PERMABOND® 712

Cyanoacrylate

Provisional Technical Datasheet

Features & Benefits

- Excellent water resistance
- Designed for hot and wet environments
- Ease of use – no mixing or heat cure
- Bonds most materials
- 100% reactive, no solvents

Description

PERMABOND® 712 is a low viscosity, solvent free cyanoacrylate adhesive. This product shows a unique resistance underwater or in hot and wet conditions. It provides high adhesion performance on a variety of substrates including metals, plastics and rubbers. It also exhibits excellent thermal resistance and is suitable for continuous use up to 120°C (150°C peak).

Physical Properties of Uncured Adhesive

Chemical composition	Ethyl cyanoacrylate
Appearance	Transparent
Viscosity @ 25°C	100 mPa.s *(cP)*
Specific gravity	1.1

Typical Curing Properties

Maximum gap fill	0.15 mm *0.006 in*
Fixture time* *(0.1 N/mm² shear strength is achieved)*	10 seconds (ABS) 15 seconds (Aluminium) 10 seconds (EPDM) 25 seconds (Mild Steel) 3 seconds (Buna N Rubber) 15 seconds (Nylon 6) 20 seconds (Nylon 6,6) 10 seconds (Phenolic) 15 seconds (PVC)
Full strength	24 hours

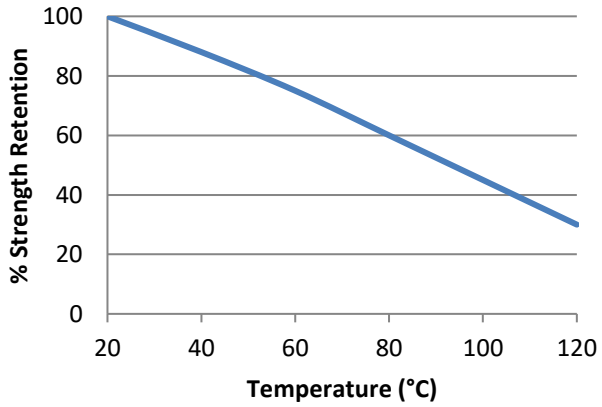
**Fixture times can be affected by temperature, humidity and specific surfaces being bonded. Larger gaps or acidic surfaces will also reduce cure speed.*

Typical Performance of Cured Adhesive

Shear strength*	Mild steel (gritblasted): 19-24 N/mm² *(2755-3480 psi)* Aluminium (gritblasted): 18-23 N/mm² *(2610-3336 psi)* Nylon 6: 4-6 N/mm² *(580-870 psi)* Nylon 6,6: 5-7 N/mm² *(725-1015 psi)* ABS: 5 N/mm² SF** *(725psi)* PVC: 6 N/mm² SF** *(870psi)* PC: 4 N/mm² SF** *(580 psi)*

**Strength results will vary depending on the level of surface preparation and gap.*
***SF = Substrate failure*

Hot Strength



"Hot strength" shear strength tests performed on mild steel. 24hr cure at room temperature and conditioned to pull temperature for 30 minutes before testing.

712 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.

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Thermal Aging

The table below shows the shear strength retained after thermal aging. Lap shear specimens were prepared and cured for 72h at 23°C, aged at the indicated temperature, and tested at 23°C.

THERMAL AGING		
Adhesion on abraded mild steel	100h at 120°C	80% strength retention
	500h at 120°C	50% strength retention

Chemical Resistance

The table below shows the shear strength retained after immersion in water. Lap shear specimens were prepared and cured for 72h at 23°C, aged at the indicated condition, and tested at 23°C.

WATER (CHEMICAL) RESISTANCE		
Adhesion on abraded mild steel	100h at 60°C	95% strength retention
	1000h at 60°C	75% strength retention

Heat and Moisture Resistance

The chart below shows the shear strength retained after heat and moisture aging. Lap shear specimens were prepared and cured for 72h at 23°C, aged at the indicated condition, and tested at 23°C.

HEAT & MOISTURE RESISTANCE		
Adhesion on abraded mild steel	170h at 85°C / 85% RH	90% strength retention

Additional Information

This product is not recommended for use in contact with strong oxidizing materials and polar solvents although will withstand a solvent wash without any bond strength deterioration. Users are reminded that all materials, whether innocuous or not, should be handled in accordance with the principles of good industrial hygiene. Full information can be obtained from the Safety Data Sheet.

This Technical Datasheet (TDS) offers guideline information and does not constitute a specification.

Storage & Handling

Storage Temperature	2 to 7°C *(35 to 45°F)*

Allow adhesive to reach room temperature before opening bottle to prevent condensation inside the bottle which can reduce shelf life.

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

1) Apply the adhesive sparingly to one surface.
2) Bring the components together quickly and correctly aligned.
3) Apply sufficient pressure to ensure the adhesive spreads into a thin film.
4) Do not disturb or re-align until sufficient strength is achieved, normally in a few seconds.
5) Any surplus adhesive can be removed with Permabond CA solvent, nitromethane or acetone.

NB:
712 cannot be used with activators or primers, such as Permabond CSA or Permabond Polyolefin Primer (POP).

Video Links

Surface preparation:
https://youtu.be/8CMOMP7hXjU

Cyanoacrylate directions for use:
https://youtu.be/PiPzutdRmsk

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