

Automotive
Living
Air
Rail
Sea
Contract

White Paper



BOXMARK
Best in Leather Interior

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This White Paper illustrates our products designed for the aviation industry as well as the flame-retardant standards this leather meets upon customers' request.

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I AIRCRAFT LEATHERS

I.1 XLIGHT

XLIGHT is the first leather in addition to durability and easy maintenance to meet all international standards.

With a laminated weight of $\pm 600 \text{ g/m}^2$ XLIGHT is the real ready to use weight saving solution. There is no need to build up extra weight with additional materials.

Excellent technical values and easy cleaning as a guarantee for long life and also in accordance with the technical requirements for passenger transportation.



XLIGHT STANDARDS

- Weight laminated (DIN EN ISO 2420)
- Thickness (DIN EN ISO 2589)
- Tensile strength (DIN EN ISO 3376)
- Tear resistance (DIN EN ISO 3377-1)
- Stitch tear resistance (DIN EN ISO 23910)
- Flammability
- Heat release
- Smoke density and toxicity

max. $600 \text{ g/m}^2 \pm 20\text{g}$

$1,0 \pm 0,1\text{mm}$

$\geq 800 \text{ N/cm}^2$

$\geq 15 \text{ N/mm}$

$\geq 50 \text{ N}$

FAR/JAR 25.583 Vertical bunsen burner test (12s)

FAR/JAR 25.583 Heat release (if required)

ABD003 I



1.2 XTREME



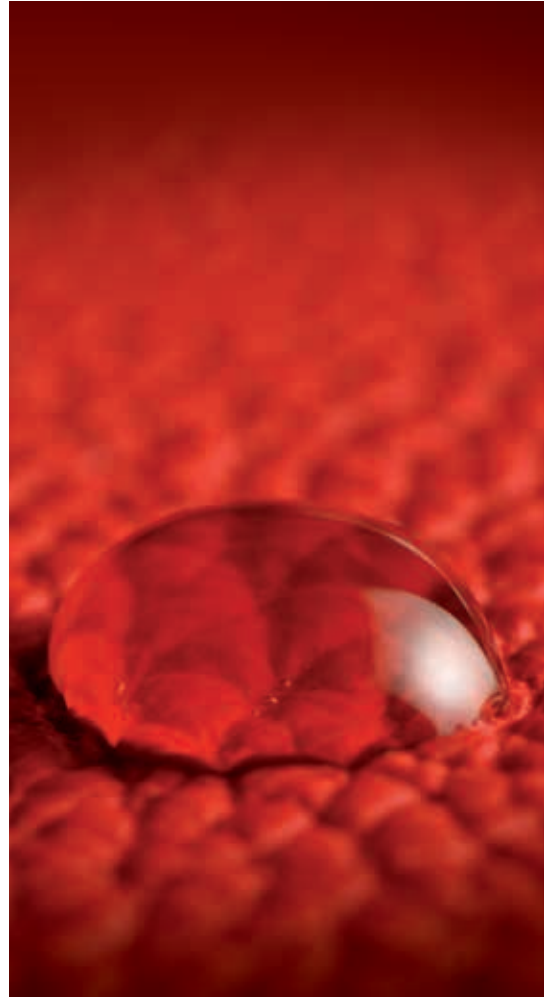
XTREME – a leather innovation by BOXMARK – is a hard-wearing leather which can be used on countless occasions, both indoors and outdoors. It features higher values as far as technical properties, feel, elegance and its natural visual appearance are concerned.

XTREME CHARACTERISTICS AND APPLICATION

XTREME features itself through the higher resistance against soil, water and insolation. Due to its material thickness of 1.3 – 1.4mm and the strong natural fiber, this special leather boasts a longer service life and better strain, ductility and tear strength properties. Thanks to its higher abrasion resistance values resulting in low maintenance.

XTREME's emotional quality comes from the exclusive touch of natural leather combined with a smashing feel, elegance and vibrancy; a feeling only found in natural products. To offer architects and designers even more design options, all 40 collection colors can additionally be supplied in various structural embossments.

XTREME is promptly available in 40 colors starting with 10 hides per color.



FIELDS OF APPLICATIONS

- Cabin Interior for commercial aircrafts
- Cabin Interior for Business and private jets
- Aircraft seats
- Covering of wall panels and built-in parts
- Leather flooring
- Airport Interior

Xtreme[®]



COLORS

XTREME is promptly available in **40 colors** starting with 10 hides per color:



Colors may differ in reality

2.2 ROYAL

The natural beauty and excellent durability of ROYAL upholstery leather from BOXMARK is truly captivating. ROYAL has excellent tensile strength, tear and kink resistance. For many decades its superior quality together with its positive characteristics have made it the perfect choice in manufacturing exclusive seating furniture as well as fixtures and fittings for commercial projects around the globe.



ROYAL EMOTIONS

Nearly all exclusive BOXMARK Emotions structural embossments are available in the colors of the Royal leather collection and offer thousands of options for design diversity. The embossments and color effects allow the designer and manufacturer to impart outstanding visual accents to every product and to create maximum individuality. Unique effects on the embossed surface are obtained by additional processing of the surface using special dyes and gloss techniques (catalogue on request).



