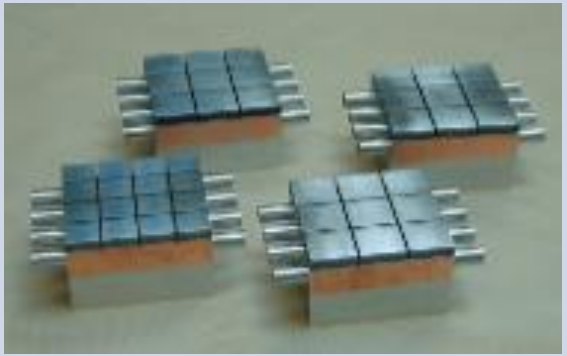
A metallurgical bonding technique by diffusion at the atomic level for the solid assembly of similar and dissimilar materials

By applying high pressure (~100MPa) and hot temperature (~1000°C) to compress the metals together homogenously from every direction , HIP allows materials to be joined with diffusion bonding at an atomic level.

Value proposition

One of the main advantages of HIP technology is its ability to join dissimilar materials, with different melting points, which allows to take advantage of their respective combined properties.

HIP bonding can manufacture parts not achievable with conventional manufacturing as NGTW process TIG, EB, Laser, furthermore the process has also received the stamp of approval from a “Notified body” accredited by the French Nuclear Safety Authority (ASN).



Technology Transfer proposal BSBF 2022

Original/Potential Field of Application

Fusion heritage

After many collaborations about assembly processes, ATMOSTAT started to work with F4E to develop a strong and suitable process to bond plasma facing components together. These components are notably used for the First Wall Panel (FWP), the Blanket Shield Module (BSM), the Test Blanket Module (TBM) or the Divertor, all parts of the ITER project.

Thanks to its compatibility with plenty of materials and alloys, as Beryllium, Tungsten, CuCrZr, Eurofer, Incolonel, 316L, composites, diamonds, CU alloys, Al alloys, and many others, HIP bonding is applicable to many industries such as space, automotive industries, healthcare or electronics, among others.

IPR Status & Contact Information

The technology is available for direct use, technical adaptation for new applications and other materials or alloys.

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