

# THERMAL IMAGING SOLUTIONS FOR INDUSTRIAL PROCESSING & CONTROL



-20 TO 2000 °C / -4 TO 3632 °F

## ETA Process Instrumentation

[www.etapii.com](http://www.etapii.com)  
[sales@etapii.com](mailto:sales@etapii.com)  
tel 978.532.1330

*New England*

## Martech Controls

[www.martechcontrols.com](http://www.martechcontrols.com)  
[sales@martechcontrols.com](mailto:sales@martechcontrols.com)  
tel: 315.876.9120

*Upstate New York*

**LAND**  
**AMETEK®**

QUALITY CUSTOMER SOLUTIONS

# THERMAL IMAGING SOLUTIONS

**AMETEK LAND OFFERS A WIDE RANGE OF ENHANCED THERMAL IMAGERS AND THERMAL IMAGING SOLUTIONS FOR INDUSTRIAL, NON-CONTACT TEMPERATURE MEASUREMENT APPLICATIONS.**

Thermal imaging cameras and systems play an important role in modern industrial processing and furnace applications, meeting the increasing demands for improved product quality, process efficiency, energy saving, predictive maintenance and emissions reduction.

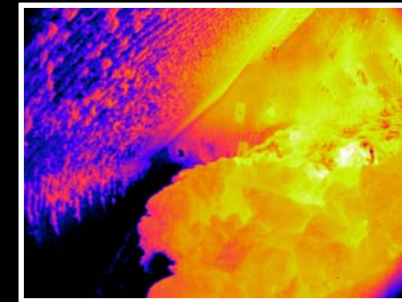
AMETEK Land provides a broad family of industrial thermal imagers and systems, covering a number of spectral bands and wide temperature ranges from 20 to 2000 °C (-4 to 3632 °F). Our products build on more than 20 years of thermal imaging experience, augmenting the market-leading range of AMETEK Land temperature measurement solutions.

Stationary cameras are used in many applications, from heavy industry to R&D across multiple markets. Depending on the different requirements of industrial processes, long-wavelength (LWIR), mid-wavelength (MWIR) and short wavelength (NIR - Near Infrared) standard models are available to cover many use cases and these form the basis for more application specific thermal imaging solutions.

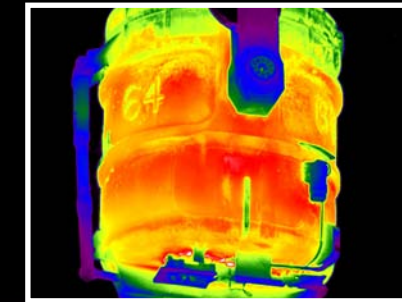
High-quality furnace borescope cameras and systems enable 24/7 temperature measurement monitoring and process control in furnace applications to prolong the furnace lifetime, continuously control the process and reduce energy consumption and emissions.

Smart imager functionalities, multiple interface and I/O options, and an integrated webserver enable the imagers to be easily integrated into new and existing process and furnaces automation systems.

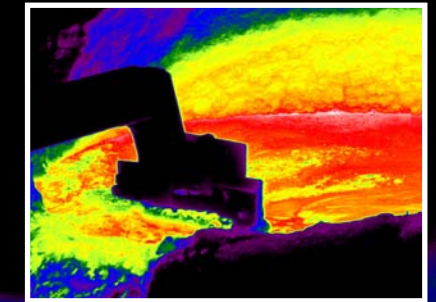
Complemented by the IMAGEPro software package – advanced image processing software for controlling, monitoring, analysing and capturing data – AMETEK Land's thermal imaging solutions cover the requirements of actual and future process imaging demands, Industry 4.0 & 5.0 communications and industrial decarbonisation.



