Low-E Coatings

Low-e coatings significantly improve energy efficiency while providing transparency and a wide variety of aesthetic options. There are two general types of low-e coatings: sputter coatings, also known as soft coats, which are applied to the glass in a large magnetron sputter vacuum deposition (MSVD) machine; and pyrolytic coatings, also known as hard coats, which are deposited during the float glass manufacturing process.

Sputter deposition enables the configuration of a nanotechnologically-precise coating. Consequently, sputter coatings can deliver high levels of visible light transmission (VLT) while restricting overall solar energy transmission (lowering SHGC values). In other words, sputter deposition enables the attainment of high light-to-solar gain (LSG) ratios (LSG = VLT / SHGC). Sputter deposition also facilitates a broad range of aesthetics.

While some sputter coatings can withstand permanent exposure to the elements or to the space within a building, many require protection by containment within an IGU or embedment within a laminated pane.

Sputter deposition involves the sequential application of layers of material that together measure only approximately 1/500th of the thickness of a sheet of paper. Among these layers, silver is central to the attainment of strong LSG ratios. Other layer materials generally contribute to aesthetics and durability.

The sputter coating process involves a conveyor system, along which the glass is first washed and dried. Pressure locks then lead into the coater. The coater interior is maintained at a vacuum of only several millionths of an atmosphere, amidst carefully-proportioned gases. As the glass passes through the coater, it proceeds under a range of targets, each comprised of one of the materials to be deposited onto the glass surface.

A strong negative charge is applied to the targets, attracting the nearby gas ions. As the ions strike the target, their impact energy releases target material that then deposits onto the glass surface. Magnetic fields concentrate the sputtering process.

After the glass proceeds through the coater, having accumulated a layer of each of the target materials, it passes through pressure locks back to normal room conditions. Careful controls confirm the uniformity of the coating.

Surface Numbers for Insulated Glass Units