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TEST REPORT

E-03801 ALCOY (Alicante) SPAIN

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N٥	2014US0229
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DATE OF RECEPTION	31/10/2014	
DATE TEST	Starting: 19/11/2014 Ending: 10/12/2014	Att. LAURA PRITCHARD
DESCRIPTION AND IDENTIFICATION OF SAMPLES	SAMPLES REFERENCED: -"FABRIC LAY-UPS: X-50: Z-FLEX A- INSULATION/ NEOPRENE". Aluminized fabric (1st and 2nd layers) neoprene (5th and 6th layers)	601/F-628 FOIL/1" INSULATION/F-628 FOIL/1" padding (3rd layer), aluminized fabric (4th layer), beige
TESTS CARRIED OUT	 HEAT RESISTANCE LIMITED FLAME SPREAD DETERMINATION OF BREAKING S⁻ DETERMINATION OF TEAR RESIST METHOD OF DETERMINING HEAT RADIANT HEAT ASSESSMENT OF RESISTANCE OF CONTACT HEAT 	TRENGTH AND ELONGATION TANCE TRANSMISSION ON EXPOSURE TO FLAME MATERIALS TO MOLTEN METAL SPLASH
ATTACHED	SAMPLE(S) SEALED	PAGE 1 OF 18
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HEAT RESISTANCE

Standard ISO 17493:2000

100 17 400.200

Apparatus Air stove

Temperature (180 ± 5) °C

Deviation from the Standard

Test uncertainty

± 0,6 %

Pre-treatment

Tested material

Assembly: Aluminized fabric aluminized fabric, padding, aluminized fabric, beige neoprene and beige neoprene

Measured surface

Inner surface

Reference		FABRIC LAY-UPS: 628 FOIL/1" INSU INSULATIC	X-50: Z-FLEX A-601/F- LATION/F-628 FOIL/1" DN/ NEOPRENE
Flame	Melting	Shrink	
No	No	Warp Weft	-2,1 % -0,7 %
No	No	Warp Weft	-0,7 % -0,2 %
No	No	Warp Weft	-2,0 % -0,8 %

PERFORMANCE LEVEL ACCORDING TO UNE-EN ISO 11612:2010

PASS

Requisites to meet according to UNE-EN ISO 11612:2010

b) No layer can melt
c) No layer shrinks more than 5%

OF

2



HEAT RESISTANCE

Standard ISO 17493:2000

100 17 400.200

Apparatus Air stove

Temperature (180 ± 5) °C

Deviation from the Standard

Test uncertainty

± 0,6 %

Pre-treatment

Tested material

Assembly: Aluminized fabric aluminized fabric, padding, aluminized fabric, beige neoprene and beige neoprene

Measured surface

Outer surface

Reference		FABRIC LAY 628 FOIL/1" INSU	-UPS: X- INSULA LATION/	50: Z-FLEX A-601/F- TION/F-628 FOIL/1" NEOPRENE
Flame	Melting	Shrink		
No	No	V V	Warp Weft	-0,1 % -0,1 %
No	No	V V	Warp Weft	-0,1 % -0,1 %
No	No	V V	Warp Weft	-0,1 % 0,0 %

PERFORMANCE LEVEL ACCORDING TO UNE-EN ISO 11612:2010

PASS

OF

3

Requisites to meet according to UNE-EN ISO 11612:2010

a) No layer can ignite
b) No layer can melt
c) No layer shrinks more than 5%

LIMITED FLAME SPREAD

Standard

UNE-EN ISO 15025:2003 (Method A)

Apparatus

Equipment for determination of limited flame spread 13008IE12

Original test date

28/11/2014

Conditioned 24h in indoor ambient conditions at 20 ± 2 °C and 65 ± 5 % HR

Original ambient conditions test

23,0°C and 43,0% HR

Gas used Propane

Deviation from the standard

Face exposed to the flame

Outer surface

Tested material

Assembly: aluminized fabric, aluminized fabric, padding, aluminized fabric, beige neoprene

