



**Test Certificate No. B 11738.1/20-5**

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

**Test order** Suitability tests for Type B FIBCs acc. IEC 61340-4-4:2018

**Test pieces** 2 white PP fabrics + 1 yellow label + 1 PE document pocket

**Date of receipt** 11.05.2020

**Specifications**

**PP-Fabrics**

Naming: Reference	coloured tapes	weight (g/m <sup>2</sup> )	Tapes / 10cm (warp x weft)
Sample A: body fabric	2 orange tapes	123 – 136, uncoated	44 x 47
Sample B: skirt fabric	2 orange tapes	63 – 66 incl. coating	37 x 39

**Yellow label with electrostatic information**

Size: 19 cm x 14 cm  
Details: Yellow taffeta material, front side with yellow background colour and black ink, rear white side unprinted  
Weight: 67 g/m<sup>2</sup>

**Document pocket**

Size: 34 cm x 26.3 cm  
Details: Transparent PE foil, unprinted  
Weight: 75 g/m<sup>2</sup>

**1. Electrical Breakdown Voltage**

The suitability of fabrics usable for Type B FIBCs depends on their breakdown voltage. 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"

**Test apparatus** High-voltage power supply: Labordata DSS 75/25 USB

**Electrodes** IEC 60243-1, Electrode device P75/P25

**Test climate** Temperature 23° C; humidity of atmosphere 20 % acc. IEC 61340-4-4:2018

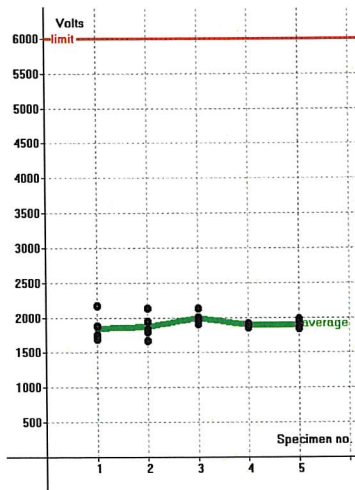
**Test conditions** Five specimens of both fabrics have been taken by a circular cutter (each specimen 100 cm<sup>2</sup>) and have been installed into the measuring device LABORDATA P75/P25 USB (diameter of the electrodes d = 75 mm and d = 25 mm). Then a direct voltage has been applied and increased up to breakdown at a speed of 300 V/s acc. IEC 61340-4-4:2018.

Five measurements have been performed at each specimen.



**Test results**

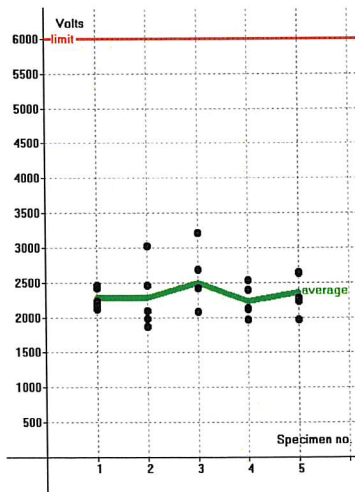
**Sample A**



Specimen no.	Maximum voltage readings					Average volts	Weight g/m <sup>2</sup>
	1	2	3	4	5		
1	1694	1713	2172	1752	1879	1842	136
2	1674	1796	1831	2133	1943	1875	123
3	1997	1948	1904	2011	2133	1998	133
4	1918	1904	1860	1918	1884	1896	132
5	1845	1943	1860	1865	1977	1898	130

Average weight, uncoated 131 g/m<sup>2</sup>  
 Standard derivation 125 V  
 Coefficient of variation 6 %  
 95% confidence interval ± 51 V  
 Maximum breakdown voltage **2172 V**  
 Total average breakdown voltage **1902 V**

**Sample B**



Specimen no.	Maximum voltage readings					Average volts	Weight g/m <sup>2</sup>
	1	2	3	4	5		
1	2456	2167	2124	2416	2236	2279	63
2	1977	2094	3022	2460	1865	2283	66
3	2084	2421	2084	3208	2680	2495	63
4	2133	2124	2392	1972	2534	2231	66
5	1972	2646	2636	2280	2236	2354	66

Average weight incl. coating 65 g/m<sup>2</sup>  
 Standard derivation 322 V  
 Coefficient of variation 13 %  
 95% confidence interval ± 132 V  
 Maximum breakdown voltage **3208 V**  
 Total average breakdown voltage **2328 V**

**2. Surface Resistivity of the document pocket and the yellow label**

Type B FIBC labels and document pockets shall not be made from materials with Surface Resistivity of less than  $1.0 \times 10^9 \Omega$ .

**Test regulations** 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"

**Test apparatus** Teraohmmeter Labordata AW 200-4, 10 V / 100 V



**Electrodes** IEC 61340-2-3, Ring electrode  
Outer diameter of inner electrode: 30 mm  
Inner diameter of annulus electrode: 56 mm  
Outer diameter of annulus electrode: 64 mm

**Test climate** Temperature 23° C; humidity of atmosphere 60 % acc. IEC 61340-4-4:2018

**Test conditions** The samples have been installed into the measuring device Labordata AW 200-4 and five measurements of both surfaces have been performed.

**Test results** **Document pocket**

Front surface (Ω)	5.8 * 10 <sup>11</sup>	5.8 * 10 <sup>11</sup>	6.1 * 10 <sup>11</sup>	6.0 * 10 <sup>11</sup>	6.1 * 10 <sup>11</sup>
Rear surface (Ω)	6.1 * 10 <sup>11</sup>	5.9 * 10 <sup>11</sup>	6.1 * 10 <sup>11</sup>	6.3 * 10 <sup>11</sup>	6.2 * 10 <sup>11</sup>

**Yellow label**

Front surface (Ω)	1.2 * 10 <sup>10</sup>	4.2 * 10 <sup>11</sup>	5.0 * 10 <sup>11</sup>	5.3 * 10 <sup>11</sup>	5.0 * 10 <sup>11</sup>
Rear surface (Ω)	2.4 * 10 <sup>11</sup>	1.0 * 10 <sup>11</sup>	5.1 * 10 <sup>10</sup>	5.2 * 10 <sup>11</sup>	5.3 * 10 <sup>11</sup>

**3. Assessment of the test results**

The breakdown voltages of both fabrics tested are clearly below 6000 V, the maximum allowable value for type B FIBCs.

The materials of the yellow label and the document pocket have surface resistivities of higher than 1.0 x 10<sup>9</sup> Ω.

**Both fabrics, the yellow label and the document pocket fulfill the conditions of IEC 61340-4-4:2018 "Standard test methods for specific applications – Electrostatic classification of flexible intermediate bulk containers (FIBCs)" to be used for**

**FIBCs of type B.**

**4. Notes**

**Note 1** Type B-FIBCs are allowed to be used in zones 21 and 22 with MIE > 3 mJ, not allowed in zones 0, 1, 2 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 B FIBCs shall be durably marked by means of permanently attached yellow labels, with at least the information and symbol ISO 7000-2415 as follows:

<b>IEC 61340-4-4</b>

<b>TYPE B</b>

- Permitted in dust zone 21-22 with MIE > 3 mJ**
- Electrical properties may be affected by general usage, contamination and reconditioning**
- All conductive objects, including personnel shall be earthed during FIBC filling and emptying operations (see IEC/TS 60079-32-1 for guidance on earthing)**

**Note 3**

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

**Note 4**

This certificate expires on 27.05.2023. The test pieces are kept in our store during this validity period.

Competent Engineer

Dipl.-Inform. Fröchtling



Head of Institute

Dr.-Ing. Kielbassa