Product Datasheet

SP&S Specialty Polymers and Services

EpoPro 170A/B

LONG WORK-LIFE EPOXY ADHESIVE & POTTING COMPOUND

EpoPro 170 A/B is a versatile, long work-life epoxy adhesive that provides strong bonds to most materials including wood, ceramics, metals, any many plastics. It is easy to mix and apply due to its 1:1 by volume mix ratio and medium bodied, spreadable consistency. It can be cured at temperatures from 20C to 180C and releases no volatiles during or after curing. When fully cured EpoPro 100A/B produces, transparent, nearly invisible bond-lines and transparent potted parts that provide exceptional environmental & fatique resistance and good chemical and heat resistance. In addition, the cured polymer provides excellent electrical insulation properties and meets NASA outgassing requirements for space, optical, and high vacuum applications.

Many variations on the standard EpoPro 170A/B system are available upon request, including custom colors, alternate worklifes & curing speeds, modified viscosities, and many other variants. Please contact us to discuss your application if you think such a variant would be helpful for your application..

APPLICATIONS & BENEFITS:

- Bonding large surfaces
- Low or no shrinkage during curing
- Exceptional Fatigue & environmental resistance
- Excellent Dielectric Properties
- Bonds metals, ceramics, wood, cardboard, glass, plastics and many other materials.
- Odorless, free of solvents & volatiles – meets NASA outgassing requirements

HANDLING PROPERTIES

	VALUE	TEST METHOD
Density Mixed, g/cm³	1.05	ASTM E-201
Viscosity Mixed @ 25ºC, cps	9,000	ASTM D-2393
Mix Ratio By Weight (By Volume)	100A:80B (1A:1B)	Calculated
Gel Time @ 25ºC, 4 fl oz mass (~500g)	90-120 minutes	ASTM D-2471
Gel Time @ 25ºC, 1/16" thick film	120-180 minutes	ASTM D-2471
Lap Shear Strength Development @ Various temperatures		ASTM D-1002

Cure temperature	Curing time	Shear Strength@ 25C
20ºC (68ºF)	12 hours	710 psi (5 mPa)
	15 hours	1050 psi (7.4 mPa)
	24 hours	1990 psi (14 mPa)
25ºC (77ºF)	8 hours	710 psi (5 mPa)
	12 hours	1200 psi (8.45 mPa)
	15 hours	1990 psi (14 mPa)
	24 hours	2130 psi (15 mPa)
	5 days	2560 psi (18 mPa)
40ºC (104ºF)	2 hour	900 psi (6.3 mPa)
	3 hours	1420 psi (10 mPa)
	6 hours	2560 psi (18 mPa)

Cure temperature	Curing time	Shear Strength@ 25C
70ºC (158ºF)	1 hour	3130 psi (22 mPa)
	2 hours	3410 psi (24 mPa)
	3 hours	3700 psi (26 mPa)
100ºC (158ºF)	6 minutes	1420 psi (10 mPa)
	10 minutes	3700 psi (26 mPa)
	30 minutes	4120 psi (29 mPa)
150ºC (302ºF)	4 minutes	2130 psi (15 mPa)
	5 minutes	4270 psi (30 mPa)
	10 minutes	4410 psi (31 mPa)

PHYSICAL PROPERTIES

	VALUE	TEST METHOD
Color	Clear to very ligh yellow	Visual
Shore D Hardness	80	ASTM D-2240
Tensile Strength, psi	4,800 psi (33 mPa)	ASTM D-638
Tensile Elongation at break	9%	ASTM D-638

Effect of Cured Temp. on Lap Shear Strengths @ various Temp.: ASTM D-1002

Test Temperature	Shear Strength (Cured 5 Days @ 25C)	Shear Strength Cured 20 min @ 100C
-60ºC -76ºF	2840 psi (20 mPa)	3560 psi (25 mPa)
-20ºC -4ºF	2840 psi (20 mPa)	3410 psi (24 mPa)
20ºC 68ºF	2560 psi (18 mPa)	3980 psi (28 mPa)
40ºC 104ºF	1420 psi (10 mPA)	1990 psi (14 mPa)
60ºC 140ºF	570 psi (4 mPa)	1000 psi (7 mPa)
70ºC 158ºF	280 psi (2 mPa)	425 psi (3 mPa)

