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उत्पाद मैन्युअल

औद्योगिक प्रयोजनों के लिए लिथियम कॉम्प्लेक्स ग्रीस

IS 14847: 2000 के अनुसार

PRODUCT MANUAL FOR

Lithium Complex Grease for Industrial Purposes

ACCORDING TO IS 14847: 2000

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	**मानक संख्या** **IS No.**	:	IS 14847 : 2000
	शीर्षक **Title**	:	Lithium Complex Grease for Industrial Purposes
	संशोधनों की संख्या **No. of amendments**	:	NIL
2.	**नमूना दिशानिर्देश** **Sampling Guidelines**		
a)	**कच्चा माल** **Raw material**	:	The material shall be prepared from refined mineral lubricating oil, a suitable lithium complex soap gelling agent and performance additives may added Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance.
b)	**समूहीकरण दिशानिर्देश** **Grouping Guidelines**	:	Each Grade intended to be covered in the scope of the licence is to be tested.
c)	**नमूने का परिमाण** **Sample Quantity**	:	10 Kg of *Lithium Complex Grease* Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market).

d)	**परीक्षण अनुरोध में घोषित किए जाने वाले पैरामीटर** **Parameters to be Declared in Test Request**	:	Grade Note: Apart from the above, any other requirements/ parameters may also be declared as per the standard, as applicable.
3.	**परीक्षण उपकरणों की सूची** **List of Test Equipment**	:	Please refer Annex –A
4.	**निरीक्षण और परीक्षण की स्कीम** **Scheme of Inspection and Testing**	:	Please refer Annex - B
5.	**एक दिन में संभावित परीक्षण** **Possible tests in a day**		
	Worked Penetration of the grease Drop Point Leakage and Deposit forming tendencies Timken Load Four Ball Weld Load Wear Scar Dia **Remark:** Till complete testing facilities are available in any Laboratory, Surveillance inspection may be carried out for two days as the tests for Timken Load, Four Ball Weld Load, Roll Stability Test and Wear Scar Dia has to be carried out in factory testing. **Remark:** As per approved Marking Fee calculation, keeping properties parameter shall be tested once in a year. During the surveillance inspection, sample kept in earlier visits may also be tested for keeping properties including the tests for Timken Load, Four Ball Weld Load, Roll Stability Test and Wear Scar Dia after completion of keeping period. Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide ready reference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	**लाइसेंस का दायरा /Scope of the Licence:**		
	Licence is granted to use Standard Mark as per IS 14847 : 2000 with the following scope:		
	Name of the product	**Lithium Complex Grease for Industrial Purposes**	
	Grade	Grade A/ Grade B	

ANNEX – A

LIST OF TEST EQUIPMENTS
(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sl. No.	Tests used in, with Clause Reference	Test Equipment
1.	Mineral Oil Extraction from grease, Cl. 4.2.1	n-Hexane, Dilute Hydrochloric Acid , Phenopthaline Indicator, Potassium Hydroxide, Ethyl Alcohol, Weighing Balance, Extraction appratus consisting of Heating Source, Round bottom flask and reflux condenser with water, Boiling Chips, Separating Funnels, Gooch Crucible, Filter Paper, Conical Flasks, Hot Air Oven -105℃, Water Bath, Hot Plate
2.	Kinematic Viscosity in cst at 40°C, Cl. 4.2.1	Cleaning solution, strongly-oxidizing cleaning solution or alkaline cleaning solutions, Sample solvent (completely miscible with the sample), Drying solvent (suitable and volatile at the used temperature), Water (deionized or distilled), Certified viscosity reference standards (CRM), Drying tubes (consisting of a desiccant drying system), Sample filter (micron screen or fretted (sintered) glass filter, no more than 75 µm), Reagent filter (micron screen or fretted (sintered) glass filter, no more than 11 µm), Manual apparatus - Glass capillary viscometer, Viscometer holder or mounting device within the temperature-controlled bath, Temperature-controlled bath (L.C. 0.02°C), Temperature-measuring device, for the range 0 °C to 100 °C, (L C 0.04°C)
3.	Viscosity Index, Cl. 4.2.1	By Calculation
4.	Flash Point, °C (COC), Cl. 4.2.1	Cleaning solvent, Verification liquids, Steel wool, Cleveland open cup apparatus, Shield, Temperature measuring device, Barometer (reading absolute pressure accurate to 0,5 kPa with a resolution of 0,1 kPa)
5.	Worked Penetration of the grease at 25±0.5°C, Cl. 4.3	Penetrometer as per Fig-1 of IS 1448 Part 60 with Full Scale Cone and One quarter scale cone and shaft, Full Scale Grease Worker and One quarter scale grease worker, Grease Cutter, Constant Temperature Test room (with air conditioner and digital humidity clock), Spatula, Timer, Double stroke machine with counter
6.	Drop Point, Cl. 4.3	Dropping Point Assembly as per Fig-1 of ASTM D 2265 consisting of Grease Cup, Test Tube, Cup Support, Thermometer and Accessories, Aluminium Block Oven as per Fig-2 of ASTM D 2265, Aluminium Block Oven Thermometer

