HJ SIP Cylinder Lubrication

Better Cylinder Condition – Reduced Oil Consumption

- Superior distribution of cylinder oil, directly onto the liner surface
- Injection above the piston, where the most corrosive wear takes place
- Introduction of fresh cylinder oil in every engine revolution, regardless of feed rate
- Timed injection of cylinder oil

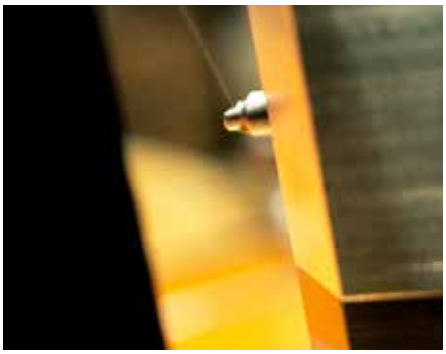
INNOVATION THROUGH GENERATIONS

HJ SIP Lubrication

Purpose

HJ SIP lubrication is designed to improve cylinder condition with reduced cylinder oil consumption.

This is achieved by an optimum cylinder oil distribution on the liner surfaces on 2-stroke diesel engines, in order to reduce corrosion and wear, and to help seal the piston rings. When lubricating according to this principle, experience has shown that a more effective utilisation of the cylinder oil is obtained.



Description

HJ SIP is an abbreviation for Swirl Injection Principle, and refers to the principle of utilizing the engine's scavenge air swirl for distribution of cylinder oil.

Depending on engine size, a suitable number of HJ SIP valves are installed in the cylinder liner.

With each ascending piston stroke of the engine, an adjusted amount of fresh cylinder oil is sprayed directly onto the liner wall. This contributes to optimization of utilization of cylinder oil.

The cylinder oil is sprayed into the engine's air swirl, whereby the centrifugal force distributes the cylinder oil in a thin and even layer on the cylinder wall.

Thereby, optimal coverage of the upper liner wall is achieved, where the need for cylinder lubrication is greatest.

- Timing (oil is sprayed above the piston, onto the liner wall, as a thin uniform oil film)
- HJ SIP ensures a thin and uniform oil film on a large surface
- Neutralises acids formed on the upper liner wall after combustion

Function

The cylinder oil is injected from the HJ SIP valves, and is distributed onto the cylinder wall, utilizing the centrifugal force of the scavenging air swirl.

After injection, a cylinder oil film covers the upper part of the cylinder liner, prior to the passing of the piston and the piston rings. The cylinder oil film contributes to neutralization of sulphuric acid, which generates from combustion of sulphurous fuel. It reduces the friction and the wear between the piston rings and the running surface of the cylinder liner.

During the descending movement of the piston and piston rings, the oil is distributed to the rest of the running surface of the cylinder liner.

HJ SIP Lubrication Systems

An HJ SIP lubrication system is a modern lubrication system, consisting of SIP compatible lubricators that pumps cylinder oil to HJ SIP valves placed in the cylinder liners' existing valve holes.

The HJ SIP lubrication system can be specified according to customer's preference e.g.:

- Electronically controlled (hydraulically driven) HJ Lubtronic lubricators and HJ SIP valves - (Typically load dependent).
- Mechanically driven lubricators with electronically controlled HJ Mechtronic regulation module and HJ SIP valves - (Typically load dependent).
- Mechanically driven lubricators and HJ SIP valves - (Typically RPM dependent).

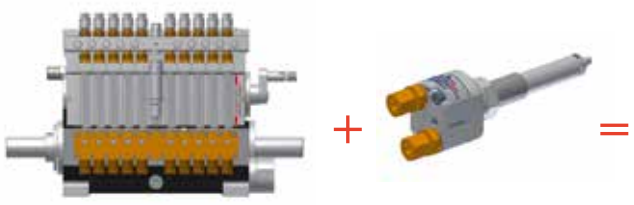
Therefore, we can always find a suitable HJ SIP lubrication solution for your fleet.

