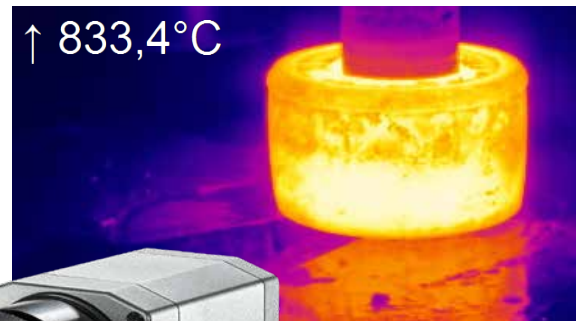
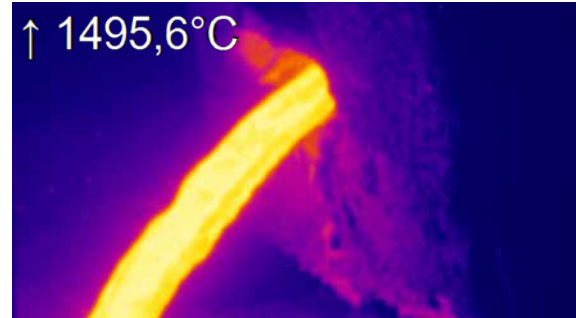


# APPLICATIONS AND PRODUCTS



## Infrared Temperature Measurement in Metal Industry





Centrifugal pipe casting machine at the foundry



CSvision ratio pyrometer is ideal for hot applications



The IR cameras of the PI series are often used for metal applications

## Optris GmbH

**Your reliable Partner for infrared temperature measurements in the metal industry**

Optris GmbH was founded in 2003 with the aim of enhancing the range of non-contact temperature sensors with advanced measurement and application principles. Since its foundation, Optris GmbH has developed into one of the **world's leading companies in the field of non-contact temperature measurement**.

Optris offers **high quality infrared thermometers** and **thermal imaging cameras**, **associated accessories** and **software** at affordable prices. The goal is to make state-of-the-art infrared technology available to all customers in industry and R&D.

Optris pyrometers and cameras are particularly suitable for **metal applications**. At higher temperatures and short measuring wavelengths (2.3  $\mu\text{m}$ ; 1.6  $\mu\text{m}$ ; 1.0  $\mu\text{m}$ ) metal surfaces have the highest radiation intensity, called emissivity, therefore the measurement of metals should always – if possible – be done in the short wavelength spectral range.

Deviations in temperature reading, caused by changing emissivities, are reduced substantially at those spectral ranges.

Our thermal imagers and infrared thermometers are used in forging continuous casting, foundry, rolling mill, induction heating, hardening and laser machining applications.

Harsh environments like smoke, steam, dust or flames are no problem for our measurement instruments – with fitting accessories they can be exposed to extreme temperatures and conditions.



**Optris managing director Dr.-Ing. Ulrich Kienitz combines 45 year of passion for infrared with a great deal of practical experience. Thanks to the entire Optris team, our products have been successfully deployed and used in more than 800.000 installations worldwide.**

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## Our Infrared Cameras

### Advanced and compact cameras for the metal industry

The **short wavelength infrared cameras of the optris PI and Xi series** are fixed thermography systems that offer outstanding value for money and are used in the metal industry for **extremely reflective surfaces**.

The **Xi 1M** is an industrial small sized rugged imager with a wide measurement range of 450 °C up to 1.800 °C without subranges. In addition, this Imager has a motorized focus and can operate autonomously.

The **optris PI 05M, 08M and 1M** are cameras made specifically for the metal industry and suitable for temperature measurements on metals due to their short measuring wavelengths of 500 nm, 800 nm and 1 µm. The special spectral ranges of the **optris PI series** ensure more accurate measurements with changing emissivities and are less sensitive to atmospheric influences.

In addition the **optris PI 450i G7 / 640i G7** are used in the field of slag detection. In this spectral range (7.9 µm) the differences in emissivity between the molten metal and the surface of the slag are relatively big. It is this feature that is used for the detection of slag.



