Interpon®
POWDER COATINGS
Architectural

Guidance Note 14

Fire Propagation and Flame Spread

AkzoNobel

1. Introduction

Fire testing and reports issued by external independent accredited laboratories certify that our range of polyester and fluoropolymer products in several colours, are classified in agreement with different norms in related regions.

2. List of Key Standards

2.1 European Standard: EN13501-1

This norm refers to fire classification of construction products and building elements using data from reaction to fire tests. This is arrived by carrying out two tests:

- EN 13823
- EN ISO 1716

EN 13823 – Single Burning Item evaluates building product (excl. floorings) fire properties regarding heat release rate, smoke production, flame and burning droplets/particles.

EN ISO 1716 (Calorific Value) test determines the potential maximum amount of energy release which can be generated by a product when complete combustion occurs. This test is relevant for classes A1 and A2. Specimens are prepared from each individual component of a product by grinding them into powder. Each component is then tested in an oxygen bomb calorimeter by placing the specimen in a crucible within a stainless-steel vessel filled with oxygen and pressure. A spark is then introduced, exploding the mixture. The resultant temperature rise will be used to calculate the calorific value of the specimen.

The classification is split into 3 components:

- **Combustibility** – A2 means limited combustibility – no contribution to fire (flammable under 20s)
- **Smoke Emission** – s1 is best, s3 is worst – quantity/speed of emission in walls, ceilings, floors
- **Release of droplets or particles** -d0 is best, d2 is worst - production of flaming droplets/debris in walls, ceilings, floors

Interpon polyester (D1036 and D2525) and fluoropolymer (D3020) as A2-s1,d0.

The results are considered increasingly unfavourable from A1 to E for the principal index, as well as for the release of smoke (s1,s2,s3) and flaming droplets (d0,d1,d2).

2.2 British Standards

British Standard 476 refers to fire tests on buildings and structures. The parts of this standard that are relevant to powder coatings are Part 6 and 7.

Part 6 – Fire Propagation
The result of this test is a fire propagation index. It is a measure of fire growth made by an essentially flat surface. The results of the test are specific to test specimen i.e. the product on that particular substrate in the form in which it was tested. Therefore, it cannot be used as a method for assessing the product in all situations.

Part 7 – Surface Spread of Flame

This is a method of measuring flame spread along the surface of a specimen. The results of the test are specific to test specimen i.e. the product on that particular substrate in the form in which it was tested. Therefore, it cannot be used as a method for assessing the product in all situations.

In UK Building Regulations 2000 – Fire Safety Approved Document B, the highest product performance classification for wall or ceiling linings is Class 0. This is achieved if a material achieves a Class 1 rating in BS476 part 7 and a fire propagation index of not more than 12 and sub-index of not more than 6 in BS476 part 6.

Interpon polyester (D1036 and D2525) products have been tested according to BS476 Part 6 and 7 and have met the criteria of Class 0 building regulation approval.

2.3 US Standards

ASTM E1321 is the norm for US for Ignition and Flame Spread Testing.

Interpon D3000 - Fluoropolymer coatings have been tested according to ASTM

E1321 and test results are as follows:

Flame Spread Test

Flame front position	Arrival time at sample
50 mm	155-215 s
100 mm	200-262 s

Flame front velocity: 0.34 -0.45 mm/s

Ignition Test

Surface Ignition Temperature 495°C

Tests conducted by VTEC Laboratories Inc.

" The specimen did not burn enough to generate data for final data analysis

2.4 Australian Standard

The norm for Australian market is: AS/NZS 1530.3-1999 – refers to fire test methods on Building Materials, Components and Structures. Part 3 of this method determines ignitability, flame propagation, heat release and smoke release.

The regulatory indices used for evaluation of tested materials are summarized in below table:

Index name	Range for the index
Ignitability index	0-20
Spread of Flame	0-10
Heat Evolved Index	0-10
Smoke Developed Index	0-10

Interpon polyester and fluoropolymer powder coatings have been tested in Australian

Wool Testing Authority (AWTA) Ltd. Test results for D1000, D2525 and D3020 product banners are summarized in below table.

Index name	D1000 White on silver	D2525 White	D2525 Dark color	D3020
Ignitability index	9	12	14	0
Spread of Flame	0	0	0	0
Heat Evolved Index	0	0	0	0
Smoke Developed Index	2*	Specimens tended to flash before ignition**.	3	1*

*Ignition is initiated by a pilot flame that is held near, but does not touch the specimen. A material that does not ignite during the standard test may ignite if contacted with a pilot flame during the test.
** Ignition was based on the occurrence of a single flash of flame which lasted longer than 10 seconds.

2.5 Chinese Standards

The norm for China market is: GB8624-12 is for classification of combustion performance of building materials and products, and classification of combustion performance of flat building materials and products. The test methods are as follows:

1. GB/T 14402-2007: Determination of Combustion Performance of Building Material Grade Products
2. GB/T 20284-2006: Single-body combustion test of building materials or products is tested

Interpon D series polyester powder coatings have been classified as: A2, s1, d0 and t2*.

- **Combustibility** – A2 means limited combustibility – no contribution to fire
- **Smoke Emission** – s1 is best, s3 is worst – quantity/speed of emission in walls, ceilings, floors is weak.
- **Release of droplets or particles (GB/T 20284)** -d0 is best, d2 is worst – no flaming droplets/particles in 600 sec
- **Smoke toxicity grade (GB/T 20285)**- t0 is best, t2 is worst – satisfy quasi-safety grade 1.

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