

SPECIAL FEATURE

GLASS COMPANY

redefines fire resistant
production with
FIREMEK

Advancing fire-resistant glazing through its FIREMEK production line, GLASS COMPANY is transforming certified products into controlled in-house processes. By integrating intumescent chemistry, automation and certification-driven manufacturing, the company is strengthening technological autonomy, design flexibility, durability and multi-threat glazing capabilities - all within European E, EW and EI performance standards.



Fire resistant glazing is entering a new phase of industrial maturity. What was traditionally regarded as a highly-specialised finished product supplied by a limited number of manufacturers is increasingly becoming an integrated production capability within glass processing companies. This shift reflects a broader evolution in the glass industry. Processors are seeking greater technological autonomy, stronger control over performance and improved flexibility in both delivery and customisation. Fire resistant glass is therefore moving from being an externally-sourced certified product to becoming a controlled, internal manufacturing process.

FROM CERTIFIED PRODUCT TO IN-HOUSE CONTROLLED PROCESS

FIREMEK is a dedicated production line designed to allow glass processors to manufacture fire resistant glazing in-house, covering the main European performance classes E, EW and EI. These classifications define distinct levels of protection. Integrity class E ensures resistance to flames and hot gases. Class EW adds control of radiant heat transmis-

sion, limiting heat radiation on the non-exposed side. Class EI combines integrity with thermal insulation, significantly reducing temperature rise behind the glazing during fire exposure. By internalising production, processors gain direct control over dimensions, multilayer configurations and integration into complex façade or partition systems. It is important to distinguish between the FIREMEK production line and the intumescent interlayer itself. FIREMEK is the industrial system -the engineered process environment- that enables consistent and certified manufacturing. The intumescent dispersion, selected and supplied as part of the FIREMEK solution, represents the functional material component of the fire-resistant glass, comparable in importance to the glass panes themselves within the final construction. This dispersion is based on advanced inorganic intumescent chemistry. Its formulation has been carefully selected to ensure stability, reactivity under fire exposure and compatibility with industrial processing. When subjected to fire, the interlayer undergoes a controlled intumescent reaction, expanding and transforming into a rigid, opaque insulating



shield that blocks flames, reduces radiant heat transmission and delays temperature rise on the protected side.

The reliability of this reaction, however, depends not only on chemistry but on process precision - and this is where the FIREMEK production line plays a decisive role.

