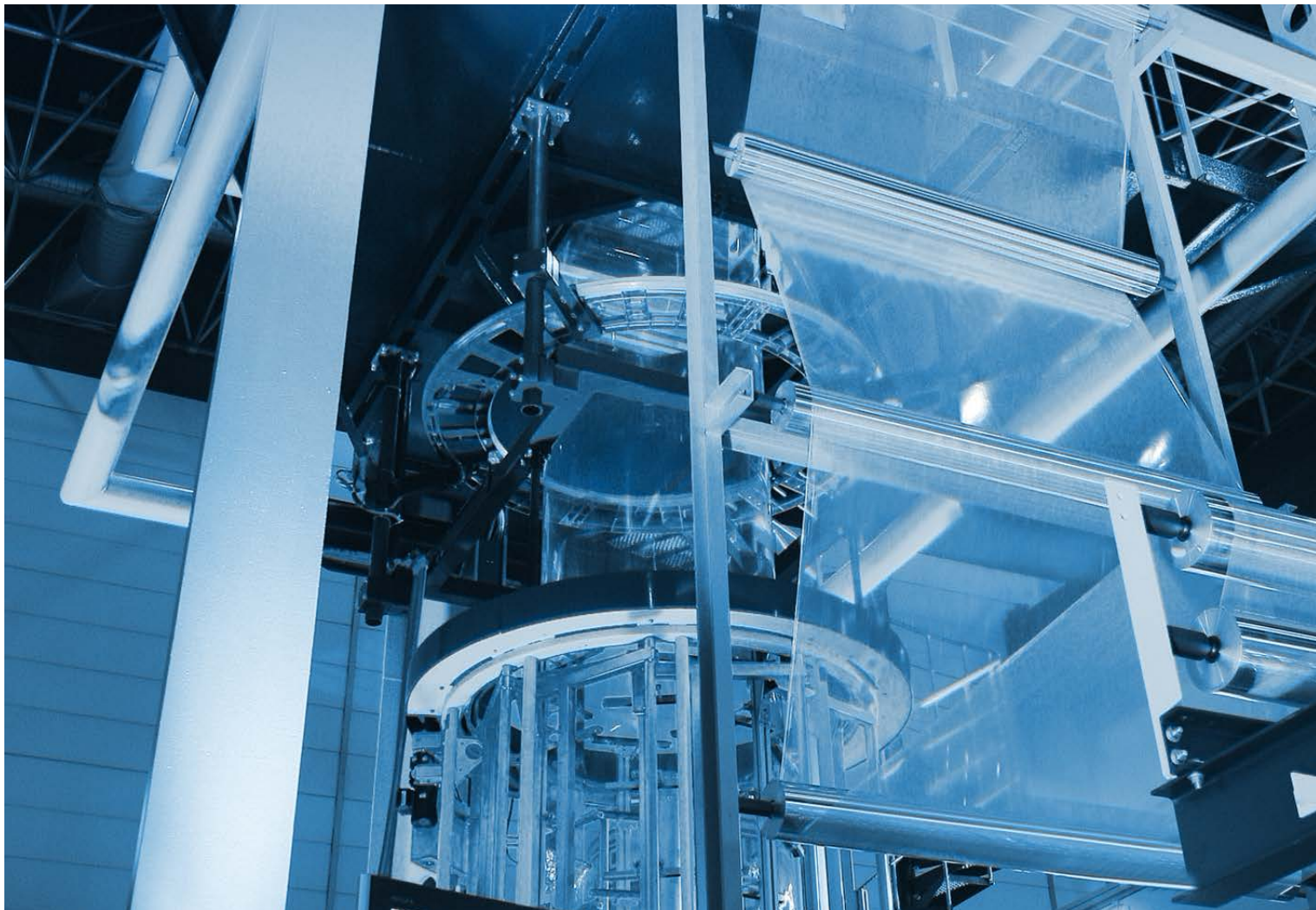


Sensors & Applications Plastics Industry



More Precision



Sensors and measurement systems for plastics production

Miniaturization and increased production speeds together with rising economic efficiency are the determining factors in the production and processing of plastics. Quality, function and haptics of the final product require reliable measurement and inspection procedures in every manufacturing stage.