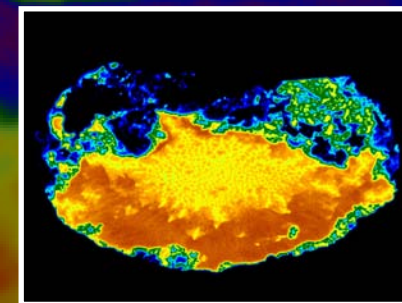
Waste/Biomass Incineration



Ladle/Vessel Monitoring



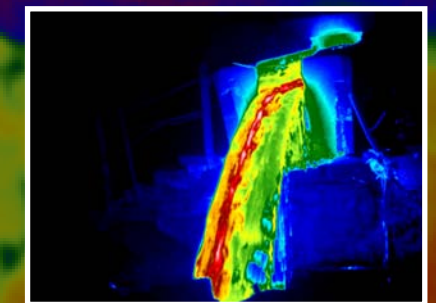
Slag Skimming



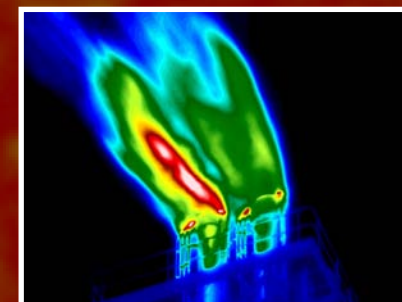
Liquid Steel/Metal



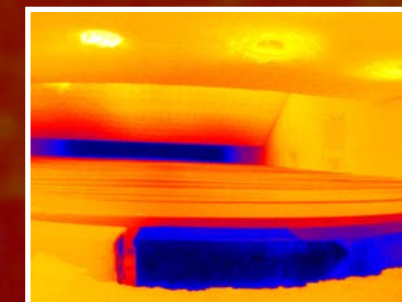
Heating, Forging/Forming



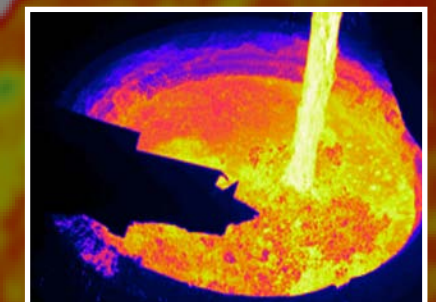
Slag Detection, Tapping



Flare Stack & Pilot Flame Monitoring



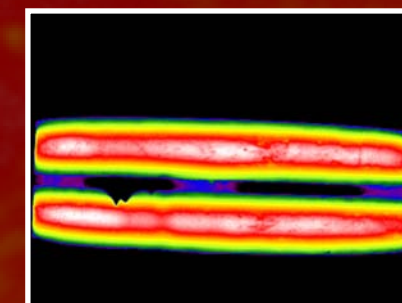
Reheat Furnaces



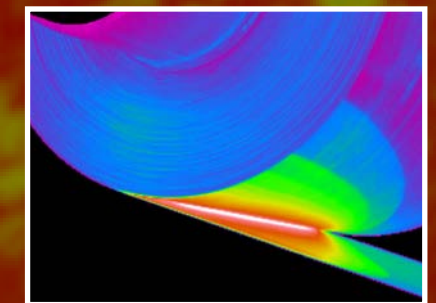
Freeboard Measurement



Glass Melt Tanks



Heat Treatment



Cold Rolling



# SMART (STAND ALONE) THERMAL IMAGERS

TEMPERATURE RANGE: -20 TO 1800 °C / -4 TO 3272 °F SPECTRAL RESPONSE: LWIR/MWIR/NIR PIXEL RESOLUTION: 307K TO 3M PIXELS

## LWIR-640



**LOW-TEMPERATURE** -20 to 1000 °C / -4 to 1832 °F

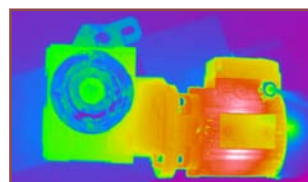
**LONG-WAVELENGTH LWIR** 8 to 14 μm

### TEMPERATURE RANGE

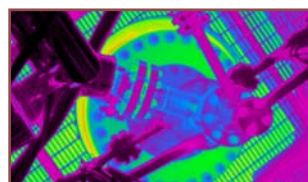
-20 to 120 °C / -4 to 248 °F  
0 to 500 °C / 32 to 932 °F  
100 to 1000 °C / 212 to 1832 °F

Spectral Response	8 to 14 μm
Pixel Resolution	640 x 480 pixels
Frame Rate	60 Hz / 7.5 Hz
Optics (FOV)	50°x37°, 25°x19°, 12°x9°, 6°x4°
Interfacing	Gbit-Ethernet / PoE
I/O Options	3x analogue/digital I/O

