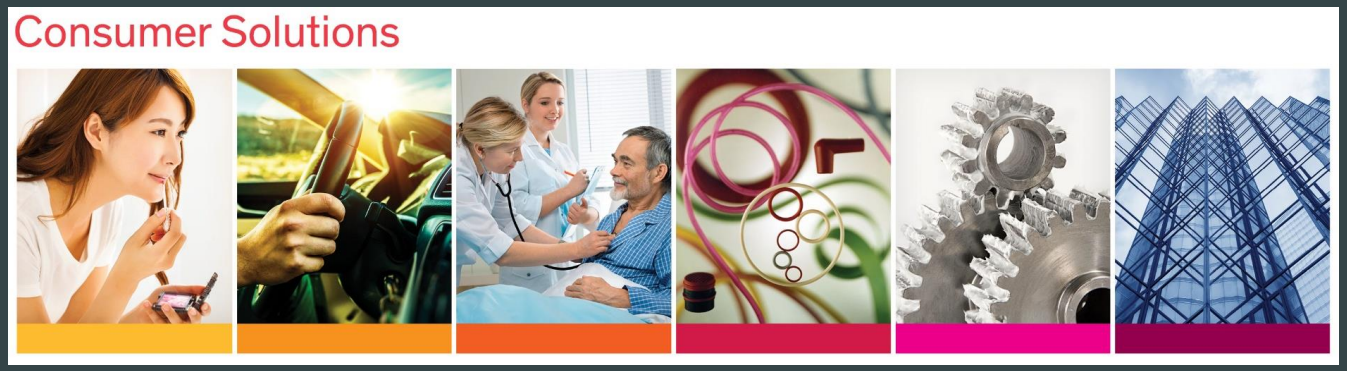
Glass Performance Days Istanbul, Turkey, 7th-9thh March 2018



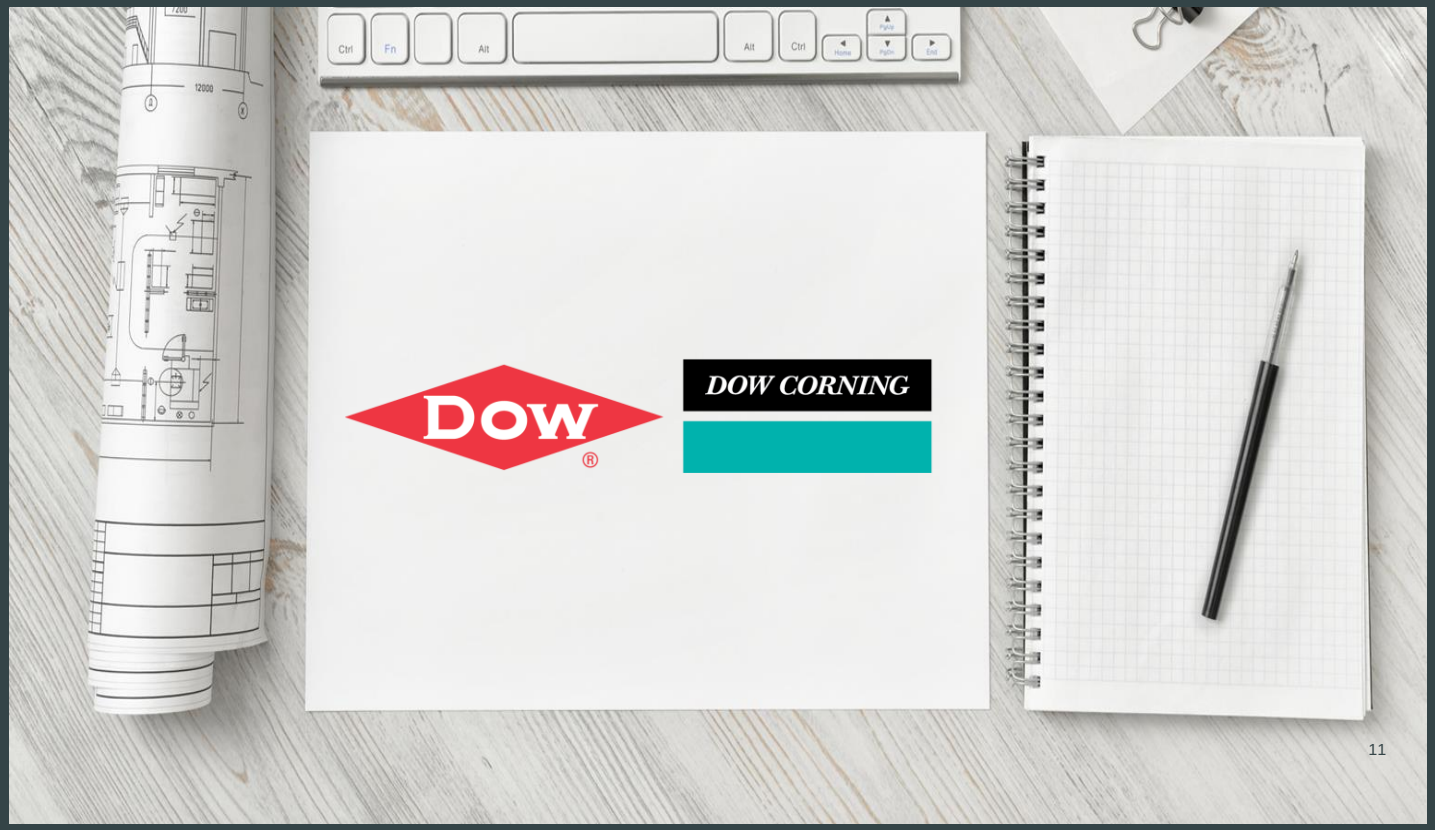
Silicone Technologies for High Performance Facade

Markus Plettau, Marketing Manager EMEA
DOW Consumer Solutions, High Performance Building