Test uncertainty

± 0,29 s

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RESULTS

Reference FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE

Pre-Treatment Original fabric

Specimen	1	2	3	4	5	6
Direction		Warp			Weft	
Flaming to top or either side edge	No	No	No	No	No	No
After flame time (s)	0,00	0,00	0,00	0,00	0,00	0,00
Afterglow time (s)	0,00	0,00	0,00	0,00	0,00	0,00
Loose waste	No	No	No	No	No	No
Inflammation of the filter paper detached from waste	No	No	No	No	No	No
Hole formation	No	No	No	No	No	No

PERFORMANCE LEVEL ACCORDING UNE-EN ISO 11612:2010

Requisites to be met according to UNE-EN ISO 11612:2010

a) No specimen shall give flaming to top or either side edge
b) No specimen shall give hole formation in any layer
c) No specimen shall give flaming or molten debris
d) The mean value of after flame time shall be \leq 2 s
e) The mean value of afterglow time shall be ≤ 2 s

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LIMITED FLAME SPREAD

Standard

UNE-EN ISO 15025:2003 (Method A)

Apparatus

Equipment for determination of limited flame spread 13008IE12

Original test date

28/11/2014

Conditioned 24h in indoor ambient conditions at 20 ± 2 °C and 65 ± 5 % HR

Original ambient conditions test

23,0°C and 43,0% HR

Gas used Propane

Deviation from the standard

Face exposed to the flame

Inner surface

Tested material

Assembly: aluminized fabric, aluminized fabric, padding, aluminized fabric, beige neoprene

Test uncertainty

± 0,29 s

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9

RESULTS

Reference FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE

Pre-Treatment Original fabric

Specimen	1	2	3	4	5	6
Direction		Warp			Weft	
Flaming to top or either side edge	No	No	No	No	No	No
After flame time (s)	0,00	0,00	0,00	0,00	0,00	0,00
Afterglow time (s)	0,00	0,00	0,00	0,00	0,00	0,00
Loose waste	No	No	No	No	No	No
Inflammation of the filter paper detached from waste	No	No	No	No	No	No
Hole formation	No	No	No	No	No	No

PERFORMANCE LEVEL ACCORDING UNE-EN ISO 11612:2010

Requisites to be met according to UNE-EN ISO 11612:2010

a) No specimen shall give flaming to top or either side edge
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d) The mean value of after flame time shall be ≤ 2 s
e) The mean value of afterglow time shall be ≤ 2 s

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auge length 200 m					
200 m					
2TO AT AVTABELAB AT W	arn				
100 mm/min	arp				
ate of extension of W	eft				
20 mm/min					
retension					
Warp	10 N		Weft	10 N	
tmosphere for condit	ioning and testing				
Temperatur	re (20±2) °C	C F	Relative humidity	(65	5±4) %
^o of specimens					
Tested	5 for each dire	ection	Rej	ected	0
Reference	FABRIC LAY-UPS FOIL/1" INSULATIC	: X-50: Z-FL)n/ Neopre	.EX A-601/F-628 FC	IL/1" INSULAT	-ION/F-628
Direction	Average load (N)	CV (%)	Elongation to the load (%	e maximum 5)	CV (%)
Warp	3400	10,0	9,0	,	4,8
Weft	3100	4,0	6,6		3,8
EQUISITE ACCORDIN he material must resist	IG TO STANDARD I a breaking load in bo	UNE-EN IS oth direction PASS	D 11612:2010 ns ≥ 300 N.		
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OF