7.	Copper Strip Corrosion, Cl. 4.3	Glass Beaker (100ml capacity), Copper strip (75x13x1.5mm), Oven (±2°C), Ether, Petroleum Hydrocarbon Solvent (60/80)- Boiling between 60 °C and 80°C and aromatic Free, Carborundum powder – No. 150 grade, Cotton wool
8.	Oxidation Stability, Cl. 4.3	Oxidation Pressure Vessel , Pressure Gauge (L C 621-827 kPa/6.89 kPa/3.45 kPa), Oil Bath – 99±0.5 °C, Dish Holder , Sample Dishes – at least 5, Thermometer (95-103 °C), N-Heptane, Oxygen, Cleaning Solution
9.	Leakage and deposit forming tendencies, Cl. 4.3	Apparatus as per Fig-1 of ASTM D 1263 with oven and temperatue indicator, Test Bearings, n- Heptane, Weighing Balance
10.	Resistance to water wash out at 80°C, Cl. 4.3	Water, Cleaning Solvent, Apparatus as per figure 1 of IS 1448 (Part 90), Ball Bearing size 6204 C3H, Bearing Housing and shield, Heating source (38±1.7°C/79±1.7 °C), Thermometer/Thermocouple (±1°C), Timer (0.1 second), Watch glass, Graduated Cylinder -100ml, Oven ±3°C, Balance 1mg
11.	Heat Stability, Cl. 4.3	Test apparatus as per figure -1, Oven 100±0.5°C, Balance 0-250gm/0.01gm
12.	Timken Load, Cl. 4.3	Timken Extreme Pressure Tester, Sample Feed Devices, Loading mechanism, Test Cups, Test Blocks, Microscope (50X to 60x), Timer (minutes/seconds), Acetone, Standard Solvent
13.	Four Ball Weld Load, Cl. 4.3	Cleaning Solvent, Four-Ball extreme pressure lubricant testing machine, Friction Recording device, Loading Disc, Microscope (±0.01 mm), Timer (0.2 s), Test Balls, Erecting Plate, Torque Wrench
14.	Encor Rust Test, Cl. 4.3	Wash Solvent , Water, Propan-2-ol, Ammonia Solution, Solvent-rinse solution, Silver nitrate, Cloth, Protective gloves, Filter Paper, Test-rig as per Annex-A, Test bearing, Dentist's Mirror, Pipette, Oven at 90+/-2°C, Dessicator
15.	Roll Stability Test, Cl. 4.3	Roll Stability Test Apparatus as per Fig-1, One-quarter scale cone and shaft with worker as specified in IS 1448 part 60
16.	Wear Scar Dia, Cl. 4.3	Four Ball Wear Tester and accessories as per Fig-1 & 2 , Microscope (automated with determination of dia in micron), Test Balls, Cleaning Fluids
17.	General Equipments, Cl. 4.3	Air conditioner, Digital hygrometer, 24 hrs electricity supply with power generator, Distilled Water, General equipminets like pipettes, beaker, measuring cylinders, filter paper, cotton, conical flasks, wash bottles, distilled water

ANNEX B

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that during operation of BIS licence, manufacturers will implement a Quality Assurance Plan (QAP) i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing theStandard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan (QAP) defining the control unit (i.e. lot/batch etc.), the levels of control (i.e. the frequency and number of samples for conducting the differenttests as per the Indian Standard) and declare the arrangement for testing i.e. whether in-house or subcontracting/sharing for each applicable test and submit the same to BIS Branch Office for information. The manufacturer shall comply with the QAP and maintain test records in accordance with para 2.1.

