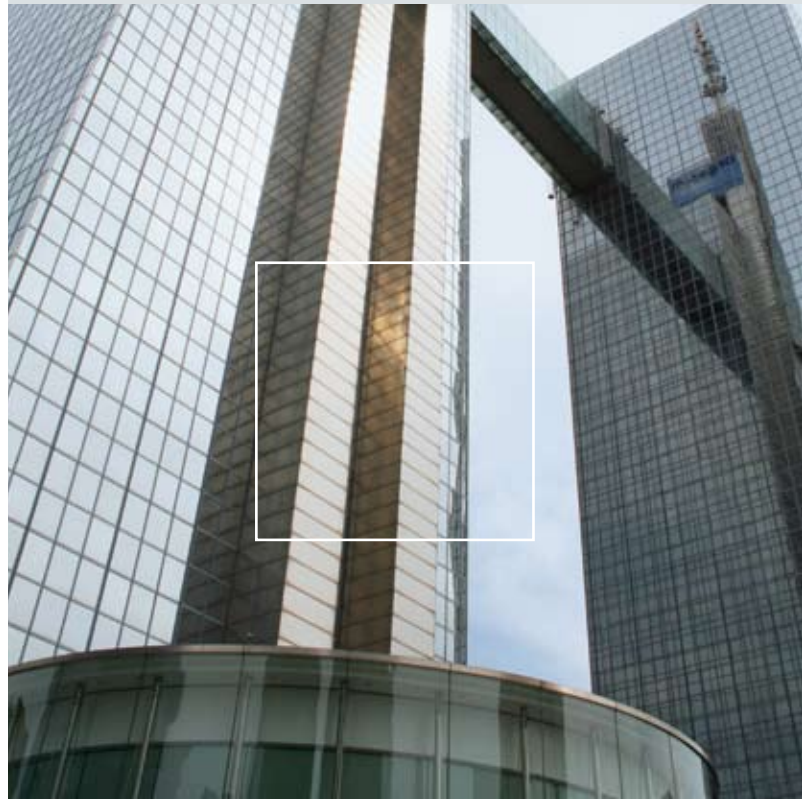


PROFILON® FF

Facade safety film



PROFILON® FF is a highly flexible, multi-ply facade safety film. It holds panes of toughened glass in place in the event of spontaneous glass breakage, preventing them from falling and thus reducing the risk of injury to people and damage to property. PROFILON® FF is fire-resistant according to DIN 4102-1 Class B1.

Modern glass facades are a dominant feature of urban architecture in cities throughout the world. However, not only new buildings are equipped with this design element; also many older buildings are visually upgraded by the addition of a glass facade fitted to the existing facade. In many such cases, toughened glass is used as the structural material.

In recent years, there has been a growing number of cases of glass breakage on toughened glass facades caused by nickel sulphide inclusions in the glass. As a result, glass weighing up to 300 kg was able to fall unresisted from a great height, severely endangering the lives of passersby. Also edge damage, constrictions to the glass or external mechanical influences can lead to glass breakage. In the event of spontaneous glass breakage, PROFILON® FF holds the facade glazing in place and prevents it from falling.

The safety film holds the pane of toughened glass in the frame construction and therefore increases the residual carrying capacity. Depending on the type of facade structure, practical tests on facades equipped with PROFILON® FF revealed a residual carrying capacity of more than 150 days in the case of glass breakage. This vastly exceeds the residual carrying capacity of 3-5 days specified by the building authorities. A special adhesive holds the glass splinters in place, while the structure of the film provides the necessary elasticity in order to ensure the bond between glass and film even under wind loads.

PROFILON® FF:

- retains glass splinters
- explosion resistance
- splinter retention
- delays the spread of fire (no smoke)
- is UV-absorbent

PROFILON® FF can be retrofitted to all types of toughened glass, including those with enamelled surface.

Because of the wide variety of facade construction types, there is no general building regulation. As a rule, an application for approval must be filed for each individual case, and is usually allowed after corresponding review.

Is there any valid standard for the increase of the residual carrying capacity in the event of glass breakage?

The answer is no. Therefore each intended use must be technically specified and individually investigated. PROFILON® FF has been successfully subjected to a large number of practical and laboratory tests by independent and acknowledged testing institutes and technical experts.

In which variants is PROFILON® FF available?

- clear
- tinted (solar protection)

How scratch-resistant is PROFILON® FF to scratching?

After an abrasion test, which scratches the film wantonly, the increase of diffused light is measured. The German Federal Office for motor vehicles, known for its high values allows an increase of diffused light of 4,5%. With only 2,5% PROFILON® FF is well below this value. The scratch-resistance generated by the special surface coating provides for a long durability of PROFILON® FF.

According to experience, PROFILON® FF works without visual and technical impairments many years after expiration of the 5-year warranty period. The specially-hardened, long-lasting surface of the film can easily be cleaned with ordinary cleaning agents.

Does the appearance of PROFILON® FF change over the years?

PROFILON® FF is provided with a UV filter that prevents the film from yellowing, even after many years' use.

How is the glass coated with PROFILON® FF?

The high-performance film is simply fitted onto the glass. This can be done by two methods:

- by hand, with the glass in place on the facade, by skilled HAVERKAMP fitters
- by machine using the dry lamination process

What does dry lamination mean?

The panes are laminated on site with PROFILON® FF using a mobile laminating machine specially developed by HAVERKAMP for this purpose. To do this, the panes are removed from the facade, and then refitted as soon as lamination is completed. This method allows the work to be done in all weathers, and therefore is highly efficient.

HAVERKAMP can also act as general contractor for such projects.

Technical data

Resistance class	DIN EN 12600
Thickness	190µ
Colour/tinting	crystal clear
Light transmission	88 % (visible light)
UV absorption	> 99 %
Adhesive	on acrylic basic
Structure	multiply laminate
Surface coating	Hardened DURITAL surface sr; increase in light scatter 2.5% after Taber abrasion test
Fire features	B1 according to DIN 4102-1
Haze coefficient	0,9 %

Additionally tested by: Laboratory for Steel and Lightweight Structures, Munich University, Prof. Dr. Bucak; engineering office Wörner und Partner, Public Experts for Glass Structures, Darmstadt; Aachen University, Chair of Steel and Light-weight Structures, Prof. Dr. Sedlacek; engineering office Dr. Ing. Peter Küffner, Public Expert for Facades and Windows; public expert office Dipl. Ing. E. Achenbach, Hadamar, Public Expert