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भारतीय मानक मसौदा

**स्नेहक, औद्योगिक तेल और संबंधित उत्पाद (कक्षा एल) - परिवार एच (हाइड्रोलिक सिस्टम) -
हाइड्रोलिक तरल पदार्थों के श्रेणियों एचईटीजी, एचईपीजी, एचईईजी और एचईपीआर – विशिष्ट**

Draft Indian Standard

**LUBRICANTS, INDUSTRIAL OILS AND RELATED PRODUCTS (CLASS L) —
FAMILY H (HYDRAULIC SYSTEMS) — SPECIFICATIONS FOR HYDRAULIC
FLUIDS IN CATEGORIES HETG, HEPG, HEES AND HEPR**

(ICS No. 75.100)

Lubricants And their Related Products Sectional Committee,
PCD 25

Last date for receipt of comment is
6 May 2024

NATIONAL FOREWORD

(Formal clauses will be added later)

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

- Wherever the words ‘International Standard’ appear referring to this standard, they should be read as ‘Indian Standard’.
- Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standard also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 1817 Rubber, vulcanized or thermoplastic — Determination of the effect of liquids	IS 3400 (Part 6) : 2018 / ISO 1817 : 2015 Methods of Test for Vulcanized Rubbers Part 6 Determination of the Effect of Liquids (<i>fourth revision</i>)	Identical

ISO 2049, Petroleum products — Determination of colour (ASTM scale)	IS 1448 (Part 12): 2013/ISO 2049 :1996 Methods of test for Petroleum and its products (Part 12) Determination of colour (ASTM scale) (<i>second revision</i>)	Identical
ISO 2160, Petroleum products — Corrosiveness to copper — Copper strip test	IS 1448 (Part 15): 2004 / ISO 2160: 1998 Methods of Test for Petroleum and Its Products (Part 15) Petroleum Products - Corrosiveness to Copper - Copper Strip Test	Identical
ISO 2592, Petroleum and related products — Determination of flash and fire points — Cleveland open cup method	IS 1448 (Part 69): 2019/ ISO 2592 : 2017 Methods of Test for Petroleum and its Products (Part 69) Determination of Flash and Fire Points — Cleveland Open Cup Method (<i>second revision</i>)	Identical
ISO 2909, Petroleum products — Calculation of viscosity index from kinematic viscosity	IS 1448 (Part 56): 2013/ ISO 2909: 2002 Methods of test for Petroleum and its products (Part 56) Calculation of viscosity index from kinematic viscosity (<i>third revision</i>)	Identical
ISO 3016, Petroleum and related products from natural or synthetic sources — Determination of pour point	IS 1448 (Part 10/Sec 2): 2021/ ISO 3016 : 2019 Methods of Test for Petroleum and its Products Part 10 Petroleum and Related Products from Natural or Synthetic Sources Section 2 Determination of pour point (<i>third revision</i>)	Identical
ISO 3104, Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity	IS 1448 (Part 25/Sec 1) : 2018/ ISO 3104 : 1994 Methods of Test for Petroleum and its Products (Part 25) Transparent And Opaque Liquids Section 1 Determination of Kinematic Viscosity and Calculation of Dynamic Viscosity	Identical
ISO 3170, Petroleum liquids — Manual sampling	IS 1447 (Part 1): 2021 Methods of Sampling of Petroleum and its Products Part 1 Manual Sampling (<i>second revision</i>)	Not Equivalent
ISO 3448, Industrial liquid lubricants — ISO viscosity classification	IS 9466 : 2020 Viscosity classification for industrial liquid lubricants (<i>first revision</i>)	Not Equivalent
ISO 3675, Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method	IS 1448 (Part 16): 2014 / ISO 3675: 1998 Methods of test for petroleum and its products Part 16 Crude petroleum and liquid petroleum products — Laboratory	Identical

	determination of density — Hydrometer method (<i>fourth revision</i>)	
ISO 4259-1, Petroleum and related products — Precision of measurement methods and results — Part 1: Determination of precision data in relation to methods of test	IS 17315 (Part 1) : 2019/ISO 4259-1 : 2017 Petroleum and Related Products — Precision of Measurement Methods and Results Part 1 Determination of Precision Data in Relation to Methods of Test	Identical
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	IS 17315 (Part 2): 2019 / ISO 4259-2: 2017 Petroleum and related products — Precision of measurement methods and results interpretation and application of precision data in relation to methods of test	Identical
ISO 4406, Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles	IS 13542: 2023/ ISO 4406: 2021 Hydraulic Fluid Power — Fluids — Method for Coding the Level of Contamination by Solid Particles (<i>third revision</i>)	Identical
ISO 6072, Rubber — Compatibility between hydraulic fluids and standard elastomeric materials	IS 15179: 2002 / ISO 6072: 1986 Hydraulic fluid power - Compatibility between elastomeric materials and fluids	Identical
ISO 6245, Petroleum products — Determination of ash	IS 1448 (Part 4/Sec 1): 2021 Methods of Test for Petroleum and its Products Part 4/Section 1 Determination of Ash (<i>fourth revision</i>)	Technically modified with ISO 6245:2001
ISO 6247, Petroleum products — Determination of foaming characteristics of lubricating oils	IS 1448 (Part 67): 2020 Methods of test for petroleum and its products determination of foaming characteristics of lubricating oils (<i>second revision</i>)	Technically modified with ISO 6247 : 1998
ISO 6296, Petroleum products — Determination of water — Potentiometric Karl Fischer titration method	IS 1448 (Part 175) : 2020 / ISO 6296 : 2000 Methods of test for petroleum and its products Part 175 Petroleum products — Determination of water — Potentiometric Karl Fischer titration method	Identical
ISO 6614, Petroleum products — Determination of water separability of petroleum oils and synthetic fluids	IS 1448 (Part 91) : 2019/ ISO 6614 : 1994 Methods of Test for Petroleum and its Products (Part 91) Determination of Water Separability of Petroleum Oils and Synthetic Fluids	Identical