Further information on non-contact temperature measurement see our brochure:

**IR Camera Brochure**

[www.optris.com/en/support/downloads/infrared-cameras/](http://www.optris.com/en/support/downloads/infrared-cameras/)



**Xi 1M**



396 × 300 px



450 to 1800 °C



0.85 – 1.1 µm



**PI 05M / PI 08M / PI 1M**

764 × 480 px

PI 05M: 900 to 2450 °C  
PI 08M: 575 to 1900 °C  
PI 1M: 450 to 1800 °C

PI 05M: 500 – 540 nm  
PI 08M: 780 – 820 nm  
PI 1M: 0.85 – 1.1 µm



**PI 450i G7 / 640i G7**

PI 450i G7: 382 × 288 px  
PI 640i G7: 640 × 480 px

150 to 1500 °C

7.9 µm





In metal welding, reliable temperature control of the weld is essential

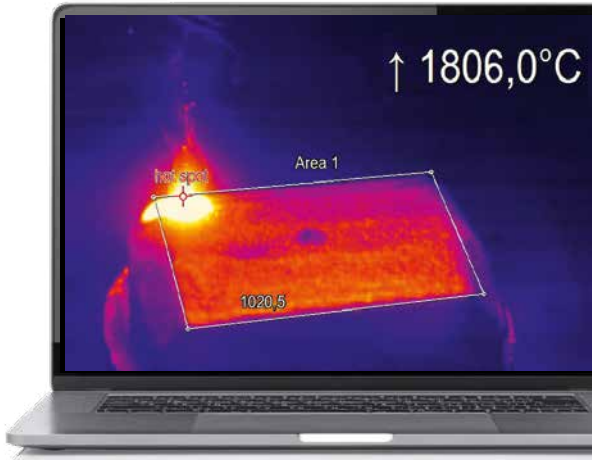
## Our Infrared Thermometers

### Innovative thermometers and pyrometers for the metal industry

Optris **infrared thermometers** for spot measurements are particularly well suited for **precise temperature monitoring** of industrial manufacturing processes. The innovative two-color-detector technology makes the **optris CTratio & CSvision 1M and 2M** best fit for measuring small, moving or even partially obscured metal objects. Both are largely insensitive to harsh conditions and provide precise and consistent measurement results.

The new optris CSvision is available in three versions with measurement ranges from **250 °C up to 3000 °C**. It is equipped with a motorized vario focus and a unique two-step **brightness reduction filter (BRF)** giving the user a tremendous advantage when aiming on hot and extremely bright objects. As CTratio it also includes **SRM – Smart Ratio Mode** for challenging applications with the demand of a variable slope.

The **optris CTlaser 05M / 1M / 2M / 3M** infrared thermometers were specifically developed for the temperature measurement of metal surfaces and molten metals. They feature short-wave spectral ranges, which also minimize measurement errors in the case of changes in emissivity.



Further information on non-contact temperature measurement see our brochure:

**Product Brochure**

[www.optris.com/en/support/downloads/infrared-thermometers/](http://www.optris.com/en/support/downloads/infrared-thermometers/)



CTratio 1M / 2M



450 °C to 3000 °C (1M)  
250 °C to 3000 °C (2M)



0.8 – 1.1 µm (1M)  
1.45 – 1.75 µm (2M)



CSvision R1M / R2M

600 °C to 3000 °C (1M)  
300 °C to 1400 °C (2M)

0.8 µm – 1.1 µm (1M)  
1.45 µm – 1.75 µm (2M)



CSLaser 2M

250 °C to 1600 °C

1.6 µm



CTlaser 05M / 1M / 2M / 3M

1.000 °C to 2000 °C (05M)  
250 °C to 2200 °C (1M / 2M)  
50 °C to 1800 °C (3M)

525 nm (05M)  
1.0 µm (1M)  
1.6 µm (2M)  
2.3 µm (3M)





*Optris devices are also often used in metal casting applications*





In the metal industry, often difficult environmental conditions prevail - here Optris Accessories are ideally used



Steel is pressed into various shapes in rolling mills, e.g. in bars

## Our Accessories

### The optimal complement to our products

Optris offers additional accessories for the temperature sensors and thermal imagers to enhance their features and their application possibilities.

