PD ISO/TR 18588:2023



BSI Standards Publication

Petroleum products — Characterization of marine fuels by viscosity-gravity constant

bsi.

National foreword

This Published Document is the UK implementation of ISO/TR 18588:2023.

The UK participation in its preparation was entrusted to Technical Committee PTI/2, Liquid Fuels.

A list of organizations represented on this committee can be obtained on request to its committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 23072 7

ICS 75.160.20

Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 October 2023.

Amendments/corrigenda issued since publication

Date	Text affected

PD ISO/TR 18588:2023

TECHNICAL REPORT

ISO/TR 18588

First edition
2023-09-22

Petroleum products — Characterization of marine fuels by viscosity-gravity constant

Produits pétroliers — Caractérisation des combustibles pour la marine par la constante viscosité-gravité

Reference number
ISO/TR 18588:2023(E)

© ISO 2023



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Characterization of petroleum fuels **1**
4.1 General 1
4.2 BMCI (or CI) 2
4.2.1 General 2
4.2.2 Calculation of BMCI (or CI) 2
4.2.3 Algorithm to calculate BMCI (or CI) 3
4.3 Viscosity-gravity constant 4
4.3.1 General 4
4.3.2 Calculation of VGC 4
4.3.3 Algorithm to calculate VGC 4
5 Samples data analysis **4**
5.1 General 4
5.2 BMCI versus VGC and density for fuels with S content ≤0,50 % by mass 5
5.3 BMCI versus VGC and density for fuels with S content ≥0,50 % by mass 6
5.4 Significance and use of VGC 8
Annex A (informative) **Algorithms to calculate SG, BMCI and VGC** **10**
Bibliography **12**

© ISO 2023 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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*.

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.

© ISO 2023 – All rights reserved

Introduction

On 1 January 2020, MARPOL Annex VI Regulation 14.1 reduced the maximum sulfur (S) content of marine fuels to be used when operating outside an emission control area (ECA) from 3,50 % by mass to 0,50 % by mass. This resulted in a more diverse range of fuel blend formulations being offered to the marine market and an increasing interest by the marine industry in the characterization of petroleum-derived fuels not including fatty acid methyl ester (FAME), in terms of their aromatic or paraffinic nature.

This document provides an indicator for defining whether a petroleum-derived residual fuel which does not include FAME, as supplied to a ship, is more aromatic or paraffinic in nature.

© ISO 2023 – All rights reserved

TECHNICAL REPORT **ISO/TR 18588:2023**

Petroleum products — Characterization of marine fuels by viscosity-gravity constant

1 Scope

This document provides best practices on the calculation and use of an informative indicator for the characterization of fossil residual marine fuels not containing FAME as defined in ISO 8217. This document is based on established guidance used by the petroleum industry to characterize petroleum fractions in terms of their paraffinic, naphthenic or aromatic nature, by their viscosity-gravity constant.

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 vegetable oils

3.2
very low sulfur fuel oil
VLSFO
marine fuel with a maximum sulfur content of 0,50 % by mass

3.3
high sulfur fuel oil
HSFO
marine fuel with a sulfur content exceeding 0,50 % by mass

4 Characterization of petroleum fuels

4.1 General

Riazi[1] cites two methods for the characterization of petroleum fractions:

— the Bureau of Mines correlation index (BMCI);

— the viscosity-gravity constant (VGC).

© ISO 2023 – All rights reserved