

SCOPE

- I 1.1 This practice covers the vendor's design and Purchaser's installation of oil mist lubrication systems for machinery for lubricating bearings.
- I 1.2 This practice covers other machinery applications such as purging of oil reservoirs, gear casings and bearing housings, to exclude atmospheric contamination.
- I 1.3 **An asterisk (*)** indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.

SUMMARY OF ADDITIONAL REQUIREMENTS

- I 2.1 **Table 1** lists the standards which shall be used with this practice.

TABLE 1

STANDARDS	
ASTM Standards	
A 120	Pipe, Steel, Black and Hot-Dipped, Zinc Coated (Galvanized) Welded and Seamless, for Ordinary Uses
A 269	Seamless and Welded Austenitic Stainless Steel Tubing for General Service

DEFINITIONS

- I 3.1 **Oil mist** is a dispersion of oil droplets (size 1 to 3 μm) in an air stream.
- I 3.2 **"Purge mist" lubrication** is a wet sump arrangement. Normal bearing housing oil levels will be maintained and atmospheric contamination excluded by introducing oil mist. The mist only purges the bearing housing. Bearing lubrication is by conventional oil bath, flinger, or oil ring.
- I 3.3 **Dry sump lubrication ("pure mist")** is an arrangement in which no oil level is maintained in the bearing housing. Lubrication will be accomplished by condensing fresh oil from the mist on to the rolling bearing (anti-friction) elements. The mist both lubricates the bearing and purges the housing.
- I 3.4 **An oil mist lubrication system** includes the mist generator console, distribution piping with supports, application fittings, bearing housing vents, and central lubricant supply tank.
- I 3.5 **Application Fittings** (or Reclassifiers) meter or convert oil mist to a spray, or condense oil droplets at lubrication points.
- I 3.7 **Generator console** as used in this practice includes the oil mist generator, generator oil supply system, air supply moisture separator/filtering system, oil mist outlet header, and attendant controls and instrumentation. For dry sump applications it may also include a stand by (backup) generator mounted directly to the generator console cabinet.

DESIGN

- I * 4.1 **Application of oil mist lubrication systems** for lubricating bearings, and other machinery applications will be specified.
- R * 4.2 **Oil mist lubrication systems shall not be applied for:**
 - a. Any equipment where the properties of the mist oil are incompatible with the primary lubricant.
 - b. Equipment with force feed lubrication systems that operate continuously.
 - * c. Electric motor drivers, unless specified otherwise.
- R 4.3 **Oil mist systems shall be designed for both dry sump lubrication ("pure mist") and "purge mist."** However, initial operation shall be with "purge mist."
Note: Future conversion to dry sump lubrication will be by the Owner's Engineer.
- O,R 4.4 **The oil mist generator vendor** shall assume **overall engineering responsibility** including but not limited to selection and sizing of all system components, and approval of detail piping drawings.
- I 4.5 **Air supply** shall normally be from the plant **instrument air system**.

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(This practice is appropriate for attachment to Inquiry or Purchase Document)

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- O 4.6 **The system** shall be **designed to ensure a homogeneous mist** at the farthest application point. The piping run between the generator and lubrication point shall not exceed the vendor's maximum recommended limit.
- R 4.7 **The generator** shall be **designed to maintain a minimum of 20 in. H₂O (5 kPa) header pressure** at the generator under rated flow capacity.
- R,M 4.8 Minimum size application fittings shall be .045 inch (1.14 mm) diameter.

GENERATOR CONSOLE

- R 4.10 All Dry Sump applications shall have oil mist generator consoles equipped with a 100% capacity spare generating module mounted directly to the cabinet of the primary module or in a location specified. The spare module shall be equipped with oil reservoir and air heaters if the primary module is so equipped. Instrumentation shall be provided to monitor primary and standby generator conditions and provide an alarm to remote location(s) in the event of malfunction.
- R * 4.11 **If a spare console is specified to be installed**, the spare unit shall not be **located** within the same process unit area.
- S * 4.12 **Enclosures for electrical equipment** shall be appropriate for the specified area classification and environmental exposure.
- O * 4.13 **Generator maximum flow** shall: be 115% of specified rated flow requirements, and be capable of proper misting operation down to 50% of rated flow and maintaining satisfactory header pressure over this flow range.
- R,M 4.14 **The generator oil reservoir shall include the following:**
 - a. Heater with temperature gage and thermostatic control to maintain oil supply at proper viscosity.
 - b. Level sight glass, weather protected open vent (if required), and valved low point drain.
 - c. Automatic and manual refilling of the reservoir from an external supply tank.
 - d. Working capacity for 48 hours operation at maximum flow.
 - e. Relief valve set at 10 psig (70 kPa).
- O 4.15 The following **identification information** shall be permanently **mounted inside the generator console:**
 - a. Operating characteristics over the specified flow range.
 - b. Instrumentation set points.
- R 4.16 **10 µm filter** shall be provided in the generator oil filling line.
- O 4.17 **The design oil consumption rate** shall be 0.65 in.³ of oil per hour per cfm of oil mist (0.0062 L/h of oil per m³/h of oil mist).
- O,R 4.18 **The generator inlet air system shall include the following:**
 - a. Inlet air filter capable of removing particles over 5 µm and a moisture separator.
 - b. Inlet air heater with temperature gage, thermostatic control and automatic cut-out on heater element over temperature.

DISTRIBUTION SYSTEM PIPING LAYOUT

- R 4.19 **Oil mist headers and laterals** shall not be **valved**, except at central points in mist distribution system between oil mist generator consoles **if two or more consoles are operating in parallel**. However, **unions** are required **at each oil mist console to facilitate its removal**.
- O,R 4.20 **Oil mist headers and branches shall be sloped** to drain to the mist generator and to the equipment, respectively. The slope shall be a minimum of 1:120.
- O,R 4.21 **Tubing and piping shall be supported** to limit sagging to a maximum deflection of one-half of the pipe ID. Adjustable supports are required.
- I 4.22 **Figures 1 and 2** show **layout requirements** for typical oil mist piping arrangements for pump installations.
- O,R 4.23 **Piping laterals shall be supported** near the Application Fittings.
- O,R 4.24 **Unavoidable low points in mist headers**, such as at an underground crossing, **shall be drained** to a knock-out pot vented to atmosphere. The drain line to the pot shall be fitted with an Application Fitting.
- * **The location of all main header drains** shall be approved by the Owner's Engineer.
- O 4.25 **The mist distribution piping shall be sized** to limit mist velocity to no greater than 20 ft/sec (6 m/s) at rated system capacity.