Eskom	Standard	Technology

Title: **Molybdenum Disulphide and Graphite Anti Wear Greases Standard**

Eskom classifications: GPS-2 LXM, GPS-0 LXG

Unique Identifier:	**240-56064803**
Alternative Reference Number:	**36-841**
Area of Applicability:	**Engineering**
Documentation Type:	**Standard**
Revision:	**2**
Total Pages:	**7**
Next Review Date:	**December 2020**
Disclosure Classification:	**CONTROLLED DISCLOSURE**

APPROVED FOR AUTHORISATION
☑ TECHNOLOGY ENGINEERING
DOCUMENT CENTRE ☎ X4962

Compiled by	Approved by	Authorised by
J.J. Bester	L.F. Barker	J.R. Hector
Senior Advisor Tribology	Chief Engineering Advisor Tribology	Senior Manager Process Engineering
Date: 12/1/2016	Date: 12/1/2016	Date: 22/1/2016

Supported by SCOT TC

Z.T. Mathe

Power Plant TC Chairperson

Date: 02/02/2016

PCM Reference : **240-53458931**

SCOT Study Committee Number/Name : **Power Plant Technical Committee**

CONTENTS

Page

TABLES

1. INTRODUCTION

This document describes the requirements for Molybdenum Disulphide and Graphite Anti-Wear Greases. It supersedes 36-841.

2. SUPPORTING CLAUSES

2.1 SCOPE

2.1.1 Purpose

The lubricants defined by this specification are high quality mineral oil based greases with good anti-wear characteristics and containing lubricant quality or commercial technical grades of molybdenum disulphide and/or graphite as an anti-wear additive package and using a lithium complex gelling agent.

2.1.2 Applicability

This document shall apply throughout Eskom Holdings Limited Divisions.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

[1] ASTM D217, *Standard Test Methods for Cone penetration of Lubricating Grease.*

[2] ASTM D445, Standard Test Method for Kinematic Viscosity of Transparent and Opaque liquids.

[3] ASTM D566, Standard Test Method for Dropping Point of lubricating Grease.

[4] ASTM D1264, Standard Test Method for Determining Water Washout Characteristics of Lubricating Greases.

[5] ASTM D1742, Standard Test Method for Oil Separation from Lubricating Grease during Storage.

[6] ASTM D1743, Standard Test Method for Determining Corrosion Preventative Properties of Lubricating greases.

[7] ASTM D2266, Standard Test Method for Wear Preventative Characteristics of Lubricating Grease (Four-Ball Method).

[8] ASTM D2509, Standard Test Method for Measurement of Load-Carrying Capacity of Lubricating Grease (Timken Method).

[9] ASTM D2596, Standard Test Method for Measurement of Extreme-Pressure Properties of lubricating Grease (Four-Ball Method).

[10] ASTM D4048, Standard Test Method for Detection of Copper Corrosion from Lubricating Grease.

[11] ASTM D4049, Standard Test Method for Determining the Resistance of Lubricating Grease to Water Spray.

[12] SABS 1851:2000, Standard Specification for Greases.

[13] US Steel Classification No. 346, Molybdenum Disulfide Greases

2.2.2 Informative

None

2.3 DEFINITIONS

None

2.3.1 Disclosure Classification

Controlled Disclosure: Controlled Disclosure to External Parties (either enforced by law, or discretionary).

2.4 ABBREVIATIONS

Abbreviation	Description
ASTM	American Society for Testing of Materials
NLGI	National Lubricating Grease Institute.
SANS	South African National Standard

2.5 ROLES AND RESPONSIBILITIES

None

2.6 PROCESS FOR MONITORING

None

2.7 RELATED/SUPPORTING DOCUMENTS

None

3. MOLYBDENUM DISULPHIDE AND GRAPHITE ANTI-WEAR GREASES

3.1 REQUIREMENTS

3.1.1 Technical data

Technical data sheets shall be supplied for all lubricants. All information listed in Appendix A Table 1 shall be provided.

3.1.2 Material Safety Data Sheets (MSDS)

Material Safety Data Sheets shall be supplied for each lubricant.

3.1.3 Branded lubricants

Only branded lubricants meeting this performance standard will be considered.

3.1.4 Lubricant compatibility

Equivalent or comparable lubricants are lubricants of the same type and grade designed to meet the requirements of the same types of applications and of a similar performance standard.

