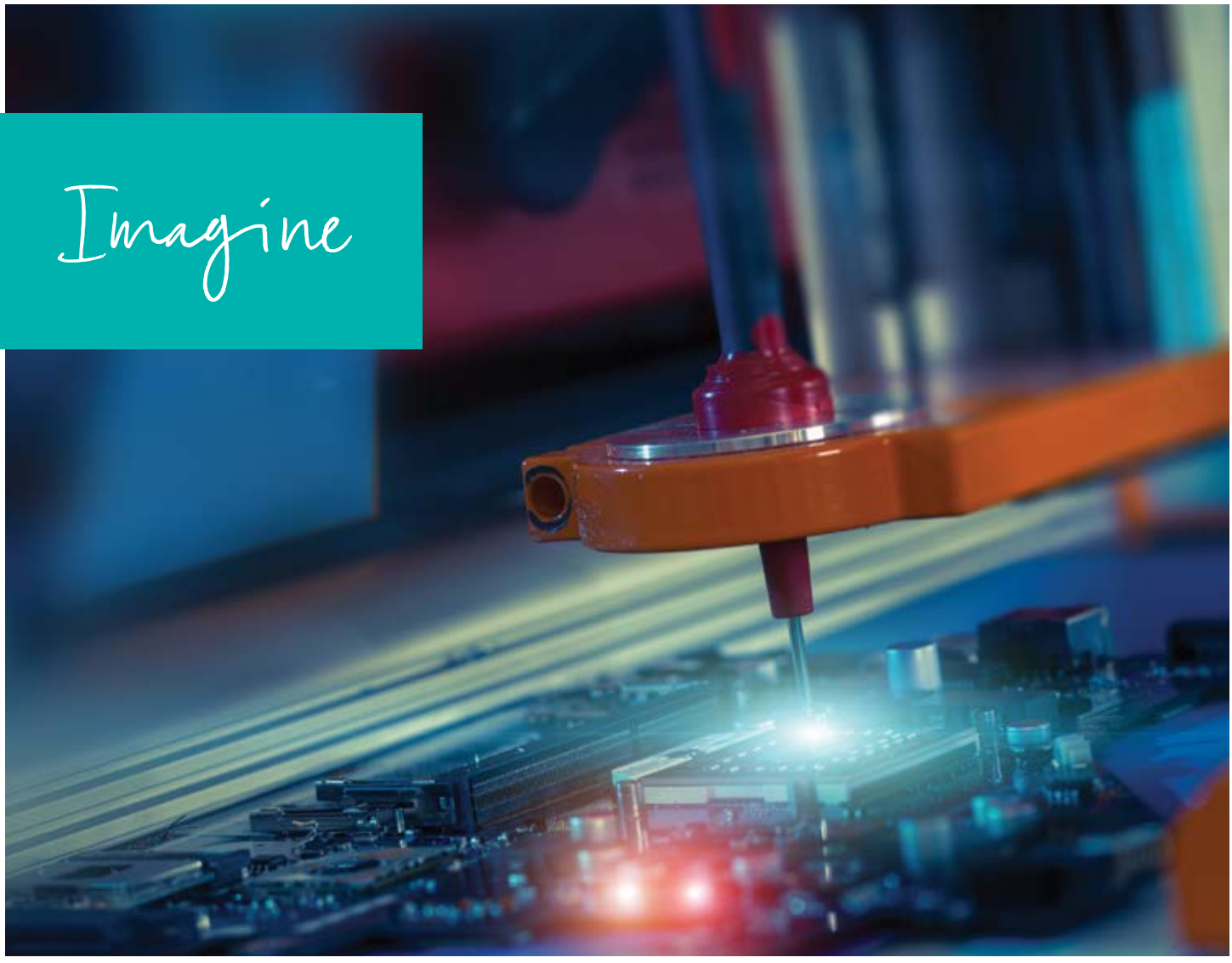
Innovative Silicone Conformal Coatings

Flexible Options for Processing, Protection and Performance from a Conformal Coating

DOWSIL™



Why Dow?

Dow has been a global leader in silicone-based technology for more than 70 years. Why do our customers consistently choose to work with us?

Unique product technology

Dow was founded to explore the power and versatility of the silicon atom. Today, we make that power and versatility available to you through our portfolio of more than 7,000 proven products and services built on our versatile silicone chemistry.

Extensive know-how

Dow multiplies the value of our products with in-house expertise and an extended network of industry resources.