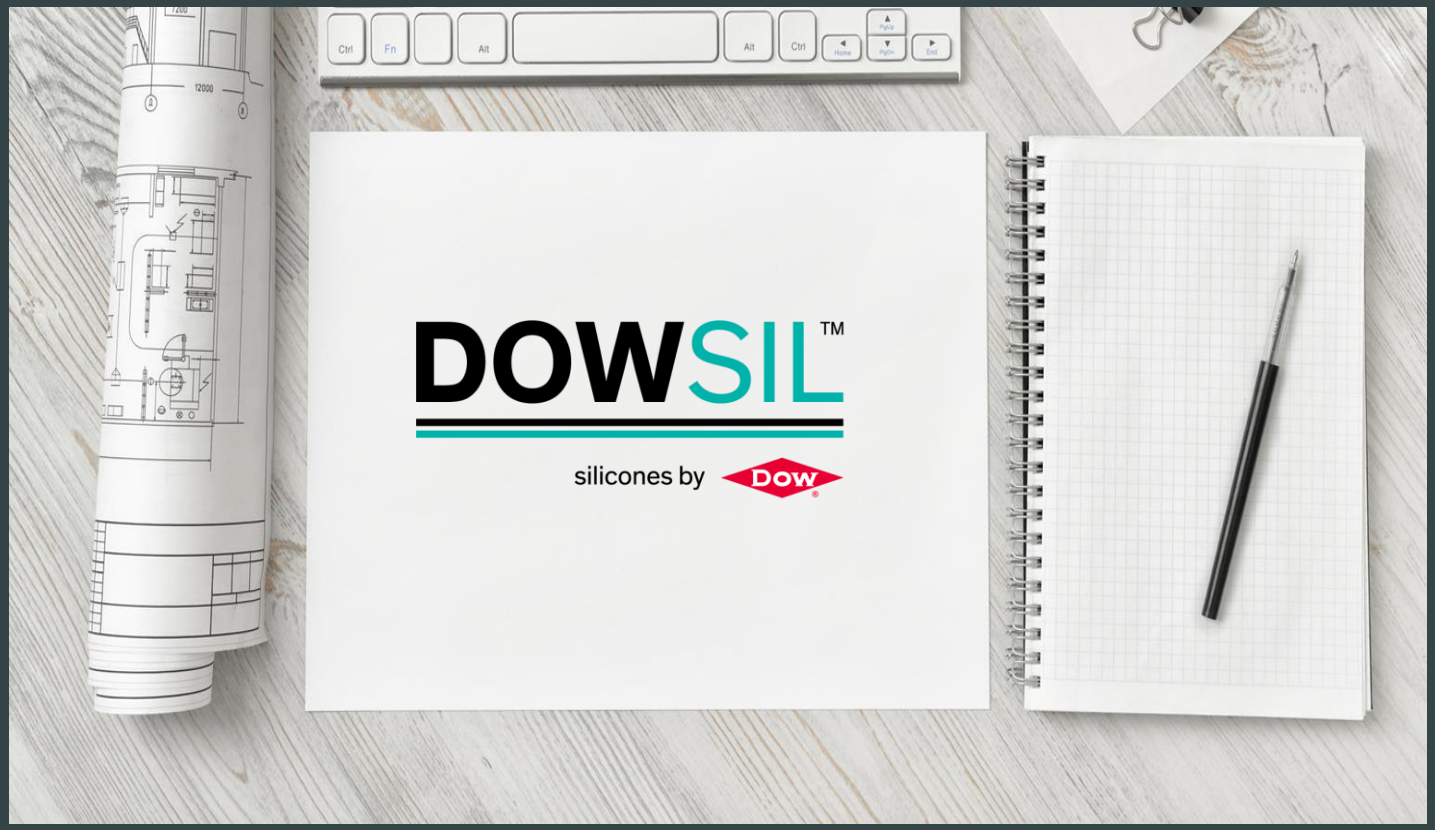
NEW YORK, 1994

DOW®

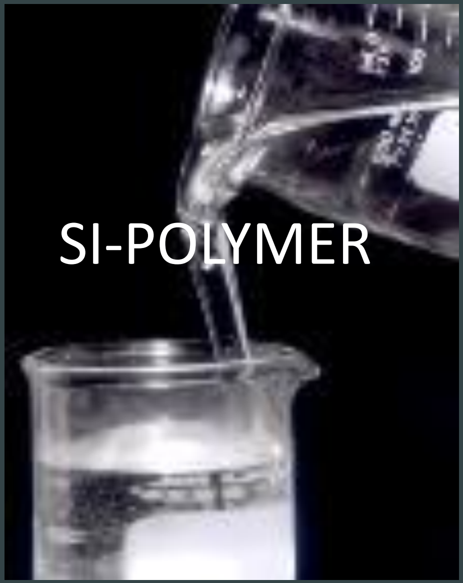
DOW CORNING BECOMES DOW

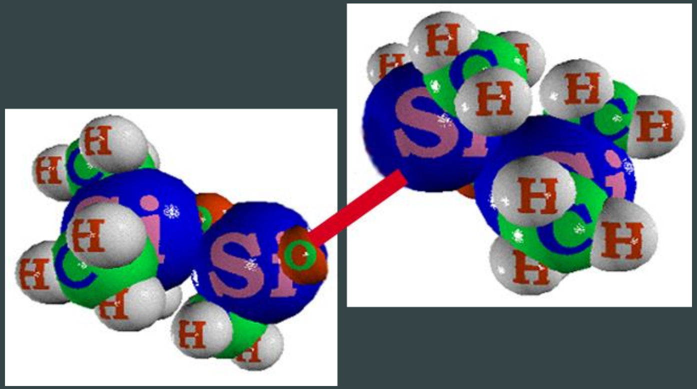


THE NEW BRAND



From Sand to Silicone





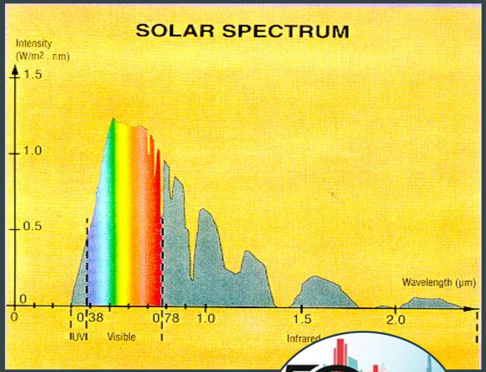
Bond energy:

SILICONE: Si-O 452KJ/mol

Polyurethane: C-O 357KJ/mol

Polysulfide: C-C 360KJ/mol

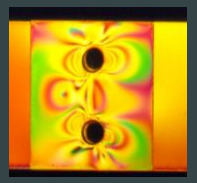
UV ±400KJ/mol

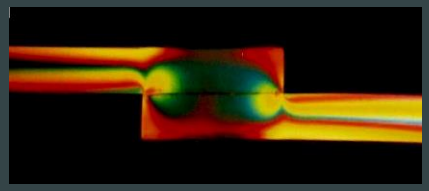


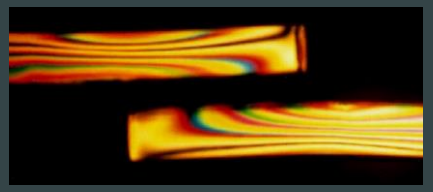
Why Silicones ?

