Product Information

Elmotherm®   011-0796

Impregnating Varnish

A member of ALTANA

Elmotherm® 011-0796

Description:

Elmotherm® 011-0796 is a non-catalytic modified, Class H, epoxy Varnish with exceptional chemical resistance and high bond strength and excellent resistance to chlorinated fluorocarbons such as Arcton and Freon.

Elmotherm® 011-0796 retains high electrical insulation properties in the presence of extreme corrosive atmospheres, moisture and radical temperature changes.

Application:

Elmotherm® 011-0796 is suitable dip processing of components at ambient temperatures.

Processing:

Windings should first be preheated to relieve stresses in the wire enamel.

When curing it may be necessary to use an initial low temperature bake of 2 hrs @ 100°C to prevent bubbling, followed by a suitable conventional curing cycle.

Where maximum resistance to refrigerants is required, an extended bake at a minimum of 160°C is recommended.

Development of Bond Strength is a function of both curing temperature and time (refer to "Cure Characteristics" graph overleaf). Curing temperatures at the lower end of the scale (130-140°C) should generally only be used when bond strength and refrigerant resistance are not of prime importance e.g. in small transformers and fractional h.p stators. For applications where windings will be expected to withstand harsh chemical environments or to endure high mechanical stress factors on, for example, high speed armatures, traction machines, stators of large industrial motors or high output units such as 2-pole motors, curing temperatures of at least 160°C should be used. When determining cure times at the chosen temperature, account must be taken of two factors:

1) Component temperatures will lag significantly behind indicated oven air temperature both in time and value attained, dependent on component size and oven efficiency and
2) That the solvent has to escape from any deep section windings, tightly wound coils and long slot lengths before the varnish cure mechanism in those areas can commence.

Maintenance of Resin:

The tank viscosity of Elmotherm® 011-0796 should be monitored regularly by reference to the Viscosity/ Temperature Graph overleaf. The recommended solvent is F66 from Sterling Technology.

A tank sampling service is available on request.

Properties:

Appearance	Pale clear straw liquid	🅤🄻
Viscosity	35 - 40 secs	B4 4 Flow Cup @ 21ºC
Specific Gravity	0.96	g / cm³
Mix Ratio	Single component	p.b.w.
Mix Ratio	Single component	p.b.v.
Gelation Time	2 hours	@ 165ºC
Cure Schedule	4 -6 hours	@ 160ºC
Flash Point	24.5	° C

Elmotherm® 011-0796

TYPICAL PROPERTIES

- **GENERAL DATA**
- **VISCOSITY/ TEMPERATURE**
- **THERMAL ENDURANCE**
- **CURE CHARACTERISTICS**
- **BOND STRENGTH**
- **LOSS TANGENT**
- **OTHER INFORMATION**

GENERAL DATA

DIELECTRIC STRENGTH	**TEMPERATURE**	21	90	130	155	180
To IEC 60464-2, 50µm on	**VOLTS/µm**	175	146	125	115	110

Aluminium panel @
500 volts/sec @ 50Hz

After 24 hrs water immersion @ 20°C		105
After 7 days water immersion @ 20°C		110

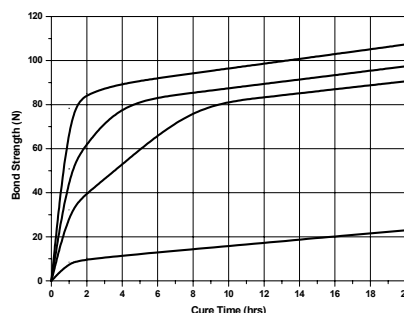| **TRACKING PROTECTION**	BS5629-3 @ 200 volts	38 drops
FLASH POINT	Abel Closed Cup	24.5°C
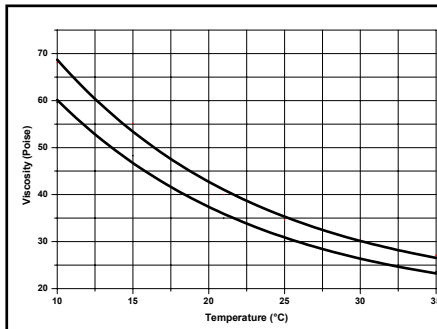
VISCOSITY / TEMPERATURE

Comparison graph of Temperature vs Viscosity using a B4 flow cup. The graph shows the upper and lower limits of operating specification. Full-scale curves for B4, Ford 4 and DIN4 Cups are available on request and these should be used as a guide to maintain and control tank viscosity.
A tank sampling service is available on request.

THERMAL ENDURANCE

Thermal Endurance has been carried out on Helical Coils to ASTM D3145 and **Twisted Pairs** to ASTM D3251 (as recognised by Underwriters Laboratories).

The results, with a 200°C grade wire enamel (MW35 type), shows Thermal Indices of 172.8°C and **186.9°C** respectively.
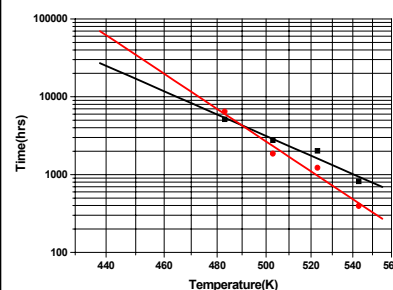
CURE CHARACTERISTICS

This graph clearly demonstrates the effect of increasing curing temperature on Bond Strength. The more demanding the application, the higher the cure temperature necessary. Whilst extending the cure time has a positive effect, particularly at higher temperatures, it can be seen that most benefit is derived from the use of higher cure temperatures.

OTHER INFORMATION

Elmotherm® 011-0796 is Underwriters Laboratories (UL) recognised for hermetic resistance.

For further information please contact STERLING TECHNOLOGY sales department.

BOND STRENGTH

This series of graphs shows the effect of operating temperature on the Bond Strength of Elmotherm® 011-0796. Carried out on Helical Coils to ASTM D2519, graphs 3 and 5 relate to material cured at 160°C for 16 hrs and 8 hrs respectively. Graphs 2 and 4 show the cure at 180°C for 16 hrs and 4 hrs respectively with Graph 1 showing a 2 hr cure @ 200°C
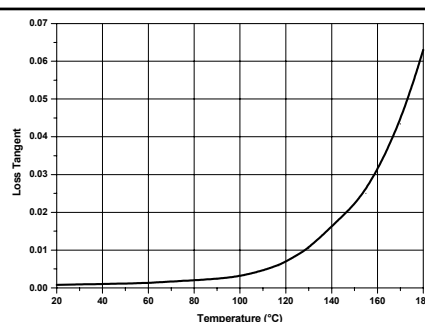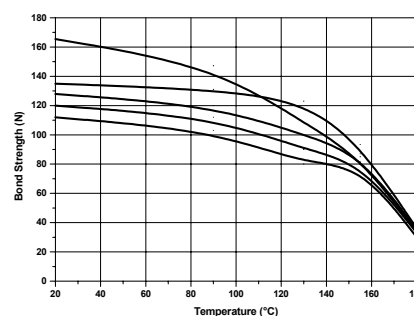
LOSS TANGENT

Loss Tangent has been determined to IEC 60250 (1977) @ 50 Hz. The graph shows the ultimate properties of the varnish under ideal cure conditions. The properties of the insulation system will be dependent on both the varnish and the other insulations used.