Collaborative culture

We work closely with our customers to help reduce time, risk and cost at every stage of your product development.

Global reach

Headquartered in Midland, Michigan, USA, Dow Chemical is a truly global company with approximately 11,000 employees working across the world, plus a comprehensive distributor network.

Proven

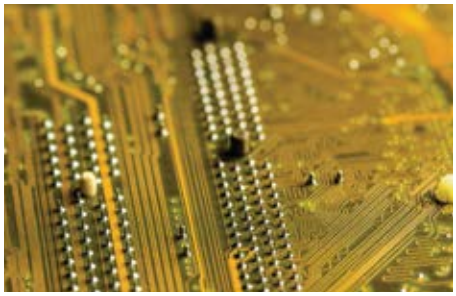
Dow has reliably supported its customers' innovation for more than seven decades and has been a global leader that invests in manufacturing and quality for silicon-based materials to ensure a steady, consistent supply of high-quality products to our customers.

Why Silicone Coatings from Dow?

In one word: reliability. The versatility of silicone chemistry expands design freedom, increases processing options, broadens performance parameters and introduces unique options for sustainability. Compared specifically to organic-based coatings, silicone solutions offer several valuable benefits.

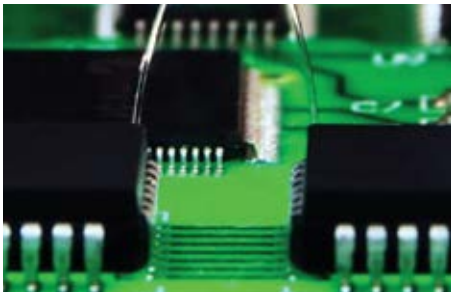
Greater thermal stability

Silicones perform reliably at sustained temperatures as low as -45°C and as high as 150°C – a far broader range than organic coatings, which degrade at such extreme temperatures. Many silicones can even withstand brief exposure to temperatures up to 250°C.



Stress relief

Silicone conformal coatings offer an extraordinarily broad range of hardness, as well as extremely low-modulus options. That means they deliver better stress-relief on delicate board components during thermal cycling.



Simple solventless options

Silicones are nearly all solventless, making them the material of choice where emerging regulations impose complex and costly special requirements for handling and processing.

Choose Your Viscosity

DOWSIL™ conformal coatings come in a range of viscosities to help you meet all of your processing and application demands.

