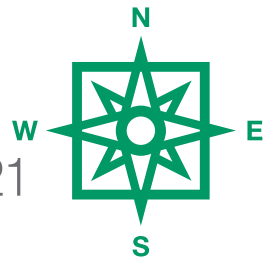


ISOLAR® Compass 3/2021

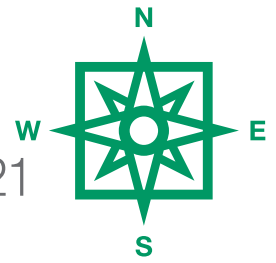


FIRE PROTECTION GLAZING

SAVE LIVES,
PROTECT VALUABLES

**ISOLAR®
GLAS**

MEHR AUS GLAS



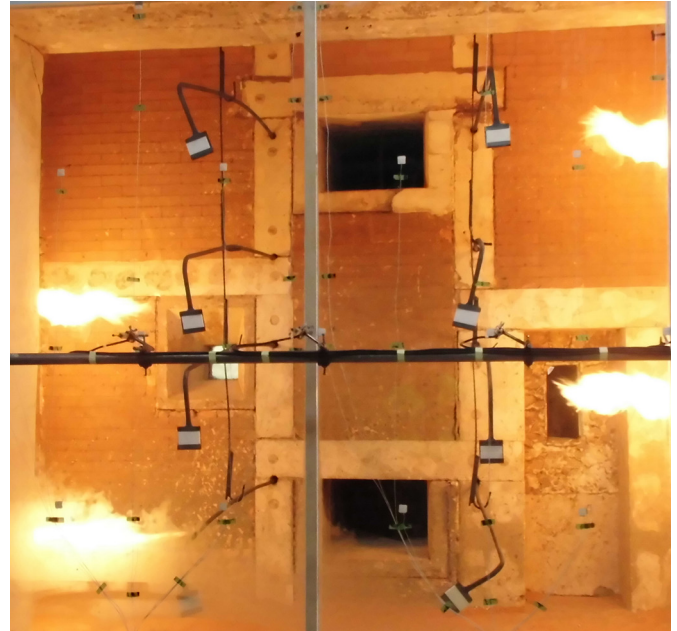
■ INTRODUCTION

Fire safety measures today are required by law wherever large numbers of people gather: in offices, event halls, industrial installations or other public and commercial spaces. In Europe, the DIN EN 13501 standard applies to construction products. It includes all building elements and materials, and therefore also glass. A more precise definition on the subject of glass can also be found in the DIN EN 357 standard.

The European Construction Products Regulation lays down the rules for dealing with construction products on the basis of standards that have been introduced. These products must have CE marking before they can be sold and used throughout the European Union. This applies, for example, to openable windows, doors and gates in exterior walls. If a standard does not yet exist for a construction product, as an alternative, national verifications of fitness for use have to be imposed, like national technical approvals or national general construction technique permits. This is applicable to doors and fixed glazing in interior walls and therefore also to the respective fire protection glazing.

All structural fire protection measures are aimed at preventing flash-over of fire and smoke from one fire compartment to another. Glazing must also meet this requirement. Conventional glazing, however, hardly provides any fire resistance. This is because in the event of a fire, there is loss of fire integrity due to the temperature differences between the room that is burning and the room that is to be protected. That's why special fire protection glazing is used. In many places, it is used to protect escape routes and stairwells from fire and smoke, enabling safe evacuation from buildings in the event of a fire. Fire protection glazing is also used to prevent flash-over where there is less separation distance between buildings (≤ 5 m) and boundary fences (≤ 3 m).

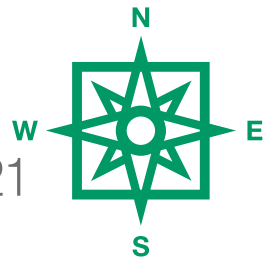
If fire protection glass is designed as laminated glass without thermal insulation, the applicable standard is EN 14449. For multi-



Fire protection glazing must always be tested in its entirety before it is approved.

pane insulating glass it is the EN 1279 standard. Depending on the requirements of the building, fire protection glass must ensure protection for 15, 30, 45, 60, 90, 120, 180 or 240 minutes. In Germany, however, the Model Building Code (Musterbauordnung) only mentions 30, 60, 90 and 120 minutes.