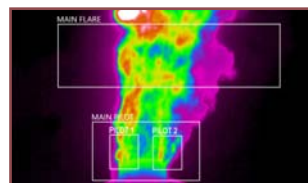
### EXAMPLE APPLICATIONS



Maintenance



Critical Vessel Monitoring



Flare Stack Monitoring



Substations / Transformers

## MWIR-640 390



**MID-TEMPERATURE** 300 to 1800 °C / 572 to 3272 °F

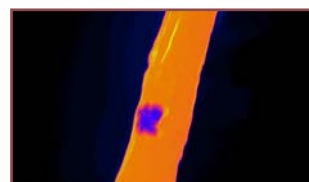
**MID-WAVELENGTH MWIR** 3.9 μm

### TEMPERATURE RANGE

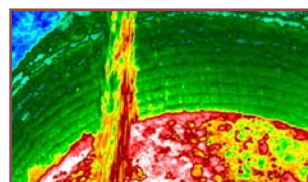
300 to 1800 °C / 572 to 3272 °F

Spectral Response	3.9 μm
Pixel Resolution	640 x 480 pixels
Frame Rate	60 Hz / 7.5 Hz
Optics (FOV)	50°x37° / 25°x19° / 12°x9°
Interfacing	Gbit-Ethernet/PoE
I/O Options	3x analogue/digital I/O Smart Functions: Integrated Webserver
Hazrdous Area Compliance	EX-proof Enclosures Available

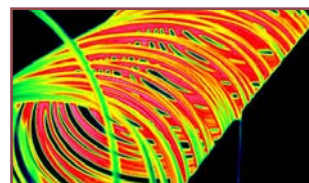
### EXAMPLE APPLICATIONS



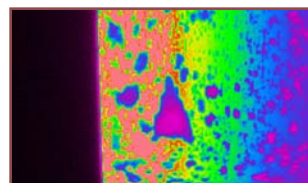
Slag Detection



Ladle Freeboard



Heat Treatment



Induction Heating

## NIR-656



**HIGH-TEMPERATURE** 600 to 1800 °C / 1112 to 3272 °F

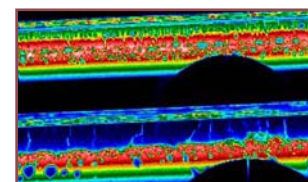
**SHORT-WAVELENGTH NIR** 1 μm

### TEMPERATURE RANGE

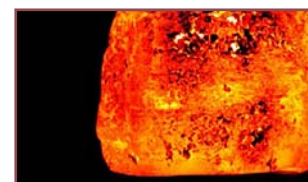
600 to 1000 °C / 1112 to 1832 °F  
800 to 1400 °C / 1472 to 2552 °F  
1000 to 1800 °C / 1832 to 3272 °F

Spectral Response	1 μm
Pixel Resolution	656 x 492 pixels
Frame Rate	30 Hz
Optics (FOV)	16°x12°, 48°x36°
Interfacing	Gbit-Ethernet
I/O Options	I/O-modules and digital interfacing via IMAGEPro

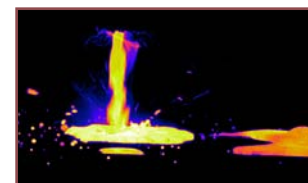
### EXAMPLE APPLICATIONS



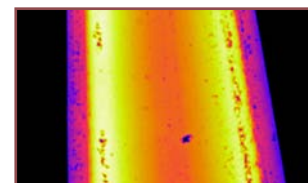
Strand Concast



Press Forging



Pouring



Hot Rolling

## NIR-2K



**HIGH-TEMPERATURE** 600 to 1800 °C / 1112 to 3272 °F

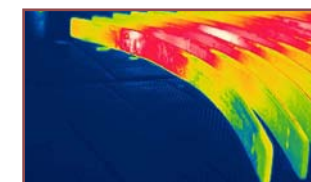
**SHORT-WAVELENGTH NIR** 1 μm

### TEMPERATURE RANGE

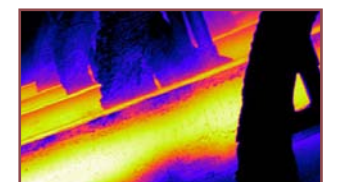
600 to 1000 °C / 1112 to 1832 °F  
800 to 1400 °C / 1472 to 2552 °F  
1000 to 1800 °C / 1832 to 3272 °F

Spectral Response	1 μm
Pixel Resolution	1968 x 1476 pixels
Frame Rate	15 Hz
Optics (FOV)	16°x12°, 48°x36°
Interfacing	Gbit-Ethernet
I/O Options	I/O-modules and digital interfacing via IMAGEPro