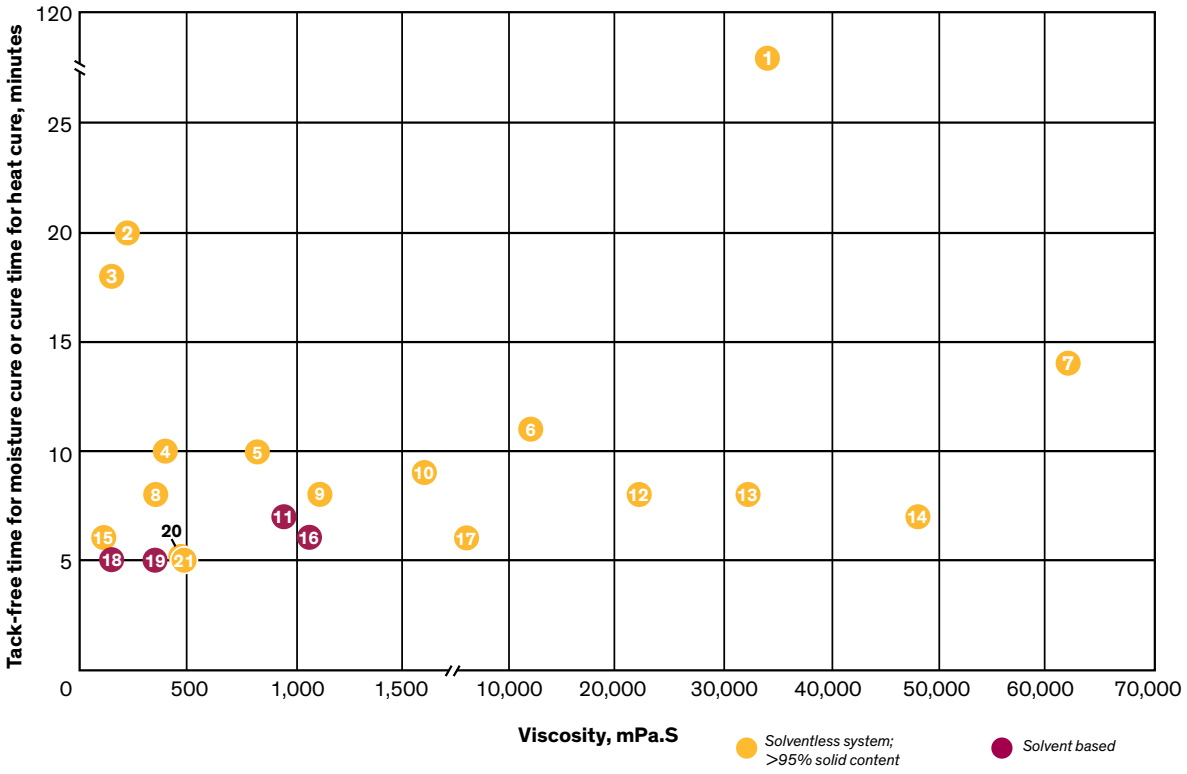
Low viscosity for high-speed production

Our low-viscosity silicone coatings support high-speed production methods, including manual or automated spraying, flow or jetting techniques. These faster-flowing materials also are suitable options when you want your coating to flow through vias or under chips.

Higher viscosity for greater control

Offering incrementally higher viscosities, this category of silicone coatings provides increasing control over the speed and distance of flow to prevent their spread into “no-go” areas. Higher-viscosity silicones also enable thicker coating layers in one pass, and some grades even offer a stable coat on tall vertical surfaces.

Viscosity/Cure Profile



1. DOWSIL™ 3140 RTV Coating
2. DOWSIL™ CC-4555 Long Bath Life Conformal Coating[1]
3. DOWSIL™ HC 2000
4. DOWSIL™ HC 2100
5. DOWSIL™ Q1-4010 Conformal Coating[1]
6. DOWSIL™ HC 1000 Gray Conformal Coating
7. DOWSIL™ 3-1944 RTV Coating
8. DOWSIL™ 3-1953 Conformal Coating
9. DOWSIL™ SE 9187 L Black, Clear or White Adhesive
10. DOWSIL™ HC 1100
11. DOWSIL™ 1-2577 Conformal Coating
12. DOWSIL™ SE 9189 L Gray or White RTV Adhesive
13. DOWSIL™ SE 9186 L Sealant
14. DOWSIL™ 3-1944 HP RTV Coating
15. DOWSIL™ 3-1965 Conformal Coating
16. DOWSIL™ 1-2577 Low VOC Conformal Coating
17. DOWSIL™ SE 9157
18. DOWSIL™ 1-2620 Dispersion
19. DOWSIL™1-2620 Low VOC Conformal Coating
20. SYLGARD™ 1-4128 Conformal Coating Kit[1]
21. DOWSIL™ 1-4105 Conformal Coating[1]

[1]*Heat Cure*

Choose Your Cure Profile

DOWSIL™ versatile silicones offer flexible cure profiles to allow you to select the optimal solution for your production line setup, volume or application.

Fast moisture cure

These coatings cure quickly at room temperature to provide a “dispense-and-forget” solution that is tack-free and ready to move down the production line in less than 10 minutes, making them the ideal option for high-volume assembly operations.

Extended-working-time moisture cure

Silicone coatings in this category also cure at room temperature but permit more time for the material to flow further over large or complex boards. They also are the preferred solution for applications that require a thicker coating.

Heat cure

Sometimes labeled “command cure” for the control they allow over the rate of cure, coatings in this category are the material of choice when your processing operation demands full cure in under five minutes. They also may impose lower stress on board components during thermal cycling.

Choose Your Hardness

Silicones can deliver lower modulus than any organic conformal-coating material. This makes them ideal for minimizing stress on small, fine wires or sensitive solder joints. Yet silicone's versatile chemistry enables hard coatings that exhibit abrasion resistance approaching acrylic or urethane solutions. Regardless of what your application requires, Dow can provide a conformal coating with the right durometer to meet your demands.

