



# Test Certificate No. C 12813.1/23-7

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**Applicant** BulkPack Exports Ltd.  
"507", "B" Block, 5th Floor, Corporate House, RNT Marg, Indore – 452 001 (M.P.), India

**Test order** **Measuring of electrical properties of Type C-FIBCs**  
**acc. IEC 61340-4-4:2018**

**Test pieces** *Flexible Intermediate Bulk Containers (FIBCs without inliner)*

**Date of receipt** 03.07.2023 + 10.07.2023

**Design**

**Manufacturer's type designation** N/A

**Dimensions** Sample a: (90 cm x 90 cm) x 100 cm (lowest size)  
**Volume** 900 litres **Tare** 1340 g  
Sample b: (90 cm x 90 cm) x 200 cm (highest size)  
**Volume** 1800 litres **Tare** 1980 g

**Fabric of wall and bottom** Polypropylene 140 g/m<sup>2</sup>, uncoated, white flat woven fabric layers with conductive\*) tapes, without coloured characterization

**Fabric of skirt** Polypropylene 90 g/m<sup>2</sup>, uncoated, white fabric with conductive\*) tapes

**Fabric of discharge spout** Polypropylene 90 g/m<sup>2</sup> + 20 g/m<sup>2</sup> coating, coating outside, white fabric with conductive\*) tapes

**Suspension** Four blue PP-webbings with conductive\*) tapes (40 mm wide, 28 g/m), sewn into the vertical seams in a length of 35 cm / 70 cm (lowest size) resp. 50 cm / 130 cm (highest size)

**Details** Four vertical seams, two horizontal seams at the bottom (U-panel design) / overlock + chain stitching / fabric folded in all the seams / top with skirt / discharge spout d = 35 cm, double seam / no inliner / no document pocket / SWL label and yellow label with electrostatic information are not greater than 100 cm<sup>2</sup> in area and therefore not subjected to any electrostatic restriction

**Note** This certificate covers all FIBCs with dimensions of between (90 cm x 90 cm) x 100 cm and (90 cm x 90 cm) x 200 cm.

**\*) Equipment for electrical conductance**

**Conductive fabrics** Conductive black PP-tapes in warp direction and weft direction in a grid size of 35 mm x 23 mm.

**Earthing flaps** Six conductive black double PE foil with inner conductive webbing in the middle of a 2 top seams, 2 vertical seams and 2 bottom seams (50 mm wide), having contact to the uncoated surfaces of both fabrics (s. annex 1).

**Suspension** Six conductive PP-tapes in warp direction of the webbings

**Conductive foils** Conductive foils are sewn between:  
- discharge spout and the bottom fabric  
- discharge spout and conductive PP-ribbon



## 1. Derivation Resistance of the FIBC

**Type C FIBCs shall have derivation resistance to groundable points of less than  $1.0 \times 10^8 \Omega$ .**

**Test regulations** Measuring performance according to IEC 61340-4-4:2018 "Standard test methods for specific applications - Electrostatic classification of flexible intermediate bulk containers (FIBC)"

**Test apparatus** Teraohmmeter Labordata AW 200-4, measuring potential applied  $U = 10 \text{ V} / 100 \text{ V}$

**Fabric electrodes** Each fabric electrode consists of a hook clip. Each hook clip has contact to the conductive tapes of the fabric.

**Webbing electrodes** Each webbing electrode consists of two metal bars of rectangular profil. The webbings have been clamped between the bars.

**Earthing electrodes** The earthing electrode consists of a crocodile clip between which the earthing flap has been clamped.

**Test climate** Temperature  $23 \pm 2 \text{ }^\circ\text{C}$  and  $20 \pm 5 \text{ \% RH}$  acc. IEC 61340-4-4:2018

**Test conditions** During the performance of measuring the FIBCs have been blown up with low air pressure and then the FIBCs have been suspended at their four lifting loops. The suspension hooks were insulated. The measurements of derivation resistances have been effected between the fabric and the suspension loops respectively the earthing flap.

The positions of the measuring points are shown in [annex 1](#).  
Resistance of the suspension frame to earth:  $> 1.0 \times 10^{12} \Omega$

**Performance of the tests** The derivation resistance  $R_A$  has been measured between the conductive threads of the FIBCs by 31 electrodes fixed at the skirt, the wall fabric, the bottom fabric, the discharge spout fabric, the webbings and the earthing flaps. The readings of the values had been effected 15 seconds after applying the measuring voltage.

