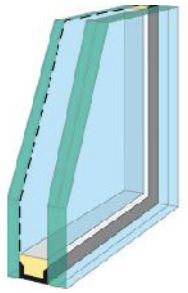
Double Glazing Glass

Energy Saving Solutions

Harris Silicones & Glass (Pvt.) Ltd.

HARRIS

Company Introduction



- Pioneers of Silicone Sealants in Pakistan
- Manufacturing in collaboration with Momentive Performance Materials (formerly GE Bayer Silicones)
- Largest Manufacturer of silicone sealants & emulsions
- Introducing Double Glazing Glass

Harris Silicones & Glass (Pvt.) Ltd.

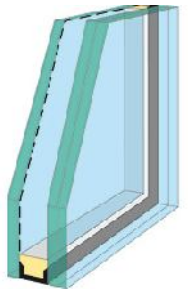
is the sole distributor and agent for Momentive Performance Materials, a world leader in silicones.

MOMENTIVE
performance materials

formerly known as:

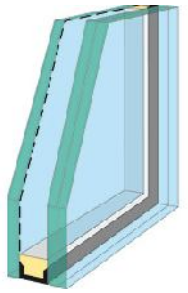
GE Bayer Silicones

Company Introduction



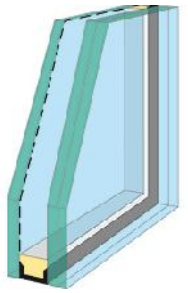
- Construction Portfolio includes:
  - Sealants
  - Insulation Glass
  - Water Repellents

Company Introduction



- Projects:
  - Shaheen Complex, Lahore
  - Alam Tower, Raiwind Road, Lahore
  - Lahore Expo Center
  - Pearl Continental Hotel, Lahore
  - Avari Hotel, Lahore
  - Rabi Center, Lahore
  - IT & Software Park, Lahore
  - Al-Tijarah Sharah-e-Faisal, Karachi
  - Saudi Pak Tower, Islamabad
  - Qaid-e-Azam International Hospital, Rawalpindi
  - Convention Center, Islamabad

Company Introduction



- Valued Customers Include:

