TEST REPORT

2018EC0063

DATE OF RECEPTION
10/10/2018

DATE TESTS
Starting: 31/10/2018
Ending: 11/12/2018

APPLICANT

Honeywell Salisbury
PO Box 70729
US-29415 NORTH Charleston
South Carolina

Att. Bill Williams

Asociación de Investigación de la Industria Textil – C.I.F.: G03182870

IDENTIFICATION AND DESCRIPTION OF SAMPLES

REFERENCES
CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

A new sample has been added to the order: CLASS 2 (Y/B)

TESTS CARRIED OUT

- DIMENSIONS OF THE INSULATING EQUIPMENT.
- THICKNESS OF INSULATING EQUIPMENT.
- PUNCTURE RESISTANCE.
- DETERMINATION OF BREAKING STRENGTH AND ELONGATION.
- DETERMINATION OF RESIDUAL ELONGATION.
- DIELECTRIC TESTS.
- FLAME RETARDANCY TEST.
- DETERMINATION OF pH VALUE.
- EXTRACTABLE PROTEINS.

Tests marked with * are not included within the scope of the ENAC accreditation

AITEX - Plaza Emilio Sala, 1
E-03801 ALCOY (Alicante) SPAIN
Tel.:+34 96 554 22 00

www.aitex.es
info@aitex.es

RESULTS

DIMENSIONS OF THE INSULATING EQUIPMENT

Standard
EN 60903:2003 (point 8.2.2)

Apparatus
Rules

Test date
16/11/2018

Test room conditions for testing
Initial

Temperature: 21.4 °C, Relative humidity of 52.4 %.

Final

Temperature: 20.9 °C, Relative humidity of 51.5 %.

Sample pre-conditioning
2 h at a temperature of 21.4 ° C and relative humidity 51.1%.

Observation or deviation of the standard

Description of the sample
Insulating glove black class 2 and category RC.

Reference
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

Test uncertainty
The expanded uncertainty is ± 1.5 mm of the value of the measured for a probability of coverage of 95%.

>>>

RESULTS

SAMPLES Nª	1	2	3
Length (mm)	400	407	399

Requirements for the dimensional evaluation of insulation gloves according to EN 60903:2003 (point 5.1.3).

- **Dimensions:** for preformed gloves the difference between max. And min. shall be (50 ± 6) mm, except for long composite gloves that will be (100 ± 12) mm. Standard lengths vary by class:

CLASS	Standard Lengths (mm)				
variation	± 15				± 20[a]
00	280	360	-	-	-
0	280	360	410	460	-
1	-	360	410	460	800[a]
2	-	360	410	460	800[a]
3	-	360	410	460	800[a]
4	-	360	410	460	-

[a] Compound Long Gloves

For a glove of 410 mm length.

PASS

_____///

The test was carried out at APPE Laboratory located at Polígono Industrial Santiago Payá C/Filá Benimerines, 25 B – 03801 Alcoy (Alicante).

RESULTS

THICKNESS OF INSULATING EQUIPMENT

Standard
EN 60903:2003 (point 8.2.3)

Apparatus
Thickness gauge.

Test date
16/11/2018

Test room conditions for testing
Initial
Temperature: 21.4 °C, Relative humidity of 52.4 %.
Final
Temperature: 20.9 °C, Relative humidity of 51.5 %.

Sample pre-conditioning
2 h at a temperature of 21.4 ° C and relative humidity 51.1%.

Observation or deviation of the standard

Description of the sample
Insulating glove black class 2 and category RC.

Test uncertainty.
The expanded uncertainty is ± 0.1 mm of the value of the measured for a probability of coverage of 95%.

Reference
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

>>>

RESULTS

SAMPLE Nº	MAXIMUM THICKNESS (mm)	SAMPLE Nº	MAXIMUM THICKNESS (mm)	SAMPLE Nº	MAXIMUM THICKNESS (mm)
1	1.73	**11**	1.82	**17**	1.72
2	1.76	**12**	1.67	**18**	1.70
3	1.75	**13**	1.68	**19**	1.73
8	1.95	**14**	1.75	**20**	1.82
9	1.90	**15**	1.70	**21**	1.74
10	1.66	**16**	1.72	**---**	---

Requirements for the thickness evaluation of insulation gloves according to EN 60903: 2003 (point 5.1.4).

- **Thickness**: The maximum thickness on the smooth face of a glove shall be:

CLASS	Thickness (mm)		
	Insulating gloves	Composite Gloves	Compound Long Gloves
00	0.50	1.8	-
0	1.00	2.3	-
1	1.50	-	3.1
2	2.30	-	4.2
3	2.90	-	4.2
4	3.60	-	-
Category A, H, Z and R gloves may require an additional thickness not to exceed 0.6 mm.			

PASS

///

The test was carried out at APPE Laboratory located at Polígono Industrial Santiago Payá C/Filá Benimerines, 25 B - 03801 Alcoy (Alicante).

