INTER PLANT STANDARD – STEEL INDUSTRY		
IPSS	**SPECIFICATION FOR LITHIUM COMPLEX GREASE**	**IPSS:1-09-020-20)** (**Second Revision**)
	Corresponding IS does not exist	Formerly: IPSS:1-09-020-10 (First 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 the steel plants reputed consulting organizations and established manufacturers of greases and was adopted with second revision in **January, 2020.**

This standard was formulated in year 1999 and was revised with first revision in October, 2010.

1. SCOPE

1.1 This Standard prescribes the requirements, methods of sampling and tests for lithium complex greases suitable for industrial purposes.

1.2 Significant consideration of IS 14847: 2000 (RA2016) has been taken while preparing this standard.

2. GRADES

2.1 The grease shall be of following grades:
NLGI Consistency (0, 1, 2, 3)

3. TECHNICAL REQUIREMENTS

3.1 The grease shall be of smooth and homogenous preparation, free from objectionable odour and visible impurities. It shall be free from resins, resin oil, rosinate, tar oil, grit and fillers such as clay, asbestos, talc, etc and from non-soap gelling agents like bentonite and silica gel.

3.2 **Composition**

3.2.1 The mineral oil extracted from the grease by method (A) prescribed in IS 1448 (Part 59):1991 shall comply with the following requirements:

Characteristics	Requirement	Method of Test Ref to (P: of IS 1448)
Kinematic Viscosity in cst at 40°C	198-242	P:25 (1976)
Flash Point, °C (COC), Min	220	P:69 (2013)
Viscosity Index (min)	90 (Without VI Improver)	P:56 (2013)

3.3 The material shall meet the technical requirements as given in Table-1.

3.4 **Keeping Quality** – The keeping quality of the material will 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. 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. The container shall be securely closed.

4.2 **Marking** – The container shall be 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
f) Identification in code or otherwise to enable the lot of consignment to be traced back
g) Standard mark

5. SAMPLING

5.1 The representative samples of the material shall be drawn as prescribed in IS 1447(Part 3):1992.

TABLE-1

REQUIREMENTS FOR LITHIUM COMPLEX GREASE

(Clause 3.3)

Sl. No.	Characteristics	Requirement				Method of Test. Ref to (P.) of IS 1448*
		NLGI/0	NLGI/1	NLGI/2	NLGI/3	
1.	Worked Penetration at 25± 0.5°C a) 60 double strokes	355-385	310-340	265-295**	220-250	P:60 (1994)
	b) After 100,000 strokes	Shall not differ by more than 35 units from the 60 double strokes value				
2.	Drop point, °C, Min	230	240	260	260	ASTM D566-2017
3.	Copper strip corrosion at 100 deg C, for 24 hours	Negative				P:51 (1963)
4.	Resistance to water washout at 80 deg C, per cent loss by mass, Max	-	8	5	5	P:90 (2008)
5.	Thermal stability, per cent loss by mass, Max	-	5	3	3	P:89 (1979)
6.	Oxidation stability (100 h) drop in pressure kg/sq cm, Max	0.5	0.5	0.5	0.5	P:94 (2019)
7.	Timken OK load, kg, min	23	23	23	23	ASTM D 2509-2015
8.	Leakage and deposit forming tendencies (wheel bearing test at 113 °C): a) Leakage by mass(g), Max	-	8	5	5	ASTM D 1263 - 1999
	b) Deposit in the wheel bearing races or the rollers	Shall be free from deposits (NLGI/1, NLGI/2, NLGI/3)				
	c) Evidence of abnormal changes in the consistency or structure of the material	Observations to be reported (NLGI/1, NLGI/2, NLGI/3)				
	d) Indication of dry running of races	No dry running of races (NLGI/1, NLGI/2, NLGI/3)				
9.	Error rust test, Max	-	0,0	0,0	0,0	IP 220-2017
10.	Roll stability test, penetration change, percent after 16 hours, Max	-	18	18	18	ASTM D 1831 - 2019
11.	Four ball weld load, kg, Min	280	280	280	280	IP 239 -2014
12.	Wear scar dia, mm max at 1200 rpm, 75 °C, 40kg,1 hr	0.6	0.6	0.6	0.6	ASTM D 2266-2015

13.	Elastomer Compatability			ASTM D 4289 - 2014
	Vol Change, percent	← -5 to + 30 →		
	Hardness change, durometer-A points	← -15 to + 2 →		
14.	Oil separation in storage condition, max	5%		ASTM D 1742 - 2018
15.	Oil separation at elevated temperature	6.0	5.0	ASTM D 6184 - 2017

* Methods of test for petroleum and its products

** For centralized lubrication system of steel plants worked penetration at 25 °C (60 strokes) for NLGI/2 grade may be 280-305.

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