EXACTUS®

Advanced Technology for Fiberglass Temperature Measurement
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:** ± 0.1°C
- **Stability:** < 0.1 °C annual drift

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

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

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 BASF’s Temperature Sensing Products

For over 30 years, BASF has supplied a wide range of industries, including semiconductor, glass, solar cell, chemical, crystal growth, heat treating, laser welding, gas turbine, bio-medical, and others with exceptionally high quality temperature-sensing products and temperature sensor calibration services to meet the demanding applications of our customers.

Metals - particularly those in the platinum group - are critical components of many products made by BASF such as contact thermocouples. The experience of our research and development group in precious metal and precious metal technologies is unmatched. From Fibro® platinum to Platinel® thermocouple wires, we have led the industry with breakthrough innovations. No one knows more about precious metals. Further information on BASF’s Temperature Sensing products are available on the Internet at www.catalysts.basf.com/tempsensing.

About BASF’s Catalysts Division

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. 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 catalyst and adsorbent solutions that drive customer success. Further information on BASF’s Catalysts division is available on the Internet at www.catalysts.basf.com.

About BASF

At BASF, we create chemistry – and have been doing so for 150 years. Our portfolio ranges from chemicals, plastics, performance products and crop protection products to oil and gas. As the world’s leading chemical company, we combine economic success with environmental protection and social responsibility. Through science and innovation, we enable our customers in nearly every industry to meet the current and future needs of society. Our products and solutions contribute to conserving resources, ensuring nutrition and improving quality of life. We have summed up this contribution in our corporate purpose: We create chemistry for a sustainable future. Further information on BASF is available on the Internet at www.basf.com.