NSG GROUP

Technical Bulletin

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Fabricating and Tempering
Pilkington **Optiwhite™** Low Iron Glass

The lack of color in Pilkington **Optiwhite**™ low iron glass gives it very high visible and solar transmission values but with the same reflection (about 4% at each surface) as standard clear glass. This results in a significantly reduced absorption of visible and solar radiant energy. For example, the solar radiation absorption of 12mm (1/2″) thick clear glass is about 30% while it is only 6% for 12mm (1/2″) Pilkington **Optiwhite™** glass.

The composition of Pilkington **Optiwhite™** glass gives it an Annealing Point of 559°C, which is 11°C higher than that of Pilkington **Optifloat™** Clear glass. The 'Softening Point' is similarly about 17°C higher. These facts are significant for bending, slumping and other processes.

Tempering furnaces heat glass by a combination of: radiation (from heating elements and hot furnace walls); hot air convection (natural or forced); and conduction (from contact with the rollers). The amount of heat received by the glass from each of these sources depends on the particular furnace design.

The particular tempering furnace settings needed for Pilkington **Optiwhite™** glass will depend on many individual variables but they can be readily determined by starting from known and proven settings for clear glass of equal thickness.

The reduced IR absorption, and the higher annealing point, of Pilkington **Optiwhite™** glass require an increase of the furnace cycle time by about 10% over the time for an equal thickness and loading rate of clear glass to supply sufficient extra heat.

There should be no change to the quench air flow volume and distribution compared to those for clear glass settings.

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The cooling rate of glass in a tempering operation is primarily dependent on quench air flow rates and surface heat transfer coefficients. These do not change with Pilkington **Optiwhite™** glass compared to clear glass. For other processes such as slumping or slow annealing it should be noted that the emissivity, at high temperature, of Pilkington **Optiwhite™** glass is somewhat lower than that of clear glass and will therefore affect the natural radiant cooling rate. This lower emissivity can also alter pyrometer temperature readings.

The final temperature settings and cycle time for each individual furnace will need to be determined by observing the tempered glass flatness, surface compressive stress, and fracture break pattern and particle size for each glass thickness and furnace loading rate.

Questions or comments should be directed to: Pilkington North America, Inc. Architectural Technical Services, 419 247 4448.

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