

Consolidated Reaction to Fire Report

TEST SUMMARY

A1 / A2-s1,d0 Reaction to Fire
BSEN 13501-1:2007+A1:2009

“Fire classification of construction products and building elements”

Consolidated Reaction to Fire Report

MicroLouvre™ K700 / 17 FHA

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1 Purpose of Classification

The purpose of the Classification is to confirm that the MicroLouvre™ FHA (Fire Heat Attenuation) Metal Fabric and the MicroLouvre™ FHA Screen product can demonstrate an A1 / A2-s1.d0 Reaction to Fire Classification according to BSEN 13501-1:2007+A1:2009

For the purpose of this Classification, information from the following bodies has been consolidated



2 Summary

MicroLouvre™ FHA Metal Fabric and Screen products have a classification without further testing against EN13501-1 of Euroclass A1.

MicroLouvre™ FHA AkzoNobel Interpon D coating is A2s-1,d0

3 Scope of Report

In order to establish the Reaction to Fire Classification the following documents were utilised and assessed
MicroLouvre™ Metal Fabric and Screen Products
(refer Appendix 1)

- i) BS EN 13501-1:2007+A1:2009 Commission Decision
- ii) 96/603/EC OR 267 19.10.1966 (p23) Commission Decision
- iii) 2000/650/EC (0) L258 12.10.2000 (p36) Commission Decision
- iv) 2003/424/EC (03) L 144 12.6.2003 (p9)

Coating

- v) CSTB Classification Report RA18-0083
- vi) In addition, reports from Exova Warrington Fire, Interscience, VTEC Laboratories, CSIRO and Tecnalia were considered

4 Description of Materials

i) MicroLouvre™ Metal Fabric

(refer Appendix 2)

Weft Wire (louvre)	Alloy	CuZn10 (C220)
Warp Wire	Alloy	CuSi3Mn (C655)

ii) MicroLouvre™ Screen Components

(refer Appendix 3)

Frame Extrusion	Alloy	EN AW-6063 T6
Corner Posts	Alloy	EN AW-6063 T6

iii) Installation Components

Channels	Alloy	EN AW-6063 T6
Fixings	Stainless Steel - Grade 316 (UNS S31600)	

iii) Polyester Powder Coating

(refer Appendix 4)

5 Report Evidence

i) International Fire Consultants Ltd (Report #19477 7 March 2019)

(refer Appendix 5)

“MicroLouvre Metal Fabric product and the aluminium extrusions and the stainless steel fixings forming the MicroLouvre Screen Product have a classification without further testing against EN13501-1 of Euroclass A1.

Powder Coating

The reaction to fire classification of the AkzoNobel powder coating is A2s-1,d0 when tested on an aluminium substrate”

ii) CSTB (Centre Scientifique et Technique du Bâtiment) Classification Report RA18-0083

(Refer Appendix 6)

<i>“Fire Behaviour</i>	<i>A2</i>
<i>Smoke production</i>	<i>s1</i>
<i>Flaming droplets or debris</i>	<i>d0</i>
<i>Classification</i>	<i>A2-s1,d0 “</i>

6 Conclusion

Certain products can be assigned a particular fire classification without the need for testing. Such products have well established reaction to fire performance and have been agreed by the Standing Committee on Construction. Agreements relating to such products, which may be classified without further testing (CWFT), are published in the official Journal of the EC and are listed on the NANDO — CPD database on the EC web site

<https://eur-lex.europa.eu/legal-content/EN/PATT/PDF/?uri=CELEX:31996D0603&from=EN>.

The copper alloy wires forming the MicroLouvre™ Metal Fabric product and the aluminium extrusions and the stainless steel fixings forming the MicroLouvre™ Screen Product have a classification without further testing against EN13501-1 of Euroclass A1.

Powder Coating

The reaction to fire classification of the AkzoNobel powder coating is A2-s1,d0 when tested on an aluminium substrate.