High Strength	→	Structural Bonding
High Elasticity	→	XXL Units
UV/Temperature resistant	→	Pure Glass Designs
Strong chemical Bond	→	Longterm Durability

Elastic Bonding:

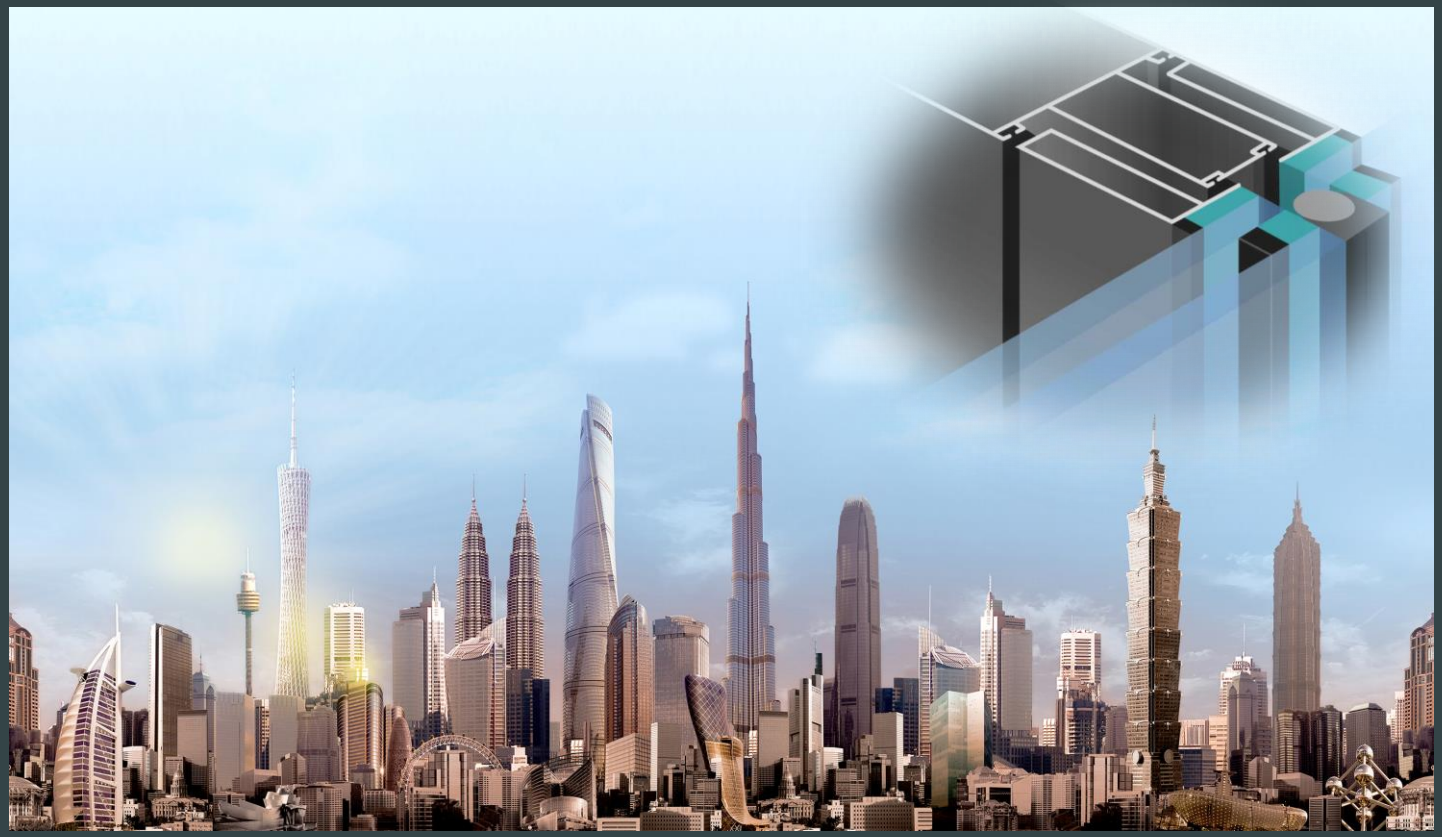




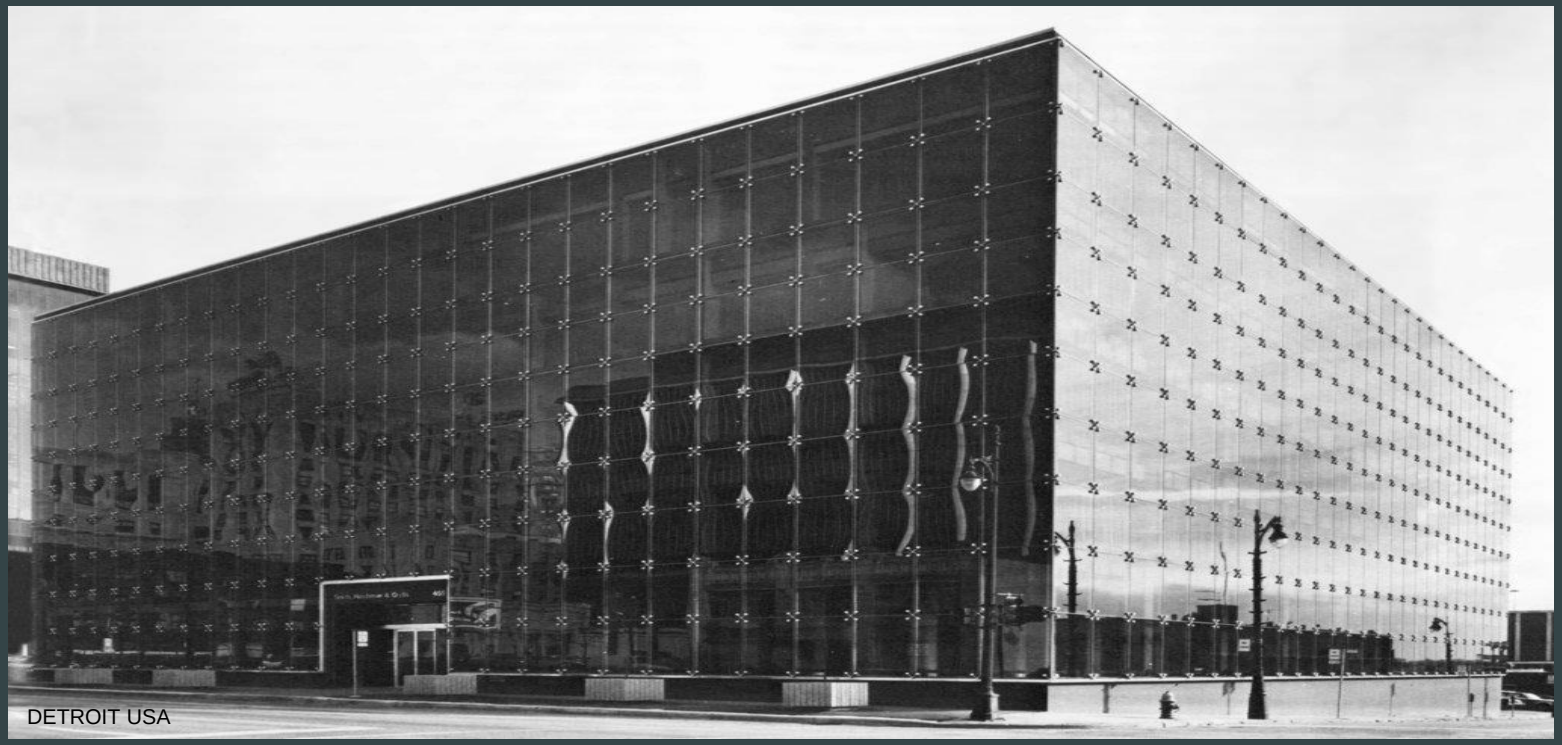


Source: ELASTISCHES KLEBEN, JOSEF WOLF, ET

Silicone Structural Glazing



54 YEARS PIONEERING THE SILICONE MARKET



DETROIT USA

New Istanbul Airport

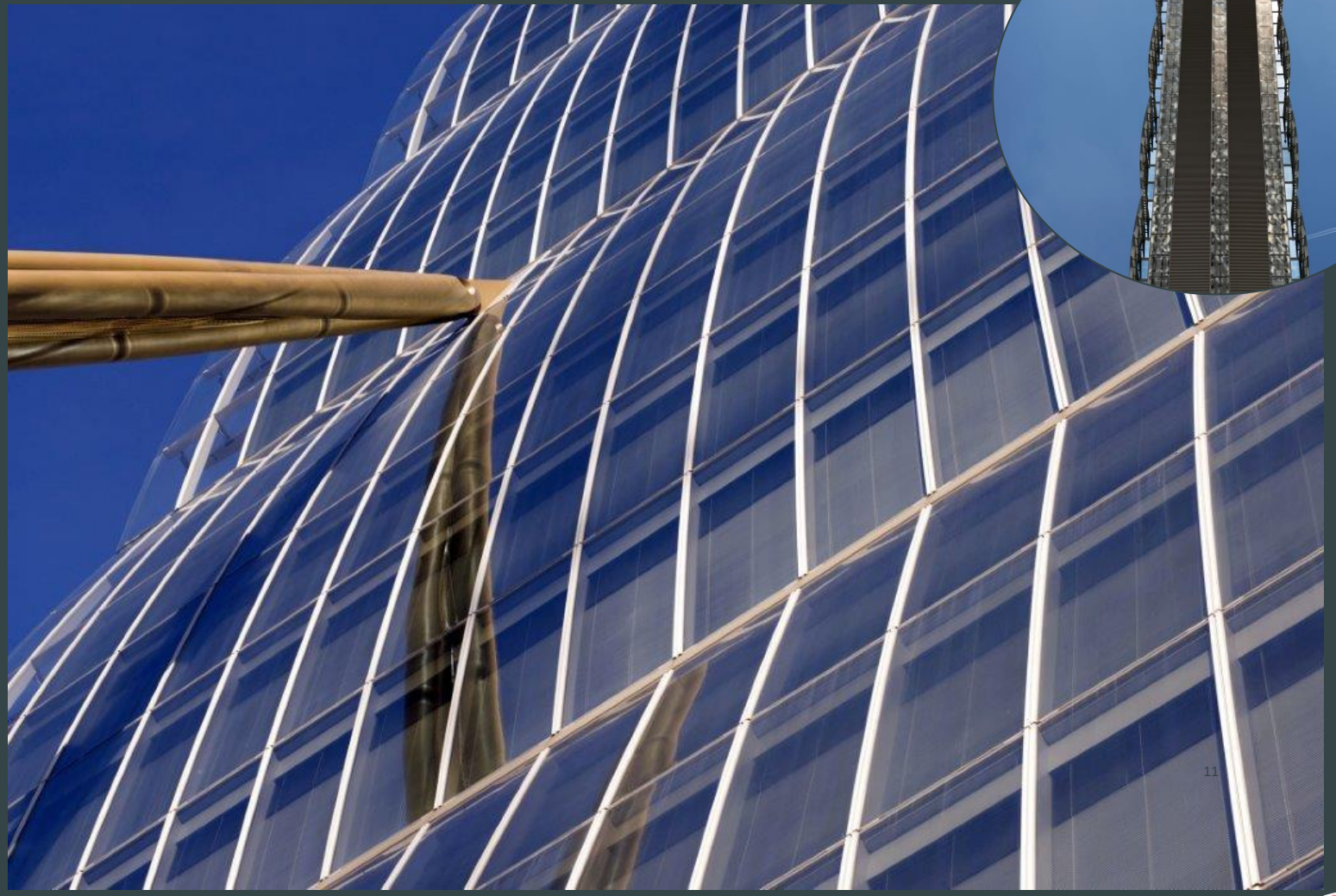
ARCHITECS HOK & PARSOONS BRICKERHOFF

New Istanbul Airport

FASCINATION SKY SCRAPER

