



Association of Public Insurance Companies (APIB)
Association des établissements cantonaux d'assurance incendie

SWISS
HAIL IMPACT PROTECTION REGISTER
HSR

APIB Test Specification No. 10
SKYLIGHTS

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10 Skylights

10.1 General information

The test specifications for the “skylight” component category include additional, component-specific provisions for the standard test, which are not governed by the general test specifications. The component category includes skylights made of the following materials:

- Glass
- Plastic

The following specifications always apply to glass and plastic skylights, unless reference to a different treatment type is made in any subsection.

10.2 Intended use

Skylights, either single-shell or multiple-shell models, are installed on roofs on curbs. They may be operable for opening. Unlike continuous light panels, skylights are individual items.

10.3 Test specimen

Skylights must be assembled realistically and fitted with the original curb according to the manufacturer's instructions with original fasteners and flashing caps.

Skylights are divided into two size groups for each dome shell material thickness, dome shell material type and dome shape (rectangular, round/oval, special shapes):

- **Group I:** Skylights up to a maximum surface area of 1.50 m²
- **Group II:** Skylights with a minimum surface area of 1.50 m²
The maximum surface area in this group must be specified by the manufacturer

The dimensions of the light-transmitting sections must be used when calculating surface areas.

Test results for skylights in transparent design colours can also be applied to opaque skylights if only the colour of the inner shells has been changed.

If skylight components consist of materials other than those of the skylight, these materials must be tested according to the component-specific test specifications.

10.4 Test set-up

The curb must be fully resting on the underlying surface.

10.5 Specimen storage prior to testing (conditioning)

10.5.1 Glass skylights

None

10.5.2 Plastic skylights

The test specimen must be stored in the test climate for at least 3 days.

10.6 Specimen treatment prior to testing

10.6.1 Glass skylights

The glass surface is moistened before impacting.

10.6.2 Plastic skylights

The surface is cooled with ice flakes for 3 minutes before projectiles are fired.

10.7 Target area and angle of impact

The following target areas are impacted on the skylight:

- Middle: Circle with a diameter of 300 mm at the centre of the test specimen
- Rim: this includes the edge, the corner and the attachment points (including fasteners and any flashing caps). The weakest point for impact must generally be sought in this area
- Transition trough (area where dome begins to rise)

The angle of impact in relation to the dome base is 90°. Any other critical target areas that exist must also be tested (refer to Part A).

