

More Precision



Measurement  
technology for medical,  
pharmaceutical  
& biotechnological  
applications



## About us

Micro-Epsilon is a medium-sized, family-run company, a leader in the field of measurement technology. For more than 40 years, we have been a top performer, providing our customers with unsurpassed solutions in precision measurement and inspection. Our product portfolio ranges from sensors for non-contact displacement and distance measurement, IR temperature measurement and colour recognition systems to systems for dimensional measurement and defect detection.

## Sensors for medical technology, pharma and biotech

Sensors and measurement technology are being used increasingly in the growth industries of medical technology, pharmaceuticals and biotechnology, where they are enhancing quality and efficiency in a sustainable way. Micro-Epsilon is constantly developing measurement solutions for these sectors, in which it represents a competent partner. An overview of some successful projects completed by us are described in this brochure.

## Partnerships with customers

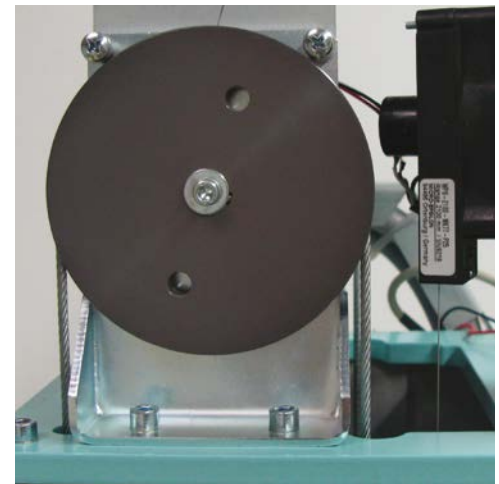
With above-average R&D activity, a high degree of expertise and a broad network of partnerships, we are creating innovative sensor products of the highest precision. Partnerships are essential in achieving such levels of excellence. That is why we view our customers as business partners. We want to win – together – with them.

# Position measurement on X-ray machines

Task: Aligning the X-ray tubes to the camera

Solution: Position measurement of all moving components for the synchronised control of the X-ray machine

Sensor: wireSENSOR



Special feature:  
Ultra sharp images via  
perfectly aligned technology



## Projection position - mammography device

Task: Automatically approaching projection  
positions for specific images

Solution: Displacement measurement of the movement,  
in order to use the data in the controller.

Sensor: wireSENSOR

Special feature:  
Support for the assistant in aligning  
the mammography device

## Recumbent position on patient beds

Task: Storing and retrieving recumbent positions

Solution: Integration of sensors into joints for position measurement

Sensor: wireSENSOR



Special feature:  
Due to the measuring wire, the  
sensors can be accommodated  
at any position in the bed



## Position of the surgical microscope

- Task: Absolute movement correction of a surgical microscope
- Solution: Integration of high-resolution capacitive sensors that detect any change in position
- Sensor: capaNCDT capacitive sensors

Special feature:  
High visual stability of images  
during the operation

## Recumbent position during computer tomography

Task: Measurement of the recumbent position for 3D reconstruction of the images

Solution: Integration of high resolution wire sensors in the patient bed

Sensor: wireSENSOR

Special feature:

