



Testing. Advising. Assuring.

Test report No. 2018-1141

for applying of a required "Verwendbarkeitsnachweis"
issued 26.02.2018

Applicant: AFS Boru Sanayi A.S
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Date of order: 04.10.2017
Date of sampling: *no official sampling of the specimen by a representative of Exova Warringtonfire, Frankfurt*
Date of arrival: 30.01.2018
Date of test: 15.02.2018

Order

Testing of the flammability (building class B1) according to DIN 4102-1 (May 1998)

Description / designation of the test object

Product name: AFSTPU (STANDARD)

Description of the relevant test procedure

DIN 4102 part 1 (Mai 1998)

This test report does not replace the required „Verwendbarkeitsnachweis“. It is only used for issuing the "Verwendbarkeitsnachweis".



1. Description of the test material

1.1 Details of the customer:

Product name: AFSTPU (STANDARD)

Product description:

Thickness: 0,5 mm to 1 mm

Color: Transparent

Component: Thermoplastic Polyurethane

Gross Weight for 1 mm thick product: 2000 g/m² ±20%

Gross Weight for 0,5 mm thick product: 930 g/m² ±20%

Intended end use of product: Industrial Hose

1.2 By Exova Warringtonfire, Frankfurt determined values:

Polyurethan

Colour:	transparent	transparent
Thickness:	0,54 mm	1,15 – 2 mm
Square weight:	880 g/m ²	2,16 kg/m ²

Testing after storing 14- days under climatic conditions (23°C / 50 % rel. humidity).

2. Test results

2.1.1 Brandschachtprüfung according to DIN 4102-1

Sample A: Material tested in production direction. Thickness: 0,5 mm

Sample B: Material tested in production direction. Thickness: 1,0 mm

Test results of the Brandschacht tests part 1						
line no.		Measurements test sample				
			A	B	C	D
1	<u>no. test arrangement according to DIN 4102 part 15, table 1</u>		1	1		
2	<u>flame height max. over lower sample edge</u> time ¹⁾	cm	40	50		
		min : s	0:19	0:36		
3	<u>ascertainties on the front side</u> Flaming/glowing time ¹⁾	min : s	0:05	0:11		
4	<u>melting / burning through</u> time ¹⁾	min : s	0:14	0:41		
5	<u>ascertainties on the back side</u> Flaming/glowing time ¹⁾	min : s	no	no		
6		discolouring time ¹⁾	min : s	no	no	
7	<u>burning droplets</u> begin ¹⁾ extent occasional dropping of material constant dropping of material	min : s	not occurred	not occurred		
8						
9						
10	<u>separating from burning sample parts</u> begin ¹⁾ occasional separating parts constant separating parts	min : s	no	no		
11						
12						
13	duration of burning on the sieve tray (max.)	min : s	not occurred	not occurred		
14	<u>influence on the burner flame by dropping of / separating material</u> time ¹⁾	min : s	no	no		
15	<u>earlier end of test</u> end of the fire scenario on the sample ¹⁾ time of a possible resulted test stop ¹⁾	min : s	no	no		
16		min : s				

¹⁾ time from start of test

Test results of the Brandschacht tests part 2					
line no.		Measurements test sample			
		A	B	C	
17	<u>flaming after end of test</u> duration	min : s	--/--	--/--	
18	number of sample		--/--	--/--	
19	front side of sample		--/--	--/--	
20	backside of sample		--/--	--/--	
21	flame length	cm	--/--	--/--	
22	<u>glowing after end of test</u> duration	min . s	not occured	not occured	
23	number of sample		--/--	--/--	
24	place of occurrence		--/--	--/--	
25	lower sample part		--/--	--/--	
26	upper sample part		--/--	--/--	
27	front side of sample		--/--	--/--	
27	backside of sample		--/--	--/--	
28	<u>smoke density</u> < 400 % x min		5	--/--	
29	> 440 % x min		--/--	--/--	
30	diagram in annex no.		1	2	
31	<u>residual length</u> single results	cm	66 / 67 65 / 65	68 / 69 68 / 68	
32	average of the single results	cm	65	68	
33	photo of the sample on page		5	5	
34	<u>smoke temperature</u> max. of the average results	°C	109	114	
35	time ¹⁾	min : s	9:16	7:38	
36	diagram in annex no.		1	2	

¹⁾ time from start of test

Remarks: Because of the residual length of > 45 cm in the test, the quantity of tests could be reduced, according to DIN 4102-16.

