SCHOTT PYRANOVA®
Special glass for integrity and insulation fire-resistant glazing
Transparency and ecology were the key words in the call for tenders ahead of the international architectural competition for the European Investment Bank’s new building in Luxemburg. Extensive use of special glass panes ensured fire protection while at the same time providing transparency in the building’s design: PYRANOVA® special glass for fire-resistant glazing was among them.
As a globally active technological group of companies, SCHOTT develops, produces and supplies special materials, components and systems. The priority task for SCHOTT’s products is to continue to improve living and working conditions for people in the future.

SCHOTT Technical Glass Solutions GmbH is a leading manufacturer of fire-resistant glazing with a strong international reputation. Known under the brands PYRAN® and PYRANOVA®, SCHOTT provides special glass for reliable, transparent structural fire-resistant glazing in order to guarantee safety, functionality and aesthetics.

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The desire for a medium-sized theatre led to the expansion of the Viennese Indoor Arena where PYRONA® special glass for fire-resistant glazing was used as a glass skirt construction to close off the emergency escape routes.
Safety is more than a feeling
SCHOTT PYRANOVA® special glass. Stay cool, calm and collected

PYRANOVA® special glass for fire-resistant glazing is a clear, laminated composite glass, consisting of several thin float glass panes. A transparent fire-resistant layer, which foams in the case of fire, is incorporated between the panes. PYRANOVA® special glass for fire-resistant glazing prevents the passage of fire, smoke and heat radiation. Depending on the thickness, PYRANOVA® special glass provides impact-resistance up to class 1 in accordance with BS EN 12600.

PYRANOVA® special glass is used in fire-resistant glazing offering a rating of EI 15 to EI 120 respectively EW 30 to EW 60. The glazing in the senior citizens’ home in Crailsheim, Germany, not only provides appealing design, but also reliably safeguards the escape routes in case of fire.

PYRANOVA® special glass for interior applications

- Clear composite safety glass for fire-resistant glazing in internal areas with fire-resistant properties in accordance with DIN EN ISO 12543
- Depending on design, it is manufactured from at least two float glass panes with transparent fire-resistant interlayers
- Can be incorporated in double-glazing, sandblasted, partially or completely printed, to provide a wide range of fire-resistant glazing options

PYRANOVA® special glass for exterior applications

- Clear composite safety glass for fire-resistant glazing in external areas with fire-resistant properties in accordance with DIN EN ISO 12543
- Depending on design, it is manufactured from at least two float glass panes with transparent fire-resistant interlayers and an external laminated pane
- Can be incorporated in double-glazing, sandblasted, partially or completely printed, to provide a wide range of fire-resistant glazing options
Fire-resistance categories for individual resistance requirements

According to EN classification 13501-2 the fire-resistance performance is expressed by letters explaining the functional requirement, and numbers explaining the minimum performance time in minutes:

- **E**: Integrity – provides a physical barrier against flame, hot gases and smoke.
- **EI**: Integrity & insulation – provides a physical barrier against flame, hot gases and smoke as well as a reduced surface temperature and resistance against spontaneous ignition on the unexposed side.
- **EW**: Provides a physical barrier against flame, hot gases and smoke and offers reduced heat radiation.

PYRANOVA® special glass fulfills the requirements of fire-resistance category EI. It provides a physical barrier against flame, hot gases and smoke as well as a reduced surface temperature and resistance against spontaneous ignition on the unexposed side.

Mode of performance

PYRANOVA® special glass for fire-resistant glazing will act as a barrier against spread of fire, smoke and heat radiation. The float glass pane facing the fire shatters. The enclosed, transparent fire-resistant layers foam up at an ambient temperature of appr. 100 °C and form an opaque heat shield, which prevents the passage of heat radiation. The criteria of insulation is fullfilled, if the temperature rise on the non-fire side is limited to an average of no more than 140 °C above the initial average temperature and in any one position by no more than 180 °C. Depending on the thickness of the composite, the fire-resistance time can be influenced accordingly.

