

TEST REPORT No. 369683

Customer

SAINT-GOBAIN PPC ITALIA S.p.A.
Via Ettore Romagnoli, 6 - 20146 MILANO (MI) - Italy

Item*

**waterproofing membrane named
"Bituver Monoplus"**

Activity

 **hail resistance according
to standard UNI EN 13583:2012**

Results

Type of support	Damaging velocity " v_d " [m/s]
soft	19

Order:
82734**Item origin:**
sampled and supplied by the customer**Identification of item received:**
2020/0150 dated 23 January 2020**Activity date:**
28 January 2020**Activity site:**
Istituto Giordano S.p.A. - Strada Erbosa Uno, 72 -
47043 Gatteo (FC) - Italy

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The results relate only to the item examined, as received, and are valid only in the conditions in which the activity was carried out.

This document is the English translation of the test report No. 369683 dated 24 February 2020 issued in Italian; in case of dispute the only valid version is the Italian one. Date of translation: 24 February 2020.

The original of this document consists of an electronic document digitally signed pursuant to the applicable Italian Legislation.

Chief Test Technician:
Ing. Chiara Bastoni.**Head of Security and Safety Laboratory:**
....**Compiler:** Dott. Marina Bonito
Reviewer: Ing. Chiara Bastoni./....

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(*) according to that stated by the customer.

Bellaria-Igea Marina - Italy, 24 February 2020

Chief Executive Officer

Description of item*

The sample under test consists of a waterproofing membrane with APAO elastoplastomeric mixture based on metallo-cene resins, with slate top finish, thickness 4 mm.

Normative references

Standard	Title
UNI EN 13583:2012	Membrane flessibili per impermeabilizzazione - Membrane bituminose, di materiale plastico e gomma per impermeabilizzazione di coperture - Determinazione della resistenza alla grandine" (<i>"Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of hail resistance"</i>)

Apparatus

Description
vertical pneumatic launching drive equipped with pressurization tank, electric valves for loading and launching, manometer to control the loading pressure and photo cell device able to measure the output velocity of the ball from the launching opening
plastic balls made of polyamide (PA 6.6), diameter (40 ± 0,5) mm and mass (38,5 ± 0,5) g each, with a smooth and defect free surface
device for creating a di 0,15 bar pressure difference, to check the holes in the specimen with soapy water
soft support comprising a steel plate, size 500 mm × 300 mm and thickness 20 mm, without cooling on which expanded polystyrene panel with compressive stress "CS(10)" equal to 100 kPa, size 500 mm × 250 mm, thickness 20 mm and mass 20 kg/m ³ , is laid
ballast steel plate, size 500 mm × 300 mm and thickness 20 mm, with a circular opening, diameter 200 mm, in the centre
soap solution

Method

Description of the specimens

5 specimens, dimensions 250 mm × 250 mm and thickness equal to that of origin, were cut by the customer from the item.



Photograph of a specimen

(*) according to that stated by the customer, apart from characteristics specifically stated to be measurements. Istituto Giordano declines all responsibility for the information and data provided by the customer that may influence the results.

Procedure

Normative reference	Activity	Description
clause 6.2	Conditioning	(23 ± 2) °C temperature (50 ± 10) % relative humidity 24 h
clause 8	Determining damaging velocity	"v _d " defined as the velocity leading to maximum one perforation for a set of 5 specimens.

Environmental conditions

Temperature	(21 ± 1) °C
Relative humidity	(46 ± 5) %

Results

Type of support	Specimen	Velocity [m/s]	Effect
soft	1	18,5	slight superficial sign at the point of impact
	2	18,9	slight superficial sign at the point of impact
	3	18,9	slight superficial sign at the point of impact
	4	18,6	slight superficial sign at the point of impact
	5	18,7	slight superficial sign at the point of impact
Average		18,7	//



Photograph of a specimen during the test

Findings

Type of support	Damaging velocity “ v_d ”* [m/s]
soft	19

(*) according to clause 3.2 “damaging velocity” of standard UNI EN 13583:2012, the hail resistance is expressed as the damaging velocity “ v_d ” of the ball, rounded to the nearest 1 m/s which has caused perforation of maximum one out of five shots.