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Nadomešča:

SIST ISO 15380:2011

Maziva, industrijska olja in sorodni proizvodi (skupina L) - Podskupina H (hidravlični sistemi) - Specifikacije za hidravlične tekočine kategorije HETG, HEPG, HEES in HEPR

Lubricants, industrial oils and related products (class L) - Family H (Hydraulic systems) - Specifications for hydraulic fluids in categories HETG, HEPG, HEES and HEPR

Lubrifiants, huiles industrielles et produits connexes (classe L) - Famille H (Systèmes hydrauliques) - Spécifications applicables aux fluides hydrauliques des catégories HETG, HEPG, HEES et HEPR

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Lubricants, industrial oils and related products (class L) — Family H (Hydraulic systems) — Specifications for hydraulic fluids in categories HETG, HEPG, HEES and HEPR

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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).

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).

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

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

The committee responsible for this document is ISO/TC 28, *Petroleum products and related products of synthetic or biological origin*, Subcommittee SC 4, *Classifications and specifications*.

This third edition cancels and replaces the second edition (ISO 15380:2011), which has been technically revised.

Introduction

The specifications for hydraulic fluids based upon mineral oils (H) are described in ISO 11158[1] while the specifications for fire-resistant hydraulic fluids (HF) are given in ISO 12922[2]. This International Standard gives specifications for environmentally acceptable hydraulic fluids (HE). These fluids are readily biodegradable and have a low eco-toxicity. They are designed to minimize the impact upon the environment in the event of a leak or spill.

This International Standard contains three informative annexes. Annex A contains guidelines for changing fluids from mineral-based oils to environmentally acceptable fluids. Annex B contains additional information on shear stability. Annex C covers the disposal of hydraulic fluids.

Lubricants, industrial oils and related products (class L) — Family H (Hydraulic systems) — Specifications for hydraulic fluids in categories HETG, HEPG, HEES and HEPR

WARNING — The handling and use of products as specified in this International Standard can be hazardous if suitable precautions are not observed. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. The environmentally acceptable fluids should not present any significant hazard to health when used correctly in hydraulic equipment, observing the supplier's handling recommendations.

1 Scope

This International Standard specifies the requirements for environmentally acceptable hydraulic fluids and is intended for hydraulic systems, particularly hydraulic fluid power systems. The purpose of this International Standard is to provide guidance for suppliers and users of environmentally acceptable hydraulic fluids and for the direction of original equipment manufacturers of hydraulic systems.

This International Standard stipulates the requirements for environmentally acceptable hydraulic fluids at the time of delivery.

Classification of fluids used in hydraulic application is defined in ISO 6743-4. This International Standard encompasses only four of the categories of environmentally acceptable fluids covered by ISO 6743-4. These categories are HETG, HEPG, HEES and HEPR. The minimum content of base fluid for each category shall not be less than 70 % (m/m).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2049, *Petroleum products — Determination of colour (ASTM scale)*

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

ISO 2592, *Determination of flash and fire points — Cleveland open cup method*

ISO 3016, *Petroleum products — Determination of pour point*

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, *Petroleum products — Determination and application of precision data in relation to methods of test*

ISO 4263-1, *Petroleum and related products — Determination of the ageing behaviour of inhibited oils and fluids — TOST test — Part 1: Procedure for mineral oils*

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*

ISO 4406, *Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles*

ISO 6072, *Rubber — Compatibility between hydraulic fluids and standard elastomeric materials*

ISO 6245, *Petroleum products — Determination of ash*

ISO 6247, *Petroleum products — Determination of foaming characteristics of lubricating oils*

ISO 6296, *Petroleum products — Determination of water — Potentiometric Karl Fischer titration method*

ISO 6341, *Water quality — Determination of the inhibition of the mobility of Daphnia magna Straus (Cladocera, Crustacea) — Acute toxicity test*

ISO 6614, *Petroleum products — Determination of water separability of petroleum oils and synthetic fluids*

ISO 6618, *Petroleum products and lubricants — Determination of acid or base number — Colour-indicator titration method*

