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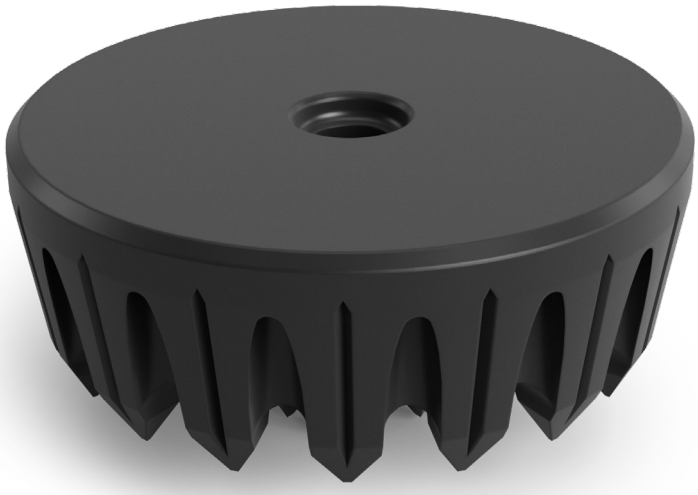

MultiMaterial-Welding®

LiteWWeight® zEPP – Technical Data Sheet

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MULTI MATERIAL WELDING ®

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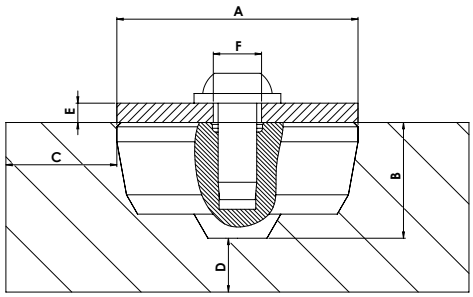
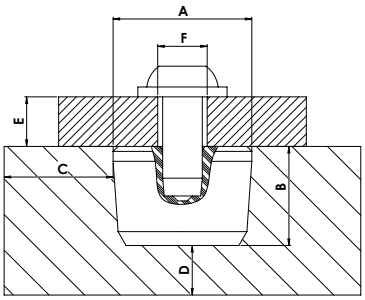
MULTIMATERIAL-WELDING®

LiteWWeight® zEPP



LiteWWeight® zEPP
Standard



LiteWWeight® zEPP
Mini

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.

LITEWWEIGHT® ZEPP

Fast, strong and reliable fixation technology for multiple EPP foam configurations. "Anti-Turning" design and precise energy input my means of ultrasound guarantee optimal anchoring in the EPP. No pre-hole in EPP required.

Products

	LiteWWeight® zEPP Standard BN 56111	LiteWWeight® zEPP Mini BN 56116
Function	Can be welded into EPP foam. Centre hole designed for self-tapping screws.	Smaller version of the LiteWWeight® zEPP Standard, designed for limited space.
Sketch		
Material	PP-GF30	PP-GF30
Color	Black or Yellow	Black or Yellow
Diameter A (mm)	25	14
Height B (mm)	12	10
Weight (g)	2,1	0,8
Designed for EPP Foam (g/L)	30 – 140*	45 - 140
Recommended screws	Delta PT® 40 | Delta PT® 50 BN 20040	Delta PT® 40 BN 20040
	ecosyn®-plast BN 84229	ecosyn®-plast BN 84229

* for higher densities, (>140 g/l) a pre-hole (Ø 8 mm) into the substrate is required

The information in this document are for guidance purposes only 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.

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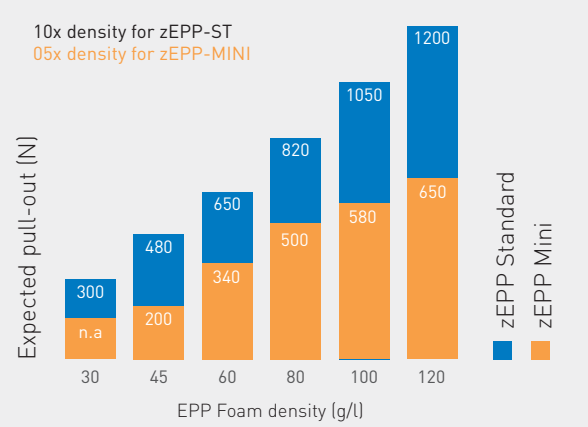
Mechanical properties

- These properties are reached after a cooling time of 15 minutes. Directly after the process, 65% of the final properties are already achieved.
- The foam reference for this database is ARPRO grade from JSP company.

