

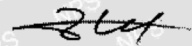
TEST REPORT

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Report No. : NPS019121422UK
Sample Trademark :
Name of Sample : Alum Foil Flex Duct
Sample Model : Alum Foil Flex Duct
Test Category : Fire tests
Test Requested : BS 476 Part 6、 Part 7、 Part 20
Test Method : BS476 Fire tests on building materials and structures
Part 6: Method of test for fire propagation for products.
Part 7 method of test to determine the classification of the surface spread of flame of products.
Part 20: Method for Determination of the Fire Resistance of Elements of Construction (General Principles)
Testing Period : December 24, 2019 - January 16, 2020
Date of Issue : January 16, 2020
Test Results : Pass

NPS

Signed for and on behalf of Consumer
NPS Laboratory Company Limited



Technical director

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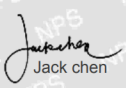
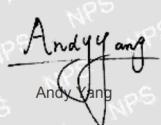
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7. Generally, the responsible is only for the samples in entrusted test.

TEST REPORT

Product Detail	Sample Name	Alum Foil Flex Duct
	Sample Model	Alum Foil Flex Duct
	Appearance&Color	Odorless
Test Content	Test Item	BS476 Part6 Part7 Part20 Test
	Test Requested	BS476 Fire tests on building materials and structures- Part 6: Method of test for fire propagation for products. Part 7 method of test to determine the classification of the surface spread of flame of products. Part 20: Method for Determination of the Fire Resistance of Elements of Construction (General Principles)
	Test Result	PASS
	Conclusion	The submitted samples complied with the requirement of above safety Standards.
Testing Laboratory	Applicant	NPS CHINA TEST LABORATORY
	Address	NPS building, No.160,GuanChang Road,ChangAnTown DongGuan City,GuangDong Province,China 523855
Remark	1) When determining for test conclusion, measurement uncertainty of tests has been considered. 2) This report shall not be reproduced except in full without the written approval of the testing laboratory.	
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;"> <p>Tested by:</p>  <p>Engineer Jack chen</p> <p>January 15, 2020</p> </div> <div style="text-align: center;"> <p>Reviewed by:</p>  <p>Supervisor Andy Yang</p> <p>January 16, 2020</p> </div> </div>		

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List of test items:

Number	Test Item	Result
1	BS476 Part 6:1989+A1:2009	Pass
2	BS 476 Part 7:1997+AC:2014	Pass
3	BS476 Part 20:1987	Pass

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Possible test case verdicts

- Test case does not apply to the test object.....: N/A
- Test object does meet the requirement: P (Pass)
- Test object does not meet the requirement: F (Fail)

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BS 476 Part 6

Clause	Requirement - Test	Result - Remark	Verdict
–	<p>Fire propagation</p> <p>Prior to testing, the sample was conditioned, to constant mass at a temperature of 23 ± 2 °C, and a relative humidity of 50 ± 10 %, and maintained in this condition until required for testing. Three specimens with dimension of 225×225mm were tested according to clause 9 of BS 476-6, and the test result was calculated through clause 10 of BS 476-6.</p>	<p>Fire propagation index: 18.87;</p> <p>Refer to 'Appendix A – Test data' for detail.</p>	P
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Appendix A

Test Data

Throughout the test on each specimen, carefully observe the material's behaviour within the apparatus and take special note of any of the following phenomena listed in clause 9.2 of the standard. None of the listed phenomena was observed and the test results on all three specimens tested were valid.

The index of the performance for the specimen was determined as follows:

$$S_1 = \sum_{t=0.5}^{t=3} \frac{\theta_s - \theta_c}{10t}, S_2 = \sum_{t=4}^{t=10} \frac{\theta_s - \theta_c}{10t}, S_3 = \sum_{t=12}^{t=20} \frac{\theta_s - \theta_c}{10t}, S = S_1 + S_2 + S_3$$

Where:

S = index of performance for each of the specimens tested and S1, S2 and S3 are sub-indices;

t = Time in minutes from the origin which reading are taken;

θ_s = Temperature rise in °C for the specimen at time, t;

θ_c = Temperature rise in °C for the calibration sheet at time, t.

