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Products from petroleum, synthetic and renewable sources — Fuels (class F) classification —

Part 1: Categories of marine fuels

Produits d'origine pétrolière, synthétique ou renouvelable — Classification des combustibles (classe F) —

Partie 1: Catégories des combustibles pour la marine

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 4, *Classifications and specifications*.

This sixth edition cancels and replaces the fifth edition (ISO 8216-1:2017), which has been technically revised.

The main changes are as follows:

— the maximum FAME content of ISO-F-DF grades has been increased to 100 % by mass;

— ISO-F-RM grades have been added in Table 1 for residual fuels with a sulfur content at or below 0,50 % by mass or 0,10 % by mass;

— ISO-F-RF grades have been added in Table 1 for residual fuels including FAME, the content of which is agreed between the buyer and the seller;

— the number of ISO-F-RM grades for residual fuels has been reduced. These grades are now for residual fuels with a sulfur content exceeding 0,50 % by mass.

A list of all parts in the ISO 8216 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The classification in this document was prepared in cooperation with ship owners, ship operators, shipping associations, national standards bodies, classification societies, fuel testing services, engine designers, fuel treatment equipment manufacturers, marine fuel suppliers, fuel additive suppliers and the petroleum industry to meet the requirements for marine fuels supplied on a world-wide basis for consumption on board ships.

The increased focus on environmental concerns and legislation to address them are leading to a transition in the nature of marine fuels. There is a shift away from marine fuels supplied from traditional oil products derived from the processing of petroleum crude, and a shift towards oil products derived from renewable and/or alternative sources. The classification takes into consideration the diverse nature of these fuels and incorporates a number of categories of distillate and residual fuels, even though it is possible that not all categories are available in every supply location.

The subcategories (M) for middle distillate fuels and (H) for heavy distillate fuels of ISO-F-D originally described in ISO 8216-99 have not been used in this document, to avoid misunderstanding with M and H used in Clause 4.

Specifications of marine fuel categories are given in ISO 8217.

Products from petroleum, synthetic and renewable sources — Fuels (class F) classification —

Part 1: Categories of marine fuels

1 Scope

This document defines the detailed classification of marine fuels within class F (fuels). It is intended to be read in conjunction with ISO 8216-99.

NOTE Class F for fuels was originally defined as part of the method of classification for petroleum products given in ISO 8681.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
fatty acid methyl ester
FAME
ester derived by (trans-) esterification of fats and oils of vegetal or animal origin

4 Explanation of symbols used

The detailed classification of marine fuels into categories of products has been established by defining the main applications and characteristics of the products from two families of fuels given in ISO 8216-99: “D” for distillate fuels and “R” for residual fuels.

According to ISO 8216-99, the products are designated by a symbol consisting of a group of letters which together constitute a code.

This code consists of the following information:

a) the initials “ISO”;

b) the letter “F” for the class of fuel;

c) the category of fuel, consisting of:

1) the family letter: “D” for distillate or “R” for residual type fuel,

2) the letter “M” designating the application “marine”. For fuels that contain fatty acid methyl ester (FAME), “M” is replaced by “F”,

3) for DM and RM grades, a letter e.g. “A”, “B”,...., “Z”, which taken separately has no significance, but has meaning in relation to the particular properties according to ISO 8217;

d) for RM grades, a combination of a number that is indicative of the maximum kinematic viscosity of the residual fuel, in square millimetres per second (mm^2/s) at 50 °C, followed by a number or letter that is indicative for the maximum sulfur content of the fuel. The letter “H” is used to designate fuels with a sulfur content above 0,50 % by mass;

e) for RF grades, a number that is indicative of the maximum kinematic viscosity of the fuel, in square millimetres per second (mm^2/s) at 50 °C.

In this classification system, products, commonly referred to as grades, are designated in a standard format. A product or grade may be designated in the complete form or in abbreviated form.

EXAMPLE Complete form: ISO-F-RMG 380-0,5; Abbreviated form: RMG 380-0,5.

5 Detailed classification

The detailed classification of marine fuels is given in Table 1.

Table 1 — Classification of marine fuels

Family Subdivision according to type of fuel	**Designation code ISO-F-**			**Remarks**
	Category [a] Subdivision according to application and properties	**Indication for maximum kinematic viscosity at 50 °C** mm^2/s	**Indication for maximum sulfur content by mass** %	
Distillate	DMX	—		Emergency purposes external to the machinery spaces. DMX shall contain no residuum and shall be free of FAME.
	DMA	—		General purpose, shall contain no residuum and shall not contain FAME other than a de minimis level.
	DMZ	—		General purpose, shall contain no residuum and shall not contain FAME other than a de minimis level.
	DMB	—		General purpose, may contain a trace of residuum from the supply chain. DMB shall not contain FAME other than a de minimis level.
	DFA	—		DMA including FAME, content agreed between the buyer and seller and in line with original equipment manufacturer (OEM) guidance.
	DFZ	—		DMZ including FAME, content agreed between the buyer and seller and in line with OEM guidance.
	DFB	—		DMB including FAME, content agreed between the buyer and seller and in line with OEM guidance.

[a] See Clause 4 for an explanation of the symbols used to define the different categories.

Table 1 *(continued)*

Family Subdivision according to type of fuel	**Designation code ISO-F-**			**Remarks**
	Category [a] Subdivision according to application and properties	**Indication for maximum kinematic viscosity at 50 °C** mm^2/s	**Indication for maximum sulfur content by mass** %	
Residual	RMA	20	0,5	General purpose residual fuel with sulfur content at or below 0,50 % by mass or 0,10 % by mass, and not containing FAME other than a de minimis level.
			0,1	
	RME	180	0,5	
			0,1	
	RMG	380	0,5	
			0,1	
	RMK	500	0,5	
			0,1	
Residual	RF	20	—	General purpose residual fuel following statutory requirements for sulfur and containing FAME, content agreed between the buyer and seller and in line with OEM guidance.
	RF	80	—	
	RF	180	—	
	RF	380	—	
	RF	500	—	
Residual	RME	180	H	General purpose residual fuels with sulfur content exceeding 0,50 % by mass, not containing FAME other than a de minimis level.
	RMG	180	H	
		380	H	
	RMK	500	H	
		700	H	

[a] See Clause 4 for an explanation of the symbols used to define the different categories.