It is recommended that the Emotions embossments are laminated when used on seat and backrest sections as well as on very taut parts in order to prevent distortion of the embossed structure.

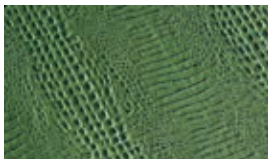
ROYAL EMBOSSMENTS



Blackpool



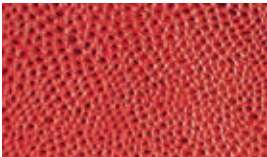
Avon



Windsor



Bristol



Essex



Manchester



Devon



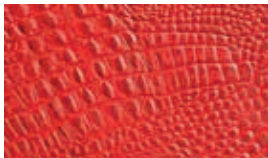
London



Torbay



Brighton



York

Colors may differ in reality

TECHNICAL SPECIFICATIONS

• Tensile test (DIN EN ISO 1421)	excellent
• Tear resistance (DIN 53356 in Newton)	excellent
• Flexing endurance (DIN 53351)	30,000 folds no variation
• Color fastness to rubbing (DIN EN ISO 105-X12)	excellent (highest rating)
• Martindale abrasion resistance (DIN EN ISO 5470-2)	> 100.000
• Color fastness to light exposure (DIN EN ISO 105-B02)	excellent
• Adhesion (IUF 470/ISO 11644)	> 2.5 N/10 mm
• Flame resistance for serial leather DIN EN 1021 Part I + 2; ISO 8191-1; BS 5852 source 3; California TB 117 (Draft 02/2002)	

Original test certificates are available upon request.

FIELDS OF APPLICATIONS

- Cabin Interior for commercial aircrafts
- Cabin Interior for Business and private jets
- Aircraft seats
- Covering of wall panels and built-in parts
- Airport Interior



COLORS

ROYAL is 1.3 – 1.4 mm thick and available for modern as well as classical styles, offering **57 different colors** as well as 19 different, hand-wiped reptile and structural prints in the “ROYAL-Emotions” version.



I.4 KING

King is a special tailor-made leather which can be produced according to design and project specifications. It can also be flame retardant-treated according to international standards. KING is a semi aniline leather, available in a thickness of 1.2 to 2.5 mm and in any desired color and structure from a quantity of 50 hides and up.

KING is offered in single colors or in a wide variety of effects such as spot, fat, hand-wiped or antique leather. It is up to you to decide appearance, grain pattern, color and technical requirements. This leather is especially suitable for the upholstery of clear, cubic furniture and objects.

FIELDS OF APPLICATIONS

- Room furnishings
- Seating furniture
- Bed headboards
- Wall coverings
- Wrapping of built-in parts
- Design objects
- Exhibits



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2 AIRCRAFT LEATHERS BY TYPE

Characteristics	XLIGHT	XTREME	ROYAL	KING
Stock item	NO	YES	YES	NO
Colors	OEM	40	57	OEM
Emotion embossing	OPT	OPT	OPT	OPT
Perforation	OPT	n.a.	n.a.	OPT
12s-vertical Bunsen burner test	YES	YES	YES	YES
60s-vertical Bunsen burner test	OPT	OPT	OPT	YES
Smoke density JAR-25, § 25.853 (c) and Appendix F, Part V, Change 15	YES	OPT	OPT	YES
Toxicity AITM 3.0005	YES	OPT	OPT	YES
Heat release JAR-25, § 25.853 (c) and Appendix F, Part IV, Change 15	YES	OPT	OPT	YES
Thickness in mm	1,0 ± 0,1	1,0 - 1,4	1,0 - 1,4	1,1 - 1,2
Weight g/m ²	600 ± 20 incl. glue and lamination	600 - 900	600 - 900	600 - 900

OEM = customer decides | OPT = optional | n.a. = not available



3 REQUIREMENTS FOR COMPONENTS

3.1 LEATHER, SEAT CUSHIONS

CURRENT GOVERNMENT AND OEM SPECIFICATIONS FOR FLAMMABILITY

Some of the main current specifications for components to meet commercial aircraft interior requirements include smoke density and flammability tests and have OSU heat-release rates below 65/65 per 25.853(d).

In addition, the major airframe manufacturers have toxicity requirements that must be met. For Airbus this is ABD003 I and for Boeing D6-51377.

COMPONENT PARTS USED IN COMPARTMENTS OCCUPIED BY CREW OR PASSENGERS, E.G

- Floor Covering
- Textiles (incl. draperies and upholstery)
- Seat cushions
- Curtains
- Padding
- Leather
- Furnishings of trays and galleys
- Electrical conduit
- Thermal and acoustical insulation
- Insulation covering
- Insulation blankets
- Air ducting
- Air ducting joints
- Joint and edge covering
- Transparencies
- Molded and thermoformed parts
- Cargo floor panels and cargo liners
- Ducts (if paragraph 6.1.2 to be applied)
- Trim strips (decorative and chafing) that are constructed of materials not used for parts covered by para. 7.1.1



FLAMMABILITY JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(ii), Change 15
Test method: AITM 2.0002 B, i.e. conformance to the criteria of the
12-s-vertical Bunsen burner test

