



## **DOWSIL™ 994 Ultra Fast Bonding Sealant**

DOWSIL™ 994 Ultra Fast Bonding Sealant is a two-part neutral-cure silicone for structural glazing and automated assembly.

### **Features & Benefits**

- Ultra-fast curing system allowing significant productivity improvements in continuous production processes, automated fabrications and specific bonding designs
- Meets European standard for structural glazing (ETAG 002)
- Ideal for bonding on UV-exposed surfaces due to excellent long term durability and UV resistance
- Excellent primer less adhesion to a wide range of substrates
- Specially designed for adhesion between glass and PVC, wood and aluminum window frames
- Excellent adhesion to a wide range of substrates including coated , enameled and reflective glasses, anodized and polyester paint coated aluminum and stainless steel
- High level of mechanical properties
- Stable viscosity for base and curing agent
- High level of structural capability
- High level of movement capability
- Odorless and non-corrosive cure
- Excellent stability through wide temperature range: -50°C to 150°C
- Fast application with easy-to-use 2-component pumping equipment
- Firm cycle time (e.g. Window and panel units can be moved along the line within a few minutes)
- Lot matching of base and curing agent not necessary
- European approval for structural glazing
- European Technical Approval ETA 18/0571 (color black)

### **Composition**

- Two-part silicone sealant
- Neutral (moisture) cure

### **Applications**

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

Ideal for continuous production processes, automated fabrications and specific bonding designs, e.g.:

- Structural glazing
- Windows and doors bonding
- Solar thermal bonding
- Internal partition wall bonding

## Typical Properties

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

Test <sup>1</sup>	Property	Unit	Result
<b>Base: as supplied</b>			
	Color and consistency		Viscous white paste
	Specific gravity	g/ml	1.34
	Viscosity (100s <sup>-1</sup> )	mPa.s	150,000
<b>Curing agent: as supplied</b>			
	Color and consistency		Viscous black paste
	Specific gravity	g/ml	1.03
	Viscosity (100s <sup>-1</sup> )	mPa.s	200,000
ASTM D93	Flash point - closed cup	°C	24
<b>As mixed</b>			
	Mixing ratio by weight (base/curing agent)		100:10 to 100:20 w / w (depending on the cure speed needed)
	Color and consistency		Black non-slump paste
ASTM D762	Specific gravity at 100:10	g/ml	1.31
ASTM D762	Specific gravity at 100:20	g/ml	1.29
	Working time (23°C 173°F, 50% R.H.)	minutes	3–10
	Tack-free time (23°C 173°F, 50% R.H.)	minutes	5–18
	Corrosiveness		Non-corrosive
<b>As cured: after 7 days at 23°C and 50% R.H.</b>			
ISO 8339	Tensile strength	MPa	> 1.8
ASTM D624	Tear strength	kN/m	6.0
ISO 8339	Elongation at break	%	> 300
ASTM D2240	Durometer hardness, Shore A	points	45
	Sealant dynamic design load	Pa	140,000
	Sealant static design load	Pa	11,000
ASTM C711	Service temperature range	°C	-50 to +150

1. ASTM: American Society for Testing and Materials.  
ISO: International Standardization Organization.

## Description

DOWSIL™ 994 Ultra Fast Bonding Sealant is a fast curing two-part, neutral silicone formulation specifically developed for structural glazing and for automated bonding applications where a fast and durable bond is required. DOWSIL™ 994 Bonding Sealant offers primerless superior adhesion on a wide variety of substrates (PVC, wood, aluminum). Adhesion and durability performances on glass and various PVC substrates have been successfully tested according to ETAG 002. It supports demanding automated assembly processes for enhanced productivity. Neutral alkoxy; cures at room temperature giving off a small amount of alcohol.

## How to Use

DOWSIL™ 994 Ultra Fast Bonding Sealant offers unprimed adhesion to most coated and uncoated glasses as well 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 Insulating Glass Sealant and DOWSIL™ 3363 Insulating Glass Sealant, as well as most commonly used glazing components. It is important when selecting components for structural glazing and for a window bonding project that adhesion and compatibility tests are carried out, and found to be successful, before the production starts.

### Mixing and Dispensing

To obtain the ultimate physical properties from DOWSIL™ 994 Ultra Fast Bonding 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.