Compact and high speed sensors from Micro-Epsilon ensure highest reliability in almost any area where high precision is expected – from machine monitoring to fully automatic quality control of the final product.



scanCONTROL 29xx

High-end automation scanner for high precision profile measurements

Inline measurement of gap, profile, step, angle

Red or blue laser line versions

Measurement on numerous surfaces, also reflecting and matt



colorSENSOR / colorCONTROL

Sensors for color recognition and color measurement

Ideal for integration into processing lines due to high measuring rates

High accuracy

Robust and suitable for industrial applications



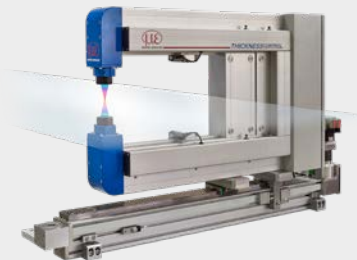
thermoIMAGER / thermoMETER

Thermal imaging cameras and infrared pyrometers for non-contact temperature measurement

Pyrometers for temperature monitoring of thin plastics

Real-time process monitoring and system control

Compact design & extensive interfaces



thicknessCONTROL

Turnkey measurement systems for thickness measurement of films and plates

Measurement of thickness and thickness profile

No consequential costs for radiation protection due to isotope and X-ray free measuring principle

Easy integration into processing lines

Film thickness from 30µm to 6mm

Thickness measurement



thicknessSENSOR

- Precise measurement results with high dynamics
- Non-contact and wear-free thickness measurements
- Compact system



One-sided thickness measurement of films

In its sensor housing, the combiSENSOR combines an eddy current displacement sensor and a capacitive displacement sensor. This unique sensor concept enables one-sided thickness measurement of electrically non-conductive materials on metallic objects. Its field of application is the thickness measurement of plastic film or of plastic coating on metal plates. Connected to the sensor via a cable, the controller processes and calculates the signals in order to put them out via interfaces.

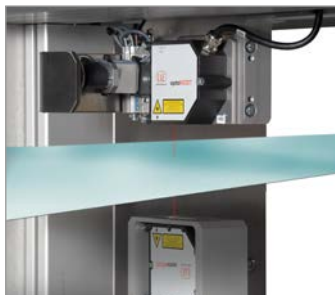
Sensor: combiSENSOR



Thickness profile measurement of strips and plates

The thicknessCONTROL measurement system is used for thickness measurement of plates and strip materials. Depending on the measurement task and materials, the head is equipped with different sensors that measure in a fixed track or in a traversing method. Comprehensive software packages and interfaces enable measured values to be recorded.

