CIMAC Publications 2024

Short descriptions of all papers issued in 2024 by CIMAC Groups

Content

1 Introduction

CIMAC members regularly raise issues which affect us all but with which no individual company can make progress because of lack of information or influence. CIMAC then arranges for international specialists amongst the members to form a Working Group to resolve these issues. They then produce a united CIMAC recommendation or a CIMAC position paper speaking for our industry as a whole. These recommendations often form the basis of subsequent standards or techniques which are used throughout the industry. While other people may bring outside information into our Working Groups by limited invitation it is only CIMAC members who are permitted to become full and long-term members of CIMAC Working Groups and thus influence the engine industry.

Besides Working Groups, CIMAC has formed Strategy Groups which deal with current "hot topics" of the large engine industry on a more strategical level.

In this publication, you will find short descriptions of all papers issued in 2024 by the groups mentioned above, sorted by publication date. The full papers are available on the CIMAC website, see CIMAC.com.

2 Guideline: The Interpretation of Marine Fuel Analysis Test Results

Issued by CIMAC WG 7 Fuels, 01/2024

This guideline is a revision of the CIMAC WG7 guideline No. 02:2016 which was developed in order to provide information on how to apply the ISO 4259 approach to the interpretation of the analysis test results in respect of the marine fuel characteristics given in ISO 8217 from both the recipient and the supplier perspectives. This revision includes tests added in recent editions of ISO 8217 and incorporates updated method precision data where relevant.

Link to full paper

3 Guideline: Overview and interpretation of total sediment test results in the context of ISO 8217:2024

Issued by CIMAC WG 7 Fuels, 03/2024

This CIMAC document provides an overview of test methodologies for assessing stability and cleanliness of residual marine fuels through the interpretation of the accelerated total sediment (TSA), potential total sediment (TSP) and existent total sediment (TSE) test results.

Link to full paper

4 Guideline: CIMAC Guideline Marine-fuels containing FAME

Issued by CIMAC WG 7 Fuels, 04/2024

Since the Paris Climate agreement in 2015, many industries have started the decarbonisation journey, with major steps taken to achieve the ambitions set out. Shipping was initially excluded from the agreement, nevertheless voluntary initiatives have been undertaken and now additional regulations have been agreed in order to reach current climate ambitions, which are to achieve net zero greenhouse gas emissions in 2050.

One of the most readily available ways to decarbonise shipping is the use of biomass derived fuels. The current amount of available biofuel is not sufficient to reach the targets set. It is however a first step and additional technical innovation, and investment will increase the uptake of this decarbonisation pathway. The development of biofuels is therefore ongoing, and more differentiation is expected in the biomass used, processing and resulting qualities. ISO has published a new version of the ISO 8217 Specifications of marine fuels standard and to support this transition it now allows the use of FAME up to a concentration of 100% in specific grades.

FAME has been used in road transportation for many years and vast experience is available. However, its adoption within the maritime industry requires specific attention to be given to the handling of these products. When these requirements are met the use onboard ships has been successful.

This document serves as a guideline for shipowners and operators to safely use biofuels in conjunction with the publication of ISO 8217:2024. It is mainly focused on Fatty Acid Methyl Esters (FAME) and blends with fossil fuel.

Link to full paper

5 Guideline: Design and operation of fuel cleaning systems for diesel engines

Issued by CIMAC WG 7 Fuels, 09/2024, v2

The safe handling of fuels on board ship requires four key component elements to align to ensure the fuel as delivered is safely and efficiently stored, cleaned, and conditioned prior to its intended use.

These elements include:

1. The correct selection of the ISO 8217 fuel grade to meet the specific ship's machinery plant and fuel system design, technical and operational requirements.
2. A fuel system designed for flexibility to cope with the global diversity of fuel blends being supplied as expected for the operational profile of the specific ship.
3. Information on the properties of each fuel at point of supply made available to enable effective fuel management.
4. Engineers well trained on the most recent best practices in applying effective fuel management.

Most ships operating today have fuel system designs common to both two-stroke and four-stroke engines meeting the minimum requirements, which are still suitable for the fuels in use. The systems, however, may not necessarily offer the degree of flexibility required to handle efficiently the more widely diverse range of fuel blends being supplied since the introduction of VLSFO (Very Low Sulfur Fuel Oil) grades from January 2020.

Experience in the use of VLSFO since the start of 2020, has highlighted the importance of much more compositional awareness of the fuel properties as supplied and a greater flexibility in system design to manage the more complex storage requirements for segregation, pre-treatment/cleaning and thermal management.

The guideline will also address the quality of distillate fuels.

Link to full paper

6 Position paper: On Enabling the Implementation of a Ship-wide Data Ecosystem

Issued by CIMAC Digitalization Strategy Group 05/2024

State-of-the-art, mature technology is available for implementing a ship-wide data ecosystem that would enable full optimization of the shipping process to reduce OPEX and environmental impact while adequately addressing the concerns of the marine industry stakeholders. The approach here

proposed aims to provide a pathway towards seamless integration of the data subsystems on board while minimising investment costs.

In particular, virtualisation of vendor hardware, especially through the use of software **containers**:

- Ensures **protection of data property** – data inside a container is not visible to the others
- Ensures **low implementation cost** and **operation overhead** – only one data centre and one operating system need to be maintained
- Avoids the **proliferation of** data processing and connectivity **equipment** – using shared computational resources
- Avoids **vendor lock-in** – all data intelligence is in the container, it can easily be replaced.

