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BSI Standards Publication

**Lubricants, industrial oils and related products  
(class L) - Family H (Hydraulic systems) -  
Specifications for hydraulic fluids in categories  
HFAE, HFAS, HFB, HFC, HFDR and HFDU**

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## National foreword

This British Standard is the UK implementation of EN ISO 12922:2020. It is identical to ISO 12922:2020. It supersedes BS EN ISO 12922:2012, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee MCE/18/-/16, Hydraulic fluids.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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### Amendments/corrigenda issued since publication

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## EUROPÄISCHE NORM

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English Version

**Lubricants, industrial oils and related products (class L) -  
Family H (Hydraulic systems) - Specifications for hydraulic  
fluids in categories HFAE, HFAS, HFB, HFC, HFDR and  
HF DU (ISO 12922:2020)**

Lubrifiants, huiles industrielles et produits connexes  
(classe L) - Famille H (Systèmes hydrauliques) -  
Spécifications applicables aux fluides hydrauliques des  
catégories HFAE, HFAS, HFB, HFC, HFDR et HF DU (ISO  
12922:2020)

Schmierstoffe, Industrieöle und verwandte Produkte  
(Klasse L) - Familie H (Hydraulische Systeme) -  
Anforderungen an Druckflüssigkeiten in den  
Kategorien HFAE, HFAS, HFB, HFC, HFDR und HF DU  
(ISO 12922:2020)

This European Standard was approved by CEN on 26 January 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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## European foreword

This document (EN ISO 12922:2020) has been prepared by Technical Committee ISO/TC 28 "Petroleum and related products, fuels and lubricants from natural or synthetic sources" in collaboration with Technical Committee CEN/TC 19 "Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin." the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 12922:2012.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Endorsement notice

The text of ISO 12922:2020 has been approved by CEN as EN ISO 12922:2020 without any modification.

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## 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 documents 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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](http://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 third edition cancels and replaces the second edition (ISO 12922:2012), which has been technically revised. The main changes compared with the previous edition are as follows:

- an introduction and a terms and definitions clause have been added;
- the methods specified for measuring water content in water-based fluid types HFA/HFB/HFC have been revised;
- the oxidation requirements for HFDU fluids have been increased.

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](http://www.iso.org/members.html).

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## Introduction

Hydraulic fluids constitute the largest segment of the industrial lubricant market. Although mineral oil-based fluids are by far the most widely used type of hydraulic fluid, there are some applications where the use of these fluids could constitute a fire hazard. In order to reduce the risk to operatives in such circumstances, fire-resistant or less flammable fluids that increase operator safety have been developed. However, the following points should be noted.

- Even fire-resistant fluids can ignite at very high temperatures and the flammability behaviour of the fluids specified in this document covers a very wide range. It is therefore necessary to know the level of hazard in order to select the appropriate fluid.
- The properties of these fluids can be significantly different to those of conventional mineral oil-based products. For example, some fire-resistant fluids contain water. It might therefore be necessary to design the system for their use. It should also not be assumed that synthetic, non-aqueous fluids can replace mineral oil products without system modifications. Some fluids, for example, are incompatible with the elastomers used with mineral oils.

To enable the satisfactory operation of fire-resistant hydraulic fluids, it is recommended that this document is read in conjunction with ISO 7745.

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# Lubricants, industrial oils and related products (class L) — Family H (hydraulic systems) — Specifications for hydraulic fluids in categories HFAE, HFAS, HFB, HFC, HFDR and HFDU

**WARNING** — The handling and use of products as specified in this document can be hazardous if suitable precautions are not observed. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use.

## 1 Scope

This document specifies the minimum requirements of unused fire-resistant and less flammable hydraulic fluids for hydrostatic and hydrodynamic systems in general industrial applications. It is not intended for use in aerospace or power-generation applications, where different requirements apply. It provides guidance for suppliers and end users of these less hazardous fluids and to the manufacturers of hydraulic equipment in which they are used.

Of the categories covered by ISO 6743-4, which classifies the different types of fluids used in hydraulic applications, only the following are detailed in this document: HFAE, HFAS, HFB, HFC, HFDR and HFDU.

Types HFAE, HFAS, HFB, HFC and HFDR are "fire-resistant" fluids as defined by ISO 5598. Most HFDU fluids, while displaying an improvement in combustion behaviour over mineral oil, fall outside this definition and are more appropriately considered as "less flammable" fluids.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 760, *Determination of water — Karl Fischer method (General method)*

ISO 2160, *Petroleum products — Corrosiveness to copper — Copper strip test*

ISO 3104, *Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity*

ISO 3170, *Petroleum liquids — Manual sampling*

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*

ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

ISO 4259-2, *Petroleum and related products — Precision of measurement methods and results — Part 2: Interpretation and application of precision data in relation to methods of test*

ISO 4263-2, *Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids — TOST test — Part 2: Procedure for category HFC hydraulic fluids*

ISO 4263-3, *Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids using the TOST test — Part 3: Anhydrous procedure for synthetic hydraulic fluids*