SHANGHAI TOWER, SHANGHAI

Allianz Tower, Milano



NATO HQ


WHEN SAFETY AND HIGH PERFORMANCE BUILDING (HPB) COUNT
ARCHITECT SOM

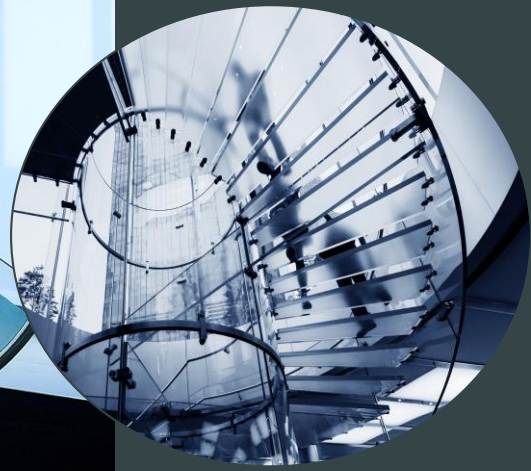
BURJ KHALIFA, DUBAI

JEDDAH TOWER, JEDDAH

ADRIAN SMITH & GORDON GILL ARCHITECTURE

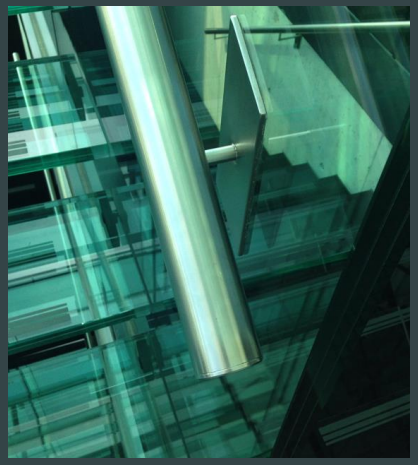
“VIDRE SLIDE “

CRICURSA & ECKERSLEY O’CALLAGHAN EOC



Crystal Clear Bonding

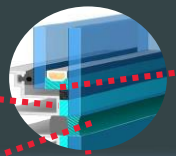
Crystal Clear Bonding



Panel Bonding – Glass, HPL, FRC

Silicone Technologies BEYOND Structural Glazing

Structural Silicone Glazing :