Highest stress relief
(<15 Shore A)

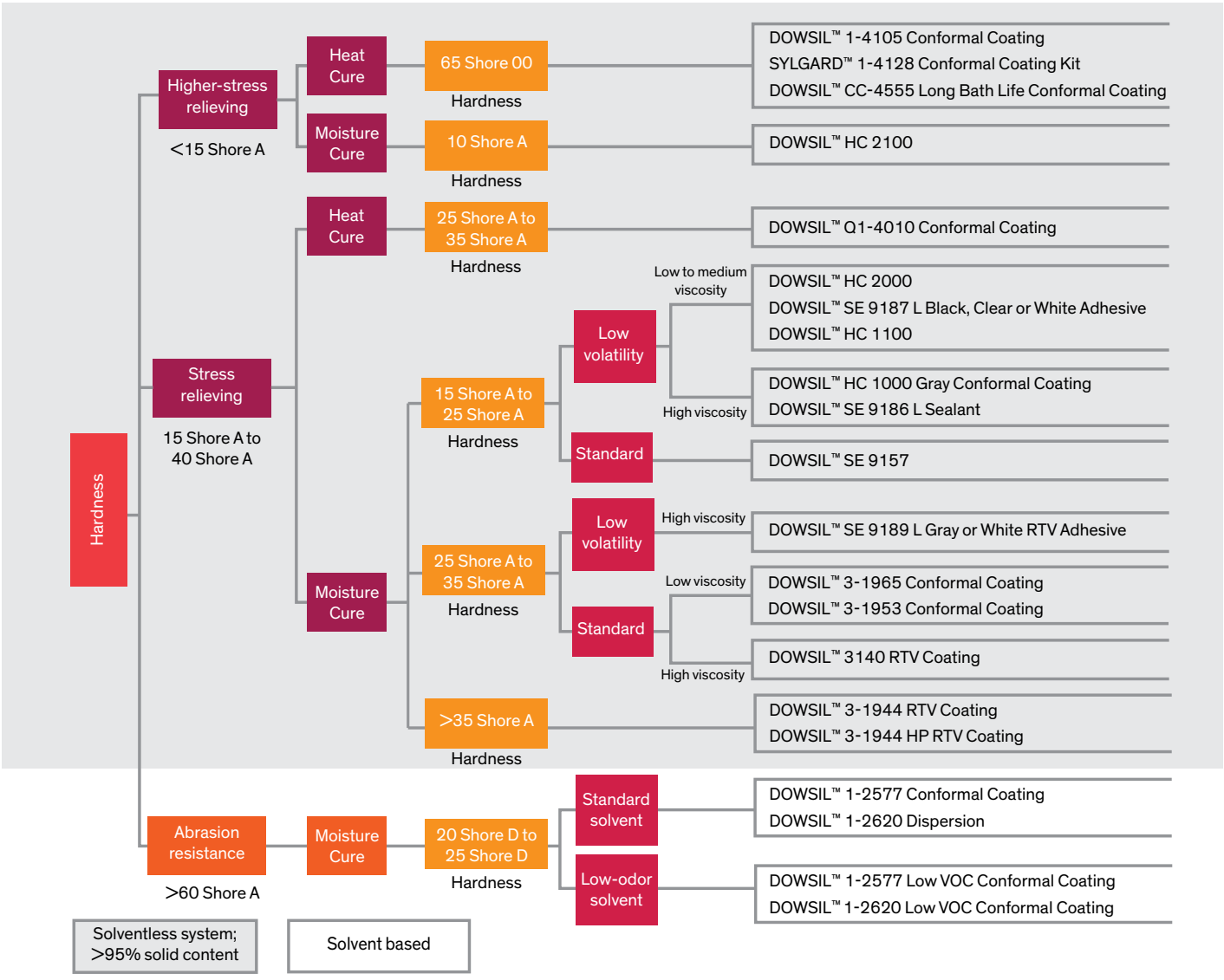
Our softest silicone coating materials maximize stress-relief on very fine wires or dense components that can be most susceptible to thermal cycling.

Stress relief
(15 Shore A to 40 Shore A)

The ideal alternative to brittle organic coatings, silicones in this category offer an optimal combination of stress relief and protection against harsher environmental elements, such as moisture, dust, vibration and impact.