Under the influence of heat the fire-resistant layer foams up and forms an opaque heat shield.

Diagrammed action mode of PYRANOVA® special glass.
PYRANOVA® special glass is suitable for all areas of buildings requiring protection from fire. With more than 30 years of extensive experience in the fire-resistant market, SCHOTT Technical Glass Solutions GmbH is both highly competent and innovative. In co-operation with system partners, SCHOTT Technical Glass Solutions GmbH develops internationally approved constructions with PYRANOVA® special glass, which are ideally suited for application in:

- doors
- facades
- as well as butt jointed partition walls, such as on escape routes and stairways.

Detailed information regarding approved systems can be found in the test certificates and approvals for each country.
In the „Manfred von Ardenne“ Innovation Park in Berlin-Köpenick, the first technology and innovation center in eastern Germany, the architect was able to realize his vision of integrating natural resources such as light and wood in the interior of the building. In a wooden structure of natural elegance, fire protection glazing with PYRANOVA® special glass provided the necessary safety standards over several floors while at the same time flooding the building with natural daylight.
Safety must come first. SCHOTT thinks: your creativity should, too.

Endless freedom of design with PYRANOVA® special glass in butt joint systems

PYRANOVA® special glass in the butt joint system

PYRANOVA® integrates easily into architectural design. The frameless butt joint with PYRANOVA® special glass joins the glass panes with a special silicon seal. This permits the installation of long runs of uninterrupted glazing to maximise visibility. The PYRANOVA® special glass in the butt joint system also permits the construction of corners.

Ideal for applications which combine fire-resistance with maximum visibility and minimum interruptions:

- freedom of design with maximum glass areas
- clear views – no distracting mullions
- large pane sizes – from floor to ceiling
- endless glass runs
- up to 60 minutes fire-resistance

The PYRANOVA® special glass in the butt joint system provides maximum light transmission without obtrusive mullions.

Maximum pane dimension can be found in the respective approvals. Fire directions must be defined for angled butt joint glazing.
The glass composition of the Planline system is safety glass in accordance with relevant standards. Requirements concerning impact resistance are fulfilled by the Planline system.

PYRANOVA® special glass

PYRANOVA® special glass in the Planline system provides fire-resistance with excellent optical characteristics. It is a flush glazing system without protruding framing.

**Extremely narrow profiles with the largest possible glass areas are features of this system.** The Planline system with PYRANOVA® special glass was successfully tested in timber and steel to fire-resistance category EI 30.

PYRANOVA® special glass in the Planline system also complies with design requirements. Stylish elements can be applied to the glass using screen-printing, sand-blasted decor or metal coating on the external toughened safety glass. There is also the possibility of integrating edge enamel in every RAL colour. Planline also permits butt joint glazing with almost invisible silicone gaps between the PYRANOVA® glass panes. This enables the production of flush and limitless butt joint glazing.

**Applications:**
PYRANOVA® special glass in the Planline system permits the installation of prestige glass partition walls with unlimited application options. The construction can be applied almost anywhere:
- schools
- office buildings
- sports halls
- hospitals
- commercial and exhibition rooms
and all other areas with increased safety requirements.

PYRANOVA® special glass in the Planline system consists of two external toughened safety glasses, serving as covering panes for the centrally located PYRANOVA® special glass.

**Glass structure**

1. Toughened safety glass ≥ 5 mm with options of screen-printing, colour, coatings and sand blasted finishes
2. Interspace ≥ 16 mm, spacer consisting of aluminium or sheet steel
3. Secondary seal
4. PYRANOVA® special glass ≥ 15 mm

**Frame section**

Mechanical attachment of glazing units is effected through a patented glass bracket. This is invisibly integrated and enables easy exchange of panes.

**The Planline system with PYRANOVA® special glass**

The Planline system with PYRANOVA® special glass was successfully tested in timber and steel to fire-resistance category EI 30.
PYRANOVA® special glass in the Planline butt joint system

Planline also permits butt joint glazing with almost invisible silicone gaps between the PYRANOVA® glass panes. This enables the production of flush and limitless butt joint glazing.

