

Steel quality optimized 3-D technology

October 28 2013

An innovative method for the quality inspection of hot surfaces is used on an industrial level for the first time: A major Turkish steel producer is optimizing the production of high speed-compatible rails with the method that has been developed in Austria. The method is based on laser light section technology, which facilitates the non-contact examination of surfaces that are still hot. Hence defects in the surface structure can be detected at an early point of time in the production process. The technology works in real time and delivers a whole range of advantages: cost reduction, rationalization, quality improvement as well as improved work safety and clear-cut documentation. The DIRIS 3D HOT method was developed by the Austrian company NextSense and is sold worldwide.

Mistakes occur. Even in steel production. Defects on the surface are especially exasperating: Trained personnel can easily detect them - but only once the just-rolled workpiece has cooled off. So by the time the product is accessible to visual inspection, many more pieces with the same defect might have been produced. An innovative method of NextSense GmbH in Graz, Austria, puts an end to that - and is now being deployed on an industrial level for the first time by a major Turkish steel producer.

Looking at it on the surface

The new method is based on the so-called laser light section technology, a method of optical 3-D measurement technology that allows for the calculation of a precise height profile. To take the measurement, a laser

line is projected on a mobile object. Shifts of the laser line caused by changes in the [surface structure](#) are registered by several cameras and converted by means of photometric calculations in 3-D coordinates. Once the object has been completely guided along under the laser line, you get a complete height profile of the object. Christoph Böhm, Marketing Manager of NextSense, explains: "Our DIRIS 3D HOT method works on a completely non-contact and automated basis. The customer gets 3-D data in real time, including the spatial depth of production errors as well as a complete documentation." Hence the method can be applied to surfaces that are still hot, such as those you have in steel production immediately after the rolling. This entails a whole range of advantages for the user of the DIRIS 3D HOT method. Defects are detected very early in the [production process](#), and once the cause has been eliminated, the production of large amounts of rejects can be prevented. In addition, the automated defect detection facilitates the classification of defects or other surface structures: chips, roll-ons, reefs or scales are detected as reliably as stamps and rolling marks. The performance of the method is immensely impressive: recesses of a depth of merely a few tenths of a mm are detected - and classified.

The automation of the surface inspection also improves work safety when dealing with hot steel products of over 1,000 degrees Celsius, because cameras withstand the heat, not employees. Naturally, another great advantage is the complete documentation of the measurement results: objective 3-D data in color diagrams replace subjective assessments made by employees.

Diris 3d hot on the rail

The many advantages have now convinced a leading steel producer in Turkey. Upon exhaustive examination of the method, the company decided to order a SURFILES DIRIS 3D HOT facility for the production of faultless rails. Especially when it comes to train rails, the

quality requirements have been rising enormously due to the fact that more high-speed lines are being upgraded. Competitive production and the delivery of huge order volumes in some cases can be guaranteed only with highly efficient production methods. The deal that has now been struck adds a success benchmark for the newly established "Surface Inspection & Profile Measurement Systems" (short: "SURFILES") division of NextSense. Alongside the rapidly growing segment of portable profile measurement devices, "CALIPRI", this multi-million contract has contributed decisively to the fact that the company has exceeded its mid-term company goal, namely the double-digit million turnover limit.

Provided by PR&D Austria

Citation: Steel quality optimized 3-D technology (2013, October 28) retrieved 23 April 2024 from <https://phys.org/news/2013-10-steel-quality-optimized-d-technology.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.