

SWANCOR 977-S

EPOXY VINYL ESTER RESIN



Product Description

SWANCOR 977-S is a high performance modified Novolac type epoxy vinyl ester resin with high-crosslinking density. It combines superior retention of mechanical properties at high temperature, such as tensile and flexural strength, and superior corrosion to oxidizing chemicals and solvents etc. **SWANCOR 977-S** is designed to provide extreme chemical resistance, to ethylene dichloride (EDC), dimethyl formamide (DMF), benzene, toluene and ketone etc.

Applications

- Chemical storage tanks, pipes, flue gas desulfurization systems (FGD), stacks, scrubbers, ducts.
- Stacks Corrosion resistant flooring while incorporated with aggregates.
- Tanks and pipes for organic solvents.

Fabrication Methods

- Can be easily applied by hand lay-up laminating, spray-up, pultrusion, resin transfer molding (RTM) and filament winding.
- Can be used in polymer concrete casting.
- Can comply with US FDA regulation 21 CFR 177.2420 if the resin is properly formulated and cured.

Typical properties of liquid resin

Property* ¹	Value
Appearance	Clear yellow liquid
Solid Content (%)	71.5 +/- 2.0
Viscosity* ²	750 +/- 150 cps 750 +/- 150 mPa.s
Specific Gravity	1.08 +/- 0.02
Gel Time (min)* ³	25~35
Shelf Life (months)	6

*¹ Measurement was obtained under 25°C.

*² LVT-#3-60rpm @25°C.

*³ 6% Cobalt: 0.4phr, 100% DMA: 0.05phr, 55% MEKPO: 2.0phr @25°C.

Typical mechanical properties of 3.2mm clear casting*⁴

Property	SI* ⁵	US Standard	Test Method
Tensile Strength	62~80MPa	9000~11000 psi	ASTM D638
Tensile Modulus	3.6~3.9GPa	5.2~5.6 X10 ⁵ psi	ASTM D638
Tensile Elongation	1.5~2.5%	1.5~2.5%	ASTM D638
Flexural Strength	90~125MPa	13000~18000 psi	ASTM D790
Flexural Modulus	3.8~4.3GPa	5.5~6.2 X10 ⁵ psi	ASTM D790
Volume Shrinkage	9.0~10.0%	9.0~10.0%	ASTM D2566
Heat Distortion Temperature* ⁶	205~210 °C	401~410 °F	ASTM D648
Barcol Hardness	50+/- 5	50+/- 5	ASTM D2583

*⁴ Cure condition for HDT: 24 hours at room temperature then 2 hours at 130°C.

*⁵ SI values based on conversion.

*⁶ Cure condition for HDT: 24 hours at room temperature then 24 hours at 200°C.

Typical gel time of SWANCOR SW 977-S*⁷

Temperatures	Chemical	10-20 mins	20-40 mins	40-60 mins
18 °C/64 °F	CHP	-	2.0%	1.5%
	CoOct	-	0.4%	0.2%
	DMA	-	-	-
25 °C/77 °F	CHP	2.0%	1.5%	1.5%
	CoOct	0.4%	0.2%	0.1%
	DMA	0.05%	-	-
30 °C/86 °F	CHP	2.0%	1.0%	1.0%
	CoOct	0.2%	0.15%	0.1%
	DMA	-	-	-

*⁷ Concentration: 6%CoOct, 100%DMA, 80%CHP(TRIGONOX K-80)

HDT by curing: 24 hours at room temperature: 77~82 °C/171~180 °F

Post curing for higher HDT

Post curing	Heat Distortion Temperature (°C/°F)
24 hours at room temperature then 24 hours at 200 °C.	205~210 / 401~410
24 hours at room temperature then 2 hours at 200 °C.	167~172 / 333~342
24 hours at room temperature then 2 hours at 130 °C.	147~152 / 297~306

The data presented herein are believed to be accurate and reliable. We require customers to inspect and test our product before use and to satisfy themselves as to contents and suitability for their specific applications. Information herein is to assist customers in determining whether our products are suitable for their applications but not to be taken as a guarantee, express warranty or implied warranty of merchantability or fitness for particular purpose, nor is any protection form any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is limited to replacement of our material and in no event shall we be liable for special, incidental or consequential damages.

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NOTICE IN USE

1. If **SWANCOR 977-S** is blended with cobalt-salt promoters, shelf life will be shortened. Promoted **SWANCOR 977-S** must be used within one week.
2. The gel time of **SWANCOR 977-S** is affected primarily by catalyst concentration and temperature. The variations of cure characteristics may be caused by the variations of catalyst, humidity, pigment, fillers and other additives. It is recommended that the fabricators check the cure characteristics with a small quantity resin before proceeding for bulk production.
3. **SWANCOR 977-S** contains organic solvent (styrene). Keep away from heat, sparks and flames.
4. **SWANCOR 977-S** is a potentially reactive chemical. Please store it in dark and keep away from heat and direct sunshine.
5. Containers, not completely emptied must be closed immediately after use.
6. For material with long storage time, it is recommended to either pump air into the resin or open the cap of containers to prevent gellation.

MATERIAL SAFETY AND HANDLING INFORMATION

SKIN CONTACT:

Thoroughly wash exposed area with soap and water immediately. Remove contaminated clothing. Launder contaminated clothing before re-use.

EYE CONTACT:

Flush with large amount of water immediately and continuously for 20 minutes, lifting upper and lower lids occasionally. Get medical attention.

INGESTION:

Do not induce vomiting. Keep person warm, quiet and get medical attention. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.

INHALATION:

If affected, remove individual to fresh air. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. Keep person warm, quiet, and get medical attention.

PERSONAL PROTECTION:

The data presented herein are believed to be accurate and reliable. We require customers to inspect and test our product before use and to satisfy themselves as to contents and suitability for their specific applications. Information herein is to assist customers in determining whether our products are suitable for their applications but not to be taken as a guarantee, express warranty or implied warranty of merchantability or fitness for particular purpose, nor is any protection form any law or patent to be inferred. All patent rights are reserved. The exclusive remedy for all proven claims is limited to replacement of our material and in no event shall we be liable for special, incidental or consequential damages.

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Do not breathe vapors. High concentration of vapor can be hazardous. Keep out of sewers. Eliminate all sources of ignition in vicinity of spill or released vapor to avoid fire or explosion. For large spills, warn public of downwind explosion hazard. Check area with explosion meter before re-entering area. Ground and bond all containers and handling equipment.

RESIN STORAGE

Keep away from ignition sources; flames, pilot lights, electrical sparks, and sparking tools. NO SMOKING. Do not store in direct sunlight. Store separate from oxidizing materials, peroxides, and metal salts. Keep container closed when not in use. To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 25°C (77°F). Copper or copper containing alloys should be avoided as containers.

SPILLS

Eliminate all ignition sources (flares, flames, including pilot lights electrical sparks). Persons not wearing protective equipment should be exclude from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent or other absorbent material and shoveled into containers.

WASTE DISPOSAL

Destroy by liquid incineration in accordance with applicable regulation. Contaminated absorbent should be disposed in accordance to government regulations.

PACKAGE

Standard packing is 200 kg steel drum.