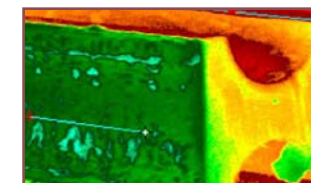
### EXAMPLE APPLICATIONS



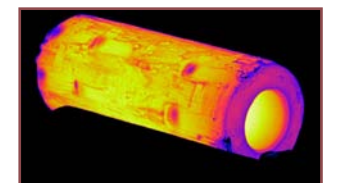
Heat Treatment



Continuous Caster



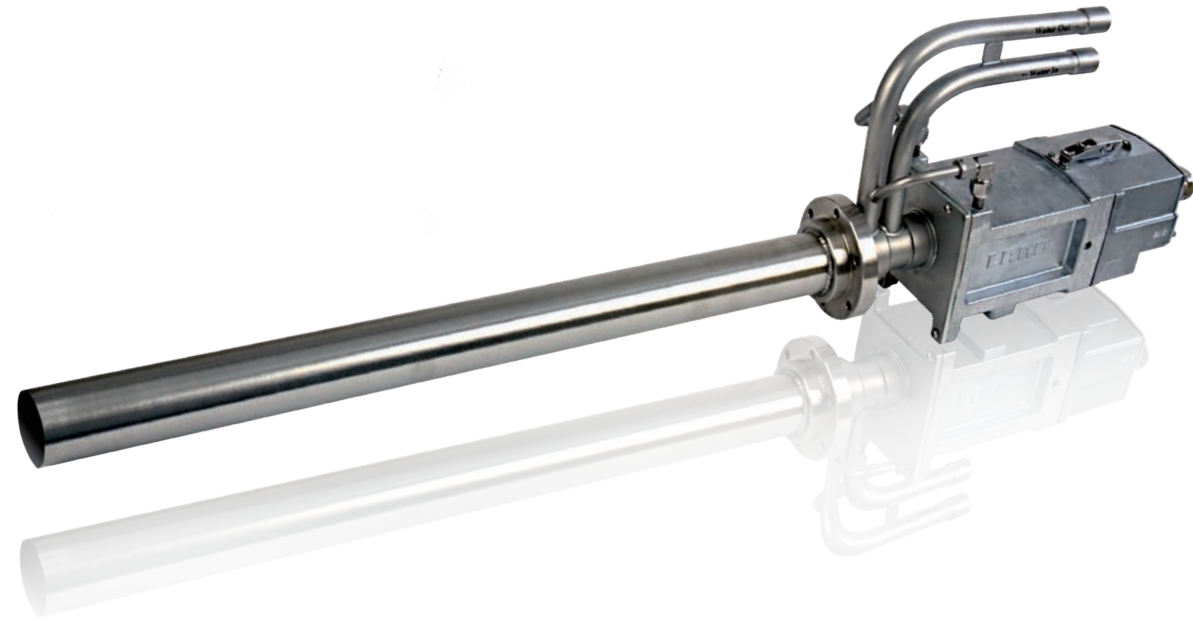
Steel Forming



Forging

# SMART FURNACE THERMAL IMAGERS & SYSTEMS

TEMPERATURE RANGE: 300 TO 2000 °C / 572 TO 3632 °F SPECTRAL RESPONSE: MWIR/NIR PIXEL RESOLUTION: 307K TO 3M PIXELS



## MWIR-B-640

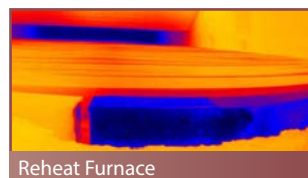
MID-TEMPERATURE 300-1800 °C / 572-3272 °F

MID-WAVELENGTH MWIR 3.9 μm

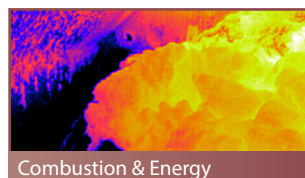
TEMPERATURE RANGE 300-1200 °C / 572-2192 °F  
500-1800 °C / 932-3272 °F

Spectral Response	3.9 μm
Pixel Resolution	640 x 480 pixels
Frame Rate	60 Hz / 9 Hz
Optics (FOV)	90°x67.5°
Interfacing	Gbit-Ethernet / PoE
I/O Options	I/O-modules and digital interfacing via IMAGEPro
Smart Functions	Integrated Webserver

### EXAMPLE APPLICATIONS



Reheat Furnace



Combustion & Energy

## NIR-B-640

HIGH-TEMPERATURE 600 to 2000 °C / 1112 to 3632 °F

SHORT-WAVELENGTH NIR 1 μm

TEMPERATURE RANGE 600 - 2000 °C / 1112 - 3632 °F  
(Wide Dynamic Range)

Spectral Response	1 μm
Pixel Resolution	640 x 480 pixels
Frame Rate	11 Hz
Optics (FOV)	44°x33°, 90°x67.5°
Interfacing	Gbit-Ethernet
I/O Options	I/O-modules and digital interfacing via IMAGEPro