VARIOLINE INTER COOL

chawla aluminium

GHANI VALUE GLASS
THE GLASS EXPERTS

Pace

Pakistan Alco Products

s.abdullahome

prime aluminium industries

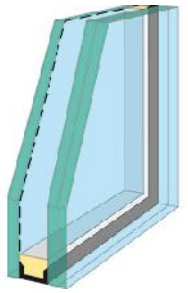
PEL

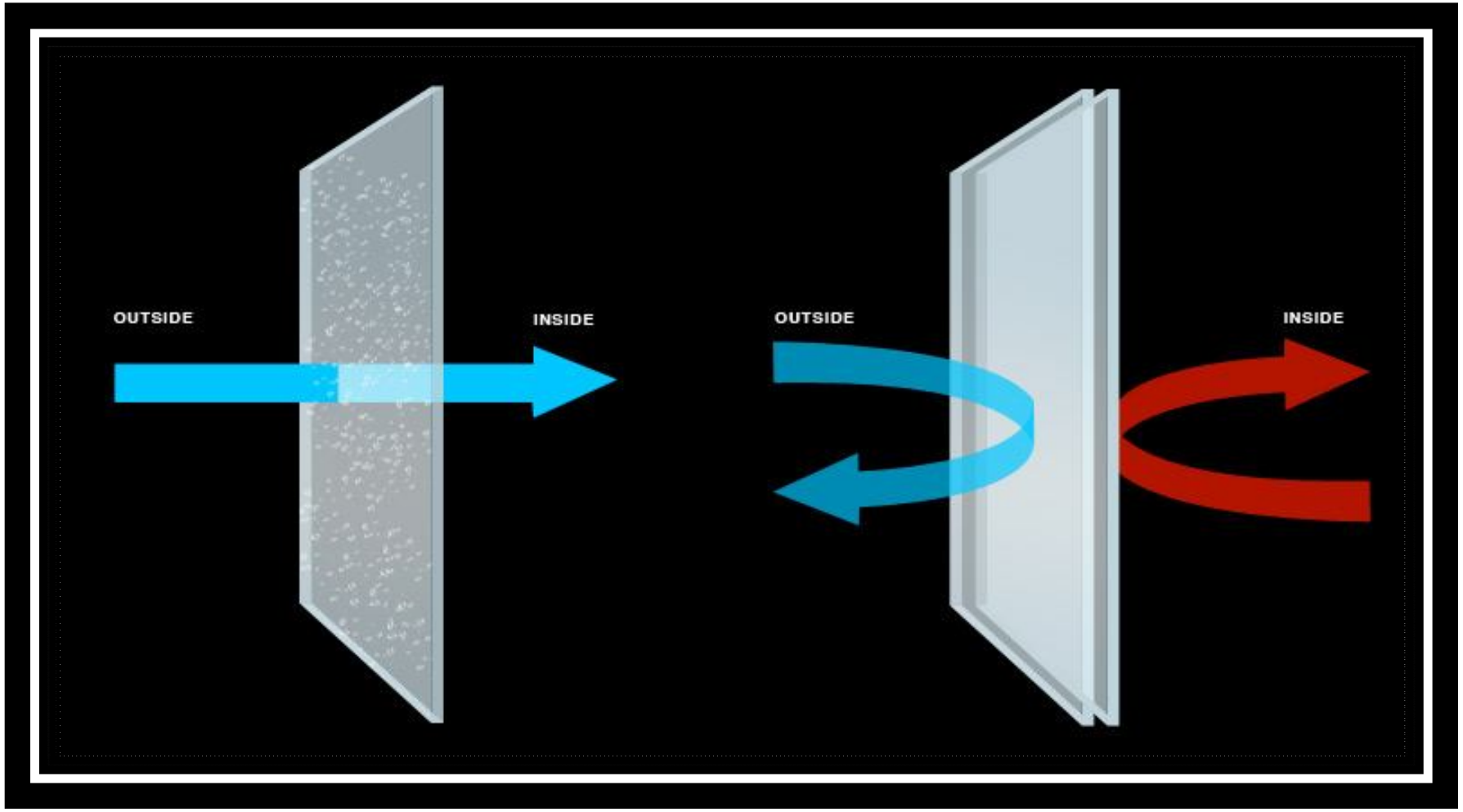
WAVES

AL-FATTAH
Toughened Glass Industries (PVT) Ltd.

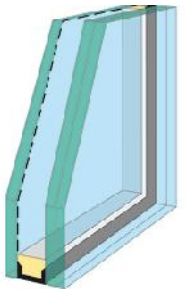
ALCON
ALCON INDUSTRIES (PVT) LTD.

