

Make complex channels simply by Hybrid FSC

**Safe
Eco-Solution**

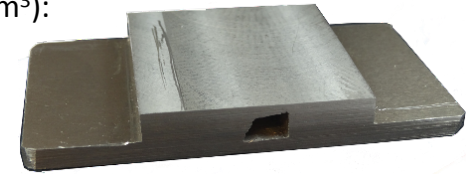
For more information:
www.weld.one

Hybrid Friction Stir Channeling (HFSC)

Simultaneous joining and channeling within a single operation

There are increasing variety of energy sources which requires efficient heat transfer channels. Heat management is one of the common challenges at novel electronic devices. These requires improved thermal management as energy consumption has increased (W/m^3):

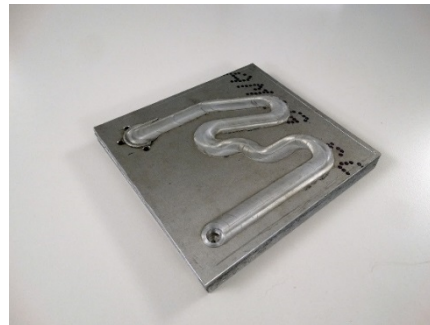
- Increase the temperature
- Reduce reliability, shorter lifetimes
- Increase the cost and size of electronic devices
- ↳ Conventional cooling methods are not enough



Manufacturing time as well as shapes & sizes of optimized cooling channel is challenging. There is also global demand for reducing CO₂ –emissions and thus energy and heat need to be transferred efficiently.

Solution - Hybrid FSC

- Friction Stir based process for joining and channeling metals (aluminum, copper, steel)
- HFSC utilizes the visco-plastic material flow
- Solid-state processing - not fusion
- Size and depth of channel are controllable



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Customer Segments

- Thermal management of electronics
- Cooling systems of electric vehicles
- Heating, Ventilating and Air Conditioning
- Solar thermal collectors
- Others: e.g. conformal cooling of molds

Friction Stir Channeling (FSC): Channeling into monolithic plate

Hybrid Friction Stir Channeling (HFSC): Simultaneous joining and channeling of two or several plates

Benefits:

- All in single automatized action
- Free paths rough channels
- High energy efficiency
- No emissions e.g. fumes or chemicals
- Enables 30 % lighter structure and more compacts units
- Higher cooling power (e.g.+45%) even with low air flow rates due to turbulence

