

REQUIREMENTS FOR MARINE DISTILLATE FUELS

TEST	UNIT	LIMIT	TEST METHOD	GRADE			
				DMX	DMA	DMB	DMC
KINEMATIC VISCOSITY at 40 °C	mm ² /s	Max	ISO 3104/ASTM D445/IP 71	5.500	6.000	11.000	14.000
		Min		1.400	1.500	3.000	2.000
DENSITY at 15 °C	kg/m ³	Max	ISO 3675 or 12185/ASTM D1298/IP 160	–	890.0	890.0	900.0
CETANE INDEX	–	Min	ISO 4264/ASTM 4737/IP 380	45	40	40	35
SULPHUR	mass %	Max	ISO 8754 or I4596/ASTM D4294/IP 336	1.00	1.50	1.50	2.00
FLASH POINT	°C	Min	ISO 2719/ASTM D93/IP 34	43.0	60.0		
HYDROGEN SULPHIDE	mg/kg	Max	IP 570	2.00			
ACID NUMBER	mg KOH/g	Max	ASTM D664	0.5			
TOTAL SEDIMENT HOT FILTRATION	mass %	Max	ISO 10307-1/IP 375	–			0.1
CARBON RESIDUE – MICRO	mass %	Max	ISO 10370/ASTM D4530/IP 398	–			0.3
CLOUD POINT	°C	Max	ISO 3015/IP 219	–16	–		
POUR POINT	WINTER	°C	ISO 3016/ASTM D97/IP 15	–6			0
	SUMMER	°C		0			6
APPEARANCE	-	-	-	CLEAR & BRIGHT			–
WATER	volume %	Max	ISO 3733/ASTM D95/IP 74	–			0.30
ASH	mass %	Max	ISO 6245/ASTM D482/IP 4	0.010			
LUBRICITY, CORRECTED WEAR SCAR DIAMETER (WSD) at 60 °C	µm	Max	ISO 12156-1	520			
VANADIUM	mg/kg	Max	ISO 14597	–	–	–	100.0
ALUMINIUM & SILICON	mg/kg	Max	ISO 10478	–	–	–	25
OXIDATION STABILITY	mg/kg	Max	ISO 12205	25			

REQUIREMENTS FOR MARINE RESIDUAL FUELS

TEST	UNIT	LIMIT	TEST METHOD	GRADE										
				RMA	RMB	RMD	RME	RMG			RMK			
				10	30	80	180	180	380	500	700	380	500	700
KINEMATIC VISCOSITY at 50 °C	mm ² /s a	Max	ISO 3104/ASTM D445/IP 71	10.0	30.0	80.0	180.0		380.0	500.0	700.0	380.0	500.0	700.0
DENSITY at 15 °C	kg/m ³	Max	ISO 3675 or 12185/ASTM D2198/IP 160	920.0	960.0	975.0	991.0					1010.0		
FLASH POINT	°C	Min	ISO 2719/ASTM D93/IP 34	60.0										
TOTAL SEDIMENT - AGED	mass %	Max	ISO 10307-2/IP 390	0.10										
CARBON RESIDUE, MICRO	mass %	Max	ISO 10370/ASTM D4530/IP 398	2.50	10.00	14.00	15.00	18.00				20.00		
POUR POINT	WINTER	°C	ISO 3016/ASTM D97/IP 15	0	0	30								
	SUMMER	°C		Max	6	6	30							
WATER	volume %	Max	ISO 3733/ASTM D95/IP 74	0.30	0.50									
ASH	mass %	Max	ISO 6245/ASTM D482/IP 4	0.040	0.070			0.100			0.150			
VANADIUM	mg/kg	Max	ISO 14597/IP 501 or 470	50	150			350			450			
ALUMINIUM & SILICON	mg/kg	Max	ISO 10478/ASTM D5184/IP 501 or 470	25	40		50	60						
SULPHUR	mass %	Max	ISO 8754/IP 470	STATUTORY REQUIREMENT										
HYDROGEN SULPHIDE	mg/kg	Max	IP 570	2.0										
ACID NUMBER	mg KOH/g	Max	ASTM D664	2.5										
SODIUM	mg/kg	Max	IP 501 or 470	50.0	100.0		50.0	100.0						
USED LUBRICATING OIL (ULO):	mg/kg	Max												
CALCIUM & ZINC			IP 501 or 470	CALCIUM > 30 & ZINC > 15										
CALCIUM & PHOSPHORUS			IP 500	CALCIUM > 30 & PHOSPHORUS > 15										