

## Technical Data Sheet: PUROK VX 61

### Product Description

**Purok VX61** is an acrylic structural adhesive that has increased flexibility. It is designed for applications that require a very high-strength adhesive to withstand light impact and vibrations.

### Key Features

- High lap shear strength
- High peel strength
- Impact toughened
- Medium flexibility
- Excellent chemical resistance
- Varied cure speed available
- Minimal surface preparation required



### Applications

- Effective for bonding dissimilar substrates with minimal surface preparation e.g. metals, plastics, and composites.
- Perfect for bonding joints that will experience movement and light impact as the increased flexibility will absorb the stress.

### Cure Times Available.

VX 61-05 (Fixture Time is ~5 minutes)  
VX 61-20 (Fixture time is ~20 minutes)  
VX 61-40 (Fixture time is ~40 minutes)  
VX 61-90 (Fixture time is ~90 minutes)

### Volumes Available.

**Cartridges**  
50ml  
200ml  
490ml



**Bulk**



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### Typical Physical Properties

#### Uncured

| Properties                     | Part A  | Part B   |
|--------------------------------|---------|----------|
| Chemistry                      | Acrylic | Peroxide |
| Colour                         | Cream   | Black    |
| Viscosity @ 10 s <sup>-1</sup> | 95,000  | 32,000   |
| Density [g/ml -1]              | 1       | 1.15     |
| Mix ratio by volume            | 10      | 1        |
| Mix ratio by weight            | 10      | 1.15     |

#### Cured

| Properties                                                                 | VX 61-05 | VX 61-20 | VX 61-40 | VX 61-70 |
|----------------------------------------------------------------------------|----------|----------|----------|----------|
| Colour                                                                     | Black    | Black    | Black    | Black    |
| Working Time                                                               | 2 mins   | 8 mins   | 25 mins  | 40 mins  |
| Handling Time<br>(Minimum time to achieve >0.3 MPa overlap shear strength) | 5 mins   | 15 mins  | 40 mins  | 60 mins  |
| Time to reach peak exothermic reaction temperature (10g mass)*             | 5 mins   | 15 mins  | 35 mins  | 70 mins  |

### Typical Performance Characteristics

#### Overlap Shear Strength

In accordance with ISO4587

#### Disclaimer

We bonded overlap shear specimens with overlap dimensions of 12.5 (length) x 25 (width) x 0.5 (thickness) mm.

We allowed each specimen to cure for 3 days at 20°C and 50% relative humidity. We then pulled the test pieces apart at a rate of 6mm/ min for metals. And 50mm/min for composites and plastics.

| Substrate                | Surface Prep                      | Overlap Shear Strength | Failure Mode |
|--------------------------|-----------------------------------|------------------------|--------------|
| Aluminium                | - IPA wiped<br>- Abraded (120g) * | 20<br>19               | CF<br>CF     |
| Anodised Aluminium       | - IPA wiped<br>- Abraded (120g) * | 18<br>19               | CF<br>CF     |
| Stainless Steel          | - IPA wiped<br>- Abraded (120g) * | 20<br>18               | CF<br>CF     |
| Mild Steel               | - Abraded (120g)*                 | 20                     | CF           |
| E-galvanised Steel       | - IPA wiped                       | 18                     | CF           |
| Hot-Dip Galvanised Steel | - IPA wiped                       | 14                     | CF           |
| GRP - Epoxy              | - IPA wiped                       | 10                     | SF           |
| GRP - Polyester          | - IPA wiped                       | 9                      | SF           |
| PMMA                     | - IPA wiped                       | 8                      | SF           |
| ABS                      | - IPA wiped                       | 6                      | SF           |
| Polycarbonate            | - IPA wiped                       | 8                      | SF           |
| PVC                      | - IPA wiped                       | 7                      | SF           |

IPA = Isopropyl alcohol, CF = Cohesive Failure, AF = Adhesive Failure, SF = Substrate Failure  
\*Abraded (120g) = Abrade with 120 grit pad then clean with IPA  
All substrates used to create a lap shear specimen were 2mm in thickness



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### Tensile Properties

In accordance with  
ASTM D638

| Properties                         | Value |
|------------------------------------|-------|
| Tensile Strength at Break[MPa]     | 14    |
| Percentage Elongation at Break [%] | 20-25 |

