Product Datasheet

SP&S Specialty Polymers and Services

EpoPro 221T1, 221T2, or 221T3 with HY 956EN/US

Flexible, Room Temperature Curing, Epoxy Potting Systems

EpoPro® 221T1/T2/T3 with Hardener HY 956 EN/US are a range of flexible, bonding and potting materials designed for sealing connectors, bonding and tacking wires, and potting circuit boards and many other electrical components. They can be cured Hardener HY 956EN/US at room temperature or more quickly with heat to produce tough, flexible castings or bonds. These systems are designed as an excellent general-purpose sealing and potting system, particularly where pressure-sensitive components are to be encapsulated or where thermal shock or crack resistance is required. The cured polymer is resistant to heat aging and to cryogenic exposure from at least -55ºC to 105ºC.

- EpoPro 221T1 / HY 956EN/US is a low viscosity potting and sealing material
- EpoPro 221T2 / HY 956EN/US is a medium viscosity potting and sealing material
- EpoPro 221T3 / HY 956EN/US is a medium to high viscosity potting and sealing material

These systems conform to the requirements of A-A-59134 and Mil-I-46856 as follows: EpoPro 221T1/HY 956EN/US conforms to type 1, EpoPro 221T2 / HY 956 EN/US resin conforms to type 2, & EpoPro 221T3 / HY 956 EN/US conforms to type 3.

TYPICAL APPLICATIONS

- General potting and sealing of circuit boards
- Encapsulation of stress-sensitive components
- Low-voltage encapsulation

HANDLING PROPERTIES

	VALUES	TEST METHOD
EpoPro 221T1		
Density, g/cm³	1.15	ASTM E-201
Viscosity @ 25ºC, cps	850	ASTM D-2393
EpoPro 221T2		
Density, g/cm³	1.15	ASTM E-201
Viscosity @ 25ºC, cps	1,450	ASTM D-2393
EpoPro 221T3		
Density, g/cm³	1.14	ASTM E-201
Viscosity @ 25ºC, cps	15,000	ASTM D-2393
Hardener HY 956 EN/US		
Density, g/cm³	1.02	ASTM E-201
Viscosity @ 25ºC, cps	180	ASTM D-2393
Mix Ratio by Weight	100A:19B	Calculated

Viscosity Mixed @ 25ºC, cps		ASTM D-2393
221T1 / HY 956 EN/US	350	
221T2 / HY 956 EN/US	900	
221T3 / HY 956 EN/US	8,000	
Gel Time at 25ºC, 100g mass	1- 2 hours	ASTM D-2471
Recommended Cure Schedules:	48 hrs. @ 25ºC **or** allow to gel (2 hrs @ 25ºC) then cure for at least 2 hrs @ 75ºC	

PHYSICAL PROPERTIES

	VALUE	TEST METHOD
Color	Light yellow	Visual
Density, g/cm³	1.11	ASTM E-201
Shore Hardness	70D	ASTM D-2240
Tensile Strength, psi	850	ASTM D-638
Tensile Elongation at break	55%	ASTM D-638
Water Absorption, % by weight		
24 hours @ 25ºC	0.04%	ASTM D-570
Glass Transition Temp. (Tg)	20 ºC	
Coefficient of Thermal Exp. (CTE)	64 ppm/ºC	ASTM E -381
Curing Shrinkage	0.15%	ASTM D-792

ELECTRICAL PROPERTIES

	VALUE			TEST METHOD
Electrolytic Corrosion	Grade AB-B/1.4			DIN 53489
Dielectric Strength, V/mil	620			ASTM D-149
	@23°C	@40°C	@50°C	
Volume Resistivity, ohm-cm	$2.5x10^{13}$	$2x10^{11}$	$3x10^{10}$	ASTM D-257
Dielectric Constant, 60 Hz	5.3	8.1	8.6	ASTM D-150
Dielectric Constant, 1 MHz	3.9	-	-	ASTM D-150
Dissipitation Factor, 60 Hz	0.060	0.12	0.21	ASTM D-150
Dissipitation Factor, 1 MHz	0.063	-	-	ASTM D-150

NOTE: Typical Properties determined using EpoPro 221T series resin cured with HY 956 EN/US cured for at least 48 hours at 25ºC. Values are based on laboratory or average production results – not for specification purposes.

SUGGESTED PROCESSING GUIDELINES:

The EpoPro 221T series resins when mixed with Hardener HY 956 EN/US can be applied by pouring, brushing, roller, squeegee, knife, spatula, or by spraying or dipping. They can also be meter-mix dispensed and can be supplied in premixed and frozen syringes for small volume applications.

Weigh resin and hardener 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 – ideally the accuracy of the scale should be less than 1% of the mass being weighed. Blend by using a spatula or stirring stick for 2-3 minutes using a kneading motion.

Scrape the bottom and sides of the mixing container carefully and frequently to produce a uniform mixture.

For best adhesion apply to clean, dry surfaces. Allow to cure at room temperature for 48 hours or allow to set at 25ºC for at least 2 hours then heat cure at 75ºC cure for at least 2 hours. For small volume application immediate heat cures may be possible and more rapid cures are possible at higher temperatures. If you would like recommendation on alternate cures please contact us. Always evaluate a suggested cure schedule in your application prior to implementing it for full scale production as each application unique conditions can affect the results.

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. Tightly re-seal after use. If the recommended storage conditions are observed two part kits will have a minimum shelf-life of 12 months from the date of shipment.

Pre-mixed & Frozen (PM&F) syringes will be shipped on dry ice and should be stored at -40C or less until ready to use. PM&F syringes will have a minimum shelf-life of 6 months at -40C or less from date of shipment

HANDLING PRECAUTIONS & PERSONAL HYGIENE:

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.

EpoPro 221T1, 221T2, or 221T3 - WARNING! May cause eye irritation. Prolonged or repeated skin contact may cause irritation, may cause allergic skin reaction. 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.

Hardener HY 956-2 - WARNING! Causes skin and eye irritation. 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.

Specialty Polymers & Services, Inc. (SP&S)
27822 Freemont Court
Valencia, CA 91355
www.spolymers.com

Tel - 661-294-1790
Fax - 661-294-0640
info@spolymers.com