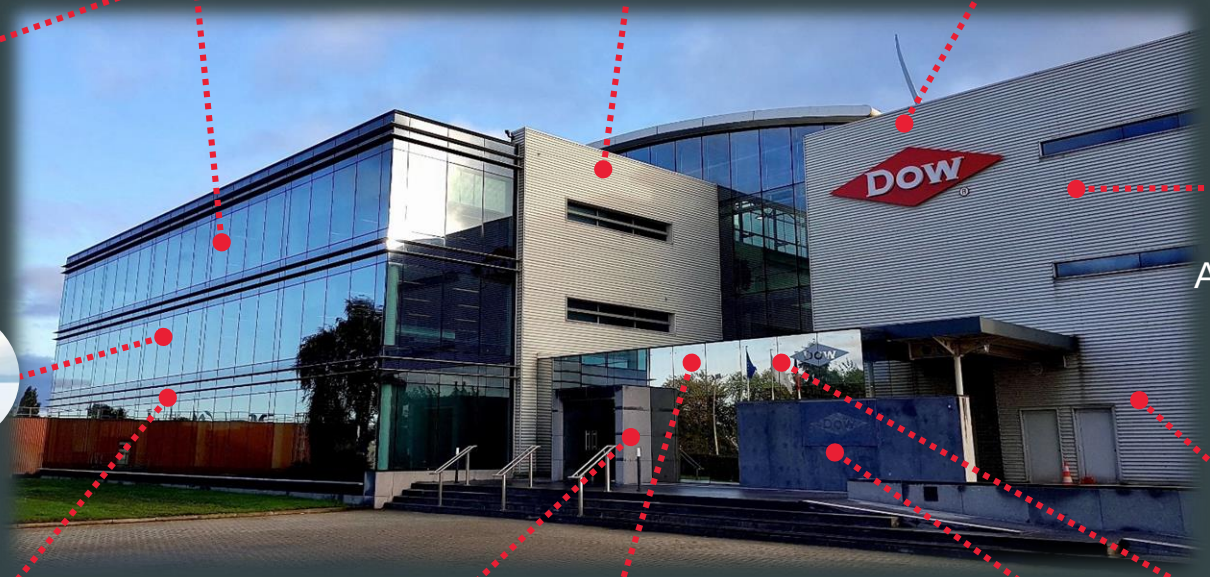


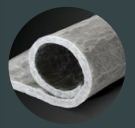
Insulating Glass Silicone:

Sprayable air & Weather Barrier

Panel Bonding

Weatherproofing Sealants & Membranes





Aerogel insulation

Smart-Glazing Si-LCD)

Clean Sealants

Elastomeric Glass Coatings:

Fire Resistance Sealants

Silicon Hybrid

Crystal Clear Bonding & Sealing

Construction Chemicals for Concrete

First Technical Approval – Panel Bonding with Silicone

UBAtc

Union belge pour l'Agrément technique de la construction

member of EOTA and UEAtc

ETA 17/0689
Version 01
Date of issue: 2018-01-08

European Technical Assessment

UBAtc Assessment Operator:
Belgian Construction Certification Association
Rue d'Arlon 53 - 1040 Brussels
www.bcca.be - info@bcca.be

BCCA

Technical Assessment Body issuing the European Technical Assessment: UBAtc.
UBAtc has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment)

Trade name of the construction product:	DOWSIL™ 896 PanelFix
Product family to which the construction product belongs:	9 - Adhesive used in cladding systems
Manufacturer:	DOW Europe GmbH Bachtobelstrasse 3 CH-8810 Horgen Switzerland
Manufacturing plant:	Dow Silicones Belgium S.P.R.L. Parc Industriel Zone C, B-7180 SENEFFE Belgium
Website:	www.dow.com
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 15-25-0005-0606, edition 2017
This European Technical Assessment contains:	7 pages, without any annexes

EOTA

European Organisation for Technical Assessment

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http://www.ubatc.be

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Fax +32 (0)2 725 32 12
info@ubatc.be

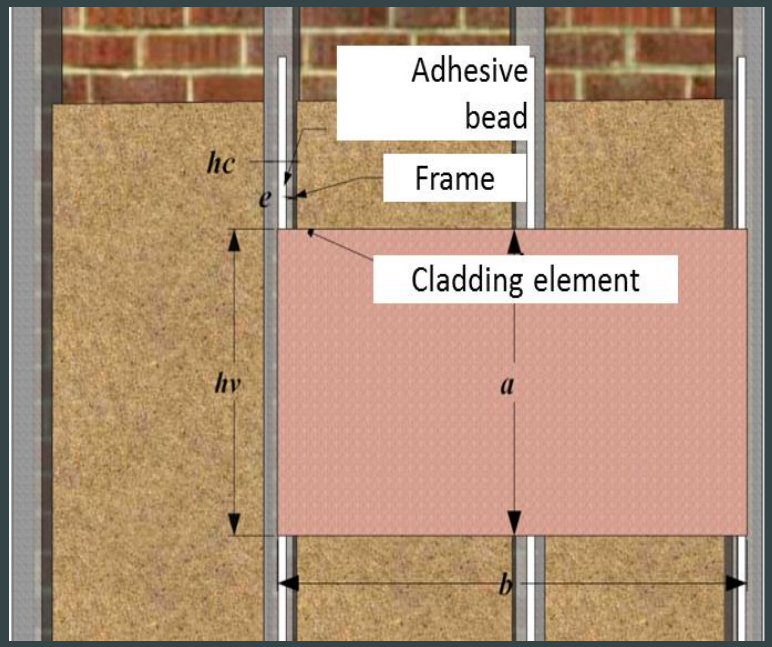
DOW

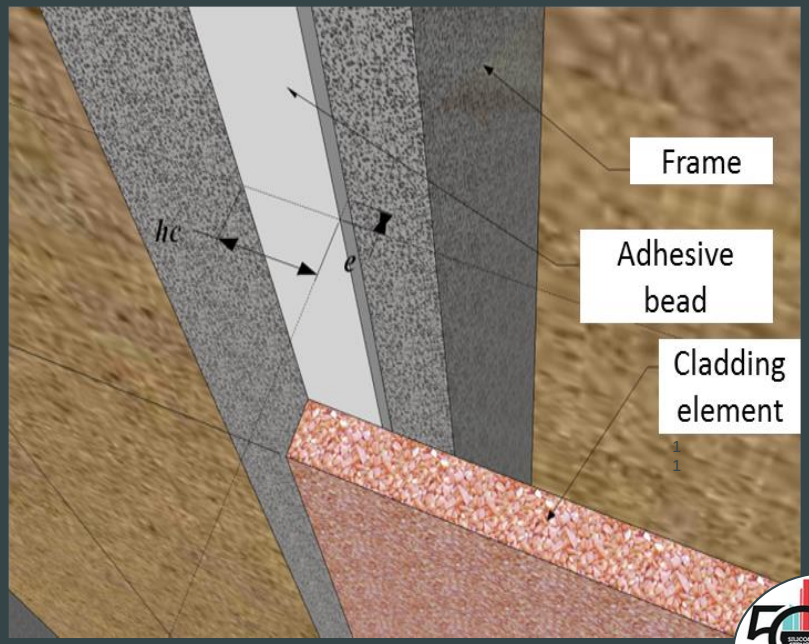
50+ years SILICONE STRUCTURAL GLAZING
PROVEN PERFORMANCE
THE BROCHU

EAD 15-25-0005-0606, edition 2017: Adhesive for wall cladding

This EAD (European Assessment Document) specifies assessment methods for adhesives for wall cladding onto metal supporting frames.

