

REQUIREMENTS FOR MARINE DISTILLATE FUELS

TEST	UNIT	LIMIT	TEST METHOD	GRADE							
				DMX	DMA	DFA	DMZ	DFZ	DMB	DFB	
KINEMATIC VISCOSITY at 40 °C	mm ² /s	Max	ISO 3104/ASTM D445/IP 71	5.500	6.000		6.000		11.000		
		Min		1.400	2.000		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	1.00		1.00		1.50		
FLASH POINT	°C	Min	ISO 2719/ASTM D93/IP 34	43.0	60.0		60.0		60.0		
HYDROGEN SULPHIDE	mg/kg	Max	IP 570	2.00	2.00		2.00		2.00		
ACID NUMBER	mg KOH/g	Max	ASTM D664	0.5	0.5		0.5		0.5		
TOTAL SEDIMENT HOT FILTRATION	mass %	Max	ISO 10307-1/IP 375	–	–		–		0.1		
OXIDATION STABILITY	g/m ³	Max	ISO 12205/IP 388	25	25		25		25		
FAME	volume %	Max	ASTM D7963/IP 579	–	–	7.0	–	7.0	–	7.0	
CARBON RESIDUE – MICRO	mass %	Max	ISO 10370/ASTM D4530/IP 398	0.30	0.30		0.30		0.30		
CLOUD POINT	°C	Max	ISO 3015/IP 219	–16	–		–		–		
POUR POINT	WINTER	°C	ISO 3016/ASTM D97/IP 15	–	–6		–6		0		
	SUMMER	°C		–	0		0		6		
APPEARANCE	–	–	–	CLEAR & BRIGHT							
WATER	volume %	Max	ISO 3733/ASTM D95/IP 74	–	–		–		0.3		
ASH	mass %	Max	ISO 6245/ASTM D482/IP 4	0.010	0.010		0.010		0.010		
LUBRICITY, CORRECTED WEAR SCAR DIAMETER (WSD) at 60 °C	µm	Max	ISO 12156-1	520	520		520		520		

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	Max	ISO 3104/ASTM D445/IP 71	10.0	30.0	80.0	180.0	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	991.0				1010.0		
CCAI	–	Max	CALCULATED	850	860	860	860	870				870		
SULPHUR	mass %	Max	ISO 8754 or 14596/ASTM D4294/IP 336	STATUTORY REQUIREMENTS										
FLASH POINT	°C	Min	ISO 2719/ASTM D93/IP 34	60.0	60.0	60.0	60.0	60.0				60.0		
HYDROGEN SULPHIDE	mg/kg	Max	IP 570	2.00	2.00	2.00	2.00	2.00				2.00		
ACID NUMBER	mg KOH/g	Max	ASTM D664	2.5	2.5	2.5	2.5	2.5				2.5		
TOTAL SEDIMENT - AGED	mass %	Max	ISO 10307-2/IP 390	0.10	0.1	0.1	0.1	0.1				0.1		
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	30	30				30		
	SUMMER	°C		Max	6	6	30	30	30				30	
WATER	volume %	Max	ISO 3733/ASTM D95/IP 74	0.30	0.50	0.50	0.50	0.50				0.50		
ASH	mass %	Max	ISO 6245/ASTM D482/IP 4	0.040	0.070	0.070	0.070	0.100				0.150		
VANADIUM	mg/kg	Max	ISO 14597/IP 501 or 470	50	150	150	150	350				450		
SODIUM	mg/kg	Max	IP 501 or 470	50	100	100	50	100				100		
ALUMINIUM & SILICON	mg/kg	Max	ISO 10478/ASTM D5184/IP 501 or 470	25	40	40	50	60				60		
USED LUBRICATING OIL (ULO):	mg/kg	–												
CALCIUM & ZINC			IP 501 or 470	CALCIUM > 30 & ZINC > 15										
CALCIUM & PHOSPHORUS			IP 500	CALCIUM > 30 & PHOSPHORUS > 15										