Any desired 3D section can be created with the volume data set





## Angular position of the assistance robot

Task: Support of operator during minimal invasive procedures

Solution: Automatically moving the endoscope on the assistance robot

Sensor: wireSENSOR

### Special feature:

The sensors are X-ray-neutral and housed below the patient bed

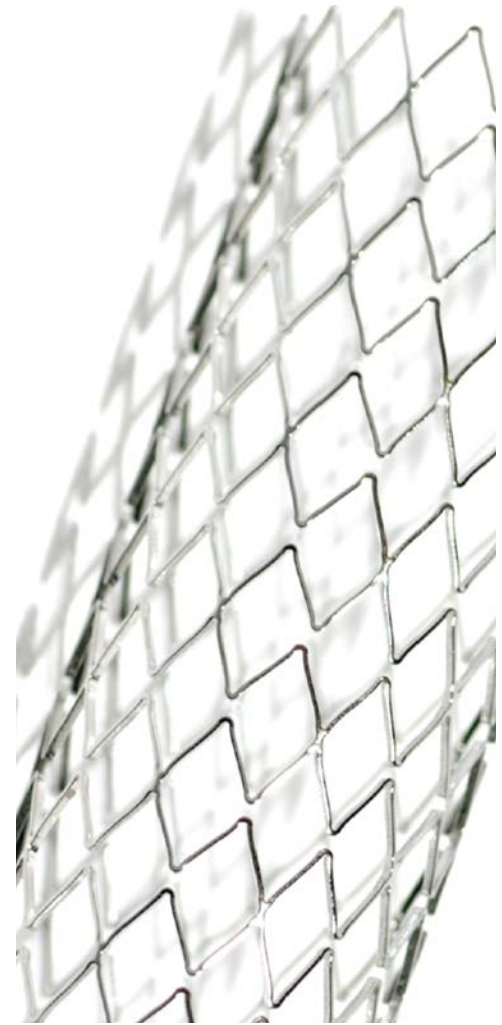


## Recording the diameter of stents

Task: Quality assurance of stents after production

Solution: Random testing of diameter and monitoring the wire of the stents

Sensor: confocalDT confocal sensors



Special feature:  
Exact wire thickness ensures  
the function and quality of  
the stents

## Lattice structure of stents

Task: Internal inspection of the lattice structure of stents

Solution: Checking the structure visually using endoscopes

Sensor: Eltrotec endoscope



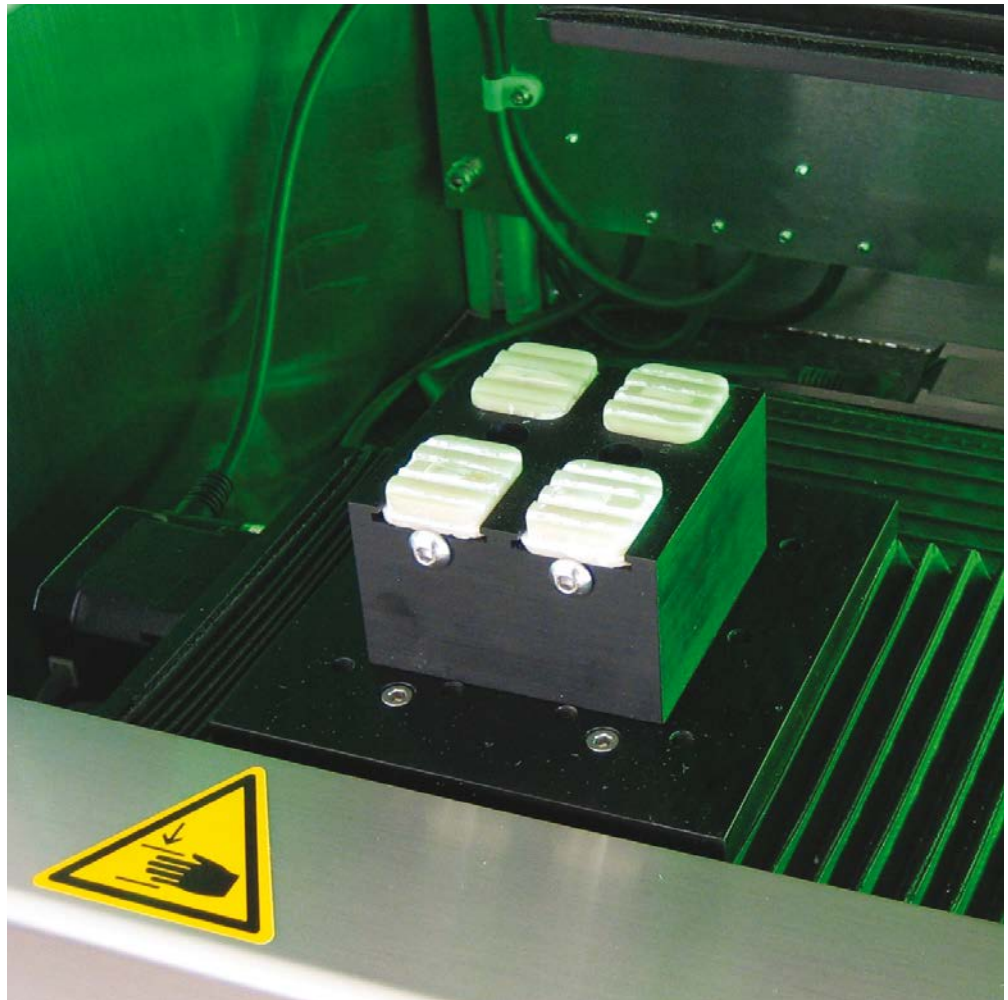
**Special feature:**  
Checking the stents  
for burrs and structural  
distortions