	(<i>first revision</i>)	
ISO 6618, Petroleum products and lubricants — Determination of acid or base number — Colour-indicator titration method	IS 1448 (Part 188): 2021 / ISO 6618: 1997 Methods of Test for petroleum and its products Part 188 Petroleum products and lubricants — Determination of acid or base number — Colour- indicator titration method	Identical
ISO 6619, Petroleum products and lubricants — Neutralization number — Potentiometric titration method	IS 1448 (Part 2): 2007 / ISO 6619 : 1988 Methods of test for petroleum and its products Part 2 Petroleum products and lubricants — Neutralization number — Potentiometric titration method (<i>second revision</i>)	Identical
ISO 6743-4, Lubricants, industrial oils and related products (class L) — Classification — Part 4: Family H (Hydraulic systems)	IS 11159 (Part 5) : 2019 / ISO 6743-4 : 1999 Lubricants, industrial oils and related products (Class L) - Classification: Part 5 Family H (Hydraulic Systems) (<i>first revision</i>)	Identical
ISO 7120, Petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust-preventing characteristics in the presence of water	IS 1448 (Part 96) : 2019 / ISO 7120 : 1987 Methods of test for petroleum and its products Part 96 petroleum products and lubricants — Petroleum oils and other fluids — Determination of rust — Preventing characteristics in the presence of water (<i>first revision</i>)	Identical
ISO 9120, Petroleum and related products — Determination of air-release properties of steam turbine and other oils — Impinger method	IS 1448 (Part 102): 2023 Methods of test for petroleum and its products Part 102 Determination of air release value (<i>first revision</i>)	Not equivalent
ISO 12185, Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method	IS 1448 (Part 167): 2018 / ISO 12185: 1996 Methods of test for petroleum and its products Part 167 Determination of density - Oscillating U - Tube method	Identical
ISO 12937, Petroleum products — Determination of water — Coulometric Karl Fischer titration method	IS 1448 (Part 182) : 2020/ ISO 12937 : 2000 Methods of Test for Petroleum and its Products Part 182 Petroleum Products — Determination of Water — Coulometric Karl Fischer Titration Method	Identical

The technical committee has reviewed the provisions of the following International Standards referred in this adopted standard and has decided that they are acceptable for use in conjunction with this standard:

<i>International Standard</i>	<i>Title</i>
ISO 4259-3	Petroleum and related products — Precision of measurement methods and results — Part 3: Monitoring and verification of published precision data in relation to methods of test
ISO 4259-4	Petroleum and related products — Precision of measurement methods and results — Part 4: Use of statistical control charts to validate 'in-statistical-control' status for the execution of a standard test method in a single laboratory
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 6341	Water quality — Determination of the inhibition of the mobility of <i>Daphnia magna</i> Straus (Cladocera, Crustacea) — Acute toxicity test
ISO 7346-2	Water quality — Determination of the acute lethal toxicity of substances to a freshwater fish [<i>Brachydanio rerio</i> 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 9439	Water quality — Evaluation of ultimate aerobic biodegradability of organic compounds in aqueous medium — Carbon dioxide evolution test
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 13226	Rubber — Standard reference elastomers (SREs) for characterizing the effect of liquids on vulcanized rubbers
ISO 13357-1	Petroleum products — Determination of the filterability of lubricating oils — Part 1: Procedure for oils in the presence of water
ISO 13357-2	Petroleum products — Determination of the filterability of lubricating oils — Part 2: Procedure for dry oils

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 14669	Water quality — Determination of acute lethal toxicity to marine copepods (Copepoda, Crustacea)
ISO 16221	Water quality — Guidance for determination of biodegradability in the marine environment
ISO 20763	Petroleum and related products — Determination of anti-wear properties of hydraulic fluids — Vane pump method
ISO 26422	Petroleum and related products — Determination of shear stability of lubricating oils containing polymers — Method using a tapered roller bearing
EN 16807	Liquid petroleum products — Bio-lubricants — Criteria and requirements of bio-lubricants and bio-based lubricants
EN 17181	Lubricants — Determination of aerobic biological degradation of fully formulated lubricants in an aqueous solution — Test method based on CO ₂ production
ASTM D2272	Standard Test Method for Oxidation Stability of Steam Turbine Oils by Rotating Pressure Vessel
ASTM D2532	Standard Test Method for Viscosity and Viscosity Change After Standing at Low Temperature of Aircraft Turbine Lubricants
ASTM D6081	Standard Practice for Aquatic Toxicity Testing of Lubricants: Sample Preparation and Results Interpretation
ASTM D6866	Standard Test Methods for Determining the Biobased Content of Solid, Liquid and Gaseous Samples Using Radiocarbon Analysis

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2: 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that off specified value in this standard.

NOTE — The technical content of this document has not been enclosed as this is identical with the corresponding ISO Standard. For details, please refer to ISO 15380 : 2023 or kindly contact:

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