Suitable meter-mix equipment should be ideally equipped with gear pumps for base and catalyst, and a static mixer ensuring minimum level of variability in mixing ratio. DOWSIL™ 994 Ultra Fast Bonding Sealant cures at room temperature and develops chemical adhesion rapidly to several substrates. Mixing ratio and consequently cure speed of the bonding sealant can be adjusted according to the cycle times in production and the customer requirements. Use standard mixing ratio 100:10 up to 100:20 by weight for optimal properties. At this mixing ratio, the sealant typically exhibits a working time of 3–10 minutes. Small variations in mixing ratio can be tolerated, but these should not exceed 100:20 to 100:10 by weight to ensure minimum properties are obtained.

For each bonding project separately and depending on customer requirements, technical service will set up individual minimum and maximum tolerances in which material can be mixed.

Lot matching of DOWSIL™ 994 Base and DOWSIL™ 994 Curing Agent is not required. Before use it is recommended that the curing agent be stirred to ensure homogeneity of all components. DOWSIL™ 994 Curing Agent will react with atmospheric moisture and therefore should not be exposed to air for prolonged periods of time.

### Cleaning

Clean all surfaces prior to application of sealant, hereby 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 solvent procedures. Solvent should be wiped on and off with clean, oil- and lint-free cloths. DOWSIL™ R-40 Cleaner is recommended for solvent cleaning of substrates. The ventilation time at room temperature should be at least 1 minute under factory conditions.

### Priming

For each bonding or structural glazing project separately, it is essential that adhesion to all concerned surfaces should be tested before application. If adhesion requires priming, a primer such as DOWSIL™ 1200 OS Primer is in general recommended. When priming, the ventilation time at room temperature should be at least 1 minute under factory conditions. Project specific priming regulation needs to be discussed and approved.

## How to Use (Cont.)

### 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™ 994 Sealant will adhere to cured silicone sealant which exhibits a clean knife-cut or abraded surface.

### Bonding/Glazing

Although DOWSIL™ 994 Ultra Fast Bonding Sealant is specially designed to build up fast adhesion, it is important to respect cure time and curing conditions of the sealant during bonding/glazing and the consequent manufacturing steps. Once bonded/glazed, handling of the units/panels within production is possible already after a few minutes. However, the actual cure time depends on the mixing ratio. The adhesion builds up during the following hours. The final strength is reached after 24 hours. Consequently, units/panels can be installed after this period of time. A further requisite for a high quality bonding/glazing application consists in an appropriate joint dimension. Depending on parameters such as glass weight/panel weight, window/panel sizes but also temperatures etc., joint dimensions will vary between 2–4 mm by 8–10 mm. More specific recommendations about bonding are available in the quality manual for bonded windows and structural glazing.

## Technical Specifications and Standards

- Conforms to SNJF – VEC



Regulation or protocol	Conclusion	Version of regulation or protocol
French VOC régulations	A+	Regulation of March and May 2011 (DEVL1101903D and DEVL1104875A)
French CMR components	Pass	Regulation of April and May 2009 (DEVP0908633A and DEVP0910046A)
Italian CAM Edilizia	Pass	Decree 11 January 2017 (GU n.23 del 28-1-2017)
AgBB/ABG	Pass	Anforderungen an bauliche Anlagen bezoglich des Gesundheitsschutzes (ABG), Entwurf 31.08.2017/August 2018 (AgBB)
Belgian Regulation	Pass	Royal decree of May 2014 (C-2014/24239)
EMICODE	EC 2	April 2019

## Technical Specifications and Standards (Cont.)

Regulation or protocol	Conclusion	Version of regulation or protocol
Indoor Air Comfort	Pass	Indoor Air Comfort 6.0 of February 2017
Blue Angel (DE-UZ 123)	Pass	DE-UZ 123 for "Low-Emission Sealants for Interior Use", (January 2019)
BREEAM International	Exemplary lvl	BREEAM International New Construction v2.0 (2016)
CDPH	Pass	

### 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 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 25°C in the original unopened containers, DOWSIL™ 994 Ultra Fast Bonding Sealant Black Curing Agent has a usable life of 12 months from the date of production.

When stored at or below 30°C in the original unopened containers, DOWSIL™ 994 Ultra Fast Bonding Sealant Base has a usable life of 14 months from the date of production.

### Packaging Information

DOWSIL™ 994 Ultra Fast Bonding Sealant Base is available in 250 kg drums.

DOWSIL™ 994 Ultra Fast Bonding Sealant Curing Agent is available in 25 kg pails.

### Limitations

Because of the risk of incompatibility, DOWSIL™ 994 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, [dow.com](http://dow.com) or consult your local Dow representative.

### Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

## **Product Stewardship**

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## **Customer Notice**

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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