

## POWERMIX PROTECT

## PMX 6000 SYSTEM – 2K-POLYURETHAN NON TOXIC - NON HAZARDOUS - NON R40

### 1. DESCRIPTION

The continuous development of the 2K-PU Power Mix series has generated a new VIP innovation in the field of adhesive technology. **Power Mix Protect - PMX 6000** system sets new standards in terms of health and work safety. Due to the reduced labelling classification according to CLP/GHS safety packaging can be reduced ( i.e. gloves) for DIY markets.

**Power Mix Protect – PMX 6000** is a system for dynamically demanding, high strength bonds, which need to retain some flexibility to maintain a high degree of mechanical strength. With an outstanding application consistency **Power Mix Protect – PMX 6000** is the ideal solution for repairing, gap filling, sealing and bonding, as it builds a solid plastic material after hardening. In general a 2K-system always stands for controlled and fast cure and makes bonding independent from surrounding temperature, humidity and bead thickness.

### 2. FEATURES

- ✓ Non Toxic / Free of labelling for H351 / R40
- ✓ Easy clean handling, non dripping, shapeable
- ✓ Suitable for end consumers
- ✓ Extremely fast controlled cure (from the inside to the outside)
- ✓ Cures independent of surrounding temperature, humidity or bead thickness
- ✓ Steadfast bonds, permanently flexible, Non sag
- ✓ Good weathering and ageing resistance
- ✓ Reworking like sanding, drilling and threading within 15-30 mins.
- ✓ Overpaintable after approx. 60 mins.
- ✓ Free of solvents and other VOC's
- ✓ Resists water, oil, petrol, solvents, acids and alkalines
- ✓ Adjustment of Shore-hardness and work times possible
- ✓ Good impact resistance

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3. APPLICATIONS - PART 1

APPLICATION FIELDS	TYPICAL USES
<p><b>AUTOMOTIVE &amp; TRUCKS &amp; TRANSPORT</b></p> <ul style="list-style-type: none"> <li>&gt;&gt; Coach building</li> <li>&gt;&gt; Automotive</li> <li>&gt;&gt; Caravan</li> <li>&gt;&gt; Buses</li> <li>&gt;&gt; Truck &amp; Transport</li> <li>&gt;&gt; Trains (Coach building)</li> <li>&gt;&gt; Farming Machinery</li> <li>&gt;&gt; Special Transport Manufacturing</li> </ul>	<p><b>EFFECTIVE REPAIR of damaged plastic parts (Bumpers, Side Mirrors, Sports Seats, Spoilers, Headlights and other Lightfittings, Roof racks, Plastic Covers and Housings, Trims)</b></p> <ul style="list-style-type: none"> <li>• Repair of holes and cuts (e.g. PUR Form elements, Radiators, etc.)</li> <li>• Sandwichelements, Box Vans, large Cover Elements, Covers, Shades, Interior- Elements, Edge Supports</li> <li>• Bonding of Interior Components</li> <li>• Bonding of wooden floors on steel frames</li> <li>• Exterior Covers</li> <li>• GRP Parts in Front- and Back areas</li> <li>• Sealing of overlapping panels, profiles, wet rooms, Skylights, Tailgates</li> <li>• Seam sealing</li> <li>• Bonding of sport seat shells</li> <li>• Bonding of dashboards</li> <li>• Fixations in the doors(e.g. crash pads)</li> <li>• Fixation of body panels</li> <li>• Bonding in of fixations for the individual adjustment of body panels (black pegs)</li> <li>• Bonding of wood panels onto dashboards</li> <li>• Bonding of interior covers for the hood</li> <li>• Rigid bonding of all types of plastic</li> </ul>
APPLICATION FIELDS	TYPICAL USES
<p><b>STRUCTURAL &amp; CIVIL ENGINEERING</b></p>	<ul style="list-style-type: none"> <li>• Signs, Mirrors, Trims, Reinforcements, Supports</li> <li>• Restoration &amp; Renovation,</li> <li>• Roofs, Windows, Panels</li> <li>• Cable shafts</li> <li>• Filling of holes, cuts and seams in metal, wood, stone, concrete or glass</li> <li>• Bonding of large surfaces</li> <li>• Filling of hollows in walls etc.</li> <li>• Repair of broken out drill holes</li> <li>• High spec assembly bonding</li> </ul>

