

(R) Lubricants, Industrial Oils, and Related Products Type G Slideway Lubricants - Specification

RATIONALE

The revision of SAE MS1007 was necessary to reflect changes to test limits, changes to test methods and additional standards that have been incorporated since SAE MS1007 was originally released in 2001.

FOREWORD

The Society of Automotive Engineers (SAE) Industrial Lubricants Committee has developed a number of industrial, non-production lubricant performance specifications.

The purpose of these voluntary SAE specifications is to:

- a. Define minimum performance requirements for industrial lubricants.
- b. Provide lubricant suppliers with performance targets for a minimum number of key industrial lubricants.
- c. Improve the availability of these lubricants to member companies.
- d. Provide a plant oriented, user friendly, classification system using common test standards and properties.

ISO Standard 6743 - Lubricants, industrial oils and related products (class L) - Classification is the foundation for these documents.

- a. Performance characteristics and test procedures are specified.
- b. For information, equivalent ISO, DIN, CEN, BSI, ASTM, AFNOR, CETOP, and IP test methods are referenced.¹

¹International Standards Organization (ISO) Deutsches Institut für Normung e. V. (DIN) European Committee for Standardization (CEN) American Society for Testing and Materials (ASTM) Association of Française de Normalisation (AFNOR) The Institute of Petroleum (IP) NOTE: Now combined with BSI British Standards Institution (BSI), BS 2000: XXX where XXX is the corresponding IP number European Committee on Hydraulic Oil and Pneumatics (CETOP)

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on this Technical Report, please visit
http://www.sae.org/technical/standards/MS1007_201204**

Industrial lubricant classifications targeted:

- a. Lubricants, Industrial Oils and Related Products - Classification (SAE MS1000)
- b. General purpose and total loss lubricants (SAE MS1001)
- c. Gear oils (SAE MS1002)
- d. Compressor oils (SAE MS1003)
- e. Hydraulic fluids (SAE MS1004)
- f. Fire resistant hydraulic fluids (SAE MS1005)
- g. Lubricants for spindle bearings and associated clutches (SAE MS1006)
- h. Metal removal fluids (SAE MS1008)
- i. Lubricants for pneumatic tools (SAE MS1009)
- j. Turbine oils (SAE MS1010)
- k. Lubricating greases (SAE MS1011)

See SAE MS1000 - Index of lubricants and symbols.

NOTE: Environmental, Technical Reports, and/or health and safety regulations may present additional specifications to the supplier.

1. SCOPE

See Table 1.

TABLE 1 - SCOPE AND FIELD OF APPLICATIONS

Code Letter	General Applications	More Specific Applications	Composition and Properties	Symbol	Remarks
G	Slideways	Lubrication	Refined mineral oils with improved extreme pressure, anti-corrosion, lubricity, and tackiness properties to prevent stick-slip	G	Typically lubrication of slideways and plain bearings in machine tools

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

- SAE MS1000 Lubricants, Industrial Oils and Related Products - Classification
- SAE MS1001 Lubricants, Industrial Oils, and Related Products Type A Lubricant for General Purpose and Total Loss Systems - Specification
- SAE MS1002 Lubricants, Industrial Oils, and Related Products Type C (Gears) - Specification
- SAE MS1003 Lubricants, Industrial Oils, and Related Products Type D Compressor Oils - Specification
- SAE MS1004 Lubricants, Industrial Oils and Related Products Type H (Hydraulic Fluids) - Specification
- SAE MS1005 Lubricants, Industrial Oils and Related Products Type HF Fire-Resistant Hydraulic Fluids - Specification
- SAE MS1006 Lubricants, Industrial Oils, and Related Products Type F Lubricant for Spindle Bearings, and Associated Clutches - Specification
- SAE MS1007 Lubricants, Industrial Oils, and Related Products Type G Slideway Lubricants -Specification
- SAE MS1008 Lubricants, Industrial Oils and Related Products Type M (Metal Removal Fluids) -Specification
- SAE MS1009 Lubricants, Industrial Oils, and Related Products Type P Pneumatic Tool Oils -Specification
- SAE MS1010 Lubricants, Industrial Oils, and Related Products Type T Turbine Oils - Specification
- SAE MS1011 Lubricants, Industrial Oils and Related Products - Type X (Greases) - Specification