**Test results** The derivation resistances of sample "a" measured between the conductive tapes of the fabrics and the suspension loops respectively the earthing flaps cover a range of

$$9.1 \times 10^4 \Omega < R_A < 9.7 \times 10^5 \Omega.$$

The derivation resistances of sample "b" measured between the conductive tapes of the fabrics and the suspension loops respectively the earthing flaps cover a range of

$$1.1 \times 10^5 \Omega < R_A < 4.7 \times 10^5 \Omega.$$

In detail the values are listed in [annex 3](#).

## 2. Breakdown Voltages of the fabrics

**The breakdown voltages of the fabrics shall be less than 6000 V.**

**Test regulations** IEC 60243-2 "Methods of test for electric strength of solid insulation materials - Part 2: applied Additional requirements for tests using direct voltage"



<b>Test apparatus</b>	High-voltage power supply: Labordata DSS 75/25 USB
<b>Test climate</b>	Temperature $23 \pm 2$ °C and $20 \pm 5$ % RH acc. IEC 61340-4-4:2018
<b>Test conditions</b>	Five specimens of all three fabrics have been taken and have been installed into the measuring device LABORDATA P75/P25 USB (diameter of the electrodes $d = 75$ mm and $d = 25$ mm). Then a direct voltage has been applied and increased up to breakdown at a speed of 300 V/s acc. IEC 61340-4-4:2018. Five measurements have been performed with each specimen.
<b>Test results</b>	<p><u>Fabric of wall and bottom</u></p> <p>Range of 25 values: <b>0 V</b> Total average of breakdown voltage: <b>0 V</b></p> <p><u>Fabric of skirt</u></p> <p>Range of 25 values: <b>0 V</b> Total average of breakdown voltage: <b>0 V</b></p> <p><u>Fabric of discharge spout</u></p> <p>Range of 25 values: <b>297 V to 2084 V</b> Total average of breakdown voltage: <b>1248 V</b></p> <p>In detail the values are listed in <u>annex 4</u>.</p>

### 3. Surface Resistivity of document pockets and labels

Type C FIBC labels (greater than 100 cm<sup>2</sup> in area) and document pockets shall be made from materials:

- with Surface Resistivity of less  $1.0 \times 10^8 \Omega$ . In addition such a material shall have a derivation resistance to the earthing points of below  $1.0 \times 10^8 \Omega$ . It shall be tested at a climate of  $23 \pm 2$  °C /  $20 \pm 5$  % RH)

or

- with Surface Resistivity of between  $1.0 \times 10^9 \Omega$  and  $1.0 \times 10^{12} \Omega$ . Such a material does not need to be earthed. It shall be tested at climates of  $23 \pm 2$  °C /  $20 \pm 5$  % RH and  $60 \pm 5$  % RH).

<b>Test regulations</b>	IEC 61340-2-3 "Electrostatics - Part 2-3: Methods of test for determining the resistance and resistivity of solid planar materials used to avoid electrostatic charge accumulation"
<b>Test apparatus</b>	Teraohmmeter Labordata AW 200-4, 10 V / 100 V
<b>Electrodes</b>	IEC 61340-2-3, Ring electrode  Outer diameter of inner electrode: <b>30 mm</b> Inner diameter of annulus electrode: <b>56 mm</b> Outer diameter of annulus electrode: <b>64 mm</b>
<b>Test conditions</b>	The samples have been installed into the measuring device Labordata AW 200-4 and five measurements have been performed.
<b>Test results</b>	<b>SWL labels and yellow labels with electrostatic information</b>  The SWL labels and the yellow labels are not greater than 100 cm <sup>2</sup> in area and therefore not subjected to any electrostatic restriction.



#### 4. Assessment of the test results

Both FIBCs have derivation resistances to groundable points of below  $1.0 \times 10^8 \Omega$  and are constructed from materials having electrical breakdown voltages of less than 6000 V.

**Both FIBCs and both labels\* fulfil the conditions of IEC 61340-4-4:2018 "Standard test methods for specific applications – Electrostatic classification of flexible intermediate bulk containers (FIBCs) to be classified as**

#### Type C FIBCs without liner

**or in combination with suitable liners which meet the requirements of Type L1, Type L1C or Type L2 acc. IEC 61340-4-4:2018 (see Note 6).**

\* The SWL labels and the yellow labels are not greater than 100 cm<sup>2</sup> in area and therefore not subjected to any electrostatic restriction.

