

Coating Technology Comparison

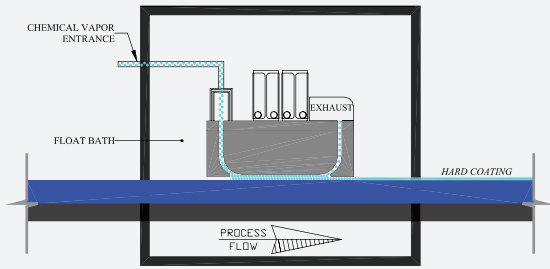


 Gold Reflective
Aesthetic

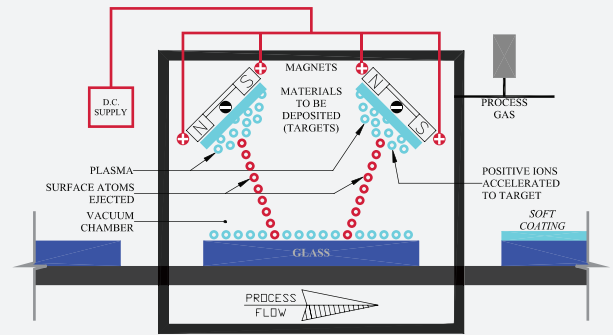
Benefits of AcuraCoat® Online CVD versus Sputtering

The two common methods of depositing thin films on flat glass are chemical vapor deposition (CVD) and magnetron sputtering deposition (MSVD). CVD ceramic coatings are called 'hard coatings' because of their unmatched mechanical and chemical durability. Sputtered coatings are called 'soft coatings' as they are damaged from exposure to air and normal handling. Both types of coatings have advantages and disadvantages; however, CVD coatings outperform sputtered soft coatings in investment payback, durability, and reliability.

Typical CVD Process



Typical Sputter Process



CVD - Hard Coatings

- Lowest capital investment
- Lowest operating and overhead costs
- Highly profitable coated products recorded
- Online process with shortest product lead time
- Easily integrated into existing float glass manufacturing line
- Available for use in single pane, monolithic applications
- Easiest color matching of products
- Virtually unlimited shelf-life with no special packaging required
- Superior durability from covalent thin-film bonds
- Suitable for high-temperature glass applications (e.g. oven doors, fireplace screens)
- No special handling required
- No perimeter edge deletion required
- Deposition at atmospheric pressure
- Easily tempered and stable through tempering process
- Easily store custom cut-size products

Sputtered - Soft Coatings

- 5X capital cost for equivalent CVD production capacity
- 4X increase in operating cost than CVD
- 6X more manpower than CVD
- Exorbitantly high maintenance costs
- Highest coating material cost
- Longest product lead time due to offline process
- Cannot be used on monolithic applications
- Short shelf-life due to damage from exposure to air – special sealed desiccated packaging required
- Weakly bonded coating results in defects from abrasions
- Not suitable for high-temperature glass applications (e.g. oven doors, fireplace screens)
- Perimeter edge deletion of coating required
- Expensive high-vacuum atmosphere required during coating deposition
- Color variation through tempering while requiring unusual tempering process skills
- Greater risk of off-angle color variation
- Offline processing nearly doubles handling and shipping costs