Measurement system: thicknessCONTROL

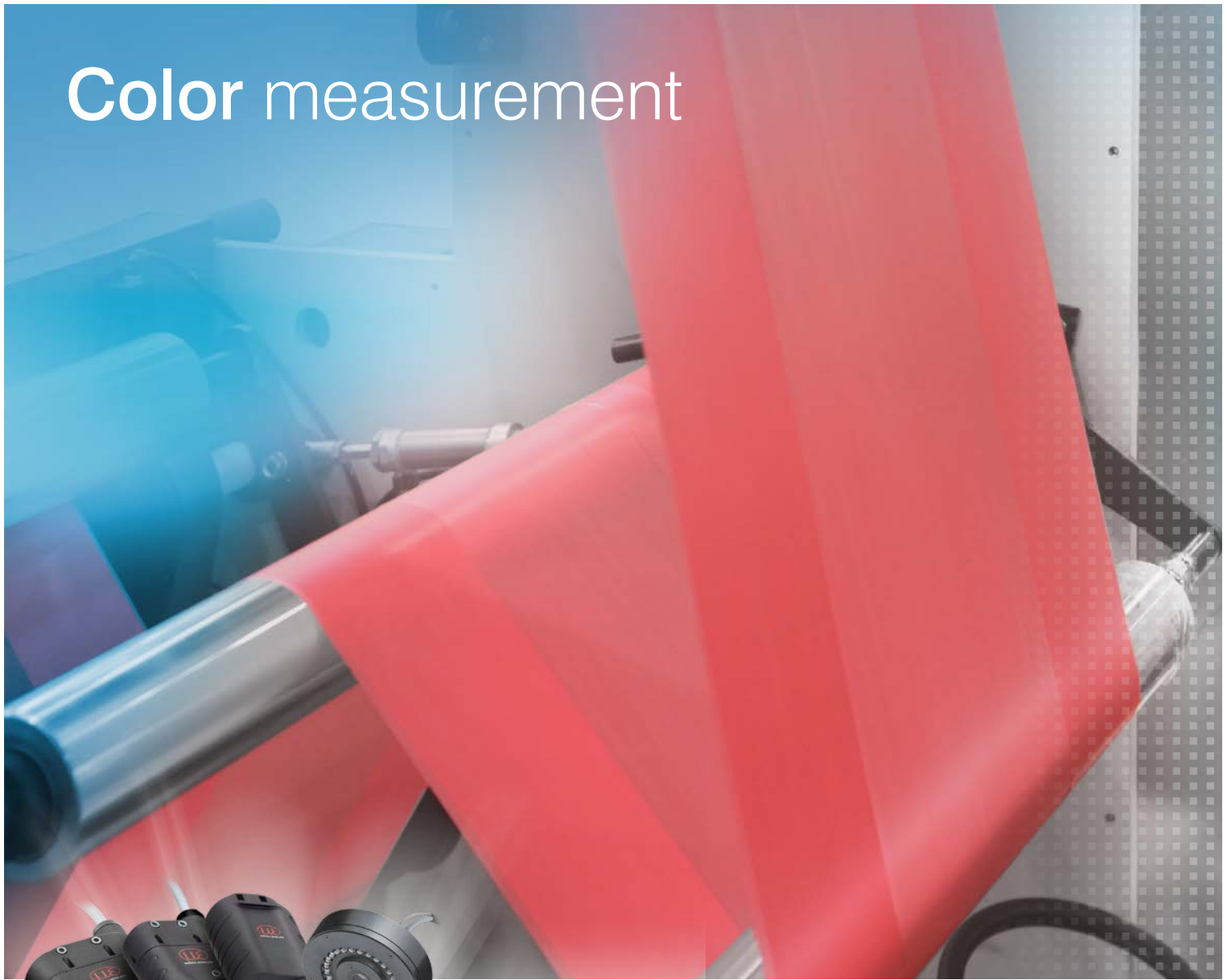


Two-sided thickness measurement

Depending on the respective measurement task, it is sensible to carry out a two-sided thickness measurement. Arranged opposite the material, two displacement sensors detect the thickness. This measurement arrangement is particularly suitable for high speed measurements and fluttering materials. Micro-Epsilon also offers turnkey systems for two-sided thickness measurements.

Measurement system: thicknessCONTROL

Color measurement



colorCONTROL ACS

- Inline color measurement at the highest precision
- Optimized sensor models for different surfaces, e.g. reflecting, transparent, curved
- High measuring rate, ideal for quality assurance and documentation in the processing line

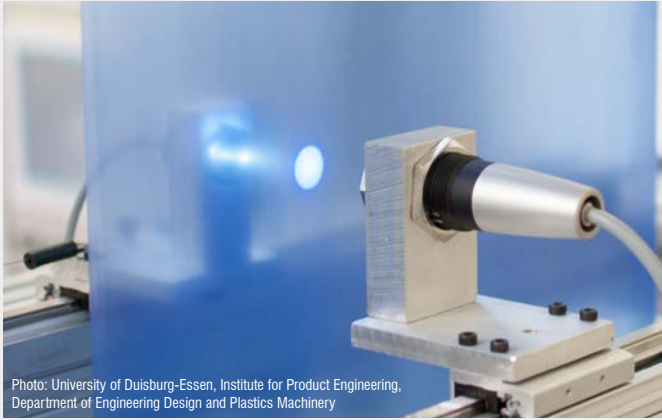
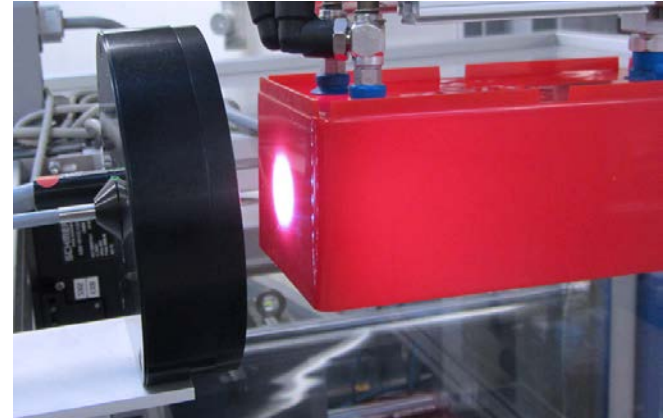


Photo: University of Duisburg-Essen, Institute for Product Engineering,
Department of Engineering Design and Plastics Machinery

Inline color measurement of transparent films

As well as color fluctuations, streaks can occur during production. As these films are translucent, the color can be measured based on the transmitted light principle. The colorCONTROL ACS7000 color measurement system measures the film color inline at high speed and at maximum precision.

