classification report

Bodycote

Title:

CLASSIFICATION REPORT FOR ROOFS/ROOF COVERINGS EXPOSED TO EXTERNAL FIRE
EN 13501-5: 2005

Notified Body No:

0833

Product Names:

ASTRON ROOF CLADDING SYSTEMS

Report No:

171551

Issue No:

1

Prepared for:

ASTRON BUILDING S.A.,
ROUTE D'ETTELBRUCK, P O BOX 152, L-90202 DIEKIRCH, LUXEMBOURG

Date:

10th March 2008

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TESTING

1. Introduction

This classification report defines the classification assigned to a family of products named, 'ASTRON ROOF CLADDING SYSTEMS', in accordance with the procedures given in EN 13501-5:2005.

2. Details of classified product

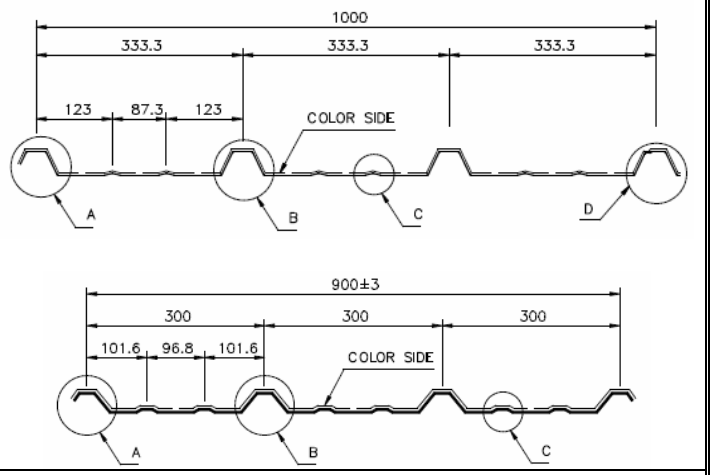
2.1 General

The family of products named, 'ASTRON ROOF CLADDING SYSTEMS', are defined as being suitable for roof/roof covering applications.

2.2 Product description

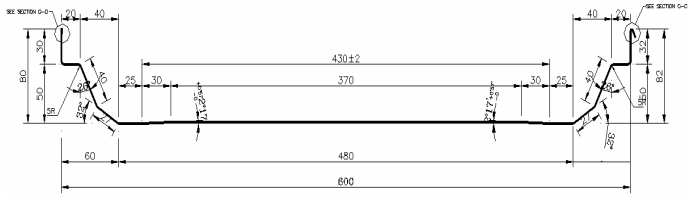
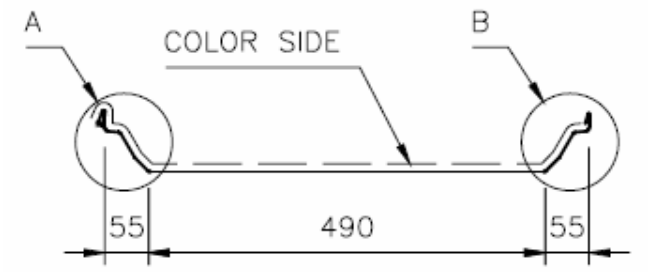
The family of products, 'ASTRON ROOF CLADDING SYSTEMS', are fully described below and in the test reports provided in support of classification listed in Clause 3.1.

General description		Astron roof cladding system
Product reference of system		"Self supporting screwed roof panels in the ASTRON System"
Overall thickness		One corrugated steel panel Depending of the system an "isoblock" Between 40 and 200mm of insulation: • **Single skin roof (SSR)**: between 40 and 120mm • **Double skin roof (DSR)**: between 80 and 200mm Depending of the system a second corrugated panel (DSR), with or without holes
Coating ('External', test face)	Product reference	Roof panels in the ASTRON system: with between 15 and 35 microns polyester coating or 25 PVDF coating
	Generic type	Polyester
	Name of manufacturer	See Note 1 Below
	Colour	Any variation allowed
	Number of coats	Two
	Application thickness (total)	Between 15 and 35 microns organic coating
	Application method	Rolled coating
	Curing process	30 seconds at a temperature of 245°C
	Flame retardant details	See Note 2 Below

Steel sheet	Generic type	Galvanized steel (Z275 or AZ 150 to AZ 185 or ZA255)
	Name of manufacturer	See Note 1 Below
	Profile reference	No variation from the approved specifications held on the confidential file relating to this assessment
	Diagram of profile LPR 1000 profile PR profile	
	Nominal thickness	Between 0.54 and 0.63mm
	Weight per unit area	Between 4 and 5 kg/m²
	Preparation details	Roll forming

