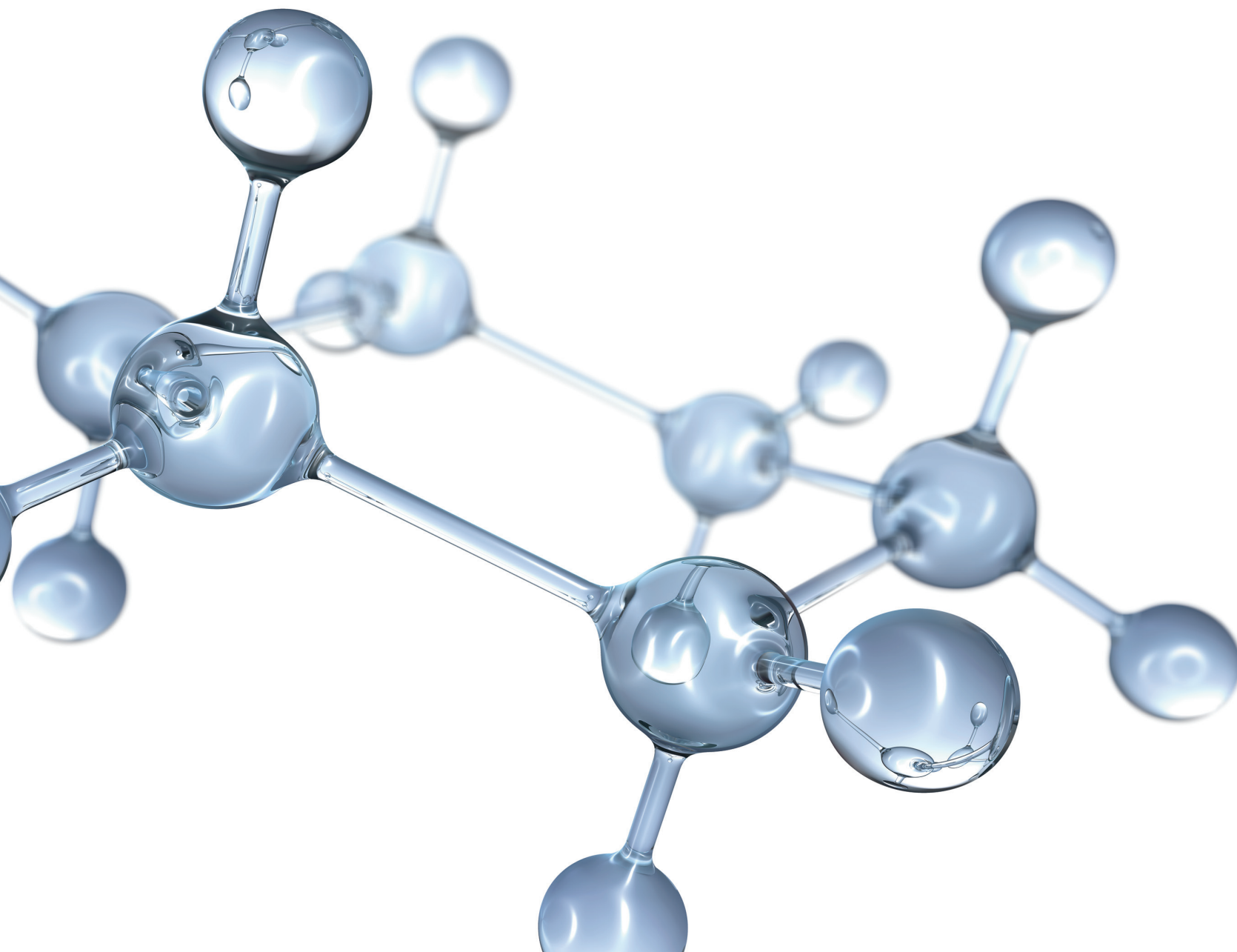


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Marine Fuels specifications  
Jan 2012



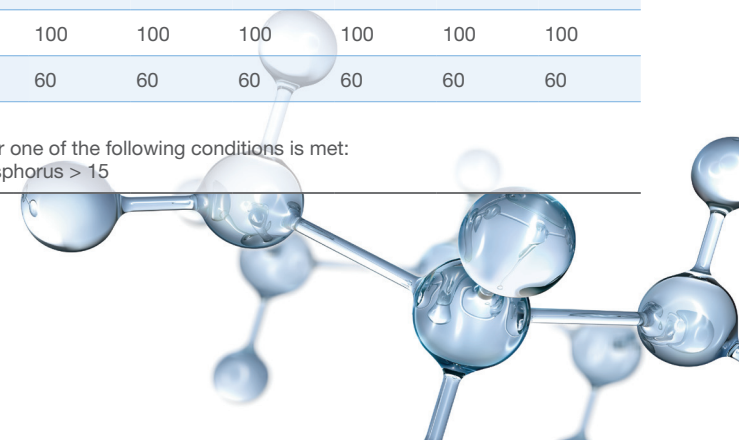
**About us**

ExxonMobil Marine Fuels is a global leader in the supply of marine fuels. We provide products to customers across the globe, ranging from passenger to cargo vessels, including container, dry bulk, cruise ships, ferries, tugboats, tankers and fishing vessels. We sell and safely deliver high quality products to

