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PERMABOND® 3D90

Cyanoacrylate 3D Print Infiltrant

Technical Datasheet

Features & Benefits

- Infiltrant for 3D printing
- Bonds most 3D powders / granules
- Low odour for improved worker comfort
- Non-frosting –good aesthetic appearance
- Ease of use – no mixing or heat cure
- 100% reactive, no solvents

Description

PERMABOND® 3D90 is a low odour, non-fogging, non-frosting alkoxyethyl cyanoacrylate. Permabond 3D90 has been developed for use as an infiltrant for toughening 3D printed parts - its ultra-low viscosity is ideal for wicking into porous surfaces and its delayed cure allows deeper penetration into larger parts. The low odour formulation allows use in large dip baths or for coating large surfaces. Using Permabond 3D90 on printed parts helps strengthen and protect them, as well as fill any voids or porosities and give a smooth, shiny finished appearance.

Physical Properties of Uncured Adhesive

Chemical composition	Alkoxyethyl cyanoacrylate
Appearance	Colourless
Viscosity @ 25°C	4 mPa.s *(cP)*
Specific gravity	1.1

Typical Curing Properties

Fixture / handling time* *(0.3 N/mm² shear strength is achieved)*	10-15 seconds (NBR rubber) 10-15 seconds (Buna N) 10-15 seconds (Steel) 20-30 seconds (PVC) 20-30 seconds (Phenolic) 20-30 seconds (ABS)
Full strength	24 hours

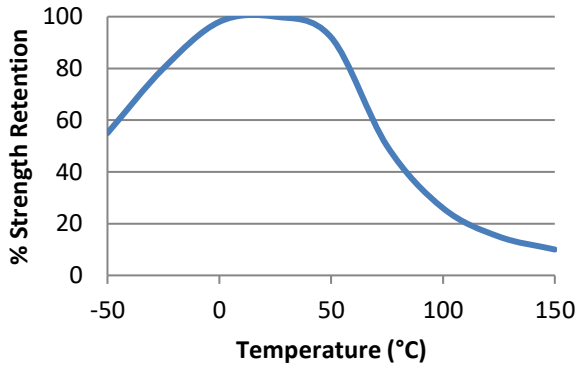
**Handling times can be affected by temperature, humidity and specific surfaces being bonded. Larger gaps or acidic surfaces will also reduce cure speed but this can be overcome by the use of Permabond C Surface Activator (CSA), CSA-NF or Permabond QFS 16. Activators should not be used prior to coating or dipping as this will prevent infiltration.*

Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Steel 16-20 N/mm² *(2300-2900 psi)* Aluminium 8-9 N/mm² *(1200-1300 psi)* Zinc 8 N/mm² *(1200 psi)* ABS >6 N/mm² *(900psi)* SF** PVC 5 N/mm² *(700psi)* PC >5 N/mm² *(700 psi)* SF** Phenolic 4N/mm² *(600psi)*
Impact Strength (ASTM D-950)	3-5 kJ/m² *(1.4-2.4 ft-lb/in²)*
Dielectric Strength (DIN 53481)	25 kV/mm
Dielectric Constant @ 1MHz (DIN 53483)	3
Hardness (ISO868)	85 Shore D
Coefficient of thermal expansion	90 x 10^{-6} mm/mm/°C
Coefficient of thermal conductivity	0.1 W/(m.K)

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

Hot Strength

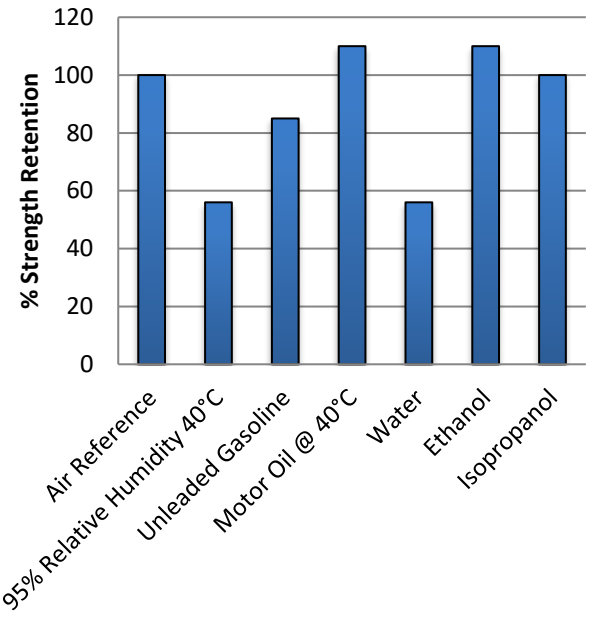


"Hot strength" shear strength tests performed on mild steel. 24hr cure at room temperature and conditioned to pull temperature for 30 minutes before testing.

3D90 can withstand higher temperatures for brief periods (such as for paint baking and wave soldering processes) providing the assembly 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.

FOR PROFESSIONAL OR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN

Chemical Resistance



Specimens were immersed for 1000 hours at 22°C (unless otherwise stated)

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.

Surface Preparation

Surfaces should be clean, dry and grease-free before applying the adhesive.

Directions for Use

FOR USE AS 3D PRINTING INFILTRANT

1) Coat or dip parts in Permabond 3D90
2) Allow adhesive ample time to soak in before removing. Hang parts to dry / drip off over a collection tray. Wet parts will bond to other surfaces they come into contact with so exercise caution.
3) Permabond CSA-NF low odour activator can be post-applied to cure liquid adhesive remaining on the surface if required.

FOR USE AS AN ADHESIVE

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:

If bonding polypropylene, polyethylene, PTFE or silicone, prime first with Permabond Polyolefin Primer (POP).

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.

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