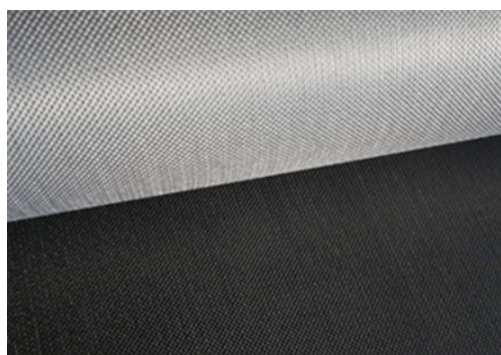


TESTING SYSTEM FOR ELECTRONIC TESTING OF WATERPROOFING MEMBRANES AS PER ASTM D7877-14

For ballasted roofs



Controlit® GS (for Bitumen roof cover) and Controlit® GS Single Ply (for synthetic roof cover) underlays

Supply only (mechanical or fully torched installation, in conjunction with the laying of the waterproofing layer, by the Company performing the roofing system installation in order to highlight and monitor any damage to the waterproofing layers, thus avoiding the infiltration of liquids between the waterproofing layers and the insulation that could compromise the future impermeability of the system) of *Controlit® GS and*

Controlit® GS Single Ply, woven and impregnated fiberglass fabrics, coated in nanotechnology with stainless steel particles and treated with flame retardants in order to allow its laying by torch (in Controlit® GS case), supplied in rolls of 50m and width of 1.65m.

Technical parameters

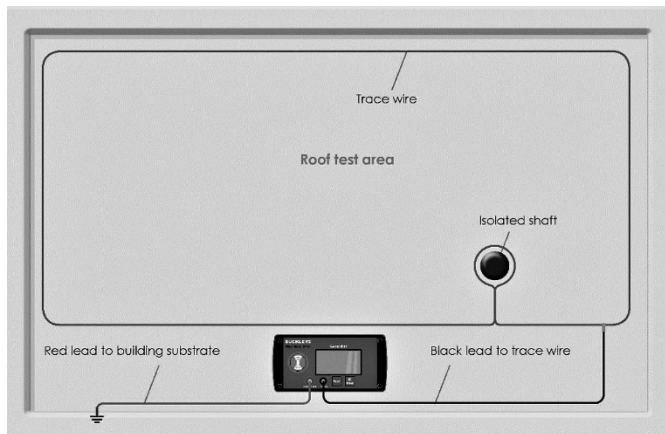
- **Yarn tex (DIN EN 12654)**
Sized warp EC 9-68 Z 20
Weft EC 9-68 Z 20
- **Coating** Stainless steel nanoparticles
- **Electrical resistance** < 1000 Ohm/sq
- **Surface Treatment** Plasma
- **Weight (DIN EN 12127)** 165 +/- 10 g/m²
- **Thickness (DIN EN ISO 5084)** 0.16 +/- 0.02 mm
- **Tensile strength not less than (EN ISO 13934 1)**
Warp 2500 N/5cm
Plot 2000 N/5cm
- **Fire resistance (EN13501-1:2007+A1:200-9)** A2-s1-d0
- **Tested and approved by manufacturers of electronic integrity control systems (ELD) both low voltage EFVM sec. ASTM D7877-14 .7 and high voltage HVMT sec. ASTM D7877-14 .9**
- **Installation with lateral & horizontal overlaps equal to 10 cm.**

Controlit® Connection Contact

Supply only (installation by the Company performing the execution of the roofing system) of stainless-steel contact points type *Controlit® connection contact*, including sealing material in bituminous, PVC or TPO sheet, heat shrinkable sheet and protective cap. Installation as per the specific instructions given in the manufacturer's user manual. Max distance between contact points 50m (100m in the case of verification done with Buckleys equipment).

Perimeter wiring

In order to guarantee the final tests and the subsequent monitoring of the finished roofing system after filling with ground / gravel / screed etc., and / or a possible search for future infiltration,



**Perimeter bordering Buckley Wet Roof Pro generator*

only supply (installation in support and fixing with compatible connection strap at 1m intervals between the waterproofing top layer and the protective material thereof, by the company carrying out the installation of the roof system) of permanent wiring system made of stainless steel filament, positioned on the perimeter of the roof to be tested, up to a maximum of 600 m². The positioning of the perimeter wiring will be reported on special graphic documentation.

Testing of the roof watertightness

The execution of final testing of the flat roof by means of electronic ELD system (Electronic Leak Detection), is made as per ASTM D7877-14, internationally recognized standard.

