Advanced Energy

ONYX-SERIES INDUSTRIAL TEMPERATURE MEASUREMENT

ONYX-S | ONYX-S2C | ONYX-MC | ONYX-MCE

Precision Temperature Measurement

The Onyx™ series of industrial pyrometers measure emitted infrared thermal radiation from an object and convert it into a temperature reading, providing accurate and repeatable measurements in even the harshest manufacturing environments.

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Pyrometers for Demanding Industrial Applications

Based on over 20 years of pyrometry and optical temperature measurement experience in some of the world's most demanding installations, the Onyx series of industrial pyrometers provides measurement precision, repeatability, and reliability to industrial applications.

About

Pyrometer Overview

Pyrometers use a wavelength filter to enable material-specific, precision measurements and limit unwanted "stray" signals. Focusing on the most demanding industrial applications, Advanced Energy's Onyx series of optical temperature pyrometers have been specifically developed to provide repeatable temperature measurement even in harsh environmental or changing emissivity conditions. Choose from single or multi-point measurement options, wavelengths targeted for the application, and active-emissivity options.

Specific Uses and Features

- Ideal for moving, rotating, or inaccessible work pieces, or when direct physical contact would damage the end product
- Wide temperature range, from 200°C (392°F) up to 2200°C (3992°F), based on selected wavelength
- Temperature-only or active-emissivity configurations
- Non-contact device, providing years of service, typically requiring minimal maintenance or re-calibration
- Provides excellent accuracy and repeatability
- Single-channel and multi-channel versions available

Typical Applications

- Quartz and sapphire — growth and annealing
- Steel — forging, finishing, and vessel monitoring
- Thin-film solar — glass, metals
- Non-ferrous metals — casting, forging, and extrusion
- Carbon fiber — production and annealing
- Technical ceramics — heat-treatment, sintering

Onyx Single-Channel Versions

The Onyx-S is a single-channel, single-wavelength, non-contact infrared optical fiber pyrometer which can be configured to one of a number of measurement wavelengths based on target material, required process temperature, and working distances. Optional accessories include a water-cooling jacket, air-purge shower to protect against lens contamination, and specialized mounting accessories.

Standard Wavelengths
700, 800, 950, 1470, 1550 nm

Emissivity
Fixed Emissivity Correction
Range = 0.05 to 1

Focus Range
100 mm to 3 m
(3.94 to 118.11 in)

Temperature Range
200°C (392°F) up to 2200°C (3992°F) based on selected wavelength

Accuracy
±4°C (±7.2°F) or ±0.4% of measured value, whichever is greater

The Onyx-S2C is a two-color ratio, non-contact infrared optical fiber pyrometer which can be configured to one of a number of measurement wavelengths based on target material, required process temperature, and working distances. Optional accessories include a water-cooling jacket, air-purge shower to protect against lens contamination, and specialized mounting accessories.

Standard Wavelengths
Two-color, 970/1070 nm

Emissivity
Fixed Emissivity Correction
Range = 0.05 to 1

Focus Range
100 mm to 3 m
(3.94 to 118.11 in)

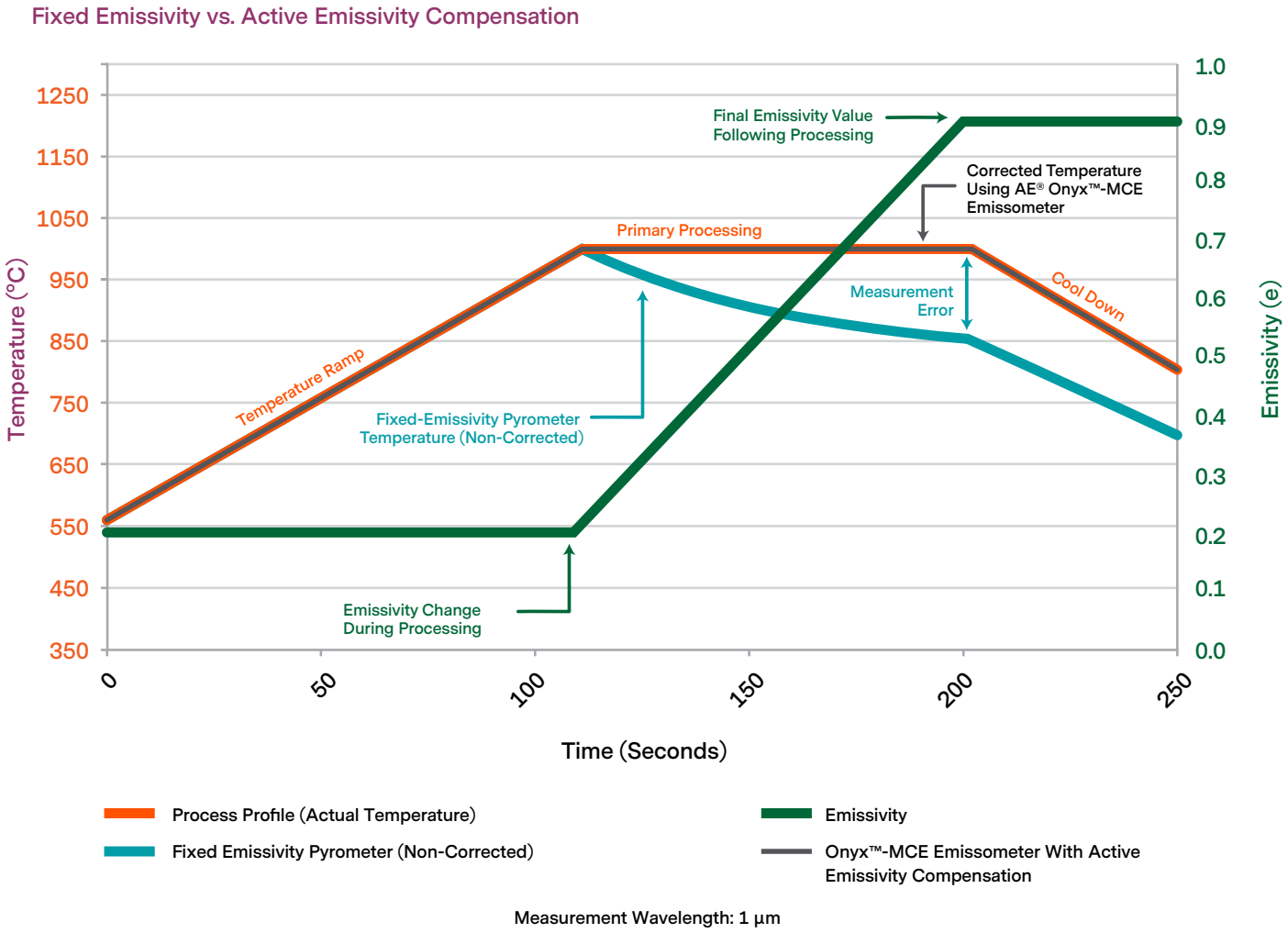
Temperature Range
600 to 1600°C (1112 to 2912°F) based on selected wavelength

