

PRODUCT SPECIFICATIONS

Marine Fuel (IFOs)

CHARACTERISTICS	UNITS	LIMITS (1)		TEST METHODS (2)		
		IFO 380 (*) (1,0% m/m S)	IFO 380 (*) (3,5% m/m S)	NORMAS EN/ISO/OTRAS (3)	NORMAS UNE (3)	NORMAS ASTM (3)
Kinematic viscosity at 50°C	mm ² /s	maximum 380,0	maximum 380,0	EN ISO 3104	UNE-EN ISO 3104	D 445
Density at 15°C (4)	kg/m ³	maximum 991,0	maximum 991,0	EN ISO 3675 EN ISO 12185	UNE-EN ISO 3675 UNE-EN ISO 12185	D 1298
Calculated Carbon Aromaticity index (CCAI)		maximum 870	maximum 870	ISO 8217(Anexo F)		
Sulphur content	% m/m	1,0	3,5	EN ISO 8754 EN ISO 14596	UNE-EN ISO 8754 UNE-EN ISO 14596	D 2622 D 4294
Flash point	°C	minimum 60,0	minimum 60,0	EN ISO 2719	UNE-EN ISO 2719	D 93
Hydrogen sulfide content	mg/kg	maximum 2,00	maximum 2,00	IP 570		
Acid number	mg KOH/g	maximum 2,5	maximum 2,5			D 664
Total aged sediment (5)	% m/m	maximum 0,10	maximum 0,10	ISO 10307-2		
Carbonaceous residue	% m/m	maximum 18,00	maximum 18,00	EN ISO 10370	UNE-EN ISO 10370	D 4530
Upper pour point	°C	maximum +30	maximum +30	ISO 3016		D 97
Water content	% V/V	maximum 0,50	maximum 0,50	ISO 3733	UNE 51027	D 95
Ash content	% m/m	maximum 0,100	maximum 0,100	EN ISO 6245	UNE-EN ISO 6245	D 482
Vanadium	mg/kg	maximum 350	maximum 350	ISO 14597 IP 470 IP 501	UNE-EN ISO 14597	D 5863 D 5708
Sodium	mg/kg	maximum 100	maximum 100	IP 470 IP 501		D 5863
Aluminium plus Silicon	mg/kg	maximum 60	maximum 60	ISO 10478 IP 470 IP 501		
Used lubricating oils (6): Calcium (Ca) and Zinc (Zn) or	mg/kg	Ca<30 and Zn<15	Ca<30 and Zn<15	IP 501 IP 470 IP 501		
Calcium (Ca) and Phosphorus (P)	mg/kg	Ca<30 and P<15	Ca<30 and P<15	IP 470(Ca) IP 500 (P)		
Compatibility	ASTM Scale	maximum 2	maximum 2			D 4740
General product requirements (7)						

EDITION: 4

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SEE NOTES IN THE NEXT PAGE

NOTAS:

- (*) The qualities referred to in this specification correspond with the RMG from the current version of ISO 8217 standard, sulphur content established in the Regulation 14 of Annex VI of MARPOL agreement.
- (1) All test methods referred to in this document include a precision statement. In case of dispute, the procedures for resolving the dispute and interpretation of the results based on the test method precision described in EN ISO 4259 standard shall be used.
- (2) Other technically equivalent test methods are acceptable under prior approval by EXOLUM. In case of dispute, the criteria about reference methods and the interpretation of results established in the ISO 8217 standard, (RMG category) shall be followed
- (3) For the test methods reflected on ISO 8217 standard and the corresponding UNE ones, the method edition to be used shall be the one specified in this standard. For the other test methods, the last published version must be applied.
- (4) If the density is determined at a different temperature, shall be converted to results at 15°C using ISO 91-1:1992, Table 53B.
- (5) Either of the standard procedures for ageing in ISO 10307-2 can be used. The reference test method shall be the Potential Total Sediment test.
- (6) The fuel shall be free from used lubricating oils (ULO). A fuel shall be considered to contain ULO when the limits exceed those established in table above.
- (7) Free from inorganic acids.
Free from bio-derived fuels.
Free from additives or contaminants that jeopardizes the safety of the ships, or adversely affects the performance of the machinery, or is harmful to personnel or contributes overall to additional air pollution.

**IF THERE IS A CHANGE IN THE OFFICIAL SPECIFICATIONS IN FORCE IN SPAIN, THIS TABLE
WILL BE REVISED TO SUIT THE NEW SITUATION.**