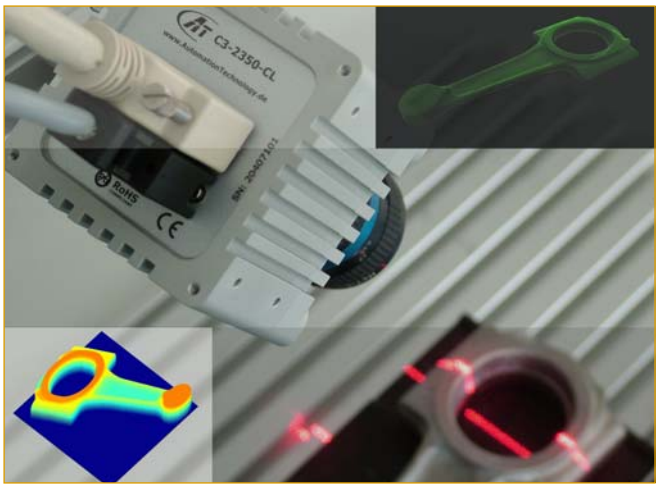
► Software for demanding 3D surface inspection

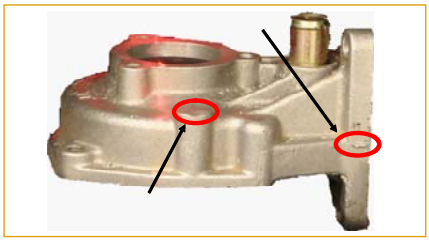
As the demand for the finest quality continues to grow, challenging imaging applications require extremely accurate high-speed inspection throughout the production process. One of the most demanding imaging applications is the inspection and measurement of complex freeform objects where completeness and dimensional accuracy have to be checked in real 3D.

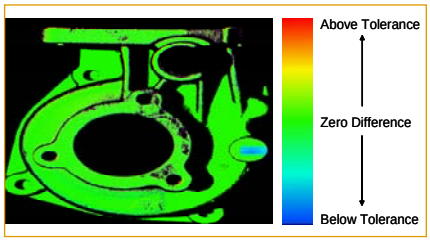


Popular approaches use established technologies based on the laser scanning triangulation method, where a laser beam is directed via a line lens onto the surface of the object to be measured. The hardware is aligned so that there is a triangulation angle between the camera and the laser line. Depth information is obtained by detecting displacements on the light strip image, due to a change of height of the object. However, this approach provides only so called 2.5D height images.

Instead CVB Match 3D offers a new practical approach for 3D imaging, providing highest accuracy and a processing speed fast enough to keep track with modern production lines. The 3D image of a perfect sample (golden template) is compared to the 3D images of upcoming test parts in the production line, complete with full alignment of the two images. Part deviations can be identified in realtime, allowing pass/fail decisions to be made.

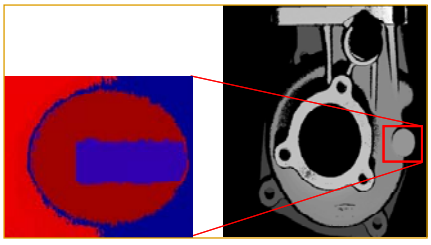
Challenging flaw detection

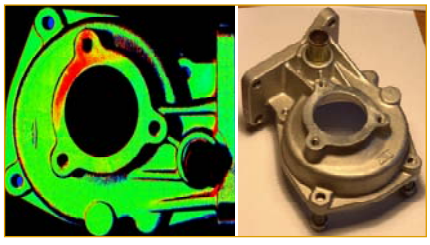




Difference image of test part from a perfect sample image shows deviations clearly

A triangulation acquisition device is able to sense this defect





Detect shape deviations

► CVB Match 3D

► Fast and extremely accurate 3D inspection

CVB Match 3D is a real industrial product that integrates easily into existing machine vision environments. The algorithm works internally on real 3D point clouds and automatically adjusts position errors or tipping and tilts in all 6 axes. Hence there is no need for a highly accurate part positioning and handling as CVB Match 3D aligns the part image in 3D before comparison. This approach results in a reduced mechanical effort and assures high inspection throughput for 100% inline control.

CVB Match 3D is extremely flexible and also allows for the inspection of different parts at the same time. Multiple models can be preloaded so that different types of parts on a single conveyor may easily be inspected. Thanks to this approach quick product changes are possible and no special calibration is required. The scanned clouds of points are arranged in a sequence and will be aligned and compared in a pipeline in appropriate speed for inline inspection. Complex, mechanical equipment is no longer necessary, as the alignment is done in software.

The easy to use programming interface includes comprehensive documentation, source code examples and open GL visualization as well as sample 3D scans.

► Surface inspection with CVB Match 3D

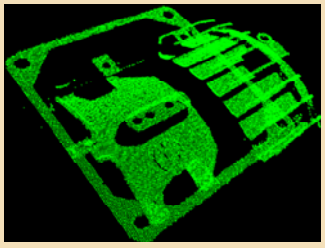


Figure 1:
The 3D representation of a perfectly manufactured part used as a MODEL

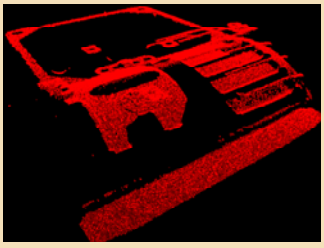


Figure 2:
3D representation of one produced part. This part is to be compared with the stored ideal MODEL

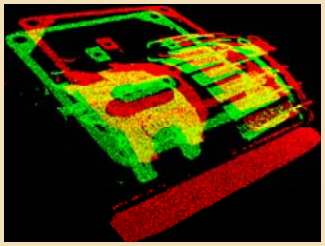


Figure 3:
Combination of both 3D representations before alignment

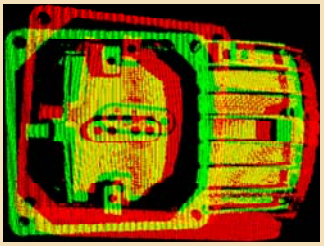


Figure 4:
Combination of both 3D representations before alignment.

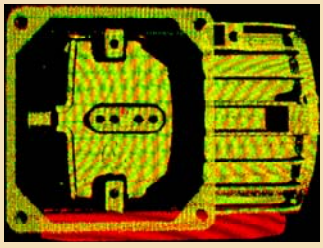


Figure 5:
Combination of both 3D representations after alignment.

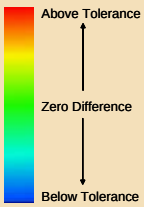
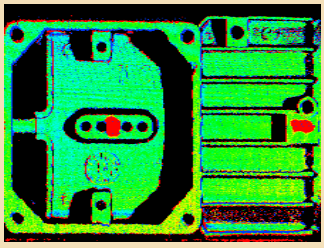


Figure 6:
After alignment CVB Match 3D shows the differences



► All components for demanding 3D inspection from a single source

Please contact us also for cameras for fast three dimensional measurements, lasers, optics, framegrabbers, mounting brackets, cables etc. Of course we also offer consulting services and feasibility studies to make your 3D application a success.

CVB Match 3D is the first released tool of a comprehensive 3D suite for Common Vision Blox. Further tools are already under development and will be released soon.

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