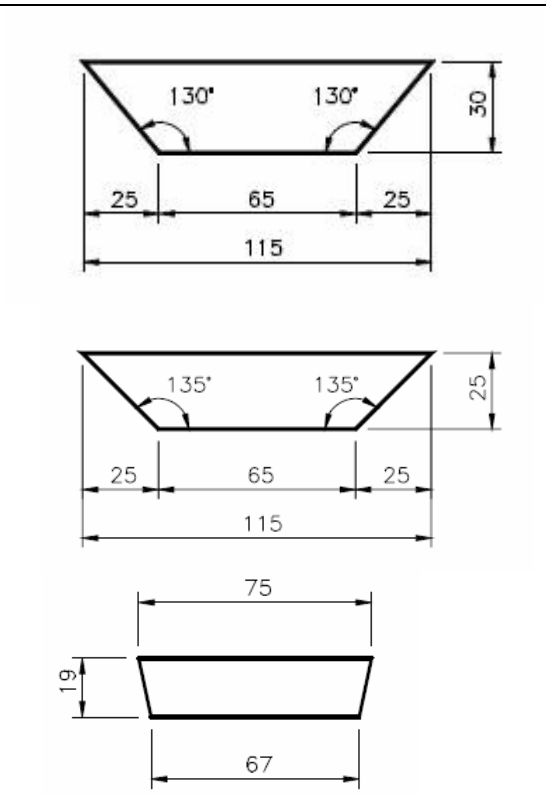
or

Coating ('External', test face)	Product reference	"self supporting "floating" panels in the ASTRON system with Aluminium-Zinc coating"
	Generic type	Aluminium-Zinc
	Name of manufacturer	See Note 1 Below
	Colour	Aluminium-Zinc
	Number of coats	One
	Application thickness	AZ 185 microns
	Application method	Rolled coating
	Curing process (duration and temperature)	30 seconds at a temperature of 245°C
	Flame retardant details	See Note 2 Below
Steel sheet	Generic type	Aluminium-Zinc coated steel (AZ 185)
	Name of manufacturer	See Note 1 Below

	Profile reference	No variation from the approved specifications held on the confidential file relating to this assessment
	Diagram of profile LMR 600 profile ASTROTEC profile CF profile	  
	Nominal thickness	Between 0.63 and 0.75mm
	Weight per unit area	Between 4.75 and 5.5 kg/m²
	Preparation details	Roll forming

With or without

ISOBLOCK		
Extruded polystyrene strip	Trade name	"Isoblock"
	Generic type	Extruded polystyrene
	Manufacturer	See Note 1 Below
	Thickness	Between 19 and 30mm

		Dimensions	
		Density	40 kg/m^3
		Flame retardant details	See Note 2 Below
		Location of 'Isoblock'	Between panel and insulation, on the intermediate support
INSULATION			
Foil faced insulation	Facing	Product reference	"ASTROTHERM"
		Generic type	4 different facings are used: • ASA (painted alufoil + glass scrim reinforcement + aluminium film) • AVS (painted alufoil + glass scrim reinforcement + PVC film) • KAS (alufoil + glass scrim reinforcement + craft paper) • MPS (vinyl film – glass scrim reinforcement + metalized polyester film)
		Name of manufacturer	See Note 1 Below
		Density / weight per unit area	• ASA 110 gr / m^2 • AVS 122 gr / m^2 • KAS 110 gr / m^2 • MPS 150 gr / m^2
		Thickness	About 1 mm
		Colour	Grey - white
		Flame retardant details	See Note 2 Below
	Adhesive	Product reference	INSULATION GLUE
		Generic type	Supplier code number 28267
		Name of manufacturer	See Note 1, National Starch

