AMRC
Composite Centre

Case Study

The University Of Sheffield.

Advanced Manufacturing Research Centre

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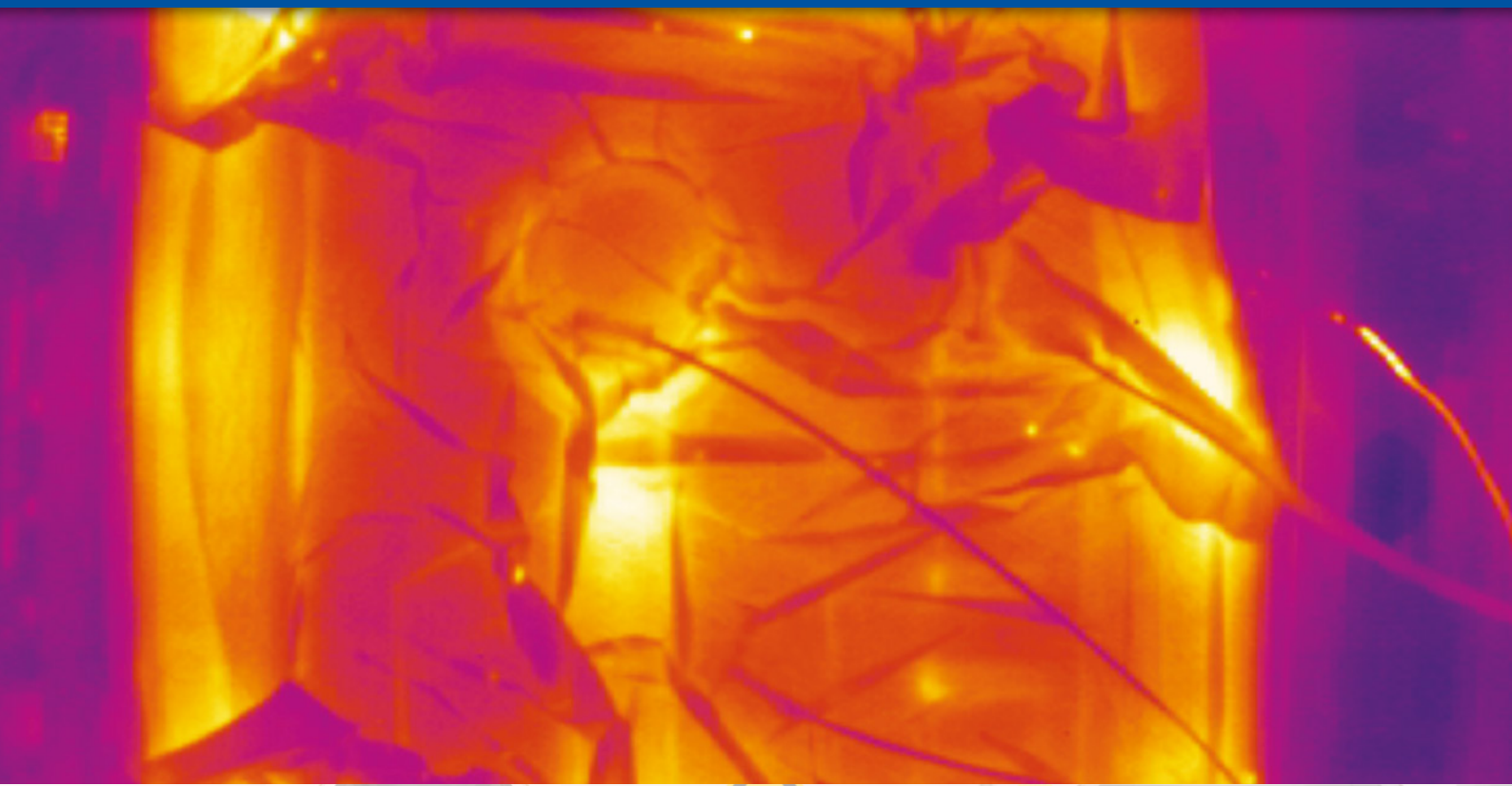
Monitoring thermal distribution

Optris IR Camera



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The AMRC Composite Centre is a state-of-the-art facility for advanced composite manufacturing research and development.

The University Of Sheffield.

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It is part of The University Of Sheffield's Advanced Manufacturing Research Centre (AMRC) with Boeing; a world-class centre for advanced machining and materials research for aerospace and other high-value manufacturing sectors. Its partnership between industry and academia has become a model for research centres worldwide.

The Composite Centre is extending the AMRC's expertise in metals production into the new generation of carbon fibre composite materials with research focussing on the production and machining of composite components, including hybrid parts which combine high-performance metals and composites in a single structure.

The team at the Composite Centre had identified the opportunity to expand their capabilities for monitoring thermal distribution when curing composites in their industrial Vötsch microwave oven – the HEPHAISTOS VHM 180/200. To do this a total of two Optris infrared (IR) thermal imaging cameras have now been fitted to the microwave system.

Previously, the microwave hosted one IR camera for the purpose of sensing temperatures in the area of the chamber that initial trials were taking place. As the microwave capabilities have expanded, the team are now utilising the full chamber and require more comprehensive visibility.

The upgrade has seen a second camera installed with enhanced software to merge images from both cameras; this is enabling the team to gain a complete view of the chamber in real time, with no compromise on sensor capability.

The reliability and consistency of the microwave process is enhanced through the coupling of metallic and fibre optic thermocouples with the thermal imaging system.

The combination of these temperature monitoring systems can effectively detect hotspots or unequal thermal distribution, which can dramatically affect the integrity of the curing process on complex, larger components.

As the cameras were integrated directly into the microwave, they also act as a unique safety feature. The cameras can detect possible fires, or if the temperature inside the microwave exceeds safe levels they were programmed to provide warnings, with the ability to shut down the microwave if needed.

The Optris infrared camera, supplied and installed by Process Parameters Ltd was chosen again due to its high-spec, ease of use and small size, making it ideal to integrate into the Vötsch microwave system.

Due to their technical background, Process Parameters were able to provide a comprehensive advisory service, to ensure the programming of the cameras provided the best set-up for requirements of the team.

The AMRC Composites Centre are leading in the field of curing composite materials and their upgraded imaging capabilities will facilitate the team in defining and accelerating the research into microwave curing as a manufacturing process for industrial implementation.

For more information about this case study or the AMRC with Boeing, please contact:
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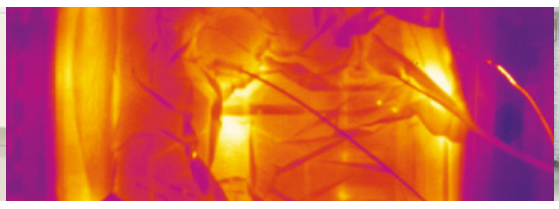

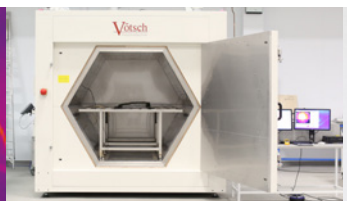

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