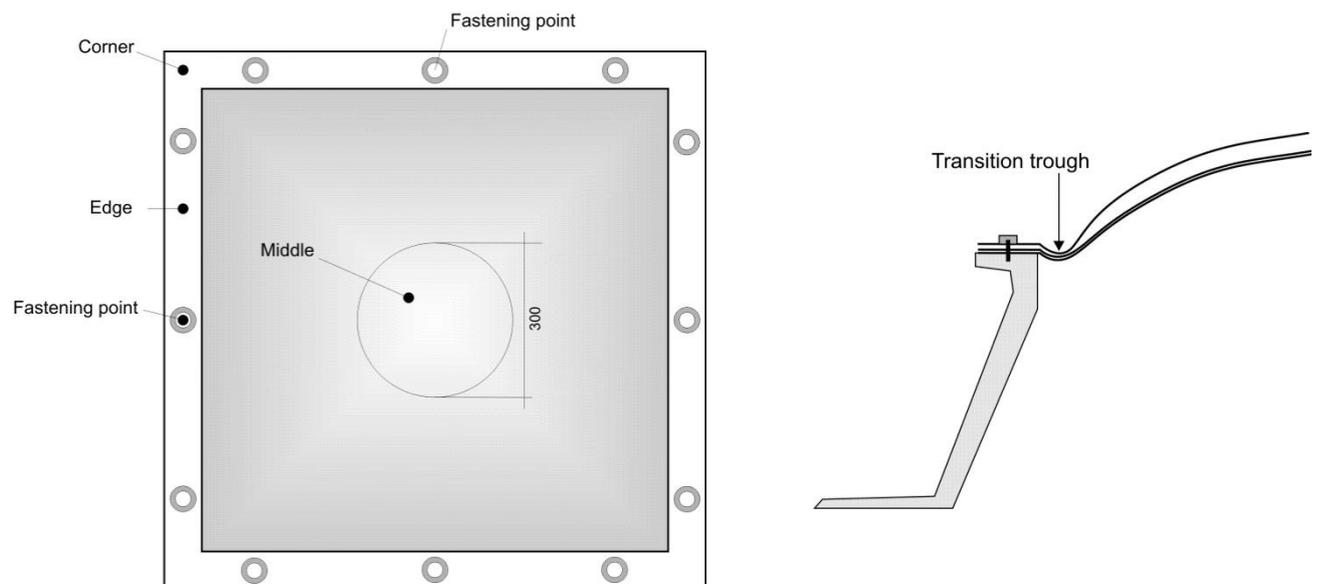


Figure 1 Target areas on the skylight: Middle and rim (corner, edge, fastening point with fasteners, transition trough) (dimensions in millimetres)

10.8 Component function

10.8.1 Glass skylights

The component is tested for watertightness, mechanics (functional efficiency of the opening and closing mechanism) and appearance.

10.8.2 Plastic skylights

The component is tested for watertightness, light transmission, mechanics (functional efficiency of the opening and closing mechanism) and appearance.

10.9 Damage criterion

10.9.1 Glass skylights

Watertightness: For skylights with multiple shells, the top shell is relevant to watertightness testing. The watertightness function is preserved provided no cracks or fractures are visible in the top shell. If any crack or fracture is present, the component is considered to be damaged regarding watertightness.

Mechanics: If the skylight can be opened and closed 5 times, the component is considered to be undamaged regarding the mechanics function. If opening and closing 5 times is not possible, the component is damaged regarding mechanics.

Appearance: The skylight is not damaged regarding appearance provided no surface change is visible. If a surface change is apparent, the component is damaged. Furthermore, skylights with multiple shells are considered to be damaged regarding appearance if the lower shells have any cracks or fractures.

10.9.2 Plastic skylights

Watertightness: For skylights with multiple shells, the top shell is relevant to watertightness testing. The watertightness function is preserved provided no cracks or fractures are visible in the top shell. If any crack or fracture is present, the component is considered to be damaged regarding watertightness.

Mechanics: If the skylight can be opened and closed 5 times, the component is considered to be undamaged regarding the mechanics function. If opening and closing 5 times is not possible, the component is damaged regarding mechanics.

Light transmission: The skylight is not damaged regarding light transmission provided no surface change is visible. If a surface change is apparent, the component is damaged.

Appearance: The skylight is not damaged regarding appearance provided no surface change is visible. If a surface change is apparent, the component is damaged. Furthermore, skylights with multiple shells are considered to be damaged regarding appearance if the lower shells have any cracks or fractures.

10.10 Measuring method

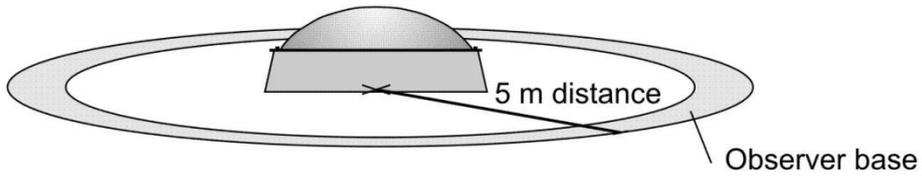
Watertightness: Watertightness is tested visually for cracks or fractures at a maximum distance of 0.50 m. The edge of the dome is also manually scanned.

Mechanics: The skylight mechanics are operated to test them.