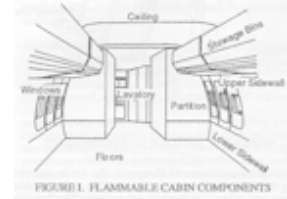
SMOKE DENSITY JAR - 25, § 25.853 (c) and Appendix F, Part V, Change 15, test method,
AITM 2.0007 A (Flaming mode)

TOXICITY Test method: AITM 3.0005

3.2 INTERIOR WALL PANELS, CEILING PANELS

CURRENT GOVERNMENT AND OEM SPECIFICATIONS FOR FLAMMABILITY

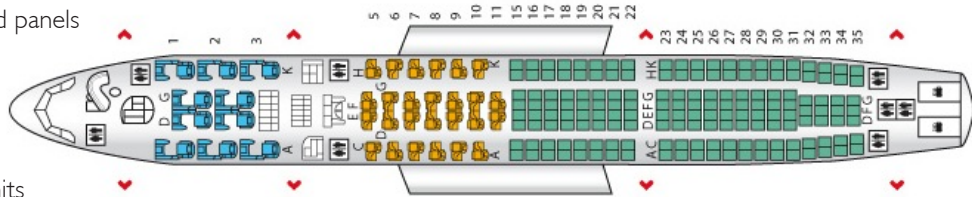
Some of the main current specifications for components to meet commercial aircraft interior requirements include smoke density and flammability tests and have OSU heat-release rates below 65/65 per 25.853(d).



In addition, the major airframe manufacturers have toxicity requirements that must be met. For Airbus this is ABD003 I and for Boeing D6-51377.

COMPONENT PARTS USED IN COMPARTMENTS OCCUPIED BY CREW OR PASSENGERS, E.G

- Interior ceiling panels
- Interior wall panels
- Partitions
- Galley structures and panels
- Large cabinet walls
- Floor panels
- Dado panels
- Passenger service units
- Door linings incl. slide container
- Class dividers
- Door frame linings
- Light panels
- Linings for stowage compartments
- (other than under seat stowage compartments and compartments for stowing small items such as magazines and maps)



FLAMMABILITY JAR - 25, § 25.853 (a) and Appendix F, Part I, para. (a)(1)(i), Change 15
Test method: AITM 2.0002 A, i.e. conformance to the criteria of the 60-s-vertical Bunsen burner test

HEAT RELEASE JAR- 25, § 25.853 (c) and Appendix F, Part IV, Change 15, Test method: AITM 2.0006

SMOKE DENSITY JAR - 25, § 25.853 (c) and Appendix F, Part V, Change 15, Test method AITM 2.0007 A (Flaming mode), AITM 2.0007 B (Non Flaming mode)

TOXICITY ABD003I Test method: AITM 3.0005

4 DETERMINATION OF THE MATERIAL'S FLAMMABILITY RESISTANCE

VERTICAL BUNSEN BURNER TEST

FAR 25.853a is a vertical Bunsen burner test designed by the FAA (Federal Aviation Administration) for cabin and cargo compartment materials. The test method is intended to determine the resistance of materials to flame when tested according to the 60-sec (i) and 12-sec (ii) vertical Bunsen burner tests.

In this test a specimen is held in a vertical position by a device inside a cabinet and a Bunsen burner (31.80mm (1.500") flame) is placed beneath it for a specific period of time (60 or 12 seconds accordingly). After the specific period of time, the burner is removed and the specimen is observed. Ignition time, flame time, drip flame time, and burn length are all recorded at the end of the test.

THE FOLLOWING ARE DESCRIPTIONS OF OBSERVATIONS RECORDED DURING THE TESTS:

IGNITION TIME	Length of time burner flame is applied to specimen
FLAME TIME	Time in seconds that the specimen continues to flame after burner flame is removed
DRIP FLAME TIME	Time in seconds that any flaming material continues to flame after falling from specimen
BURN LENGTH	Distance from original specimen's edge to farthest evidence of damage to specimen

The following are requirements for Passing the FAR 25.853a test. Appendix F to Part 25 Part I-Test Criteria and Procedures for Showing Compliance with §25.853. Limits valid both for General aviation and Airbus

Test	Flame Time (sec)	Average Drip Extinguishing Time (sec)	Average Burn length
(i) 60 sec	< 15	< 3	152,40 mm (6")
(i) 12 sec	< 15	< 5	203,20 mm (8")

Appendix F to Part 25, Part I-Test Criteria and Procedures for Showing Compliance with §25.853, or §25.855:

(a) Material testing criteria — (1) Interior compartments occupied by crew or passengers.

(i) Interior ceiling panels, interior wall panels, partitions, galley structure, large cabinet walls, structural flooring, and materials used in the construction of stowage compartments (other than under-seat stowage compartments and compartments for stowing small items such as magazines and maps) must be self-extinguishing when tested vertically in accordance with the applicable portions of part I of this appendix. The average burn length may not exceed 6 inches and the average flame time after removal of the flame source may not exceed 15 seconds. Drippings from the test specimen may not continue to flame for more than an average of 3 seconds after falling.

