PERMABOND® 170

Methyl Cyanoacrylate Adhesive

Ref.#: 041808PB170

TYPICAL APPLICATIONS

PERMABOND 170 can be used to bond most metals, plastics, and rubbers.

Bonding
Metal to Metal
Sensitive Plastic Parts
Wire Tacking

Fixturing
Parts before riveting or welding

FEATURES & BENEFITS

- Fast Setting at Room Temperature
- Rapid Development of High Strength
- Ease of use – Single Part, No Mixing
- Excellent Adhesion to Metal Surfaces
- Will Bond to Most Materials
- Less Aggressive to Sensitive Plastic Parts
- 100% Reactive, No Solvents
- Nonflammable

GENERAL DESCRIPTION

PERMABOND 170 is a methyl cyanoacrylate adhesive. It is a single part, medium viscosity liquid that will cure rapidly at room temperature when pressed into a thin film between parts. **PERMABOND 170** will cure to a fixture strength in 15 seconds on most surfaces, and rapidly develops high strength with full cure obtained in 24 hours. The adhesive was designed specifically for the bonding of metal surfaces, and provides excellent bond strength to steel, aluminum, and most metal surfaces. The methyl cyanoacrylate will also adhere well to a wide variety of other materials including most plastics and rubbers. **PERMABOND 170** has been formulated to be less aggressive to sensitive plastic surfaces such Styrofoam, polycarbonate and ABS. The cured adhesive is an inert plastic that is resistant to most chemicals. The cured 170 adhesive will also have a greater resistance to high temperatures than most conventional ethyl cyanoacrylate adhesive.

The cure of **PERMABOND 170** can be accelerated using **PERMABOND QFS 16** Cyanoacrylate Activator.

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PHYSICAL PROPERTIES OF THE UNCURED ADHESIVE

Properties	
Base Compound	Methyl Cyanoacrylate
Color	Colorless to Slightly Cloudy
Viscosity, cP	1500
Specific Gravity	1.09
Flash Point, ^{o}C (^{o}F)	75 (167)
Flammability	Nonflammable
Solids, %	100
Shelf Life stored at 2°C-7°C (35°F-45°F), months	12
Gap Fill, inches (mm)	0.015 (0.38)

CURE RATE

The cure rates of cyanoacrylates are dependent on the substrate used, gap, and relative humidity. The table below shows the set time of various substrates. Cyanoacrylate adhesives have limited gap-filling capability. The speed of cure and the ultimate strength might decrease as the gap increases. The cure speed of cyanoacrylates will depend on the ambient relative humidity; the cure rate generally increases with increasing humidity. The cure rate of cyanoacrylates can be increased by applying activator **QFS16.** However, the application of the activator might decrease the ultimate strength of the bond.

SPEED OF CURE

Set Time, seconds	
Steel	15
Buna N Rubber	15
Phenolic Plastic	15
Full Cure, hours	24

PHYSICAL PROPERTIES OF THE CURED ADHESIVE

Appearance	Colorless, Translucent Solid
Softening Point, ^{o}C (^{o}F)	170 (340)
Hardness, Shore A	90
Dielectric Strength, volts/mil	250
Operating Temperature, ^{o}C (^{o}F)	-54 (-65) to 90 (195)
Soluble In	Nitroethane, MEK, Acetone

TYPICAL PERFORMANCE OF THE CURED ADHESIVE

Cured at 25°C for 24 hours

Lap Shear Strength on (ASTM D1002)	
*Grit blasted steel, psi (N/mm^2)	3500 (24)
Aluminum, psi (N/mm^2)	2000 (14)
Brass	3000 (21)
Stainless Steel	3000 (21)
Butyl Rubber	300 (2.1)*
Nitrile Rubber	550 (3.8)*
ABS	1300 (9.0)*
Acrylic	2000 (14)
Phenolic	1400 (9.7)*
Impact Strength (ASTM D950), ft-lbs/in^2	5 - 8

*Denotes failure of the material before the adhesive bond fails.