### EXAMPLE APPLICATIONS



Industrial Furnaces



Reheat Furnaces

## NIR-B-2K

HIGH-TEMPERATURE 600 to 1800 °C / 1112 to 3272 °F

SHORT-WAVELENGTH NIR 1 μm

TEMPERATURE RANGE

600 - 1000 °C / 1112 - 1832 °F  
800 - 1400 °C / 1472 - 2552 °F  
1000 - 1800 °C / 1832 - 3272 °F

Spectral Response	1 μm
Pixel Resolution	1968 x 1476 pixels
Frame Rate	15 Hz
Optics (FOV)	95°x71°
Interfacing	Gbit-Ethernet
I/O Options	I/O-modules and digital interfacing via IMAGEPro

## NIR-B-640-EX

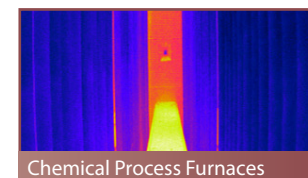
HIGH-TEMPERATURE 600 to 1800 °C / 1112 to 3272 °F

SHORT-WAVELENGTH NIR 1 μm

TEMPERATURE RANGE 600 to 1800 °C / 1112 to 3272 °F  
(Wide Dynamic Range)

Spectral Response	1 μm
Pixel Resolution	640 x 480 pixels
Frame Rate	11 Hz
Optics (FOV)	44°x33°, 90°x67.5°
Interfacing	Gbit-Ethernet / PoE
I/O Options	I/O-modules and digital interfacing via IMAGEPro
Hazardous Area Compliance	ATEX, IECEx and CSA

### EXAMPLE APPLICATIONS

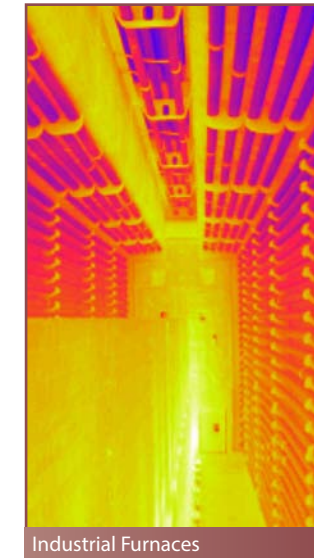


Chemical Process Furnaces

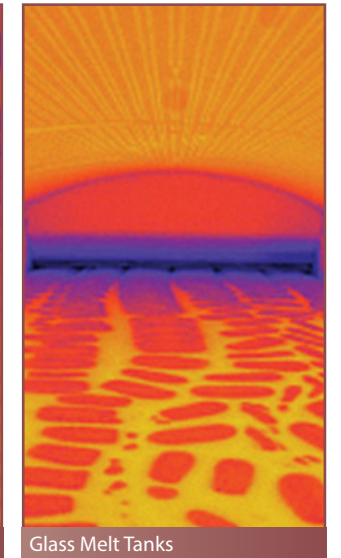


Chemical Process Furnaces

### EXAMPLE APPLICATIONS



Industrial Furnaces



Glass Melt Tanks

## NIR-B-656

HIGH-TEMPERATURE 600 to 1800 °C / 1112 to 3272 °F

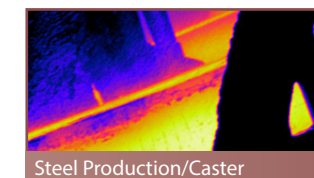
SHORT-WAVELENGTH NIR 1 μm

TEMPERATURE RANGE

600 - 1000 °C / 1112 - 1832 °F  
800 - 1400 °C / 1472 - 2552 °F  
1000 - 1800 °C / 1832 - 3272 °F

Spectral Response	1 μm
Pixel Resolution	656 x 492 pixels
Frame Rate	30 Hz
Optics (FOV)	31°x24°, 95°x71°
Interfacing	Gbit-Ethernet
I/O Options	I/O-modules and digital interfacing via IMAGEPro

### EXAMPLE APPLICATIONS



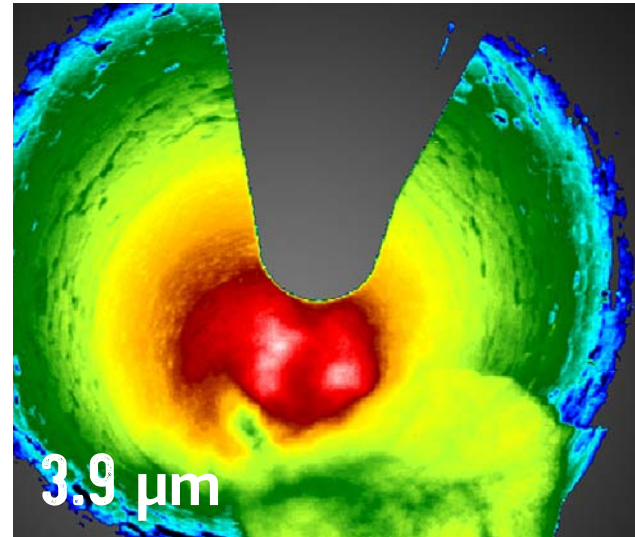
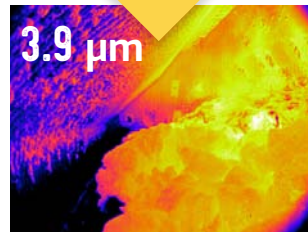
Steel Production/Caster