2.1.2 Appearance of the specimen after the test:



Sample A



Sample B

2.2.1 Normal flammability test according to DIN 4102-1

Test with edge ignition without deposit
 Flame application on: lower sample edge
 Edge ignition

Length direction

Sample-no.	1	2	3	4	5
Time from start of test					
Ignition point [s]	1	1	1	1	1
Reaching the measuring mark within 20 seconds	no	no	no	no	no
Self-extinguishing of the flame [s]	-	-	-	-	-
Max. flame height [mm]	60	70	60	60	60
Time [s]	12	12	11	11	12
End of afterflaming [s]	>10	>10	>10	>10	>10
End of afterglowing [s]	-	-	-	-	-
Flames extinguished after [s]	25	25	25	25	25
Smoke development (visual impression) _{low / moderate / strong}	strong smoke development				
Separating from burning material	yes	yes	yes	yes	yes
Time [s]	11	10	10	8	9

Remarks: dripping off from burning material

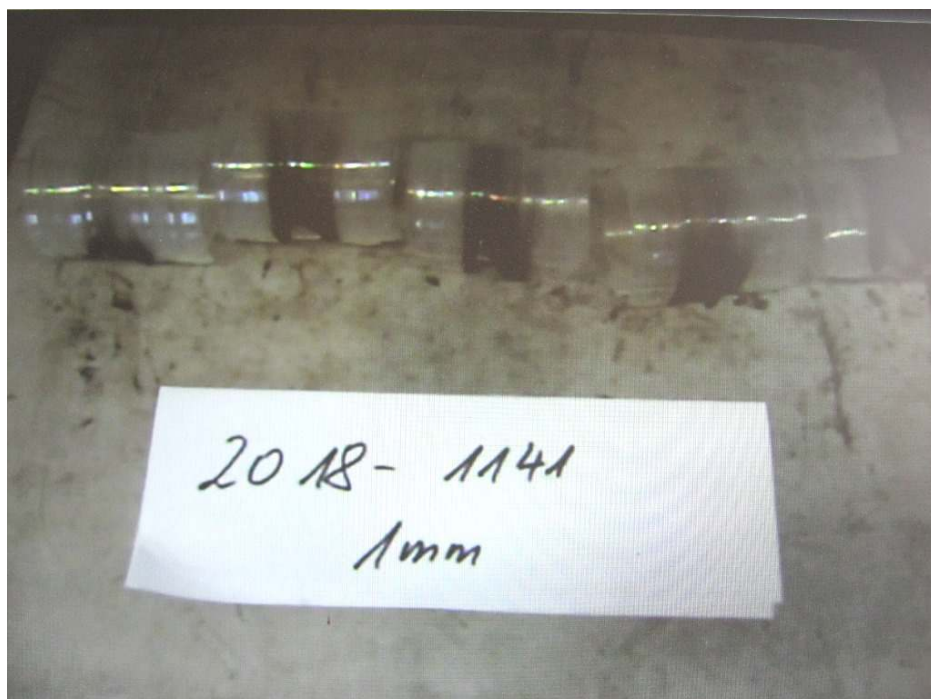
Test with edge ignition without deposit
 Flame application on: lower sample edge
 Edge ignition

Cross direction

Sample-no.	1	2	3	4	5
Time from start of test					
Ignition point [s]	1	1	1	1	1
Reaching the measuring mark within 20 seconds	no	no	no	no	no
Self-extinguishing of the flame [s]	22	20	18	18	18
Max. flame height [mm]	50	50	50	50	50
Time [s]	15	15	15	15	15
End of afterflaming [s]	7	5	3	3	3
End of afterglowing [s]	-	-	-	-	-
Flames extinguished after [s]	-	-	-	-	-
Smoke development (visual impression) _{low / moderate / strong}	strong smoke development				
Separating from burning material	yes	yes	yes	yes	yes
Time [s]	10	11	10	10	9

Remarks: dripping off from burning material

2.2.2 Appearance of the sample after the small burner test:



Assessment

The material described in chapter one fulfils the requirements of the building class B2 according to DIN 4102-1 (Mai 1998).

The determined test results show that the material also fulfils the requirements

of the building class B1 burning droplets

according to DIN 4102-1 (Mai 1998).

Special note

The fire test result is only valid for the material described in chapter one in the tested colour and square weight.

The test was carried out in free hanging configuration.

The distance to other plane material must be more or equal then 40 mm.

The material wasn't tested after an outside storage.

In combination with other materials (for example coatings, deposits) the burning behaviour could be influenced unfavourable so that the classification above is not valid any longer. According to DIN 4102-1 the burning behaviour in combination with other materials has to be tested separately.

This test report does not replace the required „Verwendbarkeitsnachweis“. It is only used for issuing the “Verwendbarkeitsnachweis”.

Frankfurt, the 26.02.2018



H. Anders
Tester in Charge



i. V.
Dipl.-Ing. T. Zachäus
Head of the business



This Test report is valid until 14.02.2023.