APPENDIX 1

19. 10. 96 EN Official Journal of the European Communities No L 267/21

II

(Acts whose publication is not obligatory)

COMMISSION

19. 10. 96 EN Official Journal of the European Communities No L 267/25

ANNEX

Materials to be considered as reaction to fire Classes A provided for in Decision 94/611/EC without the need for testing



General notes

Products should be made only from one or more of the following materials if they are to be considered as Classes A without testing. Products made by gluing one or more of the following materials together will be considered Classes A without testing provided that the glue does not exceed 0,1 % by weight or volume (whichever is the lower).

Panel products (e.g. of insulating material) with one or more organic layers, or products containing organic material which is not homogeneously distributed (with the exception of glue) are excluded from the list.


Products made by coating one of the following materials with an inorganic layer (e.g. coated metal products) may also be considered as Classes A without testing.

None of the materials in the table is allowed to contain more than 1,0 % by weight or volume (whichever is the lower) of homogeneously distributed organic material.

Material	Notes
Expanded clay	
Expanded perlite	
Expanded vermiculite	
Mineral wool	
Cellular glass	
Concrete	Includes ready-mixed concrete and precast reinforced and prestressed products
Aggregate concrete (dense and lightweight mineral aggregates, excluding integral thermal insulation)	May contain admixtures and additions (e.g. PFA), pigments and other materials. Includes precast units
Autoclaved aerated concrete units	Units manufactured from hydraulic binders such as cement and/or lime, combined with fine materials (siliceous material, PFA, blast furnace slag), and cell generating material. Includes precast units.
Fibre cement	
Cement	
Lime	
Blast furnace slag/pulverized fly ash (PFA)	
Mineral aggregates	
Iron, steel and stainless steel	Not in finely divided form 
Copper and copper alloys	Not in finely divided form 

APPENDIX 1 (cont)

The m listed in

Material	Notes
Zinc and zinc alloys	Not in finely divided form 
Aluminium and aluminium alloys	Not in finely divided form

II

(Acts whose publication is not obligatory)

COMMISSION

COMMISSION DECISION

of 26 September 2000

amending Decision 96/603/EC establishing the list of products belonging to Classes A 'No contribution to fire' provided for in Decision 94/611/EC implementing Article 20 of Council Directive 89/106/EEC on construction products

(notified under document number C(2000) 2640)

(Text with EEA relevance)

(2000/605/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

HAS ADOPTED THIS DECISION:

Having regard to the Treaty establishing the European Community,

Having regard to Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products⁽¹⁾, as amended by Directive 93/68/EEC⁽²⁾, and in particular Article 20 thereof,

Whereas:

- (1) Commission Decision 96/603/EC⁽³⁾ established a list of products belonging to Classes A 'No contribution to fire' provided for in Tables 1 and 2 of the Annex to Commission Decision 94/611/EC⁽⁴⁾, which described the European classification system for expressing the reaction-to-fire performance of construction products.
- (2) Decision 94/611/EC has been replaced by Commission Decision 2000/147/EC⁽⁵⁾, which does not refer to Classes A, thus necessitating an amendment to Decision 96/603/EC.
- (3) The measures provided for in this Decision are in accordance with the opinion of the Standing Committee on Construction,

⁽¹⁾ OJ L 40, 11.2.1989, p. 12.

⁽²⁾ OJ L 220, 30.8.1993, p. 1.

⁽³⁾ OJ L 267, 19.10.1996, p. 23.

⁽⁴⁾ OJ L 241, 16.9.1994, p. 25.

⁽⁵⁾ OJ L 50, 23.2.2000, p. 14.

Article 2

This Decision is addressed to the Member States.

Done at Brussels, 26 September 2000.

