

AcuraCoat[®] Glass Coating Technology



Stewart Engineers' AcuraCoat[®] advanced on-line pyrolytic coating equipment deposits thin functional layers on glass. These hard coated materials are the basis for products such as architectural glass (reflective, solar control, Low E/Low E PRO, etc.), solar panels or LCD displays. With high coating capacity, flexibility, speed, throughput and maximum uptime, the AcuraCoat[®] coating solution enable glass manufacturers to produce high value products at competitive costs. The coating costs per unit are significantly lower when compared to the off-line sputtered system.



AcuraCoat®

System

From design and installation to chemistry supply and market innovation, the AcuraCoat® System is more than a technology - it is a total solution. This system is comprised of one or more production coaters with chemical supply, distributed control logic and on-line quality control. This platform is the industrial benchmark for on-line pyrolytic CVD products.

Technology

The AcuraCoat technology combines a customized number of on-line coaters. Depending on the type of functional coatings, tonnage and line speed of the glass manufacturing facility, three different coating technologies may be used: Single Flow, Dual Flow, Lehr Gap. Additional features and advanced process control systems can be easily integrated into any AcuraCoat System.

Features

The AcuraCoat® System can be adapted to accommodate a wide range of line speeds and ribbon widths on either a new or existing float glass manufacturing facility.

Line Characteristics

- Width of glass: ≥ 4.0 m (typical)
- Width of coating: > 3.5 m (typical)
- Speed: 300 - 1000 m/hr

Process Specifications

- Run Time: average 12 - 16+ hours
- Coating Output: $> 50\%$ of total production
- Coating Process Yield: $> 80\%$
- Start Up Time: 15 minutes
- Shut Down Time: Immediately



Available AcuraCoat® Turnkey Systems

Coaters			Hard Coated Products						
Single Flow Coater	Dual Flow Coater	Lehr Gap Coater	Reflective	Low E	Low E PRO	Self Clean	Solar Control	Anti-Reflective	Photovoltaic PV-TCO
1	2	-	X	X	-	X	X	X	-
1	-	1	X	X	X	-	X	-	X
-	4	-	X	X	-	X	X	X	-
-	2-3	1	X	X	X	X	X	X	X*
0-1	6-7	-	X	X	-	X	X	X	X**
0-1	3-7	1	X	X	X	X	X	X	X***

*Limited capabilities due to line speeds **Customized to product specifications

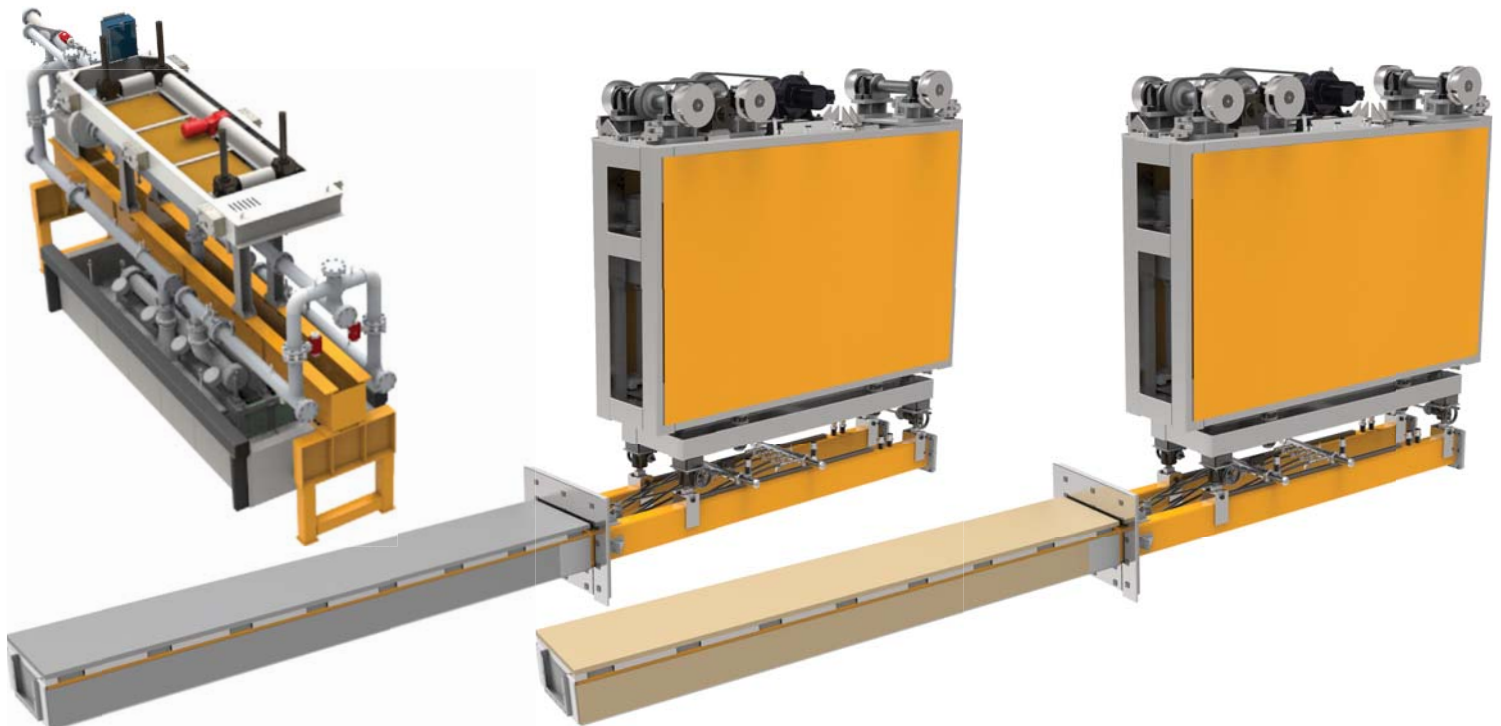
Each AcuraCoat® System includes:

