

Temperature sensors for chemical processes

A leader in precious metal thermocouples for over 30 years, BASF has now applied its technical expertise to optical temperature measurement. Exactus® instruments incorporate technology breakthroughs which provide significant proven performance advantages in non-contact temperature measurement.

Features and benefits

- Low-temperature measurements (25 °C) using short wavelengths
- High precision with resolution up to 0.01°C and accuracy of 1.5 °C
- Repeatability 0.1 °C and drift of less than 0.1 °C per year
- Speeds up to 1,000 readings per second
- Digital and/or analog outputs easily integrated into any controls system

Applications

Exactus optical sensors are suitable for a wide range of applications within the chemical industry. Ultra-sensitive electronics, precision optics, and the ability to measure low temperatures using short wavelengths allow for tighter process control, enhanced accuracy, and improved overall performance compared to other typical measurement technologies.

Heat and steam cracking

The accuracy and rapid response time of Exactus sensors can provide significant process yield improvements in cracking processes by detecting critical gas temperature changes, such as coil-out temperatures.

Calcination

For retort, product, or gas measurements, the long lifetime and very low drift of Exactus sensors can eliminate the high maintenance

and frequent replacement associated with thermocouple sensor measurements.

Exothermic processes

The broad dynamic range and fast response time make Exactus sensors ideal for monitoring even the slightest temperature changes in exothermic processes.



Exactus Specifications

	65 – 1150 °C (0.7 to 1.6 μm measurement wavelength)
	100 – 1900 °C (1.55 μm measurement wavelength)
	120 – 3000 °C (0.7 to 1.6 μm measurement wavelength)
	280 – 2200 °C (0.9 μm measurement wavelength)
	350 – 3000 °C (0.9 μm measurement wavelength)
	500 – 3000 °C (0.65μm measurement wavelength)
	Specialized optics allow measurements to 200°C at 0.90μm & 25°C at 0.7-1.6μm
Measurement ranges	

Exactus Specifications	
Accuracy	Greater of 1.5 °C or 0.15% of reading
Resolution	Up to 0.01 °C
Repeatability	0.1 °C
Drift	0.1 °C / year plus 0.05 °C / °C change in ambient temperature
Speed	Up to 1000 readings per second, 1ms response time
Target sizes	Standard target size is Focal Distance / 40.0 Small target size is Focal Distance / 200.0 Custom optics available
Maximum environment temperature without cooling	10-60 °C for electronics and standard optics If Fiber optic cable is used: – < 70 °C for standard fiber optic cable – < 250 °C for high temperature fiber optic cable
Measurement wavelengths	0.65 µm 0.90 µm 0.7 – 1.6 µm 1.55 µm



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.

BASF - We create chemistry

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BF-9444 02/19