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भारतीय मानक मसौदा

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(IS 12203 का दूसरा पुनरीक्षण)

Draft Indian Standard

**MULTIPURPOSE GREASE FOR AUTOMOTIVE APPLICATIONS— SPECIFICATION**

(Second Revision of IS 12203)

(ICS 75.100)

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Lubricants and Related Products Sectional Committee,  
PCD 25

Last date for receipt of comment is  
**17 September 2023**

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**FOREWORD**

(Formal clause to be added later)

A number of Indian Standards have been published on greases, such as grease graphited, automotive grease, general purpose greases, anti-friction bearing grease, locomotive grease, low temperature grease, lithium soap grease, etc. At the time of reviewing the specification for lithium base grease, it was felt that it is better to have a separate specification of lithium base grease for automotive purposes in order to take care of the various consumers interests.

This standard was originally published in 1987 and revised in 1999. In the first revision, requirement of consistency of work grease, free organic acidity, kinematic viscosity and life performance test were modified. Deleterious particles test and water content test were dropped as these have no sense for lithium grease. Characteristics for low temperature torque test, elastomer NBR-L compatibility test and wear scar diameter were also included.

The second revision has been brought out to keep pace with the latest technological developments and international practices. In this revision, the following changes have been made:

- Title of the specification 'Lithium Base Grease for Automotive Purpose' has been modified to 'Multipurpose Grease for Automotive Applications', as any soap-based material can be used to meet the various requirements given in Table 1. This modification is done, in light of current requirements and advancement in the field of lubrication technology in the country and also to eliminate/reduce spurious product suppliers from the market.
- The requirements of free organic acidity, elastomer NBRL compatibility, life performance of wheel bearing and low temperature torque have been modified as relevant to the industry/based on the end use applications etc.
- Four-ball weld load test has been also incorporated to check the extreme properties for grade 3 in which 3 percent Molybdenum disulphide is used.
- Clauses for references and marking have also been updated.

This standard contains clause **5.1**, which calls for agreement between the purchaser and the supplier.

While preparing this specification, considerable assistance has been taken from leading overseas company standards, namely, Ford Engineer and Daimler Benz as well as international standard ASTM D4950-22 'Standard Classification and Specification for Automotive Service Greases'.

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.

## 1 SCOPE

**1.1** This standard prescribes the requirements and method of sampling and test for multipurpose grease suitable for applications on all automotive vehicles and also as wheel bearing grease operating at temperatures ranging from -20 °C to 120 °C.

**1.2** This standard also covers grease containing molybdenum disulphide additive.

## 2 REFERENCES

The following Indian Standards contain provisions, which through reference in this text constitute the 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 indicated below:

<i>IS No.</i>	<i>Title</i>
IS 1447 (Part 3) : 2021	Petroleum and its products - Methods of sampling: Part 3 Method of sampling of semi-solid and solid petroleum products ( <i>second revision</i> )
IS 1448	Methods of tests for petroleum and its products
(Part 25/Sec 1) : 2018 / ISO 3104	Transparent and opaque liquids section 1 determination of kinematic viscosity and calculation of dynamic viscosity (Second Revision)
(Part 52) : 2017 / ISO 2176 : 1995	Drop point ( <i>second revision</i> )
(Part 53) : 1979	Determination of acidity and alkalinity of greases ( <i>first revision</i> )
(Part 56) : 2013 / ISO 2909 : 2002	Calculation of viscosity index from kinematic viscosity ( <i>third revision</i> )
(Part 58) : 1991	Determination of insolubles in greases ( <i>first revision</i> )
(Part 59) : 1991	Determination of mineral oil content in greases ( <i>second revision</i> )
(Part 60) : 2023 / ISO 2137 : 2020	Consistency of lubricating greases by cone penetrometer ( <i>third revision</i> )
(Part 69) : 2019 / ISO 2592:2017	Determination of Flash and Fire Points - Cleveland Open Cup Method ( <i>second revision</i> )
(Part 89) : 2023	Test for thermal stability of lubricating greases ( <i>first revision</i> )
(Part 90) : 2008 / ISO 11009 : 2000	Petroleum products and lubricants - Determination of water washout characteristics of lubricating greases ( <i>first revision</i> )
(Part 94) : 2019	Test for oxidation stability of lubricating greases by oxygen bomb method ( <i>first revision</i> )
(Part 165) : 2018	Test method for roll stability of lubricating grease
(Part 170) : 2021 / ISO 20623 : 2017	Determination of the extreme pressure and anti-wear properties of lubricants Four-ball method European conditions ( <i>first revision</i> )
IS 13796 : 2004	Molybdenum disulphide powder for lubricants ( <i>first revision</i> )
PCD 01 (18454)	Methods of test for petroleum and its products Part XX Determination of the leakage tendencies of automotive wheel bearing greases

PCD 01 (18991)	Methods of test for petroleum and its products Part 51 Copper strip corrosion test for lubricating greases
ASTM D1743-22	Standard test method for determining corrosion preventive properties of lubricating greases
ASTM D2266-23	Standard test method for wear preventive characteristics of lubricating grease (Four-Ball method)
ASTM D3527-23	Standard test method for life performance of automotive wheel bearing greases
ASTM D4289-21	Standard test method for elastomer compatibility of lubricating greases and fluids
ASTM D4693-07	Standard test method for low-temperature torque of grease-lubricated wheel bearings

### 3 GRADES

The material shall be of three grades, namely:

- a) Grade 1;
- b) Grade 2; and
- c) Grade 3.

