CESYCO

Advanced solutions for high-temperature inspection

Controlling heat for reliable, long-lasting inspections

Optimizing inspection in **extreme environments**

CESYCO in figures :

72 Customer countries

25 Years of expertise

5 Adaptable products

Introduction

In industry, high-temperature inspections require reliable, high-performance equipment. At CESYCO, we have developed innovative technologies to guarantee accurate observations, even under the most demanding conditions.

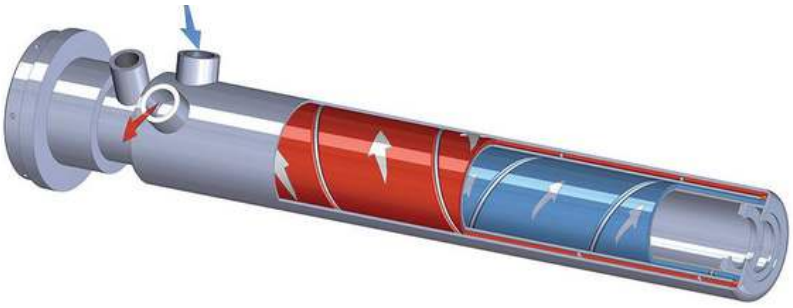
Cooling system, optical or digital image transmission, vision in the environment: each solution is designed to adapt to the specific constraints of your environment. Thanks to our expertise, we can help you choose the best configuration to ensure safety, durability and efficiency in your inspection operations.

Water cooling

During high-temperature inspections, intense heat can quickly damage imaging equipment. Water cooling is the most effective solution for protecting endoscopes and ensuring their smooth operation, even under extreme conditions.

How does it work?

The water circulates continuously through a stainless steel sheath specially designed to dissipate heat. This sheath features an internal helical wire, which generates a vortex effect. This phenomenon optimizes the distribution of water over the entire surface of the endoscope, preventing the formation of hot spots that could weaken the structure of the equipment.



Performance and strength: the keys to our technologies

The benefits:

Even temperature distribution:
Prevents overheating in certain areas of the endoscope.

Hot spot elimination:
Reduces the risk of weld failure under thermal stress.

Optimized water consumption:
Water circulation is designed for efficient use with controlled flow.

Air cooling

Air cooling is an essential solution for protecting industrial endoscopes in high-temperature environments. Using the Venturi effect, this system effectively cools the endoscope while maintaining a clear view.

How does it work?

Compressed air is injected into a specific duct at high speed. As it passes through a constricted duct, its pressure decreases and its velocity increases, creating a rapid flow of air that envelops the endoscope and prevents heat from reaching it. This phenomenon, known as the Venturi effect, is particularly effective for cooling components exposed to high temperatures.

The benefits:

Continuous, non-contact cooling:
Air protects the endoscope without the need for external fluids.

Particle and deposit removal:
The airflow prevents soot, dust and combustion residues from accumulating on the optics, ensuring clear, unobstructed vision.

Compatible with dusty environments:
Ideal for industrial furnaces, incinerators and boilers where suspended particles are a constant challenge.

Image transmission

Real-time imaging is essential for monitoring and analyzing complex industrial environments. Thanks to an integrated Full HD micro-camera, the digital video module enables instant viewing, easy recording and remote transmission, guaranteeing smooth, safe inspection.

Digital video module: real-time transmission

Digital transmission takes place via a Full HD micro-camera built directly into the endoscope. The image is sent in real time to a monitor via a video cable.

Real-time monitoring:
Instant display of images on a screen, enabling immediate decision-making.

Unlimited endoscope length:
Digital transmission enables endoscope length to be adapted to specific needs without loss of quality.

Easy recording and analysis:
Captured images and videos can be stored, shared and studied in detail.

Remote connection:
Compatible with control rooms for secure remote viewing.

Image transmission

In extreme industrial environments, image transmission must guarantee impeccable quality without compromising reliability. The optical rod is based on an aligned lens system, providing a sharp, precise image without the need for a power supply. A robust, proven solution, ideal for high-temperature inspections.

Optical rod: uncompromising image clarity

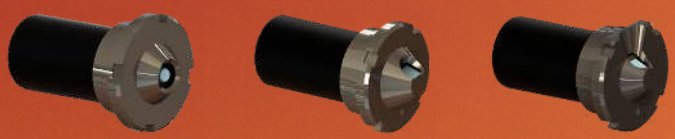
Optical rod transmission relies on a set of aligned lenses that carry the image to the eyepiece or to a recording device.

High optical quality:
lenses deliver a crisp, clear image without digital compression.

Universal compatibility:
Can be used with different types of cameras.

No power supply required:
Ideal for environments where access to electricity is limited.

Robustness and durability:
Insensitive to electronic disturbances and interference.