This certificate covers all FIBCs with dimensions of between (90 cm x 90 cm) x 100 cm and (90 cm x 90 cm) x 200 cm.

#### 5. Notes

##### Note 1

Type C-FIBCs are allowed to be used in zones 1, 2, 21 and 22, not allowed in zones 0 and 20.

The zones 0, 1 and 2 are places in which an explosive atmosphere consisting of a mixture with air of flammable substances in the form of gas, vapour or mist

- ... is present continuously, for long periods or frequently. = zone 0
- ... is likely to occur in normal operation occasionally. = zone 1
- ... is not likely to occur in normal operation but, if it does occur, will persist for a short period only. = zone 2

The zones 20, 21 and 22 are places in which an explosive atmosphere in a form of a cloud of combustible dust in the air

- ... is present continuously, for long periods or frequently. = zone 20
- ... is likely to occur occasionally in normal operation. = zone 21
- ... is not likely to occur in normal operations but, if it does occur, will persist for a short period only. = zone 22

##### Note 2

Type C FIBCs shall be durably marked by means of permanently attached yellow labels, with at least the information and symbol ISO 7000-2415 as shown in annex 2.

The designated earth bonding points shall be labelled or marked with the earth symbol IEC 60417-5019 as shown in annex 2.

The test piece has no liner and no document pocket.

**It is not allowed to use liner or document pockets without delivering proof of suitability.**



**Note 3** It is the responsibility of the manufacturer to ensure the samples tested are representative of the production.

**Note 4** If the electrical properties are guaranteed for each delivered FIBC and, at the same time, these properties are ensured by operational use on a continuous basis, then there is no electrostatic concern regarding the use of these Type C FIBCs in the above mentioned hazardous zones if properly earthed.

This statement applies on the condition that the manufactured FIBCs match the test sample. The conformity of the products manufactured by the manufacturer with the test samples are not monitored by LABORDATA.

**Note 5** Testing and certifying of the Safe Working Load (SWL) see certificate No. 12814.1/23-7.

**Note 6** Type L1 liner requirements:  
The surface resistivity of **one surface** shall be less than  $1.0 \times 10^8 \Omega$   
**and of the other surface** less than  $1.0 \times 10^{12} \Omega$  (no measurement of breakdown voltage is required)  
**or of the other surface** more than  $1.0 \times 10^{12} \Omega$  and breakdown voltage of less than 4000 V is required.

It has to be tested that L1 liners are properly earthed, the resistance from at least one side of the inner liner to the groundable points on the FIBC shall be less than  $1.0 \times 10^8 \Omega$ .

Type L1C liner requirements:  
The surface resistivity of **the internal layer** shall be less than  $1.0 \times 10^8 \Omega$   
**and of both outer surfaces** less than  $1.0 \times 10^{12} \Omega$  (no measurement of breakdown voltage is required)  
**or of one or both outer surfaces** more than  $1.0 \times 10^{12} \Omega$  (breakdown voltage of less than 4000 V is required).

It has to be tested that L1C liners are properly earthed, the resistance from any conductive layer of the inner liner to the groundable points on the FIBC shall be less than  $1.0 \times 10^8 \Omega$ .

Type L2 liner requirements:  
The surface resistivity of both surfaces shall be between  $1.0 \times 10^9 \Omega$  and  $1.0 \times 10^{12} \Omega$  (no measurement of a breakdown voltage is required).

If the surface resistivity of one surface is between  $1.0 \times 10^9 \Omega$  and  $1.0 \times 10^{12} \Omega$ , and of the other surface higher than  $1.0 \times 10^{12} \Omega$ , then in addition, a breakdown voltage of less than 4000 V is required.

It has to be tested that L2 liners are properly earthed, the resistance from any dissipative layer of the inner liner to the groundable points on the FIBC shall be less than  $1.0 \times 10^{12} \Omega$ .

