



ROMER

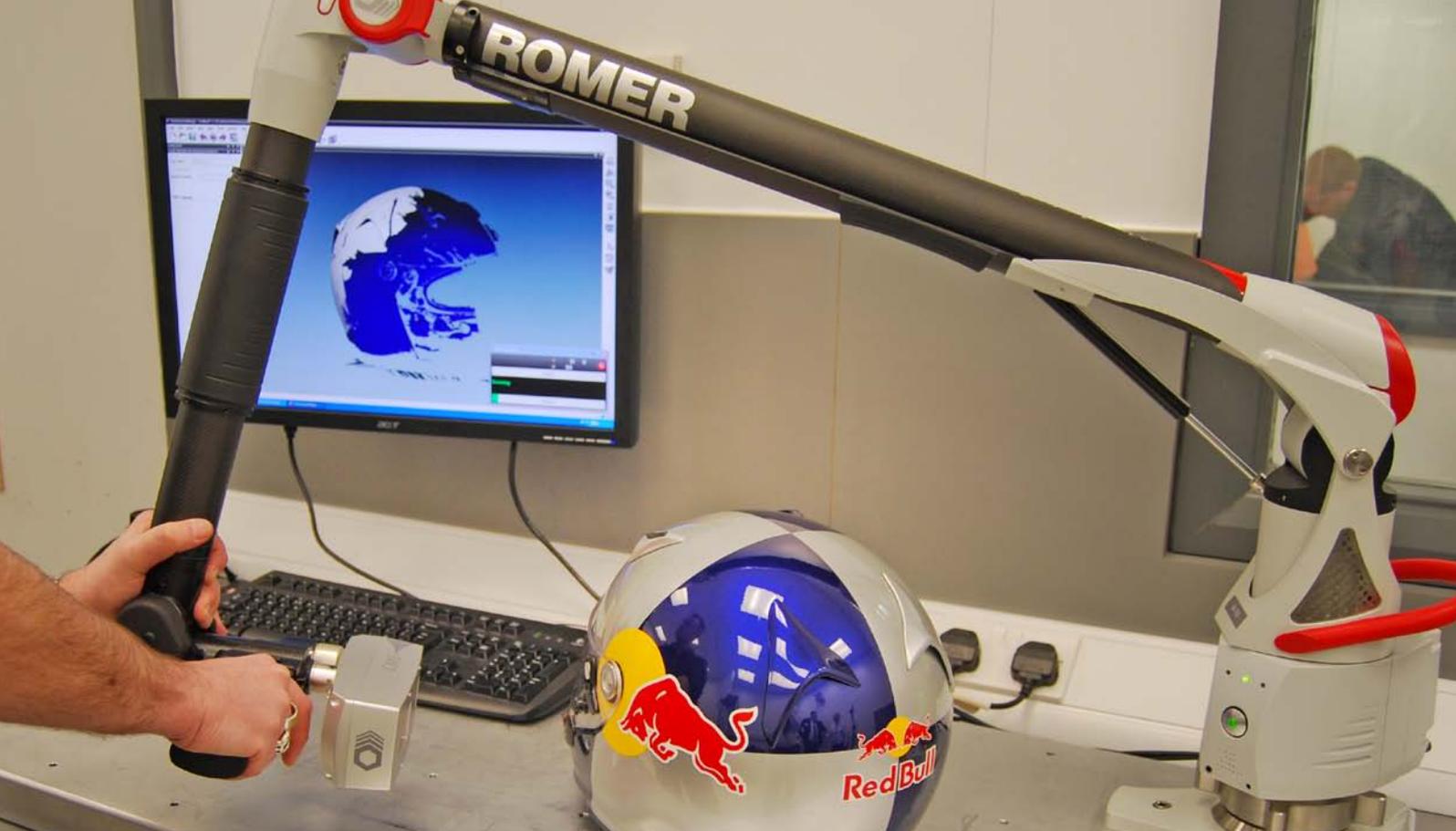
Case study Red Bull Technology
The portable measurement secrets
to maintaining pole position

Metrology to go.



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 **HEXAGON**
METROLOGY



The right scanner for the job: The CMS 108 automatically adjusts sensitivity to the surface being scanned and does not deform flexible parts of the helmet like the visor and padding

The variety of components that Red Bull Technology need to measure is vast. At their factory in Milton Keynes, UK, the workflow is governed by time management, this defines that the Inspection Department needs to be accurate, flexible and most importantly – fast! There are no second chances in an Formula 1 race hence Red Bull Technology are using ROMER Absolute Arms and CMS laser scanners from Hexagon Metrology to keep the Red Bull Racing cars in pole position.

Every small improvement made to the car has the potential to contribute to the speed and ultimately the gaining of championship points. Time constraints in the past had meant compromising which components were and were not measured, potentially leading to issues throughout the racing season. Now with three portable measuring arms amongst their arsenal of metrology equipment, Red Bull Technology has the time to concentrate on every last micron to ensure the car is kept ahead of the pack.