Glazing with the designation "G" (in Germany) or "E" (at the European level) provides integrity, but does not block heat transmission. This glazing is not fire-retardant or fire-resistant and therefore only partly suitable as fire-resistant glazing. In contrast, if a glazing is marked with "F" (in Germany) or "EI" (at the European level), it provides integrity as well as thermal insulation in the event of a fire. This means: The hottest point on the glass must not heat up by more than 180° K, the average of several points being 140° K. At the European level there is also the "EW" category. It indicates integrity and a maximum thermal radiation of 15 kW/m^2 . The letters in the designations are combined with the fire resistance period: F30 or EI30 (i.e. F+30 minutes = F30).

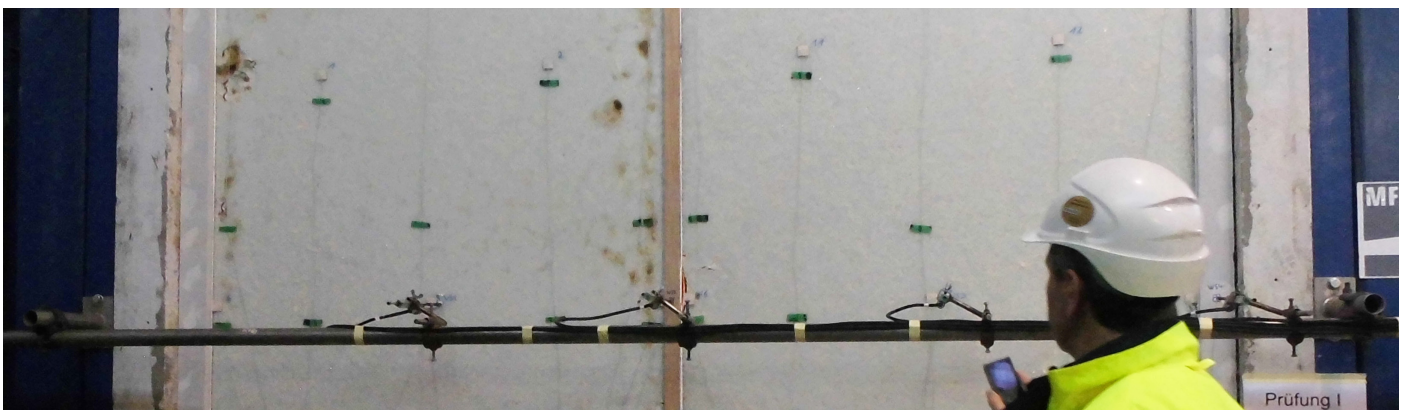


THE SOLUTION

Fire protection glazing does not provide permanent protection from fire, but only temporary protection. The DIN EN 13501-2 standard categorizes how long this protection must last. Depending on the variant, this glass must have, what are called, fire resistance periods of 15, 30, 60, 120 or 180 minutes. ARDOREX® by ISOLAR® offers fire protection glass in classes F (EI) 30 to F (EI) 120. This means that the glasses provide life-saving protection for a period between 30 and 120 minutes, depending on the design. Fire protection glazing not just inhibits the spread of fire and smoke—the main cause of deaths in a fire. It also prevents dangerous heat radiation. Because

