



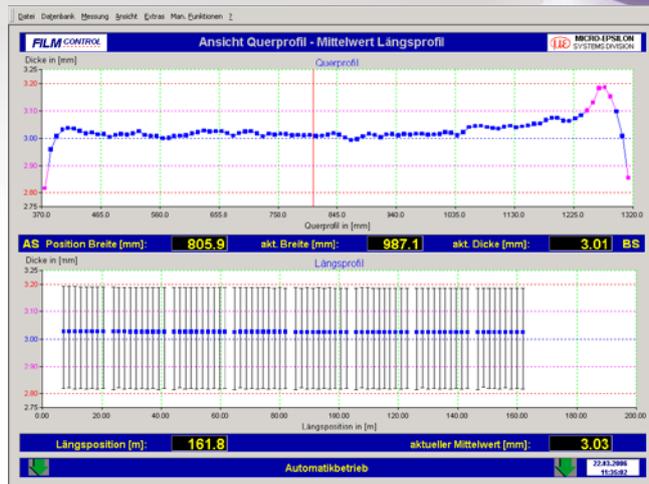
MICRO-EPSILON

Systems for flat films



Thickness measurement of flat films

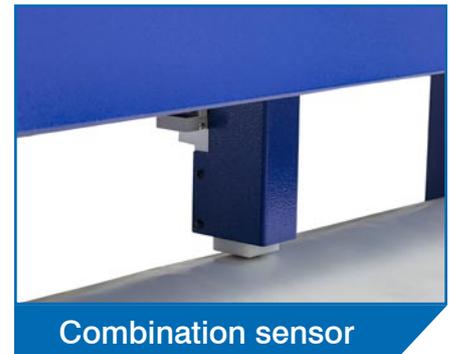
LOW-BUDGET SYSTEM



Recording the thickness profile when manufacturing plastic film is a measurement task that not only provides data for quality assurance, but which can also be used directly in the manufacturing process as it provides data for the regulation of the extrusion and calendering procedures. The measurement technologies available at Micro-Epsilon are based on a combination of a variety of displacement measurement principles, offering ideal solutions in very different situations. All the processes are characterised by high dynamics and spatial resolution. Micro-Epsilon's measurement systems provide a better environmental balance and much lower process costs than radiation measurement procedures with isotopes or X-rays.



System for flat films



Combination sensor

Micro-Epsilon measurement systems use a variety of different technologies for gauging the thickness of extruded or calendered plastic films. They are based on the combination sensor principle (combiSENSOR). Here, two sensors employing different measuring principles are combined and their specific advantages utilised.

In its sensor housing this sensor combines an eddy-current and a capacitive sensor, therefore they have the same point of view. Arithmetical coupling of both sensor signals provide compensation of mechanical changes, e.g. thermal expansion, deflections, eccentricity in the measurement roll.

Both sensors measure the distance to the metallic reference roller. The plastic film influence the capacitive sensor via an ϵ_r different to air. With the information of measuring gap and material specific ϵ_r , the measuring system calculates the target thickness precisely.

The measurement systems are suitable for films between 0.02mm and 2mm thickness and are provided as traversing units. The basis of the system, conceived as an O-frame, allows simple assembly on roller conveyors. The measured thickness profile can be divided into individual regions with the aid of analytical software, and so the data can be ideally integrated into the regulation of the extrusion dies or calender rollers. The complete electronics systems including the industrial PC is integrated within the frame, so that no additional control cabinet needs to be installed.

Technical Data

Target thickness	0.02mm to 2mm
Target width	1000mm standard 1600mm max
Material feed	150m/min
Linearity	$\leq 5\mu\text{m}$
Resolution	$\leq 1.5\mu\text{m}$

System advantages

- Non-contact and dynamic measurement with high accuracy and spatial resolution
- High product quality through in-line thickness measurement
- Easy to adapt to existing production lines
- Without radiation measuring technology

Possible film types

- Homogeneous, singlelayer films
- Multi-layer (co-extruded) films

Sensors and measuring systems from Micro-Epsilon



Sensors and systems for displacement, position and dimension

- Eddy current displacement sensors
- Optical and laser sensors
- Capacitive sensors
- Linear inductive sensors
- Draw wire displacement sensors
- Laser micrometer
- 2D/3D profile sensors (laser scanner)
- Image processing



Sensors and systems for non-contact temperature measurement

- IR handheld
- Stationary IR sensors



Turn key systems for quality inspection

- of plastics and film
- of tires and rubber
- of endless band material
- of automotive components
- of glass