Our CoolingJacket Advanced protects the IR thermometer or thermal imager in high temperature surroundings (up to 315 °C) and allows the integration of additional components like PI NetBox, USB Server Gigabit and Industrial Process Interface (PIF).

Ethernet Cat. 6, USB- and sensor cables for ambient temperatures up to 250 °C as well as an optional cable cooling for up to 315 °C are available.

Air purge collars are available in different sizes depending on the device. The sensing head will be protected from dirt and outside impacts.



Further information on non-contact temperature measurement see our brochure:

**Product Brochure**

[www.optris.com/en/support/downloads/accessories/](http://www.optris.com/en/support/downloads/accessories/)



#### Digitally controlled lens protection system

This shutter acts as a reliable safeguard for our imager optics in case of sparks, splinters or other rough fragments, which could damage them. This allows our cameras to be used safely in many applications.



#### AirPurge & Water cooled Housing for pyrometer

Even in harsh industrial environments, the sensor head is optimally protected by our protective housing. The water cooling allows the use even in very hot applications and the AirPurge keeps the optics clean from dust and other particles in dirty environments.



#### CoolingJacket Advanced

The universal protection for optris pyrometers and IR - cameras like the PI series under extreme harsh conditions. So it offers water cooling and optional protection windows.



#### Laminar AirPurge

The reliable complement for the CoolingJacket in harsh environments. It offers flexible airflow for protection from lens contamination and also has a protective window for mechanical protection.

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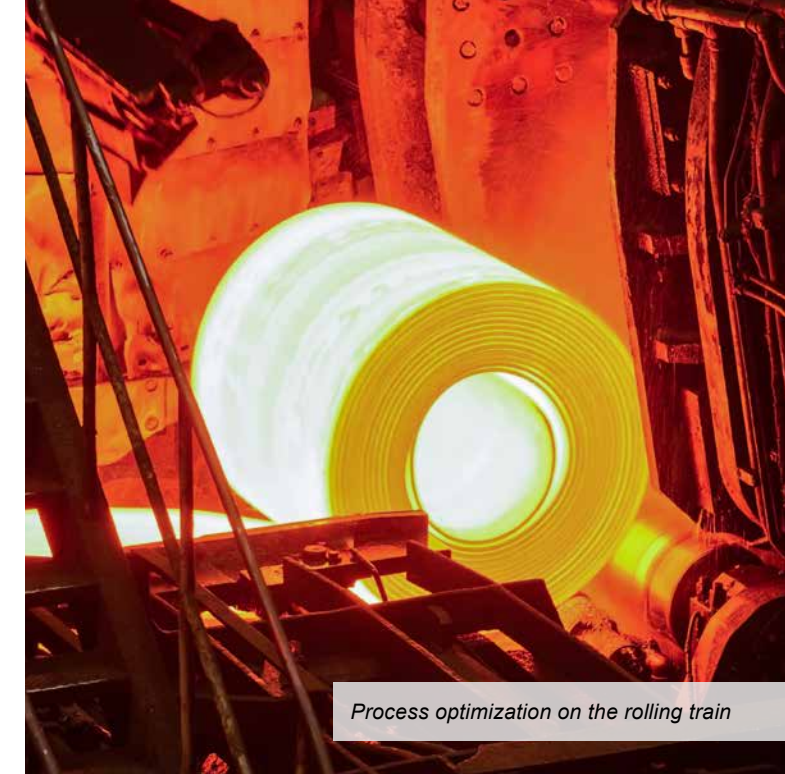
# Your metal applications - as made for our devices



