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Test Report: ICL/H20/12910

ISO 5659-2: 2012

Plastics - Smoke generation - Part 2:

Determination of optical density by a single-chamber test

Test at 50kW/m² without pilot flame

Sponsored By

Hanwha Techwin Co., Ltd
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1 Introduction

EN 45545-2 calls up tests in accordance with the procedures specified in ISO 5659-2 at one heat flux specified in EN 45545-2. There is an additional requirement to calculate and report VOF₄ value.

The principle of the test method of ISO 5659-2 is to expose a material to specified thermal conditions of pyrolysis and combustion in a continuous procedure. The change in optical density of the smoke produced when dispersed within a fixed volume of air is recorded throughout the period of test. The resulting smoke density/time curve is used to calculate the smoke index.

The test method provides a means for the comparative assessment of products, however, it does not model a real fire situation and the results cannot therefore be used to describe the fire hazard of materials under actual fire conditions.

2 Description of Test Specimens

The description of the specimens given below has been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

The test specimens consisted of 1.2mm thick steel plate (density 7.8g/cm³) coated on one face with paint EMS BLACK MATT(MNC)-1 manufactured by Akzonobel applied at 15-20um thickness

The face with the black paint was exposed to the heating conditions of the test

The sponsor of the test has not supplied additional information relating to the product that was tested.

3 Conditioning of Specimens

The specimens were received on 8th September 2020.

The specimens were conditioned to the requirements of ISO 5659-2: 2012, i.e. conditioned to constant mass at 23 ± 2°C and 50 ± 5% RH, before testing.

4 **Date of Test**

The tests were performed on 23rd September 2020.

5 **Test Procedure**

The test was performed in accordance with the procedure specified in ISO 5659-2:2012 and this report should be read in conjunction with that Standard.

Specimens were tested at 50kW/m² without pilot flame only.

6 **Test Results**

The test results apply to the sample as received tested after conditioning. The test results relate only to the behaviour of the specimens of the product under the particular conditions of test; they are not intended to be the sole criterion for assessing the potential smoke hazard of the product in use.

The test results relate only to the specimens of the product in the form in which they were tested. Small differences in the composition or thickness of the product may significantly affect the performance during the test and will therefore invalidate the test results. It is the responsibility of the supplier of the product to ensure that the product, which is supplied, is identical with the specimens, which were tested. Uncertainty measurement has not been taken into account when presenting the test results.

The results of tests carried out can be summarised as follows:-

50kW/m ² in Non-Flaming Mode				
Parameter	Test 1	Test 2	Test 3	Average
Ds at 1.5 mins	0.00	0.00	0.00	0.00
Ds at 4 mins	6.02	5.30	2.34	4.55
Ds Max (in 10mins)	38.80	33.21	38.25	36.75
Ds Max	39.03	33.29	39.11	37.14
Clear beam	94.77	92.19	93.11	93.36
Dsc	3.08	4.66	4.09	3.94
D Max Corrected	35.95	28.62	35.02	33.20
Time to max (Sec)	640.00	606.00	657.00	634.33
VOF4	4.21	4.02	1.79	3.34

Ds V time chart is given in Appendix 1.

7. Requirements

The following requirements are given in Table 5 of EN 45545-2 for R1.

Test Method	Parameter	Requirements	HL1	HL2	HL3
T10.01 EN ISO 5659-2: 50kWm ⁻²	D _s (4) dimensionless	Maximum	600	300	150
T10.02 EN ISO 5659-2: 50kWm ⁻²	VOF _{4min}	Maximum	1200	600	300

8 Conclusion

When tested in accordance with the procedure specified in ISO 5659-2 at 50kW/m² without pilot flame the material shows :

Parameter	Value recorded
D _s (4)	4.55
VOF4	3.34

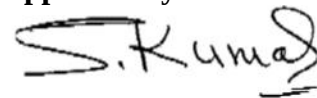
The product tested therefore satisfies the smoke emission requirements specified in EN 45545-2 Table 5 R1 for HL1 , HL2 and HL3.

Prepared by



C. B. Chong
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Approved by



S. Kumar
Technical Manager

Date: 23rd September 2020.

