

# SIGRAFLEX® foil type TF

## PTFE-coated graphite foil

### Stuffing box packing rings made from graphite foil

For many years now, compressionmolded flexible graphite packing rings have proved successful as shaft seals in pumps and valves operated at elevated temperatures.

To meet an increasing demand for low emission and leakage rates, and also a frequent need for lower friction coefficients, the SGL Carbon has developed a special SIGRAFLEX graphite foil with a thin PTFE coating on both sides.

SIGRAFLEX foils with PTFE coating are particularly suitable for being processed into stuffing box packings. They offer clear advantages in terms of minimization of leakage and shaft friction.

### Designation

SIGRAFLEX foil type TF  
F05007CTF or F05010CTF

### Material data of SIGRAFLEX® foil type TF

Typical properties	Units	Values
Thickness of foil type TF	mm	0.5
Thickness of PTFE coat	µm	ca. 5 (both sides)
Graphite density	g/cm <sup>3</sup>	0.7 or 1.0
Graphite ash content	%	≤ 2
Roll width	mm	650
Roll length	m	50
Max. service temperature	°C	300

Additional information except for max. service temperatures of SIGRAFLEX graphite foil is given in our SIGRAFLEX data sheets.

Unless stated otherwise, all values are valid at room temperature, typical, non-binding and subject to change. For engineering or design purposes please contact our technical sales team.

### Test results of stuffing box packing rings made from SIGRAFLEX foil type TF

The following is a comparative assessment of the sealing and friction properties of stuffing box packings made of SIGRAFLEX graphite foil type F05007CTF and standard graphite foil type F05007C.

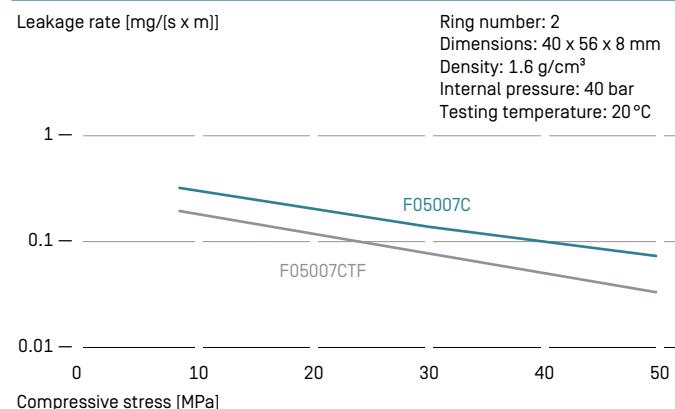
### Characteristics of the tested sealing rings

Density: 1.6 g/cm<sup>3</sup>  
 ø inside: 39.9 mm  
 ø outside: 56.1 mm  
 Ring height: 8.2 mm  
 Packing height: 16.4 mm (2 rings)

### Leakage behavior of compressed SIGRAFLEX foil type F05007CTF graphite rings

The PTFE coat on the graphite foil improves the sealability of packing rings made from this material by a factor of about 2.

### Comparison between 2 stuffing box packing ring types

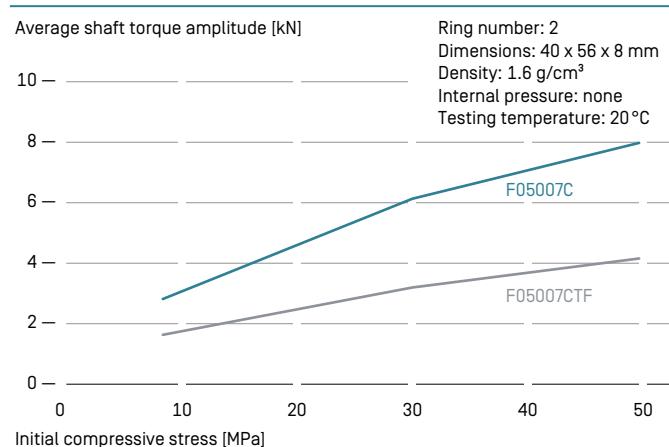


↑ Comparison between the leakage rates of stuffing box packings in type F05007C (without PTFE coating) and type F05007CTF (with PTFE coating) at 40 bar internal nitrogen pressure and different compressive stresses.

## Lower shaft torque required for SIGRAFLEX foil type TF packing rings

The PTFE coat on the graphite foil has a considerable influence on the frictional behavior of the packing. At equal compressive stress, the average shaft torque required is only half that of the uncoated graphite foil.

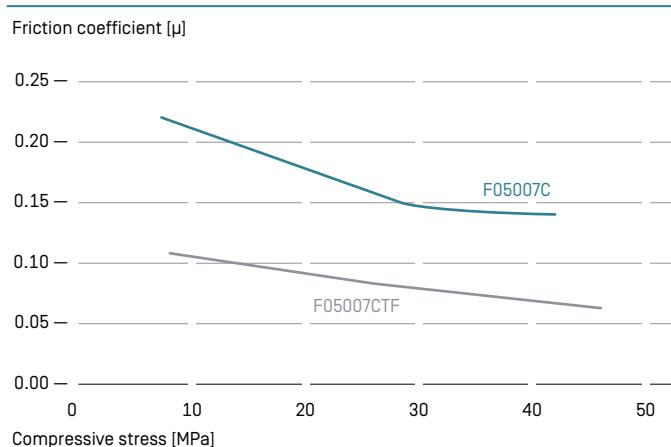
## Torque amplitude in 5<sup>th</sup> shaft motion cycle of 2 installed packing rings in type F05007C [without PTFE coating] and F05007CTF [with PTFE coating]



↑ Influence of PTFE-coated foil type F05007CTF on the required average shaft torque amplitude in the 5<sup>th</sup> shaft motion cycle with two installed packing rings, as compared with packings of type F05007C [without PTFE coating].

**Friction coefficient of SIGRAFLEX foil type TF packing rings**  
As the PTFE coat is applied to the graphite foil before manufacture of the packing rings, the friction coefficient can be roughly halved. The values measured range between 0.11 and 0.07, depending on the compressive stress.

## Comparison between the friction coefficients of 2 packing rings



↑ Comparison between the friction coefficients of stuffing box packings in type F05007C [without PTFE coating] and type F05007CTF [with PTFE coating] as a function of compressive stress.

## Conclusion

The PTFE coating on SIGRAFLEX graphite foils makes for a substantial reduction in the leakage rate of stuffing box packings and markedly improves the frictional behavior of packing rings in particular.

As manufacturer of semi-finished products, we recommend that specific application-related questions be referred to the seal manufacturer concerned.

SIGRAFLEX foil type TF sealing systems are supplied by many well-known seal manufacturers.



Additional information on our SIGRAFLEX sealing materials can be found under "Download Center" on our homepage.

[www.sigraflex.com/downloads](http://www.sigraflex.com/downloads)



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