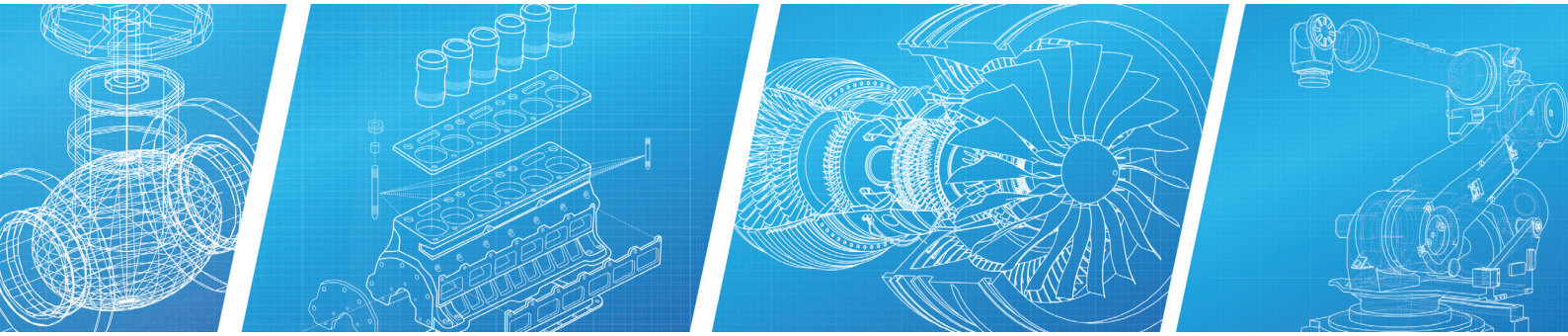
Bowers Group Case Study

Nuclear AMRC

BOWERS GROUP



Company Name	Nuclear AMRC	Products Supplied	Baty SM300 GMR Vertical Profile Projector
Location	Sheffield, UK		
Industry	Nuclear		

COMPANY BACKGROUND

The Nuclear Advanced Manufacturing Research Centre helps UK manufacturers win work across the nuclear sector – in new build, operations and decommissioning – and in other quality-critical industries.

The Nuclear AMRC combines academic innovation with industry expertise to help UK manufacturers improve capabilities and performance along the supply chain. Its facilities and services are open to all.

The centre's engineers and sector specialists work with companies to develop innovative techniques and optimised processes for large-scale high-precision manufacturing. Companies can use the Nuclear AMRC's state-of-the-art workshops to develop and test new processes on production-scale machines without losing capacity in their own factories.

APPLICATION BACKGROUND

The welding team at the Nuclear AMRC is using a Baty SM300 GMR vertical profile projector to ensure the quality of weld profiles on sub-components used in nuclear applications.

The profile of a completed weld is really important to the performance of the weld in service. Welding profiles, therefore, must be thoroughly checked to identify any discontinuities through both visual and machine inspection, in order to evaluate acceptance or rejection depending on the acceptance criteria.

John Crossley M.InstNDT, NDT Technology Lead at the Nuclear AMRC said: "The accurate measurement of weld profilesis absolutely critical to the work we do. Everything we manufacture must meet the very highest levels of quality due to the extreme conditions that components are exposed to. Some of our welding work ends up as part of containment flasks at the Sellafield nuclear fuel reprocessing and nuclear decommissioning site, therefore accuracy and quality is very important."

Located on the Advanced Manufacturing Park (AMP) in South Yorkshire, on the border of Sheffield and Rotherham, The Nuclear Advanced Manufacturing Research Centre (Nuclear AMRC) helps UK manufacturers win work across the nuclear sector. The centre's manufacturing innovation capabilities and supply chain development services are open to all UK manufacturers, from specialist SMEs to top-tier OEMs.

A profile is taken of every weld using dental putty, which is manipulated to create an impression of the weld profile, and then measured to ensure the quality of the surface finish that has been created during the welding process. The Nuclear AMRC uses a Baty SM300 GMR vertical profile projector to ensure that the weld profiles meet the required criteria and surface finish requirements, which has a large travel range of 150mm x 50mm as standard, and a linear scale stage with 0.001mm resolution.

John Crossley continued: "The Baty profile projector is really easy to use and does exactly what we need it to. We trust it to deliver accurate, repeatable measurements, meaning that we can be confident in our quality procedures, and pass this confidence onto our customers."

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Each measurement is logged by the Nuclear AMRC, and parameters for tolerances strictly met in order for the part to be accepted. If the profile of the weld is too convex or too concave it will be rejected. The weld profile must not exceed a certain level of concavity in order to be compliant with British Standards. For example, depressions in the welding joint can be a result of too much heat during the process, and can make the pipe surface weak by putting additional stress on the join. It is, therefore, important that each welding profile is measured meticulously.

The welding team at the Nuclear AMRC develops advanced and innovative joining and cladding techniques tailored to the nuclear industry. Nuclear power plants require extremely high levels of quality and assurances, and many key components must be manufactured by joining together large sub-components in a way that is resistant to corrosion, and that maintain material integrity under extreme conditions whilst in service.

Engineers and specialists at the Nuclear AMRC work directly with companies to develop innovative techniques and optimised processes for large-scale high-precision manufacturing. The centre also provides a range of supply chain development support to help manufacturers enter the nuclear market and compete worldwide.

Backed by industry leaders and government, the Nuclear AMRC is owned by the University of Sheffield, and forms part of a world-leading innovation cluster alongside the AMRC, Castings Technology International and AMRC Training Centre.