Tensile properties measured on 3mm thick dumbbell specimens  
at a rate of 5mm/min

### Hardness

Tested in accordance  
with ASTM D2240

| Properties       | Value |
|------------------|-------|
| Shore D Hardness | 70    |

Shore A hardness measured on a 7mm thick sample of cured  
adhesive

## Adhesive Performance | Temperature Resistance

### Overlap Shear Strength

In accordance with ISO4587

We bonded overlap shear specimens with overlap dimensions of 12.5 (length) x 25 (width) x 0.5 (thickness) mm. We allowed each specimen to cure for 3 days at 20°C and 50% relative humidity. We then pulled the test pieces apart at a rate of 6mm/ min for metals. And 50mm/min for composites and plastics.

### Short Term Exposure at Temperature

Test specimens  
exposed to the test  
temperature for 5  
minutes and pulled  
apart at the test  
temperature.  
Pull rate 6mm/min.

| Substrates | Surface Prep    | Test Temp [°C] | Shear Strength | Failure Mode | % Strength Retention<br>(% against 25°C strength) |
|------------|-----------------|----------------|----------------|--------------|---------------------------------------------------|
| Aluminium  | Abraded (120g)* | -16            | 21             | CF           | 122                                               |
| Aluminium  | Abraded (120g)* | 25             | 17             | CF           | 100                                               |
| Aluminium  | Abraded (120g)* | 50             | 12             | CF           | 70                                                |
| Aluminium  | Abraded (120g)* | 75             | 9              | CF           | 49                                                |
| Aluminium  | Abraded (120g)* | 100            | 5              | CF           | 29                                                |
| Aluminium  | Abraded (120g)* | 120            | 3              | CF           | 17                                                |
| Aluminium  | Abraded (120g)* | 150            | 2              | CF           | 9                                                 |
| Aluminium  | Abraded (120g)* | 200            | 0.5            | CF           | 1                                                 |

IPA = Isopropyl alcohol, CF = Cohesive failure, AF = Adhesive Failure, SF = Substrate Failure

\*Abraded (120g) = Abrade with 120 grit pad then clean with IPA

All substrates used to create a lap shear specimen were 3mm in thickness

### Long Term Exposure - 7 days

Test specimens  
exposed to the test  
temperature for 7  
days, allowed to  
condition back to  
(20°C 50%RH) and  
pulled apart at a rate  
of 6mm/min.

| Substrates | Surface Prep    | Test Temp [°C] | Shear Strength | Failure Mode | % Strength Retention<br>(% against 25°C strength) |
|------------|-----------------|----------------|----------------|--------------|---------------------------------------------------|
| Aluminium  | Abraded (120g)* | -16            | 18             | CF           | 100                                               |
| Aluminium  | Abraded (120g)* | 50             | 17             | CF           | 97                                                |
| Aluminium  | Abraded (120g)* | 100            | 20             | CF           | 100                                               |

IPA = Isopropyl alcohol, CF = Cohesive failure, AF = Adhesive Failure, SF = Substrate Failure

\*Abraded (120g) = Abrade with 120 grit pad then clean with IPA

All substrates used to create a lap shear specimen were 3mm in thickness



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### Adhesive Performance

#### Chemical and Environmental Testing

In accordance with ISO4587

Lap shears of stainless steel were made in accordance with ISO4587 with the following dimensions 25 x 12.5 x 1mm and allowed to cure for 14 days under ambient conditions (20°C 50% RH). Lap shear specimens were fully immersed in chemical solution for 24 hours and 14 days, before being tested for strength retention.

| Chemical                                  | Surface Prep | Days Immersed | Strength Retention % |
|-------------------------------------------|--------------|---------------|----------------------|
| Water                                     | IPA          | 1<br>14       | 95<br>97             |
| 5% Salt Solution                          | IPA          | 1<br>14       | 95<br>94             |
| 1.5M Hydrochloric Acid                    | IPA          | 1<br>14       | 94<br>36             |
| Conc. Bleach Solution                     | IPA          | 1<br>14       | 100<br>87            |
| Polar Protic Solvent - IPA                | IPA          | 1<br>14       | 99<br>99             |
| Polar Aprotic Solvent - Acetone           | IPA          | 1<br>14       | 3<br>0               |
| Non-polar Solvent - Diesel / Hydrocarbons | IPA          | 1<br>14       | 69<br>89             |

IPA = Isopropyl alcohol, CF = Cohesive failure, AF = Adhesive Failure, SF = Substrate Failure

\*Abraded (120g) = Abrade with 120 grit pad then clean with IPA

All substrates used to create a lap shear specimen were 3mm in thickness.

