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***भारतीय मानक***

***Indian Standard***

**IS 6552 : 2024**

**स्ट्रेट मिनरल उच्च विपासनीय  तेल - विशिष्टि**

*(*दूसरा पुनरीक्षण)

**STRAIGHT MINERAL HIGH DEMULSIBILITY OILS —SPECIFICATION**

(*Second Revision)*

ICS 75.100

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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**January 2024 Price Group X**

Lubricants and their Related Products Committee, PCD 25

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Lubricants and their Related Products Committee had been approved by the Petroleum, Coal and Related Products Division Council.

A number of rolling mills turning out accurate profiles are using oil film bearing on the back up and/or on the main rolls. These bearings need high grade bearing oil possessing excellent water separating properties because of the peculiar feature of water contamination which is common in these systems.

This standard was originally published in 1972 and was subsequently revised in 1987 to align the standard with the latest IPSS standard to enable steel plants to procure the right type of material suited to their needs.

In this revision has been brought out to keep pace with the latest technological developments and international practices. In this revision, high grade mineral oil (additives type) has been incorporated for special applications, such as oil film roll neck bearings, in steel plants.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

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 of the specified value in this standard.

*Indian Standard*

STRAIGHT MINERAL HIGH DEMULSIBILITY OILS — SPECIFICATION

*( Second Revision )*

**1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for high grade straight mineral high demulsibility oils used on oil film bearings employed in steel mills and other similar applications.

**2 REFERENCES**

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards.

**3 TYPES AND GRADES**

**3.1 Type 1**

Straight mineral high demulsibility oil. It shall be of nine grades depending upon its kinematic viscosity.

**3.2 Type 2**

High grade straight mineral high demulsibility oil, additives type. It shall be of six grades depending upon its kinematic viscosity.

**4 REQUIREMENTS**

**4.1 General**

The material shall be bright, clear and free from water, clay, dirt or any suspended impurities.

**4.2 Composition**

The material shall consist of paraffinic base oils having a high chemical stability.

NOTE — Use of viscosity index (VI) improvers is not permitted.

The high-grade mineral oil shall be free from acid and other impurities, must have resistance to oxidation and formation of sludge when subjected to rolling mill service, and must separate water, air, and other contaminants rapidly.

**4.3** The material shall also comply with the requirements given in Table 1 and Table 2, when tested according to the appropriate test methods prescribed in col (12) of Table 1 and col (9) of Table 2.

**5 PACKING AND MARKING**

**5.1 Packing**

The material shall be packed in securely closed metal or any other suitable containers as agreed to between the purchaser and the supplier.

**5.2** **Marking**

**5.2.1** The packaging of the material shall be marked with the following information:

1. Name and type of material;
2. Manufacturer's name, initials or trademark, if any;
3. Net mass of material;
4. Identification in code or otherwise to enable the lot of consignment or manufacture to be traced back from records; and
5. Any other statutory requirements.

**5.2.2** *BIS Certification Marking*

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

**6 SAMPLING**

**6.1** Representative samples of the material shall be drawn as prescribed in IS 1447 (Part 1).

**6.2** All the requirements given in **4** shall be tested on the composite sample.

**6.3** The lot shall be declared as conforming to the requirements of the specification if all the test results on the composite sample satisfy the relevant requirements.

**Table 1 Requirements for Straight Mineral High Demulsibility Oils**

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(*Clause* 4.3)