Article 1

Decision 96/603/EC is hereby amended as follows:

1. in Article 1, the first paragraph is replaced by the following:

'The materials, and products made from them, that are listed in the Annex to this Decision, shall, on account of their low level of combustibility and subject to the conditions also set out in the Annex, be classified in Classes A1 and Class A1_{Fl} as provided for in Tables 1 and 2 of the Annex to Decision 2000/147/EC.;

2. the Annex is amended as follows:

- (a) the title is replaced by the following:

'Materials to be considered as reaction to fire Classes A1 and A1_{Fl} as provided for in Decision 2000/147/EC without the need for testing.;

- (b) the general notes are amended as follows:

(i) in the first and third paragraphs, 'Classes A' is replaced by 'Class A1 and Class A1_{Fl}.'

(ii) in the first and fourth paragraphs '(whichever is the lower)' is replaced by '(whichever is the more onerous)'.

For the Commission
Erkki LIIKANEN
Member of the Commission

MicroLouvre™ Metal Fabrics

Fabric K700-17 Standard & FHA

Composition of raw materials used in MicroLouvre™ Metal Fabrics

Weft Wire (louvre)

Alloy Composition	Pre-mill (pre-flattening)	
	CuZn10 (C220)	
	Cu	89-91%
	Pb	0.05% max
	Fe	0.05% max
	Zn	Rem
Diameter (Die Size)		0.455mm (0.0179")
Mechanical Properties	Tensile	675.7MPa (98 KSI)
	Elongation	2.1%

Warp Wire

Alloy Composition	CuSi3Mn (C655)	
		Annealed Bright
	Fe	0.8% max
	Zn	1.5% max
	Si	2.8 - 3.8%
	Mn	0.5 - 1.3%
	Pb	0.05% max
	Ni+Co	0.6% max
	Cu	Rem
Diameter	Die Size	0.256mm (0.0101")
Mechanical properties	Yield	172.4 - 241.3MPa (25-35 KSI)
	Tensile	465.4MPa (67.5 KSI)
	Elongation	46.0%

Dimensions of MicroLouvre™ Metal Fabric

Woven Fabric (uncoated)

Weft (each louvre)	Width	1.27mm +0.0/-0.1mm (0.050" +0.0"/-0.004")
	Thickness	0.13mm + 0.025/-0.0mm (0.005" +0.001"/-0.0")
	Louvre spacing	1.41mm - 1.49mm (0.056" - 0.059")
	Louvre Count	17min – 18max per 25.4mm (1")
	Louvre angle	17° (degrees) from normal plane when vertical
	Warp (each wire)	Spacing (nominal)
Weight (nominal)	Fabric thickness O/A per Square Metre	1.50mm ±0.10mm (0.059" ±0.004")
	per Square Foot	1.0 kg (2.20 lb)
Fire Resistance	per Square Foot	0.093 kg (0.20 lb)
	Reaction to Fire	A1

Coated Fabric (MN204E - PPC)

Weft (each louvre)	Width	1.30mm +0.0/-0.1mm (0.054 +0.0"/-0.004")
	Thickness	0.35mm +0.025/-0.0mm (0.014" +0.001"/-0.0")
Warp (each wire)	Diameter	0.310mm (0.0122") max
	Fabric thickness O/A	1.55mm ±0.1mm (0.061" ±0.004")
Weight (nominal)	per Square Metre	1.1 kg (2.43 lb)
	per Square Foot	0.102 kg (0.23 lb)
Free Air Passage	By volume	80%
	Openness Factor	By area

FHA Coated Fabric (SN805G - PPC)

Fire Resistance	Coated Fabric Specs	As Above
	Reaction to Fire	A2-s1,d0

The technical data listed are correct as of the date of publication. Smartlouvre Technology Ltd. reserves the right to change the technical data; only the data provided on the company's website www.smartlouvre.com shall be deemed to be current.

