SmartRay

APPLICATION NOTE

FORGING INSPECTION APPLICATION

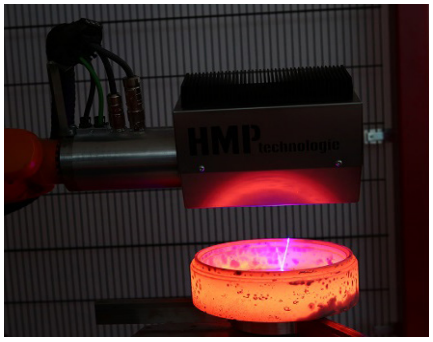
BACKGROUND

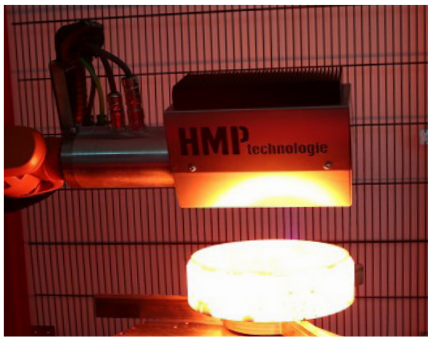
Many customers, across a range of industries – including forging, heavy and automotive – have a need to inspect red-hot, high-temperature metal pieces in the production area.

When workpieces are manufactured at very high temperatures – for example during casting or forging – it is almost impossible to achieve real-time quality control of dimensional accuracy and surface quality.

This means that production mistakes are often recognised hours or even days after production, when they have returned to room temperature. These defects are often no longer correctable at this point, so the workpiece has to be declared as scrap.

Not only does this mean that the energy used to manufacture the scrap workpiece has been wasted, but the time-intensive process must be repeated if the piece is to be melted and reforged. This significantly delays production, and reduces efficiency.





THE CHALLENGE

Could modern, contactless 3D laser technology be used to provide production-integrated measurement of high-temperature workpieces?

SmartRay authorised-partner system integrator, HMP Technologie GmbH, a leader in industrial, laser-based 3D inspection systems, based in Halsenbach, Germany, was chosen to find an innovative solution.

The development goals for this project included being able to measure a wide range of workpieces, at temperatures up to 1000°C, using a standard installation that can be employed directly in a harsh manufacturing environment.

Measurement times from 5 to 30 seconds were required, and the solution had to be simple to operate and rapidly adaptable to new workpieces, delivering precise measurements for a very low cost of retrofitting.

THE SOLUTION

Utilising more than 15 years of 3D Vision experience, SmartRay and HMP produced the Theta 3D orbital measurement facility.

Designed for customers in the forging industry, it is a roll-ring testing station that uses a robotically directed test probe to measure workpieces with a range of diameters at temperatures up to 1000°C.

It uses SmartRay's SR9600 sensor with a blue laser, which was selected since a red laser cannot be seen on red glowing metal.

Depending upon the inspection criteria, test times for this sensor are between 15 and 45 seconds, which allows between 40 and 80 workpieces to be inspected per hour.

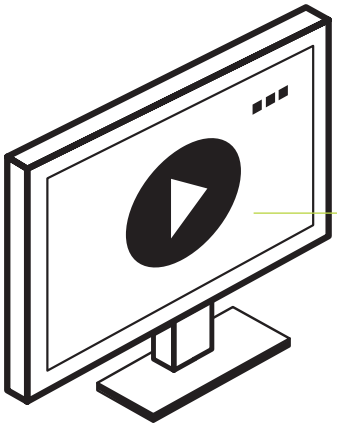
There is a comprehensive library of inspection criteria, including outer and inner diameters, circularity, out-of-roundness, heights, surface defects, and flash defects. To facilitate this, SmartRay ensured the sensor was fully compatible with third-party software from Vision Tools, delivering a complete inspection solution.

THETA 3D-ORBITAL MEASUREMENT FACILITY

THE **RESULT**

The final product, developed by combining the expertise of SmartRay and HMP and compatible with third party software, delivers a patented, unique solution for automated inspection of hot metal pieces.

The Theta 3D orbital measurement facility can be used by a range of industries to save time and money in their inspection processes, while protecting the environment by reducing waste energy use.



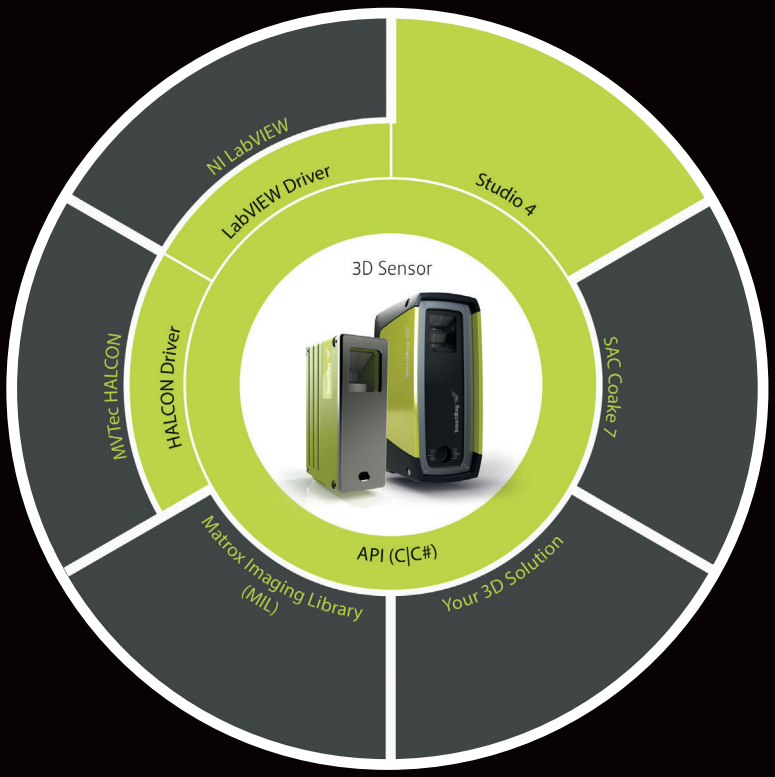
See the **Theta-600** in action by watching this 45 second video: **https://vimeo.com/340316592**

FUTURE-PROOF **SOLUTIONS**

The **SmartRay sensors** are used for forging inspection to solve a multitude of inspection tasks requiring micrometre-level precision.

Integration of the sensors is made easier by the **SmartRay DevKit 5.4**, which supports a range of third-party vision libraries. Combining full HD image processing, scanning and evaluation speeds up to 10 kHz, and high-speed Gigabit Ethernet interface for real-time data transmission, the ECCO 3D laser sensors provide the comprehensive features required for highly future-proof inspection solutions.

SDK
SmartRayDevKit



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