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org

ASTM D 92	Test Method for Flash and Fire Points By Cleveland Open Cup
ASTM D 95	Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
ASTM D 97	Test Methods for Pour Point of Petroleum Products
ASTM D 130	Method for Detection of Copper Corrosion from Petroleum Products by Copper Strip Tarnish Test
ASTM D 445	Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
ASTM D 664	Test Method for Neutralization Number of Petroleum Products by Potentiometric Titration
ASTM D 665A	Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water
ASTM D 665B	Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Synthetic Sea Water
ASTM D 974	Test Method for Acid and Base Number by Color-Indicator Titration
ASTM D 1298	Test Method for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
ASTM D 1401	Test Method for Water Separability of Petroleum Oils and Synthetic Fluids
ASTM D 1744	Test Method for Determination of Water in Liquid Petroleum Products by Karl Fischer Reagent
ASTM D 2140	Test Method for Carbon-Type Composition Of Insulating Oils of Petroleum Origin
ASTM D 2422	Classification of Industrial Fluid Lubricants by Viscosity System
ASTM D 2711	Test Method for Demulsibility Characteristics of Lubricating Oils
ASTM D 2782	Test Method for Measurement of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)
ASTM D 2877	Methods of Test for Measuring Frictional Properties of Slideway Lubricants (DISCONTINUED 1975)
ASTM D 3238	Method for Calculation of Carbon Distribution and Structural Group Analysis of Petroleum Oils by the N-D-M Method
ASTM D 4052	Test Method for Density and Relative Density of Liquids by Digital Density Meter
ASTM D 4055	Test Method for Pentane Insolubles By Membrane Filtration
ASTM E 1687	Standard Test Method for Determining Carcinogenic Potential of Virgin Base Oils In Metalworking Fluids

2.1.3 Publications

Referenced AFNOR, ASTM, BS, CEN, DIN, IP and ISO Standard hardcopies are available from the SAI Global Website (<http://www.saiglobal.com>)

2.1.4 AFNOR Publications

Available from ILI as referenced in 2.1.1.

AFNOR NFT60-183 Lubrifiants, Huiles Industrielles Et Produits Connexes Pour Glissieres De Machines -Outils - Pouvoir Lubrifiant Antisaccade (Test Method for Stick-Slip Properties of Lubricating Oils)

2.1.5 BS Publications

Available from British Standards Institution, Customer Services, 389 Chiswick High Road, London W4 4AL, United Kingdom, Tel: +44-0-20-8996-9001, www.bsi-global.com.

BS 188 Determination of the Viscosity of Liquids

BS 4231 Classification for Viscosity Grades of Industrial Liquid Lubricants

2.1.6 CETOP Publications

Hardcopies of referenced Standards may be special ordered by the European Oil Hydraulic and Pneumatics Committee (Website: <http://www.cetop.org>) at:

British Fluid Power Association
Cheriton House
Cromwell Business Park
Banbury Road
Chipping Norton
GB-Oxfordshire OX7 5SR
Phone: +44 (1608) 647900
Fax: +44 (1608) 647919
E-Mail: enquiries@BFPA.co.uk
<http://www.BFPA.co.uk>

CETOP R 48 H Procedure for Determining Corrosion Resistant Characteristics of Water Base Fire Resistant Fluids

2.1.7 DIN Publications

Available from Deutsches Institut für Normung e.V., Burggrafenstrasse 6, 10787 Berlin, Germany, www.din.de

DIN 51 519 Lubricants; ISO Viscosity Classification for Industrial Liquid Lubricants

DIN 51 558/1 Testing of Mineral Oils; Determination of the Neutralization Number, Colour Indicator Titration

DIN 51 561 Testing of Mineral Oils, Liquid Fuels and Related Liquids; Measurement of Viscosity Using the Vogel-Ossag Viscometer; Temperature Range: Approximately 10 to 150-Deg C (CANCELLED)

DIN 51 562/1 Viscometry - Determination of Kinematic Viscosity Using the Ubbelohde Viscometer - Part 1: Apparatus and Measurement Procedure.