The results of the tests relate only to the behaviour of the test specimen which is designated on the top.

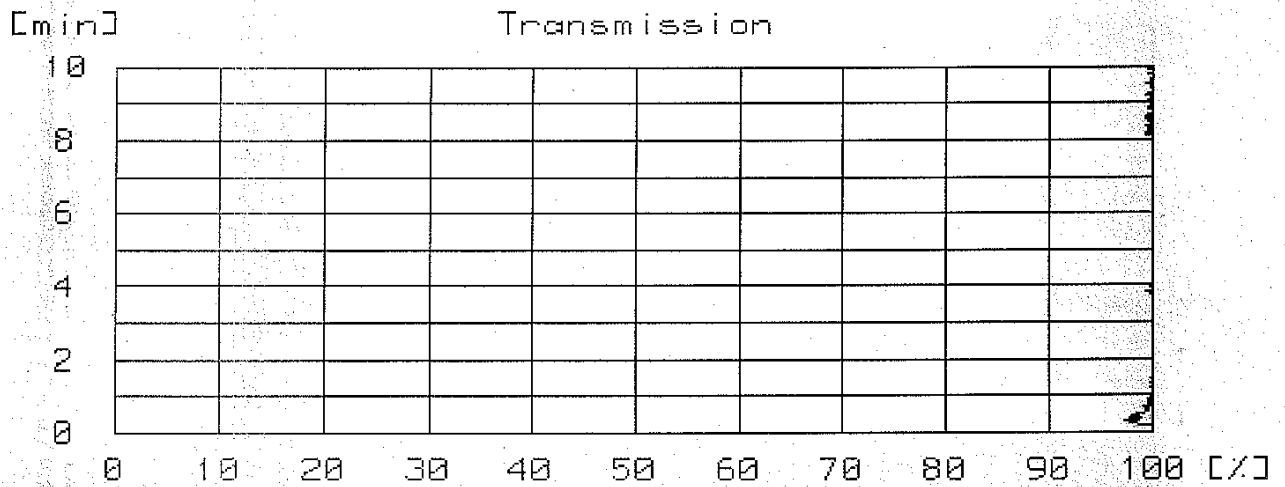
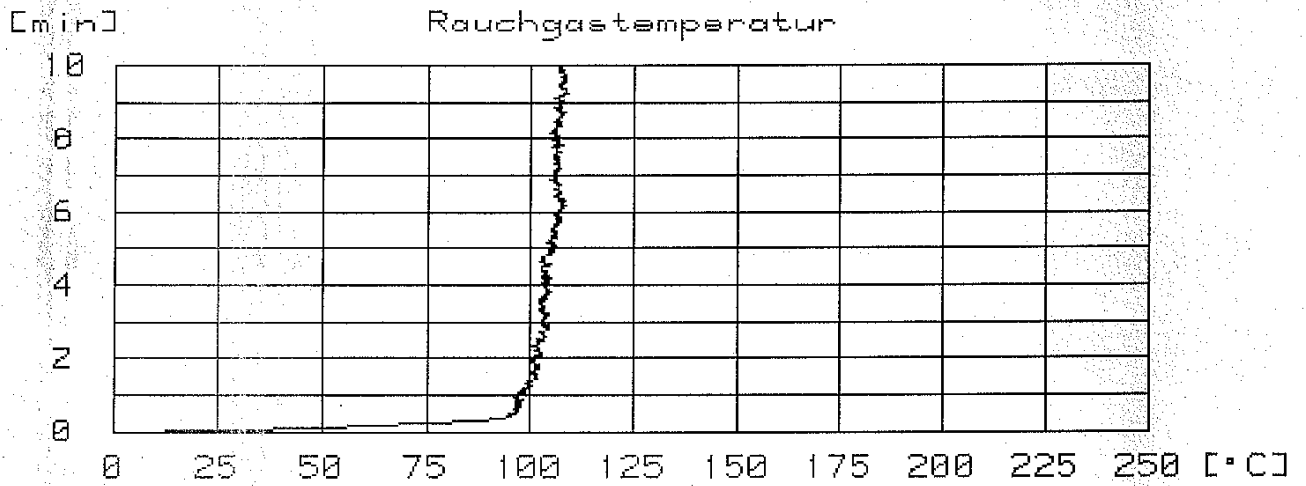
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This test report is a translation of the German version 2018-1141 (issued 26.02.2018). In case of doubt only the German version is valid

This test report contains 8 pages and 2 annexes.

Annex 1 to the Test report No. 2018-1141 issued 26.02.2018

Sample A:



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Annex 2 to the Test report No. 2018-1141 issued 26.02.2018

Sample B:

