***भारतीय मानक***

***Indian Standard***

**IS 10647 : 2024**

***व्हील बेयरिंग ग्रीस*** ― ***विशिष्टि***

(पहला पुनरीक्षण)

**Wheel Bearing Grease ― Specification**

*(First Revision)*

ICS 75.100

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भारतीय मानक ब्यूरो

BUREAU OF INDIAN STANDARDS

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**November 2024 Price Group X**

Lubricants and their Related Products Sectional Committee, PCD 25

FOREWORD

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

Standards are available on number of specifications on greases such as automotive grease, general purpose grease, graphite grease, antifriction bearing grease, locomotive grease, low temperature grease, lithium soap grease, etc. but there was no suitable specification for a good quality wheel bearing grease which is required by the automotive industry and railways. In order to meet the requirements of the industry, this specification was prepared with a view to facilitate the supply of this product to the various users.

This standard was first published in 1983. This first revision has been brought out to keep pace with the latest technological developments and international practices. In this revision, following major changes have been made:

1. References have been updated;
2. Marking clause has been updated; and
3. Test methods have been updated.

The composition of the Committee and Subcommittee 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 revised (*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*

WHEEL BEARING GREASE ― SPECIFICATION

(*First Revision*)

**1 SCOPE**

This standard prescribes the requirements and the methods of sampling and test for wheel bearing grease intended for use as lubricant in automotive wheel bearings, universal joints, axle journal boxes, etc.

**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 revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed in Annex A.

**3 REQUIREMENTS**

**3.1** **General**

The material shall be homogeneous and of fibrous texture and free from objectionable odour and visible impurities. No fillers should be used in the composition.

**3.2 Composition**

The material shall be made from refined mineral lubricating oil of the following specifications and sodium soap with or without additives:

|  |  |  |
| --- | --- | --- |
| *Characteristic* | *Requirement* | *Method of Test* |
| Kinematic viscosity in mm2/s at 100 °C | 15.5 to 20.5 | IS 1448 (Part 25/Sec1) |
| Flash Point, (COC) °C, *Min* | 200 | IS 1448 (Part 69) |

NOTE ― 1 cSt = 1 mm2/s.

**3.3 Keeping Properties (Shelf Life)**

The keeping quality of the material shall be such that when stored in original sealed containers under normal conditions, it shall retain the properties given in the specification for not less than one year from the date/month of packing of the product.

**3.4** The material shall also comply with the requirements given in Table 1 when tested according to the methods given in col 4 of Table 1.

**4 PACKING AND MARKING**

**4.1 Packing**

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

**4.2 Marking**

Material shall be marked with the following information:

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

**4.2.1** *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.

**5 SAMPLING**

Representative samples of the material shall be drawn as prescribed in IS 1447 (Part 3).

**5.1 Number of Tests**

All characteristics given in the specification shall be tested on the composite sample.

**5.2 Criteria for Conformity**

The lot shall be declared as conforming to the requirements of the specification if all the test results on the composite sample meet the relevant specification requirements of this standard.

**Table 1 Requirements for Wheel Bearing Grease**

(*Clause* 3.4)

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Characteristic** | **Requirement** | **Method of test** |
| (1) | (2) | (3) | (4) |
|  | Consistency of the worked grease at (25 ± 0.5) °C |  | IS 1448 (Part 60) |
|  | 1. Unworked penetration | Shall not differ by more than 25 units from 60 strokes |
|  | 1. 60 strokes | 250 to 280 |
|  | 1. 10,000 Strokes | Shall not differ by more than 25 units from 60 strokes |
|  | Drop point, °C, *Min* | 180 | IS 1448 (Part 52) |
|  | Free organic acidity, (as oleic acid), percent by mass, *Max* | 0.25 | IS 1448 (Part 53) |
|  | Free alkalinity (as sodium hydroxide), percent by mass, *Max* | 0.30 |
|  | Copper strip corrosion at 100 ºC for 24 h | 1b | IS 1448 (Part 51) |
|  | Water content, percent by mass, *Max* | 0.30 | IS 1448 (Part 40) |
|  | Soap content, percent by mass, *Max* | 20 | IS 1448 (Part 138) |
|  | Oxidation stability (*see* Note) (100 h), at 100 °C, drop in pressure, kgf/cm2, *Max* | 1.0 | IS 1448 (Part 94) |
|  | Thermal stability, 30 h at 100 ºC, percent by mass oil separated, *Max* | 6.0 | IS 1448 (Part 89) |
|  | Leakage and deposit forming tendencies (wheel bearing test) |  | IS 1448 (Part 196) |
|  | 1. Leakage by mass, g, *Max* | 8.0 |
|  | 1. Deposit in the wheel bearing races or the rollers | Shall be free from deposits |
|  | 1. Evidence of abnormal changes in the consistency or structure of the material | Not limited, but the observations are to be reported |
|  | 1. Indication of dry running of races | -do- |
|  | Roll stability test, change in consistency, percent after 4 h, *Max* | 10.0 | IS 1448 (Part 165) |
| NOTE — Serial No. (viii) is type test for which manufacturers/suppliers shall give the guarantee for its compliance. | | | |