*Temperature monitoring in the casting process*



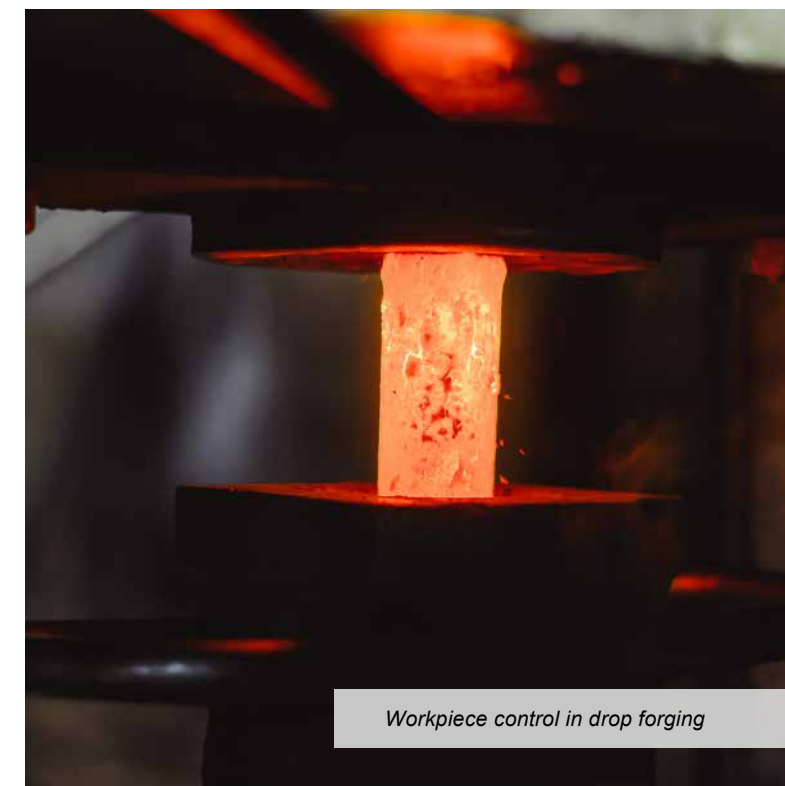
*Temperature monitoring in the production of automotive parts*