#### Floating Roller Peel

In accordance with BS EN 2243-2:2005

Floating roller peel specimens configured using abraded 3mm and 1.2mm Aluminium with a bondline thickness of 0.3mm. Test specimens left to cure for 3 days @ 20°C 50% RH. Pull rate 152mm/min.

| Substrate | Surface Prep    | Test Temp [°C] | Average Peel Force [N/cm] | Failure Mode |
|-----------|-----------------|----------------|---------------------------|--------------|
| Aluminium | Abraded (120g)* | 20             | 91                        | CF           |

IPA = Isopropyl alcohol, CF = Cohesive failure, AF = Adhesive Failure, SF = Substrate Failure

\*Abraded (120g) = Abrade with 120 grit pad then clean with IPA

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### Adhesive Performance

#### Cataplasma Accelerated Weathering

Lap Shears of stainless steel were made in accordance with ISO4587 with the following dimensions 25.0 × 12.5 x 1.0mm and allowed to cure for 14 days under ambient conditions (20°C 50% RH). Lap shears are subjected to 100%RH at 70 +2 °C for 168 hours. On removal from the oven, the samples are immediately placed into a freezer at -20+2 °C for 16 hours. Samples are removed from freezer and allowed to thaw. Lap shears are allowed to re-condition under ambient conditions (20 °C @ 50% RH) for 4 hours before being tested.

| Substrate       | Surface Prep | Strength Retention % |
|-----------------|--------------|----------------------|
| Stainless Steel | IPA Wiped    | 84                   |

IPA: Isopropyl alcohol; CF: Cohesive failure; AF: Adhesive Failure; SF: Substrate Failure

#### Heat and Humidity Ageing

Lap Shears of Aluminium (6082) were made in accordance with ISO4587 with the following dimensions 25.0 × 12.5 x 1.0 mm and allowed to cure for 14 days under ambient conditions (20 °C @ 50% RH). Lap shears are subjected to 95%RH at 70 +2°C for up to 1000 hours

| Substrate    | Exposure Time (hours) | Strength Retention % |
|--------------|-----------------------|----------------------|
| Aluminium 60 | 500                   | 95                   |
| Aluminium    | 1000                  | 92                   |

#### Salt Spray Ageing (ASTM B117)

Lap Shears of Aluminium (6082) were made in accordance with ISO4587 with the following dimensions 25.0 × 12.5 x 1.0 mm and allowed to cure for 14 days under ambient conditions (20 °C @ 50% RH). Lap shears are subjected to salt spray conditions in accordance with ASTM B117 for up to 1000 hours

| Substrate    | Exposure Time (hours) | Strength Retention % |
|--------------|-----------------------|----------------------|
| Aluminium 60 | 500                   | 95                   |
| Aluminium    | 1000                  | 92                   |

### Remarks, Disclaimer & Health and Safety

**Disclaimer** - The variability of materials, substrates and conditions of use is such that no warranty of their functionality for a specific application can be deducted from this information, written recommendation or any other type of suggestion offered. Each user has the responsibility to complete adequate evaluations on the efficacy of the materials offered by Forgeway, of its products, services, recommendations and suggestions for the specific application need, and must accomplish sufficient testing to ascertain that the final product will be safe and sound for the final intent of the end user.

**Health and safety** - Refer to Safety Data Sheet (SDS) for further information. Apply the usual industrial hygiene.

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## Online Knowledge Centre

Our online knowledge centre has a large range of articles and product reviews to educate



## Fundamentals of Adhesive eBook

Forgeways book "The Fundamentals of Adhesive" has over 200 pages full of in-depth adhesive and bonding knowledge.



## The Adhesive Learning Centre

Head to our YouTube Channel to find loads of helpful reviews, adhesive tips and informative videos all about adhesives and bonding.