APPENDIX 3

MicroLouvre™ Screens

Fabric K700-17

Composition of raw materials used in MicroLouvre™ Standard & FHA Screens

Metal Fabric

Weft Wire (louvre)		Alloy	CuZn10 (C220)
Warp Wire (weft)		Alloy	CuSi3Mn (C655)

Framing Extrusions

Frame Profiles	Code		Alloy	
	FE25		Alloy	EN AW-6063 T6
	FE38		Alloy	EN AW-6063 T6
	FE51		Alloy	EN AW-6063 T6
Track Profiles	RT37		Alloy	EN AW-6063 T6
	DT34		Alloy	EN AW-6063 T6
	BT32		Alloy	EN AW-6063 T6
Corner Post	CP25		Alloy	EN AW-6063 T6
	CP38		Alloy	EN AW-6063 T6
	CP51		Alloy	EN AW-6063 T6
Lacer Wire			Stainless Steel	316 (UNS S31600)
Hinges	FH89	Flush	Stainless Steel	316 (UNS S31600)
	OH76	Offset	Stainless Steel	316 (UNS S31600)
	LORH52	Lift-Off (right)	Stainless Steel	316 (UNS S31600)
	LOLH52	Lift-Off (left)	Stainless Steel	316 (UNS S31600)
Latches	DN28/H	Drop Nose (horizontal)	Stainless Steel	316 (UNS S31600)
	DN28/V	Drop Nose (vertical)	Stainless Steel	316 (UNS S31600)
	SC112	Spring Clip	Stainless Steel	316 (UNS S31600)
	RP/L	Ring Pin & Lanyard	Stainless Steel	316 (UNS S31600)
Handles	DH	D Handle	Stainless Steel	316 (UNS S31600)
Fasteners	M4	Screw	Stainless Steel	316 (UNS S31600)
	M5	Screw	Stainless Steel	316 (UNS S31600)

AkzoNobel Interpon D1036 Matt (30) powder coating product data sheet MicroLouvre™ Metal Fabrics K700 – 17 FHA (A2s-1, d0 Reaction to I

AkzoNobel Powder Coatings



Product Data Sheet

AkzoNobel Powder Coatings Interpon D1036 Matt (30)

Product Description

Interpon D1036 Matt (30) is a range of powder coatings intended for use on architectural aluminium and galvanized steel. Available in a wide stock range Interpon D1036 Matt (30) has been specifically formulated without the use of TGIC.

As part of the Interpon D series of architectural powders, Interpon D1036 Matt (30) gives excellent exterior durability and colour retention. All Interpon D1036 Matt (30) powders are lead free and meet the requirements of GSB standard, Qualicoat Class 1, EN12206, and EN13435 (formerly BS6490/ KRSS407), as well as AAMA 2603-13.

Qualicoat Licence number: P-0236 (FR - France), P-0735 (FR - extension) (Italy), P-0739 (Germany), P-1350 (UK - extension) (Spain), P-0885 (Czech Rep.), P-1126 (Turkey)

GSB Licence Number: 1640 (0993 30)

Powder Properties

Chemical type	Polyester
Gloss (EN ISO 2813 (60°))	25-35 gloss units
Particle size distribution	Suitable for electrostatic spray
Specific gravity	1.2-1.9g/cm ³ depending on colour
Storage	Dry, cool conditions below 30°C (open boxes must be resealed)
Shelf life	24 months below 30°C peak temperature 12 months below 35°C peak temperature
Stoving schedule (object temperature)	15-30 minutes at 180°C 12-25 minutes at 190°C 10-20 minutes at 200°C

Powder on Powder application:

- 1st phase:** Milling and partial curing of the base coat suggested 110-120°C for 15-20 min. (object temp) otherwise refer to the instruction of the spraying equipment supplier
- 2nd phase:** Application of the wood decorative powder according to the instruction of the spraying equipment supplier
- 3rd phase:** Complete curing of the full package for 20-30 minutes at 190°C (object temperature)

Test Conditions

The results shown below are based on mechanical and chemical tests which (unless otherwise indicated) have been carried out under laboratory conditions and are given for guidance only. Actual product performance will depend upon the circumstances under which the product is used.