Optimized Injection Principle

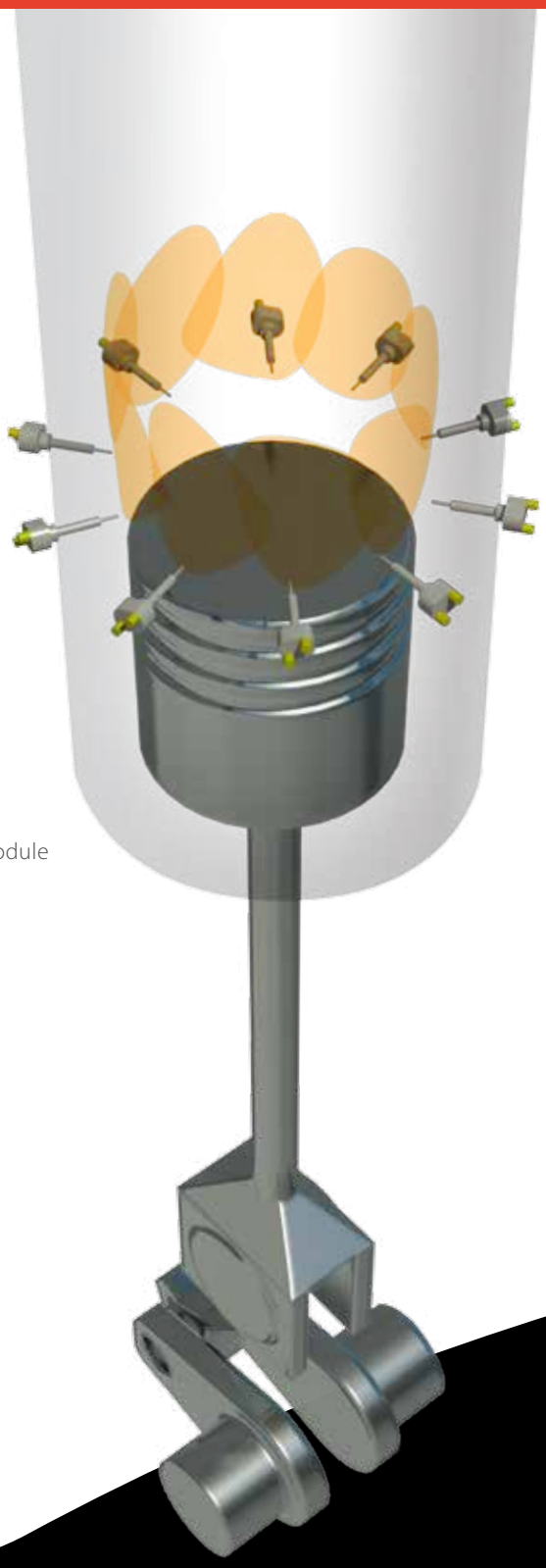
HJ SIP valves can be combined with various lubricators

Hydraulically driven electronically controlled HJ Lubtronic lubricators & HJ SIP valves

Mechanically driven lubricators with electronically controlled HJ Mechtronic regulation module & HJ SIP valves



Mechanically driven lubricators & HJ SIP valves



HJ SIP Lubrication vs. Conventional Lubrication

To ensure optimal distribution of cylinder oil, the oil is injected above the piston onto the liner wall, where the most corrosive wear takes place.

Traditional system

Cylinder oil distributed by piston = unequal distribution

HJ SIP system

Cylinder oil injection before piston passes = thin and uniform oil film

HJ SIP valves normally inject cylinder oil at a pressure of 37 bar; higher pressure than conventional return valves and accumulator valves. The pressure in the pressure pipes between the lubricator and the HJ SIP valves ensures, that the oil is incompressible. When the oil from the lubricator to the HJ SIP valve is incompressible, the system can be timed so that delivery of cylinder lubrication oil is very precise.

HJ SIP lubrication contributes to a better distribution of cylinder oil compared to traditional lubrication systems, which is why cylinder lubrication oil consumption is substantially reduced.

From the experience gained since we introduced the HJ SIP lubrication system in 2001, HJ SIP is the most economical and efficient approach to cylinder lubrication of 2-stroke diesel engines.