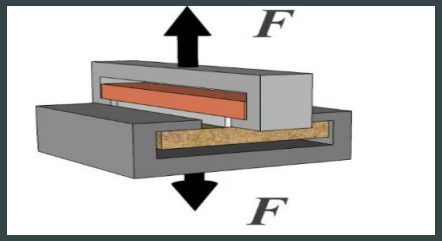
The products maintain at least 75% of their mechanical performances after ageing and conditioning

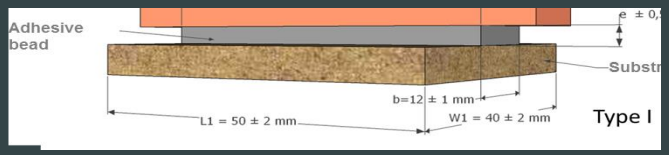


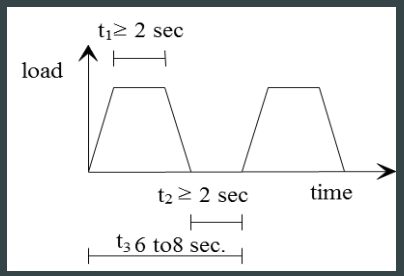


Performance after AGEING & under shear

- **Temperature** and high humidity: 1000hrs, 60C/85%RH
- **Water** immersion: 1 week
- High humidity and **Salt spray**/ NaCl 20 days
- High humidity and **SO_2**
- **Mechanical fatigue** in tension



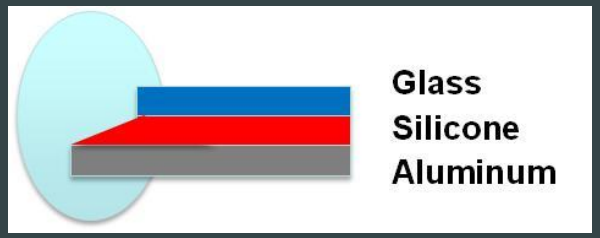


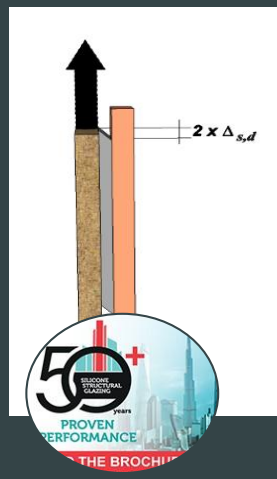


- 500 cycles of 2* max. **movement capability**
- **100% deformation in shear** (3mm)

  Allow: 50% deformation in shear (1.5mm)

  → 3mm thickness : 1.5mm deformation





DOW

Static load resistance of sealants

6 weeks under high temperature

Static load (6 weeks 85C/85%RH)

Technology	Tensile MPa	Elong. Max %	Stress at 12.5%	Adhesion %CF	Deadload resistance kPa
Silicone	1.2	250	0.2	100	150
Polyurethane	1.1	180	0.3	100	90
Hybrid	>2.0	>60	0.6	100	<30 (3d)

Although UV-resistance might not be an issue hidden bonding applications, deadload capability is key in panel bonding as glass, ceramics, HPL, etc. are typically unsupported

DOW

50+ PROVEN PERFORMANCE

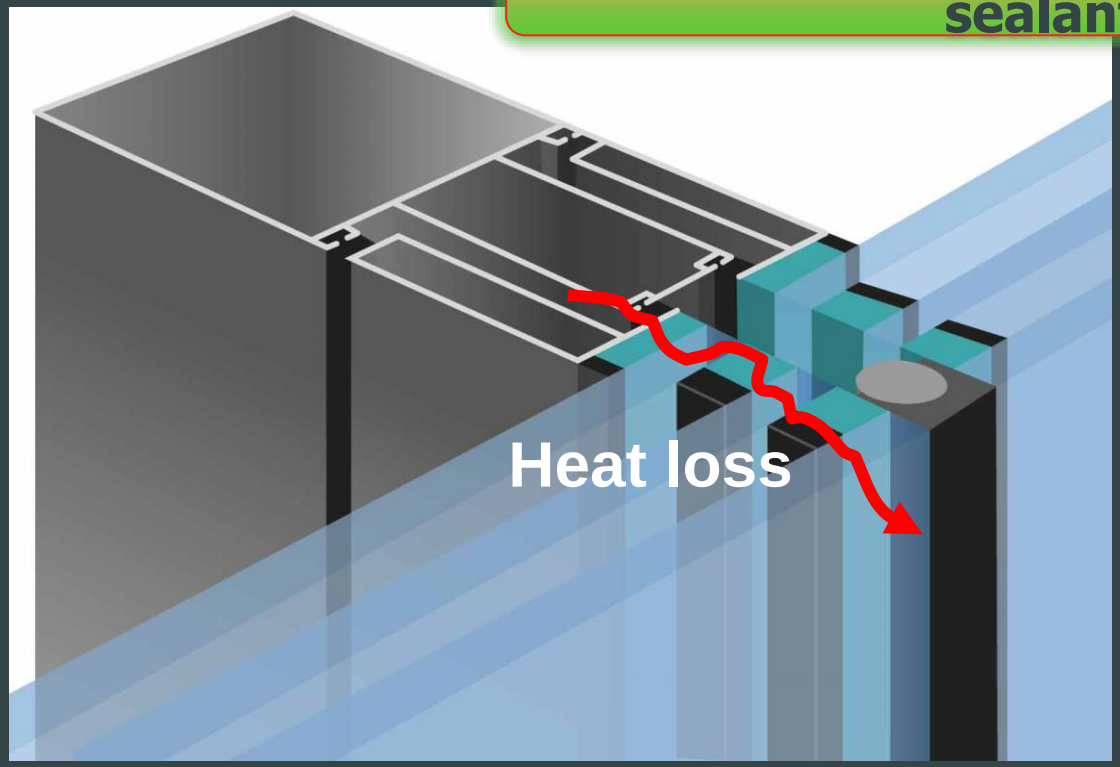
Primer Tower, Switzerland

DOW

50+ SILICONE STRUCTURAL GLAZING years
PROVEN PERFORMANCE
THE BROCHU

Improving Energy Performance with Sealants

Thermal „Bottle neck“: IG secondary sealant



NEW Warm Edge Silicone Technology

Patented

	Standard 2-part Silicone (DOW)	High Strength 2-part Silicone (DOW)	Warm Edge 2-part Silicone (DOW)
POSITIONING	Proven gas-filled IG	Productivity & Economic Joints	Energy efficiency & Comfort
Color	White – Black + all greys	White – Black + all greys	Black
Density	1.32 g/ml	1.38 g/ml	0.94 g/ml
Thermal Conductivity	0.28 W/mK	0.28 W/mK	0.185 W/mK
Economic/Slim Joints	+	+++	+
Lower u-value, energy efficiency	+	+	+++
Gas-filled 2-/-3 IG	+++	+++	+++
High Climatic loads	+	+++	+
Protective Glazing / High Wind	+	+++	+
Productivity	+	+++	+
Pumpability	++	++	+
Design Strength	+	+++	+

