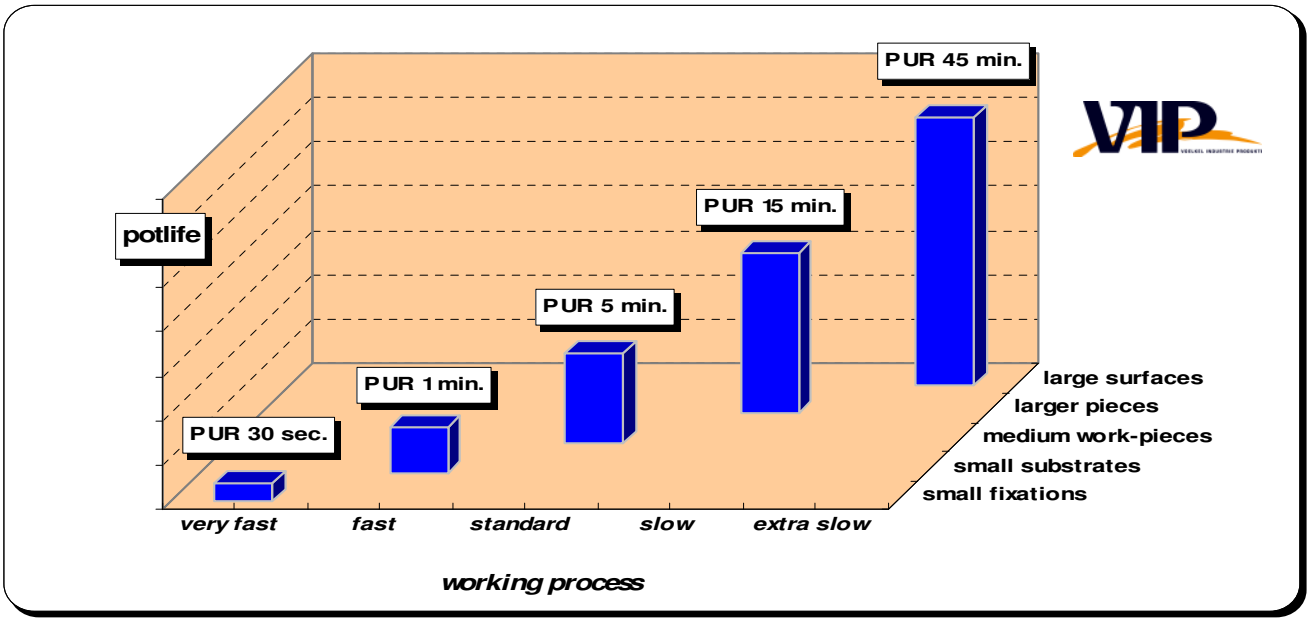
PRODUCT INFORMATION

2K Polyurethane Power Mix – Universal 30 seconds

POLYURETHANE

1. Characteristics:

In many areas of industry 2-component Polyurethane- Systems are among the most used bonding systems. One of the outstanding advantages of a 2K PUR is the wide range of adjustability of its characteristics. The rapid development of new ranges of substrates and processes creates always changing demands on the adhesive mechanisms. Through decades of building up the competence in adhesives-engineering for the classic plastic to plastic and plastic to metal bonding, as well as plastic repair, VIP developed an "Industrial Standard" through its *2K PowerMix Universal recipes*. With potlifes ranging from 30 seconds to 45 minutes and more, all thinkable bonding operations are actually possible, from manual application to automated processing, from the small speedy fixation to any large area bonding operation. *2K PowerMix Universal* is a system for dynamically demanding, high strength bonds, which need to retain some flexibility to maintain a high degree of mechanical strength. With a outstanding application consistency *2K Power Mix* 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. „Pro"-facts at a glance:

- Easy clean handling, non dripping, shapeable
- 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:

Areas of use:	Applications:
Automotive & Truck & Transport: *>> Coach building* *>> Automotive* *>> Caravan* *>> Buses* *>> Truck & Transport* *>> Trains (Coach building)* *>> Farming Machinery* *>> Special Transport Manufacturing*	***Effective Repair*** of damaged plastic parts (Bumpers, Side Mirrors, Sports Seats, Spoilers, Headlights and other Lightfittings, Roof racks, Plastic Covers and Housings, Trims) Repair of holes and cuts (e.g. PUR Form elements, Radiators, etc.) Box Vans, Covers, Shades, Interior-Elements, Edge Supports Bonding of Interior Components Bonding of wooden floors on steel frames Exterior Covers GRP Parts in Front- and Back areas Sealing of ovelapping panels, profiles, wet rooms, Skylights, Tailgates Seam sealing Bonding of sport seat shells Bonding of dashboards Fixations in the doors(e.g. crash pads) Fixation of body panels Bonding in of fixations for the individual adjustment of body panels (black pegs) Bonding of wood panels onto dashboards Bonding of interior covers for the hood Rigid bonding of all types of plastic
Structural & Civil Engineering	Signs, Mirrors, Trims, Reinforcements, Supports Restoration & Renovation, Roofs, Windows, Panels Cable shafts Filling of holes, cuts and seams in metal, wood, stone, concrete or glass Bonding of large surfaces Filling of hollows in walls etc. Repair of broken out drill holes High spec assembly bonding