The supplier shall ensure that the lubricant, when mixed in any proportion with other lubricants of the same grade and meeting the same performance requirements, is fully compatible with and equivalent to, the current lubricant and the system to be lubricated. The resultant mixture shall meet the performance requirements of this specification.

The supplier shall notify Eskom of any significant formulation changes that may affect the lubricant performance and/or its compatibility with existing equipment and/or lubricants and describe the nature of the change.

3.1.5 Packaging

Only clean new drums and pails shall be used to package Eskom lubricants.

Package sizing shall be in accordance with the relevant power station purchasing schedule.

Packaging shall be of such a nature as to ensure the lubricant's quality and condition are maintained during transportation and storage.

All information required shall be clearly visible and legible on the container.

3.1.6 Information

Packaging shall reflect the following information:

a. The lubricant Brand Name and Supplier Name.
b. The Batch Number and/or the date of manufacture.
c. The quantity in kilograms.
d. The lubricant type and NLGI consistency number applicable to the lubricant.

3.1.7 Storage

The lubricant packaging and condition shall be such that when stored, unopened, for a period of 12 months, under normal atmospheric conditions, the lubricant shall still meet the relevant performance standard and be suitable for use.

Adhesive labels shall be suitable for outdoor storage for a period of at least 2 years.

3.1.8 Transportation

All lubricants shall be transported in a manner that prevents damage to the packaging or its contents. All necessary precautions shall be taken to prevent leaks or spills.

3.1.9 Lubricant cleanliness

All lubricating greases shall be homogenous, and free from lumps, abrasive particles and other impurities that may have a detrimental effect on the performance of the grease.

3.1.10 Tests

Performance requirements for these greases are detailed in Appendix A, Table 1

Lubricant code modifiers are detailed in Appendix A, **Error! Reference source not found.**

3.2 RECORDS

3.2.1 Technical Data Sheets

Copies of latest technical datasheets showing compliance to this specification will be kept by Eskom Technology Division.

3.2.2 Material Safety Data Sheets

Copies of Material Safety datasheets shall be kept by Eskom's Technology Division.

4. AUTHORISATION

This document has been seen and accepted by:

Name	Designation
LF Barker	Chief Engineering Advisor
	Document Approved by TDAC ROD 27 February 2013
	Document Approved by SCOT Power Plant Technical Committee for update to extent Expiry date

5. REVISIONS

Date	Rev.	Compiler	Remarks
November 2012	0	J.J. Bester	Draft Document for review created from 36-841
January 2013	1	J.J. Bester	Final document for signature.
January 2016	2	J.J. Bester	No Changes Expiry Date Extension as Approved by Power Plant Technical Committee

6. DEVELOPMENT TEAM

None

7. ACKNOWLEDGEMENTS

None

APPENDIX A: PERFORMANCE REQUIREMENTS FOR MOLY AND GRAPHITE GREASES

Table 1: Performance requirements for Moly and Graphite greases

PROPERTY	TEST METHOD	REQUIREMENT	
Eskom Lubricant Code		**GPS-2**M/G**	**GPS-0**G**
NLGI GRADE		2	0
Thickener/soap/gelling agent type		Report	
Solid additives (% m/m and type)		3% Molybdenum Disulphide	5 -7% Graphite
Type of suspended solid lubricant/s		Report	
Suspended solid lubricant addition, % by mass.		Report	
Colour		report	
Appearance		report	
Normal Operating Temperature Range, °C		-10 to 120	
Base Oil Viscosity, cSt @ 40°C	ASTM D 445	80-460	
Base Oil Viscosity, cSt @ 100°C	ASTM D 445	report	
Drop point, °C.	ASTM D 566	>200	
Worked Penetration @ 25°C.	ASTM D 217	265-295	400-430
Oil Seperation, % (m/m), max.	ASTM D 1742	10	
Timken OK load, kg	ASTM D 2509	25	
Four Ball Weld Point, kg	ASTM D 2596	250	
Four Ball Wear, Scar Diameter, mm.	ASTM D 2266	0.6	
Bearing Corrosion Test	ASTM D 1743	Pass	
Copper Corrosion	ASTM D 4048	1	
Water Washout, % @ 38°C	ASTM D 1264	15	report
Resistance Of Grease To Water Spray	ASTM D 4049	20	report

NOTE Use code modifier listed in Table **2**, relevant to type of soap thickener used.

Table 2: Lubricant codes for soap thickeners or gelling agents

Thickener/gelling agent	Code modifier
Lithium	L
Lithium 12-Hydroxystearate	LH
Lithium calcium complex	LKX
Lithium complex	LX