

SWANCOR 900

Epoxy Vinyl Ester Resins



Product Description

SWANCOR 900 is a modified Novolac vinyl ester resin. It is designed for use in high temperature and high corrosion applications.

SWANCOR 900 is designed to provide superior toughness with excellent fatigue resistance due to high heat distortion temperature.

Applications

- ◆ Chemical storage tanks, pipes, flue gas desulfurization systems (FGD), scrubbers, ducts, chimneys.
- ◆ Corrosion resistant flooring while incorporated with aggregates.
- ◆ Equipment specified to handle mixture of air, exhaust gases or potentially flammable liquids.
- ◆ Tanks and pipes for organic solvents.

Fabrication Methods

- ◆ Can be applied by hand lay-up laminating, spray-up, pultrusion, 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 amber liquid
Solid Content (%)	64.5 +/- 1
Viscosity * ²	400 +/- 150cps 400 +/- 150mPa.s
Specific Gravity	1.07 +/- 0.01
Gel Time (min)* ³	15~25
Shelf Life (months)	3

*¹ Measurement were obtained under 25°C/77°F

*² LVT-#3-60rpm @25°C/77°F.

*³ 6% Cobalt: 0.4%, 100% DMA: 0.05%, 80% CHP: 1.5% @25°C/77°F .

Flexural retention of SWANCOR 900 laminates at continuous oven baking*⁴

Temperature	Percentage of flexural retention (%)* ⁵			
	1 week	3 months	6 months	12 months
200°C/392°F	102	84	75	66
180°C/356°F	99	103	89	78
160°C/320°F	-----	90	98	84

*⁴ Laminate construction is as follows: V/M/M/Wr/M/Wr/M, fiber content: 39~41%, thickness: 6.0mm.

*⁵ The percentage of flexural retention is based on a 100% flexural strength at 25°C /77°F.

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Typical properties of 3.2mm clear casting cured resin*⁶

Property	SI* ⁷	US Standard	Test Method
Tensile Strength	80~90MPa	11,000~13,000psi	ASTM D638
Tensile Modulus	3.5~3.7GPa	5.0~5.3 X10 ⁵ psi	ASTM D638
Tensile Elongation	2.2~2.8%	2.2~2.8%	ASTM D638
Flexural Strength	118~138MPa	17,000~20,000psi	ASTM D790
Flexural Modulus	3.8~4.1MPa	5.4~5.9 X10 ⁵ psi	ASTM D790
Volume Shrinkage	9.0~9.5%	9.0~9.5%	ASTM D2566
Heat Distortion Temperature * ⁸	160~165 °C	320~329°F	ASTM D648
Barcol Hardness	40~46	40~46	ASTM D2583
Charpy Test	2.0~4.0kg-cm/cm ²		ASTM D256

*⁶ Cure condition: 24 hours at room temperature then 2 hours at 130°C/266°F..

*⁷ SI values based on conversation.

*⁸ Postcuring : 24 hours at room temperature then 24 hours at 200°C/392°F.

Typical properties of 6.0 mm laminates*⁸

Property	SI	US Standard	Test Method
Tensile Strength	118~132MPa	17,000~19,000 psi	ASTM D638
Tensile Modulus	11.1~11.8GPa	1.6~1.7 X10 ⁶ psi	ASTM D638
Flexural Strength	159~173Mpa	23,000~25,000 psi	ASTM D790
Flexural Modulus	8.3~9.7GPa	1.2~1.4 X10 ⁶ psi	ASTM D648
Heat Distortion Temperature* ⁹	>270°C	>518°F	ASTM D648

*⁸ Laminate construction is as follows: V/M/M/Wr/M/Wr/M, fiber content: 39~41%, thickness: 6.0mm.

*⁹ Postcuring : 24 hours at room temperature then 6 hours at 150 °C/302°F and 18 hours at 200°C/392°F.

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Heat resistance of 6.0 mm laminates*10

Property	Temperature					
	77°F	149°F	203°F	248°F	302°F	347°F
Tensile Strength (X10 ⁴ psi)	1.85	1.85	1.85	1.80	1.70	1.25
Tensile Modulus (X10 ⁵ psi)	17.5	17.8	17.6	17.6	10.8	8.0
Flexural Strength (X10 ⁴ psi)	2.40	2.45	2.41	2.40	2.10	8.00
Flexural Modulus (X10 ⁵ psi)	12.8	12.0	11.8	10.8	8.5	5.4

Property	Temperature					
	25°C	65°C	95°C	120°C	150°C	175°C
Tensile Strength (Mpa)	127	127	127	125	118	87
Tensile Modulus (GPa)	12.0	12.3	12.2	12.2	6.9	5.5
Flexural Strength (MPa)	165	169	166	165	138	552
Flexural Modulus (GPa)	8.8	8.3	8.1	7.5	5.0	3.7

*10 Laminate construction is as follows: V/M/M/Wr/M/Wr/M, fiber content: 39~41%, thickness: 6.0mm.

Typical gel time of SWANCOR SW 900*11

Temperatures	Chemical	10-20 mins	20-40 mins	40-60 mins
18°C/64°F	CHP	-	3.0%	1.5%
	CoOct	-	0.6%	0.2%
	DMA	-	0.1%	-
25°C/77°F	CHP	1.5%	1.5%	1.5%
	CoOct	0.4%	0.2%	0.15%
	DMA	0.05%	-	-
30°C/86°F	CHP	1.5%	0.8%	0.8%
	CoOct	0.2%	0.15%	0.1%
	DMA	0.02%	-	-

*11 Concentration: 6%CoOct, 100%DMA, 80%CHP

NOTICE IN USE

- If **SWANCOR 900** is blended with cobalt-salt promoters, shelf life will be shortened. Promoted **SWANCOR 900** must be used within two weeks.
- The gel time of **SWANCOR 900** 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.
- SWANCOR 900** contains organic solvent (styrene). Keep away from heat, sparks and flames.
- SWANCOR 900** is a potentially reactive chemical. Please store it in dark and keep away from heat and direct sunshine.
- Containers, not completely emptied must be closed immediately after use.
- 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.

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PERSONAL PROTECTION:

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 excluded 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.

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Page: 3/3

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