Sensor: colorCONTROL ACS7000, ACS3 transmission sensor



Inline color measurement of injection-molded plastic parts

In plastics injection molding, color measurement can be performed only after the cooling process, as colors still can change. An empirically determined correlation between warm and cold pieces enables the ACS7000 to measure the color directly after the injection molding process and to determine any deviations early.

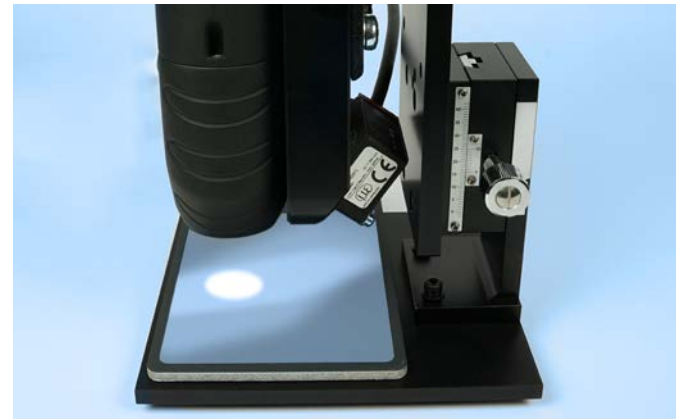
Sensor: colorCONTROL ACS7000, ACS2 sensor



Color recognition in component sorting tasks

Particularly with automated mounting, components must be sorted according to their color. The colorSENSOR CFO is ideally suited for these high production speeds. Adjustable colors and tolerance enable high flexibility.

Sensor: colorSENSOR CFO

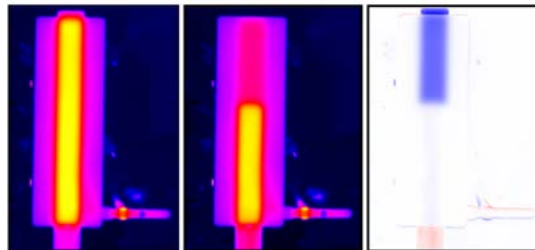
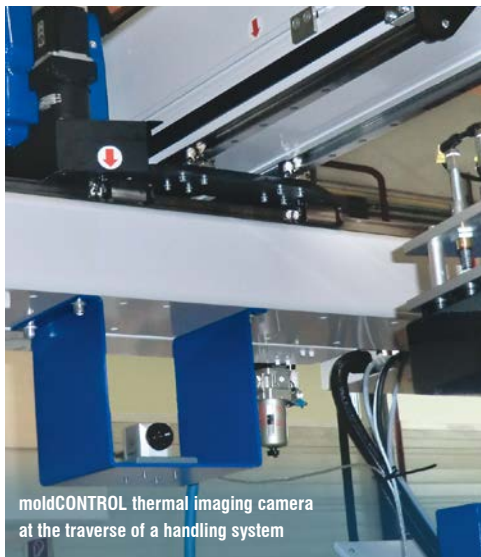


Color measurement of components

To ensure exact coloring when different batches are involved is a major challenge especially with shiny and curved surfaces. Color measurement systems from Micro-Epsilon detect the color with highest precision.

Sensor: colorCONTROL ACS7000, ACS1 sensor

Non-contact temperature measurement



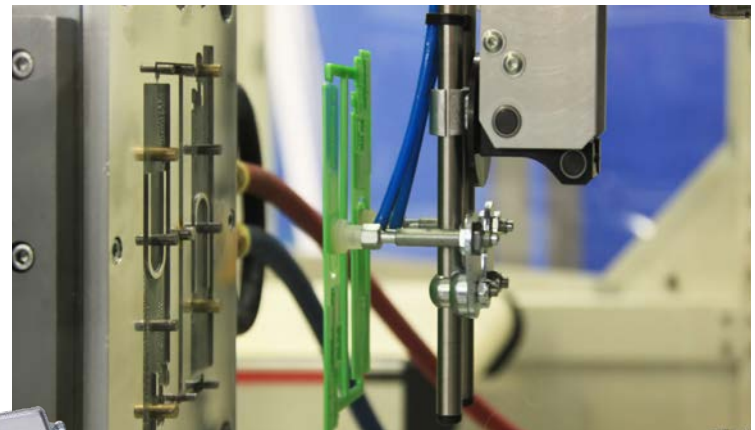
Thermography for injection molding processes

moldCONTROL is a thermography solution for recognizing quality fluctuations in injection molding production. The compact, industrial thermal imaging camera captures a thermal image of the component directly after the injection molding process. The software compares the infrared images associated with the component (actual) to stored references (target). The identified temperature differences provide the basis for a good/bad decision reported back to the handling system.