Abrasion resistant
(40 Shore A to 25 Shore D)

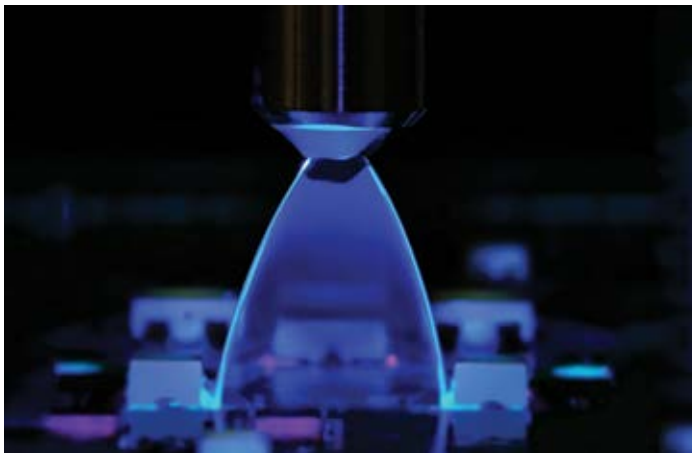
Silicones in this class cure to form hard, tough coatings comparable to acrylics – except silicones offer greater flexibility and perform reliably at much higher and lower temperatures.



Choose Solventless Silicones

While Dow offers solvent-based elastoplastic coatings that mimic the hardness of acrylic, most of our silicone products are solventless.

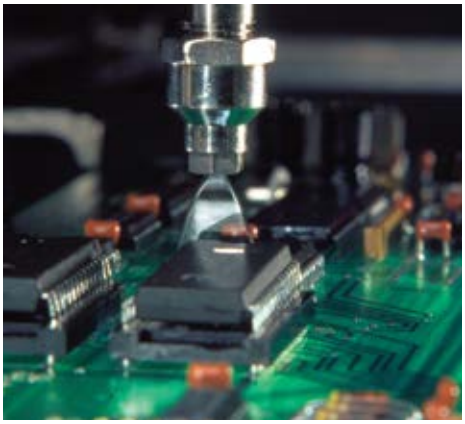
This is becoming an important selection criterion for coatings, as it impacts worker safety protocols, special equipment, handling and processing for flammable solvents and meeting environmental regulations. Choosing solventless silicone coatings can eliminate complexity, cost and time for your manufacturing operations.

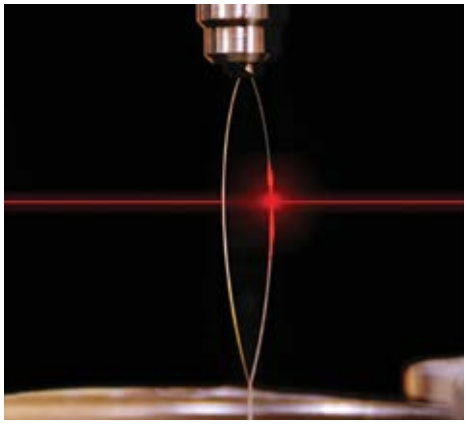


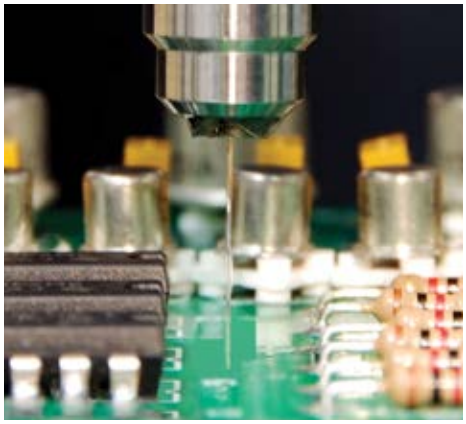
										UL		Mil Spec		IPC-CC Test
Product Type	Product Name	Benefits & Features	Viscosity, cP	Durometer	Tack-Free Time, minutes	Room Temperature Cure Time, minutes*	Heat Cure Time, minutes	Heat Cure Conditions	Specific Gravity	UL 94 Rating	UL 746 E Approval	Mil Specification	Mil Spec Type, Class Group	IPC-CC
Solventless RTV Conformal Coating	DOWSIL™ 3-1953 Conformal Coating	Medium viscosity	350	34 Shore A	8	60	0.5	60°C/ 15% RH	0.98	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 3-1965 Conformal Coating	Thinner cured coating; greater coverage area per kg; faster dispensing; easier to jet-dispense	115	33 Shore A	6	60	0.5	60°C/ 15% RH	0.99	V-0	No	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 3-1944 RTV Coating	Coverage of taller components, wire bonds & edges	64,000	36 Shore A	14	60			1.03	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 3-1944 HP RTV Coating	Allows higher-thickness coverage in critical areas	49,000	36 Shore A	7	60			1	V-0	No			
	DOWSIL™ 3140 RTV Coating	Allows higher one-pass coating thickness	34,400	32 Shore A	116	72 hours			1.05	V-1	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ SE 9189 L Gray or White RTV Adhesive	High viscosity; controlled volatility	24,500	33 Shore A	8	300			1.19	V-0	No			
	DOWSIL™ SE 9187 L Black, Clear (Translucent) or White Adhesive	Medium viscosity; controlled volatility	1,100	17 Shore A	8	300			1	V-0**	Yes**			

*Highly dependent on thickness, temperature, humidity and other cure conditions. **Applies to translucent.

