



MultiMaterial-Welding®

InWVerse® Fastener - Technical Data Sheet

MULTIMATERIAL-WELDING®

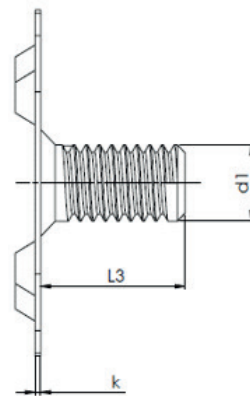
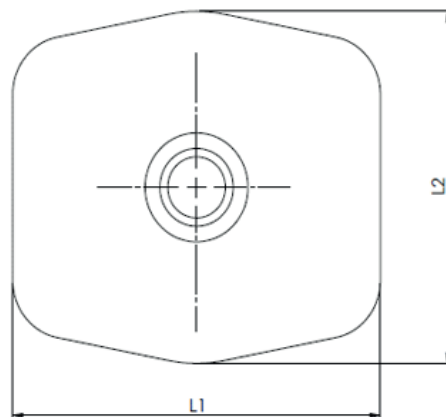
InWVerse® Fastener

MULTIMATERIAL-WELDING®

MM-Welding® is an innovative fastening technology platform that uses ultrasonic energy to partially melt thermoplastic materials into porous materials to create a functional and strong form-lock connection in fractions of a second.

INWVERSE® FASTENER

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



InWVerse® Fastener Dimensions

PRODUCTS

InWVerse Fastener®		BN 56114
Function	Rapid fixation to thermoplastic materials	
Color	Metallic	
Material	Inox Steel	
Substrate geometry	Min. thickness	1.5 mm
	Thread type	M4
Fastener geometry	Size (d1)	M4
	Thread type	M4 X 0.7-6g
	Available lengths (L3)	8,10,15,20 mm
Fastener geometry	Base length (L1)	20 mm
	Base width (L2)	18 mm
	Base thickness (k)	0.3 mm

MECHANICAL PROPERTIES

These properties are reached immediately after insertion, no curing time necessary.

Substrate	Pull Out	Max Shear
SMA GF30% (Xiran SGH60)	630N	1900N
PC/ABS (Bayblend 2953)	450N	1350N
PVC (Kydex 100)	375N	1125N
PP Talc 10-25% (Sabic PP compound 7500)	200N	600N

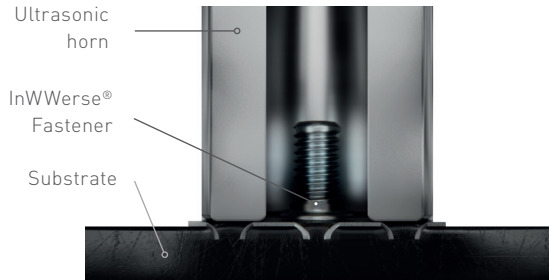
* values are subject to substrate composition and substrate geometry variations
See page 5 for applied test procedures



The information in this document are for guidance purposes and do not represent a warranty or guarantee of any kind. The physical characteristics represent typical or average values. All information and recommendations are given to the best of our knowledge and experience. The user is responsible for determining the application fit. Please consult Bossard for support and specific advice.

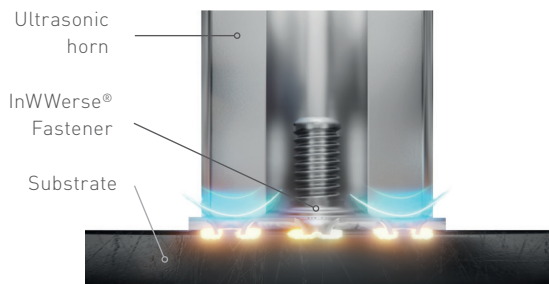
INSTALLATION & ASSEMBLY GUIDELINES

Step 1: Placement



Once the substrate is fixed and in position, the InWVerse® Fastener can be inserted into the vacuum sonotrode to be in the right position.

