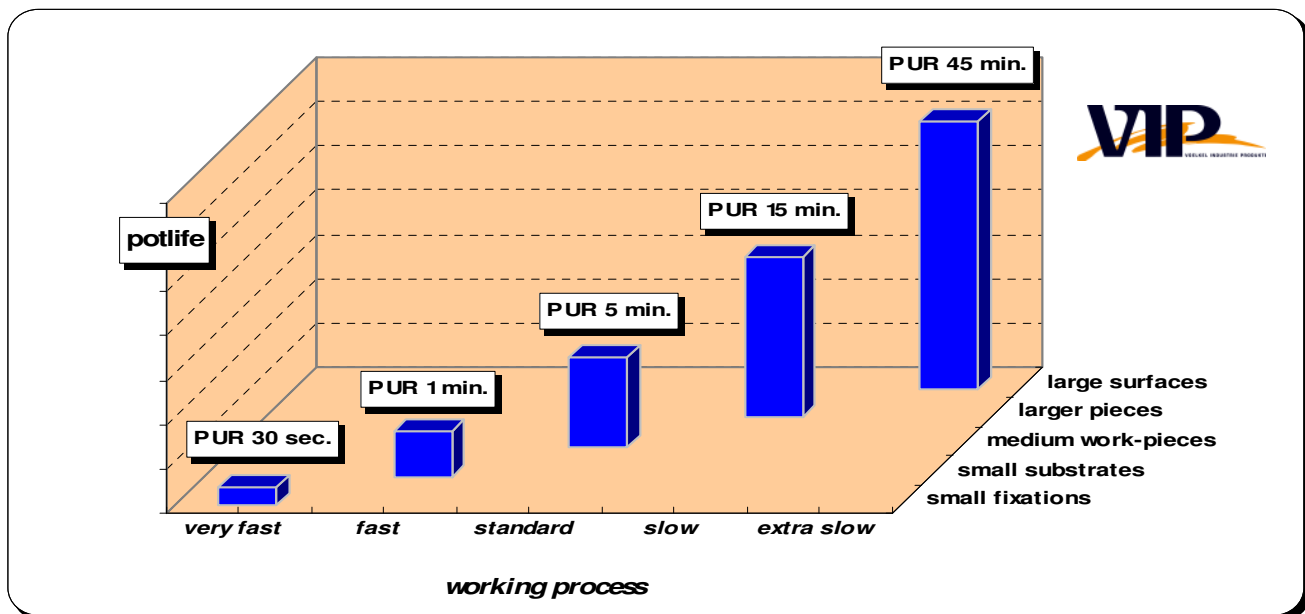


2K Polyurethane Power Mix – Flexible 5 minutes

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 potlives 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.



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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 20-30 mins.
- ◆ Overpaintable
- ◆ 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.)

Sandwichelements, Box Vans, large Cover Elements, 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 overlapping 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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<i>Window, Doors , Conservatories, Glass Industry</i>	Windowframes, Corner frames Square angle bonding
<i>Marine & Ship Building</i>	Bonding of Interior Elements Bedding of clamps and fittings
<i>Wind & Solar Energy</i>	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
<i>Plastic Working Industry</i>	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
<i>Metal Working Industry</i>	Mountings, Sleeves Supports, Reinforcements
<i>Wood Working Industry</i>	Bonding of Foot-elements on furniture Woodfiller Bonding of broken of hinges or wood connectors
<i>Plant-, Model- and Machinery Engineering</i>	Structural bonding on various substrates
<i>DIY</i>	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	Black, opaque	
Packaging sizes		50ml, 600ml, Hobbocks, Drums *
Solids	100%	
Solvents	No	
Volatile Organic Content (VOC)	< 0,1%	
Consistency	pasteus, thixotropic	
Viscosity @ +23 °C / 50% rh	~ 50.000 mPas	
Mixing Ratio (volume)	1:1	
Density @ +23 °C / 50% rh	Component A: 1,02 g/cm ³ Component B: 1,19 g/cm ³	
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	300 sec	
Tack free time @ +23 °C / 50% rh	390 sec	
Time to reworkability @ +23 °C / 50% rh	30 mins	
Full curing time @ +23 °C / 50% rh	4 hrs	
Tensile strength – DIN 53504		> 30 MPa
Tensile shear strength - DIN 54459		Steel/Steel: ~ 5,4 N/mm ² AL/AL: ~ 8,0 N/mm ² ABS/PVC: ~ 3,7 N/mm ² GRP/GRP: ~ 1,8 N/mm ²
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 12 months
@ 4-22°C/ 50%rh

Shelf Conditions Cool and Dry
Keep away from direct sunlight

Conversion table

1 feet (ft.) = 304.8mm	1 MPa = 1 N/mm ² = 145 psi
(°C x 1.8) + 32 = °F	mPa.s = cP
(°F-32) x 5/9 = °C	1inch (in.) = 25.4mm
mm/25.4 = inches (in.)	N·m x 8.851 = lb·in
µm /25.4 = mil	N·m x 0.738 = lb·ft
N x 0.225 = lb	N·mm x 0.142 = oz·in
1 feet (ft.) = 304.8mm	1 MPa = 1 N/mm ² = 145 psi

Adhesive-Consumption Table

>> Number of metres per 100ml

Bead thickness	Width of adhesive bead		
	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
Aluminium (abraded)	A PA	A Carbon
Brass	A PBT	X BMC (Bulk Molding Compound)
Cast Iron	X PC	A DMC (Dough Molding Compound)
Copper	A PE - HDPE, LDPE, PP, PTEE	X SMC (Sheet Molding Compound)
Iron	A PETG	X EPDM
Stainless Steel	A PMMA (Acrylicglass, Plexiglass®)	A Biofibre-Compound (Hemp & Flax)
Metal Paints (2K)	A Polyester	A PP-EPDM
Steel (elektrolytically galvanised)	A PP	X Siliciumcarbide, -nitride, -boride
Steel (fire galvanised)	A PPE	X
Steel (galvanised)	A PPSU	X Concrete
Steel (phosporised)	A PS (Polystyrol) – Styropor	A Basalt
Steel (sandblasted)	A PUR	A Glass
Chromium Steel	A PVC - hard/soft	A Granite
Galvanised Metals	A PDCPE (Telene)	X Rubber
	TPO (thermoplastic polyolefines)	X Wood
		Ceramics
		Marble
		Natural stone (eg. sandstone)

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 20-30 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 Description		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

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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