

Completely automatic 3D repair welding

When it comes to large, high capital cost machines such as a soft coal excavator, it is more economical to repair any worn parts than to replace the worn components with brand new ones. A chain link on an excavator is a good example here. After approximately four years of harsh, continuous operation, these steel parts are worn so much that several centimetres of steel are missing in the affected areas.

Previously, in order to repair these worn areas, the eroded material was welded on again manually, which took several hours. The welder has to manually weld on several parallel webs in order to restore the chain link to its original form.

As soon as this is done, he checks the shape conformance using templates and a calliper gauge.

Mabotic has developed a completely automatic method for RWE to automate this repair process.

In the first stage, the surface of the defective area is scanned with a scanCONTROL 2700 – 100. For this, the scanCONTROL is moved over the surface by a robot. The 3D data of the worn area together with the position data of the robot are obtained. The outstanding quality of the sensor data on different types of surfaces means that surface pre-treatment is not required.

In a second stage, 64,000 measuring points per second are obtained in the CAD target model of the chain link. Therefore, the difference in volume between the high resolution measured values and the target contour is obtained.



In the next stage, the optimum welding lines for welding the eroded material in this differential volume are calculated.

This entire process is completed in less than 3 minutes. Finally, the calculated welding lines are transmitted to the robot controller and the welding process can start.

Mabotic is also applying the system to other applications, partly due to the flexibility of the scanCONTROL range, which provides measuring ranges from 10 to 100mm with measuring point rates of 64,000 to 256,000.



scanCONTROL data (yellow), calculated welding lines (green)