3D Mould break check

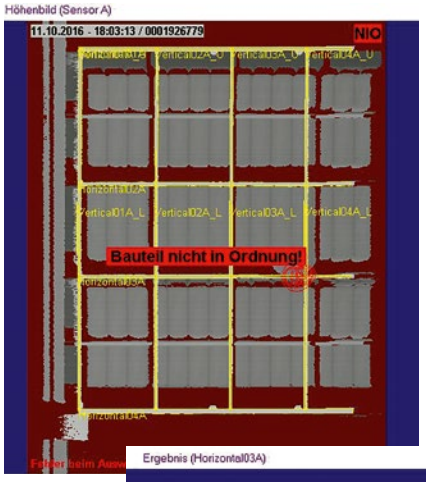
In sweets production, moulds of thermoplastic polymers are subjected to systematic wear and tear. Strong mechanical and thermal stresses lead to the moulds becoming brittle whereby parts can deform and break away. For inline recognition of break-away pieces from the ridges on the backside, and thus removing defective moulds directly from the process, Bi-Ber offers reliable 3D vision systems.

High scanning speed

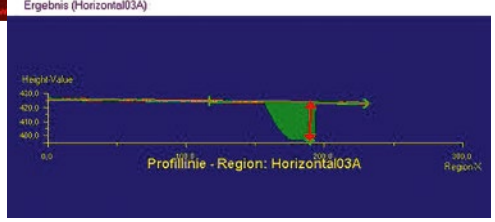
At a maximum resolution of 200 µm, mould speeds of up to 800 mm/s are possible in production. Even higher speeds are possible at lower resolutions.

How it works: Triangulation process

The system uses the triangulation method and consists of a stainless steel housing with up to three 3D sensors, an encoder for detecting the mould transport speed, a photoelectric barrier as trigger and a Panel PC with installed software for evaluation and documentation. Each sensor has a recording width of 560 mm and views the mould at an angle of 28°. The sensors calculate the height data of a profile line from the position of the laser line. The sequenced profile lines produce a 3D profile that is checked for flaking and deformations.



Sensor height image



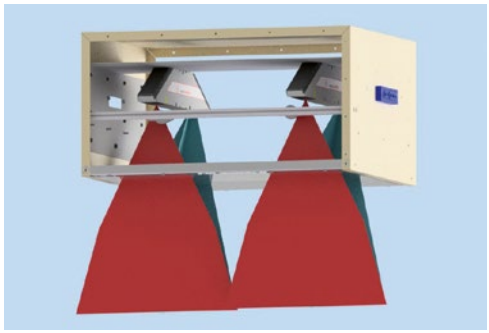
NOK (Not OK) profile line

Flexibly adaptable – System variants

The system can be freely dimensioned and be geometrically adapted individually to the respective plant. Various systems with 1, 2 or 3 sensors are available:

- examination of moulds in longitudinal or transverse transport
- monitoring widths up to 1500 mm
- optional integration of RFID readers for mould ID

All straight-line ridges are testable, curves are approximated by straight-line segments. The software can handle various mould colours, automatic type changes are possible too.



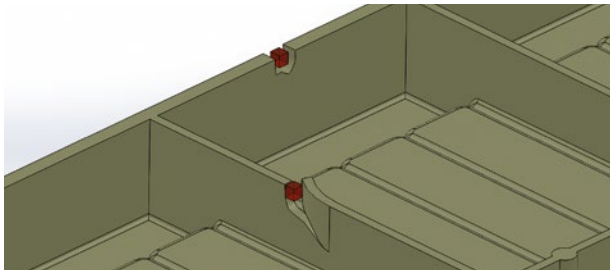
Model of a 2-sensor system

Suitable for BPA-free plastic moulds

The solution has already been successfully tested with BPA-free moulds. Therefore, the systems offer a high level of investment security even beyond 2027.

Checking accuracy under production conditions

In laboratory tests with perfect mould transport conditions, a clearly recognisable defect in the size of a cube with 2 mm edge length has been detected. Various factors under real production conditions (rolling, vibration, sliding, pollution of moulds, etc.) lead to reliably detectable defects in the size of a cube with 3 mm edge length. Real defects are usually significantly larger.



Schematic representation of the defect types: flaking (rear), deformation (front)

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