



## Technical Data Sheet

# DOWSIL™ 993 Structural Glazing Sealant

### FEATURES & BENEFITS

- Meets European standard for structural glazing as developed by EOTA working groups
- Excellent adhesion to a wide range of substrates including coated, enamelled and reflective glasses, anodised and polyester paint coated aluminium and stainless steel
- High level of mechanical properties
- Odorless and non-corrosive cure
- Excellent stability through wide temperature range: -50°C to 150°C
- Resistant to ozone
- Stable viscosity for A & B components, no heating required
- Suitable for use in impact-resistant window systems in new construction and retrofit in existing buildings
- 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
- Different gray shades available (please refer to our color card)

Two-part silicone rubber

### APPLICATIONS

- Two-part silicone sealant for structural glazing (SG)

### TYPICAL PROPERTIES

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

Test*	Property	Unit	Result
	<b>Base: as supplied</b>		
	Color and consistency		Viscous white paste
	Specific gravity		1.32
	Viscosity (100s <sup>-1</sup> )	mPa.s	150,000
	<b>Curing agent: as supplied</b>		
	Consistency		Viscous paste
	Specific Gravity		
	- Catalyst black		1.05
	- HV/GER black		1.06
	- Clear & gray catalyst		1.01
	Viscosity (20s <sup>-1</sup> )		
	- Catalyst black	mPa.s	25000
	- HV/GER black	mPa.s	100000
	- Clear & gray catalyst	mPa.s	25000
ASTM D93	Flash point - closed cup	°C	28
	<b>As mixed</b>		
	Color and consistency		White/black/gray** non-slump paste
	Specific gravity		1.30
	Viscosity (100s <sup>-1</sup> )	mPa.s	40,000
	Working time (25°C, 50% R.H.)	minutes	10 to 30
	Tack-free time (25°C, 50% R.H.)	minutes	80 to 100
	Corrosiveness		Non-corrosive
	<b>As cured - after 7 days at 25°C and 50% RH</b>		
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	11000
	Service temperature range	°C	-50 to +150

\*ASTM: American Society for Testing and Materials.

ISO: International Standardisation Organisation.

\*\*Please refer to our color card.

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

## TECHNICAL SPECIFICATIONS AND STANDARDS

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 ultraviolet radiation in hot water immersion (ISO DIS 11431)\*
- Resistance to salt spray (ISO 9227 NSS)\*
- Resistance to SO<sub>2</sub> (ISO 3231)\*
- Resistance to extreme temperature (ISO 8339)\*

\*CE Marked as structural glazing sealant component according to ETAG002, the European Technical Guidelines for structural glazing with a level of attestation of 1. (external quality audit) valid in all EC countries.

\*Meets structural glazing sealant requirements according to EN13022, SNJF VEC + VI VEC.



## HOW TO USE

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™ 791 Silicone Weatherproofing Sealant, and DOWSIL™ neutral curing insulating glass sealants such as DOWSIL™ 3362 HD 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.

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DOWSIL™ 993 Structural Glazing Sealant

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## 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. Only special, two part hand mixed cartridge systems endorsed by The Dow Chemical Company should be used to avoid incorporation of air into the material.

DOWSIL 993 Structural Glazing Sealant should be mixed in a ratio of 10:1 base to curing agent by weight, or equivalent 7.8:1 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. Small variations in mixing ratio can be tolerated, but these should not exceed 11:1 to 9:1 by weight or 8.9:1 to 7.3:1 by volume to ensure minimum properties are obtained.

Lot matching of DOWSIL 993 Structural Glazing Sealant Base and DOWSIL 993 Structural Glazing Sealant 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.

Different catalysts are available for DOWSIL 993 Structural Glazing Sealant:

- DOWSIL 993 Structural Glazing Catalyst is a medium viscosity paste, fast cure, which is suitable for meter mix equipment using a pressure pot or follower plate system for the catalyst.
- DOWSIL™ 993 HV/GER Structural Glazing Catalyst is a viscous paste, fast cure, which is suitable for meter mix equipment that uses a follower plate system for the catalyst.

## Preparatory work

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

Metal, glass and plastic surfaces 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 your representative 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.

## Equipment cleaning

When not being used it is recommended that the dispensing equipment be purged either with the base component, or flushed with a suitable solvent such as DOWSIL™ 3522 Concentrated Cleaning Solvent. If cured sealant has built up inside the equipment, flush the equipment for the appropriate time with DOWSIL 3522 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 compatible 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, DOWSIL 993 Structural Glazing Sealant Curing Agent has a usable life of 14 months from the date of production.

When stored at or below 30°C, DOWSIL 993 Structural Glazing Sealant Base has a usable life of 14 months from the date of production.

## **PACKAGING INFORMATION**

DOWSIL 993 Structural Glazing Sealant Base is available in 250 kg drums and 20 liter pails.

DOWSIL 993 Structural Glazing Sealant Curing Agent is available in 25 kg pails.

Beside black and clear, the curing agent is offered in a variety of gray shades. Custom colors may be available on request.

## **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](http://www.consumer.dow.com) or consult your local 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.

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.

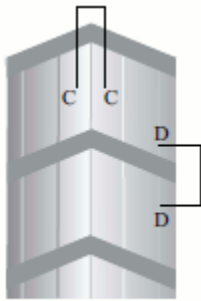
**TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, DOW SPECIFICALLY DISCLAIMS ANY OTHER EXPRESS OR IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY.**

**DOW DISCLAIMS LIABILITY FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

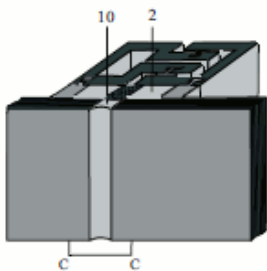
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**Application Examples**

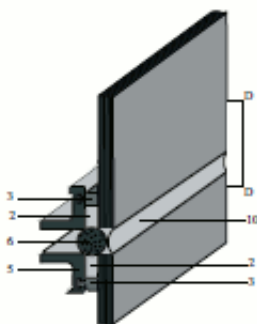
**Figure 1:** System for 4 sided structural glazing.



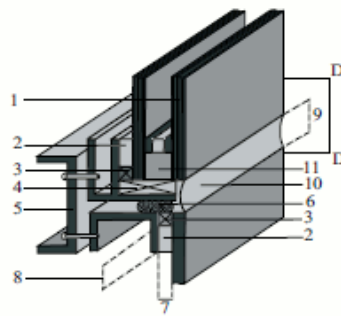
**Figure 1A:** Section CC: 4-sided Design – unsupported glass.



**Figure 1B:** Section DD: 4-sided Design – unsupported glass.



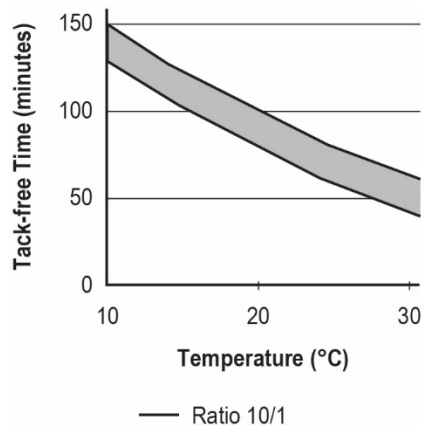
**Figure 2:** Section DD: 4-sided Design – supported insulating glass unit.



**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

**Figure 3:** DOWSIL™ 993 Structural Glazing Sealant – Tack-free time range.



**Figure 4:** DOWSIL™ 993 Structural Glazing Sealant – Snaptime range.