AXIAL PULL-OUT FORCE/PERFORMANCE

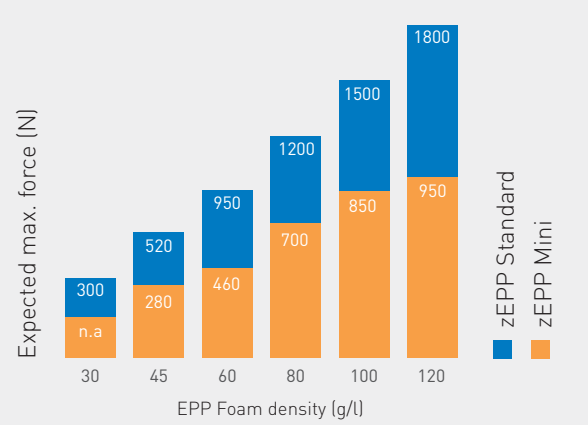


DIRECT TORQUE

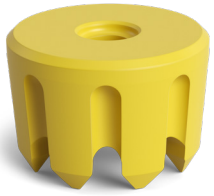
LiteWWeight®	zEPP Standard	zEPP Mini
Material:	Direct torque (Nm)	Direct torque (Nm)
EPP – 30 g/L	4.0	n.a
EPP – 45 g/L	7.0	1.5
EPP – 60 g/L	10.0	3.0
EPP – 80 g/L	13.0	4.5
EPP – 100 g/L	>16.0	> 5
EPP – 120 g/L	>16.0	> 5

	Thread failure for:	
	Delta PT 40 (Nm)	Delta PT 50 (Nm)
zEPP Standard	2.5	4.0
zEPP Mini	1.5	-

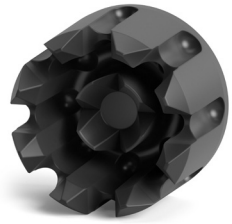
SHEAR FORCE/PERFORMANCE



LiteWWeight® zEPP
Standard Black



LiteWWeight® zEPP
Mini Yellow



LiteWWeight® zEPP
Mini Black

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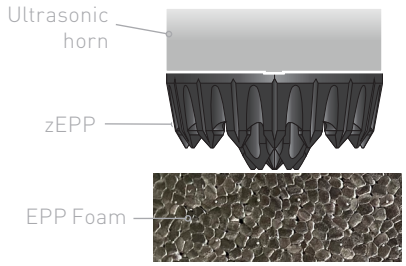
Installation & Assembly guidelines

Step 1: Placement

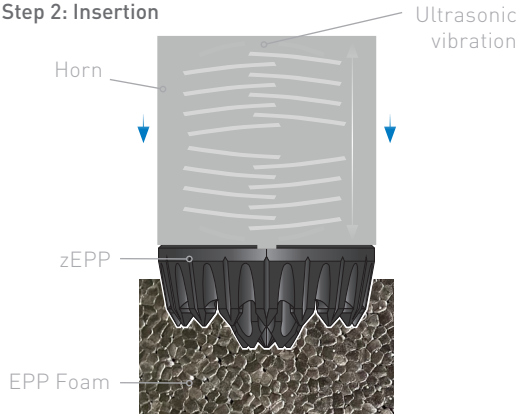


Loss of mechanical properties

[%] of optimal properties	Distal distance D [mm]	Edge distance C [mm]
100 [%]	D > 15 | 20	C > 15 | 10
80 [%]	D = 8 | 10	C = 10 | 5
60 [%]	D = 3 | 3	C = 3 | 1
Not recommended	D < 3 | 3	C < 3 | 1

Figures apply to EPP densities <= 80 g/L. For densities > 80 [g/l], a reduced loss of properties can be expected. (**zEPP Standard,** zEPP Mini)

