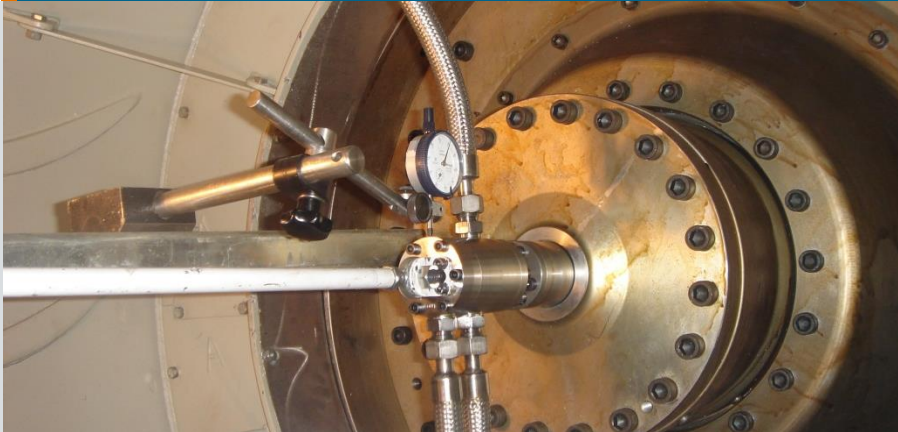




New hydraulic oil hose for sleeve bearing assemblies



Howden issues new specifications on design of hydraulic hoses for sleeve bearing assemblies.

A new and improved design has been developed for the flexible hydraulic hoses connected to the rotating oil seal. This affects all fans where the main bearing assembly is of sleeve bearing design.

Due to issues with broken return oil hoses on some of the steel bellow designs that are mounted on the rotating oil seal on sleeve bearing assemblies, Howden has developed a new hydraulic hose design to mitigate this issue.

A combination of axial movements and pressure pulsations inside the steel bellow hose possibly caused fatigue cracks in the hydraulic return hose after even short periods of operation.

This has resulted in hydraulic oil leakages in the inner tube of the diffuser which triggers an alarm that oil level is below minimum tank level.

If the oil level is not within required levels, an inspection at the fan is necessary to evaluate how to stop the oil leak on the fan. Ultimately this could cause a forced outage of the boiler or reduced boiler load.

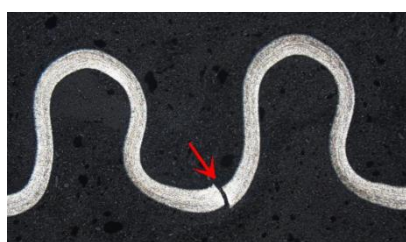
A test of the new hose design validates the quality and reliability

After identifying a new hose design, we built a test stand simulating the axial movements and pressure pulsations which the new and old hoses were exposed to. This allowed for the comparison of the old and new design and to verify if the new design were of required quality and durability.

The two hose designs were mounted in parallel to ensure that both hoses were exposed to the same conditions and a series of tests were performed. The test results showed that the new hose design is highly robust and reliable compared to the old design.

Test summary	
Pilot valve pulsation frequency:	15 Hz
Oil temp.	Approx. 70 °C
Ambient temp.	20°C
No. of axial movements of pilot valve:	Approx. 2 mio.
Pressure during test:	Static pressure 10 bar Pulsation 0 - 25 bar
Simulation of axial regulations (full stroke = 125mm)	

Test result
<ul style="list-style-type: none"> The oil hose with PTFE tubing (new design) lasted all 4 tests without any damage or leaks. We are able to force the steel bellow hoses (old design) to fail by exposing it to pressure pulsations of 30 to 40 bar The axial movements of the steel bellow hose seemed not to have an impact of the hose life time.



Cross section of the corrugated line shows crack in hose.

