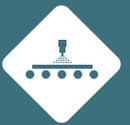


# Glass Coating - PVD (sputtering)



Application note A002-ST04-1612C



- ◆ Architectural glass
- ◆ Automotive Glass

**Glass coatings are made for modifying optical properties of glass, to improve solar transmission characteristics or just for changing its aesthetic appearance. Whether for solar and energetic control or architectural purposes only, glass coating is a very demanding process.**

For attaining thin-film coatings compliant with the highest quality standards the process gas system must be capable of providing superior layer uniformities. Easy maintenance is also a major concern when large area coaters are involved. Bronkhorst fully understands the Glass Coating Industry's demands and has therefore developed sophisticated solutions specially addressed to meet the demands of state of the art large area glass coating applications.



Glass Coating System  
(Source: Leybold Optics)

## Application requirements

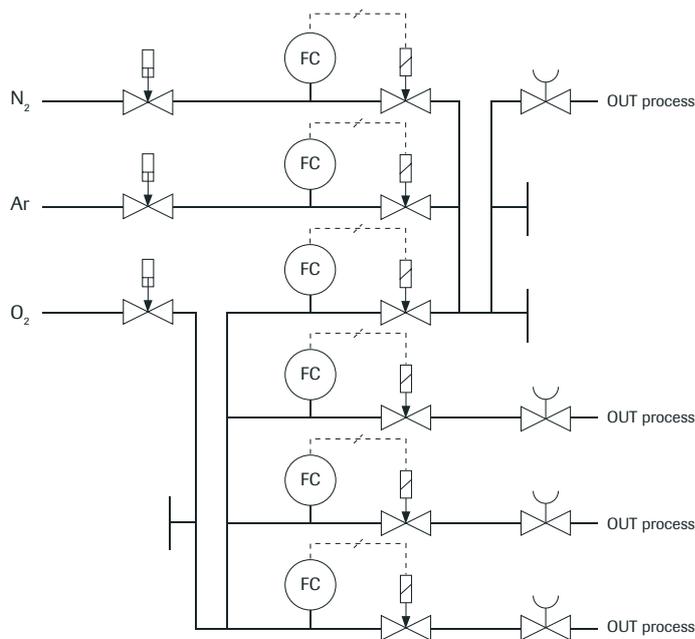
Superior layer uniformity, high yields and reduced cost of ownership are among the demands of the Glass Coating Industry. By controlling individually process gas segments, film thickness uniformity improvements are achieved. Additionally, if the control is made by instruments capable of

securing a stable flow profile, reproducibility and fast response time, optimal performance can be reached. In order to reduce the cost of ownership, instruments must be reliable and endure working 24 hours a day, 7 days a week.

### Important topics

- ◆ Repeatability
- ◆ Response time
- ◆ Reliability
- ◆ Space saving (compact)

## Process solution



Flow scheme

### Securing uniform layers through precise gas delivery

Sputtering is a physical vapour deposition (PVD) process which involves bombarding the surface of the coating material (target) with gas ions under high voltage acceleration, in order to promote the ejection of atoms from the target. The ejected atoms will be propelled towards the substrate, forming a thin-film coating over its surface.

Plasma Enhanced PVD, like magnetron sputtering, is considered to be the most efficient technology.

For this process an inert gas is required: Argon is the most commonly used, however some sputtering processes may involve oxide or nitride film coatings; if so  $O_2$  and/or  $N_2$  are added to the inert sputtering gas.

According to its nature, the process requires low pressures nevertheless the process gas flow must be sufficient for allowing the ionic bombardment process to take place, otherwise it becomes impossible to maintain the plasma. Hence, the process gas flow must be meticulously controlled, if not, the quality and optimal homogeneity of the coating may be severely compromised. ►

Due to its unique proportional electromagnetic control valve, Bronkhorst mass flow controllers are ideal for this application. The instruments allow simultaneously an extremely fast and smooth control, providing excellent stability and repeatability. ■



## Recommended products



### EL-FLOW

Mass Flow Meters and Controllers for gas applications have a housing designed for laboratory and clean processing conditions. The instruments are truly unique in their capability to measure and control flow ranges between 0...1 mln/min and 0...1670 l/min with pressure rating between vacuum and 400 bar – all in one range of instruments.

- ◆ Fast response, excellent repeatability
- ◆ High accuracy
- ◆ Virtually pressure and temperature independent
- ◆ Maintainability and stability
- ◆ Available with analog and digital in-/output.
- ◆ Standard RS-232 output
- ◆ Optional DeviceNet, PROFIBUS DP, MODBUS, EtherCAT or FLOW-BUS protocols.



### FLOW-SMS

FLOW-SMS is a concept involving the development of customized turn-key solutions. Several sensor modules are combined with control valves, shut-off valves, filters or any other functional module as per customer's request. All the modules are mounted on a rail and fieldbus communication reduces both the number of cables and the total cable length required.

- ◆ Compact assembly ensures space efficiency
- ◆ Economical solution, low cost of ownership
- ◆ Tubeless construction reduces potential leak points
- ◆ Down-ported; easily accessible from the top
- ◆ Pre-tested 'Plug and Play' units, reducing custom testing requirements
- ◆ Several components are supplied as one, less material to handle and easy to install

## Contact information



Glass Coating -  
PVD (sputtering)  
A002-ST04-1612C

ST : Surface treatment  
04 : Glass coating

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