Step 2: Insertion



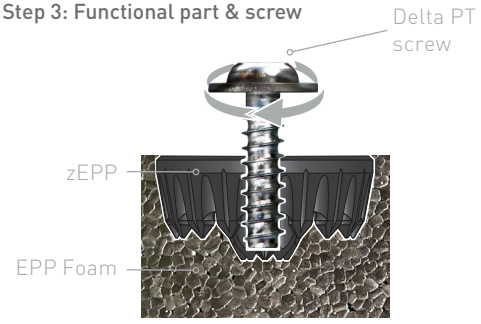
Cycle time

(**zEPP Standard,** zEPP Mini)

Material (g/L)	Welding Time (s)	Holding Time (s)	Cycle Time (s)
EPP – 30	1.7 | 2	2 | 2	3.7 | 4
EPP – 45	1.3 | 1.2	2 | 2	3.3 | 3.2
EPP – 60	0.6 | 0.8	2 | 2	2.6 | 2.8
EPP – 80	0.5 | 0.6	2 | 2	2.5 | 2.6
EPP – 100	0.5 | 0.5	2 | 2	2.5 | 2.5
EPP – 120	0.4 | 0.4	2 | 2	2.4 | 2.4

A full insertion of the fastener leads to optimal mechanical properties. The final placement of the LiteWWeight® zEPP is precisely controlled by process parameters.

Step 3: Functional part & screw

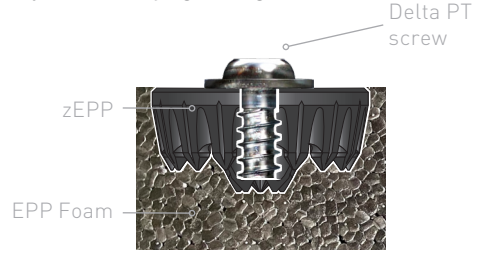


In order to achieve the max. performance we recommend the following **minimum** thread engagement, screw length.

	zEPP ST	zEPP MINI
Substrate thickness [mm]	E	E
Engagement length [mm]	> 9	> 6
Total screw length [mm]	> E + 9	> E + 6

A longer screw is possible and it will continue into the EPP foam.

Step 4: Assembly tightening



	Screw type	Delta PT® 40	Delta PT® 50
zEPP Standard	Tightening torque [Nm]	1,5	2,5
zEPP Mini	Tightening torque [Nm]	1.0	n.a
	Substrate hole diameter (F)	5 mm	6 mm

Manual installation is possible but automatic installation with a rotation speed of **500 rpm** is recommended.

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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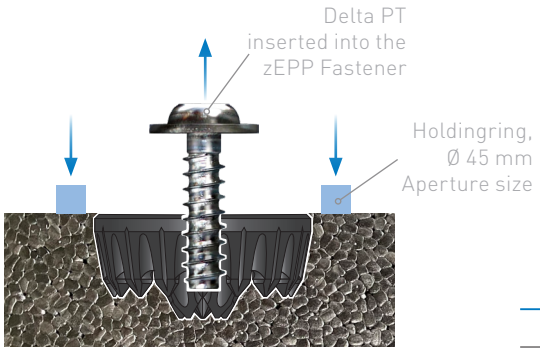
Test procedure