*Process optimization on the rolling train*

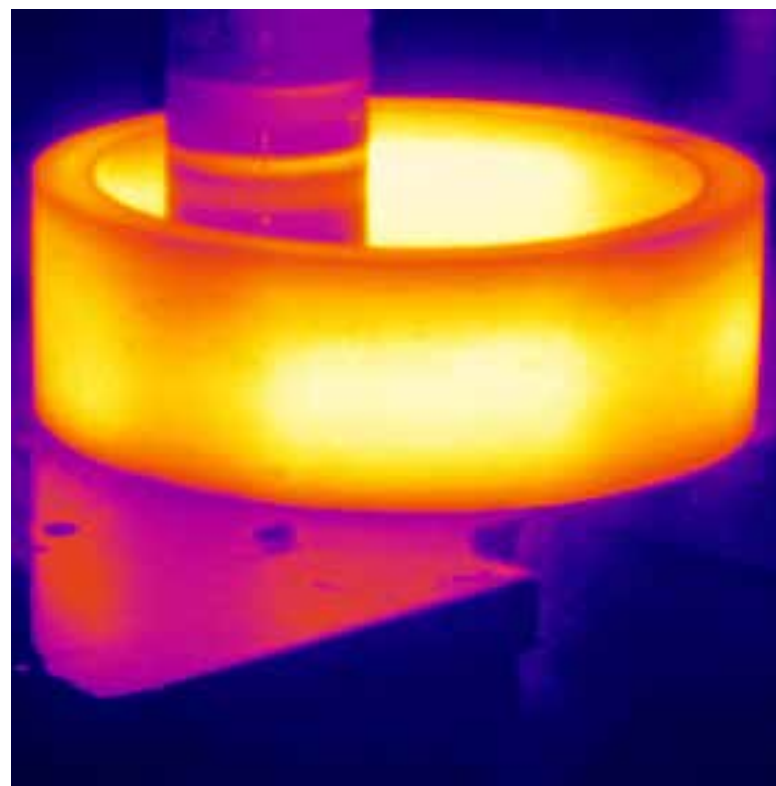
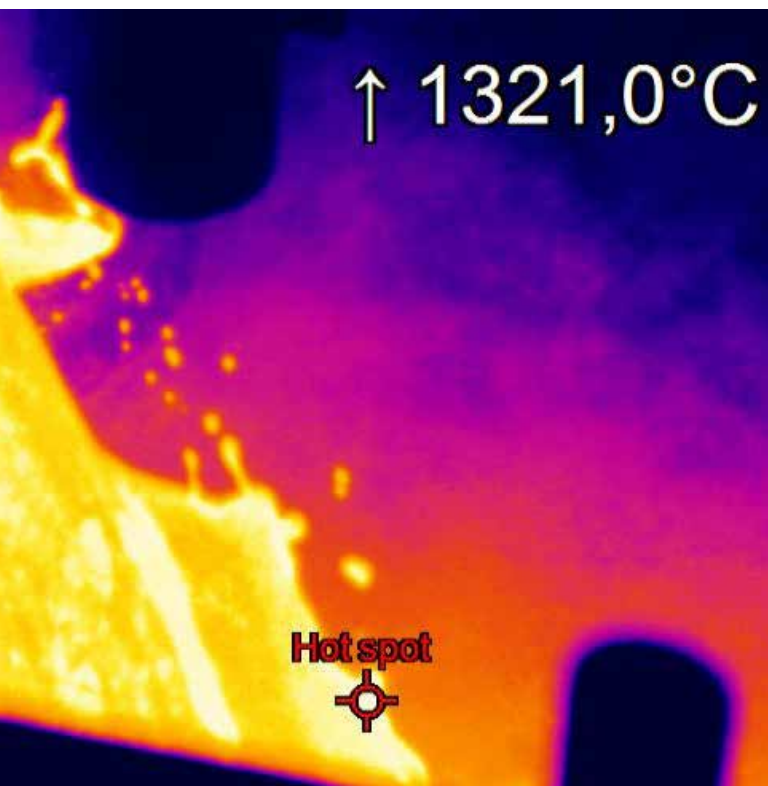
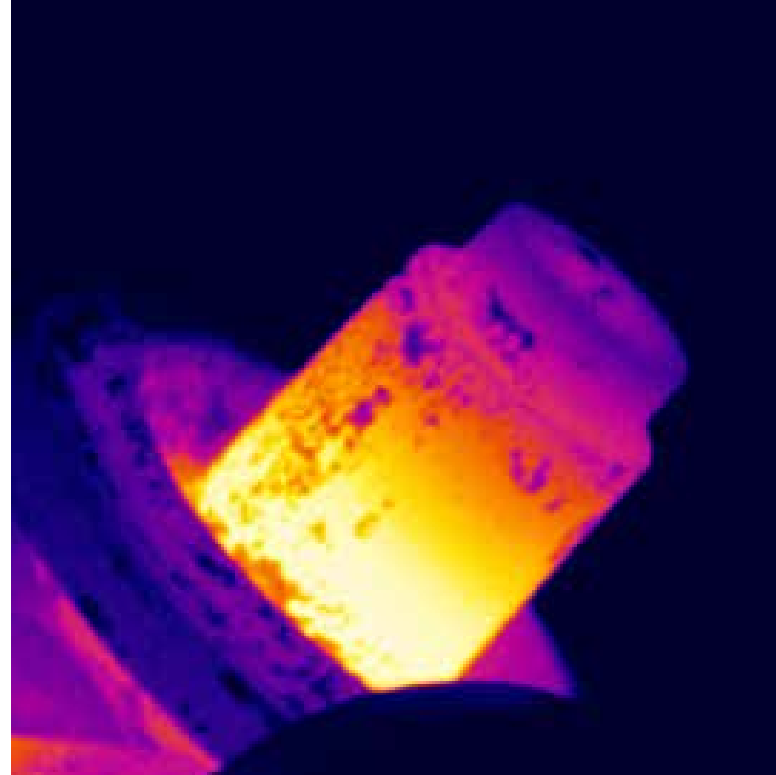
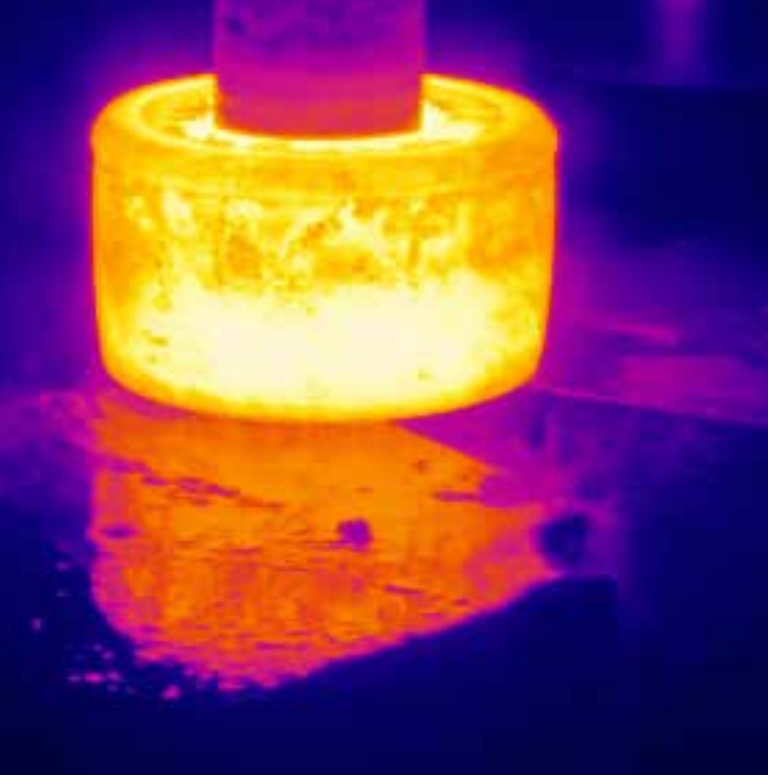


