

Improving Reliability in Molten Metal Temperature Measurement

INDUSTRY**Metal Processing****SOLUTION****Non-Contact Temperature Measurement****EQUIPMENT****Two-color pyrometers and thermal imaging systems****CHALLENGE**

A leading metals producer operates multiple high-temperature melting and casting lines for automotive and industrial applications, where accurate temperature control is essential for product quality, safety, and compliance.

Harsh operating conditions including molten metal, extreme heat, airborne particulates, slag buildup, and electromagnetic interference (EMI) can reduce the accuracy and reliability of conventional contact temperature sensors.

Thermocouples installed in furnaces and ladles failed prematurely due to:

- Extreme temperatures exceeding probe material limits
- Chemical attack and contamination from molten metal and slag
- Mechanical damage during vessel movement and cleaning
- EMI from surrounding power and induction equipment

Frequent sensor failures led to unplanned downtime, increased maintenance exposure to hazardous conditions, and higher replacement costs. Inconsistent temperature data also made it harder to stabilize melt conditions, increasing the risk of off-spec product, scrap, rework, and compliance challenges during safety and quality audits.

SOLUTION

Impac® IGAR 6 Advanced Pyrometer



Mikron® MCS640 Thermal Imager

Point Measurement with Two-Color Pyrometry

Advanced Energy ISR 6 Advanced and IGAR 6 Smart ratio pyrometers were installed to measure molten metal streams and critical process points in real time. Two-color technology helps compensate for emissivity changes and maintain measurement accuracy in dusty, high-temperature, and high-EMI environments.

Area Monitoring with Thermal Imaging

MCS640 thermal imaging systems were deployed to monitor ladles, furnaces, and transfer areas. Thermal imaging delivers continuous temperature visualization across critical assets, helping operators identify material defects, verify chamber and ladle temperature uniformity, and gain greater insight into process conditions in real time.

Together, these technologies gave the customer full visibility and control of their process while reducing reliance on contact sensors that are likely to fail in harsh molten metal environments.

RESULT

Improved Reliability

- Eliminated frequent thermocouple failures
- Enabled continuous, non-contact temperature monitoring

Optimized Control

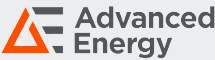
- Improved consistency of temperature measurement across melt and casting operations
- Reduced process variability, scrap, and rework

Operational Efficiency

- Reduced maintenance exposure in high-temperature environments
- Lowered downtime associated with sensor replacement

CONCLUSION

By combining two-color pyrometry and thermal imaging, the customer achieved more reliable temperature measurement across molten metal operations. Enhanced process visibility helped reduce maintenance, improve product quality, and strengthen worker safety. As production demands increase, non-contact temperature measurement offers a scalable solution for more consistent and efficient metals processing.



For international contact information, visit advancedenergy.com.

powersales@aei.com
productsupport.ep@aei.com
+1 888.412.7832

PRECISION | POWER | PERFORMANCE | TRUST

Specifications are subject to change without notice. Not responsible for errors or omissions.
©2026 Advanced Energy Industries, Inc. All rights reserved. Advanced Energy, AE®, Mikron® and Impac® are U.S. trademarks of Advanced Energy Industries, Inc.