DIN 51 569 Determination of Viscosity of Mineral Oils, Liquid Fuels and Related Liquids at Temperatures from -55°C to Approximately 100°C Using the Vogel-Ossag Viscometer

DIN 51 585	Testing of Lubricants; Testing of Corrosion Protection Properties of Steam Turbine Oils and Hydraulic Oils Containing Additives
DIN 51 592	Testing of Lubricants; Determination of the Content of Undissolved Matter in Lubricating Oils; Membrane Filter Method
DIN 51 599	Testing of Lubricating Oils; Determination of Demulsification Capacity According to the Stirring Method
DIN 51 757	Testing of Mineral Oils and Related Materials; Determination of Density
DIN 51 759/1	Testing of Liquid Mineral Oil Products; Method of Test for Copper Corrosion; Copper Strip Test (SUPERSEDED BY ISO 2160)

2.1.8 EPA Publications

Standard test methods of the U. S. Environmental Protection Agency. SW-846 Methods are available on-line (Website: <http://www.epa.gov/epaoswer/hazwaste/test/8xxx.htm>). Method 24 available in the Code of Federal Regulations in 40 CFR, Part 60, Appendix A)

EPA SW 846, Method 8082	Polychlorinated Biphenyls (PCB's) by Gas Chromatography
EPA SW 846, Method 8121	Chlorinated Hydrocarbons by Gas Chromatography: Capillary Column Technique
EPA SW 846, Method 8270C	Semivolatile Organic Compounds By Gas Chromatography/Mass Spectrometry

2.1.9 IP Publications

Available from SAI as referenced above in 2.1.3.

IP 15	Petroleum Products - Determination of Pour Point
IP 19	Determination of Demulsibility Characteristics of Lubricating Oil
IP 36	Determination of Open Flash and Fire Point - Cleveland Method
IP 71(Sect. 1)	Petroleum Products - Transparent and Opaque Liquids - Determination of Kinematic Viscosity and Calculation of Dynamic Viscosity
IP 74	Determination of Water Content of Petroleum Products - Distillation Method
IP 135	Determination of Rust-Preventing Characteristics of Steam Turbine Oil in the Presence of Water
IP 139	Petroleum Products and Lubricants - Determination of Acid or Base Number -Colour- Indicator Titration Method
IP 154	Petroleum Products - Corrosiveness to Copper - Copper Strip Test
IP 160	Determination of Density - Hydrometer Method
IP 177	Test Method for Acid Number by Potentiometric Titration
IP 226	Petroleum Products - Calculation of Viscosity Index from Kinematic Viscosity
IP 240	Determination of Extreme-Pressure Properties of Lubricating Fluids (Timken Method)

2.1.10 ISO Publications

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, www.ansi.org.

ISO 2160	Petroleum products - Corrosiveness to copper - Copper strip test
ISO 2592	Petroleum products; Determination of flash and fire points; Cleveland open cup method
ISO 3016	Petroleum products; Determination of pour point
ISO 3104	Petroleum products - Transparent and opaque liquids - Determination of kinematic viscosity and calculation of dynamic viscosity
ISO 3448	Industrial liquid lubricants - ISO viscosity classification
ISO 3675	Crude petroleum and liquid petroleum products - Laboratory determination of density or relative density - Hydrometer method
ISO 3733	Petroleum products and bituminous materials; Determination of water; Distillation method
ISO 4406	Hydraulic fluid power - Fluids - Method for coding level of contamination by solid particles
ISO 6614	Petroleum products - Determination of water separability of petroleum oils and synthetic fluids
ISO 6618	Petroleum products and lubricants - Determination of acid or base number - Colour-indicator titration method
ISO 6743/0	Lubricants, Industrial oils and related products (Class L); Classification; General
ISO 7120	Petroleum products and lubricants - Petroleum oils and other fluids—Determination of Rust - Preventing characteristics in the presence of water.

3. CONCEPT

This specification defines characteristics and requirements for type G lubricants formulated with non-corrosive, lubricity, and adhesive additives. These lubricants shall provide resistance to gel formation and have good EP characteristics.

4. REQUIREMENTS AND TESTING

See Table 2.