Step 2: Insertion

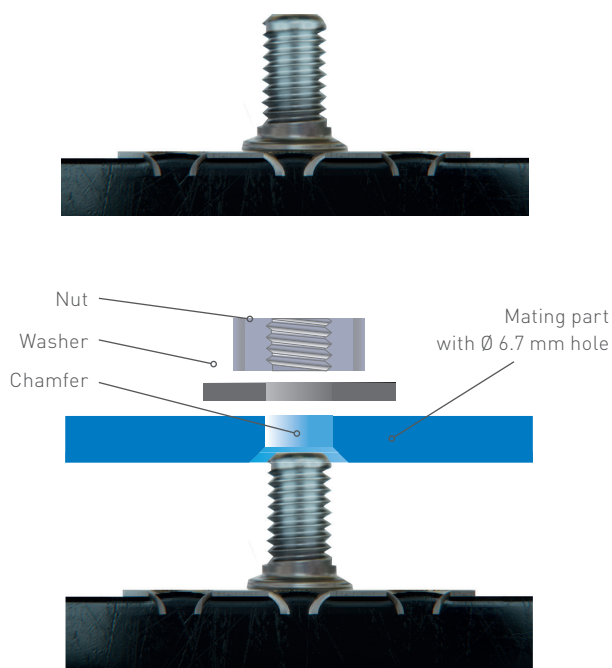


Fastener is inserted into the thermoplastic using ultrasonic welding process.

Welding time: 0.3s

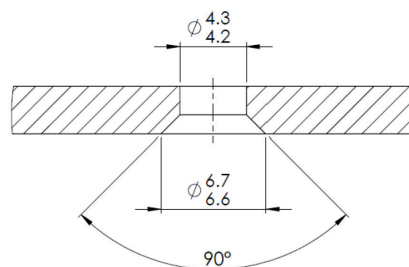
Cycle time: 1s

Step 3: Post-Welding assembly



InWVerse® Fastener substrate assembly

Immediately after the welding process. The fixation can be used and assembled with mating parts. The mating parts require a chamfer as shown in the diagram or a through hole of **6.7 mm**.



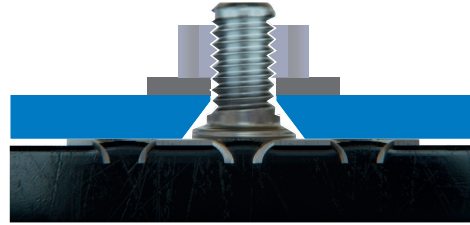
Using a standard washer and nut the part should be assembled to the correct tightness. This can vary depending on the substrate and application, however for plastics and metals we recommend a tightening torque of **2Nm**.

For further recommendation on tightening torques and assembly it is recommended to consult the Bossard team for support and advice.

Step 3: Post-Welding assembly



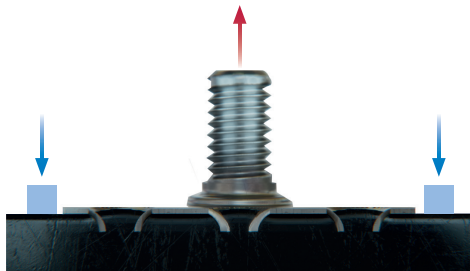
InWVerse® Fastener tightened to 2 Nm



InWVerse® Fastener fully assembled

Test procedures

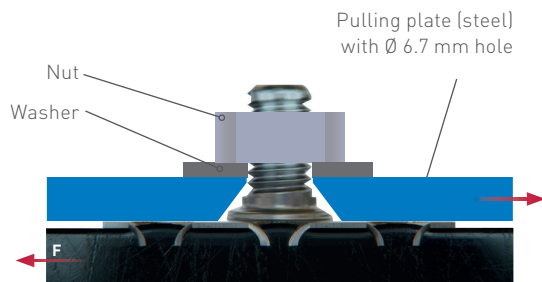
Axial pull-out



Maximum axial force needed to extract the InWVerse® Fastener from the substrate.

Test speed: 20 mm/min
Holding ring: diameter 50 mm

Shear test



Test speed: 20 mm/min

The individual assembly situation may lead to adapted values. With our proven testing capabilities, Bossard is able to support your best design and assembly conditions.

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