

**Table 1 — Requirements for marine distillate fuels**

Characteristic	Unit	Limit	Category ISO-F-				Test method reference
			DMX	DMA	DMB	DMC <sup>a</sup>	
Density at 15 °C	kg/m <sup>3</sup>	max.	—	890,0	900,0	920,0	ISO 3675 or ISO 12185 (see also 7.1)
Viscosity at 40 °C	mm <sup>2</sup> /s b	min. max.	1,40 5,50	1,50 6,00	— 11,0	— 14,0	ISO 3104 ISO 3104
Flash point	°C	min. min.	— 43	60 —	60 —	60 —	ISO 2719 (see also 7.2)
Pour point (upper) <sup>c</sup> — winter quality — summer quality	°C	max. max.	— —	- 6 0	0 6	0 6	ISO 3016 ISO 3016
Cloud point	°C	max.	-16 <sup>d</sup>	—	—	—	ISO 3015
Sulfur	% (m/m)	max.	1,00	1,50	2,00 <sup>e</sup>	2,00 <sup>e</sup>	ISO 8754 or ISO 14596 (see also 7.3)
Cetane index	—	min.	45	40	35	—	ISO 4264
Carbon residue on 10 % (V/V) distillation bottoms	% (m/m)	max.	0,30	0,30	—	—	ISO 10370
Carbon residue	% (m/m)	max.	—	—	0,30	2,50	ISO 10370
Ash	% (m/m)	max.	0,01	0,01	0,01	0,05	ISO 6245
Appearance <sup>f</sup>	—	—	Clear and bright		f	—	See 7.4 and 7.5
Total sediment, existent	% (m/m)	max.	—	—	0,10 <sup>f</sup>	0,10	ISO 10307-1 (see 7.5)
Water	% (V/V)	max.	—	—	0,3 <sup>f</sup>	0,3	ISO 3733
Vanadium	mg/kg	max.	—	—	—	100	ISO 14597 or IP 501 or IP 470 (see 7.8)
Aluminium plus silicon	mg/kg	max.	—	—	—	25	ISO 10478 or IP 501 or IP 470 (see 7.9)
<u>Used lubricating oil (ULO)</u>						The fuel shall be free of ULO <sup>g</sup> 15	
- Zinc	mg/kg	max.	—	—	—	15	IP 501 or IP 470
- Phosphorus	mg/kg	max.	—	—	—	15	IP 501 or IP 500
- Calcium	mg/kg	max.	—	—	—	30	IP 501 or IP 470 (see 7.7)

<sup>a</sup> Note that although predominantly consisting of distillate fuel, the residual oil proportion can be significant.

<sup>b</sup> 1 mm<sup>2</sup>/s = 1 cSt

<sup>c</sup> Purchasers should ensure that this pour point is suitable for the equipment on board, especially if the vessel operates in both the northern and southern hemispheres.

<sup>d</sup> This fuel is suitable for use without heating at ambient temperatures down to - 16 °C.

<sup>e</sup> A sulfur limit of 1,5 % (m/m) will apply in SO<sub>x</sub> emission control areas designated by the International Maritime Organization, when its relevant protocol enters into force. There may be local variations, for example the EU requires that sulphur content of certain distillate

Table 2 — Requirements for marine residual fuels

Characteristic	Unit	Limit	Category ISO-F-										Test method reference
			RMA 30	RMB 30	RMD 80	RME 180	RMF 180	RMG 380	RMH 380	RMK 380	RMH 700	RMK 700	
Density at 15 °C	kg/m <sup>3</sup>	max.	960,0	975,0	980,0	991,0		991,0		1010,0	991,0	1010,0	ISO 3675 or ISO 12185 (see also 7.1)
Kinematic viscosity at 50 °C	mm <sup>2</sup> /s <sup>a</sup>	max.	30,0		80,0	180,0		380,0			700,0		ISO 3104
Flash point	°C	min.	60		60	60		60			60		ISO 2719 (see also 7.2)
Pour point (upper) <sup>b</sup> - winter quality - summer quality	°C	max. max.	0 6	24 24	30 30	30 30		30 30			30 30		ISO 3016 ISO 3016
Carbon residue	% (m/m)	max.	10		14	15	20	18	22		22		ISO 10370
Ash	% (m/m)	max.	0,10		0,10	0,10	0,15	0,15			0,15		ISO 6245
Water	% (V/V)	max.	0,5		0,5	0,5		0,5			0,5		ISO 3733
Sulfur <sup>c</sup>	% (m/m)	max.	3,50		4,00	4,50		4,50			4,50		ISO 8754 or ISO 14596 (see also 7.3)
Vanadium	mg/kg	max.	150		350	200	500	300	600		600		ISO 14597 or IP 501 or IP 470 (see 7.8)
Total sediment potential	% (m/m)	max.	0,10		0,10	0,10		0,10			0,10		ISO 10307-2 (see 7.6)
Aluminium plus silicon	mg/kg	max.	80		80	80		80			80		ISO 10478 or IP 501 or IP 470 (see 7.9)

Table 2 (continued)

Characteristic	Unit	Limit	Category ISO-F-										Test method reference
			RMA 30	RMB 30	RMD 80	RME 180	RMF 180	RMG 380	RMH 380	RMK 380	RMH 700	RMK 700	
Used lubricating oil (ULO) - Zinc - Phosphorus - Calcium	mg/kg	max. max. max.	The fuel shall be free of ULO <sup>d</sup>										IP 501 or IP 470 (see 7.7) IP 501 or IP 500 (see 7.7) IP 501 or IP 470 (see 7.7)

<sup>a</sup> Annex C gives a brief viscosity/temperature table, for information purposes only. 1 mm<sup>2</sup>/s = 1 cSt

<sup>b</sup> Purchasers should ensure that this pour point is suitable for the equipment on board, especially if the vessel operates in both the northern and southern hemispheres.

<sup>c</sup> A sulfur limit of 1,5 % (m/m) will apply in SO<sub>x</sub> emission control areas designated by the International Maritime Organization, when its relevant protocol comes into force. There may be local variations.

<sup>d</sup> A fuel shall be considered to be free of ULO if one or more of the elements zinc, phosphorus and calcium are below or at the specified limits. All three elements shall exceed the same limits before a fuel shall be deemed to contain ULO.