**Table 2 Requirements of High Grade Straight Mineral High Demulsibility Oils, Additive Type**

(*Clause* 4.3)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sl No.** | **Characteristic** | **Requirement** | | | | | | **Method of Test** |
|  |  | Grade  VG 100 | Grade  VG 150 | Grade  VG 220 | Grade  VG 320 | Grade  VG 460 | Grade  VG 680 |  |
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| i) | Kinematic viscosity at 40 °C, mm2/s | 90 to 110 | 135 to 165 | 198 to 242 | 288 to 352 | 414 to 506 | 612 to 748 | IS 1448 (Part 25/Sec 1) |
| ii) | Viscosity index, *Min* | 90 | 90 | 90 | 90 | 90 | 80 | IS 1448 (Part 56) |
| iii) | Total acidity (mg of KOH per g of oil), *Max* | To report | | | | | | IS 1448 (Part 2) |
| iv) | Copper strip corrosion for 3 h at 100 °C | Not worse than No. 1 | | | | | | IS 1448 (Part 15) |
| v) | Pour point, °C, *Max* | -3 0 | | | | | | IS 1448 (Part 10) |
| vi) | Ash, percent by mass, *Max* | 0.001 | | | | | | IS 1448 (Part 4/Sec 1) |
| vii) | Foaming characteristics |  | | | | | |  |
| Foaming stability, volume in ml of foam after 10 min |  | | | | | | IS 1448 (Part 67) |
| a) At 24 °C, *Max* | Nil | | | | | |
| b) At 93 °C, *Max* | Nil | | | | | |
| c) At 24 °C, *Max* | Nil | | | | | |
| viii) | Flash point, cleveland (open) cup method, ºC, *Min* | 190 | 200 | 200 | 200 | 250 | 250 | IS 1448 (Part 69) |
| ix) | Demulsibility at (52 ± 1) ºC |  | | | | | |  |
| a) Percent water (*v/v*), *Max* | 30 26 | | | | | | IS 1448 (Part 95) |
| b) Free water, ml, *Min* | Report | | | | | |
| c) Emulsion, ml, *Max* | 1.0 | | | | | |
| x) | Rush test, |  | | | | | | IS 1448 (Part 96) |
| a) Method A | Pass | | | | | |
| b) Method B | Pass | | | | | |
| xi) | Rotating pressure vessel oxidation test (RPVOT), *Min* | 80 | | | | | | IS 1448 (Part 94) |

**ANNEX A**

(*Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 1447 (Part 1) : 2021 | Methods of sampling of petroleum and its products: Part 1 Manual sampling (*second revision*) |
| IS 1448 | Methods of test for petroleum and its products: |
| (Part 2) : 2007/ ISO 6619 : 1988 | Petroleum products and lubricants — Neutralization number — Potentiometric titration method (*second revision*) |
| (Part 4/Sec 1) : 2021 | Determination of ash (*fourth revision*) |
| (Part 10/ Sec 2) : 2021/ ISO 3016 : 2019 | Petroleum and related products from natural or synthetic sources, Section 2 Determination of pour point (*third revision*) |
| (Part 15) : 2004/ISO 2160 : 1998 | Petroleum products — Corrosiveness to copper — Copper strip test (*third revision*) |
| (Part 25/ Sec 1) : 2018/ ISO 3104 : 1994 | Transparent and opaque liquids, Section 1 Determination of kinematic viscosity and calculation of dynamic viscosity (*second revision*) |
| (Part 56) : 2013/ISO 2909 : 2002 | Calculation of viscosity index from kinematic viscosity (*third revision*) |
| (Part 67) : 2020 | Determination of foaming characteristics of lubricating oils (*second revision*) |
| (Part 69) : 2019/ISO 2592 : 2017 | Determination of flash and fire points — C level and open cup method (*second revision*) |
| (Part 91) : 2019/ISO 6614 : 1994 | Determination of water separability of petroleum oils and synthetic fluids (*first revision*) |
| (Part 94) : 2019 | Test for oxidation stability of lubricating grease by oxygen pressure vessel method (*first revision*) |
| (Part 95) : 2019 | Determination of demulsibility characteristics of lubricating oils (*first revision*) |
| (Part 96) : 2019/ISO 7120 : 1987 | Petroleum products and lubricants — Petroleum oils and other fluids — determination of rust-preventing characteristics in the presence of water (*first revision)* |

**ANNEX B**

(*Foreword*)

