

**POWER WELD**

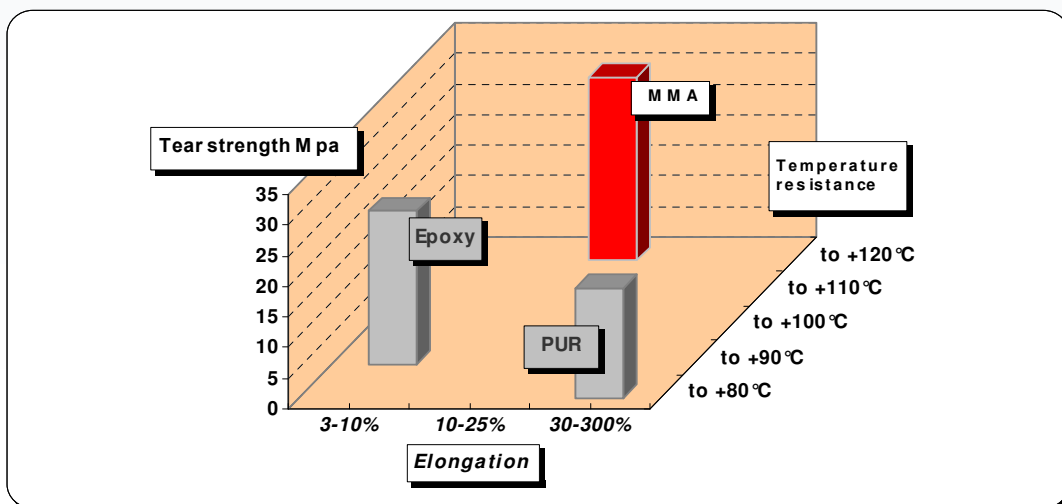
**METHYL METACRYLATE (MMA)  
FAST**

**CHARACTERISTICS**

Structural Bonding in modern Manufacturing and Processing demands extremely high degrees of strength, speed and safety for the functional bonding of modern materials. The modified Methyl-Methacrylate-Ester (MMA) is a 2-component structural adhesive for metal bonding, modern difficult to bond plastics and innovative composites. You can achieve high strength, tough yet slightly elastic bonds, mostly without chemical or mechanical preparation of the surface. In comparison to classic structural bonding (e.g. with Epoxies), MMA scores with its ex-ceptional tear strength, remaining elasticity as well as its high degree of resistance to temperature extremes. The Power Weld adhesive is easy to use and mostly non runny, because of its thixotropic viscosity. MMA is a state-of-the-art modern alternative to many conventional bonding methods like welding, soldering or riveting.

**„PRO“ - FACTS**

- High lapshear resistance
- Very good chemical resistance
- High temperature specification
- Non runny
- Partly no primer / no sanding
- Remains elastic
- Wide adhesion spectrum
- Very good working consistency
- Fills cuts and gaps up to 4mm
- Good Reworkability (sanding, drilling, painting, etc.)
- UV stable



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### APPLICATIONS

AREAS OF USE	APPLICATIONS
<p><b>Automotive &amp; Trucks &amp; Transport</b></p> <p>Coach building Automotive Caravan Buses Truck &amp; Transport Trains (Coach building) Farming Machinery Special Transport Manufacturing</p>	<p>Bonding of design elements and spoilers</p> <p>GRP-Panels on the metal frame</p> <p>GRP-Panels to steel</p> <p>Aluminium parts to steel substrates</p> <p>Carbon panels to steel</p> <p>Repair of headlamp-fixtures</p> <p>Plastic panelling and casings</p> <p>Load-areas covers on buses</p> <p>Reinforcement and fixation of floor-panels</p> <p>Fixation of metal sheets to the A-frame</p> <p>Bonding of roof panels</p> <p>Bonding of reinforcement beams</p> <p>Bonding of skips</p> <p>Bonding of side panels on refrigerated trucks</p> <p>Bonding of rail carriages</p> <p>Bonding of bus frames</p> <p>Bonding of rear spoilers</p> <p>Bonding of various car panels</p> <p>Edge reinforcements in coach building</p>
<p><b>Model Building &amp; Prototyping</b></p>	<p>Composite &amp; metal bonding on prototypes for car, truck, bus, ship or rail</p>
<p><b>Aircon &amp; Energy Engineering</b></p>	<p>Bonding of Vents and Shafts</p> <p>Bonding of Conductors</p>
<p><b>Windows &amp; Glass Processing</b></p>	<p>Window frames, edges</p> <p>Corner angle bonding</p>
<p><b>Marine &amp; Ship Building</b></p>	<p>High spec. assembly bonding</p> <p>Ships deck and hull bonding</p> <p>Bonding of the ships interior</p> <p>Cabin shells</p> <p>Bathroom units</p>