		Application rate	Max. 70 gr/m^2
		Application method	Continuous application, rolled
		Flame retardant details	Flame retardant included
	Insulation	Product reference	"ASTROTHERM"
		Generic type	Glass wool insulation
		Name of manufacturer	See Note 1 Below
		Thickness	Between 40 and 200 mm
		Density	16 kg/m³
		Flame retardant details	See Note 2 Below
LOWER SKIN (DOUBLE SKIN ROOF SYSTEM ONLY): perforated steel panel (with holes and tissue) or normal steel sheet			
Tissue face (in case of perforated panel)		Product reference	Black fibreglass Scrim
		Generic type	See Note 3 Below
		Name of manufacturer	See Note 3 Below
		Thickness	See Note 3 Below
		Density/weight per unit area	80 g/m²
		Flame retardant details	See Note 2 Below
Steel sheet		Generic type	Galvanized steel
		Name of manufacturer	See Note 1 Below
		Nominal Thickness	0,54 mm
		Weight per unit area	3.35 kg/m²
		Preparation details	See Note 3 Below
Perforation Details (in case of perforated panel)		% open area	Between 0 and 21%
		Shape of Holes	Round
		Diameter/ size of holes	5mm
		Hole Spacing (centre to centre)	8mm
Coating ('Internal', test face)		Product reference	"Self supporting, inside roof and wall panels in the ASTRON system"
		Generic type	Polyester
		Name of manufacturer	See Note 1 Below
		Colour	grey
		Number of coats	2
		Application thickness	25 microns
		Application method	Rolled coating
		Curing process (duration and temperature)	30 seconds at a temperature of 245°C
		Flame retardant details	See Note 2 Below
Description of construction of specimens (i.e. flashings, side supports etc)			Supports: galvanized profiles, S390 GD + Z275 All flashings are 0.5 to 1 mm thick, DX51D material + AZ 185 Isoblock is placed on the middle support Panels are screwed, 1/300 mm 1/333mm on supports (1/5000mm on 1/750 between panels)

Note 1 : The sponsor of the test has provided this information but at the specific request of the sponsor, these details have been omitted from the report and are instead held on the confidential file relating to this investigation.

Note 2 : The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the product / component.

Note 3 : The sponsor was unwilling to provide this information.

3. Test reports/extended application reports & test results in support of classification

3.1 Test reports/extended application reports

Name of Laboratory	Name of sponsor	Test reports/extended application report Nos.	Test method / extended application rules & date
Bodycote warringtonfire	ASTRON BUILDING S.A.	WF 167676, 167675, 167677	DD ENV 1187: 2002 – Test 1
Bodycote warringtonfire	ASTRON BUILDING S.A.	WF 167678	DD ENV 1187: 2002 – Test 2
Bodycote warringtonfire	ASTRON BUILDING S.A.	WF 167679, 167680, 167681, 167725, 167732	Final Draft ENV 1187: 2002 prA1: December 2004 – Test 4
Bodycote warringtonfire	ASTRON BUILDING S.A.	WF 171553	CEN_TC127_WG5_TG2 N022 Draft Application Rules Document 2007 07 09

3.2 Test results

3.2.1 Test 1

(WF 167676)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 15°

Supporting Deck: The specimen was tested without the presence of a standard supporting deck.

Parameter	Criteria	Test Results on Specimen				Compliance
		1	2	3	4	
Internal fire spread upwards	<0,700m	0.000m	-	-	-	Y
External fire spread upwards	<0,700m	0.000m	-	-	-	Y
Internal fire spread downwards	<0,600m	0.000m	-	-	-	Y
External fire spread downwards	<0,600m	0.000m	-	-	-	Y
Maximum burned length internal	<0,800m	0.000m	-	-	-	Y
Maximum burned length external	<0,800m	0.000m	-	-	-	Y
Burning, droplets/debris falling from exposed side	None	None	-	-	-	Y
Burning, glowing particles penetrating the roof	None	None	-	-	-	Y
Single through opening	<25mm²	0mm²	-	-	-	Y
Sum of all through openings	<4500mm²	0mm²	-	-	-	Y
Lateral fire spread	<edges[a]	None	-	-	-	Y
Internal glowing combustion	None	None	-	-	-	Y
Radius of fire spread (horizontal roof)	<0,200m	N/A	-	-	-	Y

[a] Edges of the measuring zone

(WF 167675)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 15°

Supporting Deck: The specimen was tested without the presence of a standard supporting deck.