**Note 7** This certificate expires on 21.07.2026.

Competent Engineer

Dipl.-Inform. Fröchtling

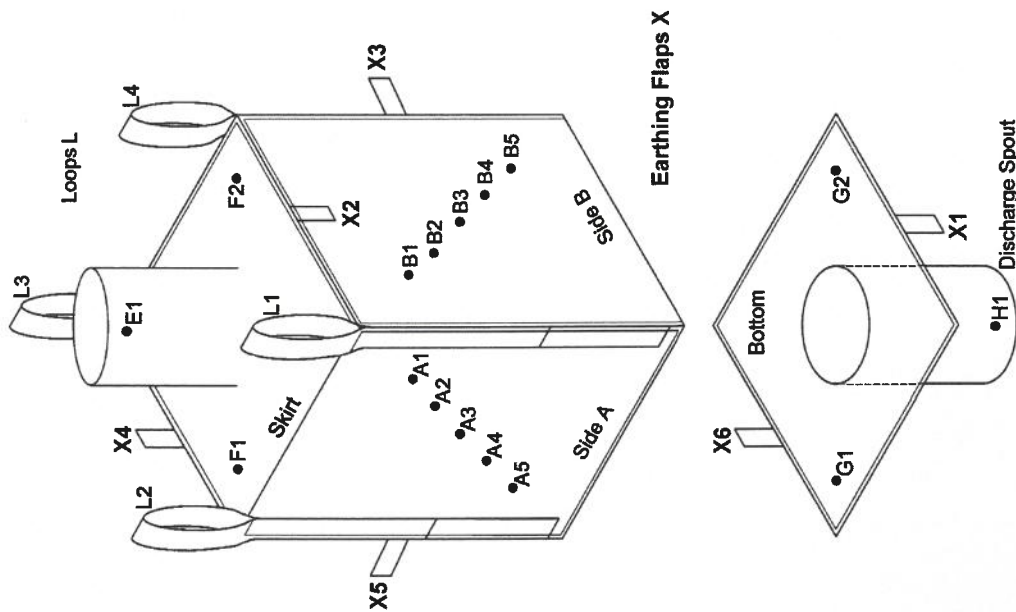
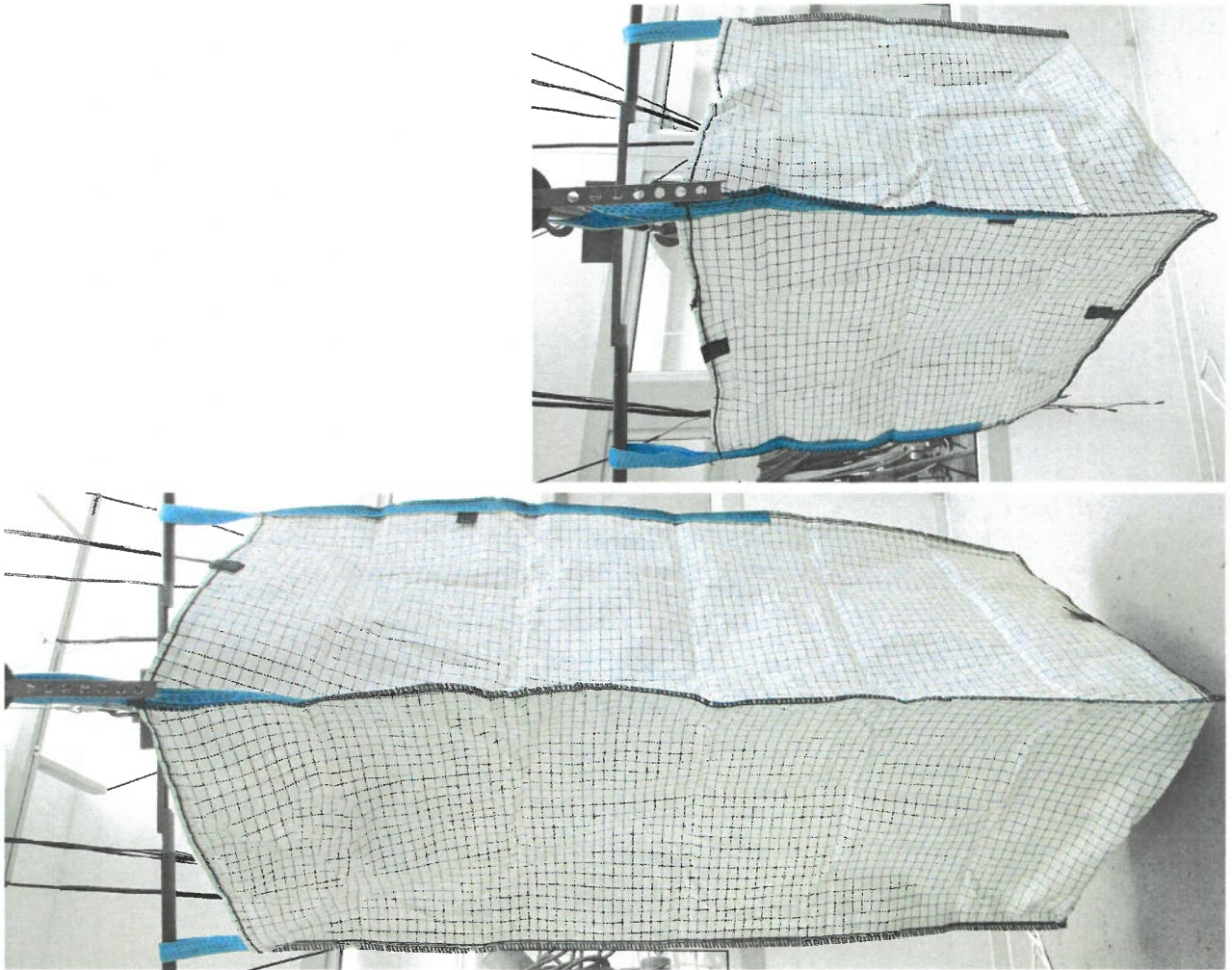


