Technical Data Sheet

DOWSIL™ 3540 Insulating Glass Sealant

FEATURES & BENEFITS

- Excellent adhesion to coated or reflective glass, aluminum or galvanized steel spacers
- Fast cure one-component technology, ideal for use at low temperature and/or low humidity in workshops
- Minimum waste and downtime by eliminating base purging and static mixer maintenance
- Packaged for both manual and robot applications
- Outstanding aging properties
- Silicone technology providing outstanding UV resistance
- Service temperature range -40°C (-40°F) to up to 100°C (212°F)
- Non-slumping, permitting ease of both manual and automated glazing
- Non-corrosive cure
- Solvent-free
- Low water absorption
- High level of mechanical properties
- Does not contain organic plasticizer that can cause fogging in the IG air space
- Resistant to ozone

Insulating Glass Sealant

APPLICATIONS

- Insulated glazing for residential and commercial glazing.
- Insulated glazing incorporating specialty glass (pyrolithic of soft coated, laminated, tinted, enameled) types, stepped glass or with free edges.
- Insulated glazing for applications under extreme conditions of humidity and temperatures, high or low.
- Insulated glazing used in greenhouses and skylights under high sun exposure.
- Adhering and jointing of glass elements.

TYPICAL PROPERTIES

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

Test*	Property	Unit	Result
	As supplied		
	Color		Black, light gray
	Consistency		Non-slumping, viscous paste
	Specific Gravity	kg/liter	1.33
CTM 0364	Extrusion rate (nozzle 6mm at 6.2 bar)	g/minute	140
	Application Temperature	°C	5 to 40
		°F	41 to 104
	After application		
	Slump	mm	1.00
	Working time 23°C (73°F) at 50% R.H.	minutes	5-10
	Skin-over time 23°C (73°F) at 50% R.H.	minutes	10-15
	TFT, tack-free time	minutes	25
	Curing time 23°C (73°F) at 50% R.H.	mm	3.8mm / 24 hours
	Curing time 23°C (73°F) at 50% R.H.	mm	8.0mm / 72 hours
	See figure 1 and 2 for different conditions		
	After 7 days of cure at 23°C (73°F) at 50% R.H.		
ASTM D676	Hardness (Shore A)		40
ASTM D0412	Tensile Strength	MPa	2.00
ISO 8339	Tensile Strength	MPa	0.76
ASTM D0412	Elongation at Break	%	450
ISO 8339	Elongation at Break	%	78
ISO 8339	Young modulus at 12.5%	MPa	2.3
ASTM E96	MVTR	gr/m^2/day	13
NFP 78-456	Penetration index at IGU	%	0,059

*CTM: Corporate Test Method, copies of CTMs are available on request.
ASTM: American Society for Testing and Materials.
ISO: International Standardisation Organisation.
NFP: Norm français Project.

DESCRIPTION

DOWSIL™ 3540 Silicone Sealant has been designed to provide a secondary seal in a dual sealed insulating glazing unit. The primary seal is typically made of polyisobutylene. It has a high green strength making it possible to handle the unit quickly and a high cure rate (4.0mm in 24 hours) as a one-component sealant. When cured it has a high modulus for a good mechanical assembly of insulating glazing. Available in black and light gray in drums, in black in all other container sizes.

DOWSIL 3540 Silicone Sealant is a neutral cure sealant, offering several advantages over acetoxy silicone formulations:

- Consistent adhesion to both aluminum spacers and glass
- No corrosion of the coating on glass, the metallic spacer or the PVB foil of laminated glass
- Reduced Vapor Transmission Rate (low Penetration Rate Index 'I')
- Compatibility with butyl used as primary seal
- High strength of bond due to its high modulus of elasticity.

PERFORMANCE TESTING

Insulating glass unit sealed with DOWSIL 3540 Silicone Sealant have been successfully evaluated by CEBTP following the French norm NFP 85-516 for 2000 hours UV resistance.

Insulating glass units sealed with DOWSIL 3540 Silicone Sealant are also tested regularly by CEKAL (France).

DOWSIL 3540 Silicone Sealant has been tested by INV as per prEn 1279-4 with the reference HW/GL/MAS/97/BE.95C.

The performance of the unit sealed with DOWSIL 3540 Silicone Sealant greatly exceeds the specifications laid down in British Standard BS 5713 and the German Standard DIN 1286 I for dual sealed units.

CURE PROPERTIES

The figures 1 and 2 correlate the DOWSIL 3540 Silicone Sealant cure in depth, expressed in mm of thickness of the joint calculated from the spacer lower part to the glass edge, with the room conditions of temperature and humidity after 12 hours (Figure 1) and 24 hours (Figure 2).

Example:
After 24 hours at 23° (73°F) and 50% R.H. the cure in depth is 3.6mm.

Figure 1: Cure in depth after 12 hours.

