

Product Data

Silicone Varnish For Coil Impregnation TSR116, TSR117, YR47

TSR116, TSR117 and YR47 are methylphenyl silicone based varnishes applied for Class H insulation (maximum operating temperature of 180°C). YR47 contains an anti-blister agent, rendering it suitable for application where blistering is a problem during the heat curing stage.

KEY FEATURES

- ◆ Excellent electrical properties such as dielectric strength and electric resistance
- ◆ Excellent high and low temperature resistance, with little insulation deterioration even at a maximum operating temperature of 200°C
- ◆ Excellent water and moisture resistance
- ◆ Excellent weather durability compared with organic varnish films
- ◆ Most of cured materials are noninflammable

TYPICAL APPLICATIONS

- ◆ Coil impregnation

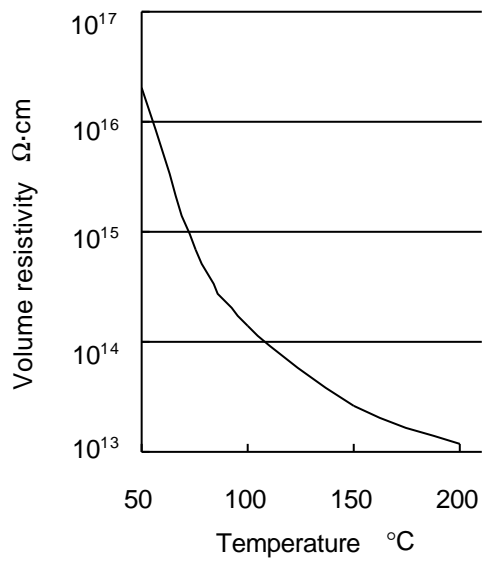
TYPICAL PROPERTY DATA

(JIS C 2122)

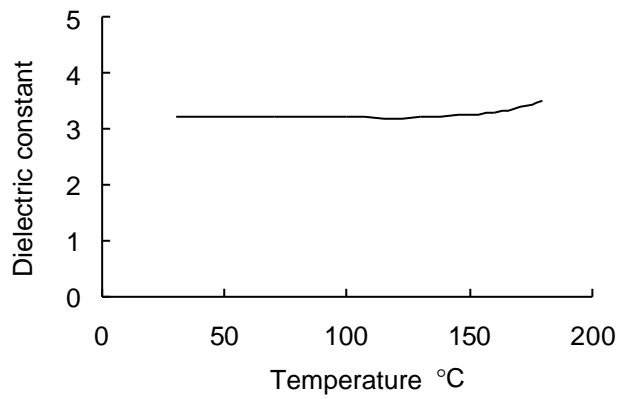
PROPERTIES		TSR116	TSR117	YR47
Appearance	Vanish	Pale yellow, transparent		
	Cured film	Smooth, luster		
Specific gravity (25°C)		1.01	1.01	1.01
Viscosity (25°C)	Pa·s {P}	0.15 {1.5}	0.14 {1.4}	0.14 {1.4}
Solid content	%	50	50	51
Acid value	KOH mg/g	2.6	2.5	2.5
Film thickness	Center mm	0.031	0.031	0.031
	Lower part %	113	116	16
Thinning ease (Xylene)		Good	Good	Good
Curing time min	200°C	30	-	-
	150°C	-	30	30
Volume resistivity Ω·cm	Normal	2.2×10 ¹⁶	5.4×10 ¹⁶	4.5×10 ¹⁶
	After wetted	2.2×10 ¹⁶	5.4×10 ¹⁶	4.5×10 ¹⁶
	180°C	6.0×10 ¹³	7.2×10 ¹³	6.3×10 ¹³
Dielectric strength kV/0.1mm	Normal	8.4	7.9	7.5
	After wetted	8.7	7.9	7.5
	180°C	7.3	7.6	7.5
Bending (3mm φ)		250°C, 300h No Change	250°C, 70h No Change	250°C, 70h No Change
Heat resistance (glass-cloth)		250°C, 2,000h, No Change		
Thermal weight loss (250°C, 72h)	%	4.4	4.8	5.1
Solvent resistance* (25°C)		Passed		

* Immersed in xylene for 60 seconds

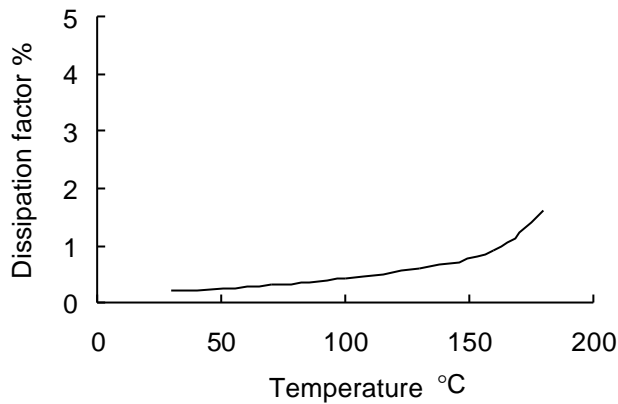
ELECTRIC PROPERTIES OF TSR117 VOLUME RESISTIVITY VS TEMPERATURE



DIELECTRIC CONSTANT VS TEMPERATURE (60HZ)



