

SAFETY DATA SHEETS

This SDS packet was issued with item:

076708606

The safety data sheets (SDS) in this packet apply to the individual products listed below. Please refer to invoice for specific item number(s).

076708226

The safety data sheets (SDS) in this packet apply to one or more components included in the items listed below. Items listed below may require one or more SDS. Please refer to invoice for specific item number(s).

076708598

Features & Benefits

- Plastic and rubber bonding
- Applications requiring fast fixturing
- Ease of use – no mixing or heat cure
- Bonds most materials
- 100% reactive, no solvents

Approved to MIL-A-46050C Type II Class 2 (existing designs)

Description

PERMABOND® 102 is a low viscosity general purpose cyanoacrylate adhesive suitable for bonding close-fitting components. It is fast setting and suitable for use on plastics, rubber and metals.

Cyanoacrylate adhesives are single component adhesives that polymerize rapidly when pressed into a thin film between parts. The moisture adsorbed on the surface initiates the curing of the adhesive. Strong bonds are developed extremely fast and on a great variety of materials. These properties make **PERMABOND** cyanoacrylates ideal adhesives for high speed production lines.

Physical Properties of Uncured Adhesive

Chemical composition	Ethyl cyanoacrylate
Appearance	Colourless
Viscosity @ 25°C	70-90 mPa.s (cP)
Specific gravity	1.1

Typical Curing Properties

Maximum gap fill	0.15 mm 0.006 in
Fixture / handling time* (0.3 N/mm ² shear strength is achieved)	10-15 seconds (Steel) 5-10 seconds (Buna N Rubber) 10-15 seconds (Phenolic) 7-10 seconds (PVC) 7-10 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) or Permabond QFS 16.

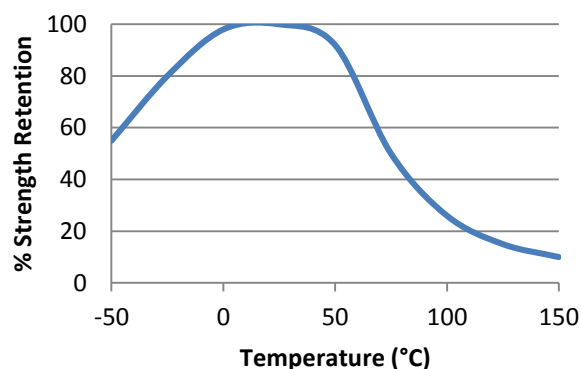
Typical Performance of Cured Adhesive

Shear strength* (ISO4587)	Steel	19-23 N/mm ² (2800-3300 psi)
	Aluminium	7-9 N/mm ² (1000-1300 psi)
	Zinc	8-10 N/mm ² (1200-1500 psi)
	ABS	>6 N/mm ² (900psi) SF**
	PVC	>6 N/mm ² (900psi) SF**
	PC	>5 N/mm ² (700 psi) SF**
	Phenolic	12-14N/mm ² (1700-2000 psi)
Impact strength (ASTM D-950)	3-5 kJ/m ² (1.4-2.4 ft-lb/in²)	
Dielectric constant @10kHz	2.5	
Dielectric strength	25 kV/mm	
Coefficient of thermal expansion	90 x 10 ⁻⁶ mm/mm/°C	
Coefficient of thermal conductivity	0.1 W/(m.K)	
Hardness (ISO868)	85 Shore D	

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

**SF = Substrate failure

Hot Strength



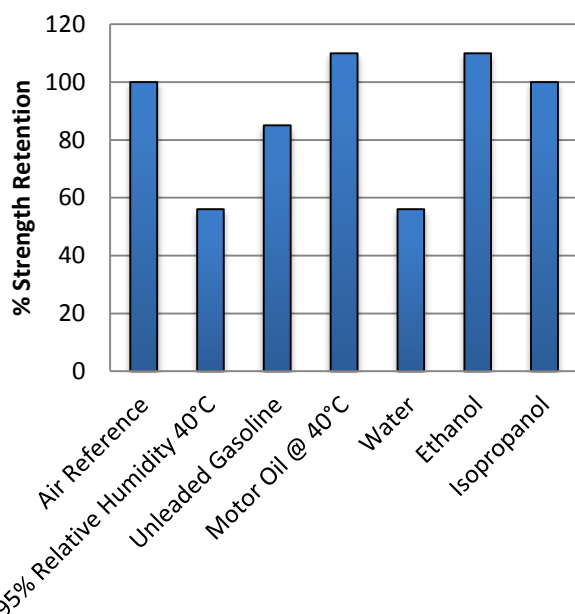
"Hot strength" shear strength tests performed on mild steel. 24hr cure at room temperature and conditioned to pull temperature for 30 minutes before testing.

102 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.

