Architectural glass reliability strengthened SYSTRON engineering

With the increasing use of magnetron-sputtered coatings on architectural and insulating glass -such as solar control and thermal insulation (Low-E) layers- edge deletion is becoming ever more critical. These predominantly multilayer functional coatings significantly enhance the energy performance of glass, while simultaneously imposing higher demands on downstream processing. In many applications, particularly in the insulating glass sector, selective removal of the coating in the edge area is essential. It ensures a permanently suitable bonding surface for sealants, supports the long-term stability of the edge seal, and fulfills structural or aesthetic requirements where glass edges remain visible.

TECHNICAL BACKGROUND: ADHESION, MOISTURE, AESTHETICS

Magnetron coatings are applied to float glass using the PVD (Physical Vapor Deposition) process through magnetron sputtering. They comprise multiple functional layers, often incorporating one or more silver layers as a core component.

These high-performance 'soft-coat' systems deliver excellent energy values but are more sensitive to mechanical stress and moisture exposure. In the edge zone, they are generally not designed to function as defined bonding substrates for primary or secondary sealants.

Drawing on practical experience, Florian Temper, Operations Manager at Eckelt Glas, notes:

"Without edge deletion, there is fundamentally a risk of adhesion problems between the coated glass pane and sealants such as butyl, silicone, polysulfide or polyurethane."

Beyond sealant adhesion, edge deletion is decisive for the durability of the edge seal. Temper adds:

"If the coating is not removed in the edge area, depending on the coating system used, there is a possibility of undercutting within the layer structure. Over time, this may impair the long-term stability of the edge seal, for

Edge deletion with the systron proMD

Process-reliable edge deletion is essential for ensuring adhesion, durability and aesthetics in coated architectural and insulating glass. Through practical experience and validated testing on demanding coating systems, SYSTRON technology demonstrates how precise parameter control enables consistent removal of functional layers while safeguarding long-term edge seal performance.

example through corrosion of the functional layers or reduced adhesion strength."
Edge deletion may also be required for aesthetic reasons, such as in stepped insulating glass units at building corners. In projects at Eckelt, edge areas are often coloured or sealed with tinted silicone to achieve a clean, uniform appearance. To stabilise the edge zone against moisture ingress and ensure lasting bonding quality, laminated safety glass units at Eckelt are also edge deleted in defined lamination configurations and coating systems.

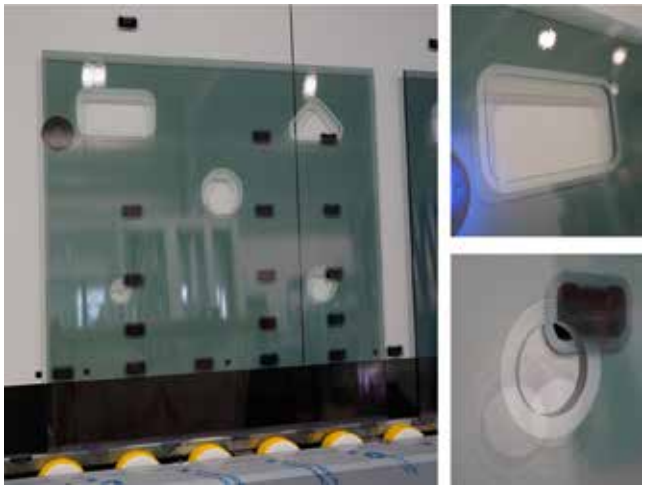

Eckelt Glas, COO of Florian Temper

WIDTH, PARAMETERS AND COATING DIVERSITY

The required deletion width is typically determined by the geometry of the primary seal of the insulating glass unit and the position of the spacer bar with its butyl seal. In practice, it usually ranges between 10 and 12 mm, although it may be specified individually by the customer - particularly in structural glazing (SG) applications or frameless glass façades. A further challenge lies in the broad diversity of coating systems available on the market. Varying layer structures and protective systems, such as EasyPro or TPF foils, demand precise adjustment of processing parameters.
Temper highlights an often underestimated factor:
"It is important to verify adhesion between the deleted zone and the sealant on a system-specific basis. Certain bonded resins in the tooling may leave residues - which can be counterproductive and, in unfavorable cases, lead to reduced adhesion strength."

EDGE DELETION IN INSULATING GLASS PRACTICE WITH A SYSTRON MACHINE

Practical implementation of edge deletion on a systron system can be seen at Bojar Glass in Poland. The company operates a systron 3527proHD and recently retrofitted the edge deletion option to its existing line. The function was introduced primarily for application-specific requirements, as Commercial Director Krzysztof Harasimowicz explains:
"We recently implemented the edge deletion option on our systron 3527proHD. The function works very reliably."
The principal motivation was the preparation of insulating glass units with cut-outs for door-handle cassettes and rotulas in elevator shafts:
"In these applications, it is essential to remove the Low-E coating in order to ensure a permanently tight bond between the butyl and the glass."



Krzysztof Harasimowicz, Commercial Director of Bojar Glass

TESTS AND MATERIAL VALIDATION IN PRACTICE

In addition to customer experience, in-house tests were successfully conducted on various glass types, including:

- 6 mm float, SGG COOL-LITE SKN 165 II
- 6 mm float, SGG COOL-LITE SKN 154 II EP
- 6 mm float, Pilkington XIV II
- 6 mm float, Guardian SunGuard eXtraSelective SNX 60

The results demonstrate that process-reliable edge deletion can be reproducibly achieved - even on demanding coating systems-provided that parameters are correctly adjusted.

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