

PRODUCT DATASHEET

# Teflon PFA/PEEK Axial Process Flow Cell

Compatible with NIR and UV-VIS Analyzers



**More signal**

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**Less noise**

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**Lower detection limits**

- For sample streams that are incompatible with metal components, specifically HF semi-conductor baths
- For corrosive process streams containing strong acids, bases, peroxides, or halogenated compounds
- All metal-free construction

## Teflon PFA/PEEK Axial Process Flow Cell

The Teflon PFA/PEEK Axial Flow Cell was developed for sample streams that are either extremely corrosive or intolerant to metal contamination, where even trace metal impurities can cause significant process problems. This long path length nonmetallic flow cell will meet these challenges with path lengths of 25 to 100 mm. This Teflon PFA/PEEK Axial Flow Cell is ideal for color measurements in a semi-conductor bath. If PTFE coated screws are unacceptable choose the complexly metal-free Teflon PFA/PEEK Flow Cell with the shorter optical pathlength.

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### A Simple, Serviceable Design

The Teflon PFA/PEEK Axial Flow Cell is a convenient, compact, rugged sample interface that is easy to install and even easier to service. The Teflon PFA/PEEK Axial Flow Cell design is called for when pathlengths exceed 20 mm and small flow volumes are required. Spectroscopic flow cell design requires stable and fixed optical path lengths, rigid optical alignment, high optical throughput, collimated (parallel) light through the sample, and smooth, turbulence-free fluid flows. In addition, the wetted flow cell materials must not contaminate the sample. The Teflon PFA/PEEK Axial Flow Cell meets all these requirements in a simple easy to maintain design. The net result is a flow cell that offers high signal-to-noise measurements, low thermal drift, low flow noise characteristics, absorbance accuracy, and low vibration sensitivity. Key elements of the design include simple, serviceable o-ring seals, sapphire windows, and o-ring sealed optics to prevent ambient moisture infiltration. If necessary, the flow cell can be completely disassembled for inspection or deep cleaning. The reassemble step is easily accomplished without changing the pathlength, a crucial parameter for repeatable measurements.

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### Process-Resistant Flow Cell Construction

The Teflon PFA/PEEK Axial Flow Cell is designed to withstand corrosive processes. Since no metal parts encounter the liquid stream, the design is ideal for processes where even parts per billion levels of metal contamination can create serious problems, as in semiconductor fab etching and cleaning steps. The Teflon PFA/PEEK Axial Flow Cell also performs well in the presence of extremely corrosive streams containing strong acids, bases, peroxides, or halogenated compounds. Other major components of the cell are Teflon PFA and Kalrez® 6375UP (ultra-pure) o-rings. Elastomeric seals prevent leakage and protect the Teflon PFA/PEEK Axial Flow Cell's vital internal optics.

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### Dual Seal for Added Safety

Perhaps the most crucial aspect of any online sample interface design is the sealing approach. Since process fluid streams will be under pressure and the composition is often hazardous leaks are unacceptable. Additionally, moisture infiltration from the external environment adversely affects performance too. Our brand utilizes multiple o-ring seals that effectively address both issues. This protects the expensive internal optics.

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### Exceptional Light Transmission

Like all our sample interfaces, the Teflon PFA/PEEK Axial Flow Cell provides exceptional optical performance. Internal optics result in a collimated light beam for consistently accurate measurements. Typically, peak transmission exceeds 30%. That means more signal, less noise, and lower detection limits for the measurement. The optics on the Teflon PFA/PEEK Axial Flow Cell are permanently aligned at the factory. As a result, there is no need for any optical adjustments in the field. Additionally, there is no chance for optical misalignment to occur under normal processing conditions or during servicing.

## Pathlengths and Operating Range

The Teflon PFA/PEEK Axial Flow Cell is available in five standard pathlengths (25, 30, 50, 75, and 100 mm), and in UV-VIS and NIR versions. It operates over the following temperature and pressure ranges:

- Temperature: 0 °C to 150 °C (o-ring material dependent)
- Pressure: 0 to 100 psi [690 kPa]

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## Optically Matched with All Our Analyzers and Compatible with Most Other Spectrometer Brands

The sample interface is a crucial component of a complete fiber optic-based analyzer system. For maximum performance, the probe or flow cell must be optically matched with both the analyzer (spectrometer) and the fiber that transmits the spectral signal. All our sample interfaces, analyzers, and fiber optic cables are optically matched, so when used in combination they achieve the highest possible consistency and performance. The Teflon PFA/PEEK Axial Flow Cell is also manufactured to facilitate full integration with any fiber optic system configured with SMA 905 connectors. This includes FT-NIR analyzers. When choosing a sample interface for an FT-NIR analyzer the current fiber core size must be taken into consideration. The Teflon PFA/PEEK Axial Flow Cell design works best when used with fibers having a core diameter of 400 to 600 micron.

One of the primary advantages of UV-VIS and NIR process spectroscopy is the utilization of intrinsically safe fiber optic cables to remotely locate the analyzer relative to the sample interface (probe or flow cell) installed in the process. Get the full power of this technology and choose the Teflon PFA/PEEK Axial Flow Cell along with one of our optically matched analyzers and process grade fiber optic cables – *for control you can measure!*

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Specifications	
<b>Optical Pathlength:</b>	25, 30, 50, 75, 100 mm
<b>Spectral Range:</b>	UV-VIS (200 – 800 nm); NIR (800- 2100 nm)
<b>Fiber Connector:</b>	SMA 905
<b>Optical Efficiency:</b>	≥30% transmission from 800 to 1650 nm for pathlengths >50 mm (%T)
<b>Temperature Range:</b>	0 to 150 °C (o-ring material dependent)
<b>Pressure Range:</b>	0 to 100 psi [690 kPa]
<b>Body Material:</b>	Teflon
<b>O-Ring Material:</b>	Kalrez® 6375 UP (wetted only)
<b>Process Connection:</b>	3/8 or 1/2 inch FNPT (pathlength dependent)

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## Large Variety of Configurable Designs

Process Insights offers a large variety of probes, flow cells, and process grade fiber optic cables that meet the harsh demands of the process environment. Several have auxiliary features. All the sample interfaces (probes and flow cells) can be optimized for the UV-VIS and NIR spectral regions or supplied with custom fiber diameters and connectors to match the optical requirements. Many include optional accessories for easy adaptation to different process installation configurations.

## GAIN REAL-TIME INSIGHT INTO YOUR PROCESS

Process Insights manufactures and delivers premium sensors, monitors, detectors, analyzers, instrumentation, and software that are mission-critical to keep your operations, personnel, and the environment safe – every day across the globe.

Get the most reliable, precision analytical technologies available on the market today. We will work to match your needs and budget, and provide the optimal, and most stable process analysis solution for your application.

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## CENTERS OF EXCELLENCE | PROVIDING PROVEN SOLUTIONS

Process Insights is committed to solving our customers' most complex analytical, process, and measurement challenges everyday.

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For a complete range of products, applications, systems, and service options, please contact us at: [info@process-insights.com](mailto:info@process-insights.com)

For a complete list of sales & manufacturing sites, please visit: <https://www.process-insights.com/about-us/locations/>

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