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A Continuous V Shape Water Cooled Divertor Structure: Flexible with Plasma Configurations and Improved Heat Flux Capability

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Aiming at achieving steady state operation of Tokamak, the divertor is supposed to exhaust particle and heat flux. Plasma configuration is one of the most important drivers for divertor design determining the position of stricken point and heat flux intensity. In order to provide flexibility with plasma configurations, a continuous V shape divertor structure with consistent heat removal capability is proposed with tolerance on variation of stricken point location. Taking into account the gradually decreasing heat flux intensity from stricken point, the divertor target is divided into three zones which are high, medium and low heat flux zones. The high heat flux zone covers stricken zone variation range in which the maximum heat removal capability of plasma facing unit is 15 MW/m2. The W/Cu hypervapotron, as plasma facing unit, is designed and optimized with sufficient heat transfer performance. The explosive bonding technology is tested and applied to produce the continuous V shape structure made of heterogeneous materials.

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