INTER PLANT STANDARD – STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR CALCIUM EP GREASE**	**IPSS:1-09-009-20** (**Fourth Revision**)
	Corresponding to IS 11637:1986 (RA 2018)	Formerly: IPSS:1-09-009-10 (Third Revision)

0. FOREWORD

0.1 This Inter Plant Standard has been prepared by the Standards Committee on Oils & Lubricants, IPSS 1:9 with the active participation of the representatives of all the steel plants and established manufacturers of greases, was adopted in **January, 2020.**

0.2 This Inter Plant Standard was originally published in 1978 and it was revised with first, second, third revision in 1986, 1995 and 2010. In this fourth revision, some modifications have been made in the light of the experience gained in the usage of this Standard, since its third revision. These modifications pertain to the requirement of characteristics like kinematic viscosity, drop point, viscosity index, flash point, Timken ok load.

0.3 Considerable support of IS 11637 -1986 (Reaffirmed 2018) has been taken while preparing this standard.

0.4 In the fourth revision, some more clauses have been introduced like supply requirement, marking and the clause of keeping quality has been modified. This also includes requirements which would enable the calcium EP greases to acquire water resistance properties and would ensure protection against rusting and corrosion. Some tables are also modified based on feedback from IPSS member organizations.

0.5 IS 11637:1986 `Specification for calcium base EP grease' is the corresponding Indian Standard. Once this IS incorporates the requirements of steel plant, this Inter Plant Standard will be withdrawn.

1. SCOPE

1.1 This Inter Plant Standard covers requirements of calcium EP grease used in steel industry for application in centralized systems serving severely loaded bearings and friction surface of all types operating at temperatures up to 65^{o}C.

2. COMPOSITION

2.1 The calcium EP grease shall consist of refined mineral oil conforming to the requirements given in Table-1, suitable calcium soap, anti-oxidant and other necessary additives.

3. GENERAL REQUIREMENTS

3.1 The calcium EP grease shall be smooth and homogenous and free from lumps, foreign matters and visible impurities. It shall have excellent pumpability and mobility to take care of long leads and shall be suitable to mill condition (water & mill scale).

4. TECHNICAL REQUIREMENTS

4.1 The technical requirements of calcium EP grease shall be as given in Table-1.

4.2 **Keeping Quality** – The keeping quality of the grease shall be such that when stored in original sealed containers under normal conditions, it shall retain the properties detailed in the specification for not less than one year from the date of manufacture.

4.3 The grease should be easily pumpable at ambient temperature to a centralized grease system.

5. PACKING

5.1 The packing shall be done in new and sound steel drums / barrels of 180 kg nominal capacity conforming to IS 13997:1994 `Drums, large open top'. The drums / barrels shall be properly sealed against water and other contaminants.

6. SAMPLING

6.1 Representative samples of the material shall be drawn as prescribed in IS 1447 (Part 3):1992 `Methods of sampling of petroleum and its products'.

7. SUPPLY REQUIREMENTS

7.1 The lubricants may be supplied in bulk or drum as per agreement between the purchaser and supplier.

7.2 The supplier is required to furnish the test certificate for each batch indicating typical values of the properties stipulated in the standard.

8. MARKING

8.1 The drums / barrels shall be securely closed and marked with the following:

a) Indication of the source of manufacture;
b) Name, type and grade of the material;
c) Net mass of the material
d) Date of manufacture;

e) Recognized trade mark, if any; and

f) Identification in code or otherwise to enable the lot of consignment or manufacture to be traced back.

8.2 The drum / barrels may also be marked with the standard mark.

TABLE-1

TECHNICAL REQUIREMENTS OF CALCIUM EP GREASE

(Clause 2.1 & 4.1)

Sl. No.	Characteristic	Requirement	Method of Test. Ref to (P.) of IS 1448*
1.	Penetration or consistency at 25± 0.5°C a) At 60 strokes b) At 10000 strokes	280-300 Shall not differ by more than 20 units from the penetration at 60 strokes	P:60 1994
2.	Drop point, °C, Min	180	P:52 2017
3.	Free organic acidity (as oleic acid), percent by mass	Not limited, but observations are to be reported	P:53 (1979)
4.	Free alkalinity [as Ca (OH)2], percent by mass	-do-	-do-
5.	Mineral oil extracted from the grease a) Kinetic viscosity at at 40°C, cSt b) Viscosity index, Min c) Flash point, Cleveland (open) cup, °C, Min	 220±10% 90 200	 P:25(1976) P:56 2013 P:69 2013
6.	Copper strip corrosion at 75°C for 24 hours	Negative	P:51 (1963)
7.	Freedom from Deleterious Particles	10	P:125 (1987)
8.	Resistance to water wash-out, at 40 °C, percent loss by mass, Max	5	P:90 2008
9.	Timken OK load, kg, Min	20	See note
10.	Oxidation stability at 65 °C (100 hours), drop in pressure, kgf/cm² Max	1.0	P:94 2019
11.	Roll stability, change in consistency in 16 hours, percent, Max	25	See Note
12.	Leakage and deposit forming tendencies (wheel bearing test) a) Leakage by mass at 65 °C for 3 hours, g, Max b) Deposit in the wheel bearing races or the rollers c) Evidence of abnormal clauses in the consistency or structure of the material d) Indication of dry running of races	 10 Shall be free from deposits Not limited, but observations are to be reported No dry running of races	See Note
13.	Heat stability at 70 °C for 1 hour	No oil separation	P:89 (1979)
14.	Water content, percent by mass, Max	1.0	P: 40 2015
15.	Rust preventive properties of lubricating greases	Pass	See Note
16.	Elastomer Compatability		ASTM D 4289 - 2014
	Vol Change, percent	← -5 to + 30 →	
	Hardness change, durometer-A points	← -15 to + 2 →	
17.	Oil separation in storage condition, max	5%	ASTM D 1742 - 2018
18.	Oil separation at elevated temperature	6.0 5.0	ASTM D 6184 - 2017

* Methods of test for petroleum and its products

NOTE:A few more Indian Standards on methods of test are under preparation. Till such time they are published, the methods given in the following standards shall be applicable for the corresponding requirements mentioned against each.

Requirement	**Standard**
Sl. No. (2)	ASTM D 566- 2017 Dropping point of lubricating grease
Sl. No. (9)	ASTM D 2509- 2015 Measurement of extreme pressure properties of lubricating greases (Timken method)
Sl. No. (11)	ASTM D 1831- 2019 Roll stability of lubricating grease
Sl. No. (12)	ASTM D 1263- 1999 Leakage tendencies of automotive wheel bearing greases
Sl. No. (15)	ASTM D 1743- 2015 Rust preventive properties of lubricating greases