**COMMITTEE COMPOSITION**

#### Lubricants and their Related Products, PCD 25

| *Organization* | *Representative(s)* |
| --- | --- |
| In Personal Capacity (*Flat - 1002, Raheja Heights, D - Wing, off Gen A K Vaidya Marg, Dindoshi, Malad East Mumbai - 400097*) | Dr Y. P. Rao **(*Chairperson*)** |
| Afton Chemicals Private Limited, Mumbai | Shri Anand Kumar |
| Ashok Leyland Limited, Chennai | Shri Mahesh P.  Shri D. Balakrishnan (*Alternate*) |
| BASF India Limited, Mumbai | Shri Neville Colaco  Shri Ashok Sambandam (*Alternate*) |
| Bajaj Auto Limited, Pune | Shri Yogesh R. Mahajan  Shri Ramesh Goykar (*Alternate*) |
| Balmer Lawrie and Company Limited, Kolkata | Dr Mohan Lal Das  Shri Srinivasan Murli (*Alternate*) |
| Bharat Petroleum Corporation Limited, Mumbai | Shri R. Subramanian  Dr Tarunender Singh (*Alternate*) |
| Bosch Limited, Bengaluru | Dr Fredrick A.  Shri Raghuveer Rao (*Alternate*) |
| CSIR - Indian Institute of Petroleum, Dehradun | Dr Anil Kumar Sinha  Dr G. D. Thakre (*Alternate* I)  Shri Sailesh Kumar Singh (*Alternate* II) |
| Central Pollution Control Board, New Delhi | Shri Dinabandhu Gouda |
| Centre for High Technology, New Delhi | Dr P. Raman  Dr N. S. Raman (*Alternate* I)  Shri Shekar Kulkarni (*Alternate* II) |
| Chennai Petroleum Corporation Limited, Chennai | Dr V. Selvavathi  Shri H. Ramakrishnan (*Alternate*) |
| Consumer Guidance Society of India, Mumbai | Dr Sitaram Dixit  Dr M. S. Kamath (*Alternate*) |
| Defence Research and Development Organization, Research Centre Imarat, Hyderabad | Shri Kamal Prakash Singh  Shri Sonam Gupta (*Alternate*) |
| Directorate General of Quality Assurance, Ministry of Defence, Kanpur | Dr Om Prakash Singh  Shri A. K. Kanaujia (*Alternate*) |
| Gulf Oil Lubricants India Limited, Mumbai | Shri Girish Jange  Dr Jencen Mathai Arivannoor (*Alternate*) |
| Hero Motocorp Limited, New Delhi | Shri Feroz Ali Khan  Shri Rakesh Sharma (*Alternate* I)  Shri Diwit Prajapati (*Alternate* II) |
| Hindustan Petroleum Corporation Limited, Mumbai | Shri Lokender Singh Tevathiya  Shri Ashish Khanna (*Alternate*) |
| IPSS Sail, New Delhi | Shri Avadesh Kumar Gupta  Shri G. Sneha Raju (*Alternate*) |
| Indian Oil Corporation (MKTG), Mumbai | Shri Rajesh Nambiar  Dr S. Venkatesan (*Alternate*) |
| Indian Oil Corporation (R and D Centre), Faridabad | Dr Deepak Saxena  Dr Pankaj Bhatnagar (*Alternate*) |
| Indian Oil Corporation Limited - Refineries and Pipelines Division, New Delhi | Shri Ashwani Sharma  Shri R. K. Chugh (*Alternate*) |
| Lubrizol India Limited, Mumbai | Shri Kailash Sawant  Shri Sreehari Kumar (*Alternate*) |
| Mahindra and Mahindra Limited, Mumbai | Shri R. Ramaprabhu |
| Maruti Udyog Limited, Gurugram | Shri Ashok Permude  Shri Narinder Kumar (*Alternate*) |
| Ministry of Road Transport and Highways, New Delhi | Shri G. Sharan  Shri S. S. Nahar (*Alternate*) |
| National Test House, Kolkata | Dr S. N. Bandhopadhyay  Dr Umesh Singh (*Alternate*) |
| Netra NTPC Limited, Noida | Shri Rajiv Satyakam  Dr Vani G. D. (*Alternate*) |
| Oil Industry Safety Directorate, Noida | Shri Rajesh Manocha |
| Reliance India Limited, Mumbai | Shri Rahul Saxena |
| Research Designs and Standards Organization (RDSO), Lucknow | Shri Kamal Prakash Singh  Shri Rajesh Srivastava (*Alternate*) |
| Society of Indian Automobile Manufacturers (SIAM), New Delhi | Shri Prashant Kumar Banerjee  Dr Sandeep Garg (*Alternate*) |
| Steel Authority of India, Centre for Engineering and Technology, Ranchi | Shri Balakrishna Bisoyi  Shri Anujeet Rituraj (*Alternate*) |
| Swastik Oil Products Manufacturing Company Private Limited, Mumbai | Shri Bhupendra Rathod  Shri Sanat Rathod (*Alternate*) |
| TVS Motor Company Limited, Hosur | Shri Ajith Kumar |
| Tata Motors Limited, Pune | Shri Manish Gopal  Shri Pallipalayam Gowrishankar (*Alternate*) |
| BIS Directorate General | Shrimati Meenal Passi, Scientist ‘F’/Senior Director and Head (Petroleum, Coal and Related Products) [Representing Director General (***Ex-officio***)] |
| ***Member Secretary***  Shrimati Kreeti Das  Scientist C/Deputy Director  (Petroleum, Coal and Related Products), BIS | |