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Window, Doors , Conservatories, Glass Industry	Windowframes, Corner frames Square angle bonding
Marine & Ship Building	Bonding of Interior Elements Bedding of clamps and fittings
Wind & Solar Energy	Repair of small holes and defects on the rotor blades (Emergency Repair) Bonding of insertions and additions on the rotor blades (e.g. Lightning receptors) Bonding in of cable shafts
Plastic Working Industry	Fast fixation of Mountings (Clips, Lugs, etc.) Individual adaptability of plastic parts Insertion of rubberlips, shafts, rings Filling of pores Fast bodyfiller for repair of holes, cuts, imperfections on PUR moulded elements Bonding of special models Design and Prototyping
Metal Working Industry	Mountings, Sleeves Supports, Reinforcements
Wood Working Industry	Bonding of Foot-elements on furniture Woodfiller Bonding of broken of hinges or wood connectors
Plant-, Model- and Machinery Engineering	Structural bonding on various substrates
DIY	Various applications & repairs for home, hobby and garden

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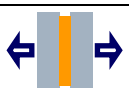
4. Technical properties:

Chemical base	2-K Polyurethanes (PUR)	
Product name	Power Mix Universal	
Colour	Opaque	
Packaging sizes 	25ml, 50ml, Hobbocks, Drums * * for further information on products and pricelists, please check out out webpage at: www.vip-gmbh.com	
Solids	100%	
Solvents	no	
Volatile Organic Content (VOC)	< 0,1%	
Consistency	pasteus, thixotropic	
Viscosity @ +23°C / 50% rh	~ 45.000 mPas	
Mixing Ratio (volume)	1:1	
Density @ +23°C / 50% rh	Component A: 1,02 g/cm³ Component B: 1,19 g/cm³	
Shore Hardness (D)	~ 70 Sh-D	
Working temperature (material) @ +23°C / 50% rh	from +17°C to +25°C	
Working temperature (workplace) @ +23°C / 50% rh	from +5°C to +30°C	
Temperature resistance	from -40°C to +120°C short term to +140°C	
Potlife @ +23°C / 50% rh	20 sec	
Tack free time @ +23°C / 50% rh	30 sec	
Time to reworkability @ +23°C / 50% rh	30 mins	
Full curing time @ +23°C / 50% rh	2 hrs	
Tensile strength – DIN 53504 	> 30 MPa	
Tensile shear strength - DIN 54459 	Steel/Steel: AL/AL: ABS/PVC: GRP/GRP:	~ 5,4 N/mm² ~ 8,0 N/mm² ~ 3,7 N/mm² ~ 1,8 N/mm²
Elongation	~ 30%	
Modulus at 100% density @ 7 Tage / +23°C / 50% rF	~ 300 MPa	
Change in volume	< 1%	
Maximum gapwidth	~ 5mm	

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Chemical Resistance

*A = no effect
*B = minimal effect
*C = failure not recommended

Water	A
Saltwater	A
Aliphatic Solvents	B
Oil & Grease	A
Petrol & Diesel	B-C
Acetic acid 10%	A
Water 90°C	B
Diluted anorganic acids and alkalines	A
Ester	C
Ketones	C
Aromatics	C
Concentrated Acids	C
Chlorinated Hydrocarbon	C

Shelf life

@ 4-22°C/ 50%rh

12 months

Shelf Conditions

Cool and Dry
Keep away from direct sunlight

Conversion table

1 feet (ft.) = 304.8mm
(°C x 1.8) + 32 = °F
(°F-32) x 5/9 = °C
mm/25.4 = inches (in.)
µm /25.4 = mil
N x 0.225 = lb
1 feet (ft.) = 304.8mm

1 MPa = 1 N/mm² = 145 psi
mPa.s = cP
1inch (in.) = 25.4mm
N·m x 8.851 = lb·in
N·m x 0.738 = lb·ft
N·mm x 0.142 = oz·in
1 MPa = 1 N/mm² = 145 psi

Adhesive-Consumption Table

>> Number of metres per 100ml

	Width of adhesive bead		
Bead thickness	**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*

5. Substrate:

Metals		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	X	PC	A	DMC (Dough Molding Compound)	X
Copper	A	PE - HDPE, LDPE, PP, PTEE	X	SMC (Sheet Molding Compound)	A
Iron	A	PETG	X	EPDM	A
Stainless Steel	A	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 (fire galvanised)	A	PPE	X		
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 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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6. Directions for use:

Before the Application of the Power Mix 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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6a. VIP Accessories for use

Product Desciption		Part no.*
Special Cleaner	1K Alkaline Liquid Cleaner- For Plastics and Metal surfaces	PMX 4910
Primer	1K Primer for Plastics	PMX 4924
Doage gun 50ml	1:1 Cartridge application - manually – metal – ***Deluxe***	PMX 5003
Dosage gun 250/310ml	1:1 Cartridge application - manually – metal – ***Deluxe***	ZUB 5001
Dosage gun 600ml	1:1 Cartridge application - manually – metal – ***Deluxe***	ZUB 5100
Mixer eco transparent	For 25/50ml cartridges - Bayonet - 16 Mixing elements – round	PMX 4942
Mixer turbo blue	For 25/50ml cartridges - Bayonet - 16 Mixing elements – square	PMX 4944
Mixer standard green	For 200-600ml cartridges - 19 Mixing elements – square - 10,7mm	PMX 4953
Contouring film	Coated - 150 x 12,5cm	PMX 4903
Reinforcement film	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

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