



Technical Data Sheet

DOWSIL™ 993 Structural Glazing Sealant

Two-part silicone rubber

Features & Benefits

- Meets European standard for structural glazing as developed by EOTA working groups
- Tested and meets Chinese GB-16776 general technical specification
- Excellent adhesion to a wide range of substrates including coated, enamelled and reflective glasses, anodised and polyester paint coated aluminum and stainless steel
- High level of mechanical properties
- Odorless and non-corrosive cure
- Excellent stability through wide temperature range: -50°C (-58°F) to 150°C (302°F)
- Structural capability
- The cured product exhibits excellent weathering characteristics, and a high resistance to ultra-violet radiation, heat and humidity
- Lot matching of base and curing agent not necessary

Applications

- Two-part silicone sealant for structural glazing.

Typical Properties

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

Test ¹	Property	Unit	Result
	Base: as supplied		
	Color and consistency		Viscous white paste
	Specific gravity		1.36
	Viscosity (100s ⁹¹)	mPa.s	150,000
	Curing agent: as supplied		
	Color and consistency		Viscous black paste
	Specific gravity		1.08
	Viscosity (100s ⁹¹)	mPa.s	15,000
ASTM D93	Flash point - closed cup	°C °F	28 82.4
ASTM D92 DIN 51376	Flash point - open cup	°C °F	84 183.2

1. ASTM: American Society for Testing and Materials
ISO: International Standardization Organization
DIN: Deutsche Industrie Norm

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DOWSIL™ 993 Structural Glazing Sealant

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Typical Properties (Cont.)

Test	Property	Unit	Result
As mixed			
	Color and consistency		Black non-slump paste
	Specific gravity		1.33
	Viscosity (100s ⁻¹)	mPa.s	40,000
	Working time (25°C/77°F, 50% RH)	minutes	10 to 30
	Tack-free time (25°C/77°F, 50% RH)	minutes	80 to 100
	Corrosiveness		Non-corrosive
As cured - after 7 days at 25°C (77°F) and 50% RH			
ISO 8339	Tensile strength	MPa	0.95
ASTM D624	Tear strength	kN/m	6.0
ISO 8339	Elongation at break	%	130
ASTM D2240	Durometer hardness, Shore A		40
	Sealant dynamic design load	Pa	140,000
	Sealant static design load	Pa	15,000
	Service temperature range	°C °F	-50 to + 150 -58 to + 302

Description DOWSIL™ 993 Structural Glazing Sealant is a two-component, neutral curing silicone formulation specifically developed for the structural bonding of glass, metal and other building components.

Cure Neutral alkoxy; cures at room temperature giving off a small amount of alcohol.

Performance Data DOWSIL 993 Structural Glazing Sealant combines excellent unprimed adhesion to a wide range of building substrates with high levels of physical properties over a wide range of temperature. It exhibits excellent retention of adhesive and mechanical properties after ageing as detailed by the EOTA Technical guide:

- 1000 hours exposure to ultra-violet radiation in hot water immersion (ISO DIS 11431)¹
- 5000 load cycles in shear and tension¹
- Resistance to salt spray (ISO 9227 NSS)¹
- Resistance to SO₂ (ISO 3231)¹
- Resistance to cleaning agent (ISO/DIS 10591)¹
- Resistance to extreme temperature (ISO 8339)¹
- Resistance to micro-organism (ISO 846)¹

¹Document ATG 98/H680 (UBAtc)

DOWSIL 993 Structural Glazing Sealant offers unprimed adhesion to most coated and uncoated glasses as well as most metal spacers. The sealant is compatible with DOWSIL™ neutral curing construction sealants, such as DOWSIL™ 795 Silicone Building Sealant, DOWSIL™ 995 Silicone Structural Sealant and DOWSIL™ 791 Silicone Weatherproofing Sealant Black and DOWSIL™ neutral curing insulating glass sealants such as DOWSIL™ 982 Silicone Insulating Glass Sealant, as well as most commonly used glazing components. It is important when selecting components for a project that adhesion and compatibility tests are carried out, and found to be successful, before the project starts.

Mixing and Dispensing

To obtain the ultimate physical properties from DOWSIL 993 Structural Glazing Sealant it is recommended that the base and curing agent are thoroughly mixed using an airless mixing system found on most existing commercially available two-part silicone dispensing machines. Neither hand mixing nor the use of hand-held power mixers are satisfactory due to their incorporation of air into the material during mixing that would result in altered physical properties of the cured sealant.

DOWSIL 993 Structural Glazing Sealant should be mixed in a ratio from 9:1 to 12:1 base to curing agent by weight, or equivalent 7.1:1 to 9.5:1 by volume for optimal properties. At this mix ratio, the sealant typically exhibits a working time of 10–30 minutes and allows units to be handled within two hours.

Lot matching of DOWSIL 993 Structural Glazing Sealant Base and Curing Agent is not required. Before use it is recommended that the curing agent be stirred to ensure homogeneity of all components.

DOWSIL 993 Structural Glazing Sealant Curing Agent will react with atmospheric moisture and therefore should not be exposed to air for prolonged periods of time.

Preparatory Work

Clean all joints and glazing pockets, contaminants such as grease, oil, dust, water, frost, surface dirt, old sealants, or glazing compounds and protective coatings.

