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“Step Out From the Old to the New”

IS 506 (1993): automotive grease (superseding IS : 509 : 1953) [PCD 3: Petroleum, Lubricants and their Related Products]



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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

स्वचल और अन्य सामान्य प्रयोजन की ग्रीज़ — विशिष्ट

(तीसरा पुनरीक्षण)

Indian Standard

**AUTOMOTIVE AND OTHER GENERAL
PURPOSE GREASE — SPECIFICATION**

(Third Revision)

UDC 621.892.097.2

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BUREAU OF INDIAN STANDARDS
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FOREWORD

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

Grease L/A No. 1 and L No. 4 were covered in IS 506 : 1953 and IS 509 : 1953 respectively. In 1973 as decided by the Sectional Committee, these two standards were amalgamated into one standard namely, IS 506 : 1973 and IS 509 : 1953 was withdrawn. In the amalgamated standard, four grades intended for general purpose chassis lubrication and other suitable applications including water pumps were stipulated.

This standard was again revised in 1983. In the revised version six grades were covered for general purpose chassis lubrication and other suitable applications including water pumps. In order to keep the defence requirements separate from the general user's requirements two separate tables, namely Table 1 Requirements for automotive grease for general users and Table 2 Requirements for automotive grease for defence requirements were prescribed. Four grades were covered under Table 1 for general users and two grades were covered under Table 2 for defence purposes.

The present revision of this standard has been prepared as the result of a review of the standard by the Technical Committee in the light of the present day requirements and advancement in the field of lubrication technology in the country. While reviewing this standard the Committee felt that this standard as well as IS 507 : 1980 'Specification for general purpose grease', which also covers one grade for defence, should be rationalized on the basis of general purpose user's and defence requirements. Accordingly the two grades for defence requirements are being deleted from this standard and one grade from IS 507 : 1980 for general user's is being added in this revised standard. With these modifications this revised standard will now be applicable only to the general user's and defence requirements will be separately covered under IS 507 : 1980 which is also being revised.

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 : 1960 'Rules for rounding off numerical values (*revised*)'. 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

AUTOMOTIVE AND OTHER GENERAL PURPOSE GREASE — SPECIFICATION

(Third Revision)

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for greases intended for automotive and general purpose applications.

2 NORMATIVE REFERENCES

The following Indian Standards contain provisions which through reference in this text constitute the provisions of the 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:

IS No.	Title
1447 (Part 3) : 1992	Methods of sampling of petroleum and its products : Part 3 method of sampling of semi-solid and solid petroleum products
1448	Methods of tests for petroleum and its products
7794 : 1975	Manual portable grease guns

3 GRADES

The material shall be of the following five grades:

- Grade 1* Generally suitable for general purpose chassis lubrication
- Grade 2* Generally suitable for plain bearing lubrication popularly known as cup grease
- Grade 3* do

Grade 4 Generally suitable for water pumps

Grade 5 Generally suitable for plain bearings and other applications where the grease is subjected to pressure under static condition over temperature range of -18°C to 60°C

4 REQUIREMENTS

4.1 General

4.1.1 The material shall be smooth, homogeneous, free from objectionable odour and visible impurities and abrasive or deleterious particles and shall not show any sign of breakdown, hardening or tendency of the constituents to separate.

4.1.2 The material shall be free from rosin, rosin oil, rosinated, tar oil, grit and fillers of any description and shall not contain nitrobenzene or any other deodorizing material.

4.1.3 The material of Grades 1 and 2 shall be of such a texture that grease gun pumps usually employed for chassis lubrication, when filled with the material can be readily worked after storage for six hours at a temperature of 0°C .

4.2 Composition

4.2.1 The material shall be prepared from following ingredients in such proportions as to comply with the requirements prescribed in Table 1.

- a) *Mineral lubricating oil* — The mineral oil used in the manufacture of the greases shall be refined, filtered mineral lubricating oils complying with following requirements:

Test	Test Limits					Test Method, Ref to IS : 1448
	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	
Flash point, $^{\circ}\text{C}$ (Cleaveland open cup,) <i>Min</i>	178	160	160	160	178	P : 69
Viscosity at 40°C , cSt	90 to 110	61.2 to 74.8	61.2 to 74.8	41.4 to 50.6	90 to 110	P : 25

- b) Generally calcium soap but excluding sodium and potassium soap.
c) Suitable tackifier may be incorporated in Grade 1.

