NSG GROUP

Technical Bulletin

ATS-129
04/2025

PROPERTIES OF SODA-LIME SILICA FLOAT GLASS

Mechanical Properties

Modulus of Rupture (MOR): tensile stress at fracture originating in the glass surface, not in the scored and cut glass edge, for 60-Second load duration on weathered, in-service, glass.

Typical Mean MOR (50% Probability of breakage)

Glass Kind	Mean MOR (psi)	Mean MOR (MPa)
Annealed	6,000	41
Heat-Strengthened	12,000	83
Fully Tempered	24,000	165

Typical Design Stress for 0.8% Breakage Probability

Glass Kind	Mean MOR (psi)	Mean MOR (MPa)
Annealed	2,800	19
Heat-Strengthened	5,600	39
Fully Tempered	11,200	77

Modulus of Elasticity (Young's)	10.4×10^6 psi (72 GPa)
Modulus of Rigidity (Shear)	4.3×10^6 psi (30 GPa)
Bulk Modulus	6.2×10^6 psi (43 GPa)
Poisson's Ratio	0.22

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Density	156 lb/ft³ (2500 kg/m³)
Coefficient of Thermal Stress	50 psi/°F (0.62 MPa/°C)
Thermal Conductivity at 75°F	6.5 Btu.in/hr.°F.ft² (0.937 W.m/m².°C)
Specific Heat at 75° F	0.21 Btu/lb_m.°F (0.88 kJ/kg.°C)
Coefficient of Linear Expansion (75-575°F)	4.6 x 10^{-6} in/in.°F (8.3 x10^{-6} mm/mm.°C)
	e.g. 200" of glass heated 100 °F expands 0.09"
Hardness (Moh's Scale)	5-6

Softening Point (ASTM C338) 1319°F (715°C)

Pilkington **Optiwhite**™ ~732°C Logη = 6.6

Annealing Point (ASTM C336) 1018°F (548°C)

Pilkington **Optiwhite**™ ~559°C Logη = 12.0

Strain Point (ASTM C336) 952°F (511°C)

Pilkington **Optiwhite**™ ~526°C Logη = 13.5

Where Logη = Viscosity (Pa.s)

Index of Refraction:

(0.5893 μm, Sodium D Line)	1.523
(1 μm)	1.511
(2 μm)	1.499

Emissivity (Hemispherical) at 75°F 0.84

Stress-Optical Coefficient Stress (psi) = 2.18 x Retardation (μm) / thickness (in)

Raw Materials used in Typical Float Glass:

Sand	Soda Ash	Limestone	Dolomite	Salt Cake	Cullet (Recycled Glass)
SiO_2	Na_2CO_3	$CaCO_3$	$MgCa(CO_3)_2$	Na_2SO_4	

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Recycled Materials:

The float glass process recycles virtually all the glass waste from the in-plant production melting and cutting processes. This broken glass, known as cullet, is reintroduced with the raw materials batch mix in the furnace as an aid to melting. It takes half the amount of energy to produce glass from cullet as it does to produce it from raw materials. Float glass contains approximately 20% Cullet (recycled glass).

Cullet generated within the same plant and reintroduced to the original process does not qualify as pre-consumer recycled content. Additionally, in effort to maintain high quality performance of our products, we do not introduce post-consumer recycled glass into our process. *Thus, pre-consumer and post-consumer recycled content of products is 0%.*

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Change Summary	Date
Format Update; removal of Chemical Analysis section	04/29/2025

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