(ii) Floor covering, textiles (including draperies and upholstery), seat cushions, padding, decorative and non decorative coated fabrics, leather; trays and galley furnishings, electrical conduit, air ducting, joint and edge covering, liners of Class B and E cargo or baggage compartments, floor panels of Class B, C, D, or E cargo or baggage compartments, cargo covers and transparencies, molded and thermoformed parts, air ducting joints, and trim strips (decorative and chafing), that are constructed of materials not covered in subparagraph (iv) below, must be self-extinguishing when tested vertically in accordance with the applicable portions of part I of this appendix or other approved equivalent means. The average burn length may not exceed 8 inches, and the average flame time after removal of the flame source may not exceed 15 seconds. Drippings from the test specimen may not continue to flame for more than an average of 5 seconds after falling.

5 DETERMINATION OF THE SPECIFIC OPTICAL DENSITY OF SMOKE

JAR/FAR 25, App. F, part V & AITM 2.0002B - AITM 2.0007, Requirement ABD0031,

$D_m = D_s \text{ max}$ = maximum specific optical density

The smoke density test determines the smoke generation of a burning material to help improve escaping after a fire. Results from the smoke density test are expressed in terms of specific optical density (D_s). Optical density (D_s) readings are taken at 1.5 minutes into the test and after 4 minutes.

PASSING CRITERIA		Limit
Flaming Mode	D_m	200
Non Flaming Mode	D_m	200

6 DETERMINATION OF THE HEAT RELEASE RATE

JAR/FAR 25, App. F, part V & AITM (AITM 2.0006), Requirement ABD0031, $HR < 65$ $HRR_{max} < 65$

The heat release rate (OSU) is a measurement of the rate at which a burning item releases heat, using the principle of oxygen consumption (calorimetry), which is a critical parameter in fire protection engineering. The heat release rate can be used in the characterization of the hazard represented by a given fuel package. The heat release rate can provide information on fire volume and fire growth rate. This method tests materials and products under a constant, imposed, external heat flux.

PASSING CRITERIA		Limit
Total Heat Release at 2 minutes	$KW \cdot \text{min} / m^2 = HR$	65
Maximum heat release within 5 minutes (peak)	$KW / m^2 = HRR_{max}$	65

7 FAR 25.853D

FAR 25.853D is comprised of above two separate tests:

OSU heat release rate & specific optical density of smoke generated by solid materials. These two tests help to determine the acceptability of the materials for usage in the interiors of aircrafts. More specifically, the OSU heat release rate theoretically attempts to limit the possibility that certain interior materials with large outer surfaces will flashover, become rapidly involved in a fire, or readily contribute to an existing fire in a crash situation. By testing the materials such contributions to existing fires may be avoided.

8 TOXICITY

Governmental regulations do not have a toxicity component.

However, the airframe manufacturers do have toxicity requirements as shown below:

DETERMINATION OF THE TOXIC COMPONENTS ON COMBUSTION PRODUCTS ABD -0031: AITM 3.0005

Flaming Mode	HCN	CO	NO _x	SO ₂	HF	HCl
Gas Specials	Hydrogen Cyanide	Carbon Monoxide	Nitrous Gases	Sulfur Dioxide	Hydrogen Fluoride	Hydrogen Chloride
Airw. limit	150	1000	100	100	100	150
Airbus limit	150	1000	100	100	100	100

Non Flaming Mode	HCN	CO	NO _x	SO ₂	HF	HCl
Gas Specials	Hydrogen Cyanide	Carbon Monoxide	Nitrous Gases	Sulfur Dioxide	Hydrogen Fluoride	Hydrogen Chloride
Airw. limit	150	1000	100	100	100	150
Airbus limit	150	1000	100	100	100	100

BOEING D6-51377: TOXIC GAS EMISSION LIMITS BSS 7239

Flaming Mode	HCN	CO	NO _x	SO ₂	HF	HCl
Gas Specials	Hydrogen Cyanide	Carbon Monoxide	Nitrous Gases	Sulfur Dioxide	Hydrogen Fluoride	Hydrogen Chloride
Boeing	150	3500	100	100	200	500

Non Flaming Mode	HCN	CO	NO _x	SO ₂	HF	HCl
Gas Specials	Hydrogen Cyanide	Carbon Monoxide	Nitrous Gases	Sulfur Dioxide	Hydrogen Fluoride	Hydrogen Chloride
Boeing	150	3500	100	100	200	500

9 BOXMARK PRODUCTS

BOXMARK offers a wide range of aircraft upholstery and component leathers tailor-made to meet the high requirements in commercial aviation.

We can develop the color or finish that you require for your specific project. BOXMARK will work with your designers and engineers to develop a leather that will be consistent with your brand.

All required aircraft industry test specifications have been obtained.

BOXMARK has also developed leathers with different substances in order to meet these standards not only for seating leathers but also for interior wall panels.

Also leather with thickness 0,5 mm and 0,9 mm passed the vertical flame test for 60 seconds, the heat release & smoke density tests.