NOTE – Grade 3 contains molybdenum disulphide

### 4 REQUIERMENTS

#### 4.1 General

The material shall be smooth and homogeneous, free from objectionable odour and visible impurities. It shall be free from rosin, rosinate, rosin oils, tar oil, grit and fillers such as asbestos, clay, talc, etc. and products gelled with bentonite and silica gel.

NOTE — A declaration shall be provided by supplier that the grease is free from rosin, rosinate, rosin oils, tar oil, grit and fillers such as asbestos, clay, talc, etc., and products is not gelled with bentonite and silica gel.

#### 4.2 Composition

The material shall consist of the following ingredients:

- a) A suitable soap-based grease to meet the requirements of Table 1;
- b) Refined mineral oil for all three grades with following requirements:

SI No.	Characteristics	Requirements	Method of Test, Ref to Parts of IS 1448
(1)	(2)	(3)	(4)
i)	Kinematic viscosity of the mineral oil at 100°C in mm <sup>2</sup> /s	14 - 18	(Part 25/Sec 1)
ii)	Viscosity Index (VI) of the mineral oil, <i>Min</i>	90	(Part 56)
iii)	Flash Point of the mineral oil, °C, <i>Min</i>	180	(Part 69)

- c) Antioxidants and rust inhibitor; and
- d) Molybdenum disulphide additive conforming to IS 13796 (in case of Grade 3 only).

#### 4.3 Keeping Quality

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 of manufacture.

4.4 The material shall also comply with the requirements given in Table 1 when tested according to the methods given in col 6 of Table 1.

## 5 PACKING AND MARKING

### 5.1 Packing

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

### 5.2 Marking

The container shall be securely closed and marked with the following information:

- a) Name and grade of material;
- b) Manufacturer's name, initials or trade-mark, if any;
- c) Net mass of material;
- d) Identification in code or otherwise to enable traceability of the lot of consignment to manufacturing details in records; and
- e) Any other statutory requirements.

#### 5.2.1 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.

**Table 1 Requirement of Multipurpose Grease for Automotive Applications**  
( Clause 4.2 and 4.4)

Sl No.	Characteristic	Requirement for			Method of Test, ref to Parts of IS 1448/ASTM
		Grade 1	Grade 2	Grade 3	
(1)	(2)	(3)	(4)	(5)	(6)
i)	Type of Soap	To be reported			Not applicable; type of soap to be declared by manufacturer
ii)	Consistency of worked grease at 25 °C ± 0.5 °C				(Part 60)
	a) Unworked penetration	Shall not differ by more than 10 units from 60 strokes			
	b) 60 strokes	265 - 295	220 - 250	265 - 295	
	c) 10,000 strokes	Shall not differ more than 20 units from 60 strokes			
	d) 100,000 strokes	Shall not differ more than 30 units from 60 strokes			
iii)	Free organic acidity (as oleic acid), percent by mass	To be reported	To be reported	To be reported	(Part 53)

iv)	Free alkalinity, percent by mass	To be reported	To be reported	To be reported	(Part 53)
v)	Drop point, °C, <i>Min</i>	180	180	180	(Part 52)
vi)	Copper strip corrosion at 100 °C for 24 h, <i>Max</i>	1a			PCD 01 (18991)
vii)	Leakage and deposit forming tendencies (wheel bearing test)				PCD 01 (18454)
	a) Leakage by mass, g, <i>Max</i>	5	5	5	
	b) Deposit in the wheel bearing races or the rollers	Shall be free from deposits			
	c) Evidence of abnormal changes in the consistency or structure of the material	To be reported			
	d) Indication of dry running of races	To be reported			
viii)	Resistance to water washout at 80°C percent loss by mass, <i>Max</i>	10	10	10	(Part 90)
ix)	Thermal stability, 30 h at 100 °C, percent by mass oil separated, <i>Max</i>	6	6	6	(Part 89)
x)	Oxidation stability ( <i>see Note</i> ) (100 h) at 100 °C, drop in pressure, kgf/cm <sup>2</sup> , <i>Max</i>	0.5	0.5	0.5	(Part 94)
xi)	Wear scar diameter, mm, <i>Max</i>	0.6	0.6	0.6	ASTM D2266
xii)	Roll stability test, change in consistency, percent after 16 h, <i>Max</i>	25	25	25	(Part 165)
xiii)	Corrosion preventing test, rating	Shall pass the test	Shall pass the test	Shall pass the test	ASTM D1743
xiv)	Elastomer NBRL compatibility ( <i>see Note</i> ) volume change, percent	-5 to +20			ASTM D4289
xv)	Molybdenum disulphide content, percent by mass, <i>Min</i>	-	-	3.0	(Part 58)
xvi)	Life performance of wheel bearing ( <i>see Note</i> ), h, <i>Min</i>	60	60	60	ASTM D3527
xvii)	Low temperature torque ( <i>see Note</i> ) at -20 °C, Nm, <i>Max</i>	10.0	15.5	15.5	ASTM D4693
xviii)	Four ball weld load, kg, <i>Min</i>	-	-	200	(Part 170)
	NOTE— Serial No.(xi), (xv), (xvii) and, (xviii) are type tests for which manufacturers/suppliers shall provide proof of conformity				

## 6 SAMPLING

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

6.1.1 Individual containers selected according to IS 1447 (Part 3) shall be opened and examined for general requirements given in 4.1. Tests for consistency, free organic acidity and free alkalinity shall be done on individual samples. Tests for copper strip corrosion shall be conducted on at least two of the individual samples.

**6.2 Number of Tests** — Tests for all the remaining characteristics shall be done on the composite sample prepared by mixing small portions from individual containers selected during sampling.

**6.3 Criteria for Conformity** — The lot shall be declared acceptable only if each of the test results obtained under **6.1.1** and **6.2** satisfy the relevant requirements of this standard.