**ANNEX A**

(*Clause* 2)

**LIST OF REFERRED STANDARDS**

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 1447 (Part 3) : 2021 | Methods of sampling of Petroleum and its products: Part 3 Method of sampling of semi-solid and solid petroleum products (*second revision*) |
| IS 1448 | Methods of tests for petroleum and its products |
| (Part 25 / Sec1): 2018/  ISO 3014:1994 | [Transparent and opaque liquids Section 1 — Determination of kinematic viscosity and calculation of dynamic viscosity (](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=22994" \t "_blank)*[second revision](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=22994" \t "_blank)*[)](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=22994" \t "_blank) |
| (Part 40) : 2015 / ISO 3733 : 1999 | [Petroleum products and bituminous materials — Determination of water — Distillation method (](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=6327" \t "_blank)*[fourth revision](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=6327" \t "_blank)*[)](https://www.services.bis.gov.in:8071/php/BIS/ShowDocument.php?row=6327" \t "_blank) |
| (Part 51) : 2023 | Copper strip corrosion test for lubricating greases (*first revision*) |
| (Part 52) : 2017 / ISO 2176 : 1995 | Drop point (*second revision*) |
| (Part 53) : 1979 | Determination of acidity and alkalinity of greases (*first revision*) |
| (Part 60) : 2023 / ISO 2137 : 2020 | Consistency of lubricating greases by cone penetrometer (*third revision*) |
| (Part 69) : 2019 / ISO 2592 : 2017 | Determination of flash and fire points — Cleveland open cup method (*second revision*) |
| (Part 89) : 2023 | Test for thermal stability of lubricating greases (*first revision*) |
| (Part 94) : 2019 | Test for oxidation stability of lubricating grease by Oxygen pressure vessel method (*first revision*) |
| (Part 138) : 2023 | Determination of soap content (*second revision*) |
| (Part 165) : 2018 | Test method for roll stability of lubricating grease |
| (Part 196) : 2024 | Determination of the leakage tendencies of automotive wheel bearing greases |

**ANNEX B**

(*Foreword*)

