



We create chemistry

# Exactus<sup>®</sup> Optical Thermometers

Fiberglass measurement solutions  
for the glass industry



## Novel Optical Temperature Measurement Technology Drives Increased Yields & Plant Profitability

BASF Exactus® optical thermometer systems provide the most accurate temperature information by closely monitoring your process temperature with the most precise and stable instruments in the industry.

**Exactus® technology stands out because of its industry-leading:**

- Speed: Up to 1000 temperature readings per second
- Accuracy: Better than 2°C
- Repeatability:  $\pm 0.1^\circ\text{C}$
- Stability:  $< 0.1^\circ\text{C}$  annual drift

Use of our sensors will also help to reduce costs and increase equipment efficiency, delivering a positive cash flow impact.

<b>Save \$ now</b>	Cash flow savings <i>per point</i> from precious metals capital reduction
<b>Save \$ over time</b>	Annual savings in reduced spinner costs <i>per location</i>
<b>Increase safety</b>	Actively monitor fiberizing process to prevent potential damage or injuries

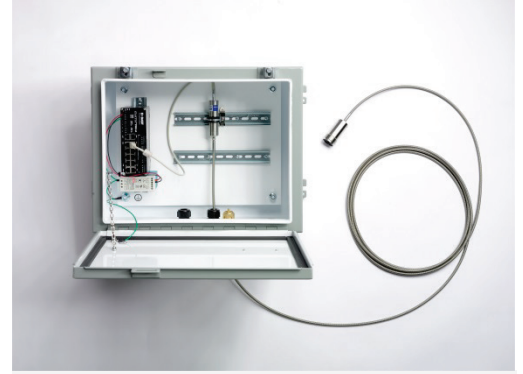
## Unparalleled Fiberglass Solutions

BASF Exactus products have been specifically designed to address a variety of glass manufacturing applications. Our decades of experience and understanding of high temperature control leads to improvement of your process yields and increased plant profitability. Unparalleled Exactus patented solutions can be utilized at essential points throughout the fiberglass manufacturing process, as highlighted below.

## Forehearth Temperature Measurement

Dependable and accurate temperature measurement in the forehearth is critical. The outstanding long-term drift and repeatability of the Exactus forehearth optical temperature system provides dependable measurements for years.

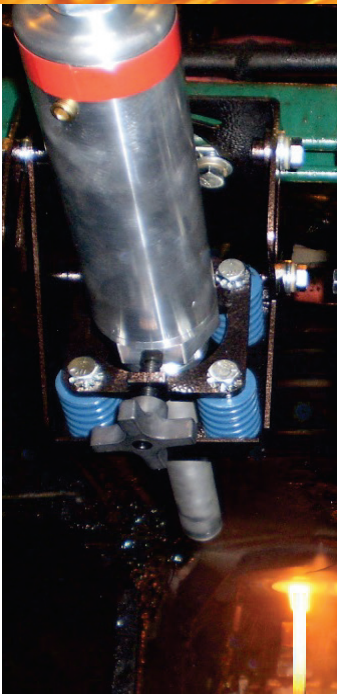
The optics head is designed to be placed on top of the refractory and to withstand ambient temperatures of up to 250°C. By using shorter wavelengths, the glass temperature beneath the surface is measured and the impact of emissivity errors are minimized.



All systems share the ability to make an immediate, positive impact on profitability due to:

- Improved process control
- Higher product quality
- Better process yields





## Glass Stream Temperature Measurement

The glass stream temperature is a critical factor for both conditioning and fiberizing. Accurate stream temperatures can be used to both improve forehearth control and optimize fiberizing parameters. A fixed instrument continuously measuring stream temperature can be used with automatic or manual control to deliver a consistent glass temperature and therefore a consistent product.

BASF Exactus® optical thermometers incorporate unique techniques utilizing shorter wavelengths which provide temperature measurements that penetrate the surface of the glass stream, thus, providing a much more accurate temperature of the stream. Long wavelength optical pyrometers only measure the surface temperature. The surface temperature does not fully represent the glass stream and can be overly influenced by bushing power changes. Alignment is simple with the bright green laser target illuminator and the adjustable dual-axis alignment assembly.

## Spinner Measurement

Spinner face temperature measurement enables manufacturers to better characterize and optimize the fiberizing

process. The speed, sensitivity and processing power of the Exactus pyrometer allow for two valuable outputs from each profile around the spinner face – an average temperature and an indication of the variation in temperature.

### Average Temperature Measurement

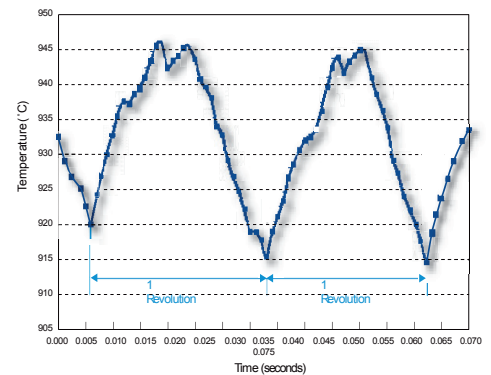
Sophisticated processing allows the user to average the temperatures over a desired set of data points, often correlated to a number of spinner revolutions. This provides a stable measurement that can be used for monitoring or control of spinner firing and other parameters.

### Temperature Variance Measurement

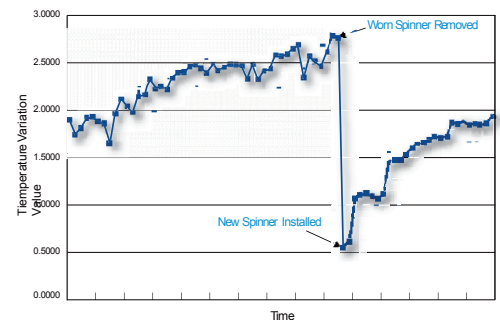
The variance value of the temperature changes per data set can also be output for monitoring. The millisecond response of Exactus yields a real time temperature profile around the spinner circumference. Logging this data completely is not practical.

By reducing this data into a variance value, changes in the condition of the spinner can be identified. Such changes in variance may be caused by:

- Variation in fiber diameter
- Presence of hot glass (slugs) exiting the spinner
- Increasing hole diameter
- Blocked spinner holes
- Condition of the spinner, including potential impending failure



Spinner face temperature over two revolutions at 1000 readings per second.



The temperature variation around the circumference of the spinner often increases until it is time for replacement. The temperature variation value provides the first ever quantifiable measure of the spinner condition, potentially leading to greater spinner life and fiber uniformity.

## About us

BASF's Catalysts division is the world's leading supplier of environmental and process catalysts. The group offers exceptional expertise in the development of technologies that protect the air we breathe, produce the fuels that power our world and ensure efficient production of a wide variety of chemicals, plastics and other products, including advanced battery materials. By leveraging our industry-leading R&D platforms, passion for innovation and deep knowledge of precious and base metals, BASF's Catalysts division develops unique, proprietary solutions that drive customer success.

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