*Quality control in the production process of steel wire*



*Workpiece control in drop forging*





## Our Software and App

### optris PIX Connect & CompactPlus Connect – license-free software

The **PIX Connect** software is the ideal real-time analysis software to record and evaluate your measurement results with optris IR cameras. It provides outstanding customization options for respective applications.

With SDKs for Windows and Linux the cameras can be easily integrated into applications and control systems. In confined spaces the 1 kHz line scan camera function can be employed. A **real-time data transfer to external software programs** (video sequences, snap shots, text files for analysis) is also supported by the PIX Connect.

The **CompactPlus Connect** software is the ideal software to analyze measurement results of optris IR thermometers. The modern software with its intuitive user interface enables the data display of multiple sensors in different windows.

### optris IRmobile app – Smart IR measuring

The **IRmobile app** for **Android** is compatible with all IR thermometers and cameras. The app enables to monitor and analyze their infrared temperature measurements directly on a connected smartphone or tablet. It also includes an integrated simulator that allows users to explore various functions without the need for a connected device. The app supports android devices from version 5.0 with Micro-USB or USB-C connectors that support USB OTG.

### optris CompactPlus Connect

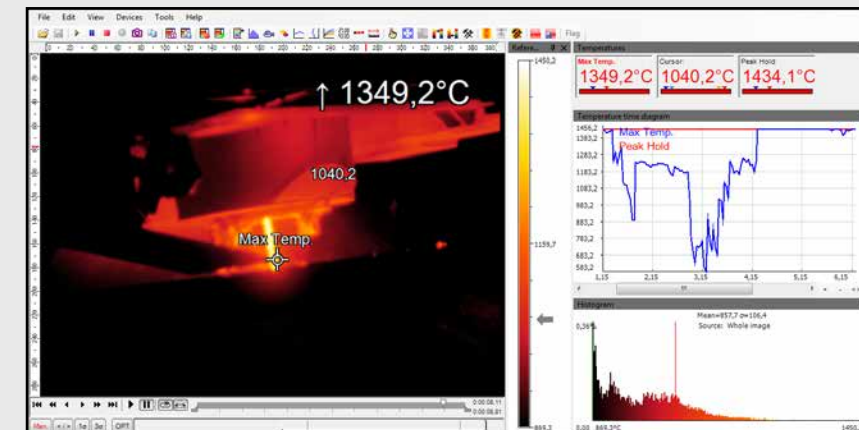


Further information on non-contact temperature measurement see our brochure:

