

Varnish

VGE-7031 Varnish

Clear modified phenolic

Can be air-dried or baked

Use up to 470 K for
1 hour to 2 hour maximum

Varnish will not outgas
after baking

Can be used in vacuum
(1.33×10^{-6} Pa
[9.98×10^{-9} torr])

Superior electrical properties

Excellent chemical resistance

May be applied by dipping,
roller coating, brushing,
or spraying

Moderately good,
low stress adhesive

Enhances thermal contact

VGE-7031 Insulating Varnish and Adhesive possesses electrical and bonding properties which, when combined with its chemical resistance and good saturating properties, make it an excellent material for cryogenic temperatures. As an adhesive, VGE-7031 bonds a variety of materials, has fast tack time, and may be air-dried or baked. It is excellent for laminating many types of materials, and may be applied to parts to be bonded and either baked shortly after applying or allowed to air dry and baked after the parts are stored and assembled hours, days, or even *weeks* later. It is also an electrically insulating adhesive at cryogenic temperatures, and is often used as a calorimeter cement. VGE-7031 is compatible when dry with a wide variety of materials, including cotton, Dacron® polyester fiber, nylon glass tapes, laminates, Mylar® polyester film, mica products, polyester products, vinyl products, wire enamels, paints, rayon, plastics, and metals. When soaked into cigarette paper, it makes a good, high thermal conductivity, low electrical conductivity heat sinking layer.

Note: May be thinned to the desired application viscosity with a 50:50 mix of denatured alcohol and toluene.

Specifications

Maximum operating temperature: 423 K (150 °C)

Thermal conductivity:

1 K (-272 °C) – 0.034 W/(m·K)

4.2 K (-269 °C) – 0.062 W/(m·K)

77 K (-196 °C) – 0.22 W/(m·K)

100 K (-173 °C) – 0.24 W/(m·K)

300 K (27 °C) – 0.44 W/(m·K)

Percent solids by weight: 18 to 20%

Viscosity at 298 K (25 °C): 1.3 kg/(m·s) (1300 cP)

Specific gravity at 298 K (25 °C): 0.88

Flash point, closed cup: 269 K (-4 °C)

Shelf life: 12 months from date on the can when stored at room temperature

Drying time (25 µm film, tack free): 5 min to 10 min at 298 K (25 °C); 2 min to 5 min at 398 K (125 °C)

Solvent system: Xylene, alcohol, acetone

Note: The solvents in the varnish have a tendency to craze Formvar® wire insulation. The wire cannot be disturbed during curing of the varnish (typically 12 to 24 hours at room temperature).