

PRODUCT DATASHEET

High Safety Process Flow Cell (HSFC™)

with NIR and UV-VIS Analyzers



More signal

Less noise

Lower detection limits

- For toxic or hazardous materials; hydrofluoric acid, chlorine, phosgene, or isocyanates
- Designed with an early warning leak detection port
- Built into a 2.35 inch thick, 1 inch Class 300 flange

High Safety Process Flow Cell

For applications involving extremely hazardous materials, the High Safety Flow Cell (HSFC™) is designed with early warning leak detection. The HSFC is an alternative to our Gas or Multi-Purpose Flow Cell. Built into a Class 300 flange, using welded construction and double o-ring sealed sapphire windows, the High Safety Flow Cell is the smart choice when uncontrolled or undetected leaks cannot be tolerated. Additionally, a weep or “tattletale” port connects to the space between the o-rings. A sensor can be coupled to the port and will indicate when the o-rings need to be replaced.

Safety Features of the Flow Cell

Each sapphire window is double o-ring sealed by a patented safety feature. A passage from between the o-rings is brought to a common port terminated in a ½ inch Class 300 flange. It is highly recommended that an optional sensor selective to the hazardous material be attached to this port with its alarm set at an appropriate level. An alarm condition would indicate that the first o-ring seal has failed, and that immediate o-ring service is required. The second o-ring seals the process until the required service is accomplished. Welded construction is used to connect the warning port. All High Safety Flow Cells are hydrostatically tested before delivery.

A Simple, Serviceable Design

The High Safety Flow Cell is a convenient, compact, rugged sample interface that is easy to install and even easier to service. 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.

Process-Resistant Construction

The High Safety Flow Cell is designed to withstand corrosive processes. It is constructed in 304L stainless steel. It can also be made from other materials depending upon specific application requirements, such as Hastelloy C-276. Elastomeric seals prevent leakage and protect the High Safety Flow Cell's vital internal optics. The process and processing environment dictate the actual o-ring material that is best suited for the application. Suitable o-ring materials must be specified to meet the process chemistry and safety requirements. Common materials, such as Viton, Kalrez®, EPDM, etc., are readily available. Consult appropriate resources for temperature specifications of various o-ring materials and chemical compatibility with the process.

Dual Seal for Added Safety

Perhaps the most crucial aspect of any online sample interface design is the sealing approach. Since process gas 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. The High Safety Flow Cell includes a dual seal at the sapphire “window-to-process” interface. This protects the expensive internal optics.

Exceptional Light Transmission

Like all our sample interfaces, the High Safety Flow Cell provides exceptional optical performance. Internal optics result in a collimated light beam for consistently accurate measurements. Typically, peak transmission exceeds 40%. That means more signal, less noise, and lower detection limits for the measurement. The optics on the High Safety 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.

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 High Safety 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 High Safety 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 High Safety Flow Cell along with one of our optically matched analyzers and process grade fiber optic cables – *for control you can measure!*

Specifications

Optical Pathlength:	20 mm, 30 mm, customer requested, subject to acceptance
Spectral Range:	UV-VIS (200 – 800 nm); NIR (800- 2100 nm)
Fiber Connector:	SMA 905
Optical Efficiency:	>40% transmission from 800 – 1650 nm (%T)
Temperature Range:	≤300 °C (o-ring material dependent)
Pressure Range:	0 to 300 psi [2000 kPa] (hydrostatically)
Body Material:	304L SS standard, or ASME specified materials having yield strengths of 30 kpsi or greater at ambient temperature
O-Ring Material:	Kalrez® 4079, Kalrez® 2035, Viton, EPDM, silicone, customer requested elastomer with a durometer >70 and Shore of A or greater
Flange Leak Port:	½ inch Class 300; MUST BE CONNECTED
Flange Body Size:	1 inch Class 300 x 2.25 inches [57.2 mm]

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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REVOLUTIONIZING MEASUREMENT

EVERYWHERE