**Product Brochure**

[www.optris.com/en/support/downloads/software/](http://www.optris.com/en/support/downloads/software/)

### optris PIX Connect



### optris IRmobile App

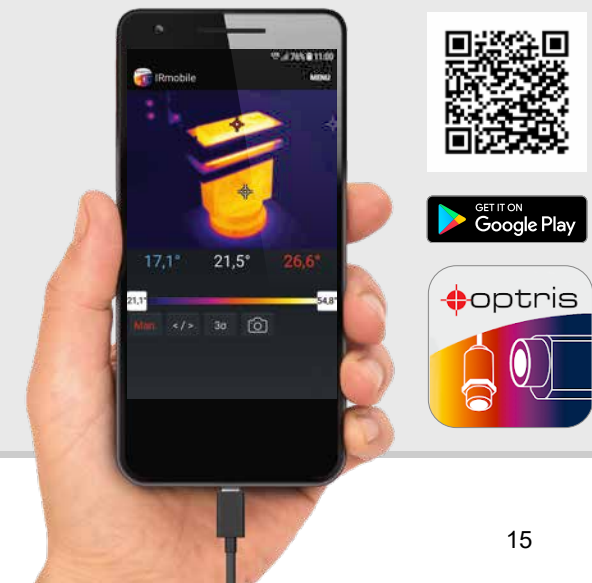


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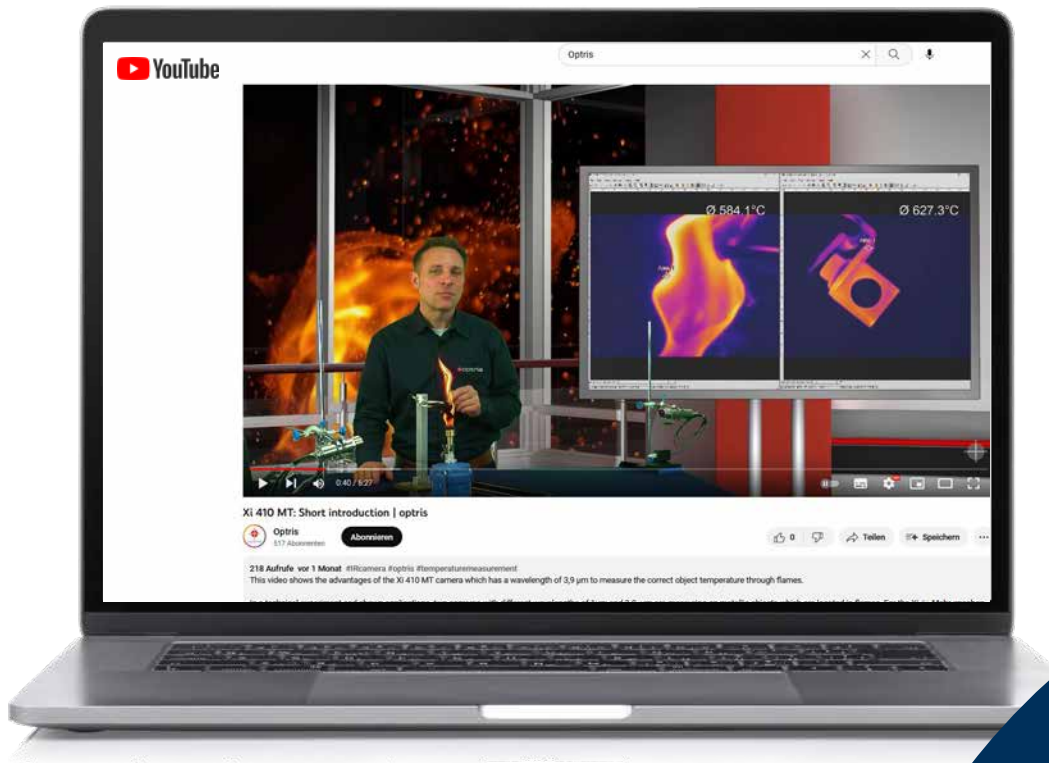
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