



Water-cooled copper components manufactured through electrodeposition

Thanks to its long-standing history in the fusion sector and through its collaboration with Fusion for Energy (F4E), Galvano-T has developed specialized expertise in manufacturing high-performance structures for neutral beam sources and beamline components. By combining specialized electrodeposition processes with precision machining, the company delivers complex, water-cooled copper components (such as Faraday shields and extraction grids) that meet the demanding requirements of fusion environments.

The technology

By integrating a generative copper electrodeposition process with specialized machining (managed through a trusted network of partners), Galvano-T provides a room-temperature alternative to traditional welding and brazing, effectively eliminating thermal stress and weakening of the material. This approach is specifically optimized for the closing of cooling channels and the joining of connectors in high-performance water-cooled structures, without compromising material properties.

Advantages and Potential Applications

- The process works at room temperature, no thermal stress for materials.
- No impact on material properties, high stability of components.
- More freedom for the steric configurations.
- Possible combination with other materials like stainless steel, black steel, Inconel, Brass, CuCrZr.
- Integration of active cooling into diverse components, including the joining of system connectors, in a single manufacturing step.

Its capability to create complex, thin-walled structures at room temperature can offer solutions for high-performance electronics, aerospace, and energy sectors, particularly for advanced heat sinks, combustion chambers, and heat exchangers where thermal stress is critical.

Collaboration opportunities

Galvano-T can be the partner for the manufacture of water-cooled components in many fields of technical application.

Beyond thermal management, the process is equally suited for the application of functional copper or nickel coatings.

Fusion for Energy Technology Transfer
Programme

Email: technologytransfer@f4e.europa.eu