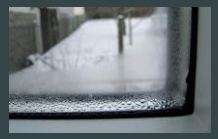
DOW

50+ years SILICONE STRUCTURAL GLAZING
PROVEN PERFORMANCE
THE BROCHU

NEW Dowsil ™ Warm Edge Silicone

Energy efficiency & comfort

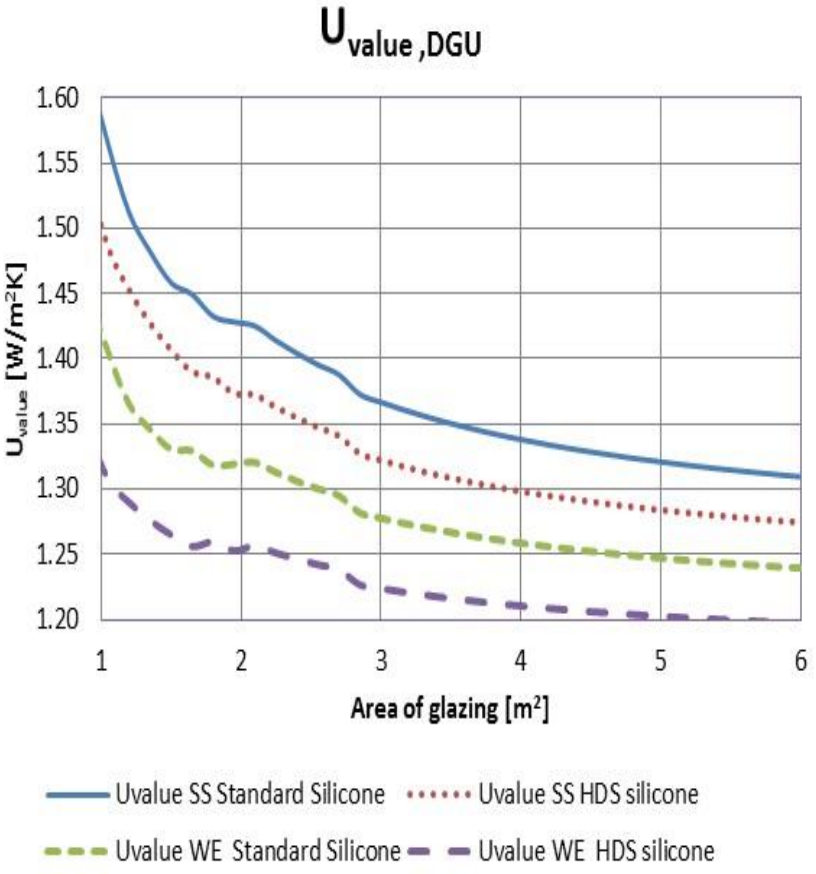
- **Energy Efficiency**
  - **Toggle Systems**: u-value improvement 0,05 up to 0,1 W/m²K
  - **Up to 30% lower psi-values in warm edge designs** compared to standard IG silicones

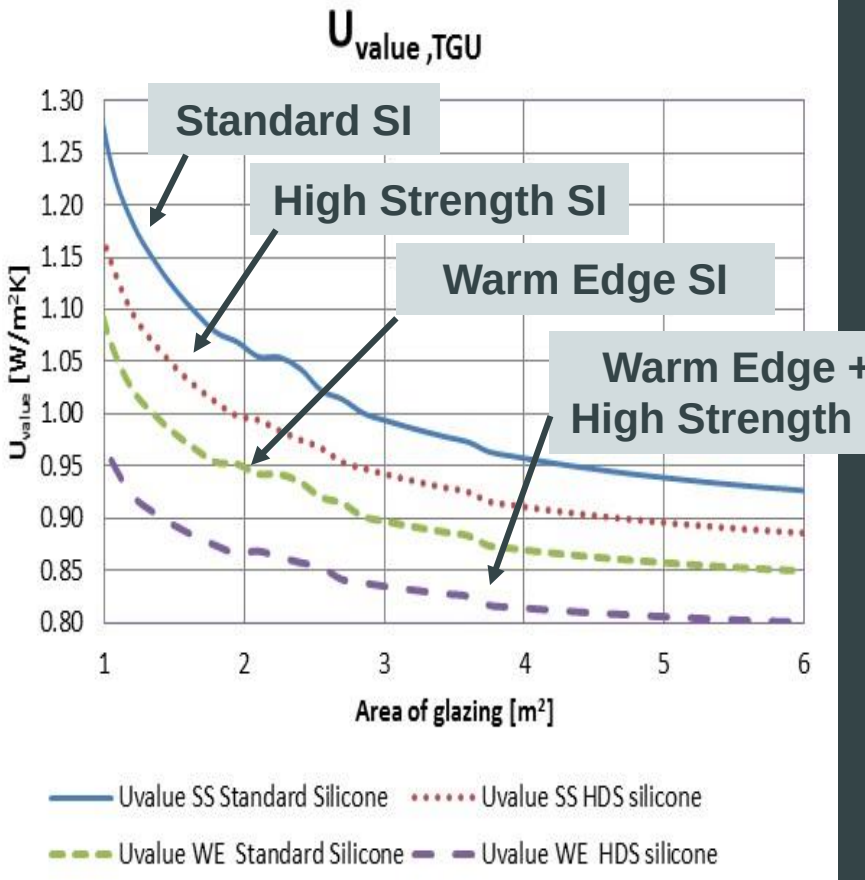


- **Better comfort**
  - **Higher surface temperature (up to 1,0˚ C) -** Lower risk of condensation inside
  - **Higher surface temperature (up to 1,0˚ C)** - Lower risk of mould growth

- **Cost efficient solution for low energy designs**

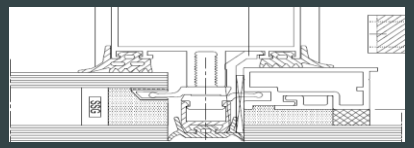
Smaller joints or less thermal conductivity ?