DISSIPATION FACTOR VS TEMPERATURE (60HZ)



INSTRUCTIONS FOR USE

1. Preliminary drying of processing materials
Remove any dust, oil, or other contaminants from the material to be processed. Pre-bake for several hours between 80 and 150°C to eliminate any water or moisture. Baking under reduced pressure conditions is highly effective.
2. First immersion
Cool the material to 50°C or below before immersing it in the varnish. Hold the material until bubbling has ceased so as to allow the varnish to impregnate the material. This process is usually carried out under reduced pressure condition.
3. Airdrying
Remove the material and drain any excessive varnish. Keep at room temperature for several hours to allow the solvent to evaporate.
4. First baking
Place the airdried material in an oven and gradually raise the temperature. Keep the material in the oven for several hours between 80 and 120°C until the solvent has completely evaporated. Then bake according to the temperature and schedule specified by the type of varnish. Standard baking schedules for TSR117, YR47 and TSR116 are Fig 1 and Fig 2, however, if the material is complex or excessively large, the baking period must be extended.
5. Second immersion
Cool the coated material to room temperature and immerse again in the varnish. It is recommended that the second immersion be completed within five minutes, as silicone film from the first baking may be damaged by extended contact with the varnish.
6. Airdrying
Repeat the air drying process 3 as after the first immer

7. Final baking

Repeat the baking process 4 as with the first immersion. Raise the temperature for the final baking according to the standard schedules shown Fig. 1 (TSR117 and YR47) and Fig. 2 (TSR116). Gradually cool the finished material to room temperature.

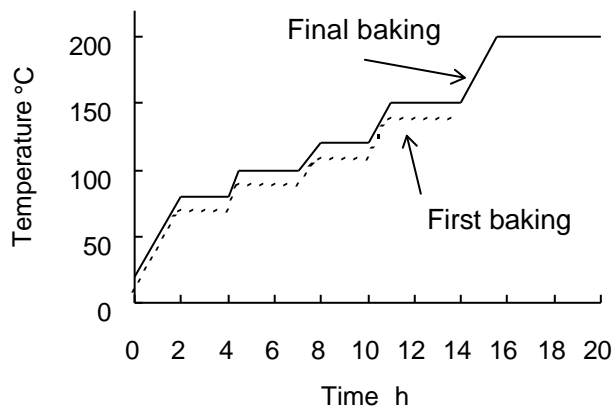


Fig1. Standard schedule for transformer coil insulation with TSR117 (YR47)

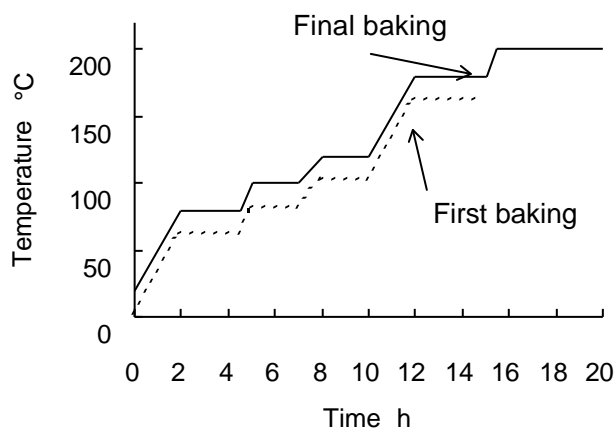


Fig2. Standard schedule for transformer coil insulation with TSR116

PRECAUTIONS DURING USAGE

- ◆ When temperature is increased rapidly during the First baking and Final baking, blistering may occur.
- ◆ Do not store varnish in lead lined vessels
- ◆ When reusing a used varnish, refine it by filtration, etc. During the refining process, avoid

solvent evaporation and contamination.

HANDLING AND SAFETY

- ◆ Wear eye protection, protective gloves, and respiratory protection while handling the product.
- ◆ Avoid any source of ignition due to flammability.
- ◆ Maintain adequate ventilation in the work place at all times.

STORAGE

- ◆ Store in a cool and dry place out of direct sunlight.
- ◆ Keep out of the reach of children

PACKAGING

TSR116

- ◆ 1kg can available in case of 10
- ◆ 18kg drum available
- ◆ 200 kg drum available

TSR117

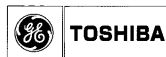
- ◆ 1kg can available in case of 10
- ◆ 18kg drum available
- ◆ 200 kg drum available

YR47

- ◆ 18kg can available
- ◆ 200 kg drum available

FOR INDUSTRIAL USE ONLY

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