- Market Development
- System Installation & Commissioning
- Project Management
- Production Guarantees
- Custom Engineering
- Chemistry Supply
- Coaters
- Ongoing Technical Support
- Auxiliary Equipment
- Single Use Operating License
- Emission Control

Lehr Gap Coater

Dual Flow Coater

Single Flow Coater



AcuraCoat® Functional Coatings

Anti-Reflective

The AcuraCoat® Anti-Reflective coatings consist of two or three layers to achieve target properties and can be "tuned" to meet customer specifications. This anti-reflective glass is specially designed to eliminate light reflection. It offers maximum transparency and optical clarity, allowing optimum viewing through the glass at all times. These coatings help solar panel cover plates achieve maximum efficiency when converting solar power into electricity by allowing the absorption of nearly every single photon of light.

Low E/ Low E PRO

The AcuraCoat® Low E and Low E PRO are highly transparent, multi layered coatings specifically engineered for heating-dominated climates. The under coat provides the color suppression and barrier properties, while the top coat provides the Low E and Low E PRO properties. It is one of the most efficient coatings on the market combining low heat loss with a high solar heat gain coefficient. The result is an aesthetically pleasing coating that drastically reduces energy use but remains easy to store and process.

PV-TCO

The AcuraCoat's® Photovoltaic Transparent Conductive Oxide (PV-TCO) coatings are specifically designed to maximize amorphous silicon cell efficiency. It consists of two or more layers. The lower layer is silica based and acts to block sodium diffusion. While the top coat is a fluorine doped tin oxide conducting layer. The PV-TCO product features high transmission, good conductivity and high haze to help trap light into the amorphous silicon layer which maximizes the efficiency of the thin film cell.

Reflective

The AcuraCoat® Reflective coating provides maximum flexibility due to the durability of the metallic oxide coating that is deposited onto the float glass during production. It consists of a silicon based single layer coating. The Reflective optical properties, reflection level and color, can be "tuned" to meet customer specifications.

Self Clean

The AcuraCoat® Self Clean coating consists of two layers. The lower layer is silica based and acts to block sodium diffusion and provide a strong foundation for the active top coat layer. The active layer is based on a crystalline titania. This Self Clean coating is activated by ultraviolet rays from the sun, it causes organic material to gradually decay and be rinsed away when it comes into contact with rainwater making windows easier to maintain.

Solar Control

The AcuraCoat® Solar Control coatings are a sun-resistant hard-coated product that consist of either two or three layers. The lower layer is SiCO, while the top layers contain various metals which form the array of uniform coating colors: Bronze, Blue, Gold, Green, Gray, or Silver. These Solar Control coatings reduce the amount of heat that gets absorbed, making it an ideal window glass for moderate to warm (or cooling-dominated) climates. In addition to blocking more of the sun's direct solar energy, it also improves thermal insulation (lower insulating glass unit u-values), which helps keep cool air inside and hot air outside.