our valued customers. Our knowledgeable and responsive teams are located around the globe, ready to address your inquiries and to offer comprehensive technical support.

**Marine fuel oil**

Test	Unit	Test method			Limits	Grade										
		ASTM	IP	ISO		RMA 10	RMB 30	RMD 80	RME 180	RMG 180	RMG 380	RMG 500	RMG 700	RMK 380	RMK 500	RMK 700
Viscosity at 50°C	mm <sup>2</sup> /s (cSt)	D445	71	3104	max.	10.00	30.00	80.00	180.0	180.0	380.0	500.0	700.0	380.0	500.0	700.0
Density at 15°C	kg/m <sup>3</sup>	D1298	160	3675 or 12185	max.	920.0	960.0	975.0	991.0	991.0	991.0	991.0	991.0	1010.0	1010.0	1010.0
CCAI	–	Calculated			max.	850	860	860	860	870	870	870	870	870	870	870
Sulfur	mass %	D4294	336	8754, 14596	max.	Statutory requirements										
Flash point	°C	D93	34	2719	min.	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
Hydrogen sulfide	mg/kg	–	570	–	max.	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Acid number	mg KOH/g	D664	–	–	max.	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Total sediment aged	mass %	–	390	10307-2	max.	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Carbon residue, micro	mass %	D4530	398	10370	max.	2.50	10.00	14.00	15.00	18.00	18.00	18.00	18.00	20.00	20.00	20.00
Pour point Winter quality Summer quality	°C °C	D97 D97	15 15	3016 3016	max. max.	0 6	0 6	30 30	30 30	30 30	30 30	30 30	30 30	30 30	30 30	30 30
Water	volume %	D95	74	3733	max.	0.30	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Ash	mass %	D482	4	6245	max.	0.040	0.070	0.070	0.070	0.100	0.100	0.100	0.100	0.150	0.150	0.150
Vanadium	mg/kg	–	501, 470	14597	max.	50	150	150	150	350	350	350	350	450	450	450
Sodium	mg/kg	–	501, 470	–	max.	50	100	100	50	100	100	100	100	100	100	100
Aluminium + silicon	mg/kg	D5184	501, 470	10478	max.	25	40	40	50	60	60	60	60	60	60	60
Used lubricating oil Calcium + zinc Calcium + phosphorus	mg/kg mg/kg	– –	501 or 470 500	– –	– –	The fuel shall be free of 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										



## Our values

In pursuit of our vision to be the premier marine fuels supplier in the world, our commitment is to uphold the values of **quality, reliability** and **integrity**. Our customers trust our products and services because of our commitment to the highest standards, reinforced by our stringent management systems

and quality assurance guarantees. We are committed to helping meet the world's energy needs while addressing the challenge of sustainability – balancing economic growth, social development and environmental protection.

## Our Web site

Visit [exxonmobilmarinefuels.com](http://exxonmobilmarinefuels.com) for further information on our range of products and services.

## Marine distillate fuels

Test	Unit	Test method			Limits	Grade			
		ASTM	IP	ISO		DMX	DMA	DMZ	DMB
Viscosity at 40°C	mm <sup>2</sup> /s (cSt)	D445	71	3104	max. min.	5.500 1.400	6.000 2.000	6.000 3.000	11.00 2.000
Density at 15°C	kg/m <sup>3</sup>	D1298	160	3675 or 12185	max.	–	890.0	890.0	900.0
Cetane index	–	4737	380	4264	min.	45	40	40	35
Sulfur	mass %	D4294	336	8754, 14596	max.	1.00	1.50	1.50	2.00
Flash point	°C	D93	34	2719	min.	43	60	60	60
Hydrogen sulfide	mg/kg	–	570	–	max.	2.00	2.00	2.00	2.00
Acid number	mg KOH/g	D664	–	–	max.	0.5	0.5	0.5	0.5
Total sediment hot filtration	mass %	–	375	10307-1	max.	–	–	–	0.10
Oxidation stability	g/m <sup>3</sup>	–	388	12205	max.	25	25	25	25†
Carbon residue, micro	mass %	D4530	398	10370	max.	0.30	0.30	0.30	0.30
Cloud point	°C	–	219	3015	max.	-16	–	–	–
Pour point Winter quality Summer quality	°C °C	D97 D97	15 15	3016 3016	max. max.	– –	-6 0	-6 0	0 6
Appearance	–	–	–	–	–	——— Clear and bright ———			–
Water	volume %	D95	74	3733	max.	–	–	–	0.30
Ash	mass %	D482	4	6245	max.	0.010	0.010	0.010	0.010
Lubricity*	µm	–	–	12156-1	max.	520	520	520	520†

