



Technical Data Sheet

DOWSIL™ Q5-8401 Adhesive

FEATURES & BENEFITS

- Flowable
- 1:1 mix ratio
- Heat cure
- High tensile strength
- Good working time after mixing
- No added solvents
- Rapid, versatile cure processing controlled by temperature
- Able to flow, fill or self-leveling after dispensing

COMPOSITION

- 2-part
- 1:1 mix
- Polydimethylsiloxane

Strong, dark gray heat cure adhesive

APPLICATIONS

DOWSIL™ Q5-8401 Adhesive can be used for:

- Sealing lids and housings
- Attaching baseplates
- Gasketing
- Connector sealing
- Engine controllers
- ABS
- Transmission controllers

TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications.

Property	Unit	Result
Viscosity (Part A)	cP	113,850
	mPa-sec	113,850
	Pa-sec	113.9
Viscosity (Part B)	cP	76,325
	mPa-sec	76,325
	Pa-sec	76.3
Viscosity (Mixed)	cP	77,425
	mPa-sec	77,425
	Pa-sec	77.4
Working Time at 25°C (Pot Life - hours)	hr	24
Heat cure time @ 120°C	minutes	90
Specific Gravity (Cured)		1.31
Tensile Strength	psi	875
	MPa	6
	kg/cm ²	61
Elongation	%	210
Tensile Modulus	psi	420
	MPa	2.9
	kg/cm ²	29

DESCRIPTION

Dow two-part heat cure (addition-curing) adhesives cure rate is rapidly accelerated with heat (see cure schedules in table) and an optimum cure schedule will balance processing performance and costs. For thicker sections or if voiding is observed the use of a 30-minute procure at 70°C (158°F) or the use of an adhesive with low-void technology may reduce voids. Addition-cure silicones are formulated with all necessary ingredients for cure and there are no by-products generated during the cure process. Deep section or confined cures are possible as cure reactions progress evenly throughout the material. These adhesives generally have long working times so users can enjoy the greatest manufacturing flexibility and reduce waste. Dow silicone adhesives retain their original physical and electrical properties over a broad range of operating conditions which enhance the reliability of and service life of PCB assemblies. The stable chemistry and versatile processing options of these adhesives offer benefits for a variety of needs from increasing component safety and reliability, reducing total cost or increasing the performance envelope of devices or modules. Underwriters Laboratory (UL) 94 recognition is based on minimum thickness requirements. Please consult the UL Online Certifications Directory for the most accurate certification information.

MIXING AND DE-AIRING

Dow silicone 1:1 adhesives are supplied in two parts that do not require lot matching. The 1:1 mix ratio, by weight or volume, simplifies the proportioning process. To ensure uniform distribution of filler, Parts A and B must each be thoroughly mixed prior to their combination in a 1:1 ratio. When thoroughly blended, the Part A and B liquid mixture should have a uniform appearance. The presence of light colored streaks or marbling indicates inadequate mixing

TYPICAL PROPERTIES (continued)

Property	Unit	Result
Tear Strength (Die B)	ppi	20
	N/cm	14
Durometer Shore A		61
Unprimed Adhesion - Lap Shear to Aluminum	psi	830
	MPa	5.7
	N/cm ²	569
Shelf Life at 25°C	months	12

and will result in incomplete cure. For fast-curing adhesives automated mix and dispense equipment should be utilized. In applications sensitive to air entrapment, de-airing with 28 to 30 inches Hg vacuum is required.

ADHESION

In general, increasing the cure temperature and/or cure time will improve the ultimate adhesion. Dow silicone adhesives are specially formulated to provide unprimed adhesion to many reactive metals, ceramics and glass, as well as to selected laminates, resins and plastics. However, good adhesion cannot be expected on non-reactive metal substrates or non-reactive plastic surfaces such as Teflon[®], polyethylene or polypropylene. Special surface treatments such as chemical etching or plasma treatment can sometimes provide a reactive surface and promote adhesion to these types of substrates. Dow primers can be used to increase the chemical activity on difficult substrates. Poor adhesion may be experienced on plastic or rubber substrates that are highly plasticized, because the mobile plasticizers act as release agents. Small-scale laboratory evaluation of all substrates is recommended before production trials are made.

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 plasticizers, 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.

PREPARING SURFACES

All surfaces should be thoroughly cleaned and/or degreased with Dow OS fluids, naphtha, mineral spirits, methyl ethyl ketone (MEK) or other suitable solvent. Solvents such as acetone or isopropyl alcohol (IPA) do not tend to remove oils well, and any oils remaining on the surface may interfere with adhesion. Light surface abrasion is recommended whenever possible, because it promotes good cleaning and increases the surface area for bonding. A final surface wipe with acetone or IPA is also useful. Some cleaning techniques may provide better results than others; users should determine the best techniques for their particular applications.

SUBSTRATE TESTING

Due to the wide variety of substrate types and differences in substrate

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surface conditions, general statements on adhesion and bond strength are impossible. To ensure maximum bond strength on a particular substrate, 100 percent cohesive failure of the adhesive in a lap shear or similar adhesive strength test is desired. This ensures compatibility of the adhesive with the substrate being considered. Also, this test can be used to determine minimum cure time or can detect the presence of surface contaminants such as mold release agents, oils, greases and oxide films.

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.

SOLVENT EXPOSURE

When liquid or vapor solvent or fuel exposure can occur in an application, the silicone adhesive discussed in this brochure is intended only to survive splash or intermittent exposures. It is not suited for continuous solvent or fuel exposure. Testing should be done to confirm performance of the adhesives under these conditions.

HANDLING PRECAUTIONS
PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT WWW.CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

USABLE LIFE AND STORAGE

Shelf life is indicated by the "Use Before" date found on the product label.

PACKAGING INFORMATION

In general, Dow adhesives/sealants are supplied in nominal 0.45, 3.6, 18 and 200 kg (1, 8, 40 and 440 lb) containers, net weight. Not all products may be available in all packages and some additional packages, such as a bladder packs or tubes, may be available for certain package sizes.

LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, www.consumer.dow.com or consult your local Dow representative.

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The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of use shall not be taken as inducements to infringe any patent.

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HOW CAN WE HELP YOU TODAY?

Tell us about your performance, design and manufacturing challenges. Let us put our silicon-based materials expertise, application knowledge, and processing experience to work for you.

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