Standard UNE-EN ISO 13937-2:2001 Apparatus INSTRON Dynamometer Atmosphere for conditioning and testing Temperature (20±2) °C Relative humidity (65±4) % (65±4) % V of specimens Tested 5 for each direction Rejected 0 0 Ve of specimens Tested 5 for each direction Rejected 0 0 The calculation of averages has been made For electronic device 160 5.9 Warp 160 5.9 Weft 150 6.2 Reference For Condition/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE Warp 160 5.9 Weft 150 6.2 Remarks The test was conducted with specimens of great width (200x200mm). EQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. PASS	Standard UNE-EN ISO 13937-2:2001 Apparatus INSTRON Dynamometer Atmosphere for conditioning and testing Temperature (20±2) °C Relative humidity (65±4) % Vo of specimens Tested 5 for each direction Rejected 0 The calculation of averages has been made For electronic device Reference Tear Average load (N) CV (%) FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 Warp 160 5.9 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE Weft 150 6.2 Remarks The test was conducted with specimens of great width (200x200mm). REQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. Image: Law of the specimene of tear material must resist a determination of tear resistance in both directions ≥ 15 N.	DETERMINATION OF TEAR RESISTANCE Standard UNE-EN ISO 13937-2:2001 Among the ison of the ison of the ison of the conditioning and testing Temperature (20±2) °C Relative humidity (65±4) % Ye of specimens Tested 5 for each direction Rejected 0 Te calculation of averages has been made For electronic device Note Calculation of averages has been made For electronic device Neference Tear Average load (N) CV (%) FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 Warp 160 5.9 FOIL'1' INSULATION/F-628 FOIL'1' INSULATION/ NEOPRENE Remarks The test was conducted with specimens of great width (200x200mm). REQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. IPASS		RE	SULTS		
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Remarks The test was conducted with specimens of great width (200x200mm). REQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. PASS	Remarks The test was conducted with specimens of great width (200x200mm). REQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. PASS	Remarks The test was conducted with specimens of great width (200x200mm). REQUISITE ACCORDING TO STANDARD UNE-EN ISO 11612:2010 The external material must resist a determination of tear resistance in both directions ≥ 15 N. PASS					
		>>>>	INSULATION/ NEOPRENE Remarks The test was conducted with specim	iens of gre	Weft eat width (200x2	150 00mm). 2:2010	6.2
			INSULATION/ NEOPRENE Remarks The test was conducted with specim REQUISITE ACCORDING TO STAN The external material must resist a c	ens of gre DARD UN determinat	Weft eat width (200x2 IE-EN ISO 1161 tion of tear resis	150 00mm). 2:2010 tance in both directions	6.2 ≥ 15 N.
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METHOD OF DETERMINING HEAT TRANSMISSION ON EXPOSURE TO FLAME

Standard ISO 9151:1995

Apparatus Convective heat

Heat flux density 79,21 kW/m²

Pre-Treatment

Conditioned 24h in indoor ambient conditions at 20 \pm 2 $^{\circ}$ C and 65 \pm 5 $^{\circ}$ HR

Ambient conditions test 22,3 °C and 50,5 % HR

Deviation from the Standard

Test date

01/12/2014

Tested material

Aluminized fabric, aluminized fabric, padding, aluminized fabric, beige neoprene and beige neoprene

Test uncertainty

± 0,36 s



Reference	Specimen	Range of HTI ^a 12 values (s)	Range of HTI ^a 24 values (s)
FABRIC LAY-UPS: X-50: Z-FLEX	1	57,4	> 60,0(*)
A-601/F-628 FOIL/1"	2	53,8	> 60,0(*)
INSULATION/F-628 FOIL/1"	3	49,2	> 60,0(*)
INSULATION/ NEOPRENE	Result	49,2	> 60,0(*)

Remark

(*)The equipment was unable to measure a temperature increase of 24 degrees in less than 60 seconds

PERFORMANCE LEVEL ACCORDING TO STANDARD UNE-EN ISO 11612:2010

B3

Results in according with standard UNE-EN ISO 11612:2010

Performance level	Range of HTI ^a 24 values (s)	
	Minimum	Maximum
B1	4,0	< 10,0
B2	10,0	< 20,0
B3	20,0	
	Heat transfer index, as defined in ISO 9151:1995	

Results have been obtained according a test method with pretenders only the classification of the materials, and are not necessary the application of the conditions

0

RESULTS

RADIANT HEAT

Standard UNE-EN ISO 6942:2002

Apparatus Equipment for the determination of radiant heat

Heat flux density 20,03 kW/m²

Pre-Treatment Flexed

Conditioned 24h in indoor ambient conditions at 20 \pm 2 °C and 65 \pm 2 % HR

Ambient conditions test 19,5 °C and 28,0 % HR

Deviation from the Standard

Test date

10/12/2014

Tested material

Aluminized fabric, aluminized fabric, padding, aluminized fabric, beige neoprene and beige neoprene

Test uncertainty

± 0,34 s

Reference	FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE		
Specimen 1 2 3 Result	RHTI ^a 12 (s) > 600(*) > 600(*) > 600(*) > 600(*)	RHTI ^a 24 (s) > 600(*) > 600(*) > 600(*) > 600(*)	