**COMMITTEE COMPOSITION**

Lubricants and Their Related Products Sectional Committee, PCD 25

|  |  |
| --- | --- |
| *Organization* | *Representative(s)* |
| Individual 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 P RAMESH (*Alternate*) |
| Bajaj Auto Limited, Pune | SHRI YOGESH. R. MAHAJAN  SHRI RAMESH GOYKAR (*Alternate*) |
| Balmer Lawrie and Company Limited, Kolkata | DR. SOMNATH CHATTOPADHYAY  SHRI MADHABA CHANDRA DASH (*Alternate*) |
| Bharat Petroleum Corporation Limited, Mumbai | SHRI M SOHAIL AKHTAR  DR TARUNENDR SINGH (*Alternate*) |
| Bosch Limited, Bengaluru | SHRI RAGHUVEER RAO |
| CSIR - Indian Institute of Petroleum, Dehradun | DR. DEVENDRA SINGH  DR. G.D. THAKRE (*Alternate*) |
| Chennai Petroleum Corporation Limited, Chennai | SHRI M ABDUL KAREEM  SHRI M. BALAGURU (*Alternate* I)  SHRI S. ARUN PRAKASH (*Alternate* II) |
| Consumer Guidance Society of India, Mumbai | DR. SITARAM DIXIT  DR. M. S. KAMATH (*Alternate*) |
| Directorate General of Quality Assurance, Ministry of Defence, Kanpur | DR. OM PRAKASH SINGH  SHRI VIKIN JAIN (*Alternate*) |
| Gulf Oil Lubricants India Limited, Mumbai | SHRI GIRISH JANGE  SHRI JENCEN MATHAI ARIVANNOOR (*Alternate I*)  SHRI UMESH CHANDRA DWIVEDI (*Alternate II*) |
| Hindustan Petroleum Corporation Limited, Mumbai | SHRI LOKENDER SINGH TEVATHIYA  SHRI ABHIJIT A SARKAR (*Alternate*) |
| Indian Oil Corporation (MKTG), Mumbai | SHRI H S NEGI  SHRI ABHIJEET CHAKRABORTI (*Alternate*) |
| Indian Oil Corporation (R and D Centre), Faridabad | SHRI MUKUL MAHESHWARI  DR PANKAJ BHATNAGAR (*Alternate*) |
| Lubrizol India Limited, Mumbai | SHRI RAHUL MISRA  SHRI AVINASH KAMUNI (*Alternate*) |
| Mahindra and Mahindra Limited, Mumbai | SHRI R. RAMAPRABHU  SHRI JEEVANNOBI G (*Alternate*) |
| National Test House, Kolkata | DR. MANGESH GHARPURE  SHRI BHASKAR N BARSAGADE (*Alternate*) |
| Reliance Industries Limited, Mumbai | SHRI BALASUBRAMANIAN K  SHRI K. K. SREERAMACHANDRAN (*Alternate*) |
| Research Designs and Standards Organization (RDSO), Lucknow | SHRI KAMAL PRAKASH SINGH  SHRI BHARAT PRASAD (*Alternate*) |
| Society of Indian Automobile Manufacturers (SIAM), Delhi | SHRI PRASHANT KUMAR BANERJEE  DR. SANDEEP GARG (*Alternate*) |
| Swastik Oil Products Manufacturing Company Private Limited, Mumbai | SHRI BHUPENDRA RATHOD  SHRI SANAT RATHOD (*Alternate* I)  SHRI MITESH A RATHOD (*Alternate* II) |
| TVS Motor Company Limited, Hosur | SHRI SUMITH JOSEPH  SHRI MANISH GOPAL (*Alternate* I)  SHRI NITHIN MADHAV (*Alternate* II) |
| Tata Motors Limited, Pune | SHRI PALLIPALAYAM GOWRISHANKAR  SHRI PALLAV CHATTERJEE (*Alternate*) |
| Vinni Chemicals Private Limited, New Delhi | SHRI HARSH VARDHAN JAIN |
| BIS Director General | SHRI CHINMAY DWIVEDI, SCIENTIST ‘E’/ DIRECTOR AND HEAD (PCD) [REPRESENTING DIRECTOR GENERAL (*Ex-Officio*)] |
| *Member Secretary*  SHRIMATI KREETI DAS  SCIENTIST ‘D’/JOINT DIRECTOR  (PETROLEUM, COAL AND RELATED PRODUCTS DEPARTMENT), BIS | |

**PCD 25:3 AUTOMOTIVE AND INDUSTRIAL GREASES, SUBCOMMITTEE**

|  |  |
| --- | --- |
| *Organization* | *Representative(s)* |
| Bharat Petroleum Corporation Limited, Mumbai | DR TARUNENDR SINGH **(*Convenor*)** |
| Afton Chemicals Private Limited, Mumbai | SHRI VISHAL NANDURKAR |
| Ashok Leyland Limited, Chennai | SHRI MAHESH P  SHRI P RAMESH (*Alternate*) |
| Bajaj Auto Limited, Pune | SHRI YOGESH. R. MAHAJAN  SHRI RAMESH GOYKAR (*Alternate*) |
| Balmer Lawrie and Company Limited, Kolkata | SHRI MADHABA CHANDRA DASH  DR. SOMNATH CHATTOPADHYAY (*Alternate*) |
| Bharat Petroleum Corporation Limited, Mumbai | SHRI VISHAL KUMAR SINHA  SHRI NAVNEET S YADAV (*Alternate*) |
| Gulf Oil Lubricants India Limited, Mumbai | SHRI UMESH CHANDRA DWIVEDI  SHRI CT CHIDAMBARAM (*Alternate I*)  SHRI D VINOD KUMAR (*Alternate II*) |
| Indian Oil Corporation (MKTG), Mumbai | SHRI ABHIJEET CHAKRABORTI  SHRI H S NEGI (*Alternate*) |
| Indian Oil Corporation (R and D Centre), Faridabad | SHRI AJAY KUMAR HARINARAIN  DR NAVEEN POKHRIYAL (*Alternate*) |
| Siddharth Grease and Lubes Private Limited, Gurugram | SHRI ROHIT KUMAR AGARWAL |
| Standard Greases & Specialities Private Limited, Mumbai | SHRI VIJAY DESHMUKH  SHRI BABAJI PATIL (*Alternate*) |
| The Waxpol Industries Limited, Kolkata | SHRI SHREY GARG  SHRI CHANDRESHWAR DAYAL (*Alternate I*)  MS. UMA SHANKAR UPADHYAY (*Alternate II*) |