

The innovative sealing solution for difficult media and operating conditions

EagleBurgmann[®]
Rely on excellence

DF-MFLWTI DiamondFace mechanical seal for refinery pumps



IDP pump with seal supply unit in application at TOTAL Leuna.

The TOTAL refinery at the Leuna chemicals site is one of the most state-of-the-art facilities of its type in Europe. It processes around 30,000 tonnes of crude oil every day, most of which is pumped in from Russia.

Around three million tons of gasoline alone are produced in Leuna annually. This largely covers the demand from the German Federal States of Saxony-Anhalt, Saxony and Thuringia. Some 1,300 filling stations in the refinery's catchment area are supplied from Leuna. The TOTAL refinery is also Germany's largest manufacturer of methanol, which is an important base material for the chemical industry. Other products such as LPG, untreated gasoline and jet fuel, diesel, heating oil and bitumen complete the range.

Harsh operating conditions lead to seal failures

A type SVCN7 pump from Ingersoll Dresser Pumps used as a stabilizer reboiler pump drives the bottom circuit of a stabilization column in which the lighter and more volatile components are separated from the reformate by distillation. The SVCN7 pumps the bottom product (stabilized reformate) to a furnace and then returns it to the bottom of the column. This mode of operation allows impurities such as pipe abrasion or catalyst residues to concentrate in the pumped column bottom, where they damage the mechanical seals. Solids in the medium and operation close to vapor pressure were the source of considerable problems for the competitor's seal that was originally used.

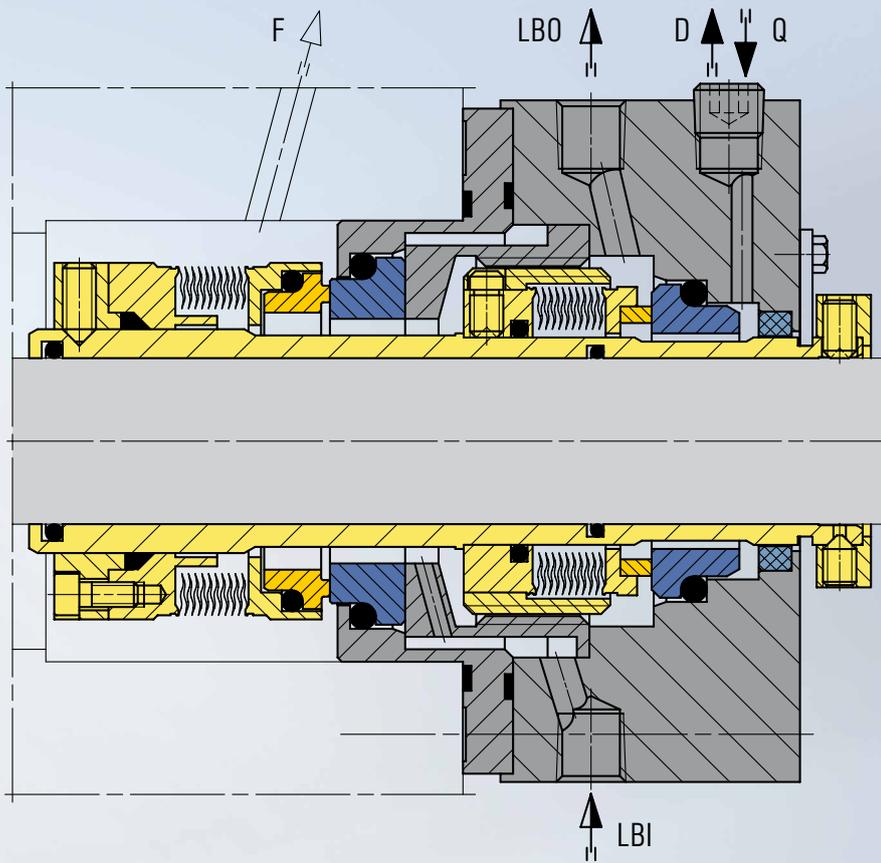
Numerous failures and very short MTBF finally induced the operator to join forces with EagleBurgmann to develop a permanent and

reliable sealing solution. Just a few months later they were able to present their innovative solution which was validated in pilot operation and fulfilled the customer's expectations.

Innovative concept: DF-MFLWTI with inserted seal face

EagleBurgmann's design solution is based on the proven metal bellows design. As metal bellows do not need elastomer secondary seals, they are the perfect candidate for application at high temperatures. The MFLWTI is a double seal in tandem arrangement and is supplied ready for installation as a cartridge unit. It is supplied unpressurized to API Plan 21+52+61.

The innovative key element of the MFLWTI is the loosely inserted face of the seal on the product side, combined with the DiamondFace diamond coating of the contact surface. Even the choice of



EagleBurgmann tandem mechanical seal DF-MFLWTI.
The seal on the product side has a loosely-inserted, diamond-coated seal face.

Yellow parts rotating, blue stationary.
Gray: Pump shaft and housing

material for the seal face highlights its flexibility: the inserted ring offers more options in this respect than shrink-fit faces. It also impresses with its positive deformation behavior in operation and, as it is able to move, it will not tilt or cant.

The diamond coating makes the seal immune to dry running and solids in the medium. EagleBurgmann DiamondFace has already proven its worth in numerous applications in the oil and gas industry, refining and power station technology, for example. Minimal friction, practically no wear and maximum chemical resistance - with the DF coating from EagleBurgmann, previously unachievable operating periods and MTBF or MTBR intervals are now possible, even under difficult conditions.

Successful conversion, increased productivity

Since conversion to the newly-developed EagleBurgmann DF-MFLWTI metal bellows seal with DiamondFace coating in 2013, the pump and seal have been running at TOTAL Leuna continuously and without complaint with regular start / stop cycles caused by scheduled switchover to the parallel pump. Plant availability has been significantly increased as a result. Given this excellent experience, TOTAL Leuna has now decided to retrofit this sealing solution in the parallel pump as well.

Groundbreaking solution for the future

The customer-specific sealing solution illustrated here sets new standards in terms of product development. The design principle of a metal bellows seal with inserted seal face is currently under development to the series production stage in the new EagleBurgmann MFLWTI series.

In the future, there will be MFLWT(I) seals available with or without DiamondFace coating for use at temperatures up to approx. 400 °C (752 °F) and pressures up to 25 bar (363 PSI).

Please contact us for further details.

Application data

Medium: Hydrocarbons
 Pressure: $p = 17.5 \text{ bar (253.8 PSI)}$
 Temperature: $t = 270 \text{ °C (518 °F)}$,
 max. 300 °C (572 °F)
 Rotational speed: $n = 1,485 \text{ min}^{-1}$
 Materials:
 Q15Q15G/KHM6G1-Q12Q1K/KHM6G1
 Seal supply system: API Plan 21+52+61