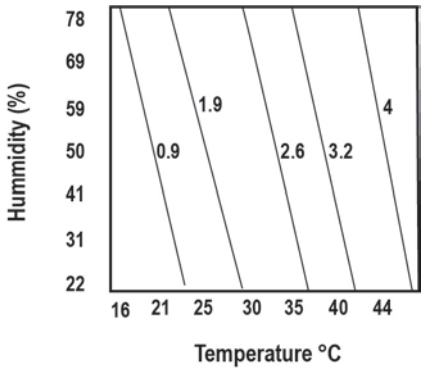
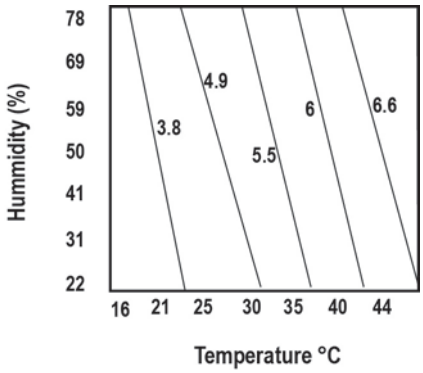


Figure 2: Cure in depth after 24 hours.



SURFACE PREPARATION

Ensure that surfaces to be sealed are clean, dry and free from frost. Clean all surfaces of release agents, water repellents, laitance, dust, dirt, old sealants and other contaminants which could impair adhesion. Non-porous surfaces should be cleaned and degreased by wiping with a suitable solvent such as DOWSIL™ R-40 Universal Cleaner on an oil and lint-free cloth before application of sealant.

Note: When using any solvent, always provide adequate ventilation. Avoid heat, sparks and open flames. Observe and follow all precautions listed on the solvent container label.

Application on coated glass

If direct adhesion of DOWSIL 3540 Silicone Sealant is needed, official approval of the glass manufacturer is required with regard to the long term adhesion of the coating to the glass. If there is any doubt concerning the adhesion of the coating to the glass, the coating shall be removed from the area where the sealant will come in contact with the glass. Experience shows that good adhesion is usually obtained on clear and tinted float glass and on hard pyrolithic coatings. However, adhesion should be checked on soft magnetron coatings, silk screen enameled coatings and on non-float colored glass (for instance stained-glass) or on glass where composition is different from usual borosilicate glass manufactured with a float process.

INSTALLATION

Design consideration

Insulating glass units intended for residential or commercial glazing, should be designed with secondary sealant dimensions in accordance with local regulations. The stress that will be applied to the glazing should be taken into account, including but not limited to dead load, wind pressure, temperature range, snow load for sloped glass surfaces in skylights or

conservatory roof. A minimum of 4mm is recommended to reach a good penetration value (low transition of moisture).

Testing
Dow recommends several factory quality control tests to ensure optimum sealant performance. These tests include:

- Slump test
- Cure test to ensure expected sealant cure rate in the local conditions of temperature and humidity
- Peel adhesion test to ensure proper sealant adhesion to production surface.

These tests should be performed for every lot change. Specific procedures for these tests are available from Dow.

Dispensing
Simple transfer ram pump can be used to dispense DOWSIL 3540 Silicone Sealant either by hand or robot gunning. When robot gunning is used, it is recommended that all flexible hoses do not transmit vapor; ideally Teflon® lined hoses should be used. As the product requires only atmospheric moisture to cure, solvent flushing of pumping equipment is generally not necessary, even when equipment has been left standing. However, it must be ensured that a cap is placed on the dispensing nozzle.

When manually gunning the sealant, this should be applied by pushing the material forward into the cavity to ensure maximum contact and adherence with the surfaces.

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.

STORAGE

Product should be stored at or below 25°C (77°F) in original, unopened containers.

LIMITATIONS

DOWSIL 3540 Silicone
Sealant should not be applied:

- As a primary or single seal of an insulating glass unit
- As a structural glazing sealant or as a secondary barrier seal of an insulating glazing unit.

The following products are available for these applications:
Ask for specific products:
DOWSIL™ 3793 Insulating Glass Sealant and DOWSIL™ 3362 Insulating Glass Sealant for insulating glass DOWSIL™ 895 Structural Glazing Sealant and DOWSIL™ 993 Structural Glazing Sealant for structural bonding (ask for advice about this application)

- To areas where food contact is likely
- In totally confined spaces, as the sealant requires atmospheric moisture to cure and in addition, releases by-products during the curing process
- For continuous use in submerged joints or in joints where physical abuse or abrasion are likely to occur
- In contact with bituminous substrates, substrates based on natural rubber, chloroprene or EPDM, or on building materials which might bleed oils, plasticizers or solvents, on green or partially vulcanized rubber gaskets and tapes.

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.

LIMITED WARRANTY INFORMATION – PLEASE READ CAREFULLY

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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Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted.

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