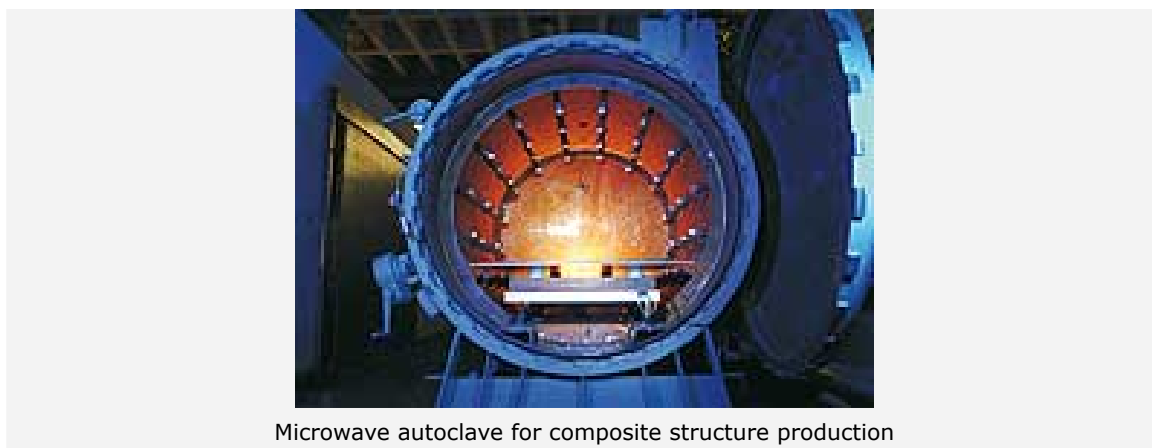


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World's first microwave autoclave for composite structure production

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A few days ago, DLR's Institute for Lightweight Composite Structures and Adaptronics in Braunschweig finished building the world's first microwave autoclave. After its upcoming release, it will be used to develop new production technologies for carbon fibre materials (CFK), a booming sector of the aerospace industry. The microwave autoclave for composite structures is a joint development between DLR and the companies Scholz Maschinenbau GmbH, and Fricke and Mallah Microwave Technology GmbH.



Microwave autoclave for composite structure production

In its Braunschweig facility, DLR has conducted years of groundbreaking research into applying microwave radiation to composite structure production. Unlike conventional equipment for hardening carbon fibre composites, whereby products are heated using a convection process and then subjected to high thermal inertia, microwave systems are able to harden products quickly and efficiently. Pressurised (autoclave) units are of particular interest to the aerospace industry. To combine the benefits of microwave and autoclave technologies, the Institute designed and built the innovation in collaboration with the microwave autoclave industry. The result was a highly flexible prototype which could be heated with circulated air, microwave fields or both, including the use of pressurisation if required.

The innovative microwave autoclave promises to meet industry requirements for shorter process lead times, during which high-frequency microwave radiation will be used to heat synthetic materials. The autoclave features a total of 96 field sources, evenly distributed over the surface of the vessel. This arrangement allows the components to maintain an even temperature, essential for hardening complex composite structures. One of the major challenges of this project was to develop the concept of positioning the sources adjacent to a pressurized vessel, which has since been patented by DLR.

The microwave autoclave was presented to a wide audience at the world's largest composite structure technology show, JEC 2007, in Paris.

Technical details	
Diameter:	1600 mm
Charge length:	4000 mm
Volume:	8 cubic metres
Microwave power:	96 Kilowatts

Heat output (circulation): 231 Kilowatts

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