Lap Shear Strength After Tropical Aging (40ºC & 92% Relative Humidity):

Aging Period	Shear Strength (Cured 16 hrs @ 40C)	Shear Strength Cured 20 min @ 100C
0 Days	2560 psi (18 mPa)	3980 psi (28 mPa)
10 days	2560 psi (18 mPa)	2560 psi (18 mPa)
30 days	1710 psi (9 mPa)	1710 psi (9 mPa)
60 days	1560 psi (28 mPa)	1560 psi (28 mPa)
90 days	570 psi (28 mPa)	1280 psi (9 mPa)

Lap Shear Strength @ 25C After Heat Aging:

Aging Period	Shear Strength - Aged @ 20C	Shear Strength - Aged @ 60C	Shear Strength - Aged @ 80C	Shear Strength - Aged @ 120C
0 Days	2560 psi (18 mPa)	2560 psi (18 mPa)	2560 psi (18 mPa)	2560 psi (18 mPa)
3 days	2560 psi (18 mPa)	2560 psi (18 mPa)	2130 psi (15 mPa)	2130 psi (15 mPa)
10 days	2560 psi (18 mPa)	2420 psi (17 mPa)	2130 psi (15 mPa)	2280 psi (16 mPa)
60 days	2560 psi (18 mPa)	2130 psi (15 mPa)	2130 psi (15 mPa)	2130 psi (15 mPa)
1 year	2280 psi (16 mPa)	1560 psi (11 mPa)	1280 psi (9 mPa)	
2 years	1990 psi (14 mPa)	1420 psi (10 mPa)	710 psi (5 mPa)	
4 years	1990 psi (14 mPa)	994 psi (7 mPa)	430 psi (3 mPa)	
5 years	1990 psi (14 mPa)	994 psi (7 mPa)	280 psi (2 mPa)	

Lap Shear Strength with various Substrates: (metals cured 20 min@100ºC, plastics 16 hrs@40ºC)

Material	Shear Strength@ 25ºC
Aluminum	3840 psi (27 mPa)
Carbon Steel	3840 psi (27 mPa)
Stainless Steel	3270 psi (23 mPa)
Galvanized Steel	1990 psi (14 mPa)
Copper	3270 psi (23 mPa)
Brass	2990 psi (21 mPa)
SMC	1065 psi (7.5 mPa)
ABS	852 psi (6 mPa)
Polycarbonate	426 psi (3 mPa)
PVC	288 psi (2 mPa)
Nylon 6	430 psi (3 mPa)

Chemical Resistance (Lap Shear Strength @ 25 After Immersion for 90 days)

Chemical	Shear Strength	Chemical	Shear Strength
Control	*2560 psi (18 mPa)*	Ammonia	1420 psi (10 mPa)
Acetone (30 days)	570 psi (4 mPa)	Water @ 20ºC	1420 psi (10 mPa)
Acetylene	430 psi (3 mPa)	Water @ 90ºC	430 psi (3 mPa)
Ethyl Acetate (30 days)	570 psi (4 mPa)	Paint Thinner	1200 psi (8.5 mPa)
Acetic Acid 10%	*degraded*	Gasoline	2410 psi (17 mPa)
Methanol	*degraded*	Lubricating Oil(HD30)	2560 psi (18 mPa)
Mineral Oil	2560 psi (18 mPa)	Transmission Fluid	2560 psi (18 mPa)
Vegetable/Corn Oil	2560 psi (18 mPa)	Power Steering Fluid	2410 psi (17 mPa)
Kerosene	*degraded*		
Trichloroethylene	*degraded*		

Fatigue Strength (load frequency 90 Hz), cured 20 min @ 100C

Fatigue Limit Load (% of Shear Strength)	Cycles to Failure
50%	1,000 – 10,000
40%	10,000 – 100,000
30%	100,000 – 1 million
20%	1 million – 10 million
15%	>10 million