Substrate	Aluminium (0.5-0.6 mm Al Mg1)
Pretreatment	Chromate (DIN 50539)
Dry Film Thickness	60-80 microns
Stoving Schedule	18 minutes at 190°C (object temperature)
Flexibility	ISO 1519
Adhesion	ISO 2409
Erichsen Cupping	ISO 1520
Impact resistance	ISO 18272 (1193) 20 inch pounds
Hardness	ISO 2815 > 60



Interpon D1036 Matt (30)

Chemical and Durability tests		
Acetic acid salt spray	ISO 9227	Pass at 1000 hours <10 mm ² corrosion/10cm
Constant humidity	ISO 6270	Pass at 1000 hours - no blistering, no staining
Sulphur dioxide	ISO 3231	Pass 30 cycles - no blistering, loss of gloss or discoloration
Permeability	Pressure Cooker EN12205-5.10	Pass - no collects after 1 hour
Chemical resistance		Generally good resistance to acid, alkalis and oils at 60°C in 100ppm concentrations
Mortar Resistance	EN12206-1	No effect after 24 hours
Exterior durability	ISO 2810 (1 year)	>50% gloss retention, Colour change in accordance with GSB or Qualicoat
		Chalking - none in excess of minimum in ASTM D1059 1180
Accelerated Weathering Test	ISO11341	>50% gloss retention after 1000 hours
	QUV-B 313	>50% gloss retention after 300 hours

Pretreatment

For maximum retention it is essential to preheat components prior to the application of Interpon D1036 Matt (30).
Aluminum components should receive a full multi-stage chromate conversion coating or suitable alternative in accordance with GSB or Qualicoat.
Detailed advice should be sought from the pre-treatment supplier.

Galvanized steel requires surface preparation by either multi-stage pretreatment using either zinc rich primer or zinc rich primer with a phosphating or use of anti-rusting additives may be required - follow the procedural advice of the pretreatment supplier.

Interpon D1036 Matt (30) products may also be used on cast or mild steel. For outdoor use Interpon P2 anti-corrosive primer over a correctly prepared substrate is recommended.

Application

Interpon D1036 Matt (30) powders can be applied by manual or automatic electrostatic spray or into suitable equipment and recycled through the system. Please consult AkzoNobel for further details as to the correct mixing ratio for virgin titanium powder.

All powders can show colour differences from batch to batch, this is normal and unavoidable. White AkzoNobel take every precaution to minimize visible differences, this cannot be guaranteed. Applications and finishes are advised to have a single batch for parts that will be assembled together. Different parts may only apply single batch powder.

Recycled products have better application properties than blended products (more stable) but attention must be paid to the mixing ratio for virgin titanium powder. For more details, it is suggested to read the **Metallic Applications Guidelines**.

Different substrates (aluminium, steel, galvanized steel,...), use of primer, and by changes in film thickness may require different mixing ratios. Please consult AkzoNobel for further details.

Products with different colours should not be mixed even if same colour and gloss.

Post Application

For specific advice on the suitability of post coating processes such as bending or the use of sealants, adhesives, thermal break, cleaning etc., please consult AkzoNobel.



3/3

Classification repo
No. RA13-011

4. Classification and direct field of application

4.1 Reference of the classification

This classification has been carried out in accordance with clauses 11.7.3, 11.9.2 and 11.10.1 of the NF EN 13501-1 standard.

4.2 Classification

Fire behaviour	Smoke production	Flaming droplets or debris
A2	s1	d0

Classification: **A2 - s1, d0**

Appendix 5



INTERNATIONAL FIRE
CONSULTANTS LIMITED



Ref: #19477

By email only: apc@smartlouvre.com

7 March 2019

SmartLouvre Technology Ltd
Unit 18 The Tanneries
Brockhampton Lane
Havant
Hampshire
PO9 1JB

To Whom It May Concern

MicroLouvre – Reaction to Fire Performance

SmartLouvre Technology Ltd has commissioned International Fire Consultants (IFC) to review the reaction to fire performance of the elements that make up the MicroLouvre Metal Fabric and MicroLouvre Screen products.