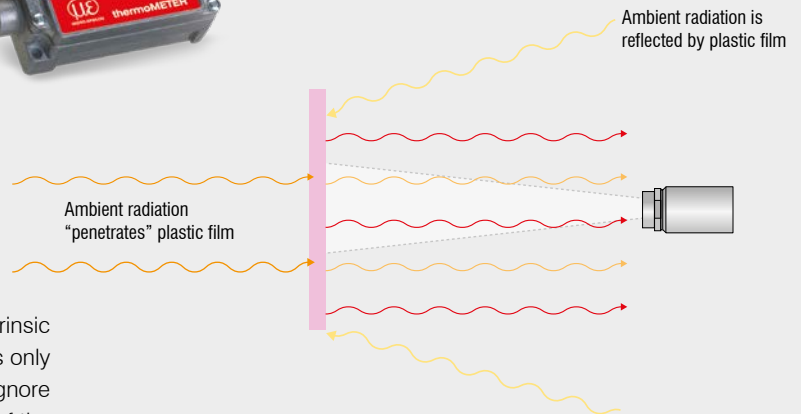
Temperature measurement in the plastics industry

Micro-Epsilon offers a wide range of non-contact, infrared thermometers and thermal imagers, which enable precise temperature measurement. The infrared measuring devices are used in a wide range of applications:

- Extrusion of blown film, flat films and plates
- Thermoforming
- Laminating and embossing
- Injection molding
- Coating
- Plastics welding

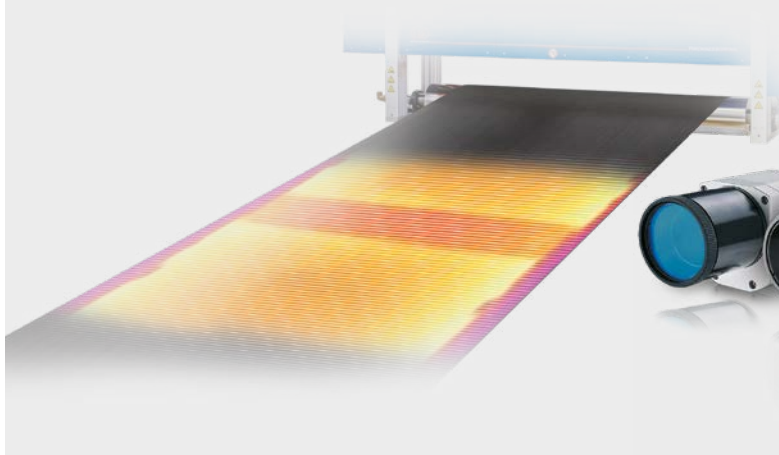


Infrared radiation also penetrates thin films and distorts the intrinsic radiation of the films. The infrared CT-P3 and CT-P7 pyrometers only detect the infrared radiation emitted by the plastic films and ignore the penetrated radiation. This is how high precision detection of the surface temperature is possible.



Line scan feature for the detection of temperature profiles

In order to ensure homogeneity of high temperatures, e.g. in thermoforming and calendering processes, the line scan feature is used. The thermal imaging camera provides temperature profiles per line. This enables the evaluation of the temperature distribution across the entire production line.

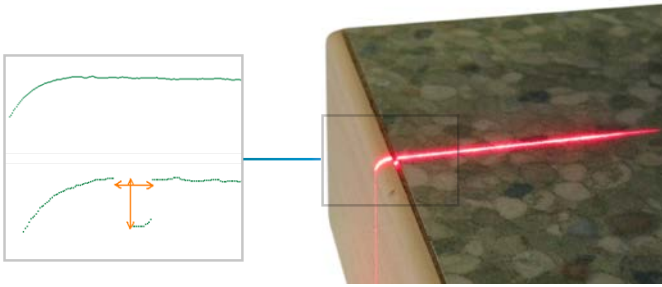


Profile measurement



scanCONTROL

- 2D/3D laser scanner
- High resolution profile measurement
- Compact with integrated controller
- Red and blue laser