The Double Glazing Principle

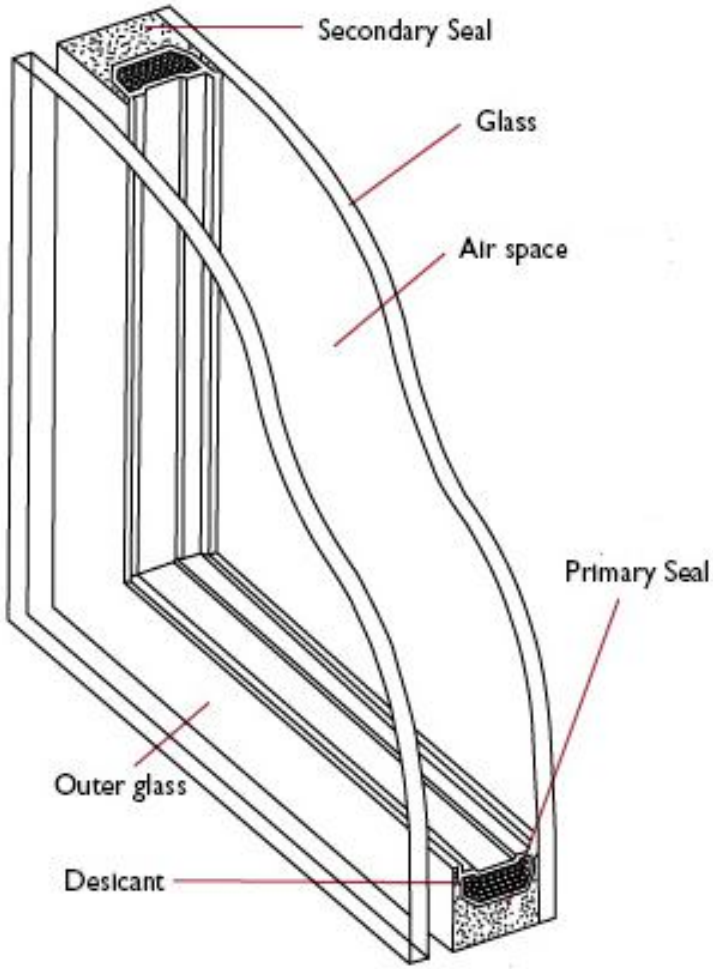




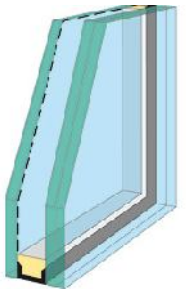
What is Double Glazing



- Two sheets of **glass**
- aligned with aluminum **spacer bars** that dictate the spacing
- Dual seal system
  - Spacer bar adjoined with **butyl sealant**, which is characterized by a very low moisture vapor transmission
  - Both sheets of glass joined with **Insulation Glass Silicone Sealant** (IGS)

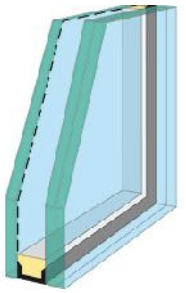


What is Double Glazing



- At Harris Silicones, we only use the highest quality of materials for our insulation glass manufacturing
- Spacer Bars are of Italian origin, from **Profil Glass**
  - High frequency welded spacer bars, oil & dust free manufacturing
- Offer a complete range, from 5.5mm to 19.5mm of thickness

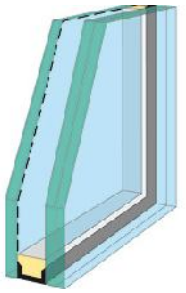
What is Double Glazing



- At Harris Silicones, we only use the highest quality of materials for our insulation glass manufacturing
- **Two-component insulation glass silicone sealant** from Momentive Performance Materials (Formerly GE Bayer Silicones)
- Specially formulated for dual seal system
- Compatible with structural glazing sealants

MOMENTIVE
performance materials

What is Double Glazing



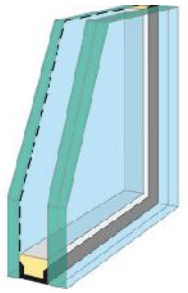
- Momentive Insulation Glass Sealant IGS 3723

Typical Product Data

Uncured Properties	Component A	Component B
Colour	White	Black
Specific Gravity	1.40	1.00
Mixed Compound Properties - Ratio by weight 12.5 : 1		
Colour	Black	
Specific Gravity	1.37	
Snap Time	20 - 50 minutes	
Sag/Flow	2 mm max.	
Corrosiveness	Non-corrosive	
Cured Properties - 7 days @ 23°C, 50% RH		
Shore A Hardness	43	ISO 868
Tensile Strength, MPa	2.1	ISO 37, S 2
Elongation at Break, %	200	ISO 37, S 2
Lap Shear Aluminium, MPa Lap Shear Glass, MPa	0.9 0.9	
Cold Flow	Negligible	
Heat Resistance, °C	150	