Parameter	Criteria	Test Results on Specimen				Compliance
		1	2	3	4	
Internal fire spread upwards	<0,700m	0.000m	0.000m	0.000m	0.000m	Y
External fire spread upwards	<0,700m	0.000m	0.000m	0.000m	0.000m	Y
Internal fire spread downwards	<0,600m	0.000m	0.000m	0.000m	0.000m	Y
External fire spread downwards	<0,600m	0.000m	0.000m	0.000m	0.000m	Y
Maximum burned length internal	<0,800m	0.000m	0.000m	0.000m	0.000m	Y
Maximum burned length external	<0,800m	0.000m	0.000m	0.000m	0.000m	Y
Burning, droplets/debris falling from exposed side	None	None	None	None	None	Y
Burning, glowing particles penetrating the roof	None	None	None	None	None	Y
Single through opening	<25mm²	0mm²	0mm²	0mm²	0mm²	Y
Sum of all through openings	<4500mm²	0mm²	0mm²	0mm²	0mm²	Y
Lateral fire spread	<edges[a]	None	None	None	None	Y
Internal glowing combustion	None	None	None	None	None	Y
Radius of fire spread (horizontal roof)	<0,200m	N/A	N/A	N/A	N/A	Y

[a] Edges of the measuring zone

(WF 167677)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 15°

Supporting Deck: The specimen was tested without the presence of a standard supporting deck.

Parameter	Criteria	Test Results on Specimen				Compliance
		1	2	3	4	
Internal fire spread upwards	<0,700m	0.000m	0.000m	0.000m	0.000m	Y
External fire spread upwards	<0,700m	0.000m	0.000m	0.000m	0.000m	Y
Internal fire spread downwards	<0,600m	0.000m	0.000m	0.000m	0.000m	Y
External fire spread downwards	<0,600m	0.000m	0.000m	0.000m	0.000m	Y
Maximum burned length internal	<0,800m	0.000m	0.000m	0.000m	0.000m	Y
Maximum burned length external	<0,800m	0.000m	0.000m	0.000m	0.000m	Y
Burning, droplets/debris falling from exposed side	None	None	None	None	None	Y
Burning, glowing particles penetrating the roof	None	None	None	None	None	Y
Single through opening	<25mm²	0mm²	0mm²	0mm²	0mm²	Y
Sum of all through openings	<4500mm²	0mm²	0mm²	0mm²	0mm²	Y
Lateral fire spread	<edges[a]	None	None	None	None	Y
Internal glowing combustion	None	None	None	None	None	Y
Radius of fire spread (horizontal roof)	<0,200m	N/A	N/A	N/A	N/A	Y

[a] Edges of the measuring zone

3.2.2 Test 2

(WF 167678)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Substrate: The specimen was tested without the presence of a standard supporting deck.

Parameter	Criteria		Test Results					Compliance
			Spe. 1	Spe. 2	Spe. 3	Mean	Max	
Damaged length a 2m/s – roof covering	≤0,550m	≤0,800m	0.020m	0.030m	0.060m	0.037m	0.060m	Y
Damaged length a 2m/s – substrate	≤0,550m	≤0,800m	0.000m	0.000m	0.000m	0.000m	0.000m	Y
Damaged length a 2m/s – roof covering	≤0,550m	≤0,800m	0.080m	0.070m	0.050m	0.067m	0.080m	Y
Damaged length a 2m/s – substrate	≤0,550m	≤0,800m	0.000m	0.000m	0.000m	0.000m	0.000m	Y

3.2.4 Test 4

(WF 167679)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 0°

Deck: The specimen was tested without the presence of a standard supporting deck.

Supporting structure: The specimen was tested without the presence of a supporting structure.

Preliminary test (Stage 1):

Parameter	Criteria				Test Results	Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Burn time	<5min	<5min	<5min	<5min	0min	Y	Y	Y	Y
Flame spread distance	<0,38m	<0,38m	<0,38m	No limit	0m	Y	Y	Y	Y
Penetration	None	None	None	None	None	Y	Y	Y	Y

Penetration test (Stage 2):

Parameter	Criteria				Test Results				Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Specimen 2	Specimen 3	Mean [a]	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Penetration time	≥60min	<60min >30min	≤30min	≤30min	>60min	-	-	-	Y	Y	Y	Y
[a] If one or two of the specimens have not failed at one hour, a time of 60min shall be used in calculating the mean time of penetration.												

(WF 167680)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 45°

Deck: The specimen was tested without the presence of a standard supporting deck.

Supporting structure: The specimen was tested without the presence of a supporting structure.

Preliminary test (Stage 1):

Parameter	Criteria				Test Results	Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Burn time	<5min	<5min	<5min	<5min	0min	Y	Y	Y	Y
Flame spread distance	<0,38m	<0,38m	<0,38m	No limit	0m	Y	Y	Y	Y
Penetration	None	None	None	None	None	Y	Y	Y	Y

Penetration test (Stage 2):

Parameter	Criteria				Test Results				Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Specimen 2	Specimen 3	Mean [a]	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Penetration time	≥60min	<60min >30min	≤30min	≤30min	>60min	-	-	-	Y	Y	Y	Y
[a] If one or two of the specimens have not failed at one hour, a time of 60min shall be used in calculating the mean time of penetration.												

