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## Progress in the production of the W7-X divertor target modules

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The realization of the 19.6 m<sup>2</sup> highly heat loaded surface of the actively water-cooled divertor of Wendelstein 7-X (W7-X) requires the installation of 100 target modules distributed in ten discrete similar divertor units. A target module is made of target elements mounted onto rails joined by a stiffening plate forming a frame with an attachment system to the plasma vessel. The target modules are water-cooled from manifolds to distribute the water equally between the target elements with flanged connections to the water supply system. A target element is made of a CuCrZr copper alloy heat sink armored with carbon fibre reinforced carbon CFC NB31 tiles and designed to remove a stationary heat flux up to 10 MW/m<sup>2</sup> on its main area. The main challenge was to fit modules in the limited available space taking into account the 3-D shape of the plasma vessel, the neighboring in-vessel components and diagnostics. The assembly of the modules was carried out in the workshop of IPP-Garching. Special attention was given to the positioning of the individual target elements onto the supporting frame to avoid local heat loads or leading edges, and on the reliability of the orbital welding for the cooling circuits. The quality of the target modules was assessed as follows: visual inspections, measurement of the 3-D CFC surface, dynamic pressure tests, He leak testing under pressure at different temperature (20°C, 160°C) in vacuum oven, high heat flux testing. The paper presents the design, manufacturing process and the results of the quality assessment of the 30 first finished modules to be positioned in the horizontal part of the divertor.

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