



**CIMAC**

INTERNATIONAL COUNCIL  
ON COMBUSTION ENGINES

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# CIMAC Guideline

## ISO 8217:2017 - FAQ

By CIMAC WG7 'Fuels'

This publication is for guidance and gives an overview regarding the questions that may arise with the publication of ISO 8217:2017, the latest specification of marine fuels. The publication and its contents have been provided for informational purposes only and is not advice on or a recommendation of any of the matters described herein. CIMAC makes no representations or warranties express or implied, regarding the accuracy, adequacy, reasonableness or completeness of the information, assumptions or analysis contained herein or in any supplemental materials, and CIMAC accepts no liability in connection therewith.

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# Content

1	Introduction .....	3
2	Questions and Answers related to ISO 8217:2017 .....	3
2.1	What are the benefits of using ISO 8217:2017 Standard over the previous editions (ISO 8217:2005 and/or 2010/12)? .....	3
2.2	What amendments and new information should I be particularly mindful of in the Standard? .....	3
2.3	Why have the Scope and General Requirements been changed? .....	3
2.4	Why has the word "environment" been removed from the new clause 5.2? .....	4
2.5	How to decide in accordance with Clause 1 whether a fuel sample contains material at a concentration above which it is unacceptable for use? .....	4
2.6	Why add FAME grades at all? .....	4
2.7	Why has the "de minimis" FAME level been increased to approximately 0.5%? .....	5
2.8	Why does the Standard not contain specifications for the new maximum 0.10 % Sulphur fuel oils? .....	5
2.9	How do we best apply the ISO Standard to a bunker nomination when purchasing these new ULSFO? .....	5
2.10	Do we expect to see major changes with the max 0.50% sulphur fuels? .....	6
2.11	Why are there no limit ranges for properties but mostly only maximum values causing large differences between fuels of equal specification (as for many new ULSFOs classified as RMD80)? .....	6
2.12	How does the new Standard help against compatibility issues of fuels (even if belonging to the identical category)? .....	6
2.13	Why has no limit been put on Cloud Point (CP) and Cold Filter Plugging Point (CFPP)? .....	6
2.14	Why no changes to the maximum limits on cat fines (Al+Si)? .....	7
2.15	Why have several annexes been deleted from the Standard? .....	7
2.16	Why has CIMAC produced this Q&A on ISO 8217:2017? .....	7
3	Next Step .....	7

# 1 Introduction

With the introduction in 2012 of edition five of ISO 8217 “*Petroleum products -- Fuels (class F) -- Specifications of marine fuels*”, a number of questions arose in the industry. These were directed to the ISO working group, ISO/TC 28/SC4/WG6, to answer.

In 2017, a new edition of ISO 8217 (edition six) has been published. In the absence of an in-depth discussion of the various reports and associated background documentation that helped form the basis for the revision, ISO WG6 has identified the most pertinent questions that may arise about this version of the specification.

In collaboration with the ISO Committee, CIMAC WG7 has collated and provided responses to these questions which reflect the collective thinking of the ISO Committee. This FAQ will provide the reader with the basis and reasoning for the changes made to the previous version, ISO 8217:2012.

Should you have further questions, please do not hesitate to contact CIMAC WG7 or visit [www.cimac.com](http://www.cimac.com)

## 2 Questions and Answers related to ISO 8217:2017

### 2.1 What are the benefits of using ISO 8217:2017 Standard over the previous editions (ISO 8217:2005 and/or 2010/12)?

While there are only minor changes to existing characteristics already included in the 2010/2012 edition, additional requirements have been included for distillate fuels to protect against cold operability issues. Hence, adopting the latest revision of the ISO 8217 offers improved quality control and better protection against operational issues while the introduction of DF (Distillate FAME) grades will improve fuel oil availability in some ports.

Compared to ISO 8217:2005, this revision carries over the more stringent limits on minimum viscosity for distillate grades, lubricity, cat fines, acid number, H<sub>2</sub>S content and CCAI found in the 2010/2012 edition.

### 2.2 What amendments and new information should I be particularly mindful of in the Standard?

Amendments to the Scope and General Requirements and the addition of DF grades containing biodiesel (FAME), plus the reporting of cold properties of Cloud Point (CP) and Cold Filter Plugging Point (CFPP) are of principal interest.

### 2.3 Why have the Scope and General Requirements been changed?

The Scope has been amended to address the evolving composition of fuels. It has therefore been expanded to include fuels containing not only “petroleum” hydrocarbons but also hydrocarbons from co-processing of renewable feedstock with petroleum feedstock and hydrocarbons from synthetic or renewable sources. The “renewable” hydrocarbons are similar in composition to and indistinguishable from “petroleum” hydrocarbons. There is substantial positive experience with these fuels in other transportation sectors.

The general requirements have been amended and the text and underlying meaning redistributed and strengthened throughout the whole specification. In earlier versions, Clause 5 was continuously being misread and misunderstood, so the working group agreed to rework the wording to clarify and minimize any future misunderstanding of the intent of this clause.