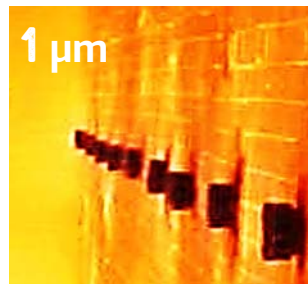


# FURNACE MONITORING

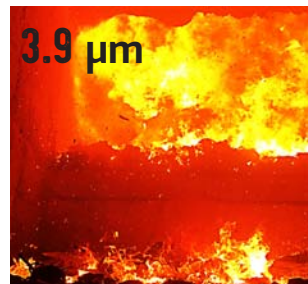
SHOULD A 1  $\mu\text{m}$  OR 3.9  $\mu\text{m}$  BORESCOPE BE USED?



**3.9  $\mu\text{m}$**   
CEMENT ROTARY KILN  
A 3.9  $\mu\text{m}$  borescope is recommended to provide a wide and clear view through smoky and dusty atmospheres.



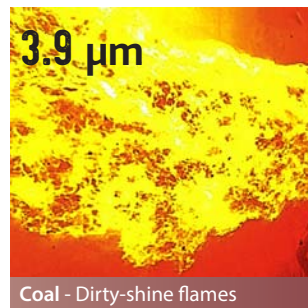
1  $\mu\text{m}$   
Reformer - Clear flames



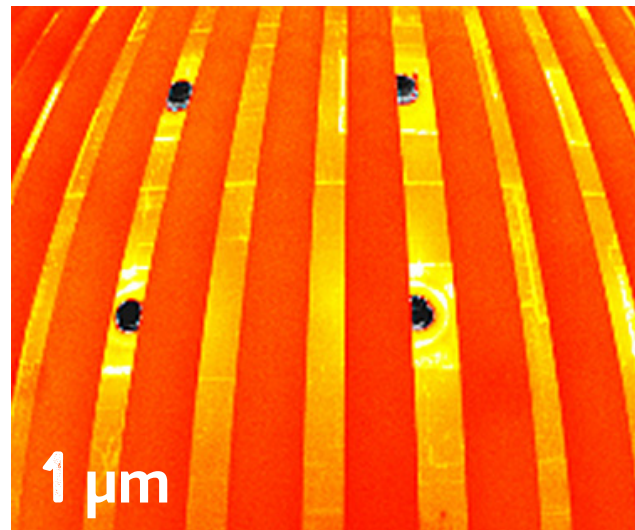
3.9  $\mu\text{m}$   
Waste - Dirty-shine flames