1.3 **RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT**:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: Entire quantity of Lithium Complex Grease of each grade produced in a single reaction tank at a time shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommendedlevels of control are given in **Table 1**. Manufacturer has the discretion of declaring their own levels of control or accept the levels of control given in this document.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan.

2. ENSURING COMPLIANCE THROUGH TESTING- manufacturers shall ensure compliance of their products to all the requirementsof the Indian Standard for which they may have in-house test facilities. However, there is no obligation to maintain in-house laboratory. Licensee may use alternative arrangements for tests of the production as per the declared QAP. Various alternatives are available for operation of BIS certification as given below and the relevant guidelines for availing such relaxations by the manufacturers, as amended from time to time, are to be referred:

i) Shared testing resources like common facility,

ii) Cluster based testing facility,

iii) Sub-contracting to outside laboratories which may either be:

a) BIS recognised/empanelled laboratories, or

b) Any accredited laboratory as per ISO/IEC 17025

2.1 **TEST RECORDS**- The manufacturers shall maintain test records for the tests carried out (either in-house or at a sub-contracted or at shared test facility) to establish conformity of the product to the Standard for operation of licence. For the tests being subcontracted or conducted at a shared test facility,test results issued by the laboratories or test facilities, shall be made available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark as given in the Schedule of the license shall be incorporated legibly and indelibly on each container/packet provided always that the material so marked conforms to each requirement of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

3.2 **Additional Marking requirements**: Additionally, the following shall also be marked on container/packet of the grease.

a) "For BIS certification details please visit www.bis.gov.in"

4. REJECTION - The production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act,2016.

TABLE 1

(Recommended Levels of Control by BIS – for Guidance Only)

(1)				(2)		
Test Details				**Recommended Levels of Control**		
Cl.	**Requirement**	**Test Methods**		**No. of Sample**	**Frequency**	**Remark**
		Clause	**Reference**			
4.2.1	Kinematic Viscosity in cst at 40°C	4.2.1	IS 1448 (Part 25)	1	Each Fifth Control Unit	
4.2.1	Viscosity Index	4.2.1	IS 1448 (Part 56)	1	Each Fifth Control Unit	
4.2.1	Flash Point	4.2.1	IS 1448 (Part 69)	1	Each Fifth Control Unit	
4.3 Table 1	Worked Penetration of the grease at 25±0.5°C 60 double strokes	4.3 Table 1	IS 1448 (Part 60)	1	Each Control Unit	
4.3 Table 1	Worked Penetration of the grease at 25±0.5°C 10000 double strokes	4.3 Table 1	IS 1448 (Part 60)	1	Each Fifth Control Unit	
4.3 Table 1	Drop Point	4.3 Table 1	ASTM D 2265	1	Each Control Unit	
4.3 Table 1	Copper Strip Corrosion at 100°C for 24 h	4.3 Table 1	IS 1448 (Part 51)	1	Once in 6 months	
4.3 Table 1	Oxidation Stability	4.3 Table 1	IS 1448 (Part 94)	1	Once in 6 months	
4.3 Table 1	Leakage and deposit forming tendencies	4.3 Table 1	ASTM D 1263	1	Every Fifth Control Unit	
4.3 Table 1	Resistance to water wash out	4.3 Table 1	IS 1448 (Part 90)	1	Every Fifth Control Unit	
4.3 Table 1	Heat Stability	4.3 Table 1	IS 1448 (Part 89)	1	Every Fifth Control Unit	
4.3 Table 1	Timken Load	4.3 Table 1	ASTM D 2509	1	Once in 6 Months	
4.3 Table 1	Four Ball Weld Load	4.3 Table 1	IP 239	1	Once in 6 months	
4.3 Table 1	Emcor Rust Test	4.3 Table 1	IP 220	1	Once in 6 months	
4.3 Table 1	Roll Stability Test	4.3 Table 1	ASTM D 1831	1	Every Fifth Control Unit	
4.3 Table 1	Wear Scar Dia	4.3 Table 1	ASTM D 2266	1	Once in 6 months	
4.4	Keeping Quality	4.4	IS 14847	1	Once in a year	