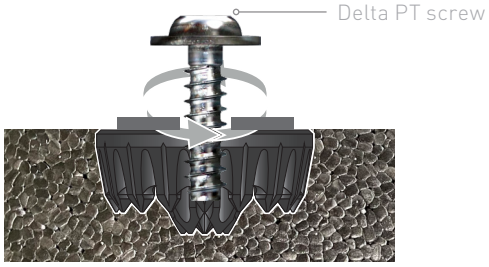
Axial pull-out



Axial Force needed to extract the LiteWWeight® zEPP out of the foam

Test speed:	20 mm/min

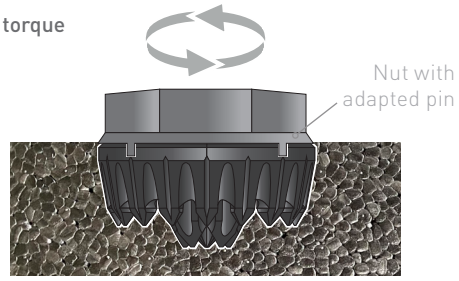
Installation torque



Required tightening torque to install the screw into the LiteWWeight® zEPP

Test speed:	500 rpm
Assembly:	Delta PT screw 40/50 x 12 Steel washer

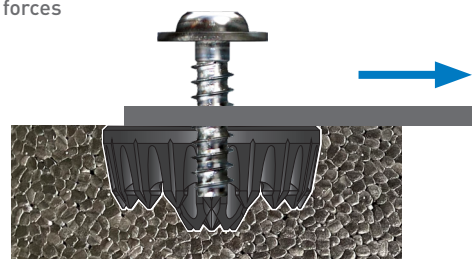
Direct torque



Loosening torque between the foam and the LiteWWeight® zEPP

Test speed:	5 rpm
Assembly:	Hexagonal nut with pins

Shear forces



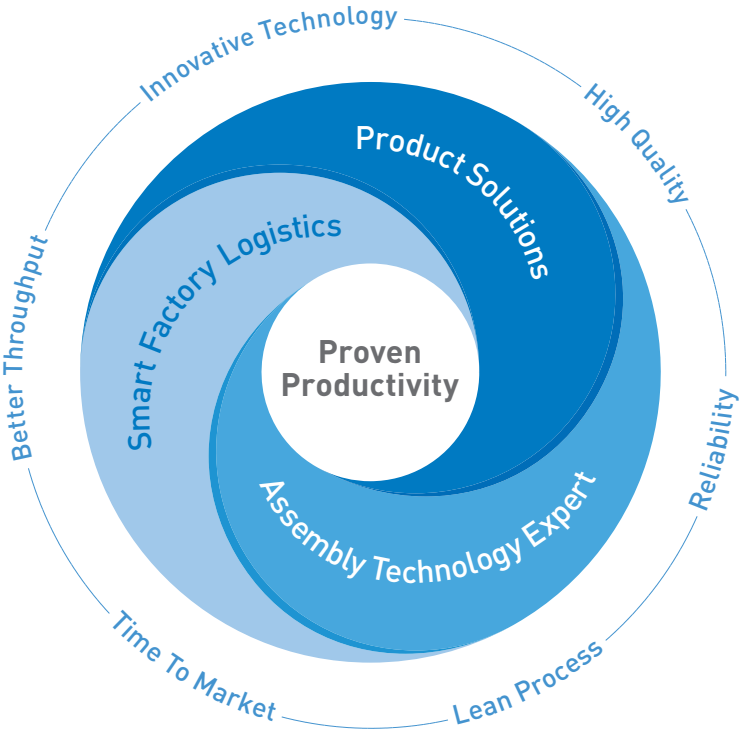
Shear force needed to exctract the LiteWWeight® zEPP out of the foam.

Test speed:	20 mm/min

The data and values described in this document represent common standard assemblies.
For your individual support and application scenario, Bossard is at your disposal with 14 state of the art accredited testing laboratories all around the world. Benefit from Bossard's engineering laboratories and the most modern measuring and testing facilities, with an ISO/IEC 17025 certification. Bossard Assembly Technology Expert services help you find exactly the right design, process and assembly solution. It is about Proven-Productivity!

PROVEN PRODUCTIVITY – A PROMISE TO OUR CUSTOMERS

The strategy for success



From years of cooperation with our customers we know what achieves proven and sustainable impact. We have identified what it takes to strengthen the competitiveness of our customers. Therefore we support our customers in three strategic core areas.

Firstly, when finding optimal **Product Solutions**, that is in the evaluation and use of the best fastening part for the particular function intended in our customers' products.

Second, our **Assembly Technology Expert** services deliver the smartest solutions for all possible fastening challenges. Our services cover from the moment our customers developing a new product, to assembly process optimization as well as fastening technology education for our customers' employees.

And thirdly, optimising our clients' productions in a smart and lean way with **Smart Factory Logistics**, our methodology, with intelligent logistics systems and tailor-made solutions.

Understood as a promise to our customers, "Proven Productivity" contains two elements: Firstly, that it demonstrably works. And secondly, that it sustainably and measurably improves the productivity and competitiveness of our customers.

And this for us is a philosophy which motivates us every day to always be one step ahead.

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