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<b>Wind &amp; Solar Energy</b>	<ul style="list-style-type: none"> <li>Bonding of stall-stripes on the rotorblades edge</li> <li>Bonding of lightning-security-receptors</li> <li>Cableshaft bonding</li> </ul>
<b>Sports &amp; Leisure Industries</b>	<ul style="list-style-type: none"> <li>Sports articles made from plastic (e.g. snowboards &amp; skies)</li> <li>Bonding of trim</li> <li>Bonding of reinforcements</li> <li>Golfclub bonding (heads to shaft)</li> </ul>
<b>Plastic Working Industries</b>	<ul style="list-style-type: none"> <li>Bonding of reinforcements</li> <li>Bonding of fixations (clips, etc.)</li> <li>Bonding of metal sheets to flexible plastic parts</li> <li>Bonding of trim and decorative lining</li> </ul>
<b>Metal Working Industries</b>	<ul style="list-style-type: none"> <li>Signage frame bonding</li> <li>Bonding of illuminated signs</li> <li>Partgroup assembly bonding</li> <li>Bonding of mountings, supports, sleeves, fixations, metal-spindels</li> <li>Pinhole filling on metal surfaces</li> <li>Repair of holes, gaps and bridges</li> <li>Panel bonding</li> </ul>
<b>Plant-, Model- and Machinery Engineering</b>	<ul style="list-style-type: none"> <li>Structural bonding of a large variety of metal- and composite parts</li> <li>Tube bonding</li> <li>Bonding of rubberlips to Composites</li> <li>Grip elements, extension elements</li> <li>Bonding of trim and decorative lining</li> </ul>
<b>DIY</b>	<ul style="list-style-type: none"> <li>Repairs for home, hobby and garden</li> </ul>

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## METHYL METACRYLATE (MMA) FAST

TECHNICAL PROPERTIES	POWER WELD	
Chemical Base	2-K Methyl Methacrylate (MMA)	
Colour	milky, black	
Packaging Sizes	on demand	
Solvents	no	
Volatile Organic Content (VOC)	430g/kg	
Consistency	pasteus	
Viscosity @ +23°C / 50% rh	100.000 mPas	
Mixing Ratio (Volume)	1:1	
Density @ +23°C / 50% rh	0,97 g/ml	
Shore Hardness (D)	Sh-D 78	
Working Temperature (Material)	+10°C to +30°C	
Working Temperature (Workplace)	+6°C to +30°C	
Thermal stability	-50°C to +120°C	
Potlife @ +23°C / 50% rh	4-8 mins	
Working time @ +23°C / 50% rh	~ 4 mins	
Tack free @ +23°C / 50% rh	~ 10 mins	
Full curing time @ +23°C / 50% rh	~ 24 hrs	
Elongation	~ 19%	
Change in volume	< 5%	
Maximum gapwidth	~ 4mm	
Tear strength	Steel/Steel	~ 30 N/mm <sup>2</sup>
	AL/AL	~ 27 N/mm <sup>2</sup>
	ABS/ABS	~ 18 N/mm <sup>2</sup>
	GRP/GRP	~ 16 N/mm <sup>2</sup>
	PC/PC	~ 8 N/mm <sup>2</sup>

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<b>Chemical Resistance</b> *A = no effect *B = minimal effect *C = failure not recommended	Water	A
	Saltwater	A
	Oil & Grease	A
	Petrol & Diesel	A
	Water 90°C	B
	Acetic acid 10%	B
	Xylol	B
	Strong Acids & Alkaline	C
<b>Shelf life @ 4-22°C/ 50%rh</b>	12 months	
<b>Shelf conditions</b>	The storage stability of the Power Weld is < 20°C for one year from the time of manufacture. The expiry date can be seen as ED on the cartridge or label. Temperatures above 25°C reduce storage stability. Lower temperatures of 5-12°C increase the shelf life. If the storage temperature exceeds 40°C and the humidity is high, storage life is reduced to 6 months. The product should be protected from frost (do not refrigerate). Material removed from the container may have been contaminated during use. Therefore do not throw any product residues back into the original container. No liability can be accepted for materials that have been contaminated or stored in a manner other than those listed above.	

\*) All data measured at 23°C @ 50%rh. Meanderings at different ambience- and processing parameters have to be taken into account.

**CONVERSION TABLE**

		Bead thickness	5mm	10mm	15mm
1 feet (ft.) = 304.8mm	1 MPa = 1 N/mm <sup>2</sup> = 145 psi	2mm	10m	5m	3,3m
(°C x 1.8) + 32 = °F	mPa.s = cP	4mm	5m	2,5m	1,6m
(°F-32) x 5/9 = °C	1inch (in.) = 25.4mm	6mm	3,3m	1,6m	1,1m
mm/25.4 = inches (in.)	N·m x 8.851 = lb·in	8mm	2,5m	1,2m	0,8m
µm /25.4 = mil	N·m x 0.738 = lb·ft	10mm	2m	1m	0,6m
N x 0.225 = lb	N·mm x 0.142 = oz·in				
N/mm x 5.71 = lb/in	1 MPa = 1 N/mm <sup>2</sup> = 145 psi				