New hose design

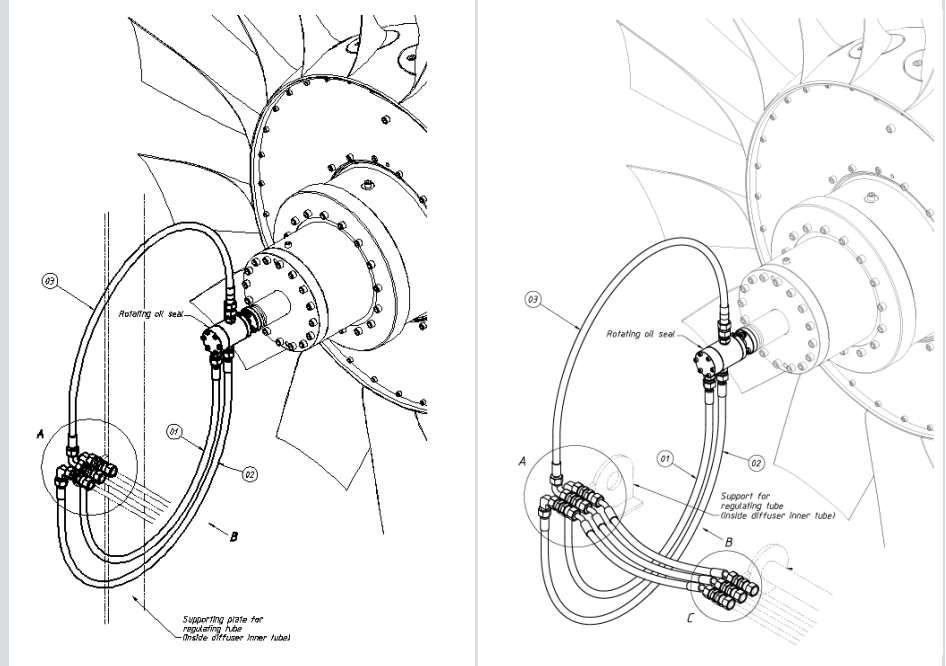
- Braid and fitting made of AISI 316 stainless steel
- Inner hose is an anti-static teflon tube
- Subjected to the exact same pressure tests as the old design
- Overall bursting pressure is the same as the old design even though there is only one braid layer
- Teflon inner hose is more pressure resistant
- Designed with a separate 90° fitting avoid twisting of hoses when tightened during mounting.



New hydraulic hose design

Benefits

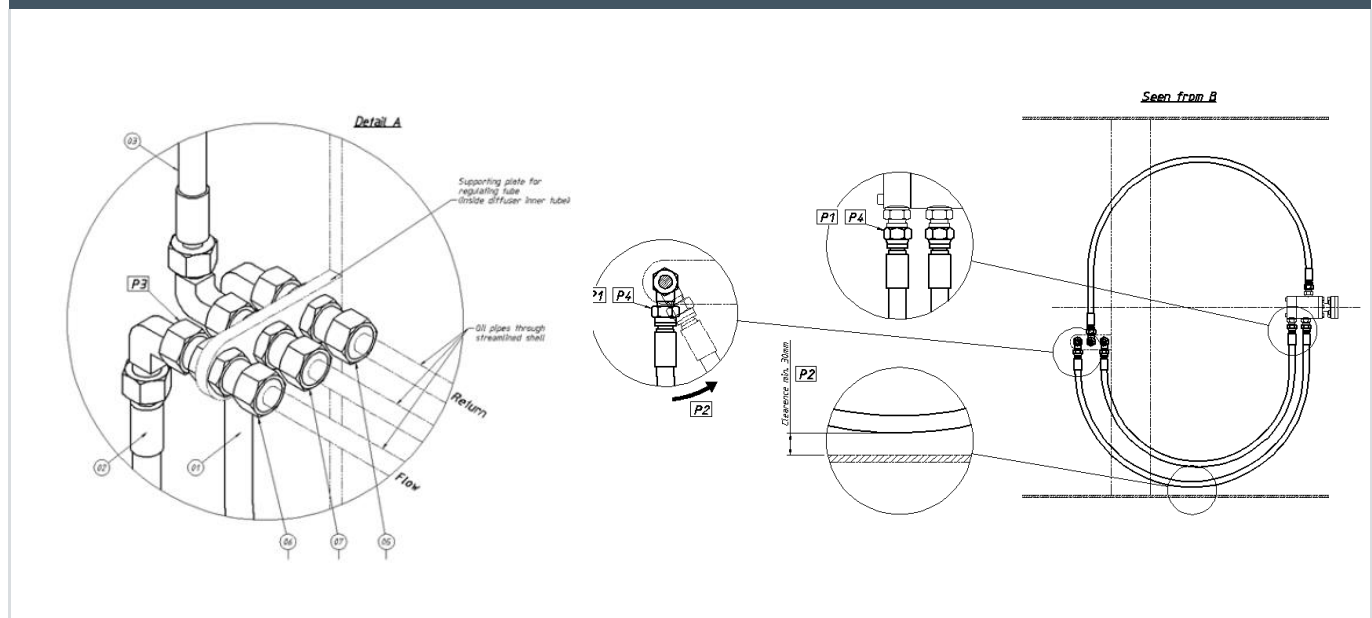
- Significantly longer life time
- Compatible with all old hose designs
- AISI 316 stainless steel braid and fitting are resistant to sulphuric acid
- Lower stress concentrations as the hose is made of teflon
- The teflon hose contains carbon which makes it anti-static
- No welding between fittings and hose minimizes risk of leakage



Picture left: Design with 3 hoses and 3 pipes
Picture right: Design with 6 hoses

The new hydraulic hose design has a longer lifetime, higher reliability and highly reduced risk of rupture and leakage.

Installation of hydraulic hose



For more information please **contact your local Howden office.**

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