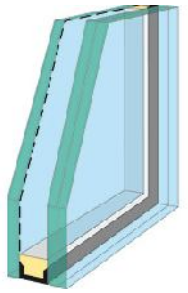
MOMENTIVE
performance materials

Benefits of Double Glazing

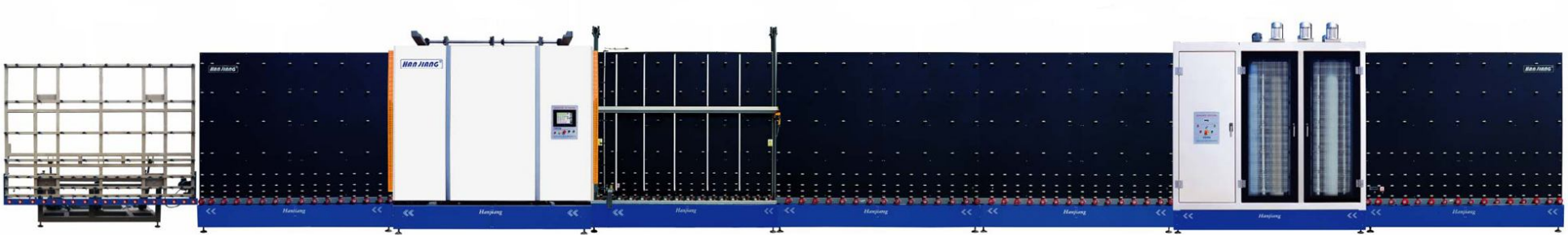


- Improved Thermal Insulation
  - reduces electricity & gas bills
- Improved Energy Efficiency
  - Improved efficiency of heating & cooling
- More Comfortable Rooms
- Less Condensation
  - Inner surface of glass stays warmer, reducing internal condensation
- Noise Reduction

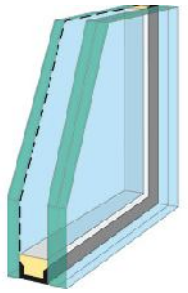
Harris Silicones & Double Glazing



- Harris Silicones & Glass (Pvt.) Ltd. offers double glazing on a state of the art IG machine:
  - Fully automatic machine
  - Ensure proper cleaning in dust-free environment
  - Automated argon gas filling station
  - Handle glass of various sizes
  - Double Glazing & Triple Glazing options
  - Equipped to handle online & offline coating

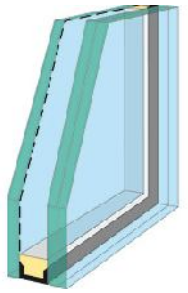


Design Considerations



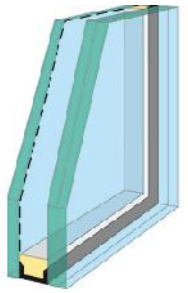
- The larger the gap between the two panes of glass, the higher the thermal & noise insulation will be:
  - i.e. a 12mm gap will be more efficient than a 5mm gap
  - The gap can be controlled by the width of the spacer bar. Standard sizes of 5mm, 6mm, 12mm and 19mm are available.
- Use of Argon gas will increase performance
- Use of coated or tinted glass can reduce heat gain caused by solar energy.