Metal, glass and plastic surface should be cleaned by mechanical or solvent procedures. Where used, solvent should be wiped on and off with clean, oil- and lint-free cloths.

Priming

Priming is not usually required when using DOWSIL 993 Structural Glazing Sealant. However, it is essential that adhesion be tested prior to use. Specific primer recommendations will be made by the technical services department on a project basis. Please contact Dow for further advice.

Masking and Tooling

Areas adjacent to joints may be masked to ensure a neat sealant line. Do not allow masking tape to touch clean surfaces to which the silicone sealant is to adhere. Tooling should be completed in one continuous stroke within 5 minutes after sealant application. Masking tape should be removed immediately after tooling.

How To Use
(Cont.)

Equipment Cleaning

When not being used it is recommended that the dispensing equipment be purged either with the base component. If cured sealant has built up inside the equipment, flush the equipment for the appropriate time with concentrated Cleaning Solvent, using a solvent recirculation system. This solvent dissolves cured silicone sealant and provides optimum cleaning performance.

Maintenance

No maintenance is needed. If sealant becomes damaged, replace damaged portion. DOWSIL 993 Structural Glazing Sealant will adhere to cured silicone sealant which exhibits a clean knife-cut or abraded surface.

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

When stored at or below 30°C (86°F), DOWSIL 993 Structural Glazing Sealant Curing Agent has a usable life of 12 months from the date of production.

Packaging
Information

DOWSIL 993 Structural Glazing Sealant Base is available in 226.8 kg drums.

DOWSIL 993 Structural Glazing Sealant Curing Agent is available in 19 kg pails.

Limitations

DOWSIL 993 Structural Glazing Sealant should not be used for structural applications without the prior written approval of the construction industry technical service. Each project shall be specifically and separately approved by Dow.

Project approval involves the following prerequisites:

- Joint dimensioning and print reviews.
- Successful laboratory adhesion and compatibility testing to all project building components.
- Observance of professional sealant application and workmanship standards.

Dow should not be held liable for any possible claims arising from structural use of DOWSIL 993 Structural Glazing Sealant for projects which have not been specifically approved by Dow.

For projects which have been approved, Dow will issue a structural adhesion warranty on a case by case basis at the user's request. It is the user's exclusive responsibility to ensure project compliance with local building regulations. Because of the risk of incompatibility, DOWSIL 993 Structural Glazing Sealant should not come into contact with, or be exposed to, sealants that liberate acetic acid.

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.

Application Examples

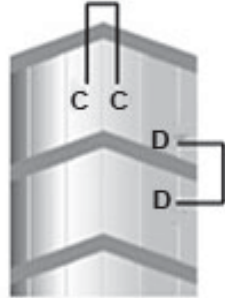


Figure 1:
System for 4-sided structural glazing.

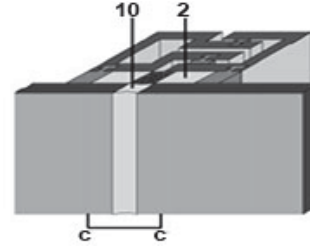


Figure 1A:
Section CC: 4-sided design

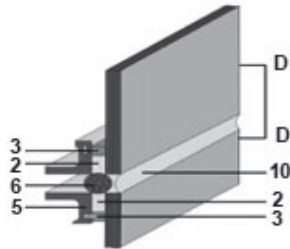


Figure 1B:
Section DD: 4-sided design -
unsupported glass

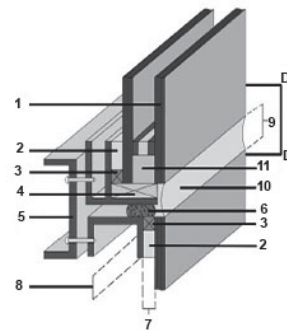


Figure 2:
Section DD: 4-sided design – supported
insulating glass unit

Application Examples (Cont.)

Legend

1. Insulating glass unit
2. Silicone structural seal (DOWSIL 993 Structural Glazing Sealant)
3. Silicone rubber spacer block
4. Silicone setting block
5. Aluminium profile
6. Backer rod
7. Structural sealant width dimension
8. Structural sealant bite dimension
9. Weatherseal dimension
10. Silicone weatherseal (DOWSIL 791 Silicone Weatherproofing Sealant)
11. Silicone insulated glass seal (DOWSIL 982 Silicone Insulating Glass Sealant)

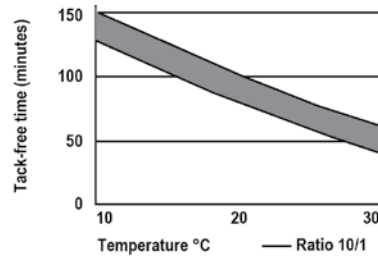


Figure 3:
DOWSIL 993 Structural Glazing Sealant -
Tack-free time range

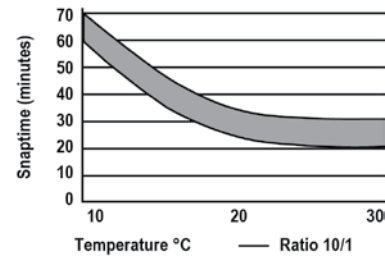


Figure 4:
DOWSIL 993 Structural Glazing Sealant -
Snaptime range

<http://www.consumer.dow.com>

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.

Dow's sole warranty is that our products will meet the sales specifications in effect at the time of shipment.

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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