1  $\mu\text{m}$   
Heating - Clear flames



3.9  $\mu\text{m}$   
Coal - Dirty-shine flames



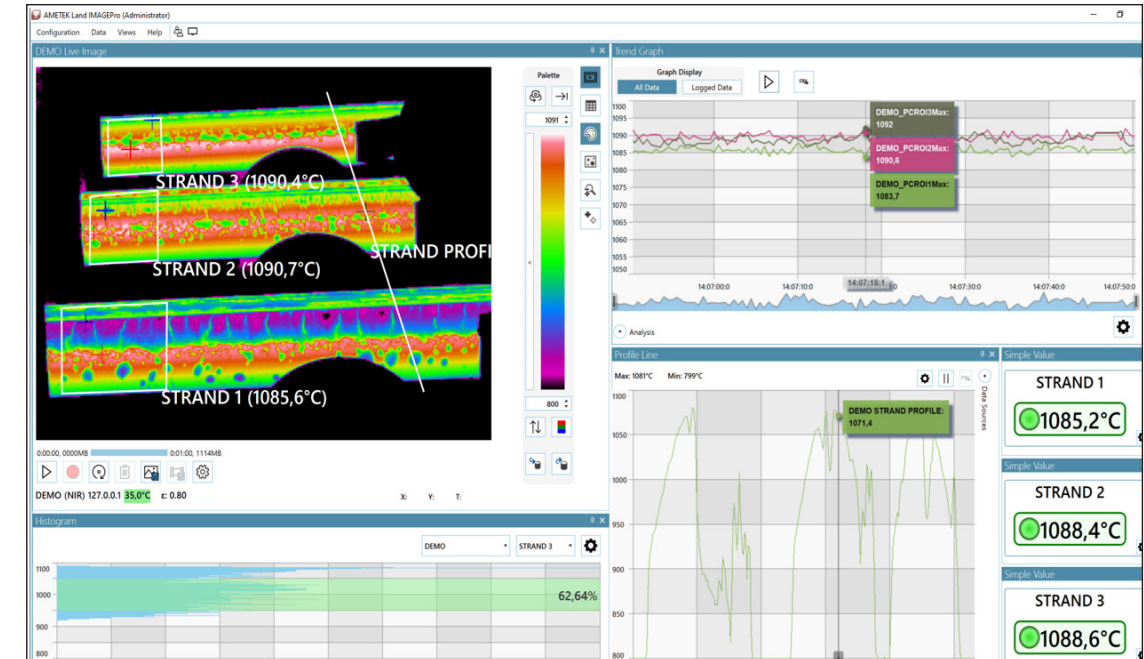
1  $\mu\text{m}$   
INDUSTRIAL FURNACES  
A 1  $\mu\text{m}$  borescope is recommended for natural gas, oxy and hydrogen flames.

# IMAGING SOFTWARE

THERMAL IMAGING SOLUTIONS

## IMAGEPRO

The innovative IMAGEPro package is an advanced image processing software for controlling, monitoring, analysing and capturing imager data.

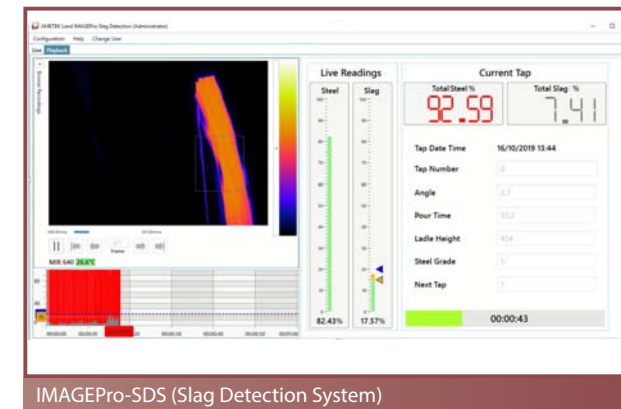


FOR UP TO 16 THERMAL IMAGERS\*  
\*DEPENDENT ON NETWORK CAPACITY AND PC HARDWARE.

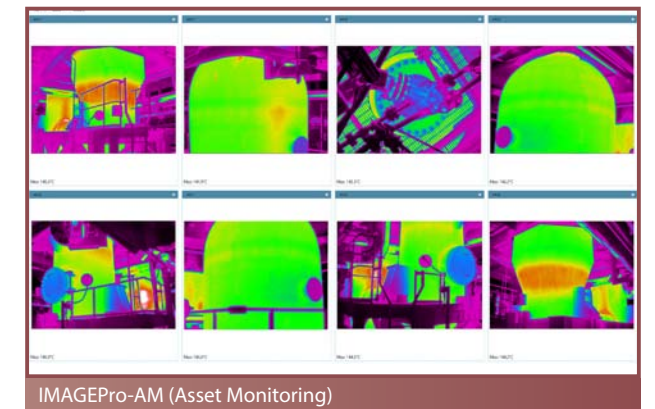
IMAGEPro is a Windows PC software system that enables configuration of imager, display properties and advanced temperature analysis options and supports multiple simultaneous imagers. Free 30-day trial available for extensive testing.

Able to monitor and control up to sixteen imagers, IMAGEPro offers real-time analysis for thermal imager ranges. Giving users exceptionally detailed control over their thermal imaging measurements, IMAGEPro enhances application measurements.

### APPLICATION VERSIONS



For monitoring and reducing slag carryover in steel production facilities.



For monitoring of the shell temperatures of critical vessels and furnaces.