(WF 167681)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 45°

Deck: The specimen was tested without the presence of a standard supporting deck.

Supporting structure: The specimen was tested without the presence of a supporting structure.

Preliminary test (Stage 1):

Parameter	Criteria				Test Results	Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Burn time	<5min	<5min	<5min	<5min	0min	Y	Y	Y	Y
Flame spread distance	<0,38m	<0,38m	<0,38m	No limit	0m	Y	Y	Y	Y
Penetration	None	None	None	None	None	Y	Y	Y	Y

Penetration test (Stage 2):

Parameter	Criteria				Test Results				Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Specimen 2	Specimen 3	Mean [a]	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Penetration time	≥60min	<60min >30min	≤30min	≤30min	>60min	-	-	-	Y	Y	Y	Y
[a] If one or two of the specimens have not failed at one hour, a time of 60min shall be used in calculating the mean time of penetration.												

(WF 167725)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 0°

Deck: The specimen was tested without the presence of a standard supporting deck.

Supporting structure: The specimen was tested without the presence of a supporting structure.

Preliminary test (Stage 1):

Parameter	Criteria				Test Results	Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Burn time	<5min	<5min	<5min	<5min	0min	Y	Y	Y	Y
Flame spread distance	<0,38m	<0,38m	<0,38m	No limit	0m	Y	Y	Y	Y
Penetration	None	None	None	None	None	Y	Y	Y	Y

Penetration test (Stage 2):

Parameter	Criteria				Test Results				Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Specimen 2	Specimen 3	Mean [a]	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Penetration time	≥60min	<60min >30min	≤30min	≤30min	>60min	>60min	>60min	≥60min	Y	Y	Y	Y
[a] If one or two of the specimens have not failed at one hour, a time of 60min shall be used in calculating the mean time of penetration.												

(WF 167732)

Test conditions: The external face of the specimen was subjected to the heating conditions of the test.

Test pitch: 0°

Deck: The specimen was tested without the presence of a standard supporting deck.

Supporting structure: The specimen was tested without the presence of a supporting structure.

Preliminary test (Stage 1):

Parameter	Criteria				Test Results	Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Burn time	<5min	<5min	<5min	<5min	0min	Y	Y	Y	Y
Flame spread distance	<0,38m	<0,38m	<0,38m	No limit	0m	Y	Y	Y	Y
Penetration	None	None	None	None	None	Y	Y	Y	Y

Penetration test (Stage 2):

Parameter	Criteria				Test Results				Compliance			
	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)	Specimen 1	Specimen 2	Specimen 3	Mean [a]	Class B_{ROOF} (t4)	Class C_{ROOF} (t4)	Class D_{ROOF} (t4)	Class E_{ROOF} (t4)
Penetration time	≥60min	<60min >30min	≤30min	≤30min	>60min	>60min	>60min	≥60min	Y	Y	Y	Y
[a] If one or two of the specimens have not failed at one hour, a time of 60min shall be used in calculating the mean time of penetration.												

4. Classification and field of application

4.1 Reference of classification

This classification has been carried out in accordance with EN 13501-5:2005

4.2 Classification

The family of products named, 'ASTRON ROOF CLADDING SYSTEMS', in relation to their external fire performance are classified:

B_{ROOF} (t1)

B_{ROOF} (t2)

B_{ROOF} (t4)

4.3 Field of application

This classification is valid for the following conditions:

B_{ROOF} (t1)

Range of pitches	0 to 20°
Range of decks	No variation from product description.

B_{ROOF} (t2)

Range of substrates	No variation from product description.

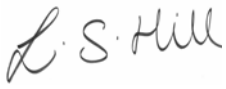
B_{ROOF} (t4)

Range of pitches	Any pitch allowed.
Deck	No variation from product description.
Supporting structure	No variation from product description.

5. Limitations

This European Standard does not represent type approval or certification of the product.

SIGNED



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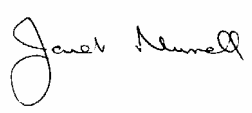
Leigh Hill
Technical Consultant
Technical Department

APPROVED



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Janet Murrell
Technical Manager
Technical Department
on behalf of:
Bodycote warringtonfire

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