\* This requirement is applicable to fuels with a sulfur content below 0.05%.

† If the sample is not clear and bright, the test cannot be undertaken and the limit shall not apply.

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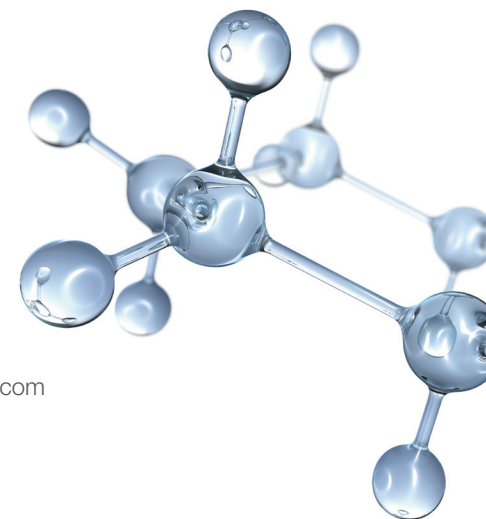
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## ExxonMobil Marine Fuels specifications (Jan 2012)

Exxon Mobil Corporation and affiliated companies (ExxonMobil) supply marine fuels against the attached specifications, which apply to fuels manufactured by ExxonMobil and those purchased or exchanged. These specifications are regularly reviewed to encompass both equipment-builder and industry requirements, including standard setting organisations such as ASTM and ISO. These specifications comply with ISO 8217:2010. Therefore, please note that these specifications are subject to change without notice. In addition, local conditions may require deviation from published specifications or may offer a higher quality, but without guarantee. Please contact your ExxonMobil Marine Fuels representative regarding current typical qualities at your nominated bunker port. Final product quality specifications are subject to order confirmation details.

This document is supplied for information only and is not part of any contract for the supply of marine fuels. Any warranties as to the quality of marine fuels supplied will be set out separately in a contract with the relevant ExxonMobil Marine Fuels entity.

### Test methods

The test methods indicated are used by ExxonMobil's laboratories worldwide. The methods are similar, but not necessarily identical to those in the ISO specifications.

#### Density

All densities are in units of kg/m<sup>3</sup> at 15°C. To convert these units to kg/L divide by 1000.

#### Viscosity

Local practice may dictate viscosity measurement at other temperatures with conversion to 50°C. In case of dispute, the same method will be used to confirm the original measurement. Note: original measurement temperature will be used in the case of dispute.

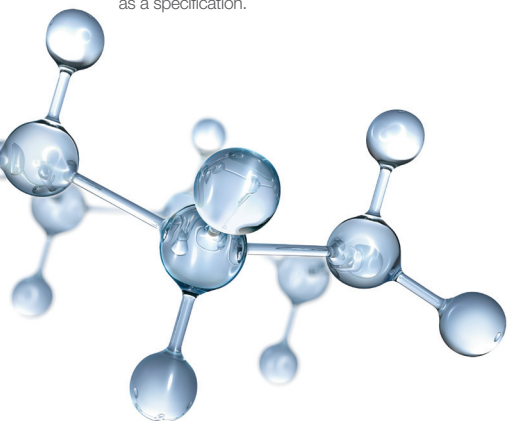
#### Calculated values

Properties of interest to operators may be approximated by calculation from measured specification properties. These include calculated energy content and CCAI. ExxonMobil does not calculate these values and does not recognize calculated energy content as a specification.


### Sampling and delivery

ExxonMobil employs continuous drip samplers as the preferred method for obtaining representative samples of a marine fuel oil delivery. Samples are drawn following the procedures set out in the ExxonMobil Sampling Policy. Purchasers may wish to use the services of an independent survey at delivery.

Quantity measurement is according to the terms of the most current version of ExxonMobil Marine Fuels General Conditions of Contract. ExxonMobil uses certified calibrations of barges and tanks to determine quantities delivered.



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