



**TEST REPORT No.: 18.0278 - 88**

Test: **Dust explosion**

Applicant: **XP Products LLC**  
**800 W. 5<sup>th</sup> Ave. Suite 201G, Naperville, IL 60532, USA**

Producer: **XP Products LLC**  
**800 W. 5<sup>th</sup> Ave. Suite 201G, Naperville, IL 60532, USA**

Tested Subject: **XP DRUM KIT**

Design of Sample: **-**

Sample Number: **20746 (1 qty.)**

Certificate Number: **Only tests**

Delivery of Sample: **17<sup>th</sup> of October 2018**

Testing Method: **Customer requirements**

Present at tests: **Mr. David Hakes, President, XP Products, USA**

Responsible person: Ing.Ladislav Byrsky  
Deputy of Testing Laboratory

Date of issue: 13<sup>th</sup> of November 2018

Elaborated by:  
Ing.Tomáš Štula, Ph.D.  
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Number of annexes: -

Test results mentioned in this test report relate to the items tested only and not replace any other documents.  
In any case the test report shall not be reproduced, except in full, without the written approval of the Testing Laboratory.

**Test Sample:** XP DRUM KIT includes:

1. Heavy duty 55 gallon steel drum, Serial No.: unmarked
2. Drum cover clamp and drum lid including EPDM rubber gasket
3. 20" Transition piece, inner dia. 425mm
4. Hydraulic truck, lifting capacity 800 lb, Serial No.: CY015197

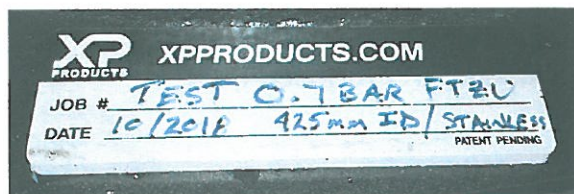
- Documentation:**
1. Instalation, operation, and maintenance manual  
XP DRUM KIT Patent Pending – Utility 35 USC 111(A)
  2. DWG 18-051, Rev.0, 8/5/2018
  3. DWG of transition piece



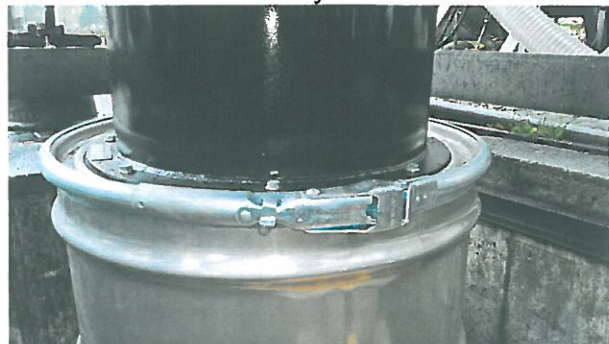
Kit assembly front view



Kit assembly rear view



Drum plate



Cover lid and clamp with rubber gasket

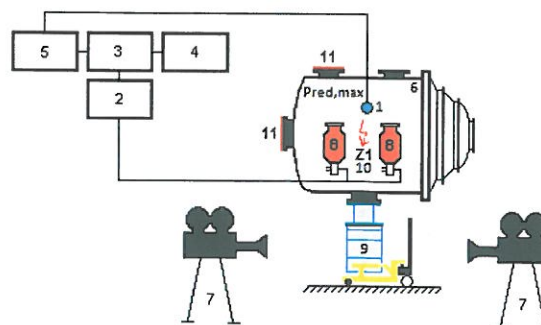
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**Testing Procedure:**

St1 dust explosion verify of kit strength and flame leak for  $P_{red,max}=0,7$  bar g.

Dust specification: St1, Brown coal  
 $K_{st}=190$  bar·m/s,  $P_{max}=7,6$  bar  
 Explosion vessel:  $6,0\text{m}^3$  (L/D=1,1)  
 Ignition position: Z1 (center), energy 10kJ  
 Kit position during tests: Underneath explosion vessel

**Test Conditions:**  $t_{Amb.}= 12-15^{\circ}\text{C}$

**Test Apparatus Arrangement:****Test Instruments and Apparatus:**

1. Pressure transducer Kistler 701A	Reg.No.026
2. Timer / control unit FTZU 002	
3. Transient memory ADAM	Reg.No.230
4. PC computer EVA with plotter	Reg.No.230
5. Charge amplifier Kistler 5011	Reg.No.030
6. Test vessel FTZÚ6 m <sup>3</sup>	
7. 2x Video Camera (30fps, 250fps)	
8. Dust injectors (4 qty.)	
9. XP-Drum Kit	
10. Ignition position	
11. Venting location	
12. Thermometer ALMEMO 2290-3	Reg.No.165
13. Set of weights	Reg.No.237

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**Test Results:***Table of Results:*

Test No.	Dust	Con. Vessel	Ign. loc.	Vent area (m <sup>2</sup> )	Drum Kit configuration	P <sub>red,max</sub> (bar g)	Flame leak	Note / Test Result
1	St1 BC	K <sub>max</sub>	Z1	0,20	Complete Drum Kit	0,51	No	No deformation, damage or compromise of gasket/clamp
2	St1 BC	K <sub>max</sub>	Z1	0,17	Complete Drum Kit	0,51	No	No deformation, damage or compromise of gasket/clamp
3	St1 BC	K <sub>max</sub>	Z1	0,14	Complete Drum Kit	1,01	No	No deformation, damage or compromise of gasket/clamp
4	St1 BC	K <sub>max</sub>	Z1	0,14	Complete Drum Kit	0,80	No	Test No.3 confirmation No deformation, damage or compromise of gasket/clamp
5	St1 BC	K <sub>max</sub>	Z1	0,14	Drum Kit without rubber gasket between drum/cover lid	0,98	No	No deformation, damage or compromise of gasket/clamp
6	St1 BC	K <sub>max</sub>	Z1	0,17	Drum Kit without rubber gasket between drum/cover and lift truck	0,53	No	No deformation, damage or compromise of gasket/clamp
7	St1 BC	K <sub>max</sub>	Z1	0,14	Drum Kit without rubber gasket between drum/cover and lift truck	0,75	No	Test No.6 confirmation No deformation, damage or compromise of gasket/clamp

Table legend:

Dust - used dust classification

(BC – brown coal)

Con. Vessel – dust cloud concentration in the vessel

Ignition loc. – Ignition position

Vent – Vessel venting area

Drum Kit configuration – tested device configuration

P<sub>red,max</sub> – Max. explosion reduced pressure in the vessel

Flame leak – flame leaking between drum and cover lid (high-speed camera detection)

*Test pictures:*

Test No.3

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Gasket removed out from Cover lid and Clamp (before Test No.5)



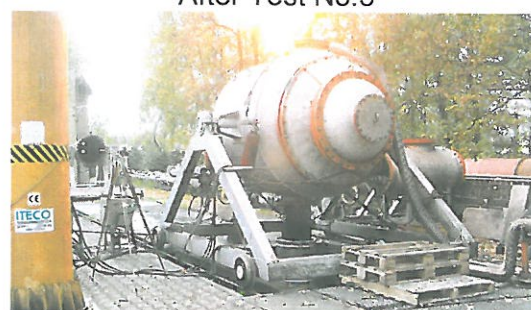
Test No.5



After Test No.5



No truck lift support before Test No.6 / 7



Test No.7

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Tested by: Ing.Tomáš Štula, Ph.D  
Vladimír Sembol  
Tomáš Malík

Date of testing: 18<sup>th</sup> of October 2018

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