Fire Propagation index $I = i_1 + i_2 + i_3$

Where, i_1 , i_2 and i_3 are given by the expressions:

$$i_1 = \frac{1}{3} [(S_1)_A + (S_1)_B + (S_1)_C], i_2 = \frac{1}{3} [(S_2)_A + (S_2)_B + (S_2)_C], i_3 = \frac{1}{3} [(S_3)_A + (S_3)_B + (S_3)_C]$$

The following test results were obtained for each specimen tested:

Specimen No.	Sub-indices			Index of performance
	S1	S2	S3	S
A	5.35	8.09	5.65	19.09
B	5.08	7.99	5.63	18.69
C	5.25	7.99	5.61	18.85
Number of specimens tested	Sub-index	Sub-index	Sub-index	Fire propagation
	i_1	i_2	i_3	I
3	5.22	8.02	8.63	18.87

Note: If a suffix "R" is included in the above fire propagation index I, this indicates that the results should be treated with caution.

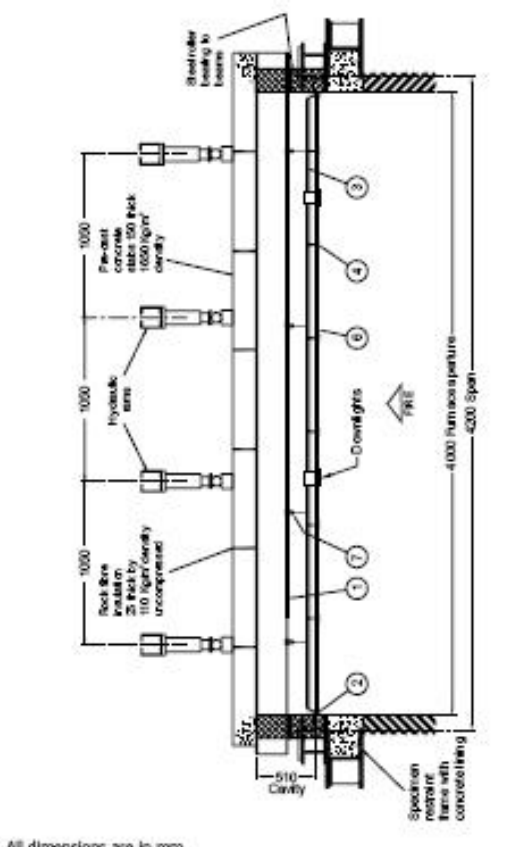
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BS 476 Part 7

Classification	Spread of flame at 1.5 min		Final spread of flame (10 min)	
	Limit (mm)	Limit for one specimen in sample (mm)	Limit (mm)	Limit for one specimen in sample (mm)
class1	175	175+25	183	183+25
class2	225	225+25	487	487+25
class3	275	275+25	723	723+25
class4	Exceeding the limits for class 3			
Explanation of prefix and suffixes which may be added to the classification		<ol style="list-style-type: none"> 1. A suffix R is added to the classification if more than six specimens are required in order to obtain six valid test results (e.g. class 2R). 2. A prefix D is added to the classification of any product which does not comply with the surface characteristics specified in the Standard and has therefore been tested in a modified form (e.g. class D3). 3. A suffix Y is added to the classification if any softening and/or other behaviour that may affect the flame spread occurs (e.g. class 3Y). 		
		<p>For example, a classification of D3RY could be achieved indicating (a) a modified surface has been used; (b) a class 3 result has been obtained; (c) additional specimens have been used to obtain 6 valid results and; (d) softening and/or other behaviour has occurred which is considered to have affected the test result.</p>		