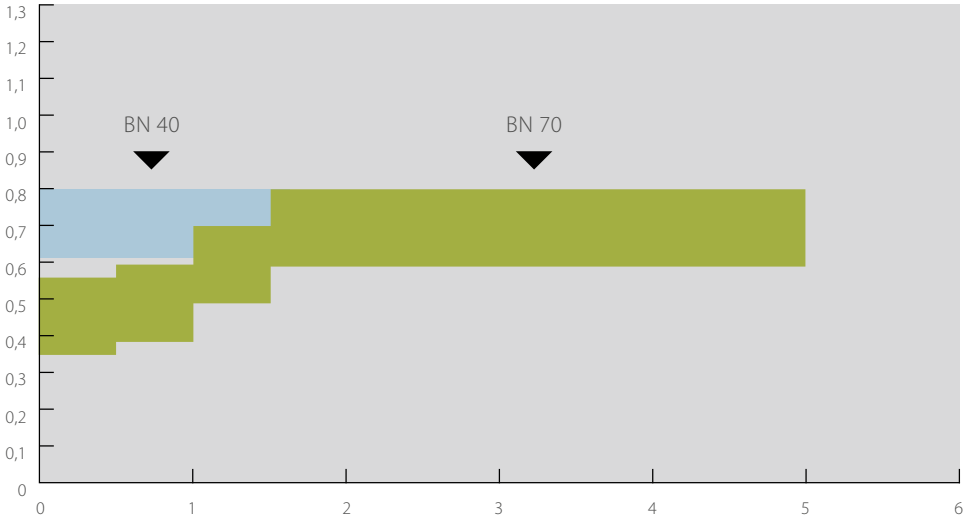
Installations

Cylinder Oil Feedrate

Based on experience from hundreds of installations.

Please consult our website www.hjlubricators.com for latest updates.

Note: You always have to carry out port inspections prior to setting of feed rate



HJ SIP lubrication is easily applicable to all major 2-stroke diesel engine designs such as MAN B&W, Wärtsilä (Sulzer) and Mitsubishi engines.

Whether retrofitting or installing on a newbuilding, the process of installing HJ SIP lubrication requires:

- Cylinder liners must be prepared for HJ SIP lubrication. (Either from your liner supplier or machined in-situ).
- HJ SIP valves are mounted in the cylinder liners, in the same position as the non-return valves or accumulator valves.
- HJ SIP compatible lubricators are installed.

HJ SIP Installation on Newbuildings

As cylinder oil is one of the most expensive costs in connection with vessel operation, we can only recommend that shipowners install HJ SIP when they are in the process of specifying newbuilding data for a new vessel.

HJ SIP Installation as Retrofit

As it is possible to perform a retrofit installation in-situ, an HJ SIP retrofit can be carried out during one or a few port calls, without affecting the schedule of the vessel. This fact (installation in situ) reduces the time and cost involved in a HJ SIP retrofit, thus reducing the payback time and making it even more profitable to implement HJ SIP on vessels in operation.