4.3 The material shall also comply with the requirements given in Table 1 when tested according to the methods given in 'P' series of IS : 1448 and Annex A to this standard. Reference to the relevant method of test is given in col 8 of Table 1.

4.4 Keeping Quality (Shelf Life)

The material when stored in original sealed containers under normal temperature conditions in shade shall retain the properties described under 4 for a period of not less than one year after the date of manufacture of the product.

5 PACKING AND MARKING

5.1 Packing

The material shall be packed in suitable clean, dry, leak-proof containers, free from rust, as agreed to between the purchaser and the supplier.

5.2 Marking

The containers shall be securely closed and shall be marked with following:

- a) Indication of the source of manufacture;

- b) Name and grade of the material;
c) Net mass in the container;
d) Date of manufacture;
e) Recognized trade-mark, if any; and
f) Batch number or code number to enable the lot of consignment of manufacture to be traced back.

5.2.1 Each package may also be marked with the Standard Mark.

6 SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed in IS 1447 (Part 3) : 1992

6.2 Number of Tests and Criteria for Conformity

6.2.1 Individual containers selected according to IS 1447 (Part 3) : 1992 shall be opened and examined for the general requirements given in 4.1. Tests for consistency shall be carried out on all the individual samples and tests for corrosion shall be conducted on three of the individual samples. No failure shall be reported if the lot is to be accepted under this clause.

6.2.2 Tests for all the remaining characteristics shall be made on the composite sample and all the test results shall satisfy the corresponding requirements for the acceptance of the lot.

Table 1 Requirements for Automotive and Other General Purpose Grease
(Clauses 4.2 and 4.3)

Sl No.	Characteristics	Requirements for					Method for Test, Ref (P) of IS 1448
		Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	Consistency of worked material at $25 \pm 0.5^\circ\text{C}$ (60 double strokes)	310 to 340	265 to 295	220 to 250	175 to 205	260 to 300	P : 60
ii)	Copper strip corrosion test at 75°C , 24 h: a) Condition of grease b) Condition of copper strip	No green colouration or change in structure No pitting or etching — slight brown staining may be permitted					P : 51
iii)	*Free organic acidity (as oleic acid), percent by mass, <i>Max</i>	0.5	0.5	0.5	0.5	0.5	P : 53
iv)	Free alkalinity, as $\text{Ca}(\text{OH})_2$, percent by mass, <i>Max</i>	0.5	0.5	0.5	0.5	0.15	P : 53
v)	Drop point, $^\circ\text{C}$, <i>Min</i>	95	95	95	95	100	P : 52
vi)	Heat stability at $95 \pm 1^\circ\text{C}$	No sign of breakdown, marked change in consistency or separation of oil					P : 62
vii)	Corrosion preventive test, <i>Max</i>	← Rating I —————→					P : †
viii)	Water content, percent by mass, <i>Max</i>	1.5	1.5	1.5	2.0	1.0	P : 40
ix)	Sulphated ash, percent by mass, <i>Max</i>	4.0	5.0	6.5	8.0	5.0	P : 4
x)	Low temperature pumping properties	Shall be easily pumpable at 0°C					Annex A

*If aluminium soaps are present, the requirements for acidity shall not apply.

†Under preparation : till such time it is published ASTM D 1743 : 1987 may be followed.

ANNEX A

[*Table 1, Sl No. (x)*]

DETERMINATION OF LOW TEMPERATURE PUMPING PROPERTIES

A-1 APPARATUS

A-1.1 Grease Gun — Push type (*see* IS 7794 : 1975).

A-1.2 Refrigerator — Capable of being maintained at 0°C.

A-2 PROCEDURE

A-2.1 Fill the gun with grease and place in a refrigerator at 0°C.

A-2.2 Maintain at the test temperature for 24 hours.

A-2.3 Remove the gun from the refrigerator and operate it immediately.

NOTE — Protective gloves should be worn.

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