CHEMICAL RESISTANCE

Cured PERMABOND adhesives have good resistance to many common solvents. However, the cured resistance is reduced as the polarity of the solvent increases. Non-polar solvents such as gasoline, motor oil, and dioctyl phthalate **(DOP**) have only a minimal effect but polar solvents cause severe bond deterioration. Alcohols will only deteriorate bonds over several months, but acetone is a good solvent for cyanoacrylate. Boiling water will destroy the bonds in less than 24 hours and this process is accelerated when the solution is alkaline. Amines tend to dissolve the bond rapidly. Most solvent washes will not affect the adhesive bonds due to the short exposure time.

THERMAL RESISTANCE

The cured cyanoacrylate is a thermoplastic material that soften at approximately 177°C (350°F), but it can safely be used at temperatures between –54°C (-65°F) and 90°C (195°F). Beyond this temperature, strength loss is relatively rapid. While the product may perform in certain situations, a general recommendation is not made for use above 82°C (180°F). All grades can resist short exposures up to 150°C (300°F).

SURFACE PREPARATION

The surface should be free of gross contamination such as dirt, dust, grease or oil. An alcohol wipe is suitable for cleaning most surfaces. Acetone is recommended for epoxies, polyesters, phenolics, melamine, urea formaldehyde, nylon and polyurethane. Optimum strength is obtained by abrading the surface followed by a solvent wipe to remove any loose particles.

APPLICATION & DISPENSING

PERMABOND 170 is easily dispensed using automated or semi-automated equipment.

APPLICATION

1. For best results the surface should be properly cleaned.
2. Apply the adhesive sparingly to one surface.
3. Assemble the parts making sure that they are correctly aligned.
4. Apply sufficient pressure to ensure that the adhesive spreads into a thin film.
5. Do not move parts until fixture strength is achieved.
6. When bonding polyethylene, polypropylene, PTFE or silicone, we recommend priming the surfaces with Permabond Polyolefin Primer before using the adhesive.

STORAGE & HANDLING

Cyanoacrylate adhesives are subject to an aging process and have a limited shelf life. The shelf life is one year when stored in a refrigerator. It could be less when stored at ambient environment depending on conditions of temperature and humidity.

A note of caution: Before opening, the containers must be warmed to room temperature; otherwise water might condense into the bottle and cause hardening of the adhesive.

Cyanoacrylates can form strong bonds to skin rapidly. To break the bond, peel and flex the skin carefully. Immersion in soapy water aids in breaking the cyanoacrylate bond. With appropriate caution, solvents like acetone or nail polish remover can also be used. To avoid skin bonding, wear polyethylene gloves. Do not use rubber or cloth gloves. Cyanoacrylate vapors are lachrymatory and can irritate eyes and mucous membranes in poorly ventilated areas. **Use of goggles or safety glasses is recommended**.

VAPOR CONTROL RECOMMENDATIONS

Use adequate ventilation. Remove adhesive vapors with suitable exhaust ducting. Since cyanoacrylate vapors are heavier than air, place exhaust intake below work area. Activated charcoal filters using an acidic charcoal have been found effective in removing vapors from effluent air. Avoid use of excess adhesive. Excess adhesive outside of the bond area will increase the level of vapors. Automatic dispensing equipment will prevent excess adhesive. Assemble parts as quickly as possible. Long open times will increase level of vapors.

CLEAN UP OF SPILLED LIQUID

When large quantities of cyanoacrylate adhesives are accidentally spilled, the area should be flooded with water that will cause the liquid cyanoacrylate to cure. The cured material can then be scraped from the surface.

NOTE: The liquid adhesive should not be wiped up with rags or tissue. The fabric will cause polymerization and large quantities of adhesive will generate heat on cure, causing smoke and strong irritating vapors**. ALWAYS FLOOD WITH EXCESS WATER TO CLEAN UP SPILL CONDITION**.

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