

# InWVerse® Fastener



## THE INWVERSE® FASTENER TECHNOLOGY

- Very fast processing time of only 1 second
- Suitable also for low wall-thicknesses
- No pre-hole or through-hole required
- Strong form locking due to innovative crater shaped design



## WHAT IS MULTIMATERIAL-WELDING?

MultiMaterial-Welding (MM-Welding® in short) is a Fastening Technology Platform that uses ultrasonic energy to partially liquify thermoplastic materials to create a functional and strong connection within lightweight materials in fractions of a second.

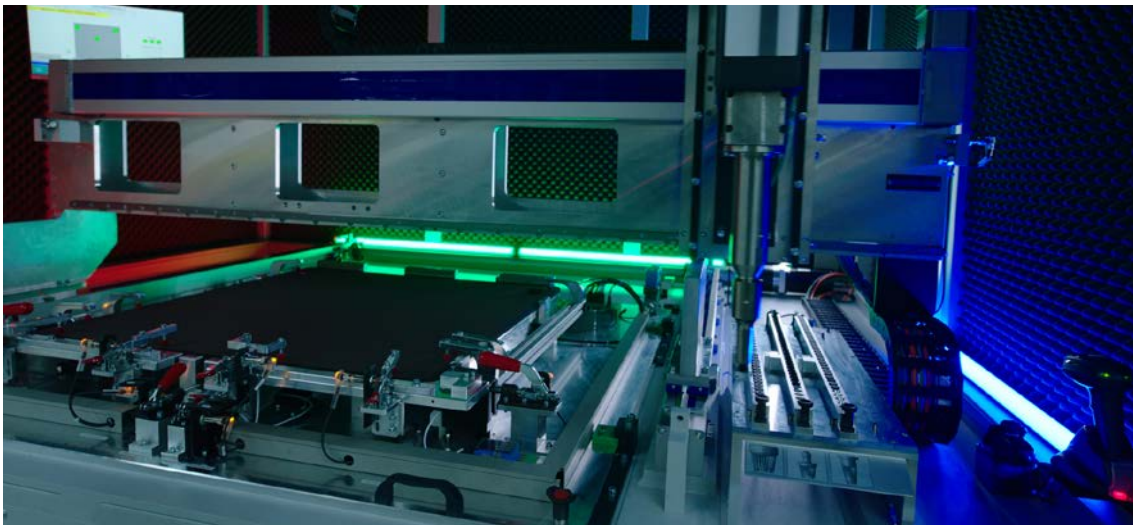
Based on the innovative MultiMaterial-Welding process, the InWVerse® Fastener Technology takes the industry proven advantages and features to another exciting field of applications. The MultiMaterial-Welding engineers have developed a novel fastening system which allows to precisely establish an immediately loadable connection point onto thermoplastic substrates.

## Advantages compared to **adhesive bonding**

- Much faster cycle times
- Less attention to surface conditions required since bonding happens not through adhesion but through mechanical interlocking
- No critical substances to handle or store (no shelf-life issues)
- Process Traceability

## Advantages compared to **embedding**

- No complex tooling for metallic inserts needed (i.e. injection moulding)
- No sink marks at thin wall thicknesses
- Flexible in positioning
- No overmoulding of thread



## INSTALLATION PROCESS



InWVerse® Fastener with special „crater“ design positioned into place.



Ultrasonic energy is applied. Within a second the localized thermoplastic melting generates a strong form-locking.



Threaded connection point reliably installed and ready for next production step. Possible to run process without creating marks on distal side.



## QUALITY CONTROL SOFTWARE TOOLS WITH „SMART SOLUTIONS“ READY FOR INDUSTRY 4.0



SmartSolutions is based on machine learning and transforms production data into meaningful and actionable insights for our customers in real-time.

It allows quality control of 100% of produced parts and eliminates the need for destructive testing:

## SERIAL PRODUCTION

To install the MM-Welding® fasteners, ultrasonic welding equipment is necessary, which is available through the MM-Welding® production systems. From stand-alone systems for small scale and flexible projects, up to massive serial production projects are available.

## THE PROVEN CUSTOMER BENEFIT

MultiMaterial-Welding InWVerse® Fastener is an ideal technology for today's requirements on cost reduction, automation and process optimization.

It allows new design thinking (e.g. lower material thicknesses) and immense cost reduction for several volume scenarios.

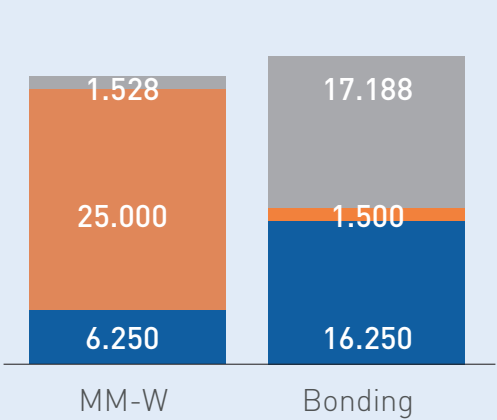
Bossard takes "Proven productivity" for real and offers a unique business model.

Our "pay-per-weld" offering eliminates investment requirements and makes it very easy to benefit from the unique advantages of MultiMaterial-Welding. Tailor made systems provided by Bossard offer a turn-key solution and an easy forecasting for the end user.

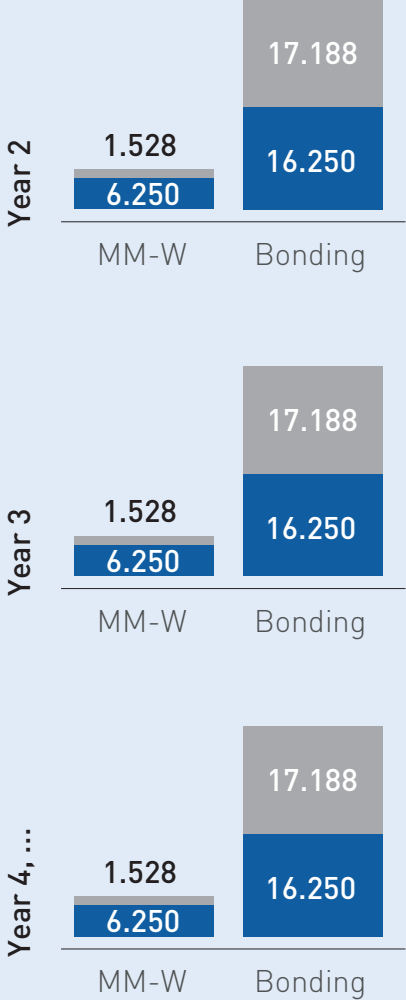
Interested? Contact us and discuss about your application and the most ideal MultiMaterial-Welding solution for you.

**HOW INWVERSE® FASTENER CAN SAVE PRODUCTIONS COSTS**

Scenario:  
Adhesive bonding of fastening elements onto FRP for sportscar application.  
25k connection points p.a. with 8 fasteners per assembly.



- Variable costs
- Investment
- Processing cost



	Overall 1st year	Overall following years
MM-W	31.917	7.917
Bonding	42.750	41.250
<b>Saving</b>	<b>4.833</b>	<b>33.333</b>



MM Welding® technology is a proprietary technology of MultiMaterial-Welding AG, Switzerland, and is licensed by Bossard AG.

MultiMaterial-Welding™ technology is based on the patented WoodWelding® technology of WoodWelding SA and is licensed by MultiMaterial-Welding AG, Switzerland