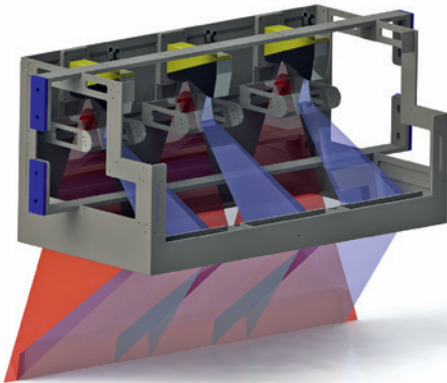# 3D Mould break check

During production, chocolate moulds 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. To recognise break-away pieces from the ridges on the backside, and thus providing automatic inline monitoring of mould wear, Bi-Ber has developed a reliable 3D camera system.
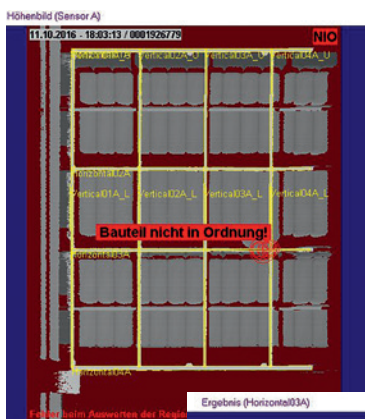

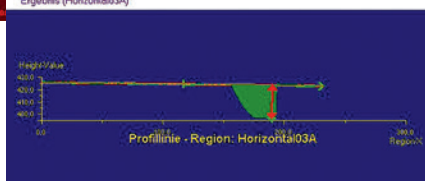*3D model of a 3-sensor system*

How it works: Triangulation process

The system uses the triangulation method and consists of a sensor box with up to three Cognex 3D cameras DS1300R, a rotary encoder for detecting the mould travel speed, a photoelectric barrier as trigger and a Panel PC with installed software for evaluation and documentation. Each camera has a recording width of 340 mm and views the mould at an angle of 45°. The cameras observe the deformation of a laser line, which beams perpendicular onto the mould moving underneath. The sequenced profile lines produce a 3D profile that can be checked for chipping or 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 system with 1, 2 or 3 sensors are available:

• examination of moulds in longitudinal or transverse travel
• monitoring widths up to 900 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.
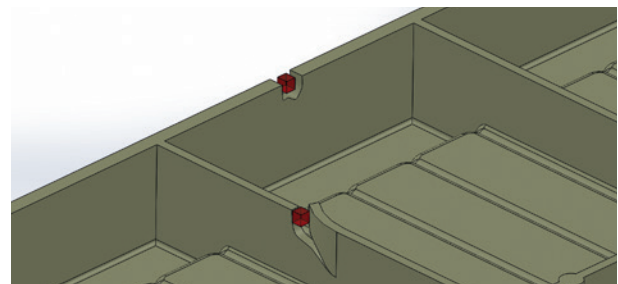

Interior view of a camera housing with 2 sensors

Checking accuracy under production conditions

There are basically two types of defects on the moulds: Flaking – material is missing along a ridge. Deformation – the material is still present, this is a precursor of flaking. Both types of defects are detected by the system.

In laboratory tests with perfect mould travel 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 for both defect types.

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