ACHIEVED TEST RESULTS ON BOXMARK LEATHER

- | | |
|---|--------|
| • Vertical Flame Test
12 sec Vertical Test according to FAR 25.853 (a)
Appendix F, Part I, (a), (1), (ii) | passed |
| • Vertical Flame Test
60 sec Vertical Test according to FAR 25.853 (a)
Appendix F, Part I, (a), (1), (i) | passed |
| • Smoke Density
According to FAR 25.853 (d), Appendix F, part V | passed |
| • Smoke Density
Airbus ABD0031 AITM 2.0002B - AITM 2.0007 | passed |
| • Heat Release
According to FAR 25.853 (d) - Appendix F, part IV | passed |
| • Heat Release
Airbus ABD0031 AITM 2.0006 | passed |
| • Toxic Components on Combustion products
Airbus ABD -0031: AITM 3.0005 | passed |
| • Toxic Components on Combustion products
Boeing D6-51377: Toxic Gas Emission Limits BSS 7239 | passed |

BOXMARK leathers can also be tested according to general aviation guidelines and respect all requirements of the Airbus 2520 MIF001400 issue 1, paragraph 2.3.1-2.3.2-2.3.4. Every batch is identified by a specific code and test reports are kept on record for at least 5 years. Physical requirements will vary according to the intended and requested use and are engineered in accordance with the OEM specifications. Leathers can be tested according to the following standards upon customers requirements.



Test & methods	Standard	Requirement
Weight	DIN EN ISO 2420	max. 750 g/m ²
Thickness	DIN EN ISO 2589	1,1 ± 0,1 mm
Tensile strength	DIN EN ISO 3376	≥ 800 N/cm ²
Tear resistance	DIN EN ISO 3377-1	≥ 15 N/mm
Stitch tear resistance	DIN EN ISO 23910	≥ 50 N
Dimension of hide		≥ 4,5 m ²
Resistance to rubbing	DIN EN ISO 11640	
	Dry	≥ 2000 cycles
	Wet	≥ 500 cycles
	Taber test (CS 10/2 × 500 g)	≥ 2000 revolutions
Behaviour at permanent folding	DIN EN ISO 5402 (50.000 flexes)	no damage / cracks on finish
Light fastness	DIN EN ISO 105-B 02	≥ 5
Thermal and aging resistance	Exposure to 3 days storage at 50°C in drying oven	No deterioration in bending stress and adhesion finish
Adhesion strength of finish	DIN EN ISO 11644, IUF 470	≥ 4,5 N/cm
Water resistance	Approximately 3 cm ³ of distilled water shall be dropped on the rear face of the leather. After drying at 23°C ± 5K no color change or edge build up on the grain side is allowed.	
Odour and haptic	No unpleasant odour is allowed. Typical leather odour is permissible. Haptic of the leather shall be soft.	
Cleanability	The leather must be easy to clean with water and mild cleaning detergent. Coke, tea, blood, orange juice, vomit residues and alcohol must be easily removable.	
Flammability	FAR/JAR 25.583 Vertical bunsen burner test (12 seconds)	
Heat release	FAR/JAR CS 25.853 Heat release (if required)	
Smoke density and toxicity	ABD0031	

Fire Test Laboratory
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AIRBUS

Report No.: 13-1420

Certificate

Designation: King 2507 FAR 1, 1mm, Cashmere
Elnad
Manufacturer of specimen: BOJMARK LEATHER GmbH & Co KG
Manufacturer designation: King
Batch no.: 200454
Customer: BOJMARK LEATHER GmbH & Co KG, Christian Schober
Order No.: 07.11.2013
Certified with Customer's statement of conformity. Documentation is attached to order 07.11.2013
Material Structure of Specimen: Textile 2
King 2507 FAR 1, 1mm, Cashmere
Nominal thickness = 1,1mm

Test Standard: Requirement Results: Passed/Failed

File Testing Handbook: CSFAR Part 26 85504103
DOTFAAAR-0912, Chapter 1
Analysis Method: 20-91

ATM 2 0002 B: ARD0001
ATM 3 0007: ABS0001
ATM 3 0005: SMD0001

Finalized result see page 2/10
The fire test laboratory is part of the design organization Airbus Deutschland GmbH. The Organization is approved by the European Aviation Safety Agency (EASA) with DOT Approval No. EASA.211.031
Certified hereby that above mentioned material/part has been tested in accordance with the terms of the order, addressed requirements and mentioned test standard.

Signed: Merken (Department ESMB2) Date

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AIRBUS

Test Report No.: 13-1420

Type of test: Determination of the Resistance of Material to Flame
Vertical Burner Test, 12s Ignition Time

Test standard: File Testing Handbook, DOTFAAAR-0912, Chapter 1 & ATM 2.0002 B

Material/Part Designation: King 2507 FAR 1, 1mm, Cashmere
Elnad
Manufacturer Designation: King
Thickness (mm): 1,1

Test results:

Sample No.	Mean Arworthiness				Customer Limit
	1	2	3	4	
Burn length (mm)	43	51	49	4	48
After Burne Area (g)	0	0	0	0	15
After Burne Area of Drops (g)	0	0	0	0	5
Drops (mg)	n	n	n	n	n

