

PROFILON® ER1

**Explosion resistant
security film**

PROFILON® ER1 is a highly flexible, 4-ply security film with impact and explosion resistant properties. It was designed to absorb the maximum area pressure as built up by a shock wave. PROFILON® ER1 is hardly flammable in conformity with DIN 4102-1 class B1.

This high-performance film offers protection in the event of a bomb explosion at very high constructional danger zones, e.g. in cases of high and narrow construction or at especially endangered entrance areas.

Additionally, the multi-ply quality of PROFILON® ER1 generates an excellent impact resistance, which is an important additional feature for endangered parts of a building.

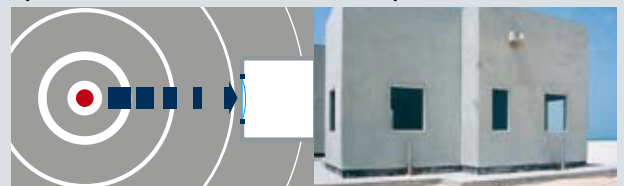
PROFILON® ER1 provides:

- extremely high explosion resistance
- impact resistance
- splinter retention
- reduction of the spreading of fire (no fuming)
- UV absorption



PROFILON® ER1 was tested in a shock tube with a reflected pressure wave. These repeating shock waves alternately produce firm pressure and suction. In doing so, an explosion in a narrow and high construction is simulated, where the shock waves are reflected by the surrounding buildings.

Open Air Test (GSA/British standard resp.)



Pressure Impulse Tube (German/European standard)



Which resistance class does PROFILON® ER1 achieve?

PROFILON® ER1 is a multi-ply film laminate with a strength of 475µ. Though the coating with PROFILON® ER1 single and insulation glass achieves impact resistant properties of laminated security glass. The coated glass achieves the following resistance classes:

- explosion resistance tested in shock tube according to DIN EN 13541 ER1 (NS)
- impact resistance (steel ball drop test):
 - A1 according to DIN 52 290
 - P2A according to EN 356 and
 - UL 972

Which variants of PROFILON® ER1 are available?

- transparent
- solar (sun protection)

How scratch-resistant is PROFILON® ER1?

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 thresholds values allows an increase of diffused light of 4,5%. With 2,5%, PROFILON® ER1 is well below this value. The scratch-resistance generated by the special surface coating provides for a long durability of PROFILON® ER1.

According to experience, PROFILON® ER1 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 agents.

Does PROFILON® ER1 change its appearance in the course of time?

PROFILON® ER1 is equipped with a UV filter preventing a yellowing of the foil even after many years

How is the glass coated with PROFILON® ER1?

The high-performance film is installed from the inward looking side onto the pane. A corresponding frame fixture provides for a firm connection with the frame. This is done, dependent on the window construction, either by installing PROFILON® ER1 below the pane holding profile, by sealing with silicone or through the additional mechanical connection „PROFICON“. The glass panes are not taken out of the frame, but coated directly within the frame with PROFILON® ER1 by trained HAVERKAMP installers.

Technical data

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| Resistance class | ER 1 according to EN 13541 (NS) A1 according to DIN 52 290/impact resistance P2A according to EN 356 |
| Thickness | approx 475µ |
| Colour/Tinge | crystal clear |
| Light transmission | 90,2 % (visible scope) |
| UV absorption | > 99 % (300 – 380 nm) |
| Adhesive | on acrylic basis |
| Composition | multi-ply laminate, developed in Sandglider-process |
| Surface coating | hardened DURITAL-surface sr; increase of scattered light 2,5 % according to Taber abrasion test |
| Fire features | B1 according to DIN 4102, part 1 |
| Haze value | 0,9% |

Further tested by Fraunhofer Institute for short-term dynamics, Ernst-Mach-Institute