**SUBSTRATES**

Metals		Plastics		Composites & other	
Aluminium (eloxised)	A	ABS	A	GFK	A
Aluminium (abraded)	A	PA	A	Carbon	A
Brass	A	PBT	X	BMC (Bulk Molding Compound)	X
Cast Iron	A	PC	A	DMC (Dough Molding Compound)	X
Copper	A	PE - HDPE, LDPE, PTEE	X	SMC (Sheet Molding Compound)	A
Iron	A	PETG	X	EPDM	A
Stainless Steel	A	PMMA (Acrylglas, Plexiglas®)	A	Biofibre-Compound (Hemp & Flax)	X
Metall paints (2K)	A	Polyester	A	PP-EPDM	A
Steel (electrolytically galvanised)	A	PP	X	Siliciumcarbide, -nitride, -boride	A
Steel (fire galvanised)	A	PPE	X	Concrete	X
Steel (galvanised)	A	PPSU	X	Basalt	A
Steel (phosphorised)	A	PS (Polystyrol) – Styropor	X	Glass	A
Steel (sandblasted)	A	PUR	A	Granite	A
Chromium Steel	A	PVC - hard/soft	A	Rubber	X
Galvanised Metals	A	PDCPE (Telene)	X	Wood	A
		TPO (thermoplastic polyolefines)	A	Ceramics	A
				Marble	A
				Natural stone (eg. sandstone)	A

A = very much suitable, partly without (\*) or with suitable chemical and/or mechanical pre treatment (\*).  
 X = not specifically tested.

\*) Thorough cleaning of the substrates is always necessary. A suitable primer will always increase the adhesion, regardless of the adhesive system you are intending to use. Because of the large variety of usages of the individual products and the magnitude of circumstances (e.g. methods of usage, surface conditions, system build, etc.) the user is obliged to do a personal trial prior to usage. VIP GmbH offers the possibility of bonding trials in VIP's own lab for classification of various substrates and suitable adhesives.

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### DIRECTIONS FOR USE

Before the Application of the Power Weld it is necessary to check the safety data sheet (SDS) for info on precautions and security measures associated with the product. Even on not classified products the usual precautions for chemical materials should always be adhered to.

Easy application with hand operated or pneumatic dosage gun. To prevent any irregularities in the dried product a guaranteed 1:1 mixing ratio must be achieved at all times. This is only possible using the suitable static mixers with a minimum 16 mixing elements as recommended.

Surfaces must always be dry and free of dust, oils or any grease. For cleaning we recommend the VIP Special Cleaner. On all unprepared metals, please clean with a solvents base spirit wipe first. Please remove rust or other corrosion and fill the damaged areas using our VIP liquid metal or knead metal. In general the use of a chemical (use of a primer) or mechanical preparation (sanding, shot blasting, etc.) always increases the adhesion on the surface to be bonded.

Open the cartridge and attach the static mixer. First apply 2-3cms that you have to discard to ensure the proper mixing of the product. Afterwards apply the Power Weld onto the areas to be bonded. Please apply the adhesive immediately as a thin film or as a bead or droplet onto the substrate. If required smoothen over the bond with a spatula.

The thickness of your bead is dependent on the materials to be bonded (ideally 0.75mm to 3mm). Please ensure that you position the parts within the recommended work time. Later corrections, while the material is curing can reduce the adhesion to your substrates. Please make sure hat the material completely fills the gap to achieve a homogenous adhesive bead.

The cure time is dependent on thickness, working temperature and the temperature of your substrates. For best results, please apply the product at 22°C. Materials with a high conductivity of heat will prolong the cure time. The product will not cure under a surrounding temperature of 6°C. If the substrate is too cold, a thin (mostly invisible) film of condensed water might build on the surface, and this can cause adhesion failure. These surfaces must be tempered and dried prior to bonding.

The cure speed varies depending on the surface materials (steel reacts faster than plastics). The optimum gap width is

between 1-4 mms depending on adhesive area, material elongation, stress and mechanical strain.

The final cure is achieved after approx. 24 hours (dependent on temperature, material and gapwidth).

**Caution:** The mixing of the two components causes a chemical reaction with a strong exotherm build up of heat. When mixing larger amounts a plainly recognisable rise in temperature in the material will occur. Ideally please bond the parts with a low bead thickness (up to 3 mm). Never exceed a bead thickness of 4 mm. Do not discard the reacting material in plastic bins and do not hold metal work pieces in your hands while the adhesive is curing.

All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the user's responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability from his use of the product (e. g. usage parameters, conditions of the substrate, system build, etc.). We recommend in general testing the suitability on a small sample prior to use. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Changes in the material due to product improvements can occur and do not always warrant a change in the technical info.

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Valid is only the latest updated version of this technical product information.

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