## **2.4 Why has the word "environment" been removed from the new clause 5.2?**

The scope of the ISO 8217 defines in clear terms, the fuel requirements as delivered to the ship for use in marine diesel engines and boilers and is not intended to cover environmental issues nor pertain to hold any form of environmental protection other than being a commercial Standard used globally in the purchase of marine fuels. This area is covered under other environmentally based legislation.

## **2.5 How to decide in accordance with Clause 1 whether a fuel sample contains material at a concentration above which it is unacceptable for use?**

Recognising that the full composition of the fuel is not necessarily apparent through assessing only the routine fuel parameters as listed in Tables 1 or 2, an extended, in-depth investigative process might be involved. For the most cases, the first indication that the fuel may be an issue, is when a ship's fuel system and/or machinery plant experience operational problems.

The next step is for the crew to carry out a series of actions to gather evidence and record the observations of the fuel in use. Importantly, the crew needs to ensure there have been no gaps or mistakes in applying on-board fuel management best practices.

When the fuel is analysed using advanced investigative methods it may well be that an unexpected component is found in the fuel. Many of these substances may be harmless while others may have been associated with problems in the past.

Since almost anything may be harmful or harmless depending on the concentration, there will need to be further investigations as to their possible impact. There is on-going work to determine the levels of some common chemical species that can typically be found in marine fuel oils in order to address this point.

Very often if it can be demonstrated that the supplier of the suspect fuel has had similar problems on other ships during the same period, this may be sufficient to support a claim. However, ships must be thorough in their record keeping of every move of the bunkers on board from bunker tank to storage tank to separator to engine and combustion to effectively present their case.

Companies facing such a case are best advised to seek experts in the field to provide case specific guidance.

## **2.6 Why add FAME grades at all?**

With the increasing demand for maximum 0.10% sulphur fuel oils, some ports may offer automotive diesel fuel containing biodiesel (FAME) as the only fuel available. The maximum 7.0 % (v/v) has been chosen as this aligns, at the time of writing this guideline, with the concentrations allowed in those countries applying environmental regulations.

In some areas, it may be difficult to buy FAME free distillate fuels and this Standard now provides a marine biodiesel specification that suppliers can offer instead of DMA or DMB when those grades are unavailable.

Guidance and support to help operators understand a ship's capacity to use such a fuel can be found on the CIMAC web site, "guideline for ship owners and operators on managing distillate fuels up to 7.0% v/v FAME (biodiesel)" (<http://www.cimac.com/working-groups/wg7-fuels/index.html>).

## **2.7 Why has the "de minimis" FAME level been increased to approximately 0.5%?**

Based on field experiences and available testing data on FAME levels found in marine fuels, the increase of the de minimis level of FAME to approximately 0.5 volume % will provide greater scope for supply but will not have a negative impact on the ship's operations.

## **2.8 Why does the Standard not contain specifications for the new maximum 0.10 % Sulphur fuel oils?**

Some of the new, maximum 0.10% sulphur fuels designed for operation in Emission Controlled Areas (ECAs), herein designated ULSFO, do not easily fit into any of the existing grade categories. However, these fuels appeared on the market during the latter stages of the Standard revision and it was not possible to revise the categorisation of marine fuels or amend the specification tables accordingly in time to meet ISO's publication timetable.

It was agreed by the ISO Committee that with the emergence of the Very Low Sulphur Fuel Oils (VLSFO), containing a maximum of 0.50% sulphur, targeted to meet MARPOL Annex VI sulphur regulations in 2020, it would be best to wait for the market to stabilise after initial VLSFOs are introduced, in addition to the new ULSFO.

In the meantime, these fuels can be defined under an existing ISO 8216 category, e.g. ULSFO fuels containing residual components and requiring heating, and therefore be categorized as RM, generally falling under existing ISO grades such as RMD 80 or RME 180. ULSFO fuels which are "distillate like" and do not need heating for injection can be categorized as DM generally falling under existing ISO 8217 Table 1 distillate grades.

Both RM and DM type ULSFO will have characteristics which may not perfectly align with an existing ISO Grade and any outlying differences should be addressed and additionally agreed between Buyer and Seller.

## **2.9 How do we best apply the ISO Standard to a bunker nomination when purchasing these new ULSFO?**

How the new ULSFO type fuels can be best accommodated in specific ISO grades will be addressed during the ISO Committee's next meetings. In the interim, in addition to the fuel characteristics, the suppliers should advise buyers of any precautions necessary to use the fuels without challenges, particularly to avoid cold flow issues, overheating and or incompatibility.