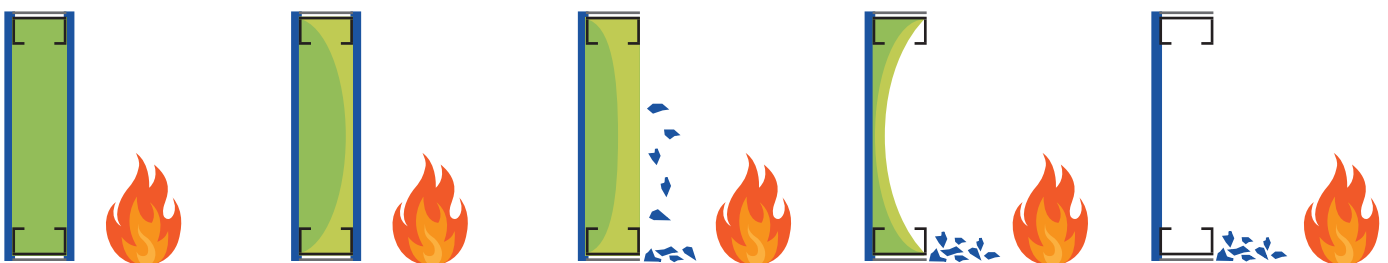
even where the separating building material is not combustible, heat radiation from a fire can cause spontaneous combustion of equipment or chemicals in adjacent rooms.

To ensure protection from this, it is necessary to use laminated glass or multi-pane insulating glass units made of a laminated glass of the class F(EI) 30-120 with a special assembly. There is a transparent hydrogel layer in the space between the glass panes. If a fire occurs, the water in the gel evaporates and forms a heat-insulating, opaque layer.



In the event of a fire, a hydrogel layer between the glass panes provides protection against fire, smoke and heat generation.

SO FUNKTIONIERT BRANDSCHUTZGLAS



When a fire starts: The flame of the fire attacks the glass from the right side.

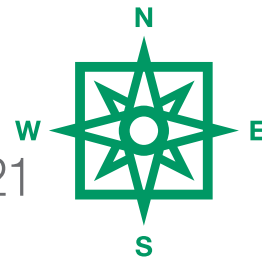
After about 2 minutes, the glass on the side exposed to the fire gets detached from the gel. Water vapour is formed.

After about 6 minutes, the glass on the side exposed to the fire breaks and falls off.

The gel evaporates. On the opposite side (left side), the glass remains cold.

After the specified time has elapsed, the pane remains intact on the cold side of the residual ash.

The heat generated by the fire causes the hydrogel layer between the panes to react. This layer evaporates very slowly, thereby dissipating heat and protecting the pane on the opposite side facing away from the fire from breaking. The glazing thus provides temporary protection against fire.



■ VERIFICATIONS FOR USE FOR FIRE PROTECTION GLAZING

Besides fire protection glass, fire protection glazing also includes the frame design, fixings and fittings. The fire protection glazing is only tested and approved in this complete form in extensive fire protection tests. For the fire protection glasses of the ARDOREX® family, there are general construction technique permits from the Deutsches Institut für Bautechnik (German Institute for Building Technology) available for numerous constructions. These include various steel constructions, aluminium constructions with and without doors, constructions made of hardwood and softwood as Georgian bars in building interiors or as clerestories in exteriors, as well as gypsum-plasterboard stud walls with simple self-build systems. For external walls, the class F(EI) 30 and 90 multi-pane insulating glass units can be used in windows with CE-marking in accordance with the product standards EN 16034 in conjunction with EN 14351 Part 1 throughout Europe.

■ FIRE PROTECTION GLASS – THE KEY BENEFITS

- High level of light transmission
- High level of sound insulation
- Low weight and thin panes (especially in higher classes such as F(EI) 60 and 90)
- No splintering into the areas to be protected
- Combination with solar control, laminated safety glass, alarm glass and radiation protection glass, ornamental glass, Viennese muntin bars, leadlights, etc. possible
- UV-resistant without additional coating and UV-permeable for plants
- Large pane formats available
- Thermal insulation up to $U_g = 0.5/W/m^2K$ in the insulating glass
- Safety glazing, manufactured using tempered safety glass or laminated safety glass

■ LEGAL NOTICE

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ISOLAR® Compass is a product of ISOLARGLAS Beratung GmbH.

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