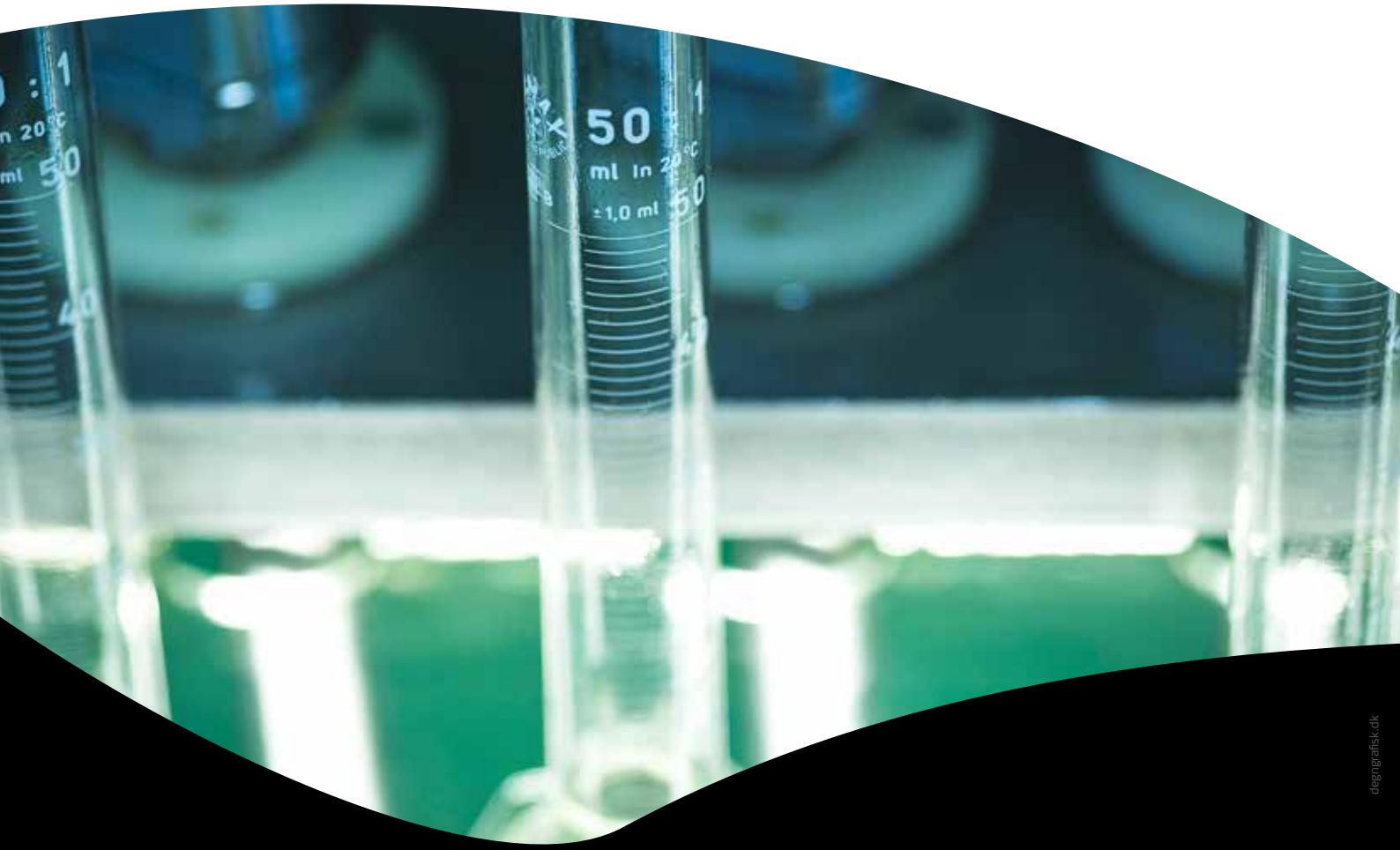
We have experienced and professional partners worldwide, including our own engineers, ready to perform retrofit of the HJ SIP system. Therefore, we will always find a suitable solution for retrofitting your fleet, which of course includes supervision by one of our experienced service engineers.

There are different types of HJ SIP valves depending on engine design. For all types, performance is unchanged, and the differences lie solely in design, for easiest possible fitting.

HJ SIP valves can be mounted as a replacement for accumulator valves on Wärtsilä (Sulzer) engines and non-return valves on MAN B&W and Mitsubishi engines.

In most cases, cylinders are only to be machined on the inside. Therefore, the machining can be made in-situ without pulling the liners.

The dimensions of valve housing and stay bolts are delivered to fit the existing holes in the liner.



Hans Jensen Lubricators A/S
Smedevænget 3
DK-9560 Hadsund

Tlf. +45 98 57 19 11
Fax +45 98 57 13 87
Mail hjl@hjlubri.dk

www hjlubricators.com

Hans Jensen Lubricators A/S
Danish Export Association
Shanghai Rep. Office
Rm1703, 1277 Beijing Xi Lu
Shanghai 200040
China
Phone +86-21 5965 6790

INNOVATION THROUGH GENERATIONS