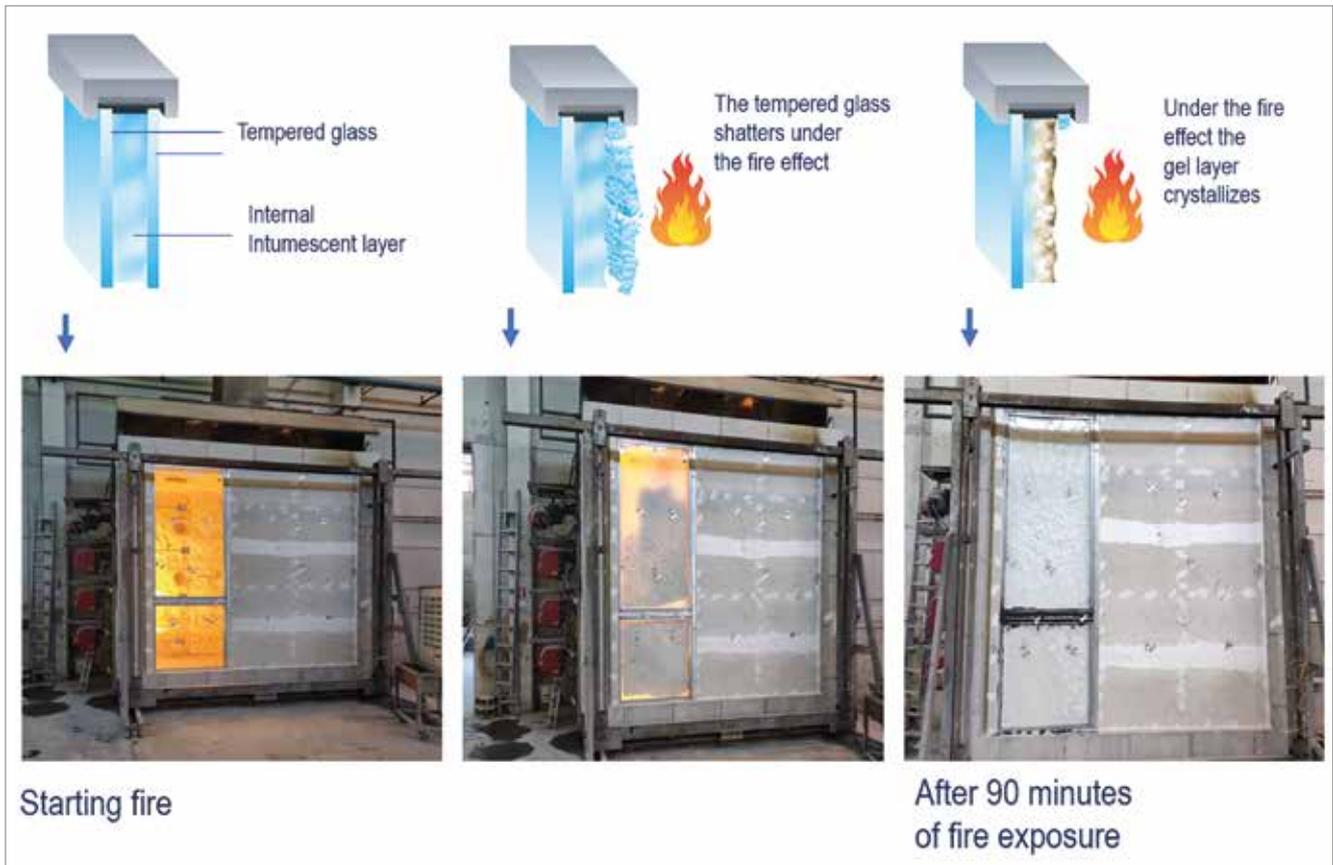
FIREMEK AS A PRODUCTION LINE

FIREMEK is not a material, but a complete industrial manufacturing platform designed for repeatability, stability and compliance. The production line integrates vacuum mixing technology to ensure homogeneous preparation of the intumescent dispersion, automated dosing systems for precise layer thickness control, assembly stations for spacer positioning and curing ovens with monitored thermal cycles. All process phases are controlled via PLC systems with advanced HMI, enabling parameter moni-

toring, batch traceability and production documentation. This structured workflow transforms fire-resistant glass production into a controlled industrial process rather than a semi-manual operation. The line ensures consistency of layer thickness, elimination of air inclusions, controlled curing behaviour and stable final performance. In this context, the intumescent dispersion can be seen as the functional core material, while FIREMEK represents the technological framework that allows that material to perform reliably within a certified glazing system.

DESIGN FLEXIBILITY AND SYSTEM INTEGRATION

Internal production through FIREMEK provides significant design flexibility. Processors can control glass dimensions, shapes and multilayer configurations without being constrained by predefined external formats.



The system supports integration into insulating glass units, enabling fire-resistant glazing to be combined with thermal insulation, solar control coatings and acoustic performance when required by the project specification. Compatibility with steel, aluminium and timber framing systems further expands application possibilities. It is essential, however, that these framing systems are themselves certified for fire resistance according to the relevant European standards. Fire performance is always the result of a

complete system -glazing and frame together- and certification must reflect this integrated approach. This system-level understanding strengthens the processor's technical credibility when working with façade engineers, architects and certification institutes.

DURABILITY AND MATERIAL STABILITY

Long-term durability is a decisive factor in fire-resistant glazing applications. Environmental exposure, UV radiation and moisture ingress can compromise perfor-

mance if materials and processing are not properly controlled. Within the FIREMEK system, the selected inorganic intumescent dispersion contributes to improved environmental stability compared to conventional organic alternatives. The chemistry has been chosen for its reduced sensitivity to UV degradation and moisture-related instability, supporting long-term reliability in demanding architectural environments. However, material stability alone is not sufficient. The performance of the final glass

unit depends equally on the precision of mixing, dosing, curing and edge sealing - all parameters governed by the FIREMEK production line. In this sense, durability is the result of both material formulation and process engineering working together as a unified system.

CERTIFICATION EMBEDDED IN THE SYSTEM

In fire-resistant glazing, certification cannot be separated from manufacturing discipline. Compliance with European fire standards depends

on the combination of glass panes, intumescent interlayer, layer thickness, curing parameters, framing system and installation method. The FIREMEK production line has been developed to align process control with certification requirements, embedding conformity into manufacturing practice. Testing, documentation and traceability are integrated within the industrial workflow, ensuring that performance claims are supported by consistent

production parameters. This integration reinforces market credibility and provides processors with a structured pathway to enter specification-driven fire protection markets.

EXPANDING TOWARD MULTI-THREAT GLAZING

Beyond standard fire protection, the market is increasingly exploring glazing solutions capable of addressing multiple risk scenarios. The controlled environment provided by the FIREMEK

production line supports research and development of hybrid systems combining fire resistance with ballistic or impact performance. Such configurations are relevant for high-security buildings, infrastructure projects, transportation and sensitive facilities. The ability to engineer multi-layer constructions internally enhances flexibility and accelerates innovation cycles, positioning processors as technological partners rather than simple product suppliers.

A STRATEGIC INDUSTRIAL EVOLUTION

Bringing fire-resistant glass production in-house through the FIREMEK line represents a strategic evolution for glass processors. It enables technological autonomy, improved control over lead times, enhanced customisation capabilities and deeper integration within the company's existing insulating glass and lamination operations. In an industry where performance consistency, certification integrity and reliability are fundamental, distinguishing clearly between the production platform and the functional interlayer material is essential. FIREMEK provides the industrial framework, while the selected inorganic intumescent dispersion delivers the reactive fire-protection performance within that framework. Together, they form a controlled and scalable system that transforms fire-resistant glazing from an externally sourced specialised product into an internally-managed industrial capability.



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