Roller Peel Strength	28 pli	ISO 4578
Glass Transition Temp. (Tg)	113ºF (45ºC)	ASTM D-648
Coefficient of Thermal Expansion (CTE):		ASTM E-831
Below Tg / Above Tg	45 ppm/ºC / 85 ppm/ºC	
Water Absorption (% weight gain)		
24 hours immersion @ 25ºC	0.8%	
30 minutes @ 100ºC	1.3%	
Water vapor permeability (1mm thick film)	16g / m^2 / 24 hours	
Electrolytic Corrosion	A-A/B1.2	DIN 53489
Dielectric Strength @ 50 Hz & 25ºC	26 kV/mm	
Dielectric Constant @ 25C		ASTM D-150
@ 50Hz / @1 KHz / @10 KHz	3.4 / 3.2 / 3.2	
Loss tangent @ 25C		ASTM D-150
@ 50Hz / @1 KHz / @10 KHz	.026 / .018 / .017	
Thermal Conductivity	0.22 W/mK	

Shear Modulus	DIN 53445
@ -50ºC / @ 0ºC	217,500 psi (1500 mPa) / 174,000 psi (1200 mPa)
@ 50ºC / @ 100ºC	29,000 psi (200 mPa) / 1015 psi (7 mPa)

NOTE : Most Typical Properties determined using EpoPro 170A/B cured for for 16 hours @ 40ºC unless otherwise stated. Values are based on laboratory or average production results – not for specification purposes.

SUGGESTED PROCESSING GUIDELINES:

EpoPro 170A/B can be applied by stiff brush, roller, squeegee, knife, or spatula. It is also suitable for meter-mix dispensing and can be supplied in dual syringes cartridges for use with static mixing nozzles.

Weigh Part A and Part B in the recommended ratio as accurately as possible into a clean mixing container. Always use weighing equipment having accuracy in proportion to the amounts being weighted. Blend by using a spatula or stirring stick for 1-2 minutes using a kneading motion. Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture.

Apply the adhesive to clean, dry surfaces. Allow to cure before handling. See chart above to determine the minimum time required at the ambient temperature to achieve enough dtrength for parts to be handled. Often 500 – 1000 psi is enough for simple handling, but do not subject parts to impact or large stress prior to full curing. For the highest strength bonds or for improved chemical or heat resistance use a heat cure or allow to cure at room temperature then post cure for 10 - 20 minutes at 100C.

STORAGE GUIDELINES:

Store this material in a clean, cool and dry environment in its tightly closed original container. Products may settle during storage and should be thoroughly re-mixed prior to use. Avoid extended exposure to high humidity. Tightly re-seal after use. If the recommended storage conditions are observed the products will have a minimum shelf-life of 12 months from the date of shipment.

HANDLING PRECAUTIONS:

Mandatory and recommended industrial hygiene procedures should be followed whenever these products are being handled and processed. For additional information please consult the corresponding material safety data sheets.

PERSONAL HYGIENE:

EpoPro 170A

CAUTION! May cause eye irritation. Prolonged or repeated skin contact may cause irritation, may cause allergic skin reaction. Harmful if inhaled or swallowed. Avoid contact with eyes, skin, or clothing. Wear eye protection and impervious gloves when handling. Wash thoroughly after handling. Avoid breathing vapor or mist. Keep containers closed when not in use. Use only with adequate ventilation. Do not take internally.

EpoPro 170B

WARNING! Causes skin and eye irritaion. May cause allergic skin and respiratory reactions. Harmful if inhaled or swallowed. Do NOT get in eyes, on skin, or clothing. Wear chemical splash goggles and impervious gloves when handling. Wash skin and clothing thoroughly after handling. Avoid breathing vapor or mist. Use only with adequate ventilation. Keep containers closed when not in use. Do NOT take internally.

FIRST AID

In case of contact:

Skin – Immediately wash skin thoroughly with mild soap and water. Remove contaminated clothing and wash before reuse. Destroy contaminated shoes and other articles made of leather.

Eyes – Immediately flush eyes with plenty of water for 15 minutes and get prompt medical attention.

Inhalation - Remove person to fresh air. Administer oxygen or artificial respiration if necessary. Call a physician.

Ingestion - Do not induce vomiting. Dilute with plenty of water and contact physician immediately. Never give anything by mouth to an unconscious person.

DISCLAIMER:

IMPORTANT: The following supercedes Buyer's documents. **SELLER / MANUFACTURER MAKES NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller / Manufacturer be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict liability, tort or contract arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results presented are based on controlled or laboratory work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended

Specialty Polymers & Services, Inc. (SP&S)
27822 Fremont Court **Tel: 661-294-1790**
Valencia, CA 91355 **Fax : 661-294-0640**
www.spolymers.com **info@spolymers.coim**