

ICS 75.100

supersedes:
SN180-3:2015-07

1 Field of application

For normal service, SMS group recommends the use of mineral oil based lubricants that have been formulated to have excellent demulsibility. They should also have good natural oxidation resistance and rust inhibitors. This class of lubricants is covered in section 2 of this specification. However, SMS group also realizes that there are some special applications where it is desirable or required to use synthetic lubricants, or lubricants that are compatible with various rolling solutions. This class of lubricants is covered in section 3 of this specification.

2 Mineral Oil Bearing Lubricants (preferred)

The X-Roll® Oil Bearing- standard lubricant must be a high grade mineral oil, free from acid and other impurities, must have high resistance to oxidation and formation of sludge when subjected to rolling mill service, and must separate rapidly from water, air, and other contaminants. The lubricant supplier shall assume responsibility for satisfactory in-service performance, and shall provide assurance that the lubricant will not cause damage to materials commonly used in the bearing assembly or the lubrication system. The lubricant supplier should also assume responsibility for compatibility of the lubricant with any existing lubricant in the system.

2.1 Viscosity

ASTM D 445 or ISO 3448

The viscosity grade of the oil will be specified by SMS group for each application. The following ISO viscosity grades will be used: 100, 150, 220, 320, 460 and 680. As per ISO and ASTM specifications, SMS group recognizes that the required tolerance on viscosity is +/- 10 %. SMS group prefers a viscosity tolerance of +/- 5%.

2.2 Viscosity Index

ASTM D 2270 or ISO 2909

90 minimum for VG 460 or less. 85 minimum for ISO VG 680. No V.I. improvers for lubricants of ISO viscosity grades 460 or less. SMS group must be notified if the VI of a proposed lubricant is equal to or in excess of 120.

2.3 Demulsibility

This requirement is intended to assure excellent long term, in-service demulsibility. Note that the two standard ASTM tests required in this specification are conducted using reagent-grade distilled water. SMS group highly recommends that mill operators request that the following tests also be run using local roll coolant to confirm that standard test results are valid for the specific installation.

ASTM D 2711-01a

Test to use non-EP test method. Test to be run at 82 °C, using reagent-grade distilled water: 30 ml minimum water (greater than 90 % to be obtained before centrifuging), 1.5 % water in oil maximum, and 1.0 ml maximum oil emulsion.

ASTM D 1401

Test to be run at 82 °C for lubricants with ISO 100 viscosity or higher. Test to be run at 54 °C for lubricants with ISO viscosity less than 100. Use reagent-grade distilled water. Time to 40 ml oil, 37 ml water, 3 ml emulsion:

<u>ISO VG</u>	<u>Time, minutes</u>
100 - 220	20
320 - 460	40
680	50

2.4 Pour Point

ASTM D 97

- 6 °C for ISO VG 460 and lower. 0 °C for ISO VG 680 and higher.

2.5 Foaming Characteristics

ASTM D 892

Sequence I: 150 ml / 0 ml.

The desired foaming properties are a minimal foaming tendency and minimal foam stability. Note that SMS group does not recommend the addition of excess anti-foaming agents, as they tend to interfere with demulsibility and air release.

2.6 Rust Protection

ASTM D 665 (procedure A)

Pass

ASTM D 665 (procedure B)

Optional

2.7 Flash Point

ASTM D 92

Minimum flash point 195 °C

2.8 Copper Corrosion

ASTM D 130

3 hours at 100 °C, maximum 1.0 required.

2.9 Neutralization Number

ASTM D 974

Report only.

3 Alternate – High Grade Additive Type or Synthetic Oil

SMS group recognizes that some special formulations of high grade, additive type and synthetic oils have been developed specifically for oil film roll neck bearings. If selected, these oils must meet the minimum requirements below. Deviations should be reviewed by SMS group prior to implementation so that worldwide experience can be incorporated into the selection of the lubricant. Lubricants covered by this specification include, but are not limited to: synthetic oils and rolling solution compatible oils.

The lubricant supplier shall assume responsibility for satisfactory in-service performance, and shall provide assurance that the lubricant will not cause damage to materials commonly used in the bearing assembly or the lubrication system. The lubricant supplier shall assume responsibility for compatibility of the lubricant with any existing lubricant in the system.

3.1 Viscosity

ASTM D 445 or ISO 3448

The viscosity grade of the oil will be specified by the SMS group for each application. The following ISO viscosity grades will be used: 100, 150, 220, 320, 460 and 680. As per ISO and ASTM specifications, SMS group recognizes that the required tolerance on viscosity is +/- 10 %. SMS group prefers a viscosity tolerance of +/- 5 %.

3.2 Viscosity Index

ASTM D 2270 or ISO 2909

90 minimum. SMS group must be notified if the VI of a proposed synthetic lubricant is equal to or in excess of 120.

3.3 Demulsibility

If the proposed roll lubricant is to be used on a mill with water based coolant, then SMS group highly recommends that mill operators request that the specified tests also be run using local roll coolant to confirm that standard test results are valid for the specific application. This requirement is intended to assure excellent long term, in-service demulsibility.

ASTM D 2711-01a

Test to use non-EP method. Test to be run at 82 °C, using reagent-grade distilled water: 30 ml minimum water (greater than 90 % to be obtained before centrifuging), 1.5 % water in oil maximum, and 1.0 ml maximum oil emulsion.

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3.9 Neutralization Number

ASTM D 974

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Referenced technical standards, codes and regulations

ASTM D 92b	Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
ASTM D 97	Standard Test Method for Pour Point of Petroleum Products
ASTM D 130	Standard Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test
ASTM D 445a	Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)
ASTM D 665	Standard Test Method for Rust-Preventing Characteristics of Inhibited Mineral Oil in the Presence of Water
ASTM D 892	Standard Test Method for Foaming Characteristics of Lubricating Oils
ASTM D 974	Standard Test Method for Acid and Base Number by Color-Indicator Titration
ASTM D 1401	Standard Test Method for Water Separability of Petroleum Oils and Synthetic Fluids
ASTM D 2270	Standard Practice for Calculating Viscosity Index From Kinematic Viscosity at 40 and 100 °C
ASTM D 2711	Standard Test Method for Demulsibility Characteristics of Lubricating Oils
ISO 2909	Petroleum products - Calculation of viscosity index from kinematic viscosity
ISO 3448	Industrial Liquid lubricants; ISO viscosity classification

Previous editions

1991-02, 1999-03, 2001-01, 2009-01, 2009-07, 2015-07

Revision of April 2016

Oilfilm bearing changed in X-Roll® Oil Bearing,
Referenced technical standards, codes and regulations updated