Remarks: Longitudinal

Sample No.	Mean Arworthiness				Customer Limit
	1	2	3	4	
Burn length (mm)	50	50	54	82	203
After Burne Area (g)	0	0	0	0	15
After Burne Area of Drops (g)	0	0	0	0	5
Drops (mg)	n	n	n	n	n

Remarks: Transversal

The material/part has been tested in accordance with the above mentioned test standard

Date of test: 26. Nov. 13 Performed by: Merken
Checked: Merken (Department ESMB2)

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D-20199 Bremen
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Telexfax: (+49) 421 538-3999
E-mail: Firetestlab@airbus.com

AIRBUS

Test Report No.: 13-1420

Type of test: Determination of the Specific Optical Density of Smoke

Test standard: File Testing Handbook, DOTFAAAR-0912, Chapter 6 & ATM 2.0007

Material/Part Designation: King 2507 FAR 1, 1mm, Cashmere
Elnad
Manufacturer Designation: King
Thickness (mm): 1,1

Test results:

Flaming Mode				Non-Flaming Mode			
Sample No.	Weight (g)	within 4 min. (at g)	at g	Sample No.	Weight (g)	within 4 min. (at g)	at g
1	4,6	39	240	5	4,2	102	260
2	4,2	73	240	6	4,4	92	250
3	4,5	168	240	7	4,1	78	250
4	4,3	15	240	8			

Mean: 20
Rel. standard deviation: 79,2%
Arworthiness Limit: -----
Customer Limit: 200

Mean: 92
Rel. standard deviation: 11,5%
Arworthiness Limit: -----
Customer Limit: 200

*Dm = Dm max = maximum specific optical density
Hochdruck (W/cm²): 2,516

Remarks: All samples tested with an additional horizontal wire fixation in front of specimen
Sample: 1, 2, & 4. Burn more strongly. No visible directionality.

The material/part has been tested in accordance with the above mentioned test standard

Date of test: 26. Nov. 13 Performed by: Merken
Checked: Merken (Department ESMB2)

Page 3 of 4

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E-mail: Firetestlab@airbus.com

AIRBUS

Test Report No.: 13-1420

Type of test: Determination of the Toxic Components on Combustion Products

Test standard: ATM 3.0005

Material/Part Designation: King 2507 FAR 1, 1mm, Cashmere
Elnad
Manufacturer Designation: King

Test results:

Sample No.	Flaming Mode*					
	HClN	CO	NOx	SO2	HF	HClO
1	23	274	43	52	0	0
2	23	274	43	52	0	0
3						
4						
Mean	23	284	40	46	0	0
Arworthiness Limit	150	1000	100	100	100	150
Customer Limit	150	1000	100	100	100	150

Sample No.	Non - Flaming Mode*					
	HClN	CO	NOx	SO2	HF	HClO
5	19	24	3	4	0	0
6	15	19	3	2	0	0
7						
8						
Mean	16	22	3	3	0	0
Arworthiness Limit	150	1000	100	100	100	150
Customer Limit	150	1000	100	100	100	150

*400 volume in open
3 samples only necessary if the concentration exceeds 80% of the arworthiness limit value
Analysis method: Urapor FGAS FGAS FGAS Urapor Urapor

Remarks: The material/part has been tested in accordance with the above mentioned test standard

Date of test: 26. Nov. 13 Performed by: Merken
Checked: Merken (Department ESMB2)

Page 4 of 4

Fire Test Laboratory
Airbus Operations GmbH
Airbus-Messe 1
D-20199 Bremen
Phone: (+49) 421 538-5060/4103
Telexfax: (+49) 421 538-3999
E-mail: Firetestlab@airbus.com

AIRBUS

Report No.: 14-0530

Screening Testreport

Designation: King 8500 FAR
Manufacturer of specimen: BOJMARK LEATHER GmbH & Co KG
Manufacturer designation: King
Batch no.: 200454
Customer: BOJMARK LEATHER GmbH & Co KG, Christian Schober
Order No.: 29.05.2014
Material Structure of Specimen: Textile 2
King 8500 FAR 1,0-1,2 mm
Versuchs 10, Proben A-E
Leather: King 8500
Adhesive: Thermoplastic sheet

Test results:

Sample	Top	Weight (g)	W1/W2 (%)	at g	Exp. (mm)
A	98,8	32	111	40	
B	99,3	42	91	42	
C	97,7	48	110	51	
D	98,9	44	100	45	
E	98,5	41	109	51	

Mean: 43
Rel. standard deviation: 11,2%
Arworthiness Limit: -----
Customer Limit: -----

*D100max = maximum heat release rate within 3 minutes
**H01 = total heat release at 2 minutes
Exhaust Volume: 0,977 Heatflow (W/cm²): 3,487

Remarks: Heat Release Chamber: 2

The material/part has been tested in accordance with the above mentioned test standard

Date of test: 11. Jun. 14 Performed by: Merken
Checked: Merken (Department ESMB2)

Page 1 of 2

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AIRBUS

Test Report No.: 14-0530

Type of test: Determination of the Heat Release Rate and the Heat Release

Test standard: File Testing Handbook, DOTFAAAR-0912, Chapter 8 & ATM 2.0008

Material/Part Designation: King 8500 FAR
Manufacturer Designation: King
Thickness (mm): 3,6