The MicroLouvre Metal Fabric product consists of copper alloy weft and warp wires of minimum dimensions 1.26 x 0.13mm. These wires can be coated with powder coating produced by AkzoNobel. The MicroLouvre Screen product consists of MicroLouvre Metal Fabric, as described above, tensioned within aluminium frames, using stainless steel tensioners and installed with stainless steel fixings.

IFC have reviewed the reaction to fire performance information forwarded by SmartLouvre Technologies Ltd for the MicroLouvre product and summarise the conclusions as follows.

Copper Wires, Aluminium Extrusions and Stainless Steel Fixings

In the introduction of BS EN 13501-1 there is reference to the European Commission's list of products which, under specific conditions, can be considered to be Class A1 without testing. This information is given in the Commission Decision 96/603/EC (OJ L 267 19.10.1966 p23) as amended by 2000/650/EC (OJ L258 12.10.2000 p36) and 2003/424/EC (OJ L 144 12.6.2003 p9).

Certain products can be assigned a particular fire classification without the need for testing. Such products have well established reaction to fire performance and have been agreed by the Standing Committee on Construction. Agreements relating to such products which may be classified without further testing (CWFT), are published in the official Journal of the EC and are listed on the NANDO – CPD database on the EC web site <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31996D0603&from=EN>. The copper alloy wires forming the MicroLouvre Metal Fabric products, the aluminium extrusions and the stainless steel fixings forming the MicroLouvre Screen Products have a classification without further testing against EN13501-1 of Euroclass A1.

Powder Coating

The reaction to fire classification of the AkzoNobel powder coating is A2-s1,d0 when tested on an aluminium substrate.

We trust this is of assistance at this time.

Yours sincerely,

David Cooper BEng (Hons) AIMMM AIFireE
Associate Director
International Fire Consultants Ltd. (IFC)

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An International Fire Consultants Group Company

Appendix 6



Direction Sécurité, Structures et Feu
Division Etudes et Essais Réaction au Feu
Safety, Structures and Fire Department
Reaction to Fire Tests and Studies Division



RAPPORT DE CLASSEMENT EUROPEEN DE REACTION AU FEU REACTION TO FIRE EUROPEAN CLASSIFICATION REPORT

N° RA18-0083

Selon l'Arrêté du 21 novembre 2002 modifié relatif à la Réaction au Feu des produits de construction et d'aménagement
 Laboratoire pilote agréé par le ministère de l'intérieur (Arrêté du 5 février 1959 modifié)
 According to the modified Ordinance dated November 21st, 2002 as regards the Reaction to Fire performance of construction and installation products
 Pilot laboratory approved by the Ministry of the Interior (Ordinance of February 5th, 1959 modified)

Valable 5 ans à compter du 16 février 2018
 Valid 5 years from February 16th, 2018

A la demande de : AKZO NOBEL POWDER COATINGS SNC
Owner: Zone Industrielle de la Gaudrée
 91410 DOURDAN
 FRANCE

Marque(s) commerciale(s) : INTERPON POLYESTER Coatings
Commercial brand(s):

Description sommaire : Peinture appliquée sur support tôle d'aluminium
Brief description: Paint applied on aluminium sheet substrate

Date du rapport : 19 avril 2018
Date of issue: April 19th, 2018

4. Classement et domaine d'application / Classification and direct field of application

4.1 Référence du classement / Reference of the classification

Le classement est prononcé suivant la norme NF EN 13501-1+A1:2013.
 This classification has been carried out in accordance with the NF EN 13501-1+A1:2013 standard.

4.2 Classement / Classification

Comportement au feu <i>Fire behaviour</i>		Production de fumées <i>Smoke production</i>		Gouttes ou particules enflammées <i>Flaming droplets or debris</i>
A2	-	s1	,	d0

Classement / Classification : A2 - s1, d0