



Inspection of polycarbonate sheets

In the plastics industry, polycarbonate sheets of different thickness, transparency, coloring and surface finish are produced. In an extrusion process, a thermoplastic granulate is pressed into long thin strands and then cooled. If required, the endless belt is then cut to size. Since the sheets produced have different properties depending on the composition of the granulate, the distribution of the color intensity is continuously checked in an automated process.

colorSENSOR CFO200 sensors combined with the CFS3-A20 transmission sensor from Micro-Epsilon are used for this quality inspection. The measurement on the sheets takes place directly after cooling in the production line. The distance between the transmitter and the receiver units is 80 mm. During the production process, the intensity distribution and the color differences are precisely detected. If the color of a plastic sheet deviates from the setpoint, the controller transmits the signal to the plant control system via Modbus TCP.

Using the web-based parameterization implemented in the controller, overlapping values caused by ambient light or different plate thicknesses can be avoided. This ensures precision throughout. For this measurement task, the transmission sensor can be placed freely above the measuring object. The integrated multi-teach function increases accuracy and process reliability.

The high color accuracy and repeatability of Micro-Epsilon color sensors, even on smooth and reflective surfaces, makes them suitable for a wide range of applications that require accurate color measurement. Fast inline measurement allows immediate parameter adjustment, reducing waste and costs.

Requirements for the measurement system

- Measuring rate: 1000 Hz
- Color distance: $\Delta E \leq 1.5$
- Measurement of different sheet thicknesses
- Measurement on smooth or reflective surfaces

Ambient conditions

- Dust and dirt
- Stray light from production and ceiling illumination
- Room temperature: 20 - 23 °C
- Vibrations of the conveyor belt

System design

- Controller: colorSENSOR CFO200
- Transmission sensor: CFS3-A20
- Mounting adapter, DIN rail

Advantages

- Multi-teach function and color grouping
- Automation of the test process on the production line
- High color accuracy and repeatability
- Simple integration of the system solution
- Free placement of the transmission sensor above the measuring object
- Visualization of the lab values at the facility via Micro-Epsilon sensorTOOL
- The integrated evaluation unit enables an immediate automated output of the visible OK/NOK result via the switching outputs