

# Test report 921374-16-0316-01



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Swissi Process Safety GmbH · Mattenstrasse 24 · CH-4002 Basel · Switzerland

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## Test of a FIBC “ALSAN TYPE D 04/2016” as Type D according to IEC 61340-4-4 Ed. 2

### Summary

On behalf of ALSAN Plastik Tekstil Metal San. Tic. Ltd., a FIBC sample Type D has been tested. The tests have been performed according to the IEC International Standard IEC 61340-4-4/Ed.2/2012. The tests included gas ignition tests during filling and emptying of FIBC on the test rig of the SWISSI Process Safety GmbH and measurement of the breakdown voltage.

In 453 ignition tests **no ignition** occurred. The breakdown voltage **is less than 6 kV**. Thus, the tested FIBC's has met the requirements for breakdown voltage and ignition testing as specified in Clause 7.2 and Clause 7.3.2 of the IEC International Standard 61340-4-4/Ed.2/2012.

The Type D label is **not in compliance** with the requirements of FIBC Type D according IEC 61340-4-4, Ed.2.

Detailed information on the sample, test parameters and test results are shown in the following tables.

Date: May 20, 2016

Our reference: KU

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express written approval of  
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The test results refer exclusively  
to the units under test.

Head of Testing

May 20, 2016

Christian Kubainsky

The results in this test report are based on measurements of samples given to the test laboratory.  
The total test report may be copied but not parts of it.

This classification certificate for a FIBC design shall be valid for a period of three years from the date of issue.



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### Test Object

No	Sample	Sample Description	Receiving Date
1	FIBC Type D	<p>ALSAN TYPE D 04/2016</p> <p>Color: white fabric, blue yarn, fabric coated Construction: U-Profil, 4 lifting loops Size: 90cm x 80cm x 115cm Label: 1 pc 7cm x 11cm, white liner: no</p>	24th April 2016

### Test conditions

Test Rig	
Test method	Gas ignition tests according to IEC 61340-4-4/Ed.2/2012
Date of testing	May 18 <sup>th</sup> /19 <sup>th</sup> , 2016
Material circulated in the test rig	Indelpro Valtec HP423 homopolymer polypropylene resin
Mass flow rate during filling of FIBC	1 kg/s
Charging current during filling of FIBC	-3 $\mu$ A
Corona tip voltage required to maintain the charging current of -3 $\mu$ A	-(15 $\pm$ 2) kV
Gas flow rate in the ignition probe	0.21 l/s
Gas mixture for ignition tests	5.4 % C <sub>2</sub> H <sub>4</sub> (ethylene) in a mixture with air The ethylene concentration was continuously monitored with an infrared ethylene gas analyser
Minimum ignition energy of gas mixture	0.14 mJ
Number of ignition tests/ignitions in the preceding Type B FIBC tests	At 23°C and 20%rh: 20/10 At 23°C and 60%rh: 14/10

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## Test Results

<b>FIBC Sample</b>	Type D FIBC			
<b>Date of tests</b>	May 18 <sup>th</sup> , 2016			
<b>FIBC earthed/isolated</b>	isolated			
<b>Charging current</b>	-3.0 $\mu$ A	<b>Voltage at corona tips</b>	-(15 $\pm$ 2) kV	
<b>Temperature</b>	23 $^{\circ}$ C	<b>Relative humidity</b>	20 % rh	
<b>Test gas</b>	5.4 % C <sub>2</sub> H <sub>4</sub> in a mixture with air	<b>Minimum ignition energy</b>	0.14 mJ	
<b>FIBC ignition tests (number of ignition tests / ignitions)</b>				
Side	Filling		Emptying	Total
	Side	Label 1	Outlet	
A	50/0	10/0	10/0	70/0
B	50/0	0/0	0/0	50/0
C	50/0	0/0	1/0	51/0
D	50/0	0/0	6/0	56/0
<b>Total</b>	227/0			

<b>FIBC Sample</b>	Type D FIBC			
<b>Date of tests</b>	May 19 <sup>th</sup> , 2016			
<b>FIBC earthed/isolated</b>	isolated			
<b>Charging current</b>	-3.0 $\mu$ A	<b>Voltage at corona tips</b>	-(15 $\pm$ 2) kV	
<b>Temperature</b>	23 $^{\circ}$ C	<b>Relative humidity</b>	60 % rh	
<b>Test gas</b>	5.4 % C <sub>2</sub> H <sub>4</sub> in a mixture with air	<b>Minimum ignition energy</b>	0.14 mJ	
<b>FIBC ignition tests (number of ignition tests / ignitions)</b>				
Side	Filling		Emptying	Total
	Side	Label 1	Outlet	
A	50/0	10/0	10/0	70/0
B	50/0	0/0	0/0	50/0
C	50/0	0/0	6/0	56/0
D	50/0	0/0	0/0	50/0
<b>Total</b>	226/0			

The measurement of the break down voltage has been performed according to IEC 60243-1 with a high voltage supply using the P25/75 electrode arrangement.  
Date of testing: 20 May, 2016.

Climate	Breakdown voltage in kV							
	Inlet	Top	Side A	Side B	Side C	Side D	Bottom	Outlet
23 $^{\circ}$ C / 20% rh	2.8 $\pm$ 0.3	3.3 $\pm$ 0.3	3.1 $\pm$ 0.4	3.1 $\pm$ 0.4	3.5 $\pm$ 0.1	3.3 $\pm$ 0.4	3.2 $\pm$ 0.2	3.0 $\pm$ 0.3



### Pictures



Picture 1: tested FIBC



Picture 2: Label on tested FIBC

IEC 61340-4-4	<b>FIBC does not require earthing</b>
	<ul style="list-style-type: none"><li>• Permitted in dust zones 21- 22 and gas zones 1- 2 (explosion groups IIA/IIB with MIE <math>\geq 0,14</math> mJ) and where charging currents <math>\leq 3 \mu\text{A}</math></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</li></ul>
TYPE <b>D</b>	

Picture 3: Example of a label for Type D FIBC