Reference name: Camera quality control of roof tiles

Supplier: ELVAC a.s.
Customer: KM BETA a.s.

We developed the camera-based quality control system for roof tiles in cooperation with KM BETA a.s., for which it is intended. It achieves a reliability of 95 %.

Roof tile inspection includes:

- verification of correct width,
- deformation detection,
- surface coating inspection.

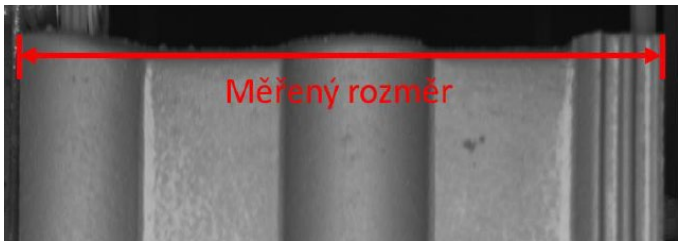
Application description:

The subject of inspection is a roof tile moving on a conveyor belt at a speed of approximately 1 m/s. If a defective piece is detected, it is discarded.

The system consists of 6 cameras located in an inspection cell through which the conveyor belt passes. The key element for reliable defect detection is **ELVAC Vision**. This is software that enables optical inspection and image analysis using neural networks and conventional machine vision methods.

Verifying the correct tile width:

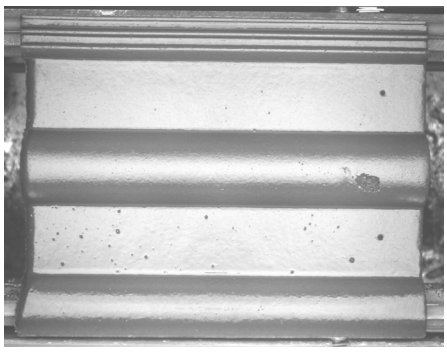
The task is performed by 2 high-resolution cameras. A roof tile is OK if its width meets the range of 330 to 333 mm. The measurement accuracy is +/- 1 mm, but if necessary, the tolerance limits can be adjusted in the user interface.



Tile deformation detection:

Three high-resolution cameras are used to detect roof tile deformations. The front and side surfaces are evaluated to determine whether the tile meets/does not meet the required surface integrity. On the top surface, specific deformations are detected and classified into the following categories:

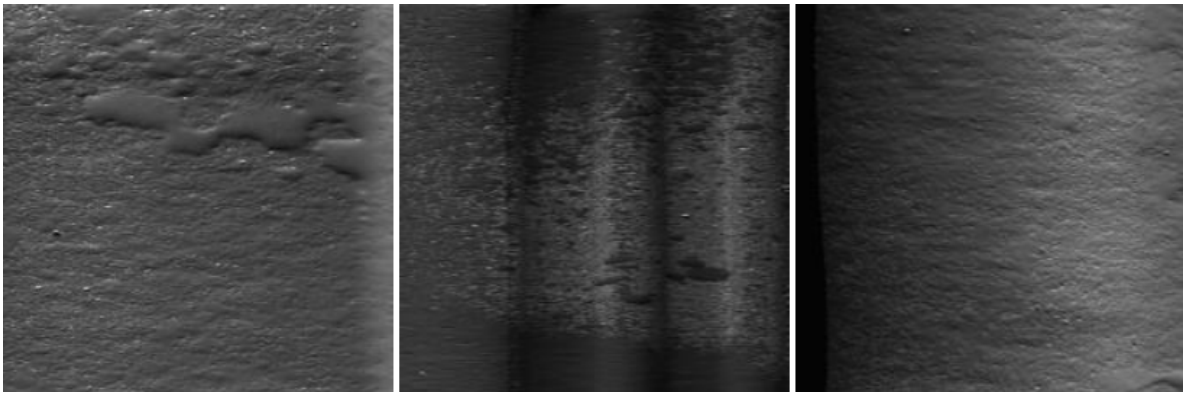
- Undercut or sticker
- Hole
- Break
- Abrasion
- Top edge
- General defect
- Straight and round cut
- Back and front corners
- Muzzle imprint
- Helmet eye



Inspection of the surface coating of the tile:

The spray inspection is carried out by 1 high-resolution camera. The tiles can be in 11 different colors and each time in a matte, glossy or matte finish. This makes a total of 33 different surface finishes.

It is checked whether the entire tile is covered with paint without color differences that arise due to malfunction of the application nozzles. A defect is signaled if several tiles in a row are defective. The specific number of tiles can be determined in the user interface.



Customer benefits:

The main benefit is the increased quality control of manufactured roof tiles.

Other benefits include the ELVAC Vision user interface, which allows:

- visualize detected defects,
- display production statistics,
- set inspection parameters,
- increase inspection reliability by training neural networks.

Výstupní stanice - Kontrola deformací střešních tašek
KMBeta
VisnovaMatna
Výsledky inspekce - kompletní
Výrobek: VisnovaMatna
Výsledek: OK
Pozice v sekvenci: 3/3
Průměrná šířka tašky: 332.29 mm
Znečištění K1: 4.83 %
Znečištění K2: 2.91 %
Znečištění: NOK
Živý náhled vyhodnocení inspekcí
ElvacVision
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