The information given and the recommendations made herein are based on our research and are believed to be accurate but no guarantee of their accuracy is made. In every case we urge and recommend that purchasers before using any product in full-scale production make their own tests to determine to their own satisfaction whether the product is of acceptable quality and is suitable for their particular purpose under their own operating conditions. THE PRODUCTS DISCLOSED HEREIN ARE SOLD WITHOUT ANY WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED.

No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program.

Chemical Resistance



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

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:

For difficult or porous surfaces using a Permabond activator is recommended. 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)
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Allow adhesive to reach room temperature before opening bottle to prevent condensation inside the bottle which can reduce shelf life.

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. 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.

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No representative of ours has any authority to waive or change the foregoing provisions but, subject to such provisions, our engineers are available to assist purchasers in adapting our products to their needs and to the circumstances prevailing in their business. Nothing contained herein shall be construed to imply the non-existence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of this patent. We also expect purchasers to use our products in accordance with the guiding principles of the Chemical Manufacturers Association's Responsible Care® program.

MSDS
Material Safety Data Sheet
PERMABOND® 102



READ MATERIAL SAFETY DATA SHEET BEFORE HANDLING PRODUCT!

Issue Date 02/11/05

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NUMBER

PRODUCT NAME

Manufacturer

PERMABOND® 102

PERMABOND LLC

20 World's Fair Drive

Somerset, NJ 08873

EMERGENCY PHONES:

MEDICAL – 1-866-827-6282

TRANSPORT - (CHEMTREC) – 1-800-424-9300

MSDS REQUESTS: HELP LINE: 1-800-640-7599

SYNONYMS

SUPER GLUE

2. COMPOSITION/INFORMATION ON INGREDIENTS

CHEMICAL FAMILY

COMPONENT

Ethyl cyanoacrylate

Cyanoacrylate Adhesive

CAS NUMBER

7085-85-0

CONCENTRATION (%)

60 - 100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

WARNING.

ON CONTACT, WILL BOND EYELIDS TOGETHER

SKIN IRRITANT. ON CONTACT WILL BOND SKIN

Colorless Liquid Pungent odor

EYE

On contact, will bond eyelids together.

SKIN CONTACT

Repeated or prolonged skin contact may result in moderate irritation. On contact, immediate bonding of the skin will occur.

INHALATION

Vapor may be irritant to the respiratory tract.

INGESTION

On contact, immediate bonding of mouth could occur.

4. FIRST-AID MEASURES

EYE

Flush with large amounts of water while holding eyelids open. Get medical attention immediately. Cured adhesive will not bond well to surface of eye, but corneal damage from abrasion may result. Do not wear contact lenses when working with this material.

SKIN CONTACT

No attempt should be made to remove material from skin or to remove contaminated clothing, as the bonded skin can be easily torn. Wash with large volumes of soap and water while flexing bonded skin parts. This procedure will slowly release bonded areas. DO NOT mechanically remove cured adhesive or attempt to pull skin apart.

INHALATION

Remove to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention.

INGESTION

Immediate bonding of mouth will occur. Get medical attention.

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5. FIREFIGHTING MEASURES

FLASH POINT	167 °F (Setaflash Closed Tester)
EXTINGUISHING MEDIA	CO2; Dry Chemical; Foam
SPECIAL FIREFIGHTING PROCEDURES	Fire fighters should be equipped with self-contained breathing apparatus to protect against potentially toxic and irritating fumes.
FIRE & EXPLOSION HAZARDS	Cloths used to wipe up spills may cause rapid polymerization that could generate sufficient heat to ignite the cloth.
FLAMMABILITY HAZARD CLASS	Combustion will evolve toxic and irritant vapors. 2 = Moderate.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK PROCEDURES	SMALL SPILLS: wipe up with cloth. Immediately soak cloth with water to polymerize the adhesive. Caution! Cloth containing adhesive may undergo autoignition if not soaked with water. LARGE SPILLS: flood area with water. When cured, remove film with a scraper. Wear NIOSH approved respirator for organic vapors if needed, and protective clothing.
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For safety and environmental precautions, please review entire Material Safety Data Sheet for necessary information.

7. HANDLING AND STORAGE

STORAGE TEMPERATURE	= 35 - 45 °F = 2 - 7 °C
HANDLING/STORAGE	Keep away from heat, sources of ignition and direct sunlight. Keep material refrigerated at the storage temperature referenced above.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

COMPONENT	EXPOSURE LIMITS	
Ethyl cyanoacrylate	ACGIH-TWA: 0.2 ppm	OSHA-PEL: 2 ppm OSHA-STEL: 4 ppm
VENTILATION REQUIREMENTS	Local.	
EYE PROTECTION REQUIREMENTS	Safety glasses, goggles or face shield to protect against splashing.	
GLOVE REQUIREMENTS	Wear polyethylene gloves. Do not wear rubber or cloth gloves.	
CLOTHING REQUIREMENTS	No special clothing required for low volume activity.	
WASH REQUIREMENTS	Wash before eating, drinking, or using toilet facilities.	
RESPIRATOR REQUIREMENTS	Avoid prolonged or repeated breathing of vapor or mists. If exposure may or does exceed occupational exposure limits, use a NIOSH approved respirator to prevent overexposure.	