Please also refer to CIMAC position paper "New 0.10% sulphur marine (ECA) fuels" (<http://www.cimac.com/working-groups/wg7-fuels/index.html>)

## **2.10 Do we expect to see major changes with the max 0.50% sulphur fuels?**

With the impending implementation in 2020 of MARPOL Annex VI's global max 0.50% sulphur requirement for marine fuels, we anticipate a surge in VLSFO RM and DM type fuels coming to the market. We can therefore expect a broader choice from different geographic areas of fuel formulations which ships will have to manage.

Although we expect similar fuels to those we have seen with the 0.10% ULSFO, the ISO Committee will continue to collect and monitor the statistics to strengthen the content of the next ISO 8217 Standard and will keep the industry advised.

## **2.11 Why are there no limit ranges for properties but mostly only maximum values causing large differences between fuels of equal specification (as for many new ULSFOs classified as RMD80)?**

Traditionally and historically, the specifications have been set up with maximum or minimum specifications to protect engines and systems against "pain points" where the fuel approached critical values. Engines today are usually not pushed to the limits by the conservative grades being purchased and as long as the quality delivered is known, most engine plants and fuel systems can use the fuel delivered with the proper precautions.

Adding ranges, unnecessarily, to every parameter could easily over complicate the Standard and might even limit availability and result in increased costs. Purchasers with special needs, e.g. minimum viscosity, should request additional parameters in their purchase contract, similar to existing practise.

## **2.12 How does the new Standard help against compatibility issues of fuels (even if belonging to the identical category)?**

While each individual fuel oil should be delivered as a stable product, compatibility of one fuel oil with another cannot be predicted, nor guaranteed. Test methods exist to determine the compatibility of two fuels and predict the long term stability of a fuel.

As a "rule of thumb", fuels of the same viscosity grade with similar densities are likely to be compatible but the compatibility of two fuels is highly dependent on the composition of the actual fuels and cannot be predicted with certainty nor specified by a purchaser.

## **2.13 Why has no limit been put on Cloud Point (CP) and Cold Filter Plugging Point (CFPP)?**

Increasingly we have seen that new ULSFO fuels can be more paraffinic in certain geographical areas, which may lead to cold flow operability issues when the ship is operating in a colder environment and does not have suitable fuel heating arrangements to compensate; more specifically this has been an issue for distillate fuel oils.

While CFPP is part of the European auto diesel fuel specifications standard EN 590, climate related requirements within EN 590 are set at a national level taking into account the specific climate of the country.

Defining a suitable fuel characteristic and a limit to guarantee the cold operability of marine distillate fuels for all ships in all climate regions without significantly impacting other segments of the fuels market, requires more in depth study to ensure that there are no unintended adverse consequences. Therefore, the requirement to report CP and CFPP will provide additional information on the cold flow properties of the fuel that will help ship's to mitigate cold operability issues ahead of any potential problems being experienced and supply important data to the next revision of the Standard.

## **2.14 Why no changes to the maximum limits on cat fines (Al+Si)?**

Every edition of ISO 8217 is based on extensive statistical evaluation of the market at the time and this edition was not different. The Standard specifies the requirements prior to on-board settling, centrifuging and filtering of the fuel. With the centrifuge(s) at the correct operating settings, the cat fines content, as measured by the Al+Si level, can be reduced to an acceptable limit at the engine inlet.

In order to provide an increased safety margin, the cat fines limit was reduced to 60 mg/kg in ISO 8217:2010. A further reduction of the Al+Si limit would likely have a negative impact on fuel oil availability and cost of the product, therefore, lacking significant overriding evidence of a need, no change in the specification was deemed necessary.

## **2.15 Why have several annexes been deleted from the Standard?**

The number of informative annexes to the Standard has grown significantly over the development of each of the editions. The aim of a fuel specification Standard is to define the specifications the fuel has to meet for purchasing and to keep informative annexes to a minimum. The ISO Committee therefore agreed to delete some of the annexes and moved the critical supporting information previously in the annexes into the body of the Standard.

## **2.16 Why has CIMAC produced this Q&A on ISO 8217:2017?**

There is a very close cooperation between CIMAC WG7 Fuels and ISO/TC 28/SC 4/WG6 and in anticipation of the release of the 6th edition of ISO 8217, CIMAC WG7 saw a need to develop this "Question and Answer" guide explaining the ISO WG6 rationale in the development of the Standard.

## **3 Next Step**

Indications from the IMO Sub Committee on Pollution Prevention and Response (PPR) are that the Marine Environmental Protection Committee (MEPC) is looking to ISO to provide further guidance for addressing any quality concerns. ISO/TC 28/SC4/WG6 has already started the process of analysing the needs, including any possible grade rationalisations, as we move inexorably towards the new 0.50% sulphur world in 2020.

## Imprint

CIMAC Central Secretariat  
c/o VDMA e. V.  
Lyoner Strasse 18  
60528 Frankfurt, Germany  
Phone +49 69 6603-1355  
Fax +49 69 6603-2355  
E-mail: [info@cimac.com](mailto:info@cimac.com)

President: Klaus M. Heim  
Secretary General: Peter Müller-Baum

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