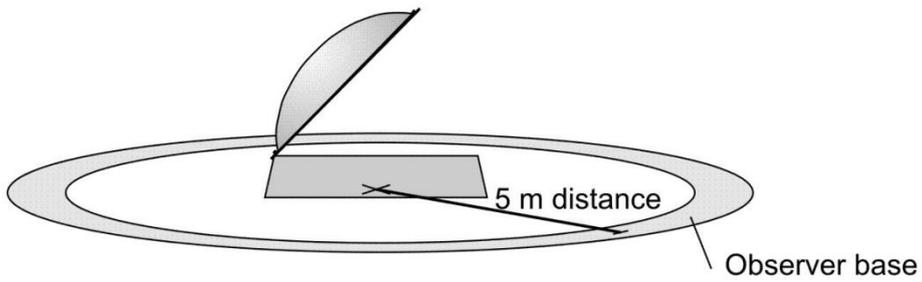
Light transmission: Light transmission is tested by examining the specimen visually for the presence of micro-stretching or any other internal material defect that limits light transmission. Visual tests for micro-stretching or internal material defects are made against light at a distance of 5 m.

Appearance: The appearance must be tested visually in daylight or artificial light, examining for surface changes at a distance of 5 metres between the test specimen and the tester, as per Figure 2. Furthermore, for skylights with multiple shells, the appearance must be tested visually for cracks and fractures in daylight or artificial light at a distance of 5 metres between the test specimen and tester. The light dome must be examined from both the inside and outside. If the skylight can be the opened, it must be assessed when it is closed and when it is open.

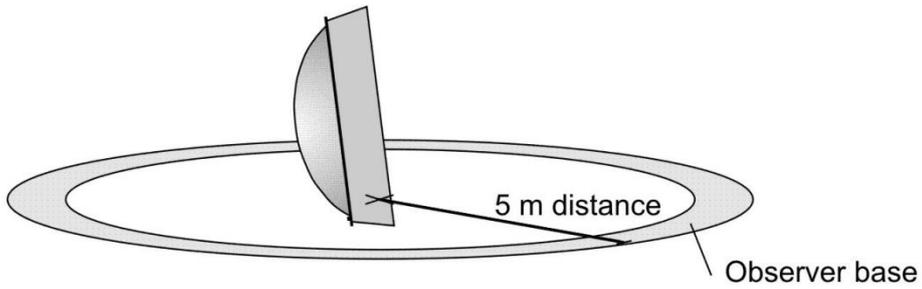
Assessment from the outside with the skylight closed



Assessment from the outside with the skylight open



Assessment from the inside with the skylight closed



Assessment from the inside with the skylight open

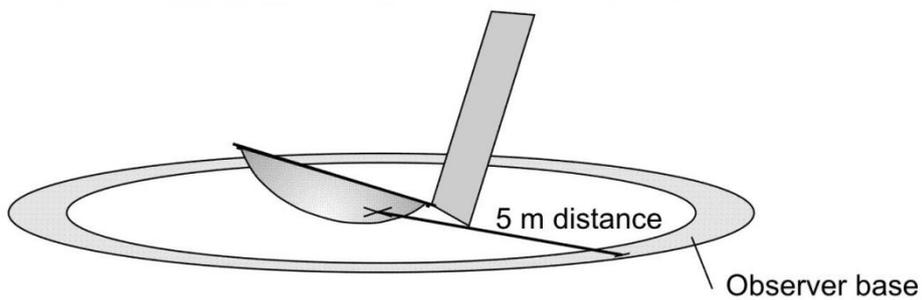


Figure 2 Position of the dome for assessment of the outer and inner appearance (closed or open).

10.11 Existing standards and regulations (not exhaustive)

- SIA 232.306 (2005): Prefabricated roofing accessories – Plastic skylights – Product specification and test methods (SN EN 1873)
- FM 4431 (2006): Approval standard for skylights – FM Approvals appendix D: Simulated hail resistance test using freezer ice balls