Product Information

Gels

Dow Corning® Q3-6575 Dielectric Gel

2-part, very soft, clear, 1:1 mix ratio, low temperature gel

FEATURES

- Fast heat cure
- Suitable for very low temperatures (-80 to 200C / -112 to 392F)

BENEFITS

- Fast heat cure to speed processing
- Gel remains flexible in very low temperature applications

TYPICAL PROPERTIES

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Property	Unit	Value
Viscosity (Part A or Base)	cP	750
	mPa-sec	750
	Pa-sec	0.8
Viscosity (Part B or Catalyst)	cP	750
	mPa-sec	750
	Pa-sec	0.7
Viscosity (Mixed)	cP	750
	mPa-sec	750
	Pa-sec	0.8
Specific Gravity (Uncured)	-	1.02
Gel Time @ 135C	minutes	5.8
Cure Time at 25ºC	hrs	24
Heat Cure Time @ 70ºC	minutes	40
Heat Cure Time @ 100ºC	minutes	20
Gel Hardness	grams	75
Penetration	1/10 mm	80
Dielectric Strength	volts/mil	450
	kV/mm	18
Dielectric Constant at 100 Hz	-	2.82
Dielectric Constant at 100 kHz	-	2.83
Volume Resistivity	ohm*cm	1.2 E+14
Dissipation Factor at 100 hz	-	0.002
Dissipation Factor at 100 kHz	-	<0.0001
Shelf Life at 25ºC	months	12

DESCRIPTION

Two-part, low temperature gels exhibit the stability of their properties at temperatures down to -80C allowing electronics to operate at these extreme temperatures. The soft nature of these gels can also assist in managing the CTE mismatch between components or materials during such low temperature excursions. This low temperature performance could assist in lowering field failures and warranty costs. Gels are a special class of encapsulants that cure to an extremely soft material. Gels cure in place to form cushioning, self-healing, resilient materials. Cured gels retain much of the stress relief and self-healing qualities of a liquid while providing the dimensional stability of an elastomer which is increasingly needed for delicate components. Gels have been used to isolate circuits from the harmful effects of moisture and other contaminants and provide electrical insulation for high voltages. Another use is providing stress relief to protect circuits and interconnections from thermal and mechanical stresses. Gels are usually applied in thick layers to totally encapsulate higher architectures. More recently, gels have found application in optoelectronics due to their stress relieving capability and high refractive index, as well as the stability of these properties over time.

MIXING AND DE-AIRING

Some gels are supplied in bladder packs that avoid direct air contact with the liquid gel components, allowing use of air pressure over the pack in a pressure pot for dispensing. Do not apply air pressure directly to the liquid gel surface (without the bladder pack) as the gel can become supersaturated with air and bubbling can occur when the material is dispensed and cured. Use of bladder packs prevents bubbling, maintains cleanliness and avoids gel contamination. Gels can be dispensed manually or by using one of the available types of meter mix equipment. Typically, the two components are of matched viscosities and are readily mixed with static or dynamic mixers, with automated meter-mix normally used for high volume processes. For low-volume applications, manual weighing and simple hand mixing may be appropriate. Inaccurate proportioning or inadequate mixing may cause localized or widespread problems affecting the gel properties or cure characteristics. If possible, the potential for entrapment and incorporation of gas (typically air) should be considered during design of the part and selection of a process to mix and dispense the gel. This is especially important with higher-viscosity and faster-curing gels. Degassing at >28 inches (10-20 mm) Hg vacuum may be necessary to ensure a void-free, protective layer.

POT LIFE AND CURE RATE

Working time (or pot life) is the time required for the initial mixed viscosity to double at room temperature (RT). The cure reaction begins when Parts A and B are mixed. As the cure progresses, viscosity increases until the material becomes a soft gel. Cure conditions are shown in the typical properties table. Cure is defined as the time required for a specific gel to reach 90% of its final properties. Gels will reach a no-flow state prior to full cure. Addition-cure silicone gels may be RT and heat cure or exclusively heat cure. Adding heat accelerates the cure reaction. Additional time should be allowed for heating the part to near oven temperature. Cure schedules should be verified in each new application.

USEFUL TEMPERATURE RANGES

For most uses, silicone elastomers should be operational over a temperature range of -45 to 200°C (-49 to 392°F) for long periods of time. However, at both the low- and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations. For low-temperature performance, thermal cycling to conditions such as -55°C (-67°F) may be possible, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

COMPATIBILITY

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include: Organotin and other organometallic compounds, Silicone rubber containing organotin catalyst, Sulfur, polysulfides, polysulfones or other sulfur containing materials, unsaturated hydrocarbon plasitcizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small scale compatibility test be run to ascertain suitability in a given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured gel indicates incompatibility and inhibition of cure.

REPAIRABILITY

In the manufacture of electronic devices, salvage or rework of damaged or defective units is often required. Removal of Dow Corning dielectric gels to allow necessary repairs can be assisted by using Dow Corning® OS Fluids. Additional information regarding these products is available from Dow Corning. Digestive stripping agents, such as SU100 from Silicones Unlimited, can also be used. In addition, if only one component needs to be replaced, a soldering iron may be applied directly through the gel to remove the component. After work has been completed, the repaired area should be cleaned with forced air or a brush, dried, and patched with additional silicone gel.

PACKAGING

In general, Dow Corning dielectric gels are available in batch-matched kits containing both Part A and Part B components. Packages that are typically available include 210-mL dual cartridges, one-gallon pails, five-gallon pails and 55-gallon drums. Not all gels may be available in all packages, and some additional packages and package sizes may be available.

STORAGE AND SHELF LIFE

Storage conditions and shelf life ("Use By" date) are indicated on the product label.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area. For further information, please see our website, www.dowcorning.com, or consult your local Dow Corning representative.

LIMITATIONS

These products are neither tested nor represented as suitable for medical or pharmaceutical uses.

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 Form No. 11-1279A-01