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3. APPLICATIONS - PART 2

APPLICATION FIELDS	TYPICAL USES
WINDOW, DOORS , GLASS INDUSTRY	<ul style="list-style-type: none"> <li>• Windowframes, Corner frames</li> <li>• Square angle bonding</li> </ul>
APPLICATION FIELDS	TYPICAL USES
MARINE & SHIP BUILDING	<ul style="list-style-type: none"> <li>• Bonding of Interior Elements</li> <li>• Bedding of clamps and fittings</li> </ul>
APPLICATION FIELDS	TYPICAL USES
WIND-& SOLAR ENEREGY	<ul style="list-style-type: none"> <li>• Repair of small holes and defects on the rotor blades (Emergency Repair)</li> <li>• Bonding of insertions and additions on the rotor blades (e.g. Lightning receptors)</li> <li>• Bonding in of cable shafts</li> </ul>
APPLICATION FIELDS	TYPICAL USES
PLASTIC WORKING INDUSTRY	<ul style="list-style-type: none"> <li>• Fast fixation of Mountings (Clips, Lugs, etc.)</li> <li>• Individual adaptability of plastic parts</li> <li>• Insertion of rubberlips, shafts, rings</li> <li>• Filling of pores</li> <li>• Fast bodyfiller for repair of holes, cuts, imperfections on PUR moulded elements</li> <li>• Bonding of special models</li> <li>• Design and Prototyping</li> </ul>
APPLICATION FIELDS	TYPICAL USES
METAL WORKING INDUSTRY	<ul style="list-style-type: none"> <li>• Mountings, Sleeves</li> <li>• Supports, Reinforcements</li> </ul>

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3. APPLICATIONS - PART 3

APPLICATION FIELDS	TYPICAL USES
WOOD WORKING INDUSTRY	<ul style="list-style-type: none"> <li>• Bonding of Foot-elements on furniture</li> <li>• Woodfiller</li> <li>• Bonding of broken of hinges or wood connectors</li> </ul>
APPLICATION FIELDS	TYPICAL USES
PLANT-, MODEL- AND MACHINERY ENGINEERING	<ul style="list-style-type: none"> <li>• Structural bonding on various substrates</li> </ul>
WIDTH	TYPICAL USES
DIY	<ul style="list-style-type: none"> <li>• Various applications &amp; repairs for home, hobby and garden</li> </ul>

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4. PRODUCT PROPERTIES	STANDARD	DATA
Chemical base	-	2-K PUR on HDI & Polyolen base
Product name	-	Power Mix Protect, PMX 6000 System
Colour	-	Black
Packaging sizes	-	50ml, other types / packaging on request
Consistency	-	pasty
Viscosity at +23°C / 50% rh	DIN EN 12092	Comp.A: 55.000 – 85.000 Comp B: 27.000 – 52.000
Mixing Ratio ( Volume )	-	1:1
Density at +23°C / 50% rh	DIN EN 542	Comp. A: 1,50 ± 0,02 Comp. B: 1,50 ± 0,02
Hardness [Shore D] at +23°C / 50% rh	ISO 868	50 – 60
Working temperature (material) at +23°C / 50% rh	-	from +15 to +25
Working temperature (workplace) at +23°C / 50% rh	-	from +5 to +30
Temperature resistance [°C]	ISO 11346	from -40 to +120, short term to +150
Potlife at +23°C / 50% rh	DIN EN 14022	60 - 80
Tack free time in [sec.] at +23°C / 50% rh	-	110 - 150 thin layers of 0,5 mm: appr.. 10-20 min.
Time to reworkability [min.] at +23°C / 50% rh	-	appr. 30
Full curing time [hrs.]	-	appr. 2 full curing after 24 hrs.
Tensile strength [MPa]	ISO 37	> 30
Tensile shear strength [N/mm <sup>2</sup> ] without chemical pretreatment	DIN 54459	stainl steel/stainl steel (1.4462) appr. 4,6 stainl steel/stainl steel (1.4571) appr. 8,1 PC/PC appr. 6,7 PMMA/PMMA appr.1,3
Elongation [%]	ISO 37	appr. 30 - 50
Modulus at 100% density [MPa] at 7 days/ +23°C / 50% rh	ISO 37	appr. 300
Change in volume [%]	-	< 1
Maximum gap value [mm]	-	appr. 5
Shelf life at +23°C / 50% rh	-	12 months
Storage	-	Cool and Dry Keep away from direct sunlight

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5. CHEMICAL RESISTANCE	SUBSTANCE	DATA
<b>Description</b> *A = no effect *B = minimal effect *X = failure not recommended	Water	A
	Saltwater	A
	Aliphatic Solvents	B
	Oil & Grease	A
	Petrol & Diesel	X
	Acetic acid 10%	A
	Water 90°C	B
	Diluted anorganic acids and alkalines	A
	Ester	X
	Ketones	X
	Aromatics	B
	Concentrated Acids	X
	Chlorinated Hydrocarbon	X

**6. ADHESIVE - CONSUMPTION CHART**

>> Number of linear meters per 100ml

LAYER	WIDTH OF THE BONDING SPOT		
	5mm	10mm	15mm
2mm	10m	5m	3,3m
4mm	5m	2,5m	1,6m
6mm	3,3m	1,6m	1,1m
8mm	2,5m	1,2m	0,8m
10mm	2m	1m	0,6m