Vision

Understanding endoscope vision: angles, fields, directions and lighting

The effectiveness of industrial inspection depends on the ability to capture precise images tailored to the specific needs of each environment. This is why the choice of field of view, angle, direction and lighting is essential to optimize analysis and maintenance of high-temperature installations.

Vision directions: tailor-made inspection

Depending on environmental constraints and inspection objectives, endoscope viewing directions can be adjusted:

Axial vision: Ideal for direct observation of what lies in the axis of the endoscope.

Lateral vision: Recommended for analyzing walls or hard-to-reach areas.

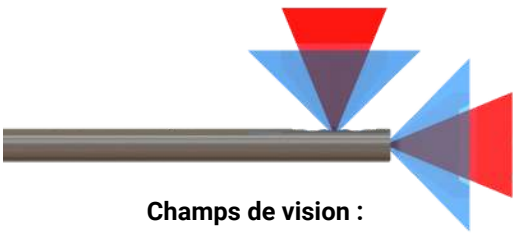
Bi-vision: Combines axial and lateral vision for simultaneous inspection from multiple angles, without repositioning the equipment.

Fields of view: precision or wide coverage

The field of view (FOV) defines the amount of space visible through the endoscope.

60°: Provides a more distant, detailed view, ideal for observing specific features in depth.

90°: Provides a wider view, enabling you to monitor a large area in a single image.

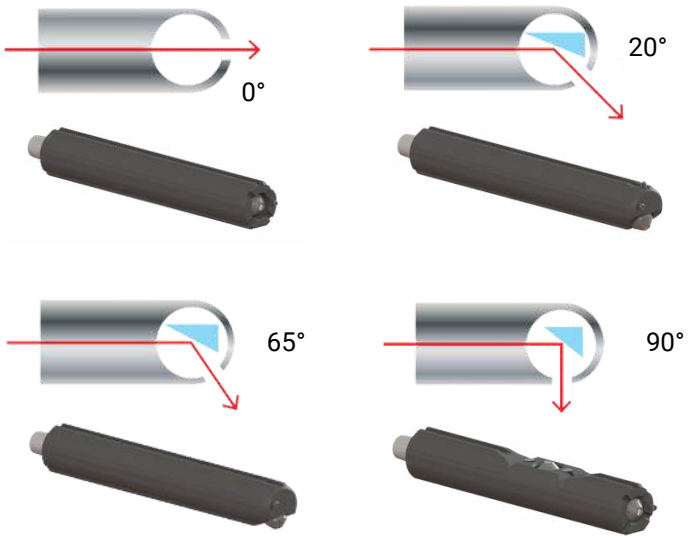


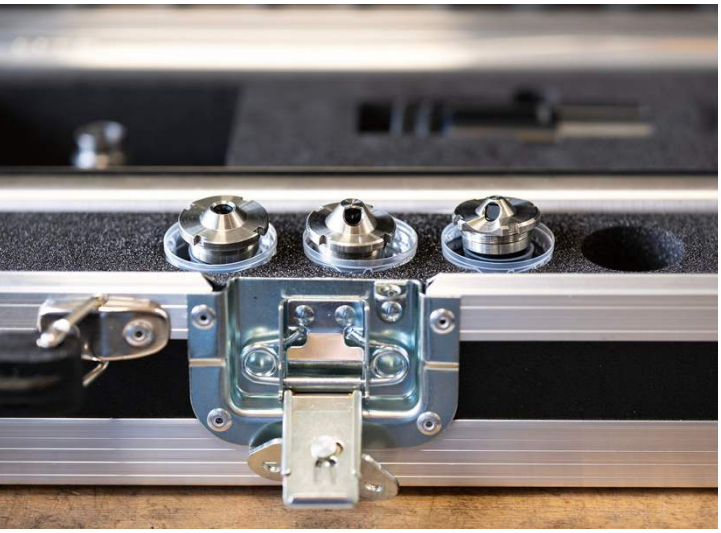
Champs de vision :

60° **ou** **90°**

Vision

Angles of vision: adapting to environmental constraints





CESYCO endoscopes are available with a range of viewing angles, providing the right perspective for every inspection requirement:

0° (axial vision): Ideal for straight-line observation, perfect for in-depth inspections in ducts or tubes.

Between 20° and 110°: Offer a better perspective on offset areas without repositioning the endoscope.

90° (lateral vision): Allows you to see the inside walls of a furnace or pipe without having to tilt the unit.

LED lighting: optimum visibility in all conditions

Some industrial environments are totally dark, preventing effective inspection without a light source.

Axial LED: illuminates directly in the line of vision, ideal for in-depth inspections.

Lateral LED: illuminates walls and improves visibility in off-center areas.

Optimized contrast: LEDs reduce shadows and guarantee a sharp image, even in low-light conditions.

CESYCO

High Temperature Endoscopy

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