

## **Product Data**

# **Silicone Varnish for Laminating Board TSR125A**

TSR125A is silicone varnish used in fabricating laminated board from glass cloth or mica which can be molded under either high or low pressure.

### **KEY FEATURES**

Laminated board fabricated with TSR125A provides excellent physical and electrical properties over a wide range of ambient temperatures. TSR125A must be used with a curing catalyst: catalyst CR24 for low pressure molding, CR25A for high pressure molding. Varnish mixed with low pressure type catalyst CR24 can also easily be applied in fabricating laminated tubing.

### **TYPICAL PROPERTY DATA**

<b>PROPERTIES</b>		
Appearance		Pale yellow, clear
Specific gravity (25°C)		1.06
Viscosity (25°C)	mPa·s	23
Solid content	%	60
Solvent		Toluene

### **TYPICAL PROPERTIES OF SILICONE LAMINATE SHEET (2 mm thick) (JIS C 2241)**

<b>PROPERTIES</b>		<b>TEST CONDITION</b>	<b>VALUE</b>
Breakdown voltage (edgewise)	kV	A	32 Passed
		D-48/50	15 Passed
Insulation resistance	$\Omega$	A	$1.2 \times 10^{14}$
		D-48/50	$1.4 \times 10^{10}$
Volume resistivity	$\Omega \cdot \text{cm}$	A	$> 10^{15}$
		C-96/35/90	$9.3 \times 10^{13}$
Dielectric ratio (1MHz)		A	4.0
		D-24/23	4.2
Dielectric loss (1MHz)	%	A	0.2
		D-24/23	0.4
Bending strength	MPa {kgf/mm <sup>2</sup> }	A (Length-wise)	150{15.3}
		A (Width-wise)	145{14.8}
Thermal weight loss	%	E-24/250	0.28
Water absorption rate	%	D-24/23	0.09
Solvent resistance		toluene:25°C, 1h	Non peel off

Test piece preparation method

Prepare the varnish solution: 100g of TSR125A with 0.4g of CR25A. Soak a 0.18mm thick, heat cleaned piece of glass cloth in the varnish. Heat at 110°C for 10 minutes to foam a pre-preg sheet. Stack 10 pre-preg sheets and press mold under 70kgf/cm<sup>2</sup> for 30 minutes at 160°C. Bake the molded sheet for 2 hours at 120 °C, 16 hours at 200°C, and finally 2 hours at

250°C.

*Typical property data values should not be used as specifications.*

## APPLICATION PROCEDURE

### (1) Preparation of the processing solution

Add CR24 or CR25A to TSR125A and dilute with toluene or xylene if necessary. Adjust the amount of solvent in order to attain around a 40% ratio of silicone resin to glass cloth when treated.

### (2) Dipping of glass cloth and preliminary baking

Dip the de-sized and non-alkaline glass cloth in the varnish. Bake for 10~20 minutes at 70~90°C if CR24 has been added, or 10~20 minutes at 90~110°C for CR25A. Baking at too high of a temperature or for too long a period time may cause molding failure.

### (3) Press molding

Stack the processed silicone glass cloth to the required finished thickness. If the thickness is between 3 and 5 mm, press cure under 40 ~ 100 kgf/cm<sup>2</sup> of pressure for 1 ~ 1.5 hours at 140~160°C for catalyst CR24, or at 160~180°C for catalyst CR25A. Allow the material to cool to below 80°C before removing it from the press.

The above press molding condition are based on 3 - 5mm thick laminate board. Conditions should be adjusted corresponding to the required board thickness.

### (4) Heat aging

At this stage, press molded laminate board is still insufficient in physical strength and solvent resistance. Heat treatment under the following schedule will improve these properties.

First step	90°C	16 h
	120°C	2 h
	150°C	2 h
	180°C	2 h
	200°C	2 h
	220°C	2 h
Final step	250°C	2 - 10 h

## HANDLING PRECAUTION

1. Prepare only the necessary amount of varnish solution as varnish mixed with catalyst is reactive and tends to gel.
2. Avoid excessive heating at the preliminary drying stage.
3. Baking must be conducted carefully, particularly with thick section laminates which may transform or distort under their own weight.

4. TSR125A must be used with a catalyst. Select catalyst CR24 or CR25A depending on the following application objective.  
CR24 --- Low or high pressure molding (for laminate tubing and boards)  
CR25A --- High pressure molding (for laminate boards)
5. Add the catalyst: 0.3~0.8g of CR24, or 0.3~0.5g of CR25A per 100g of varnish. Determine the exact amount in a preliminary test, taking into account drying and press molding conditions.

## HANDLING AND SAFETY

- ◆ Wear eye protection, protective gloves, and respiratory protection while handling the product.
- ◆ Since the product is flammable, strictly prohibit the use of devices that may cause fire.
- ◆ As an electrostatic prevention, have equipments and devices grounded.

## PRECAUTIONS FOR STORAGE

- ◆ Avoid direct sunlight and store the product, after it has been tightly sealed, in a dark indoor area which has little moisture.
- ◆ Keep out of the reach of children.

## PACKAGING

- ◆ 18kg can available by the can
- ◆ 180kg drum available by the drum

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### **FOR INDUSTRIAL USE ONLY**

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