BASF
We create chemistry

EXACTUS®

Optical temperature sensing solutions for photovoltaic processes

Exactus® instruments incorporate technology break-throughs which provide significant proven performance advantages in non-contact temperature measurement.

Features and benefits

- Low-temperature measurements (≥ 25 ºC) using short wavelengths
- High precision with resolution up to 0.01ºC and accuracy of 1.5 ºC
- Repeatability 0.1 ºC and drift of less than 0.1 ºC per year
- Speeds up to 1,000 readings per second
- Digital emissivity correction
- Industry-leading single and dual-wavelength sensors
- Digital/Analog output for closed-loop controls

Applications

Exactus optical sensors are suitable for a wide range of applications within the solar 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 measurement technologies.

Silicon Crystal Growth

The high resolution and low drift of Exactus® sensors provide significant yield improvements in crystal growth processes. The ability to correct for a partially obstructed viewport and handle changing emissivity conditions make this sensor uniquely suitable for several processes such as:

- Ingot casting
- Ribbon-pulling
- Single crystal growth

Thin Film Deposition

The capability of the Exactus® sensor to measure low temperatures at short wavelengths makes it ideal for thin film deposition applications. The highly repeatable measurements can result in higher product yields.

Laser/Induction Soldering

Exactus® optical temperature sensors provide the low-temperature capability, speed, and repeatability necessary for laser/induction soldering process steps. Our capabilities increase quality and yield during laser or induction soldering of individual solar cells into modules.

Exactus Specifications		
Measurement ranges	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	
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 0.7 – 1.6 μm	0.90 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

www.catalysts.basf.com/tempsensing

Americas
BASF Corporation
Temperature Sensing Business
46820 Fremont Boulevard
Fremont, CA 94538
Tel: +1-510-490-2150

Exactus® Applications Support
4011 S.E. International Way
Suite 604
Portland, OR 97222
Tel: +1-503-794-4073

Asia Pacific
BASF South East Asia Pte Ltd.
7 Temasek Boulevard
#35-01 Suntec Tower One
Singapore 038987
Tel: +65-6337-0330

Europe, Middle East, Africa
BASF Italia S.r.l.
Divisione Catalizzatori
Via di Salone, 245
00131, Rome, Italy
Tel: +39-06-41992-1

Germany
Tel: +49-6103-6049407

BF-9457 02/19