	45	40	40	35	ISO 4264	
Sulfur <sup>b</sup>	mass %	max.	1,00	1,50	1,50	2,00	see 7.2 ISO 8754 ISO 14596	
Flash point	°C	min.	43	60	60	60	see 7.3 ISO 2719	
Hydrogen sulfide <sup>c</sup>	mg/kg	max.	2,00	2,00	2,00	2,00	IP 570	
Acid number	mg KOH/g	max.	0,5	0,5	0,5	0,5	ASTM D664	
Total sediment by hot filtration	mass %	max.	—	—	—	0,10 <sup>e</sup>	see 7.4 ISO 10307-1	
Oxidation stability	g/m <sup>3</sup>	max.	25	25	25	25 <sup>f</sup>	ISO 12205	
Carbon residue: micro method on the 10 % volume distillation residue	mass %	max.	0,30	0,30	0,30	—	ISO 10370	
Carbon residue: micro method	mass %	max.	—	—	—	0,30	ISO 10370	
Cloud point	°C	max.	−16	—	—	—	ISO 3015	
Pour point (upper) <sup>d</sup>	winter quality	°C	max.	−6	−6	−6	0	ISO 3016
	summer quality	°C	max.	0	0	0	6	ISO 3016
Appearance	—	—	Clear and bright <sup>i</sup>			e, f, g	see 7.6	
Water	volume %	max.	—	—	—	0,30 <sup>e</sup>	ISO 3733	
Ash	mass %	max.	0,010	0,010	0,010	0,010	ISO 6245	
Lubricity, corrected wear scar diameter (wsd 1,4) at 60 °C <sup>h</sup>	µm	max.	520	520	520	520 <sup>g</sup>	ISO 12156-1	

Table 1 (continued)

Characteristics	Unit	Limit	Category ISO-F-				Test method reference
			DMX	DMA	DMZ	DMB	
a	1 mm <sup>2</sup> /s = 1 cSt.						
b	Notwithstanding the limits given, the purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See Annex C.						
c	Due to reasons stated in Annex D, the implementation date for compliance with the limit shall be 1 July 2012. Until such time, the specified value is given for guidance. For distillate fuels the precision data are currently being developed.						
d	Purchasers should ensure that this pour point is suitable for the equipment on board, especially if the ship operates in cold climates.						
e	If the sample is not clear and bright, the total sediment by hot filtration and water tests shall be required, see 7.4 and 7.6.						
f	If the sample is not clear and bright, the test cannot be undertaken and hence the oxidation stability limit shall not apply.						
g	If the sample is not clear and bright, the test cannot be undertaken and hence the lubricity limit shall not apply.						
h	This requirement is applicable to fuels with a sulfur content below 500 mg/kg (0,050 mass %).						
j	If the sample is dyed and not transparent, then the water limit and test method as given in 7.6 shall apply.						

Table 2 — Residual marine fuels

Characteristic	Unit	Limit	Category ISO-F-											Test method reference	
			RMA	RMB	RMD	RME	RMG				RMK				
			10 <sup>a</sup>	30	80	180	180	380	500	700	380	500	700		
Kinematic viscosity at 50 °C <sup>b</sup>	mm <sup>2</sup> /s	max.	10,00	30,00	80,00	180,0	180,0	380,0	500,0	700,0	380,0	500,0	700,0	ISO 3104	
Density at 15 °C	kg/m <sup>3</sup>	max.	920,0	960,0	975,0	991,0	991,0				1010,0			see 7.1 ISO 3675 or ISO 12185	
CCAI	—	max.	850	860	860	860	870				870			see 6.3 a)	
Sulfur <sup>c</sup>	mass %	max.	Statutory requirements											see 7.2 ISO 8754 ISO 14596	
Flash point	°C	min.	60,0	60,0	60,0	60,0	60,0				60,0			see 7.3 ISO 2719	
Hydrogen sulfide <sup>d</sup>	mg/kg	max.	2,00	2,00	2,00	2,00	2,00				2,00			IP 570	
Acid number <sup>e</sup>	mg KOH/g	max.	2,5	2,5	2,5	2,5	2,5				2,5			ASTM D664	
Total sediment aged	mass %	max.	0,10	0,10	0,10	0,10	0,10				0,10			see 7.5 ISO 10307-2	
Carbon residue: micro method	mass %	max.	2,50	10,00	14,00	15,00	18,00				20,00			ISO 10370	
Pour point (upper) <sup>f</sup>	winter quality	°C	max.	0	0	30	30	30				30			ISO 3016
	summer quality	°C	max.	6	6	30	30	30				30			ISO 3016
Water	volume %	max.	0,30	0,50	0,50	0,50	0,50				0,50			ISO 3733	
Ash	mass %	max.	0,040	0,070	0,070	0,070	0,100				0,150			ISO 6245	
Vanadium	mg/kg	max.	50	150	150	150	350				450			see 7.7 IP 501, IP 470 or ISO 14597	
Sodium	mg/kg	max.	50	100	100	50	100				100			see 7.8 IP 501 IP 470	

Table 2 (continued)

Characteristic	Unit	Limit	Category ISO-F-										Test method reference
			RMA	RMB	RMD	RME	RMG				RMK		
			10 <sup>a</sup>	30	80	180	180	380	500	700	380	500	
Aluminium plus silicon	mg/kg	max.	25	40	40	50	60				60		see 7.9 IP 501, IP 470 or ISO 10478
Used lubricating oils (ULO):  calcium and zinc; or calcium and phosphorus	mg/kg	—	The fuel shall be free from ULO. A fuel shall be considered to contain ULO when either one of the following conditions is met:  calcium > 30 and zinc > 15; or calcium > 30 and phosphorus > 15										see 7.10 IP 501 or IP 470 IP 500
<p><sup>a</sup> This category is based on a previously defined distillate DMC category that was described in ISO 8217:2005, Table 1. ISO 8217:2005 has been withdrawn.</p> <p><sup>b</sup> 1 mm<sup>2</sup>/s = 1cSt.</p> <p><sup>c</sup> The purchaser shall define the maximum sulfur content in accordance with relevant statutory limitations. See 0.3 and Annex C.</p> <p><sup>d</sup> Due to reasons stated in Annex D, the implementation date for compliance with the limit shall be 1 July 2012. Until such time, the specified value is given for guidance.</p> <p><sup>e</sup> See Annex H.</p> <p><sup>f</sup> Purchasers shall ensure that this pour point is suitable for the equipment on board, especially if the ship operates in cold climates.</p>													