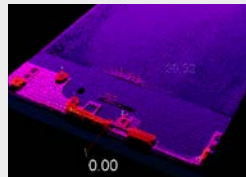
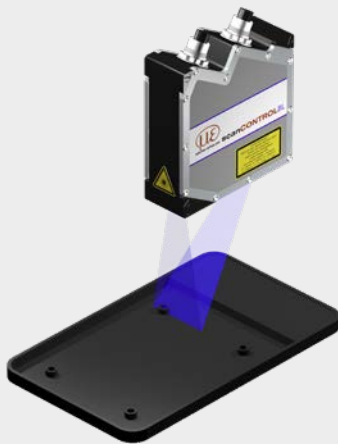
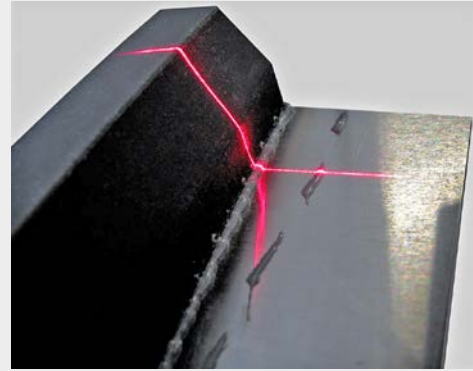


Defect recognition on worktops

Foreign bodies, uneven distribution of the adhesive or unevenness when closing may produce open joints between the top material and the sidebars. The scanCONTROL laser profile sensors check if there are open joints and detect their gap size.

Inspection of protruding adhesive beading

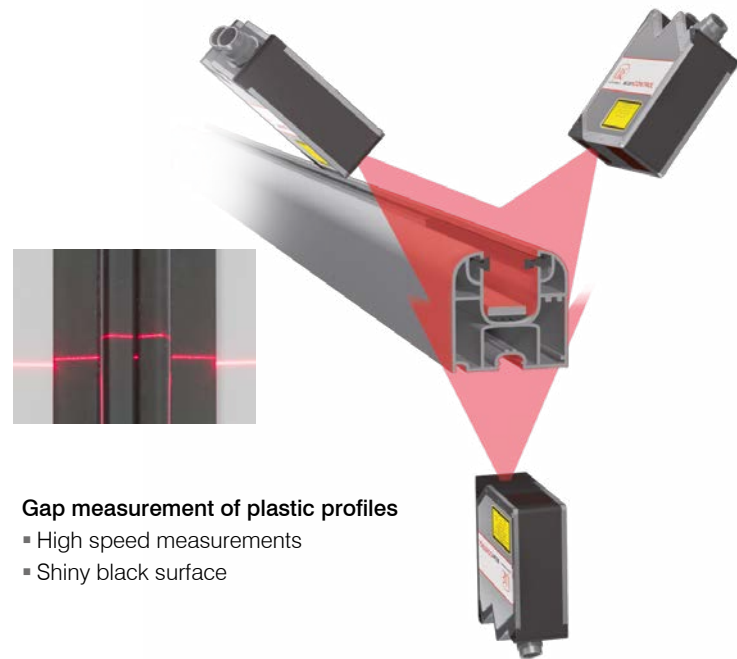
- Maximum height of protrusion is limited
- Adhesive drops on shiny surfaces are also recognized
- Inspection of liquid adhesive



Dimensional measurement of extremely small, mechanical structures

While the plastic components are fed into the line, the laser scanner detects the dimensions of the smallest of structures. Deviations in the micrometer range are reliably measured using a Blue Laser Scanner.

Sensor: scanCONTROL BL



Gap measurement of plastic profiles

- High speed measurements
- Shiny black surface

Sensors and Systems from Micro-Epsilon



Sensors and systems for displacement, distance and position



Sensors and measurement devices for non-contact temperature measurement



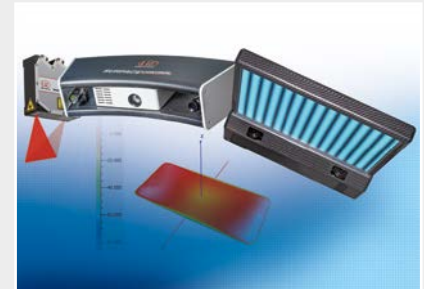
Measuring and inspection systems for metal strips, plastics and rubber



Optical micrometers and fiber optics, measuring and test amplifiers



Color recognition sensors, LED analyzers and inline color spectrometers



3D measurement technology for dimensional testing and surface inspection

More Precision

Whether it is for quality assurance, predictive maintenance, process and machine monitoring, automation or R&D – sensors from Micro-Epsilon make a vital contribution to the improvement of products and processes. High precision sensors and measuring systems solve measurement tasks in all core industries – from machine building to automated production lines and integrated OEM solutions.



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