

# SWANCOR 905C

## Epoxy Vinyl Ester Resins



### Product Description

**SWANCOR 905C** is a brominated Bisphenol A type epoxy vinyl ester resin. It provides excellent corrosion resistance to a broad range of organic and inorganic acids, alkali, oxidizing chemicals and salt solutions etc as good as Bisphenol A type resins. It also provides very good mechanical strength such as tensile and flexural while incorporated with reinforcement such glass fiber, carbon fiber or kevlar fiber etc. **SWANCOR 905C** offers excellent flame retardancy for FRP applications. ASTM E84 Class 1 can be achieved while incorporated with Nyacol APE 3040. It is also 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 and grating.
- Corrosion resistant flooring while incorporated with aggregates.
- Equipment specified to handle mixture of air, exhaust gases or potentially flammable liquids.
- Military applications such as Kevlar fiber based panels.

### 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* <sup>1</sup>       | Value                          |
|------------------------------|--------------------------------|
| Appearance                   | Clear liquid yellow liquid     |
| Solid Content (%)            | 65.0 +/- 1.5                   |
| Viscosity * <sup>2</sup>     | 300~450 cps      300~450 mPa.s |
| Specific Gravity             | 1.15 +/- 0.02                  |
| Gel Time (min)* <sup>3</sup> | 15~25                          |
| Shelf Life (months)          | 9                              |

\*<sup>1</sup> Measurement was obtained under 25°C.

\*<sup>2</sup> LVT-#3-60rpm@25°C.

\*<sup>3</sup> 6% Cobalt: 0.4phr, 100% DMA: 0.05phr, Andonox LCR: 1.2phr.

### Typical clear casting properties of cured resin

| Property                                   | SI* <sup>4</sup> | US Standard                  | Test Method |
|--|------------------|------------------------------|-------------|
| Tensile Strength                           | 80~90MPa         | 11,000~13,000psi             | ASTM D638   |
| Tensile Modulus                            | 2.7~3.5GPa       | 4.0~5.0 X10 <sup>5</sup> psi | ASTM D638   |
| Tensile Elongation                         | 5.0~6.0%         | 5.0~6.0%                     | ASTM D638   |
| Flexural Strength                          | 118~152MPa       | 17,000~22,000psi             | ASTM D790   |
| Flexural Modulus                           | 3.1~3.8GPa       | 4.5~5.4 X10 <sup>5</sup> psi | ASTM D790   |
| Volume Shrinkage                           | 7.0~8.0%         | 7.0~8.0%                     | ASTM D2566  |
| Heat Distortion Temperature * <sup>5</sup> | 106~116°C        | 223~241°F                    | ASTM D648   |
| Barcol Hardness                            | 35 +/- 3         | 35 +/- 3                     | ASTM D2583  |

\*<sup>4</sup> SI values based on conversion.

\*<sup>5</sup> Cure condition for HDT: 24 hours at room temperature then 2 hours at 105 °C

### Ignition resistance of SWANCOR 905C laminate

| Limited Oxygen Index (LOI) | ASTM D2863                                  | Value    |
|----------------------------|---|----------|
|                            | Unfilled<br>3.75% Nyacol APE 3040<br>filled | 23<br>29 |
| Tunnel Test (Flame Spread) | ASTM E84* <sup>6</sup>                      | Value    |
|                            | 3.75% Nyacol APE 3040<br>filled             | 20       |

\*<sup>6</sup> Glass fiber content: 25-30%

### Typical gel time of SWANCOR 905C

| Gel Time<br>Temperature | Materials | 10~20 min                             | 20~40 min | 40~60 min |
|-------------------------|-----------|---------------------------------------|-----------|-----------|
|                         |           | Cured by MEKP/CoOct/DMA* <sup>7</sup> |           |           |
| 18°C/64°F               | MEKP      | 1.00%                                 | 1.00%     | 0.80%     |
|                         | CoOct     | 0.40%                                 | 0.40%     | 0.40%     |
|                         | DMA       | 0.20%                                 | 0.10%     | 0.05%     |
| 25°C/77°F               | MEKP      | 1.20%                                 | 1.00%     | 0.90%     |
|                         | CoOct     | 0.40%                                 | 0.30%     | 0.30%     |
|                         | DMA       | 0.08%                                 | 0.02%     | 0.02%     |
| 30°C/86°F               | MEKP      | 1.20%                                 | 1.00%     | 0.90%     |
|                         | CoOct     | 0.40%                                 | 0.30%     | 0.30%     |
|                         | DMA       | 0.05%                                 | 0.02%     | 0.01%     |

\*<sup>7</sup> Concentration: MEKP: Degussa Curox M400, CoOct: 6%,  
DMA: 100%

*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 from 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 905C** is blended with cobalt-salt promoters, shelf life will be shortened. Promoted **SWANCOR 905C** must be used within three months.
2. The gel time of **SWANCOR 905C** 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 905C** contains organic solvent (styrene). Keep away from heat, sparks and flames.
4. **SWANCOR 905C** 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.

### 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:

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.

*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 from 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.*