## Measuring dental samples

- Task: Investigation of the occlusal (contact with an opposing tooth) surfaces of dental implants and checking for signs of wear
- Solution: High-resolution digitalisation of the implant using a displacement sensor
- Sensor: confocalDT confocal sensor



Special feature:  
Up to four implants  
can be scanned  
at the same time





## Monitoring the quality of arch wire

Task: Monitoring arch wire performance after automatic bending

Solution: Contour test on three axes using micrometers

Sensor: optoCONTROL ODC optical micrometer

Special feature:  
Faster treatment time due to  
perfectly bent arch wires

## Foil temperature on the dental thermoforming unit

Task: Temperature measurement of dental film for thermoforming

Solution: Non-contact temperature measurement of the foil using infrared sensors

Sensor: thermoMETER CS OEM temperature sensor



**Special feature:**  
The miniature sensor hardly affects the design of the device



## Motion measurement in rehab and fitness equipment

Task: Logging the movement of the device

Solution: Position measurement and counting the movements made

Sensor: wireSENSOR



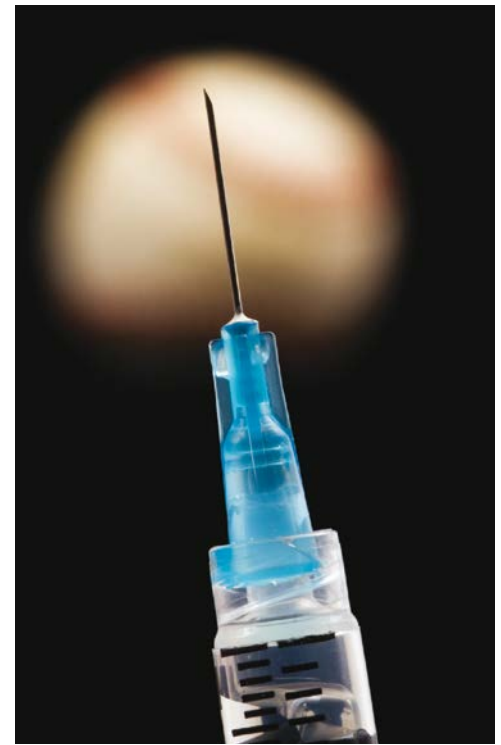
Special feature:  
Optimal training through logging  
of training data

## Inserting needles in cannulas (tubes)

Task: Determining the ideal time for needle adherence

Solution: Temperature monitoring with infrared sensors

Sensor: thermoMETER temperature sensors



Special feature:  
Firm fit of the needle  
in the cannula (tube)