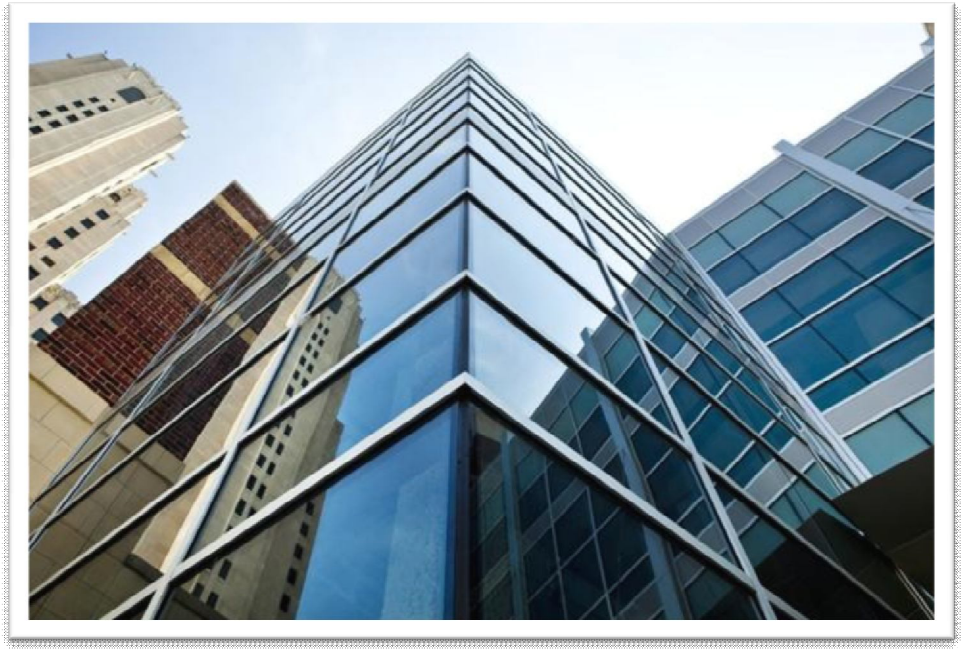
Benefits of Argon



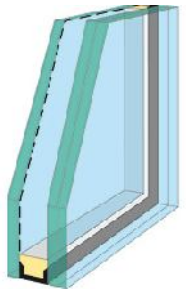
- Argon is an inert gas, which has a higher density than air
- Has a thermal conductivity that is 37% lower than that of dehydrated air
- Improves thermal insulation considerably in comparison to unfilled double glazing units
- No impact on visibility or clarity of unit
- Improves the performance of insulation glass units, in particular with the use of Low-E glass

Design Considerations



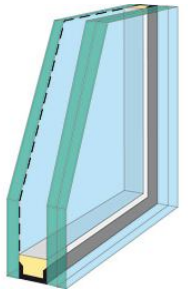


Modes of Heat Transfer



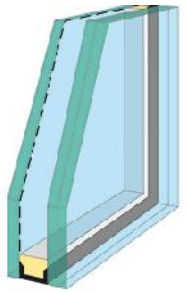
- Conduction
  - Caused by direct contact of surfaces
  - Insulation glass is effective in reducing this
- Convection
  - Caused by fluids
  - Measured by the U-Value
  - Insulation glass reduces convection by creating a layer of air in between two sheets of glass that reduces convection by over 50%
- Radiation
  - Caused by solar energy
  - The best way to reduce solar heat gain is by using coated or tinted (Low-E) glass

Design Considerations



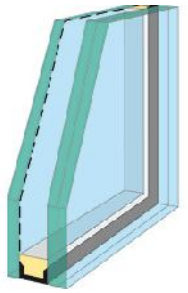
Property	Single Glazed	Double Glazed
Glass Specification	5mm Clear Float Glass	2 sheets x 5mm Float Glass
Visible Light Transmittance (%)	89.00	79.00
Solar Energy Transmittance (%)	80.00	64.00
UV Transmittance (%)	65.00	50.00
U-Value	0.93	0.50
Solar Heat Gain	0.83	0.72

Design Considerations



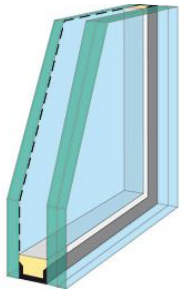
- U-Value
  - The measure of heat gain or loss through glazing due to temperature differential between the outdoor and indoor air.
  - A lower U-Value corresponds to higher performance
- Solar Heat Gain
  - The ratio of total solar heat gain through the glass relative to the incident solar radiation. Includes both the solar energy directly transmitted through the glass plus the energy absorbed through the glass and subsequently convected inward.
  - The lower the heat gain, the higher the performance

Design Considerations



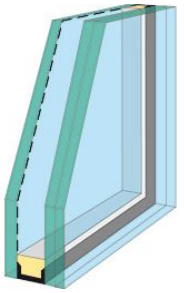
- Transmittance
  - Percentage of normally incident visible light or solar energy passing through glazing
  - Lower transmittance results in higher insulation performance, but lower visibility
  - Balance has to be created between transmittance of visible light & solar energy
  - Low-E glass has high transmittance of visible light, and low transmittance of solar energy
- Reflectance
  - Percentage of normally incident visible light or solar energy reflected away from glazing
  - Reflectance is the inverse of transmittance

