APPLICATION BULLETIN.....

Cooling Tower Gear Box Reducer
Industry – Refining, Petro–Chemical & Power Generation

LubriMist® Oil Mist Improves Gear Box Reliability On Your Cooling Tower.... Provides A Fast Payback

Excessive Wear and Corrosion From Intermittent Operation

Internal gear box oil pumps and distribution devices only function when the gear box is operating. During idle periods bearing and gear surfaces above the oil reservoir drain and become oil free. This leads to corrosion and at restart excessive wear is experienced because of metal–to–metal contact.

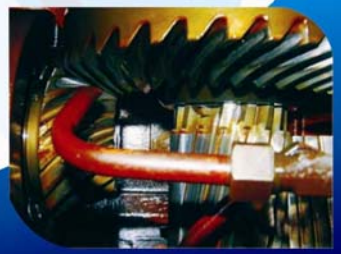
Inadequate Lubrication During Slow Roll

Non–operating cooling tower fans, without protective clutches, can turn or slow roll due to downward air drafts caused by adjacent cells. This low–speed win milling, often opposite the design direction, will not provide sufficient energy to properly operate the internal oil circulating devices. Gears and bearings are then subject to excessive wear due to inadequate lubrication.

The Solution

LubriMist® mist systems prevent moisture and condensation from entering the gear box by delivering a pressurized constant flow of oil mist lubrication into and through the gear box. This minimizes lubricant contamination, extends wear protection and oil change intervals. The oil mist also continuously coats internal surfaces with an oil film thus eliminating corrosion and excessive wear during downtime, at start–up and with wind milling.

One LubriMist® oil mist system with the generator Located at ground level will provide oil mist lubrication To the cooling tower gear boxes and their electric motor drivers plus the associated water pumps and related drivers.



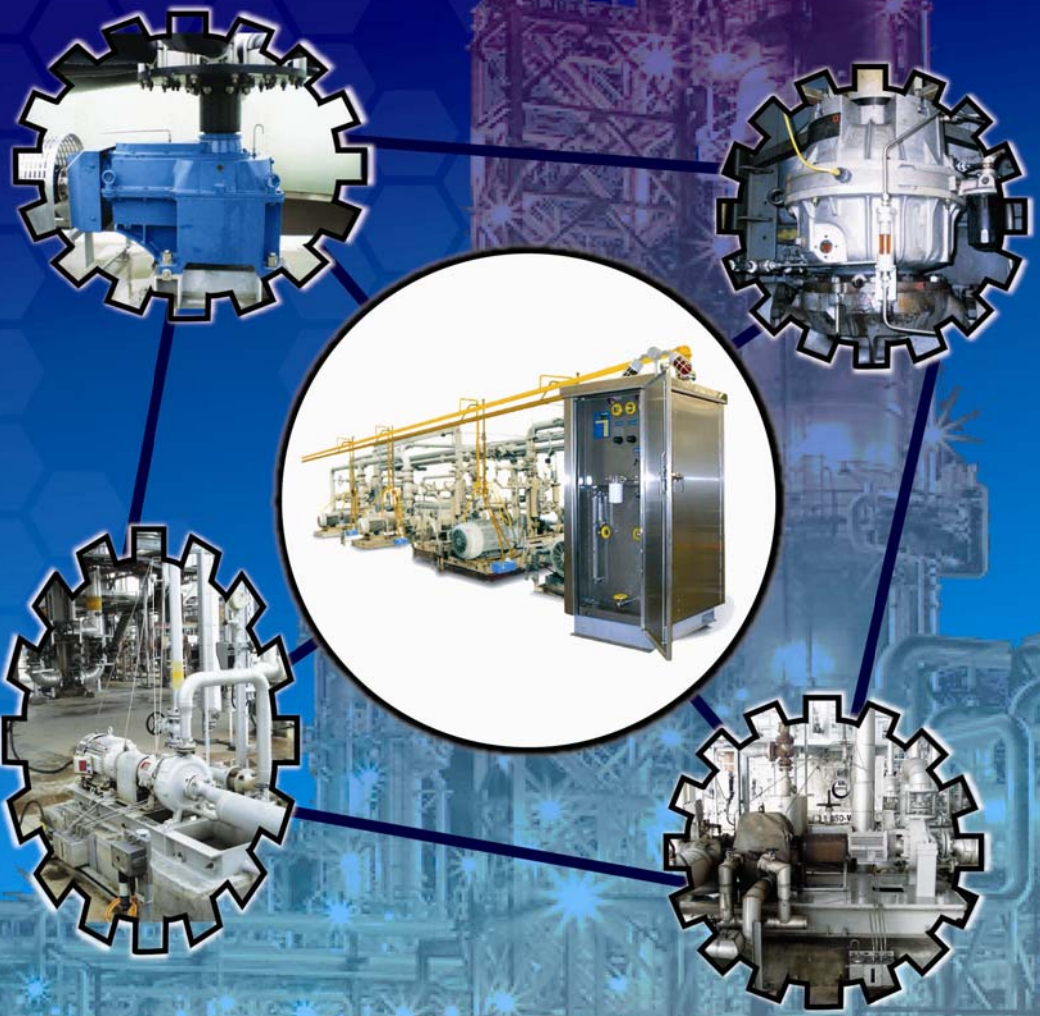
Gear Box has been operating since 1996. Gear teeth condition looks like a new gear and receive excellent lubrication

LSC Lubrication Systems Company
www.lsc.com

LONG WIN THAI
THE RIGHT SOLUTION
Regional office in South East Asia

LONG WIN THAI CO., LTD.
Banplong Rd, T.Mab Ta Phud, A.Muang, Rayong 21150, Thailand
Tel +(66–38) 692443–4 Fax +(66–38) 692151
www.longwinthai.com Info@longwinthai.com