ISO 6619, *Petroleum products and lubricants — Neutralization number — Potentiometric titration method*

ISO 6743-4, *Lubricants, industrial oils and related products (class L) — Classification — Part 4: Family H (Hydraulic systems)*

ISO 7120, *Petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust-preventing characteristics in the presence of water*

ISO 7346-2, *Water quality — Determination of the acute lethal toxicity of substances to a freshwater fish [Brachydanio rerio Hamilton-Buchanan (Teleostei, Cyprinidae)] — Part 2: Semi-static method*

ISO 8192, *Water quality — Test for inhibition of oxygen consumption by activated sludge for carbonaceous and ammonium oxidation*

ISO 9120, *Petroleum and related products — Determination of air-release properties of steam turbine and other oils — Impinger method*

ISO 9439, *Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Carbon dioxide evolution test*

ISO 10634, *Water quality — Guidance for the preparation and treatment of poorly water-soluble organic compounds for the subsequent evaluation of their biodegradability in an aqueous medium*

ISO 11500, *Hydraulic fluid power — Determination of the particulate contamination level of a liquid sample by automatic particle counting using the light-extinction principle*

ISO 12185, *Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method*

ISO 12937, *Petroleum products — Determination of water — Coulometric Karl Fischer titration method*

ISO 14593, *Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Method by analysis of inorganic carbon in sealed vessels (CO_2 headspace test)*

ISO 14635-1, *Gears — FZG test procedures — Part 1: FZG test method A/8,3/90 for relative scuffing load-carrying capacity of oils*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 20763, *Petroleum and related products — Determination of anti-wear properties of hydraulic fluids — Vane pump method*

DIN 51554-3, *Testing of mineral oils; Test of susceptibility to ageing according to Baader; Testing at 95 °C*

ASTM D2532, *Standard Test Method for Viscosity and Viscosity Change After Standing at Low Temperature of Aircraft Turbine Lubricants*

3 Sampling

Sampling of hydraulic fluids for the purpose of this International Standard shall be carried out in accordance with the pertinent procedure specified in ISO 3170. A representative test specimen should be taken for analysis.

Any drum, barrel, tanker compartment or other type of container delivered to the end user may be sampled and analyzed at the purchaser's discretion.

4 Requirements of environmentally acceptable hydraulic fluids

For the purpose of this International Standard, hydraulic fluids shall be triglycerides, polyglycols, synthetic esters, polyalphaolefins and related hydrocarbon products. The classification of these hydraulic oils shall be in accordance with ISO 6743-4 for categories HETG, HEPG, HEES and HEPR. The minimum content of base fluid for each category shall not be less than 70 % (*m*/*m*).

Fluid classification should correspond to the major base stock component.

When tested using prescribed methods, the fluids' characteristics shall comply with limiting values set out in Table 1 to Table 5, where applicable.

The appearance of the delivered oils shall be clear and bright and free of any visible particulate matter when viewed under normal visible light at ambient temperature. The cleanliness level shall be expressed according to ISO 4406 and ISO 11500.

The precision (repeatability and reproducibility) of the test methods in this International Standard and the interpretation of the results shall be in accordance with ISO 4259, which shall be consulted in instances of uncertainty or dispute.

The environmental behaviour specifications for categories HETG, HEPG, HEES and HEPR are given in Table 1.

Table 1 — Environmental behaviour requirements for categories HETG, HEPG, HEES and HEPR

Characteristic of test	Unit	Requirement	Test method or applicable standard
Biodegradability, 28 days, min.	%	60	ISO 14593 or ISO 9439
Toxicity[a]			
Acute fish toxicity, 96 h, LC50, min.	mg/l	100	ISO 7346-2
Acute Daphnia toxicity, 48 h, EC50, min.	mg/l	100	ISO 6341
Bacterial inhibition, 3 h, EC50, min.	mg/l	100	ISO 8192

[a] Water-soluble fluids shall be tested according to the test method cited. Fluids with low water solubility shall be tested using water-accommodated fractions, prepared according to ISO 10634.