## Colour assignment with cannula holders

Task: Assignment of the cannula holder to the correct cannula diameter

Solution: Colour measurement of the cannula holder during production

Sensor: colorSENSOR colour sensor



Special feature:  
Automatic sorting of parts  
in production

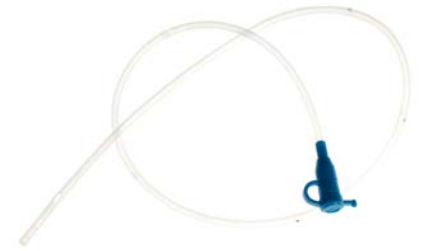


## Detection of hose thickness

Task: High quality due to consistent hose wall thicknesses

Solution: Layer-thickness measurement using a non-contact sensor

Sensor: confocalDT confocal sensor



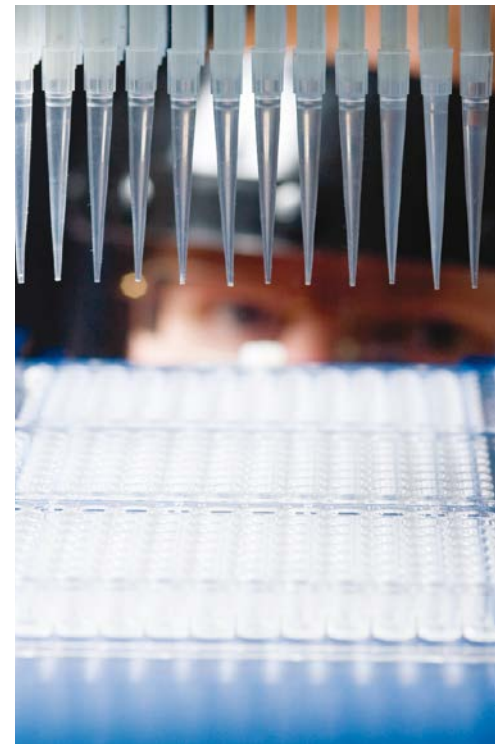
**Special feature:**  
One sensor is sufficient for  
checking multiple layers in  
the hose

## Fill level in a microtitre

Task: Accurate dosing while automatically pipetting microtitres

Solution: Micrometer accuracy filling level measurement using a confocal sensor

Sensor: confocalDT confocal sensor



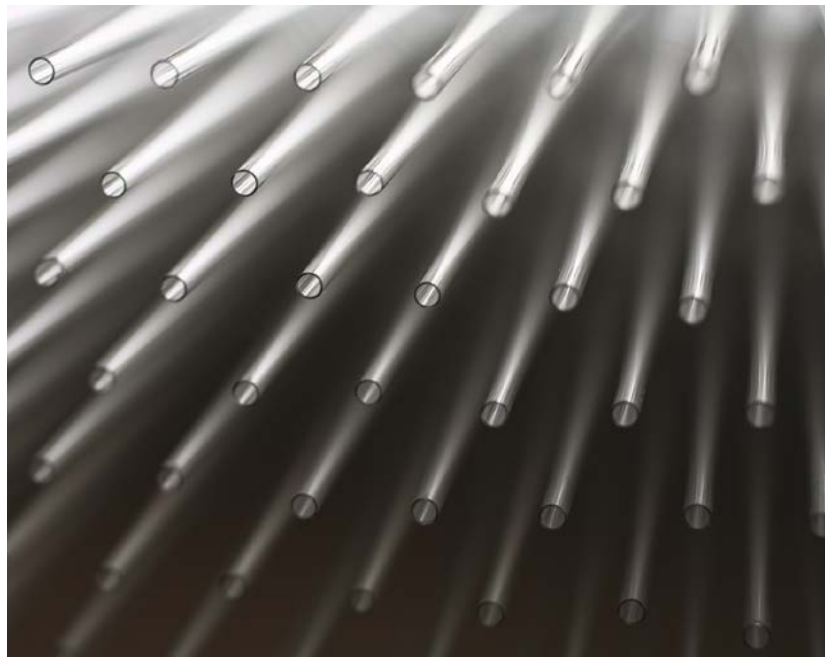
Special feature:  
Measurement of all liquids

