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Hybrid channeling an advanced solution for optimal thermal management

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Hybrid Friction Stir Channeling Tests in Al-Al components: Internal Pressure / Helium Leak

Average burst pressure: **420 bar** ∜Max **460 bar** (Max without leak: **440 bar**)

Critical zones:

♥ Weld at the start and end of the channel and Couplings

High pressure resistance \rightarrow superior for any heat transfer application!



Aalto University School of Engineering Overpressure method (1 bar) with helium sniffing

Average leak rate: **1 x 10⁻⁵ mbar*l/s** (9 samples) ∜smaller than that of standard hose couplings!

For comparison:



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Final Remarks

Hybrid friction Stir Channeling is a feasible technique to produce, in one action, closed internal channels of large dimensions, with complex path, while joining multimaterial components, such as Cu and Al, delivering sound high performance components with continuity of thermophysical properties and structural resistance

Aalto University School of Engineering