Test results:

Sample	Top	Weight (g)	W1/W2 (%)	at g	Exp. (mm)
A	98,8	32	111	40	
B	99,3	42	91	42	
C	97,7	48	110	51	
D	98,9	44	100	45	
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Mean: 43
Rel. standard deviation: 11,2%
Arworthiness Limit: -----
Customer Limit: -----

*D100max = maximum heat release rate within 3 minutes
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Exhaust Volume: 0,977 Heatflow (W/cm²): 3,487

Remarks: Heat Release Chamber: 2

The material/part has been tested in accordance with the above mentioned test standard

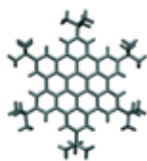
Date of test: 11. Jun. 14 Performed by: Merken
Checked: Merken (Department ESMB2)

Page 2 of 2

Copy of the test reports are available upon request.



I0 PRODUCT SAFETY



Testing and analysis of Polycyclic Aromatic Hydrocarbons (PAH) for current requirements of the GS Mark Certification.

On November 20, 2007, the Committee for Technical Work Equipment and Consumer Products (AtAv) decided to include the test for **PAH** as a mandatory requirement for **GS Mark** certification. Until now, PAH tests and analyses were conducted voluntarily, independent of GS Mark certification. As of April 1st, 2008, GS Mark certification of products must comply with the PAH limits as defined in the table below.



Test Results for BOXMARK Upholstery Leather; even good enough for Category I
Report AZ 44289 TÜV 10/07/2008

Parameter	mg/kg
naphthalene	< 0,2
acenaphthylene	< 0,2
acenaphthene	< 0,2
fluorene	< 0,2
phenanthrene	< 0,2
anthracene	< 0,2
fluoranthene	< 0,2
pyrene	< 0,2
benz[a]anthracene	< 0,2
chrysene	< 0,2
benzo[b]fluoranthene	< 0,2
benzo[k]fluoranthene	< 0,2
benzo[a]pyrene	< 0,2
dibenz[a,h]anthracene	< 0,2
benzo[g,h,i]perylene	< 0,2
indeno[1,2,3-cd]pyrene	< 0,2
Dibenz(ah)anthracene	< 0,2
Benzo(ghi)perylene	< 0,2
Total PAK (EPA)	n.n.

Parameter	Category I	Category 2 (Upholstery materials)	Category 3
	Materials in direct contact with food, or materials intended to be put into the mouth, and toys for children aged < 36 months	Materials with foreseeable contact with skin for longer than 30 seconds (long-term skin contact), and toys not covered by category I	Materials with foreseeable contact with skin up to 30 seconds (short-term skin contact) or without skin contact
Benzo[a]pyrene mg/kg	Not detectable (<0.2)	1	20
Sum of 16 PAH (EPA) mg/kg	Not detectable (<0.2)	10	200

II PRODUCTION ORGANISATION APPROVAL

With the „Production Organisation Approval“ certificate, which was granted in 2013, BOXMARK is authorised as a certified producer for aeronautics and thus a supplier to the international aircraft industry.

Stran 1 od 2
Page 1 of 2

REPUBLIKA SLOVENIJA
Članica Evropske Unije
Republic of Slovenia
A Member of European Union

POTRDILO O ODOBRTIVI PROIZVODNE ORGANIZACIJE
PRODUCTION ORGANISATION APPROVAL CERTIFICATE

REFERENCA: SI.21G.0003
REFERENCE:

V skladu z Uredbo (ES) št 216/2008 Evropskega parlamenta in Sveta ter Uredbo Komisija (ES) št 748/2012, ki sta zdaj v veljavi in pod spodaj navedenimi pogoji Javna agencija za civilno letalstvo RS potrjuje, da je *Pursuant to Regulation (EC) No 216/2008 of the European parliament and the Council and to Commission Regulation (EC) No 748/2012 for the time being in force and subject to the conditions specified below, Civil Aviation Agency of Republic of Slovenia hereby certifies:*

BOXMARK Leather d.o.o.
Industrijsko naselje 10
SI-2325 Kidričevo

Kot proizvedno organizacijo v skladu s poddelom G oddelka A Priloge (del 21) k Uredbi (ES) št 748/2012 potrjuje za proizvodnjo proizvodov, delov in naprav, navedenih na priloženem seznamu odobritev, in za izdajo povezanih spričeval z uporabo navedenih sklicevanj
As a production organisation in compliance with Annex (part 21), Section A, Subpart G of Regulation (EC) No 748/2012, approved to produce products, parts or appliances listed in the attached approval schedule and issue related certificates using the above references

POGOJI:
CONDITIONS:

- Odobritev je omejena s priloženimi pogoji za odobritev in
The approval is limited to that specified in the enclosed terms of approval; and
- Odobritev mora biti v skladu s postopki, določenimi v predstavitvi proizvedne organizacije
This approval requires compliance with the procedures specified in the approved production organisation exposition; and
- Potrdiilo je veljavno, dokler odobrena proizvedna organizacija izpolnjuje pogoje iz Priloge (del 21) k Uredbi (ES) št 748/2012.
This approval is valid whilst the approved production organisation remains in compliance with the Annex (Part 21 of Regulation (EC) No 748/2012.
- Če so zgoraj navedeni pogoji izpolnjeni, ta odobritev velja za nedoločen čas, razen, če se odobritev predhodno odpove, nadomesti, začasno razveljavi ali preklicuje.
Subject to compliance with the foregoing conditions, this approval shall remain valid for an unlimited duration, unless it approval has previously been surrendered, superseded, suspended or revoked.