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Issue Date 02/11/05

9. PHYSICAL AND CHEMICAL PROPERTIES

PURE SUBSTANCE OR MIXTURE	Mixture
PHYSICAL FORM	Liquid
COLOR	Colorless
ODOR	Pungent
PH AS IS	Not applicable
pH IN (1%) SOLUTION	Not applicable
OXIDIZING PROPERTIES	Not applicable
BOILING POINT	1403 °F
MELTING/FREEZING POINT	Not available
SOLUBILITY IN WATER	Insoluble
VISCOSITY	100 cPs
SPECIFIC GRAVITY (WATER=1)	1.05
BULK DENSITY	8.75 lb/gal
VAPOR PRESSURE (mmHg)	0.3
VAPOR DENSITY (air = 1)	>1
VOLATILES	Nil
VOLATILE ORGANIC COMPOUNDS	Nil
FLASH POINT	167 °F (Setaflash Closed Tester)

10. STABILITY AND REACTIVITY

STABILITY	Stable
REACTIVITY HAZARD CLASS	2 = Reactive material.
HAZARDOUS DECOMPOSITION PRODUCTS	Decomposes upon heating to release toxic fumes of nitrogen oxides, carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

ROUTE OF ENTRY	Inhalation; Skin Contact; Eye Contact; Ingestion
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CHRONIC (LONG TERM) EFFECTS OF EXPOSURE

TARGET ORGANS	Skin; Eyes; Respiratory system
CARCINOGEN	No.

COMPONENT	ORAL TOXICITY	NOTES ON ORAL TOXICITY
Ethyl cyanoacrylate	Oral LD50: Rat 180 mg/kg	Ingestion may cause irritation of the gastrointestinal tract. On contact, immediate bonding of mouth could occur.

COMPONENT	DERMAL TOXICITY	NOTES ON DERMAL TOXICITY
Ethyl cyanoacrylate	Dermal LD50: Rabbit 220 ml/kg	Irritating to the skin. On contact, immediate bonding of the skin will occur.

MSDS
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PERMABOND® 102



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Issue Date 02/11/05

11. TOXICOLOGICAL INFORMATION – CONT'D

COMPONENT	INHALATION TOXICITY	NOTES ON INHALATION TOXICITY
Ethyl cyanoacrylate		Vapor, if generated, can cause irritation of the eyes, nose and respiratory tract. Avoid breathing vapors or mists.
COMPONENT		NOTES ON EYE IRRITATION
Ethyl cyanoacrylate		On contact, will bond eyelids together. Vapors are lachrymatory. Will cause eye irritation. Cyanoacrylates will not bond to the eye but may cause corneal scratching.

12. ECOLOGICAL INFORMATION

POTENTIAL TO BIOACCUMULATE	Unknown.
AQUATIC TOXICITY	None Established

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS	Disposal should be in accordance with local, state or national legislation.
EMPTY CONTAINER WARNINGS	Empty containers may contain product residue; follow MSDS and label warnings even after they have been emptied.

14. TRANSPORTATION INFORMATION

This section provided for general information only.

FOR NON-BULK SHIPMENTS.

FOR MORE COMPLETE TRANSPORTATION REGULATORY INFORMATION PLEASE REFER TO THE SHIPPING DOCUMENTS ACCOMPANYING THE SHIPMENT OF THIS PRODUCT.

DOT CLASSIFICATION

PROPER SHIPPING NAME	COMBUSTIBLE LIQUID, N.O.S.
TECHNICAL NAME	(ETHYL CYANOACRYLATE)
HAZARD CLASS	N
U.N. NUMBER	NA1993
PACKING GROUP	III

The information provided herein may not include the impact of additional regulatory requirements (eg, for materials meeting the definition of a hazardous waste under RCRA, hazardous substances under CERCLA, and/of marine pollutants under CWA or other similar federal, state or local laws) or any associated exceptions or exemptions under regulations applicable to the transport of this material.

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Issue Date 02/11/05

15. REGULATORY INFORMATION

USA

TSCA

All components are on the TSCA inventory.

SARA/TITLE III

Contains no substances at or above the reporting threshold under Section 313.

CAS NUMBER

CONCENTRATION (%)

16. OTHER INFORMATION

MSDS DATE

02/11/05

This MSDS contains changes from the previous one in section 1; the medical emergency phone number was changed.

FOR INFORMATION CONTACT:

Permabond LLC
HELP Line: 1-800-640-7599

ADDITIONAL INFORMATION: The information given and the recommendations made herein apply to our product(s) alone and are not combined with other product(s). Such are based on our research and on data from other reliable sources and are believed to be accurate. No guaranty of accuracy is made. It is the purchaser's responsibility before using any product to verify this data under their own operating conditions and to determine whether the product is suitable for their purposes.