Accuracy
±4°C (±7.2°F) or ±0.4% of measured value, whichever is greater

Accurate Measurement Despite Changing Emissivity

Material surface properties often change during the manufacturing process as a result of oxidation or through the introduction of coatings. This change affects the emissivity of the material being measured, which is a critical parameter for accurate temperature measurement.

Temperature Measurement Accuracy For an Object with Changing Emissivity



Measurement Wavelength: 1 µm

Onyx Multi-Channel Versions

The Onyx-MC is a multi-channel, non-contact optical fiber temperature pyrometer that can be configured in a variety of measurement wavelengths based on a target material, required process temperature range, and working distances. Proprietary ambient temperature calibration technology ensures ongoing temperature measurement accuracy across a wide range of conditions by continuously monitoring each unit's internal temperature and automatically compensating for variations.

Standard Wavelengths
700, 800, 950, 1470, 1550 nm

Emissivity
Fixed Emissivity Correction
Range = 0.01 to 1

Focus Range
100 mm to 3 m
(3.94 to 118.11 in)

Temperature Range
200°C (392°F) up to 2200°C (3992°F) based on selected wavelength

Accuracy
±4°C (±7.2°F) or ±0.4% of measured value, whichever is greater

The Onyx-MCE is a multi-channel, non-contact optical fiber temperature pyrometer and incorporates a separate input for real-time reflectance measurement and active emissivity compensation. The system makes use of real-time emissivity measurement to precisely compensate for a material's change in emissivity during processing. The Onyx-MCE can be configured in a variety of measurement wavelengths and from single to dual measurement channels using separate optical sensors.

Standard Wavelengths
919 nm temperature measurement, 910 nm active emissivity source

Emissivity
Active Emissivity Correction
Range = 0.0001 to 1

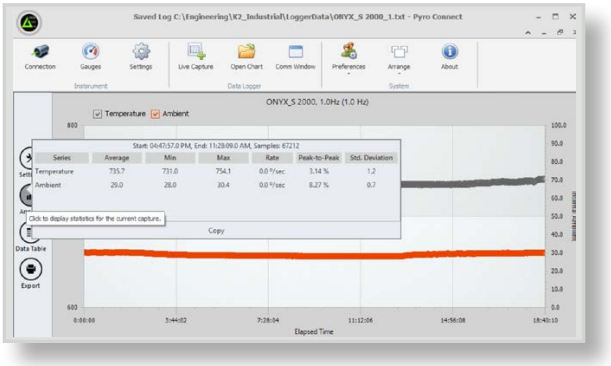
Focus Range
100 mm to 3 m
(3.94 to 118.11 in)

Temperature Range
530 to 1200°C (986 to 2192°F) based on selected wavelengths

Accuracy
±1.5°C (±2.7°F)

Custom Data Logging Software

PyroConnect™ software enables in-situ data logging, data acquisition and calibrations in hostile manufacturing environments. Used in conjunction with Advanced Energy pyrometers, this Windows®-based software enables complete customization of pyrometer monitoring to ensure the most demanding accuracy and repeatability requirements over a broad temperature range. It is fully configurable by the end user, and available on multi-channel and single-channel Onyx series industrial pyrometers.



ABOUT ADVANCED ENERGY

Advanced Energy has devoted more than three decades to perfecting power — enabling design breakthroughs and driving growth for leading semiconductor and industrial customers. Our precision power and control technologies, along with our applications know-how, inspire close partnerships and perpetual innovation in thin-film and industrial manufacturing.

Founded in 1981, Advanced Energy has built a diversified and global business, delivering advanced power and control technologies to customers across a broad range of industries. The AE team, deployed throughout North America, Europe, and Asia, provides technical expertise and responsive and agile power solutions for thin-film and industrial manufacturing.

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Advanced Energy

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