Datum prvotne izdaje: 12.06.2013
Date of original issue

Datum te revizije: 29.1.2015
Date of this revision

Št. revizije: Izdaja 003
Revision No.: Issue 003
Podpis: 
Signed

Za pristojni organ:  za civilno letalstvo RS
For the competent authority: Civil Aviation Agency of Republic of Slovenia

Obrazec EASA 55a – 3. izdaja EASA Form 55a issue 3

REPUBLIKA SLOVENIJA <i>Republic of Slovenia</i>	Pogoji odobritev <i>Terms of Approval</i>	PO <i>TA:</i> SI.21G.0004
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Ta dokument je del potrdiila proizvedne organizacije številka SI.21G.0004, izdane
This document is part of Production Organisation Approval Number SI.21G.0004 issued to

Naziv podjetja: BOXMARK Leather d.o.o.

Company name

Oddelak 1. OBSEG DEL:
Section 1 SCOPE OF WORK

PROIZVODNJA <i>PRODUCTION OF</i> C2 Parts	PROIZVODI / KATEGORIJE <i>PRODUCTS / CATEGORIES</i> Production of Parts
--	--

Za podrobnosti in omejitve glej Odstavek 1.8 predstavitve proizvedne organizacije.
For details and limitations refer to the Production Organisation Exposition, Paragraph 1.8

Oddelak 2. LOKACIJE: Industrijsko naselje 10, SI-2325 Kidričevo
Section 2 LOCATION
For the details of the approved facilities linked to above location refer to POE Paragraph 1.7.

Oddelak 3. UGODNOSTI:
Section 3 PRIVILEGES:

Proizvedna organizacija ima v okviru svojih pogojev za odobritev in v skladu s postopki svoje predstavitve proizvedne organizacije pravico uveljavljati ugodnosti, določene v 21A.163. Veljajo naslednji pogoji.
The Production Organisation is entitled to exercise, within its Terms of Approval and in accordance with the procedures of its Production Organisation Exposition, the privileges set forth in 21A.163. Subject to the following:

Pred odobritvijo projekta za proizvod se lahko za namene skladnosti izda obrazec EASA 1
Prior to approval of the design of the product an EASA Form 1 may be issued only for conformity purposes.

Datum prvotne izdaje: 12.06.2013
Date of original issue

Datum te izdaje: 29.1.2015
Date of original issue

Št. revizije: Izdaja 003
Revision number: Issue 003

Podpis: 
Signed

Za: Javna Agencija za civilno letalstvo RS
For: CA4 RS

Obrazec EASA 55b – 2. izdaja EASA Form 55b – issue 2

I2 QUALITY AND ENVIRONMENT

BOXMARK is certified according to ISO 9001 and ISO TS 16949 for the production and development of automotive and furniture leathers. BOXMARK is also certified according to the ISO 14001 Ecological Standard for environmental management.

Our certifications apply to all our departments and activities.



I3 INDOOR AIR



10.1 EMISSION CRITERIA

	Standard	BOXMARK
Individual VOCs	≤ 0.1 TLV	≤ 0.1 TLV
Formaldehyde	≤ 0.05 ppm	≤ 0.025 ppm
4-Phenylcyclohexene	≤ 0.0065 mg/m ³	≤ 0.0033 mg/m ³
Total VOCs	≤ 0.5 mg/m ³	≤ 0.056 mg/m ³
Total Aldehydes	≤ 0.1 ppm	≤ 0.05 ppm



10.2 DER BLAUE ENGEL (THE BLUE ANGEL)

The Blue Angel is a German certification for products and services that have environmentally friendly aspects. After the introduction of Germany's Blue Angel in 1978 as the first worldwide environmental label, other European and non-European countries followed this example and introduced their own national and supra-regional environmental labels. The common goal of these labels is to inform consumers about environmentally friendly products thereby giving global support to product-related environmental protection.

In 1994, some countries cooperated in developing the Global Eco Labeling Network (GEN) - a non-profit interest group composed of eco-label organizations throughout the world.



10.3 REACH

Registration, Evaluation, Authorization and restriction of Chemicals (REACH) is a European Union Regulation from 18 December 2006.

In accordance with the REACH regulation, BOXMARK is able to issue declarations of conformity for the majority of its products.

REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. Its 849 pages took seven years to be adopted, and it has been described as the most complex legislation in the Union's history and the most important in 20 years. It is the strictest law so far, regulating chemical substances and will impact industries throughout the world. REACH entered into force in June 2007, with step-by-step implementation over the next decade.



BOXMARK

BOXMARK LEATHER GMBH & CO KG

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