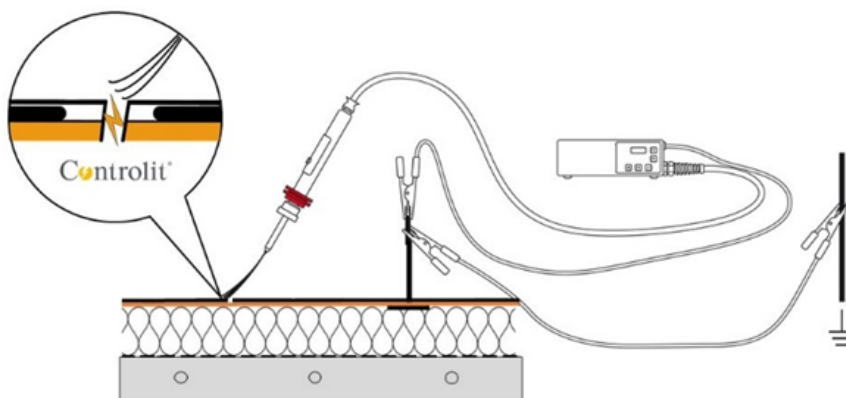
The check will be carried out in two stages:

1. With HVMT technology (High Voltage Membrane Testing) according to paragraph 9 of the same standard at the end of the laying of the top waterproofing layer to check the integrity of the membrane before carrying out the subsequent treatment.
2. with EFVM (Electronic Field Vector Mapping) technology in accordance with paragraph 7 of the standard at the end of the work to ensure the absence of any damage to the waterproofing layers due to subsequent treatment.

At the end of the work, before final testing, all the waterproofing must be fully tested by the selected company (the Company performing the execution of the roofing system).

HVMT - High Voltage Membrane Testing

High Voltage testing is carried out on the surface of the roof waterproofing system, which must be clean/ dry, a direct current voltage, calculated according to the thickness of the waterproofing

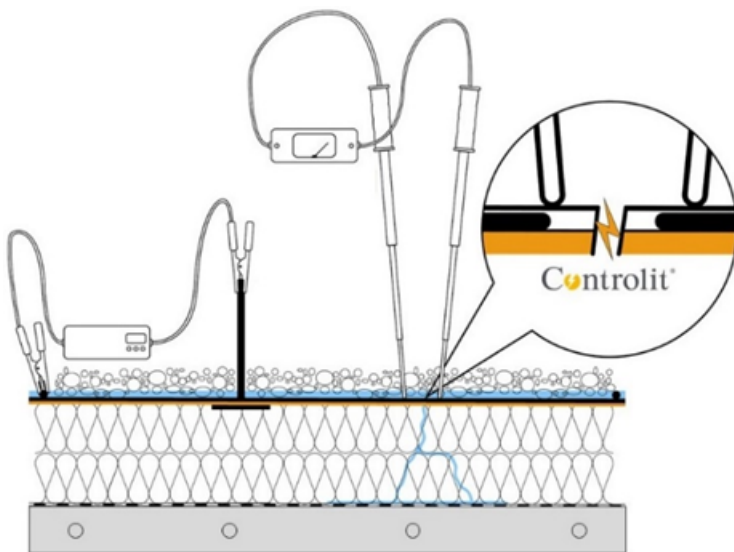


material (Dielectric Strength), is applied with brush of determined width, connected to the central unit, which is also connected to Controlit[®] conductive underlay via the appropriate Controlit[®] Connection Contact points. The detection of imperfections / damages is based on the detection of the passage of current, in

the form of a high-voltage arc, between the surface of the waterproofing system and the conductive underlay Controlit®. The location of the defect will be noticed both visually (high-voltage arc) and by sound (on the central unit). With the same equipment it is also possible to check the details and vertical parts of the roof.



EFVM - Electronic Field Vector Mapping



EFVM (wet testing) is carried out on the surface of the roof system, (which must be moist enough), low voltage electric pulses are induced in direct current, through the perimeter cable (trace wire), with a generator unit and specified frequency.

In this way, a surface electric field is created (the membrane also represents an electrical insulator that does not allow the passage of electricity) whose direction is indicated by the voltage variation of the electrically conductive path to earth via the Controlit® conductive underlay, whose intensity will vary closer to a possible imperfection of

the waterproofing layer that allows moisture to come into contact with the conductive Controlit® fabric placed under the waterproofing. The operator, through a pair of electrodes and equipped with a special detector unit, is directed to any damage to the waterproofing membrane until he determines its exact position.