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BS 476 Part 20

Clause	Requirement - Test	Result - Remark	Verdict
–	A total load of 8134 kg was applied to the beam by four point loads produced by hydraulic rams. The rams were positioned at distance 1/8, 3/8, 5/8 and 7/8 of the span of the beam, as shown in Figure 1. The applied load, together with the dead load, was calculated to develop the maximum permissible stress in bending. The load was kept constant for 108 minutes, after which time it was removed from the beam.	Loading Conditions	P
–	 <p>Figure 1 – Longitudinal Section</p>		P

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Photograph

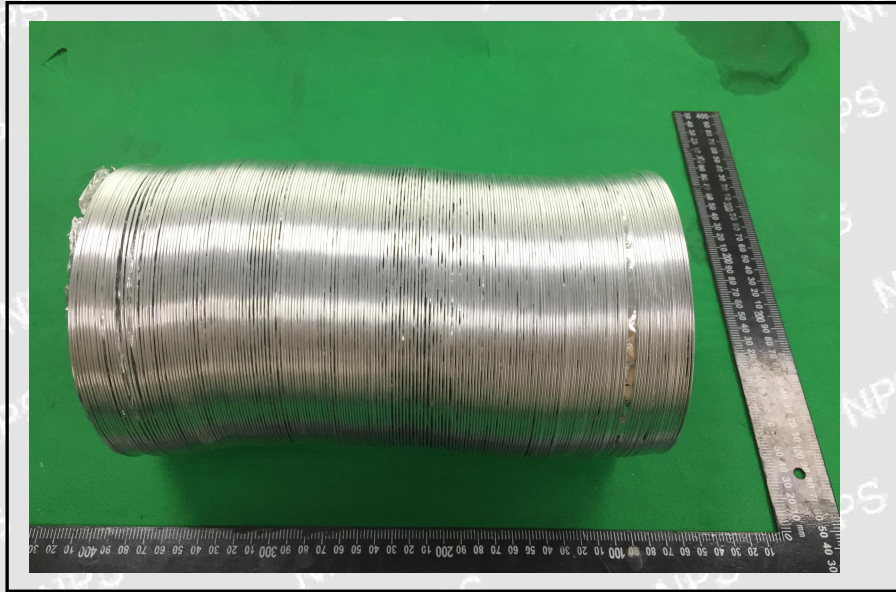


Photo 1#

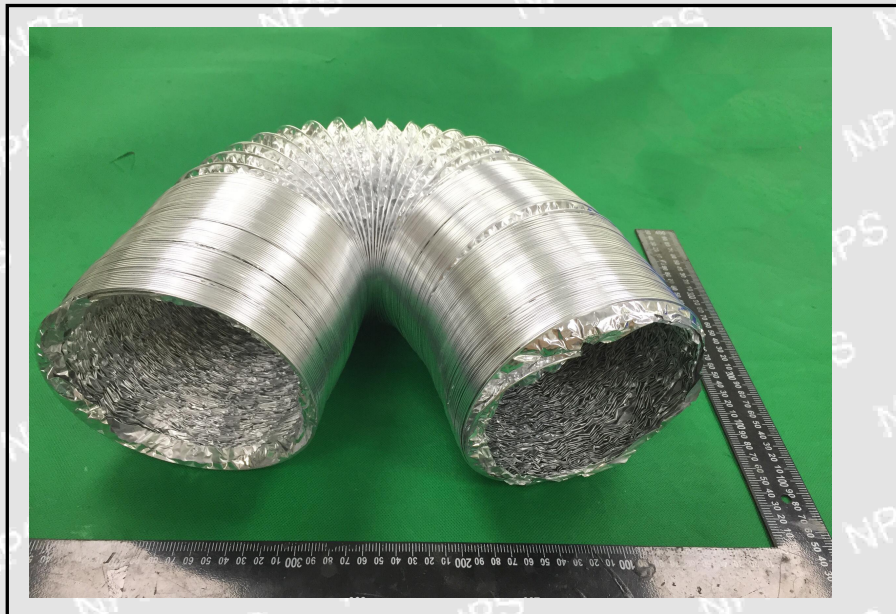


Photo 2#

NPS authenticate the photo on original report only.

End of Report