Silicone Sealants in Construction



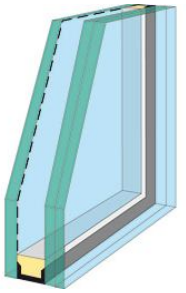
- Structural Glazing
  - System bonding glass to building's structural framework
  - Dynamic wind loads are transferred onto glass. High performance sealants allow wind loads to be transferred onto structural framework.
- Expansion Joint Sealant
  - Accommodate joint movement and expansion due to structural movement & wind loads, solar heat gain or loss (i.e. expansion or contraction due to hot or cold weather)

Structural Glazing Sealant



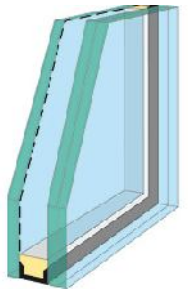
- **UltraSil SSG-4000**
- Neutral Cure, 100% silicone
- +/-25% Mvmt. Capability
- High Modulus
- 20-30 minute Tooling Time
- Exceeds ASTM C1184
- Color: Black

Expansion Joint Sealants

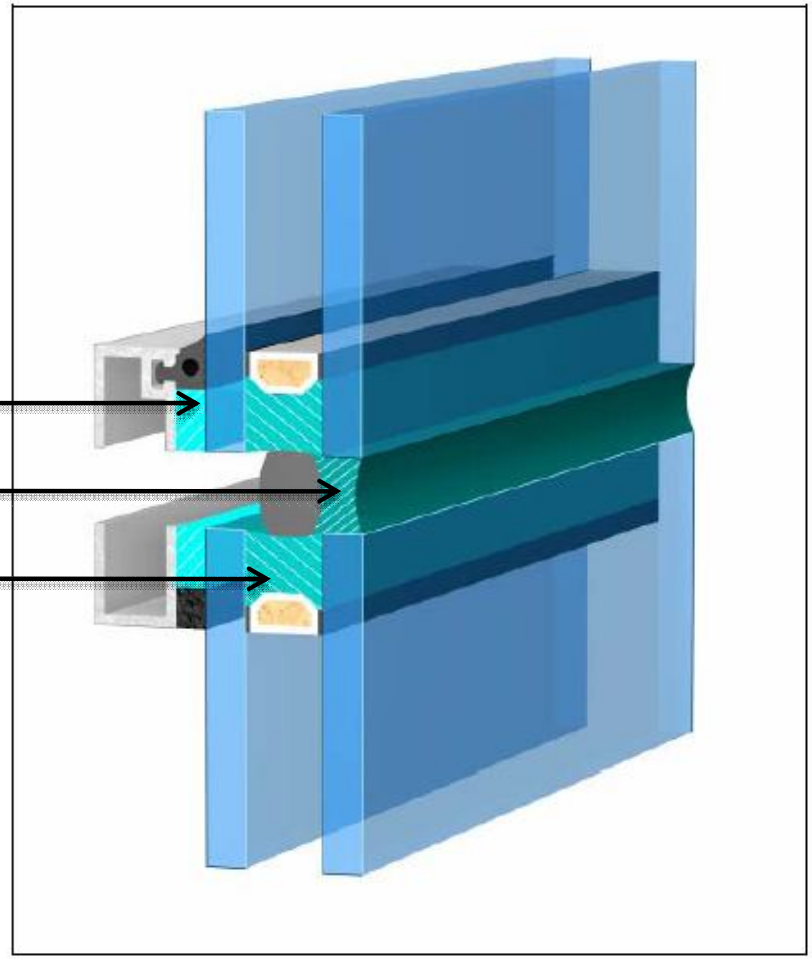


- **GlazeOn WeatherSeal** is a tested, and certified expansion joint sealant.
- Specifications:
  - Rated for ±50% joint mvmt.
  - Exceeds ASTM C920 & C1184
  - Neutral Cure, 100% silicone, 1 part
- 20-30 minute tooling time
- Available in Colors

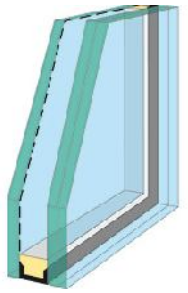
Structural Glazing with Insulation Glass



- Designing Structural Glazing Systems with Insulation Glass Units & Perimeter Sealing



Questions?



THANK YOU!