



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

**SWISS
HAIL IMPACT PROTECTION
REGISTER HSR**

APIB Test Specification No. 09
Waterproofing Membranes

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Consult online at www.hagelregister.ch
Vereinigung Kantonaler Feuerversicherungen
Bundesgasse 20
Postfach
CH - 3001 Bern
Tel. 031 320 22 22
Fax 031 320 22 99
E-mail mail@vkf.ch
Internet www.vkf.ch

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9 Waterproofing Membranes

9.1 General information

The test specifications for the "Waterproofing Membranes" component category includes additional, component-specific provisions for the standard test, which are not governed by the general test specifications.

The test specifications cover waterproofing membranes made from all materials.

9.2 Intended use

Waterproofing membranes are used exclusively in roof construction. This includes edges, corners, seams and fixations. The waterproofing membrane is fully supported on a fixed substrate.

9.3 Test specimen

The waterproofing membrane specimen width is 350 mm and the length is a minimum of 1000 mm.

9.4 Test set-up

The waterproofing membrane is tested with two different substrates:

- hard substrate: consisting of a steel plate with sandpaper (120 grit) placed on it
- soft substrate: consisting of a steel plate with extruded polystyrene rigid foam sheet (20 kg/m³) placed on it

The test is always performed on both substrates. If the hail impact resistance of the waterproofing membrane differs as a result of the different substrates, the lower hail impact resistance class applies to the register entry.

9.5 Specimen storage prior to testing (conditioning)

At least 1 day of conditioning in the testing climate (reference Part A).

9.6 Specimen treatment prior to testing

The membrane surface is cooled with ice for 3 minutes before projectiles are fired. For testing using the hard substrate the steel plate must be cooled to a temperature of 10°

9.7 Target area and angle of impact

The surface of the test specimen is impacted. The target area conforms to Figure 1. Several tests can be performed on one test specimen. The distance between target areas must be at least 150 mm and a distance to the edge of at least 75 mm must be maintained. The angle of impact is 90°. Any other critical target areas that exist must also be tested (refer to Part A).

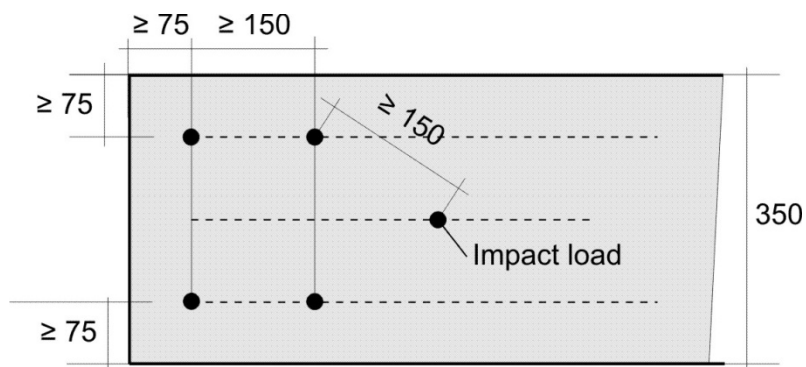


Figure 1 Target areas for waterproofing membranes in plan view (dimensions in millimetres)

9.8 Component function

The component is tested for watertightness.

9.9 Damage criterion

The test specimen is considered to be undamaged provided it has no punctures.

9.10 Measuring

If no puncture is visible, the vacuum test is performed according to EN 13583.

9.11 Hail impact resistance allocation to the Swiss Hail Impact Protection Register according to EN 13583

Testing is waived for waterproofing membranes that have already been tested for hail impact resistance according to EN 13583. Hail impact resistance is assigned according to Table 1. This table is based on comparative studies carried out by the Swiss Federal Laboratories for Materials Testing and Research (EMPA) using polyamide and ice spheres.

The damage velocity classifications in a, b and c are assigned according to SIA 271. The conversion table applies to bonded, mechanically fastened, or ballasted waterproofing membranes according to SIA 271.

Plastic and elastomer sheets	v_{damage} [m/s]	
	Hail impact resistance, hard underlying surface, class a	≥ 15
Hail impact resistance, hard underlying surface, class b	≥ 20	HW 4
Hail impact resistance, hard underlying surface, class c	≥ 25	HW 5
Hail impact resistance, soft underlying surface, class a	≥ 20	HW 4
Hail impact resistance, soft underlying surface, class b	≥ 25	HW 5
Hail impact resistance, soft underlying surface, class c	≥ 30	HW 5

Polymer bitumen sheets	V_{damage} [m/s]	
	Hail impact resistance, hard underlying surface, class a	≥ 15
Hail impact resistance, hard underlying surface, class b	≥ 20	HW 5
Hail impact resistance, hard underlying surface, class c	≥ 25	HW 5
Hail impact resistance, soft underlying surface, class a	≥ 20	HW 4
Hail impact resistance, soft underlying surface, class b	≥ 25	HW 4
Hail impact resistance, soft underlying surface, class c	≥ 30	HW 5

Table 1 Assignment of values according to EN 13583 in hail impact resistance classes 1 to 5 (V_{damage}: Damage velocity for bonded, mechanically fastened and, ballasted waterproofing membranes)

9.12 Existing standards and regulations (not exhaustive)

- SN EN 13583, SIA 289.307 (2001): Waterproofing membranes - bitumen, plastic and elastomer sheets for roof waterproofing - determination of hail impact resistance
- SIA 271 (2007): Waterproofing of buildings