Head of Institute

Dr.-Ing. Kielbassa



Annex 1 / Test Certificate No. C 12813.1/23-7



Positions of Measuring Points



Annex 2 / Test Certificate No. C 12813.1/23-7



Alternative labels for earth bonding points

<b>IEC 61340-4-4</b>	<b>FIBC shall be properly earthed according to manufacturer's instructions</b>
<b>TYPE C</b>	<ul style="list-style-type: none"><li>• Permitted in dust zones 21-22 and in gas zones 1-2 (explosion groups IIA/IIB)</li><li>• Electrical properties may be affected by general usage, contamination and reconditioning</li><li>• All conductive objects, including personnel shall be earthed during FIBC filling and emptying operations (see IEC/TS 60079-32-1 for guidance on earthing)</li></ul>

Prescribed electrostatic label for Type C FIBC



Annex 3 / Test Certificate No. C 12813.1.1/23-7

**Electric derivation resistance of Type C FIBCs**

Symbols indicating the applied measuring voltage: - 10 V = 100 V = 500 V

Conductive tapes at position	Earthing points of white sample „a“						Conductive tapes at position	Earthing points of green sample „b“					
	Loop L1	Loop L2	Loop L3	Loop L4	Flap X1	Flap X2-6		Loop L1	Loop L2	Loop L3	Loop L4	Flap X1	Flap X2-6

Wall fabric – side A

<b>A 1</b>	- 1.5 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.9 <sup>∧</sup>	- 9.2 <sup>∧</sup>	- 9.8 <sup>∧</sup>	<b>A 1</b>	- 2.4 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.8 <sup>∧</sup>	- 1.6 <sup>∧</sup>	- 1.6 <sup>∧</sup>
<b>A 2</b>	- 2.2 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>A 2</b>	- 2.3 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.8 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.5 <sup>∧</sup>
<b>A 3</b>	- 2.1 <sup>∧</sup>	- 2.8 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.3 <sup>∧</sup>	<b>A 3</b>	- 2.3 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.7 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>
<b>A 4</b>	- 2.0 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.2 <sup>∧</sup>	<b>A 4</b>	- 2.4 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.7 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.4 <sup>∧</sup>
<b>A 5</b>	- 2.4 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.8 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.6 <sup>∧</sup>	<b>A 5</b>	- 2.5 <sup>∧</sup>	- 3.4 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.0 <sup>∧</sup>	- 1.6 <sup>∧</sup>	- 1.7 <sup>∧</sup>

Wall fabric – side B

<b>B 1</b>	- 2.1 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>B 1</b>	- 2.6 <sup>∧</sup>	- 3.5 <sup>∧</sup>	- 2.8 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 1.9 <sup>∧</sup>	- 1.8 <sup>∧</sup>
<b>B 2</b>	- 2.1 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.3 <sup>∧</sup>	<b>B 2</b>	- 2.4 <sup>∧</sup>	- 3.4 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 1.9 <sup>∧</sup>	- 1.6 <sup>∧</sup>	- 1.7 <sup>∧</sup>
<b>B 3</b>	- 2.2 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>B 3</b>	- 2.7 <sup>∧</sup>	- 3.7 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.9 <sup>∧</sup>	- 2.0 <sup>∧</sup>
<b>B 4</b>	- 2.5 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.8 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.7 <sup>∧</sup>	<b>B 4</b>	- 3.8 <sup>∧</sup>	- 4.8 <sup>∧</sup>	- 4.4 <sup>∧</sup>	- 3.5 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 3.2 <sup>∧</sup>
<b>B 5</b>	- 2.2 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>B 5</b>	- 2.9 <sup>∧</sup>	- 3.9 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 1.8 <sup>∧</sup>	- 2.2 <sup>∧</sup>

