

## **New butterfly valve for corrosive media**

**The demand for highly corrosion resistant butterfly valves continues to grow and GEMÜ have introduced a new range to complement their other lined butterfly valves.**



The new GEMÜ 490 butterfly valve is fitted with a TFM liner and PFA-encapsulated stainless steel disc as standard. The design of the butterfly valve, and especially the liner, the shaft seal and backing has been optimised to reduce actuation torques, while providing increased tightness at the same time. The new butterfly valve therefore uses smaller actuators, this being reflected in reduced purchase and operating costs. The technical improvements to the sealing concept increase the service life and reduce the probability of failure.

### **Why TFM instead of PTFE**

TFM is a further development of the classic PolyTetraFluorEthylene (PTFE) material. The tremendous properties of PTFE have been improved even more in this second generation.

#### Properties of TFM

- TFM is highly resistant to chemicals and can therefore be used almost universally.
- The gas permeability is significantly less than with conventional PTFE (see diagram 2). This means that less medium diffuses through a TFM seal with the same material thickness as PTFE. 3 mm thick TFM material corresponds to around 5-6 mm thick PTFE. In line with the requirements of the chemical industry, the material thickness of the liner and coating of the butterfly disc is at least 3 mm for the GEMÜ 490.
- The cold flow properties with TFM are significantly lower than with PTFE. A significantly lower plastic deformation of the material therefore results at the same mechanical stress (see diagram 1). This means that the liners of butterfly valves will remain dimensionally stable for longer.
- The surface quality of TFM is considerably improved in comparison to PTFE (see diagram 3). The smoother surface reduces the mechanical friction and hence wear by the butterfly disc. The liner remains durable for longer and less ground particles find their way into the medium. At the same time, the liner for the GEMÜ 490 is shaped spherically inside and outside, thereby reducing the torque and extending the service life.

### **The backing**

The backing behind the actual liner consists of two parts. Both backing parts are fully inserted in the space between the body and the TFM liner and centred with the shaft bushing. The backings are sufficiently strong in design, so that

their flexibility is better transferred to the TFM liner. At the same time, the tolerances of the backings have been further reduced. The greater fitting accuracy leads to improved mechanical properties. The backing is also designed in such a way that it resists considerably greater deformations with permanent elasticity. The side play between the backing and liner is so great that no negative stresses can be transferred when compressing the liner between the flanges. These design measures also result in a further reduction in the torque and hence a longer service life of the liner.

## **The spindle seal**

The spindle seal has also been optimised further. The transition from shaft disc to liner is positive and edge-free in design. Every shaft bushing has dual protection against overload, so that the butterfly valve fulfils the leakage in the Technical Guidelines on Air Quality Control (TA Luft) VDI 2440 paragraph 5.2.6.4.

## **Explosion protection**

GEMÜ 490 is available in ATEX compliant versions for explosion endangered areas of group II, zones 0, 1, 2 or 20, 21 and 22.

## **General technical data**

GEMÜ 490 is available in sizes DN 40 – 1000. A wafer design and a lugged version for end-of-line duty are the body design options. The body material is available in GGG 40.3, stainless steel 316 L and cast steel as standard. Special materials are available on request both for wafer and lugged bodies.

The maximum operating pressure is 10 bar at DN 40 – 600 and 6 bar at DN 650 – 1000. The temperature limits are -20°C to max. 200°C, in relation to the pressure-temperature curve in the valve technical data.

## **Operators**

GEMÜ 490 is available with manual (GEMÜ 497), pneumatic (GEMÜ 491) and motorized (GEMÜ 498) operators. The pneumatic actuators can be fitted with pilot valves, electrical position indicators and positioners. In this way, the new butterfly valve can be integrated in any automated system.

Smaller operators can be used due to the reduced torque which results in lower purchase and operating costs.

## **Areas of application for GEMÜ 490**

The TFM liner of the butterfly valve provides a very high resistance to chemicals. The butterfly disc is made from stainless steel or PFA-encapsulated stainless steel. The butterfly valve is used in all applications where corrosive liquids and gases are to be controlled. Typical examples are:

- Chemical industry
- Mining and metal extraction

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- Steel works
- Treatment of highly corrosive waste waters
- Treatment and distribution of ultra-pure water in pharmaceutical installations and in the semiconductor industry

Thanks to its construction, it can also be used in explosion endangered areas. The butterfly valve has also been approved for applications up to 200 °C in accordance with the TA Luft standard.