PYRANOVA® special glass in the Planline butt joint system is a flush glazing system, consisting of triple glazing with two external toughened safety glasses and a centrally arranged PYRANOVA® special glass pane.

**Applications:**
PYRANOVA® special glass in the Planline butt joint system allows the realisation of internal glass partition walls with unlimited application options. The construction can be applied almost anywhere, e.g. in
- schools
- office buildings
- sports halls
- hospitals
- commercial and exhibition rooms
and all other areas with increased safety requirements.

The Planline system with PYRANOVA® special glass consists of the combination of two external toughened safety glasses, serving as covering panes for the centrally located PYRANOVA® special glass.

Not only flush but also butt-jointed glazing prevents risk of injuries in the university sports hall in Göttingen, Germany, while providing appealing optical characteristics.
PYRANOVA® special glass for fire-resistant glazing in the Augsburg senior citizens home ensures the necessary peace of mind among the residents.
More than just safety, yet still not enough for SCHOTT.

Additional functionality with laminated composite glass

A powerful combination – fire-resistant glazing and functional glass

In combination with functional glass PYRANOVA® special glass fulfils safety, aesthetic and energy efficiency requirements:
- solar protection
- heat insulation
- noise protection
- safety against falling and overhead protection
- design
- personal and building protection
- X-ray protection
- integrated blind systems

Thermal Safety – It is recommended that a thermal safety check be performed where the possibility of excessive heat due to solar radiation exists e.g. insulated glazed units or secondary glazing. Consideration to excessive thermal stress should be given at all stages of design and construction.

In combination with other functional glass, ISO PYRANOVA® special glass fulfils additional requirements to sound insulation and privacy, such as by the integration of blind systems in the interim unit space.

PYRANOVA® Secure special glass for attack-resistant glazing, fulfils additional safety requirements providing protection against impact, burglary and bullets.
To play safe.

Used in personal- and object protection fire-resistant glazing with PYRANOVA® special glass comply as attack-resistant glazing meeting additional requirements regarding impact-, burglar- and bullet resistance. Attack-resistant glazing is used in public and commercial areas, but may also be interesting for private applications. Possible application fields are:

- prisons
- embassies
- jewelers
- ministries
- banks

The combination of PYRANOVA® basic glass with the appropriate interlayers can provide impact and burglary protection according to DIN EN 356 in the classes P1a to P5a and P6B to P8B. As bullet-resistant glazing according to DIN EN 1063, PYRANOVA® secure special glass prevents bullet penetration and even splintering when necessary.
PYRANOVA® special glass has a lot of advantages, especially the facts.

Technical Data

<table>
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<tr>
<th>Glass type</th>
<th>Fire-resistance classification [EN 13501-2]</th>
<th>Thickness [mm]</th>
<th>Weight [kg/m²]</th>
<th>Light transmission [%]</th>
<th>Ug value [W/m²K]</th>
<th>Sound insulation value Rw [dB]</th>
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Further design and combination options on request. Maximal glass dimensions depend on the approved system and can be seen in the testing certificates and approvals.

Fire-resistant glazing by PYRANOVA® special glass provides the following distinctive properties:

- **Enduring transparency and stability in building applications, ambient temperature from -40 °C to 50 °C**
- **Good sound insulation properties**
- **In accordance with EN 13501, PYRANOVA® special glass provides up to 120 minutes insulation and integrity against flames, smoke and heat radiation from the fire to the non-fire side of the glazing**
- **PYRANOVA® special glass has also been successfully tested for impact-resistance in accordance with EN12600**
- **PYRANOVA® special glass can be provided in combination with a range of glass types in addition to the standard clear float sheets**
- **PYRANOVA® special glass in selected designs meets the requirements for burglar and bullet-resistance in accordance with DIN EN 356 and an DIN EN 1063**