And **the data exchange model here proposed**:

- Ensures **protection of data property** – each producer can decide which data to publish
- Ensures **business model freedom** – each producer can manage different data subscriptions according to the associated license agreement
- Ensures **secure data exchange** – only authorised subscribers can receive the (encrypted) data
- Ensures **low implementation cost** and **operation overhead** and avoids **vendor lock-in** – a common SDK is used by all players in the industry

Risk reduction associated with data sharing would be ensured by the use of proven technology.

Link to full paper

7 CIMAC WG7 Fuels Guideline - ISO 8217:2024 - FAQ

Issued by CIMAC WG 7 Fuels, 06/2024

With the introduction in 2012 of the fifth edition 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. As a result of learnings from that process, on releasing the sixth edition, WG6 decided, in cooperation with CIMAC WG7, to make an up-front set of “frequently asked questions” (FAQ) to speed up the communication and the education process. As the FAQ was a success, ISO WG6 and CIMAC WG7 will repeat this process, issuing a new FAQ for future editions. In 2024, a new edition of ISO 8217 (edition seven) 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 standard. In collaboration with the ISO/TC 28/SC4/WG6, CIMAC WG7 has collated and provided responses to these questions which reflect the collective thinking of the working group. This FAQ will provide the reader with the basis and reasoning for the changes made to the previous edition, ISO 8217:2017.

Link to full paper

8 CIMAC and Maritime Battery Forum Joint Whitepaper Environment for the use of batteries in deep-sea shipping

Issued by CIMAC and the Maritime Battery Forum, 09/2024

The experts from #CIMAC Greenhouse Gas Strategy Group, Working Group 20 System Integration, Working Group 21 Propulsion, and the Maritime Battery Forum have consolidated their knowledge and existing literature with empirical data in a comprehensive paper.

By means of the 2023 GHG strategy, the International Maritime Organization (IMO) set the course for the decarbonization of the shipping industry. The goal is “to reach net-zero [Greenhouse gas (GHG)] emissions by or around, i.e. close to, 2050” (IMO 2023a: 1), with additional sub-targets set for 2030 (by at least 20%, striving for 30%) and 2040 (by at least 70%, striving for 80%). While further policy measures will follow, the industry is already working on different solutions to decarbonize. According to DNVs Maritime Forecast to 2050 (DNV 2023a: 33), hydrodynamics and machinery are expected to lower GHG emissions by 5% to 15% or even 20% respectively. Logistics and digitalization may also contribute to 20% GHG emission reduction from ships.

Even more emission reductions can be expected from the usage of alternative energy sources and carbon capture and storage: 0% to 100% and 0% to 90% reduction potential respectively. Especially deep-sea shipping needs to reduce emissions, since it causes most of today’s shipping sector emissions (Transport & Environment 2024: 1). Accordingly, the question arises: how to achieve the needed reduction, especially in deep-sea shipping? Although alternative fuels are key to achieve decarbonization, further steps need to be taken.

In multiple studies (e.g., DNV 2023b, IMO 2023b, IEA 2023) there have been discussions on the upcoming challenges in terms of technologies (e.g. alternative fuels, carbon capture/storage) and the required changes with respect to infrastructure, demand signals, the rate of change itself, and last but not least the political measures to be implemented by the international community. These developments emphasize the need to implement reduction measures to enable the industry sub targets already on the horizon in 2030. Electrification and battery usage are important for the global energy transition and are also mentioned in the context of deep-sea shipping. However, are battery-electric propulsion and spinning reserve realistic options and, if so, to which extent? Since the answer is way more detailed than a simple yes or no CIMAC and the Maritime Battery Forum decided to jointly work on and publish a series of papers helping to clear the fog around the topic battery usage in deep-sea shipping.

In fact, we see a certain lack of transparency on the battery usage in deep-sea shipping as today’s public discourse tends to include positions that either try to give an easy answer e.g., only including specific use-cases, or are highly complex hypothetical scenarios with very specific assumptions. Thus, as the interconnecting piece between technology supplier and buyer, we strive to provide an unbiased overview of the industry through various angles addressing technological, environmental, economic, operational, or legal aspects. Furthermore, we aim to give a better overview on the status quo enabling CIMAC, Maritime Battery Forum members and other stakeholders to better assess hypotheses and scenarios on future developments in the merchant ship industry. This is the first paper in the series – here we focus on the use-cases, application areas and limits. To this end, we want to answer two questions concerning the battery use in deep-sea shipping: 1. What use-cases for batteries are and will (likely) be existent in the industry? 2. Which are the application areas and their corresponding limitations?

Link to full paper

Imprint

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CIMAC is the leading global non-profit association promoting the development of ship propulsion, train drive and power generation. The association consists of National Member Associations and Corporate Members in America, Asia and Europe. CIMAC provides a forum for technical interchange with all parties interested in piston engines, gas turbine systems, non-shaftline propulsion systems, automation and controls, system integration and digitalization solutions.

CIMAC acts as a global platform for discussion through a range of events, namely the CIMAC Congress (once every three years), CIMAC Circles, CASCADES and web seminars. The content-related work evolves around CIMAC's Strategy and Workings Groups which produce publications on various topics.

For further information about CIMAC please visit http://www.cimac.com.