# ACCESSORIES FOR STATIONARY IMAGERS

## MAIN ACCESSORIES



**CAMERA ENCLOSURES**  
(WATER COOLED, AIR PURGED,  
HEATED, EX-PROOF)



**CAMERA POWER SUPPLY UNITS**  
(SEALED TO PROCESS)  
INCLUDES FIBRE OPTIC DATA ADAPTER



**AIR BLOWER UNITS**



**POWER SUPPLY OPTIONS**  
& PoE POWER SUPPLY



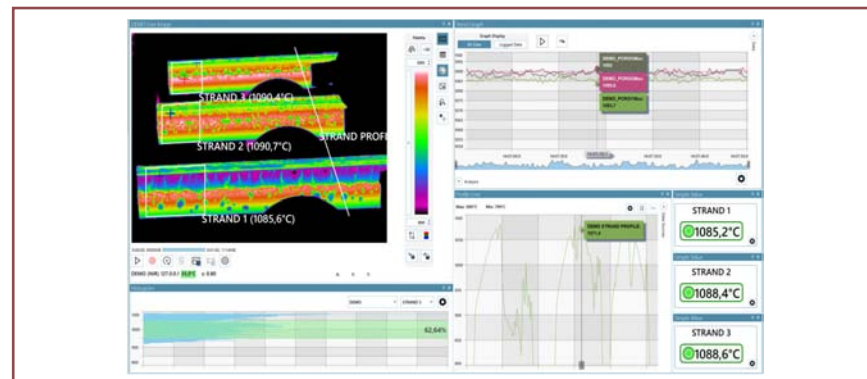
**CABLES AND CONNECTORS**



**PC AND WORKSTATIONS**



**SDK - CAMERA SOFTWARE**  
DEVELOPMENT KIT

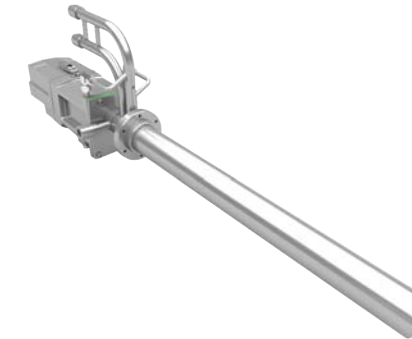


**IMAGEPro SOFTWARE**

# ACCESSORIES FOR FURNACE IMAGERS

## BORESCOPE AUTO-RETRACTION SYSTEMS

### STANDALONE IMAGING SYSTEM



#### MWIR-B-640

#### NIR-B-640

#### NIR-B-656

#### NIR-B-2K

A typical\* system includes:

- Borescope thermal imaging camera
- Water cooled/air purged housing
- Power supply unit (PSU)
- Cables (25 or 50 m)
- IMAGEPro software

#### NIR-B-640-EX

A typical\* system includes:

- Borescope thermal imaging camera
- Water cooled/air purged housing
- Field connection box (ExHazloc)
- Control room unit (ExHazloc, associated apparatus)
- Junction box (ExHazloc)
- Cables (10, 25 or 50 m)
- IMAGEPro software

\*Dependant on system configuration.

### ELECTRICAL AUTO-RETRACT (AR) SYSTEM



#### MWIR-B-640

#### NIR-B-640

#### NIR-B-656

#### NIR-B-2K

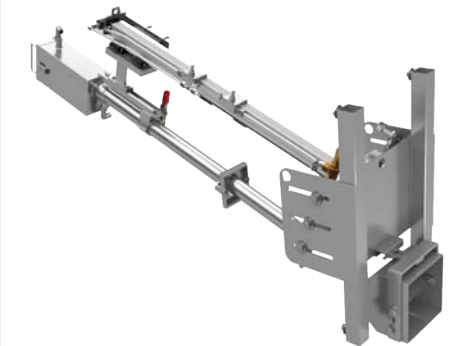
#### NIR-B-2K-GLASS

A typical\* system includes:

- Borescope thermal imaging camera
- Water cooled and air purged borescope tube and imager protective housing
- Electric auto retraction system (24V)
- Control box (IP65 rated and includes PLC, UPS and connection terminals)
- Connection cables
- IMAGEPro software

The UPS provides the power to retract the borescope should power failure occur. If the stored energy in the UPS falls to a certain level, the borescope automatically retracts.

### PNEUMATIC AUTO-RETRACT (PAR) SYSTEM



#### NIR-B-2K-GLASS

A typical\* system includes:

- Borescope thermal imaging camera
- Water cooled and air purged borescope tube and imager protective housing
- Pneumatic auto retraction system
- Control unit and media control box
- Connection cables
- IMAGEPro software

The integrated backup air cylinder provides the pneumatic energy to retract the borescope should air supply failure occur.

**AUTO-RETRACT SYSTEMS PROTECT THE THERMAL IMAGING CAMERAS FROM DAMAGE BY OVERHEATING IN THE EVENT OF LOSS OF WATER FLOW, AIR PRESSURE, ELECTRICITY SUPPLY OR HIGH BORESCOPE TIP TEMPERATURE ALARM.**