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**7. SUBSTRATES**

METAL		PLASTICS		COMPOSITES & OTHERS	
Aluminium (eloxised)	A	ABS	A	GRP	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	X	PE - HDPE, LDPE, PP, PTEE	X	SMC (Sheet Molding Compound)	A
Iron	X	PETG	X	EPDM	A
Stainless Steel	X	PMMA (Acrylicglass, Plexiglass®)	A	Biofibre-Compound (Hemp & Flax)	A
Metal Paints (2K)	A	Polyester	A	PP-EPDM	A
Steel (elektrolytically galvanised)	A	PP	X	Siliciumcarbide, -nitride, -boride	A
Steel (galvanised)	A	PPSU	X	Concrete	A
Steel (phosporised)	A	PS (Polystyrol) – Styropor	A	Basalt	A
Steel (sandblasted)	A	PUR	A	Glass	X
Chromium Steel	A	PVC - hard/soft	A	Granite	A
Galvanised Metals	A	PDCPE (Telene)	X	Rubber	X
		TPO (thermoplastic polyolefines)	X	Wood	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 specially 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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### 8. APPLICATION NOTES:

Before the Application of the Power Mix Protect it is necessary to check the material safety data sheet (MSDS) 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 a hand operated or pneumatic dosage gun. To prevent any irregularities in the dried product a guaranteed (1:1) mixing ratio (volume) must be achieved at all times. This is only possible using the suitable static mixers with a minimum of 16 mixing elements as recommended by VIP.

Attach mixing nozzle to your chosen cartridge. Always ensure that both channels of the cartridge are open and not blocked. Before starting the real application dispose of a small amount (5cm). Now the correct mixing ratio is guaranteed and the product is ready for use.

Surfaces must always be dry and free of dust, oils or any grease. For cleaning we recommend the VIP Special Cleaner. 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.

Depending on the type of plastics please abrade the surface with sandpaper and when repairing cuts please cut out a "V"-groove. Remove any old paint by sanding it off. Please use a plastic primer on **all plastics** (except GRP). Spray on the adhesion promoter (VIP Primer) and let it flash off approx. 5-10 minutes. On thermoplastics (PVC, PC, PMMA, etc.) you can prime using an Isopropyl alcohol (IPA). Other types of solvents can damage the surface.

Afterwards go directly onto the parts to be bonded. Apply the adhesive immediately either as a thin film (approx. 0.2mm), a bead or a droplet onto the substrate. If required please smoothen the bead with a plastic spatula. The thickness of your bead should depend on the type of materials to be bonded. Please ensure that you connect the parts within the potlife of the chosen adhesive and press them together firmly to achieve a good adhesion.

The cure time is dependent on thickness, working temperature and the temperature of your substrates (per 10°C higher or lower temperature, the cure time can half or double up). Thick beads harden quicker than thin films. The optimum working temperature is @ 22°C. Materials with a high degree of temperature-lead-through can prolong the curing process. 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. This can be prevented by tempering the surface prior to the bonding process.

For some repairs the usage of a reinforcement film on the back of holes and cuts can be beneficial. Contouring films can help with modelling and shaping the adhesive. These foils need to be removed after cure.

Please avoid longer pauses, as the adhesive will cure in the mixing nozzle. Any reworking (e.g. sanding) of the material is possible after 15-30 minutes. The bonded area can be overpainted after full curing.

For overpaintability of PUR we recommend the use of solvent based 1K or 2K resin systems or waterbased systems. In most cases those paint systems and coatings are based on polyurethanes and therefore in the same chemical family as the adhesive.

On **all unprepared metals** we recommend to clean (degrease) with a solvent based spirit wipe first and afterwards sand or shot blast the surface first. Remove any rust or other corrosion and fill the damaged areas (VIP liquid metal, knead metal). 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. This can be prevented by tempering the surface prior to the bonding process.

**Caution:** The mixing of the two components causes a chemical reaction with a strong exothermal build up of heat. When mixing larger amounts (approx. 5mm bead thickness) a plainly recognisable rise in temperature in the material will occur. The reaction temperature will not exceed 90°C. Do not discard the reacting material in plastic bins and do not hold metal work pieces in your hands while the adhesive is curing.



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**9. PRODUCT OVERVIEW**

Product Description	Content	Item-No.:
<b>Powermix 2K Adhesive</b>	50ml Cartridge, other packagings on request	PXM 6050
<b>Special Cleaner</b>	1K Alkaline Liquid Cleaner- For Plastics and Metal surfaces	PMX 4910
<b>Primer</b>	1K Primer for Plastics	PMX 4924
<b>Dispensing gun 50ml</b>	1:1 Cartridge application - manually – metal – Deluxe	PMX 5003
<b>Mixer turbo blue</b>	For 25/50ml cartridges - Bayonet - 16 Mixing elements – square	PMX 4944
<b>Contouring film</b>	Coated – reinforced - 150 x 12,5cm	PMX 4904

\* For further accessories, please check out the latest VIP Product/Pricelists or our web page: [www.vip-gmbh.com](http://www.vip-gmbh.com)

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