										UL		Mil Spec		IPC-CC Test
Product Type	Product Name	Benefits & Features	Viscosity, cP	Durometer	Tack-Free Time, minutes	Room Temperature Cure Time, minutes*	Heat Cure Time, minutes	Heat Cure Conditions	Specific Gravity	UL 94 Rating	UL 746 E Approval	Mil Specification	Mil Spec Type, Class Group	IPC-CC
Solventless RTV Conformal Coating	DOWSIL™ SE 9186 L Sealant, Translucent or Black	High viscosity; controlled volatility	27,000	25 Shore A	8	300			1.02		No			
	DOWSIL™ SE 9157 Clear	Medium viscosity	5,675	25 Shore A	6	300			1		No			
	DOWSIL™ HC 1000 Gray	High viscosity	12,000	24 Shore A	11	30			1.07	V-0	No			
	DOWSIL™ HC 2000	Low viscosity; controlled volatility	150	25 Shore A	18	210			1.01		No			
	DOWSIL™ HC 1100 Gray	Medium viscosity; controlled volatility	2,375	22 Shore A	9	30			1.08		No			
	DOWSIL™ HC 2100	Low viscosity; controlled volatility	400	10 Shore A	10	30			0.98		No			
	DOWSIL™ CC-3122 Conformal Coating	Low viscosity	80	75 Shore A	6				1.03		No			
Solventless Heat Cure Conformal Coating	DOWSIL™ 1-4105 Conformal Coating	Long open time; “command cure”; uses CTE to its advantage to hold chips down to board	450	65 Shore 00			10	105°C	0.97	V-1	Yes			
	DOWSIL™ Q1-4010 Conformal Coating	Allows higher one-pass coating thickness	825	33 Shore A			10	100°C	1	V-1	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	SYLGARD™ 1-4128 Conformal Coating Kit	Two parts; much longer room-temperature shelf life	470	65 Shore 00			5	105°C	0.97		No			
	DOWSIL™ CC-4555 Long Bath Life Conformal Coating	Optimized version for dip-coating	225	78 Shore 00			20	120°C	0.98	V-0	No			
Solvent-Based RTV Conformal Coating	DOWSIL™ 1-2577 Conformal Coating	Medium viscosity with firm, abrasion-resistant surface after cure	950	20 Shore D	7	60	2	60°C/ 15% RH	1.11	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 1-2577 Low VOC Conformal Coating	Solvent is not considered a volatile organic compound; low odor; not ozone-depleting	1,050	25 Shore D	6	60	2	60°C/ 15% RH	1.12	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 1-2620 Dispersion	Thinner cured coating; greater coverage area per kg; faster dispensing	150	25 Shore D	5	60	2	60°C/ 15% RH	1.11	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ 1-2620 Low VOC Conformal Coating	Low viscosity	350	25 Shore D	5	60	2	60°C/ 15% RH	1.12	V-0	Yes	MIL-I-46058C Amend 7	Type SR, QPL	IPC-CC-830
	DOWSIL™ CC-2570 Conformal Coating	No fluorescence; better optical performance	1,000	25 Shore D	7	60	2	60°C/ 15% RH	1.11	V-0	Yes			
	DOWSIL™ CC-2571 Conformal Coating	No fluorescence; better optical performance	75	25 Shore D	15	60	2	60°C/ 15% RH	1.11	V-0	Yes			







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.

For more information about our materials and capabilities, visit **consumer.dow.com/pcbsystemassembly**.

Images: AV25466, dow_42083505507, dow_40962968681, dow_42006832533, AV25470 Courtesy of Nordson ASYMTEK, AV25471 Courtesy of Nordson ASYMTEK, AV25472 Courtesy of Nordson ASYMTEK, dow_40354031623, AV25476 Courtesy of Nordson ASYMTEK, AV25474 Courtesy of Nordson ASYMTEK

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