Wall fabric – side C

<b>C 1</b>	- 2.6 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 1.6 <sup>∧</sup>	- 1.6 <sup>∧</sup>	<b>C 1</b>	- 2.1 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.4 <sup>∧</sup>
<b>C 2</b>	- 2.4 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>C 2</b>	- 2.0 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.3 <sup>∧</sup>
<b>C 3</b>	- 2.5 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.5 <sup>∧</sup>	<b>C 3</b>	- 2.0 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.3 <sup>∧</sup>
<b>C 4</b>	- 2.6 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.6 <sup>∧</sup>	<b>C 4</b>	- 1.9 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.2 <sup>∧</sup>
<b>C 5</b>	- 2.2 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.3 <sup>∧</sup>	<b>C 5</b>	- 2.3 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 1.8 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.6 <sup>∧</sup>

Wall fabric – side D

<b>D 1</b>	- 2.6 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 1.7 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>D 1</b>	- 3.3 <sup>∧</sup>	- 4.3 <sup>∧</sup>	- 3.6 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.6 <sup>∧</sup>
<b>D 2</b>	- 2.3 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.2 <sup>∧</sup>	<b>D 2</b>	- 2.5 <sup>∧</sup>	- 3.4 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.7 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.4 <sup>∧</sup>
<b>D 3</b>	- 2.3 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.5 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 1.3 <sup>∧</sup>	- 1.2 <sup>∧</sup>	<b>D 3</b>	- 3.0 <sup>∧</sup>	- 4.0 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 2.1 <sup>∧</sup>
<b>D 4</b>	- 2.1 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.1 <sup>∧</sup>	- 1.0 <sup>∧</sup>	<b>D 4</b>	- 2.9 <sup>∧</sup>	- 3.8 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.0 <sup>∧</sup>	- 2.0 <sup>∧</sup>
<b>D 5</b>	- 2.4 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	- 1.4 <sup>∧</sup>	<b>D 5</b>	- 3.6 <sup>∧</sup>	- 4.6 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 1.9 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.7 <sup>∧</sup>

Skirt fabric

<b>F 1</b>	- 3.4 <sup>∧</sup>	- 4.4 <sup>∧</sup>	- 3.4 <sup>∧</sup>	- 3.1 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 1.8 <sup>∧</sup>	<b>F 1</b>	- 2.9 <sup>∧</sup>	- 4.0 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.0 <sup>∧</sup>
<b>F 2</b>	- 2.5 <sup>∧</sup>	- 3.3 <sup>∧</sup>	- 2.6 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.1 <sup>∧</sup>	<b>F 2</b>	- 2.3 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.6 <sup>∧</sup>	- 1.1 <sup>∧</sup>

Bottom fabric

<b>G 1</b>	- 2.1 <sup>∧</sup>	- 2.7 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.2 <sup>∧</sup>	- 1.0 <sup>∧</sup>	- 1.1 <sup>∧</sup>	<b>G 1</b>	- 2.6 <sup>∧</sup>	- 3.6 <sup>∧</sup>	- 2.8 <sup>∧</sup>	- 2.0 <sup>∧</sup>	- 1.5 <sup>∧</sup>	- 1.8 <sup>∧</sup>
<b>G 2</b>	- 2.2 <sup>∧</sup>	- 2.9 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 2.1 <sup>∧</sup>	- 9.1 <sup>∧</sup>	- 1.2 <sup>∧</sup>	<b>G 2</b>	- 2.3 <sup>∧</sup>	- 3.2 <sup>∧</sup>	- 2.4 <sup>∧</sup>	- 1.8 <sup>∧</sup>	- 1.2 <sup>∧</sup>	- 1.5 <sup>∧</sup>