## Contour of glass capillaries

Task: Quality assurance of the production of glass capillaries

Solution: Checking the diameter and layer thickness of glass capillaries

Sensor: confocalDT confocal sensor



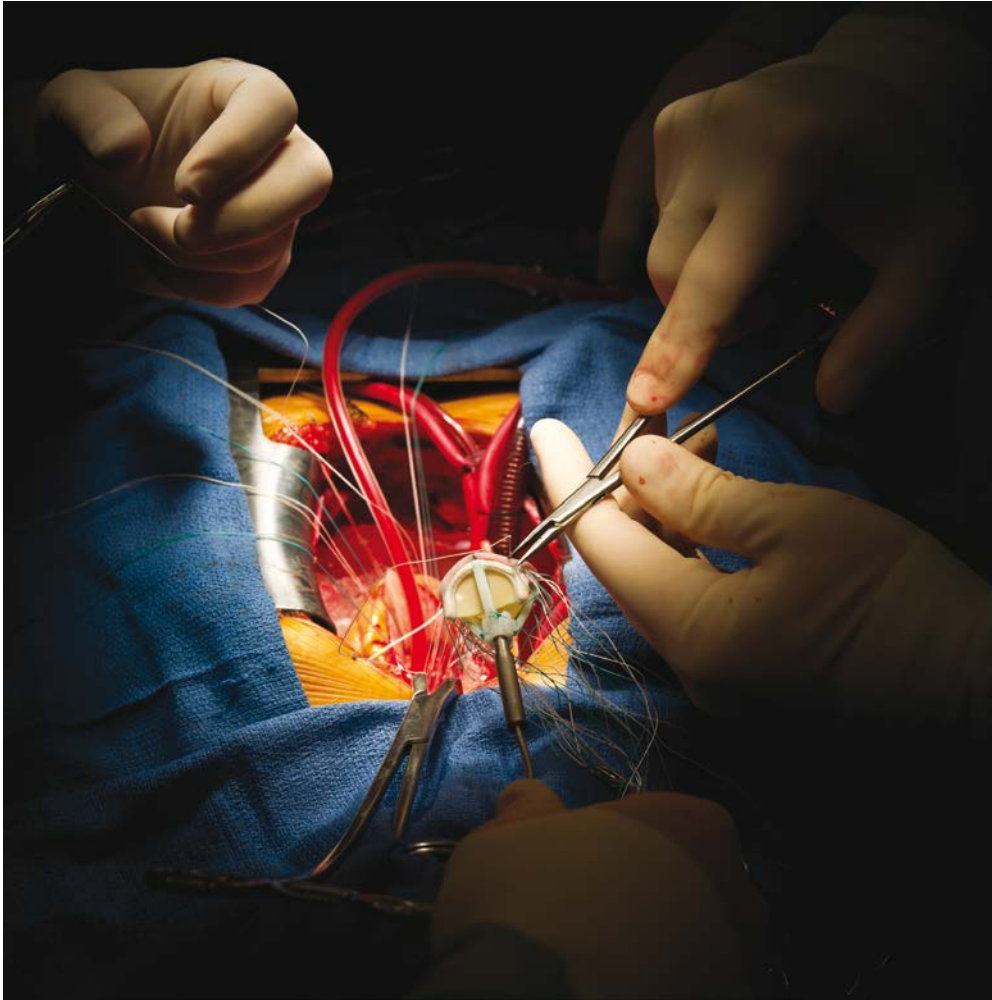
**Special feature:**  
Measuring and classifying several layers using one sensor

## Measuring membrane thickness

Task: Functional assurance of the membrane for ventricular pumps

Solution: Non-contact thickness measurements during production

Sensor: confocalDT confocal sensor



Special feature:  
Consistently high quality and  
service life of the membrane

## Checking the wear of tablet presses

Task: Constantly stamping pressed tablets

Solution: Displacement measurement system integrated in the tablet punch to check the wear of the punch

Sensor: optoNCDT laser sensor

Special feature:  
Accurate determination of the  
system's maintenance intervals  
to minimise costs



## Determining tablet size

Task: Monitoring tablet size during production

Solution: Height measurement and classification of pressed tablets

Sensor: optoCONTROL ODC optical micrometer



Special feature:  
Constant tablet size  
over a long period

## Testing the active ingredients of tablets

Task: Constant distance of the Raman microscope from the tablet  
Solution: Precise surface topography of the tablet using a confocal sensor  
Sensor: confocalDT confocal sensor



Special feature:  
Due to the high resolution, the distance from the microscope to the tablet is kept exactly constant





## Foreign bodies in the tablet packaging process

**Task:** Recognising foreign bodies between the individual layers of the blister packs

**Solution:** Recognising tablet parts and foreign objects, ejecting defective blister packs

**Sensor:** mainSENSOR magneto-inductive sensor

**Special feature:**  
Foreign bodies are detected indirectly via a lever



## Recognising the tablet colour

Task: Putting the correct tablets in the correct packs

Solution: Checking the colour of the tablets before packaging

Sensor: colorSENSOR colour sensor

Special feature:

„Duds“ are found and can be rejected



## Temperature measurement of batteries

Task: Monitoring the temperature of high-performance batteries

Solution: Non-contact temperature sensor for monitoring the assembly of the battery

Sensor: thermoMETER temperature sensor

**Special feature:**

**No defective batteries are manufactured or delivered**



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