Appendix 1

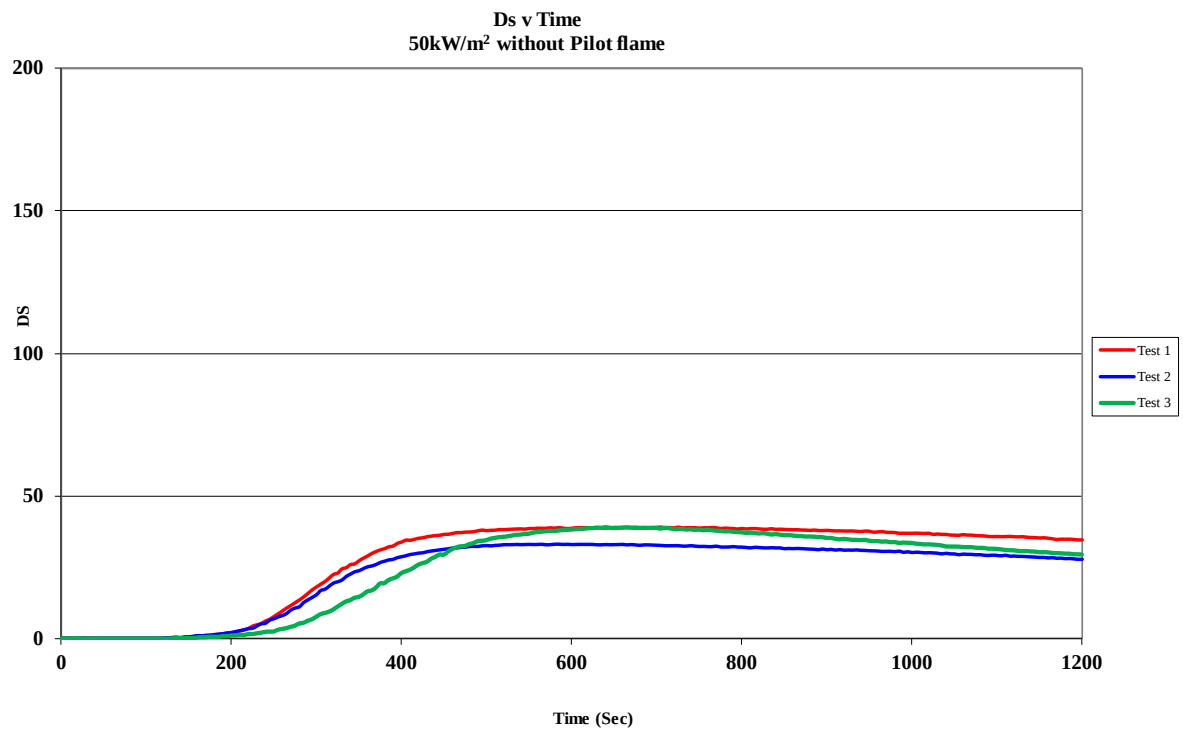


Fig 1: Ds v Time in Flaming mode



Photo 1: Specimen before test. From left to right Test 1, test 2 and test 3

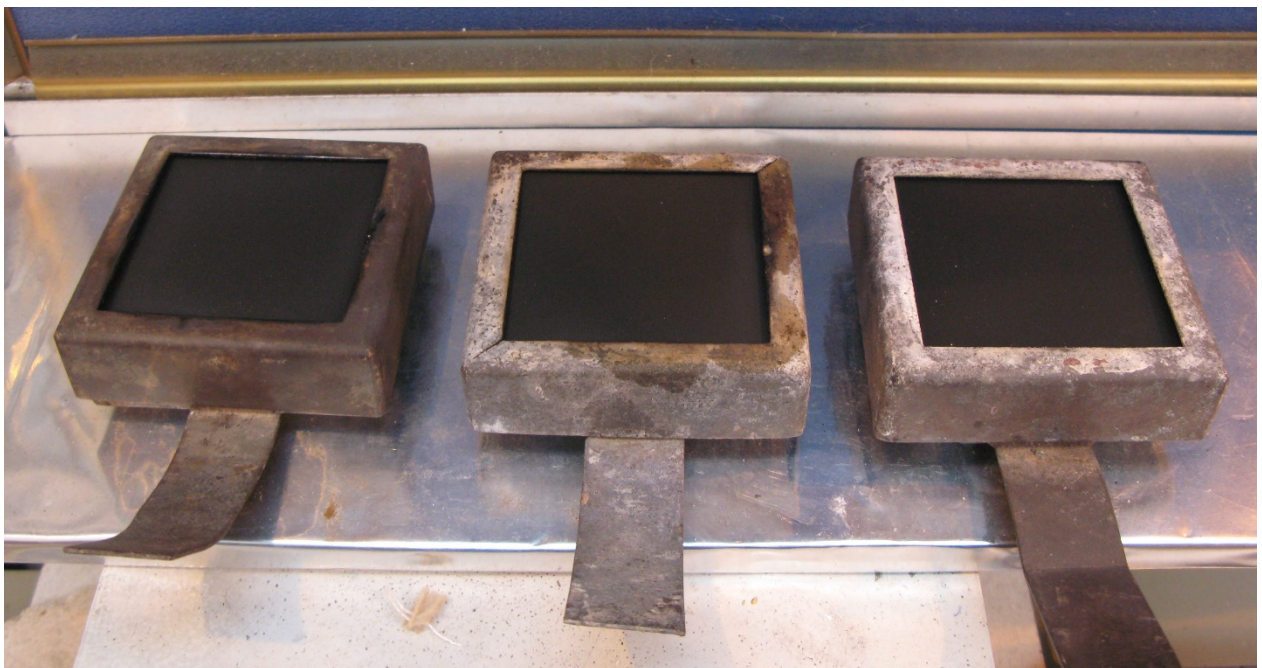


Photo 2: Specimen after test. From left to right Test 1, test 2 and test 3