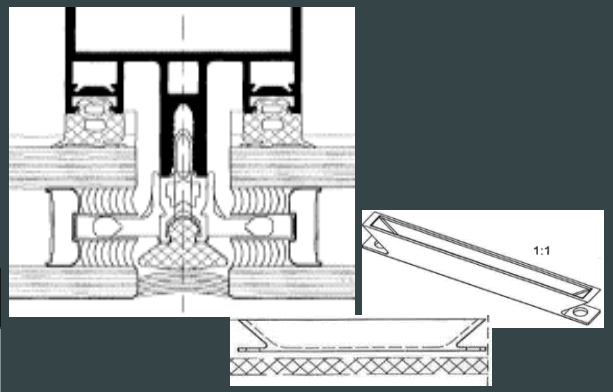




DGU:4/16/4 – 1.1W/m²K
TGU: 6/14/4/14/4 – 0.7W/m²K
0.5-4m height, width 1.5m fix

Toggle Systems better with Warm Edge Silicone



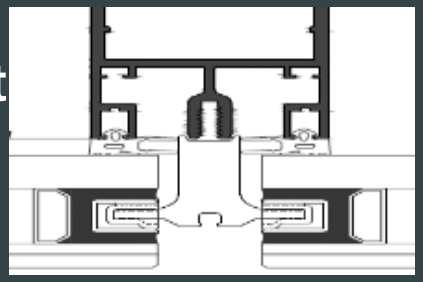


		TODAY	
0,7 W/m²K triple glazed	u-profile	Warm Edge Silicone 0.185 W/m²K	Standard Silicone 0.28 W/m²K
Schueco	non continuous	0,9 (0,9332)	1,0 (1,019)
HUECK	continuous	0,9 (0,941)	1,0 (1,092)
REYNAERS	continuous	0,9 (0,93)	1,0 (1,02)

- Min. Improvement of u-value: 0,1 W/m²K
- Significant improvement as no design change !

Toggle Systems – Condensation

SG-Systems with U-profile: significant improvement

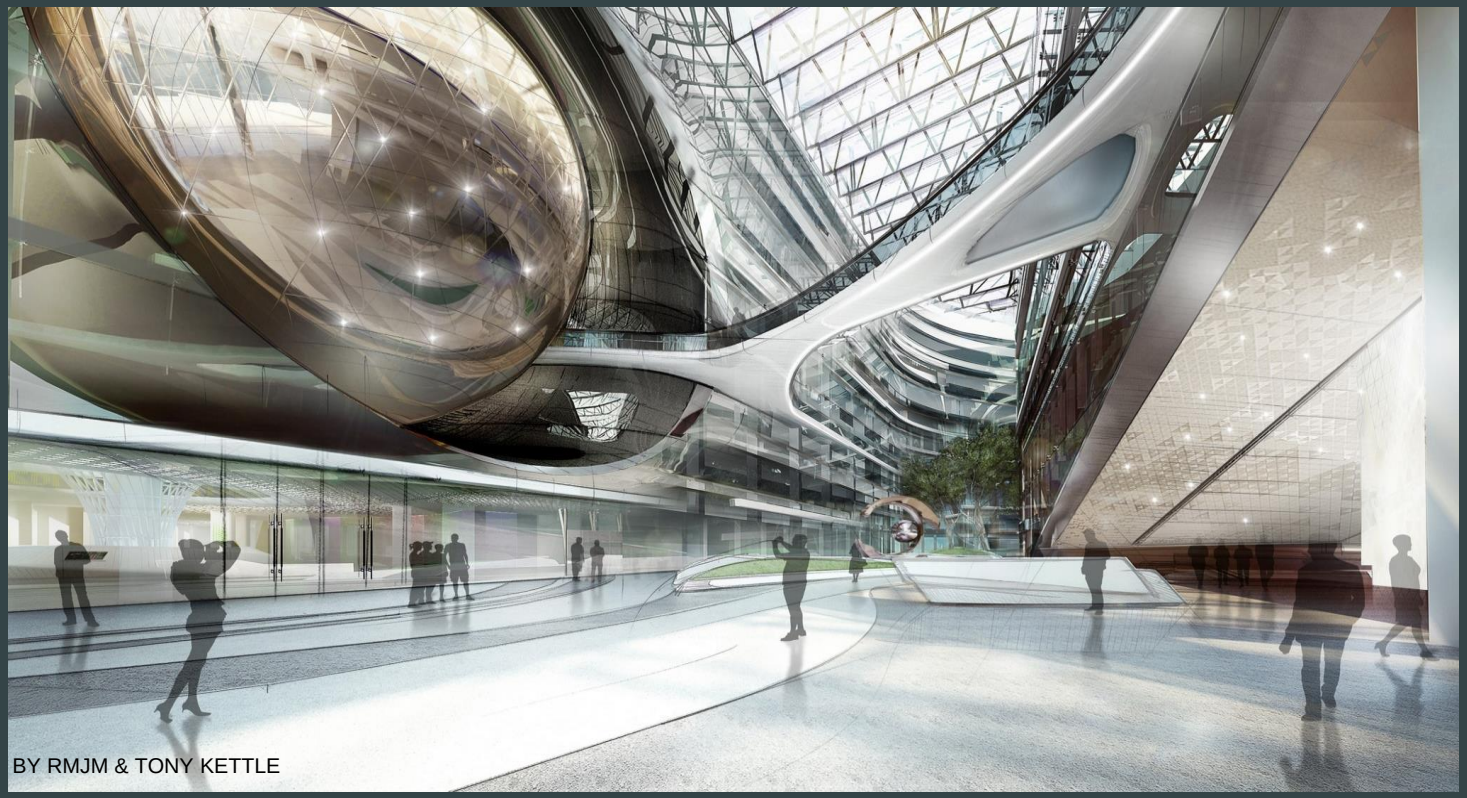


- **Min. Temperature improvement**: 0,9-1,0˚ C
- **Less condensation** at even lower temperatures
- **Less mould growth**

	Warm Edge Silicone		Standard Silicone		Organics (PU/PS)	
double	0.185 W/mK	0.185 W/mK	0.28 W/mK	0.28 W/mK	0.40 W/mK	0.40 W/mK
glazed	0°-20°	`-10°C-20°C	0°-20°	`-10°C-20°C	0°-20°	`-10°C-20°C
System 1	12,3 °C	8,5 °C	11,3 °C	7,0 °C	10,4 °C	5,6 °C
System 2	13,4 °C	10,1 °C	12,5 °C	8,8 °C	11,7 °C	7,6 °C

	Warm Edge Silicone		Standard Silicone		Organics (PU/PS)	
Triple	0.185 W/mK	0.185 W/mK	0.28 W/mK	0.28 W/mK	0.40 W/mK	0.40 W/mK
glazed	0°-20°	`-10°C-20°C	0°-20°	`-10°C-20°C	0°-20°	`-10°C-20°C
System 1	14,9 °C	12,4 °C	13,9 °C	10,9 °C	12,9 °C	9,4 °C
System 2	16,1 °C	14,2 °C	15,3 °C	13,0 °C	14,4 °C	11,6 °C

LAKHTA CENTER, SAINT PETERSBURG



Silicone – Changing the worlds face

Thank You

 Form No. 00-0000-01 X