

# Technical data sheet



Product: ET515

Manufacturer: PERMABOND ENGINEERING ADHESIVES

Product group: KLEBSTOFF

Article group: 2-K KLEBSTOFF

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## PERMABOND® ET515

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## Features & Benefits

- Adhesion to a wide variety of substrates
- Full cure at room temperature
- Easy to apply
- Semi-flexible
- Good impact strength

## Description

**PERMABOND® ET515** is a 1:1 mixable epoxy adhesive. ET515 is a semi-flexible toughened adhesive with good adhesion to a variety of substrates such as wood, metal, ceramics and some plastics and composites. It's a relatively fast curing epoxy; reaching handling strength in 20-30 minutes. It is ideal for bonding different materials where differential thermal expansion is anticipated.

## Physical Properties of Uncured Adhesive

|                      | ET515 A side                      | ET515 B side                      |
|----------------------|-----------------------------------|-----------------------------------|
| Chemical composition | Epoxy Resin                       | Polyamine Hardener                |
| Appearance           | Colourless                        | Colourless                        |
| Viscosity @ 25°C     | 20rpm: 15,000 mPa.s ( <b>CP</b> ) | 20rpm: 19,000 mPa.s ( <b>CP</b> ) |
| Specific gravity     | 1.1                               | 1.1                               |

## Typical Curing Properties

|                         |                     |
|-------------------------|---------------------|
| Mix ratio by volume     | 1:1                 |
| Maximum gap fill        | 2 mm <b>0.08 in</b> |
| Usable / pot life @23°C | 10-20 mins          |
| Handling time @23°C     | 20-30 mins          |
| Working strength @23°C  | 24 hours            |
| Full cure @23°C         | 72 hours            |

## Typical Performance of Cured Adhesive

|                                      |  |
|--------------------------------------|--|
| Shear strength* (ISO4587)            | Mild steel: 8-12 N/mm <sup>2</sup><br>( <b>1160-1740psi</b> )<br>Aluminium: 9-12 N/mm <sup>2</sup><br>( <b>1305-1740psi</b> )<br>Stainless Steel: 6-9 N/mm <sup>2</sup><br>( <b>870-1305psi</b> )<br>Carbon Fibre: 8-12 N/mm <sup>2</sup><br>( <b>1160-1740psi</b> )<br>FRP Glass/Polyester: 3-5 N/mm <sup>2</sup><br>( <b>435-725psi</b> )<br>FRP Glass/Epoxy: 4-6 N/mm <sup>2</sup><br>( <b>580-870psi</b> )<br>Polycarbonate: >5 N/mm <sup>2</sup> ** SF<br>( <b>&gt;725psi</b> )<br>PA6 30% filled: 4-5 N/mm <sup>2</sup><br>( <b>580-725psi</b> ) |
| Peel strength (aluminium) (ISO11339) | 100-150 N/25mm ( <b>23-34 PIW</b> )  |
| Hardness (ISO868)                    | 30-50 Shore D  |
| Elongation at break (ISO37)          | 20-40%   |
| Glass transition temperature Tg      | 20°C ( <b>68°F</b> )   |
| Dielectric strength                  | 15-25 kV/ mm   |
| Thermal conductivity                 | 0.34 W/(m.K)   |

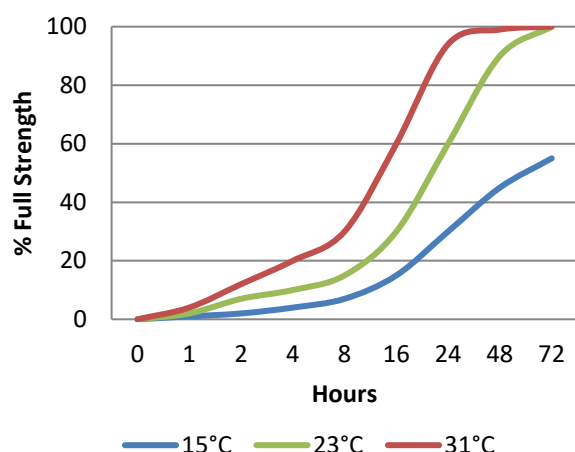
\*Strength results will vary depending on the level of surface preparation and gap.

\*SF Denotes substrate failure

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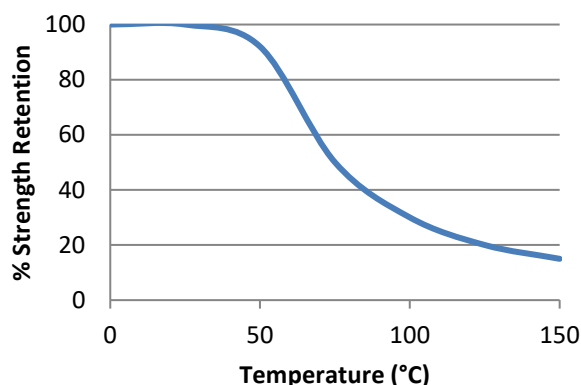
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## Strength Development



Graph shows typical strength development of bonded components. An increase of 8°C in temperature will halve the cure time. Lower temperatures will result in a slower cure time.

## Hot Strength



"Hot strength" shear strength tests performed on mild steel. Fully cured specimens conditioned to pull temperature for 30 minutes before testing at temperature. ET515 can withstand higher temperatures for brief periods (such as for paint baking and wave soldering processes) providing the joint is not unduly stressed. The minimum temperature the cured adhesive can be exposed to is -55°C (-65°F) depending on the materials being bonded.

## Additional Information

This product is not recommended for use in contact with strong oxidizing materials.

Information regarding the safe handling of this material may be obtained from the safety data sheet.

Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene.

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## Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive. Use a suitable solvent (such as acetone or isopropanol) for the degreasing of surfaces. Some metals such as aluminium, copper and its alloys will benefit from light abrasion with emery cloth (or similar), to remove the oxide layer.

## Directions for Use

- Dual cartridges:
  - Insert the cartridge into the application gun and guide the plunger into the cartridge.
  - Remove the cartridge cap and dispense material until both sides are flowing.
  - Attach the static mixer to the end of the cartridge and begin dispensing the material.
- Apply material to one of the substrates.
- Join the parts. Parts must be joined within the usable pot life of mixing the two epoxy components.
- Large quantities and/or higher temperature will decrease the usable life or pot life.
- Apply pressure to the assembly by clamping until handling strength is obtained.
- Full cure will be obtained after 72 hours at 23°C (73°F). Heat can be used to accelerate the curing process.

## Storage & Handling

|                     |                        |
|---------------------|------------------------|
| Storage Temperature | 5 to 25°C (41 to 77°F) |
|---------------------|------------------------|

## Video Links

Surface preparation:

<https://youtu.be/8CMOMP7hXjU>

Two-part epoxy directions for use:

<https://youtu.be/GRX1RyknYqc>



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