Discharge spout fabric

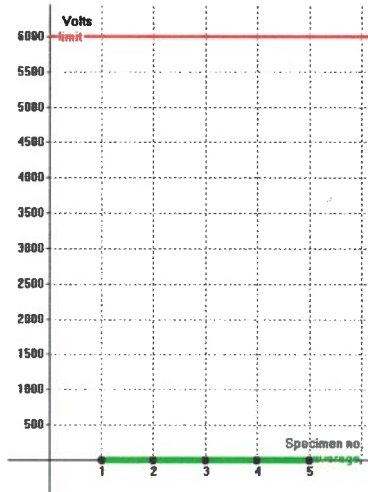
<b>H 1</b>	= 9.6 <sup>∧</sup>	= 9.7 <sup>∧</sup>	= 9.4 <sup>∧</sup>	= 9.3 <sup>∧</sup>	= 6.6 <sup>∧</sup>	- 9.4 <sup>∧</sup>	<b>H 1</b>	- 3.6 <sup>∧</sup>	- 4.7 <sup>∧</sup>	- 3.8 <sup>∧</sup>	- 3.0 <sup>∧</sup>	- 2.3 <sup>∧</sup>	- 2.7 <sup>∧</sup>
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Annex 4 / Test Certificate No. C 12813.1/23-7

**Breakdown voltages of wall and bottom**

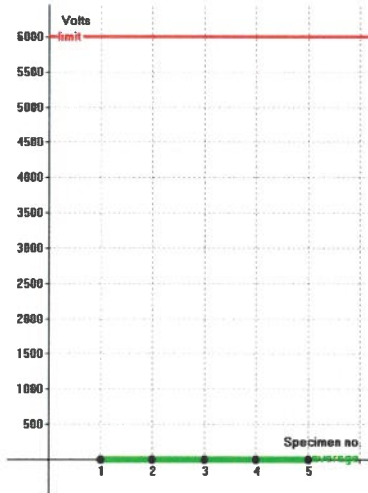


Specimen no.	Maximum voltage readings					Average Volts	Weight g/m <sup>2</sup>
1	0	0	0	0	0	0	135
2	0	0	0	0	0	0	136
3	0	0	0	0	0	0	134
4	0	0	0	0	0	0	135
5	0	0	0	0	0	0	137

Average weight, uncoated 135 g/m<sup>2</sup>  
Standard derivation 0 V  
Coefficient of variation 0 %  
95% confidence interval +/- 0 V

**Maximum breakdown voltage 0 V**  
**Total average breakdown voltage 0 V**

**Breakdown voltages of skirt**

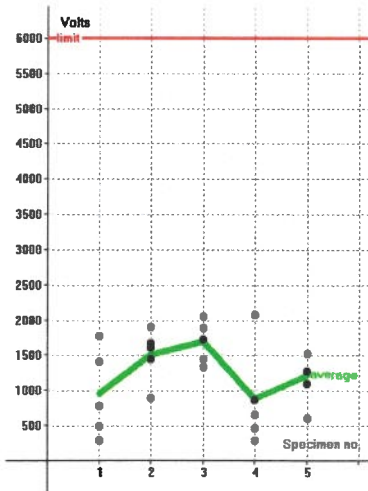


Specimen no.	Maximum voltage readings					Average Volts	Weight g/m <sup>2</sup>
1	0	0	0	0	0	0	89
2	0	0	0	0	0	0	94
3	0	0	0	0	0	0	92
4	0	0	0	0	0	0	91
5	0	0	0	0	0	0	91

Average weight, uncoated 91 g/m<sup>2</sup>  
Standard derivation 0 V  
Coefficient of variation 0 %  
95% confidence interval +/- 0 V

**Maximum breakdown voltage 0 V**  
**Total average breakdown voltage 0 V**

**Breakdown voltages of discharge spout**



Specimen no.	Maximum voltage readings					Average Volts	Weight g/m <sup>2</sup>
1	297	498	791	1416	1787	957	106
2	1445	898	1601	1674	1904	1504	107
3	1713	1455	1347	1899	2055	1693	110
4	302	659	869	473	2084	877	105
5	1533	1264	1098	615	1528	1207	108

Average weight incl. coating 107 g/m<sup>2</sup>  
Standard derivation 547 V  
Coefficient of variation 43 %  
95% confidence interval +/- 225 V

**Maximum breakdown voltage 2084 V**  
**Total average breakdown voltage 1248 V**