The ROMER Absolute Arms are used with two different types of software for 3D scanning and point-to-point measurement, the same software is used on the other metrology systems across the factory including Leica Laser Trackers. All the systems are 7 Axes arms with a TESA Kinematic Joint which allows the connection of a Hexagon Metrology CMS 108 laser scanner.

Measurement is part of the day to day production process inside the Red Bull Technology's plant; the arms are based within the composite production area and are continuously used to check mouldings and finished components. "The thing that we are trying to do is improve our production flow and make sure that we are checking components as accurately as possible". States Chris Charnley, Quality Manager, Red Bull Technology.

The portability of a ROMER arm lends itself to the vast manufacturing facility at Red Bull Technology, wherever a measurement may be needed, for example a chassis on a machining jig, the arm is easily moved to the location required, saving time in the process.

Rapid prototyping equals a faster car

The rapid development nature of F1 depends heavily on the ability to gather 3D point data quickly and effectively. To achieve this within the required time

constraints Red Bull Technology are using a Hexagon Metrology CMS 108 laser line scanner which when coupled with any of their arms provides the latest in 3D scanning technology. The CMS 108 has automatic laser power control which automatically adapts laser sensitivity to match the surface conditions being scanned.

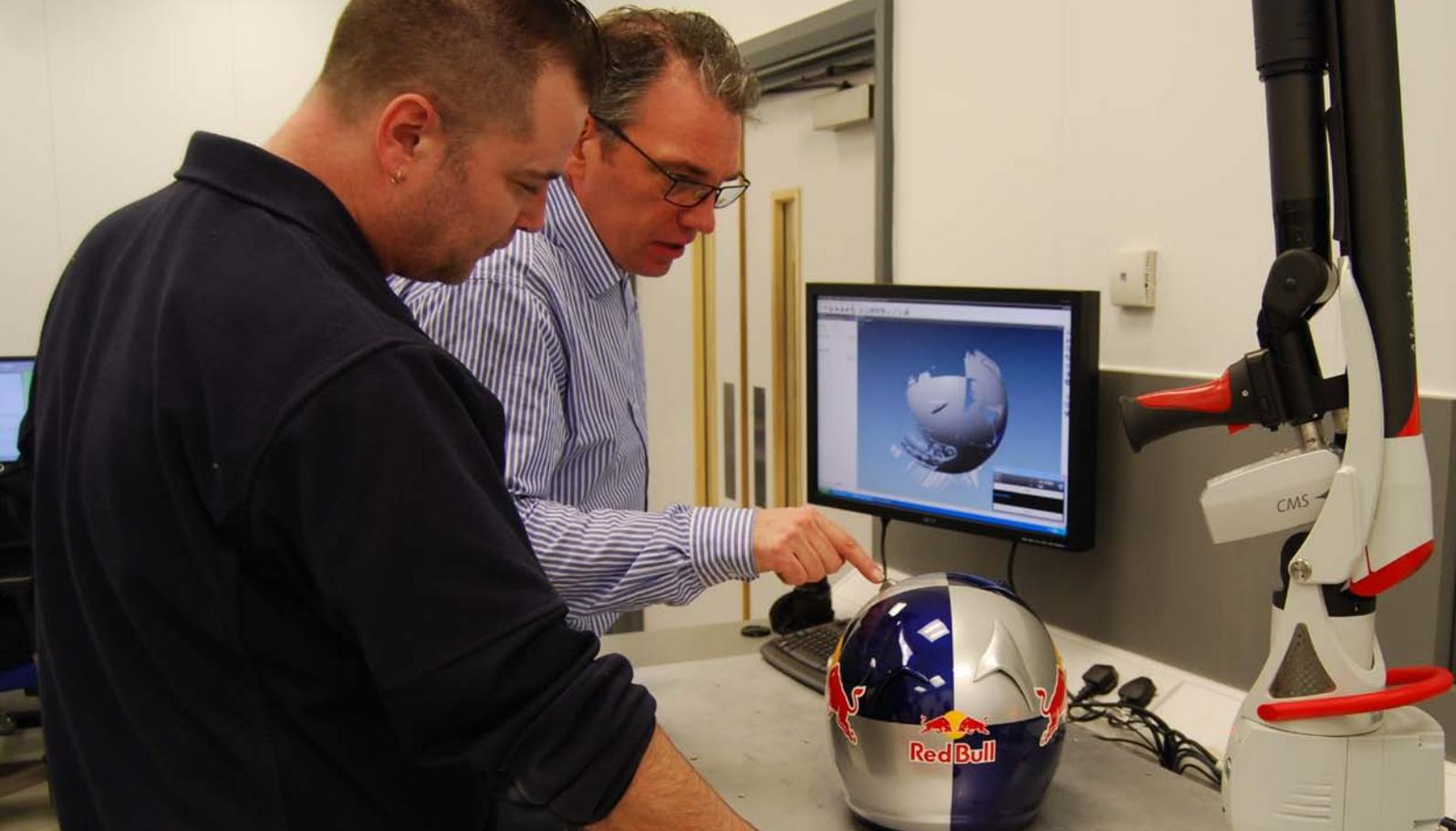
The company had been looking for a 3D scanner for a number of years, but it wasn't until they witnessed the capabilities of the new CMS 108 that a purchase was made. Chris describes why the CMS 108 was the right scanner for them, "The lack of need for operator intervention to keep changing settings in order to scan different surfaces means that varying colours and materials are scanned easily with only one setting. This contributes wholly to our time management needs".