Improve Plant Reliability By Centralized Oil Mist Lubrication System



The Leader In Oil Mist Lubrication Systems Asia Regional Sales & Services

LONG WIN THAI CO., LTD.
Banplong Rd, T.Mab Ta Phud, A.Muang, Rayong 21150, Thailand
Tel +(66–38) 692443–4 Fax +(66–38) 692151
www.longwinthai.com • email<info@longwinthai.com>

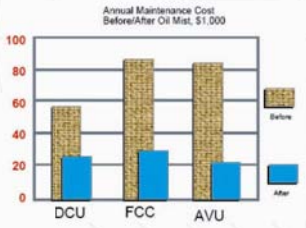
LubriMist® Oil Mist Description

Introduction

An oil mist system is a centralized lubrication system that generates, conveys and automatically delivers lubricant to machinery bearings. It is a system that has few moving parts making it very reliable. The lean mixture of oil and air produced by the generator is known as oil mist. The oil particles form a stable suspension that can be conveyed considerable distance (180 meters) through piping and tubing to the point requiring lubrication. Oil mist is a proven technology and it provides many advantages over conventional lubrication techniques such as oil splash and grease.

Applications and Use

Oil mist is used to lubricate rolling element bearings of all types. The most common applications in refineries and petrochemical plants are the bearings in pumps and their electric motor drivers. In addition, oil mist is used to purge gearboxes and the bearing houses of small steam turbines using sleeve bearings. Oil mist systems have been used in the hydrocarbon processing industry since the late 1960's with widespread use in many areas of the world commencing in the 1980's.



Financial Benefits

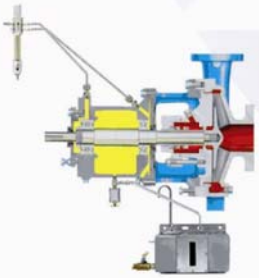
Oil mist systems are justified for economic reasons. It has been documented in technical papers released by users, by bearing manufacturers and in publications on university research that bearings lubricated with oil mist have longer life than bearings lubricated with oil sump or grease. Users claim from 50% to 90% reduction in lubrication related bearing failures when oil mist is used. A bearing failure can lead to an equipment overhaul costing $5,000 to $10,000, not including lost production. Reduction in seal failures has also been documented with the use of oil mist. The savings result in payback on the investment in less than two years and this combined with twenty-year life and low system operating cost means oil mist is a high-return, low-risk project.

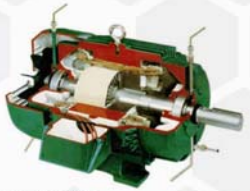
Reasons for Superior Performance

- Bearings run cooler, typically on the order of 10 C. Lower bearing operating temperature means longer life.
- Oil mist lubrication is contaminant free. Studies have shown that it is common to have high contamination levels in oil sumps even though bearing housing seals are in place and recommended oil change intervals are followed. This contamination is not present with oil mist.
- External contaminants such as water vapor and particulate matter are excluded from the bearing housing because the mist system operates at positive pressure.
- The internal surfaces of the bearing housing are always coated with oil so there is no possibility for corrosion. This also applies to stand-by equipment meaning back-up machinery is ready for operation.

Oil Mist and Industry Specifications

The American Petroleum Institute (API) and the Process Industry Practices (PIP) group have taken a position that supports the use of oil mist. In their "Recommended Practices for Machinery Installation and Installation Design" specification (API RP-686, PIP REIIE 686), oil mist systems are prominently described. In the API specification for pump design (API-610) oil mist lubrication is included as a means

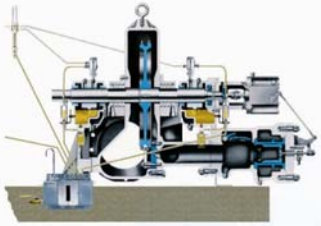




Pure Oil Mist Application for Pump API and Motor

- Pure Oil Mist provides the lubrication, continually supplies to bearing.
- Bearing run cooler typically 10 C, lower friction, less heat generation.
- Wear Particles are Continuously Washed from The Bearing Surface.

Purge Oil Mist Application for Turbine



- Oil Mist purge over oil level in housing with slight positive pressure to keep oil free from contamination.
- Continuously coats all internal surfaces with Lubricant to anti corrosive agent.

Oil Mist Equipment Designs and Certifications

The microprocessor controlled central consoles are easily tied into DCS systems. In addition, consoles that are third party approved for NEC and IEC hazardous area classifications are available. It is not necessary to carry out special designs for particular projects as the vendor equipment is already approved for use in hazardous classified areas.

Machinery Manufactures

As the use of oil mist has grown around the world, pump and electric motor manufacturers have incorporated bearing housing designs for oil mist lubrication. Pump and electric motor manufacturers that have a significant presence in the hydrocarbon processing industry supply equipment ready for oil mist lubrication. API-610 gives them clear standards for use of oil mist with pumps. The procedures for converting from grease lubricated motor bearings to oil mist are also readily available and easily adapted.

Conclusions

Oil mist lubrication is a proven technology that delivers both financial and environmental benefits. Equipment failures are reduced lowering operating and maintenance costs. Consumption and discharge of lube oil is also reduced with oil mist. Financial payback on the investment in oil mist systems is quick and low risk. Leading vendors of oil mist systems have the experience and knowledge for the successful application of oil mist to machinery in the hydrocarbon processing industry. The use of oil mist lubrication is becoming a preferred approach to bearing lubrication by many of the leading companies in this industry.