Remark

(*)The equipment was unable to measure a temperature increase of 12 and 24 degrees in less than 600 seconds

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PERFORMANCE LEVEL ACCORDANCE WITH STANDARD UNE-EN ISO 11612:2010 C4

Results in accordance with Standard UNE-EN ISO 11612:2010

Performance level	Range of RHTI ^a 24 values		
	Minimum	Maximum	
C1	7,0	< 20,0	
C2	20,0	< 50,0	
C3	50,0	< 95,0	
C4	9	95,0	
Heat transfe 6942:2002	r index, as defined	in EN ISO	

Results have been obtained according a test method with pretenders only the classification of the materials, and are not necessary the application of the conditions

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RESULTS ASSESSMENT OF RESISTANCE OF MATERIALS TO MOLTEN METAL SPLASH Standard UNE-EN ISO 9185:2008 **Apparatus** Metal Equipment for molten metal splashes test Aluminium **Pouring temperature** Pouring angle **Pouring height** 780 °C ± 20 °C 60 ° ± 1° 225 mm ± 5 mm **Pre-treatment** ---**Deviation from the Standard** ---FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-Reference 628 FOIL/1" INSULATION/ NEOPRENE Mass of metal Mass of metal Metal adhered to fabric Assessment of PVC film used (g) pouring (g) 363 351 Yes Not damaged 361 351 Yes Not damaged 361 352 Yes Not damaged 364 351 Yes Not damaged PERFORMANCE LEVEL ACCORDING WITH UNE-EN ISO 11612:2010 D3 Results interpretation according to UNE-EN ISO 11612:2010 **Performance levels** Molten Aluminium (g) Min. Max. D1 100 < 200 D2 200 < 350 D3 350 .///

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RESULTS ASSESSMENT OF RESISTANCE OF MATERIALS TO MOLTEN METAL SPLASH Standard UNE-EN ISO 9185:2008 Apparatus Metal Equipment for molten metal splashes test Iron **Pouring temperature** Pouring angle **Pouring height** 1400 °C ± 20 °C 75 ° ± 1° 225 mm ± 5 mm **Pre-treatment** ---**Deviation from the Standard** FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-Reference 628 FOIL/1" INSULATION/ NEOPRENE Metal adhered to Assessment Metal pouring Ignition Puncture of PVC film fabric mass (g) No No 215 No Not damaged 212 No No Not damaged No 212 No No No Not damaged 213 Not damaged No No No PERFORMANCE LEVEL ACCORDING WITH UNE-EN ISO 11612:2010 E3 **Results interpretation according to UNE-EN ISO 11612:2010 Performance levels** Molten iron (g) Max. Min. E1 60 < 120 E2 120 < 200 E3 200

Remark

Test covered by accreditation number No. 056-TEST, emitted by BELAC.

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CONTACT HEAT

Standard ISO 12127-1:2007

Apparatus

ÖTI CONTACT HEAT PROTECTION TESTER

Conditioned

24h in indoor ambient conditions at 20 ± 2 °C and 65 ± 5 % HR

Ambient conditions test

23,1 °C and 43,0 % HR

Pre-treatment

Deviation from the Standard

Test date 28/11/2014

Tested material

Assembly: aluminized fabric, aluminized fabric, padding, aluminized fabric, beige neoprene

Test uncertainty

± 0,13 s

Reference	FABRIC LAY-UPS: X-50: Z-FLEX A-601/F-628 FOIL/1" INSULATION/F-628 FOIL/1" INSULATION/ NEOPRENE		
Specimen	Contact temperature Tc (°C)	Threshold time T (s)	
. 1	250	42,94	
2	250	34,75	
3	250	47,50	
Result	250	34,8	

F3

RESULTS

PERFORMANCE LEVEL ACCORDING TO STANDARD UNE-EN ISO 11612:2010

Requisites according to standard UNE-EN ISO 11612:2010

Borformanaa lavala	Threshold time (s)	
Ferior marice levers	Minimum	Maximum
F1	5,0	< 10,0
F2	10,0	< 15,0
F3	15,0	



Lucia Martinez Head of PPE's department

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