"The arm has made a massive difference with requests from the design office for things that we would never have done before." Explains Mark Foden, Senior Mechanical Inspector. "The original reason for the procurement of the scanner was for measurement and inspection, but with the success of the CMS 108 laser scanner the majority of the work is now reverse engineering."

Additional benefits

Another benefit of 3D scanning over traditional point measurement is non-contact measurement, meaning that parts are not deformed during inspection. Additionally with the ROMER arms there is no time pressure related to creating inspection programs as with traditional CMMs, "this means that we put the part on the table and are measuring it within seconds" explains Charnley.





Red Bull Technology engineers discuss the 3D measurement data required from a racing helmet

Chris Charnley, Quality Manager, looks over a suspended Formula 1 car in the trophy laden Red Bull Technology foyer

In addition to using the scanner for shape and form measurements all of the arms are used extensively with point-to-point touch probes for feature based inspection. Where required the Red Bull Technology engineers are combining scan and touch data to achieve higher levels of accuracy.

User Friendly

Prior to investing in the ROMER Absolute Arms Red Bull Technology had been using several other portable arm products including arms from Hexagon Metrology and other suppliers. Sam Harper, Composites Inspection Team Leader, gives his verdict on the new arms, "The arms are very good, we are finding errors on components now that we didn't know we had before, the handling of the arm is excellent compared to previous arms and the easy changing of probes makes the arms very user friendly."

Meeting Service expectations

The level of customer service expected by the Formula 1 manufacturer is paramount, Chris talks of his experience with Hexagon Metrology service and applications teams: "People put themselves out at strange times of the day and at weekends; that service to me is something we have to have. Portable engineers from Hexagon Metrology are setting the standards for customer service."

A True Partnership

The Innovation Partnership means that aside from using production products from Hexagon Metrology, Red Bull Technology engineers are also involved with Hexagon Metrology R&D and testing, being at the forefront of automotive technology both companies benefit from this cooperation.

Steve Nevey, Business Development Manager explains the importance of the partnership, "We are very much pushing the boundaries of technology and it is important that we have partners that can push those boundaries with us. Whilst there are lots of things that we are the best at, we accept that there are things we are not the best at, one of those being metrology, and so we are leveraging the expertise from throughout Hexagon Metrology to get better at measurement, get the best out of the systems and ultimately win more championships."

Chris Charnley - "Hexagon Metrology is our metrology supplier; we don't have this partnership with any other measurement company"

Hamish Eccles

More Info: www.redbullracing.com

Did you know?

Sebastian Vettel finished the 2009 season as the youngest-ever World Drivers' championship runner-up. He also secured Red Bull's first pole position and race win in the team's history, going on to become the youngest driver ever to win the World Drivers' Championship.

He followed up his first championship with a second in 2011, becoming the youngest double as well as youngest consecutive champion. Vettel holds numerous other "youngest" Formula One records, including: the youngest driver to have taken part in an official practice session of a Grand Prix, to score championship points, to lead a race, to secure pole position, and to win a race.



ROMER

Coordinate measuring machines for research, development, production and assembly in their most mobile form – this is what ROMER stands for in the global Hexagon Metrology network. The portable measuring arms in which ROMER specialises are produced in Europe and the United States in compliance with stringent quality and environmental standards. ROMER measuring arms permit tactile or optical 3D measurement. Stability, low weight and simple operation are their key advantages.

Hexagon Metrology

Hexagon Metrology is part of the Hexagon AB Group and includes leading metrology brands such as Brown & Sharpe, Cognitens, DEA, Leica Geosystems (Metrology Division), Leitz, m&h Inprocess Messtechnik, Optiv, PC-DMIS, QUINDOS, ROMER and TESA. Hexagon Metrology brands represent an unrivaled global installed base of millions of Coordinate Measuring Machines (CMMs), portable measuring systems and handheld instruments, and tens of thousands of metrology software licenses. Hexagon Metrology empowers its customers to fully control manufacturing processes that rely on dimensional precision, ensuring that products manufactured precisely conform to the original product design. The company offering of machines, systems and software is complemented by a wide range of product support, aftermarket and value-added services.

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Learn how the Leica Absolute Tracker AT901 gives Red Bull Racing wings.

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