RESULTS

PUNCTURE RESISTANCE

Standard
EN 60903:2003 point 8.3.2

Apparatus
INSTRON Dynamometer

Gauge length
(500±50) mm/min

Atmosphere for conditioning
Temperature (23±2) ºC **Relative humidity** (50±5) %

Nº of specimens
2

Conditioning date
21/11/2018

Test date
26/11/2018

Reference	GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)
Specimens	**Maximum force (N)**
1	115.54
2	98.25

Remark
The expanded uncertainty of maximum force is ±10% of the value of the measured for a probability of coverage of 95%.

REQUISITE ACCORDING TO STANDARD EN 60903:2003 POINT 6.1.
Mechanical puncture resistance should correspond to a higher than 18N/mm for insulating gloves and must be greater than 60N for composed gloves.

PASS

///

RESULTS

DETERMINATION OF RESIDUAL ELONGATION

Standard
EN 60903:2003 point 8.3.3

Apparatus
INSTRON Dynamometer

Gauge length
50 mm

Mounting Laxo
Atmosphere for conditioning and testing
Temperature (23±2) ºC **Relative humidity** (50±5) %

Nº of specimens
3

Conditioning date
21/11/2018 - 03/12/2018

Test date
03/12/2018

Reference	Residual Elongation (%)	C.V. (%)
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B) Original	0%	0.0
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B) After thermal aging (168h to 70º±2C)	0%	0.0

REQUISITE ACCORDING TO STANDARD EN 60903:2003 POINT 5.2.2.
The residual elongation should not exceed 15%.

PASS

///

RESULTS

DIELECTRIC TESTS

Standard
EN 60903:2003 (point 8.4)

Apparatus
Equipment testing of dielectric equipment.

Test date
16/11/2018 - 03/12/2018

Test room conditions for testing

Initial (30-11-2018)
Samples 6, 7: Temperature: 22.1 °C, Relative humidity of 48.6 %.
Final
Samples 6, 7: Temperature: 22.3 °C, Relative humidity of 48.3 %.

Initial (20-11-2018)
Samples 8, 9 and 10: Temperature: 22.4 °C, Relative humidity of 55.9 %.
Final
Samples 8, 9 and 10: Temperature: 25.8 °C, Relative humidity of 50.1 %.

Initial (28-11-2018)
Samples 12, 13: Temperature: 21.3 °C, Relative humidity of 45.4 %
Final
Samples 12, 13: Temperature: 21.4 °C, Relative humidity of 45.6 %

Initial (29-11-2018)
Sample 15, 16: Temperature: 21.3 °C, Relative humidity of 49.9 %.
Final
Sample 15, 16: Temperature: 21.2 °C, Relative humidity of 52.1 %.

Initial (03-12-2018)
Samples 17, 18: Temperature: 22.6 °C, Relative humidity of 46.2 %.
Final
Samples 17, 18: Temperature: 22.6 °C, Relative humidity of 47.9 %.

Initial (20-11-2018)
Samples 19, 20 and 21: Temperature: 23.5 °C, Relative humidity of 55.7 %.
Final
Samples 19, 20 and 21: Temperature: 23.5 °C, Relative humidity of 56.7 %.

Sample pre-conditioning

16-11-2018
2 h at a temperature of 21.4 ° C and relative humidity 51.1%.

>>>

RESULTS

Observation or deviation of the standard

Description of the sample
Insulating glove black class 2 and category RC.

Test uncertainty
The expanded uncertainty is ± 7% of the value of the measured for a probability of coverage of 95%.

Reference
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

Pre-Treatment Conditioning to moisture absorption: (16 ± 0.5) h by immersion in water.

SAMPLE Nº	8	9	10
Proof test voltage (kV)	20.1	20.1	20.1
Maximum proof test current (mA)	10.7	10.4	10.5
Test Time (s)	180	180	180
Proof test voltage result	Pass	Pass	Pass
Withstand test voltage (kV)	30.1	30.1	30.1
Withstand test voltage result	Pass	Pass	Pass
Overcoming Dielectric Tests	YES	YES	YES

Pre-Treatment Exposure to aging: 168 h at a temperature of (70 ± 2) ° C and relative humidity less than (20) %. Cool min. 24 h.

SAMPLE Nº	6	7
Proof test voltage (kV)	20.1	20.1
Maximum proof test current (mA)	9.4	9.3
Test Time (s)	180	180
Overcoming Dielectric Tests	YES	YES

>>>

RESULTS

Pre-treatment

Exposure to very low temperature of Category C: (24 ± 0.5) h at (-40 ± 3) ° C, 1 min. Then fold over the wrist and subject to a force of 100 N for 30s.

SAMPLE Nº	19	20	21
Proof test voltage (kV)	20.1	20.1	20.1
Maximum proof test current (mA)	10.0	9.8	20.1
Test Time (s)	180	180	180
Overcoming Dielectric Tests	YES	YES	YES

Pre-Treatment

Exposure to Category A contamination: (8 ± 0.5) h. Submerged in H2SO4 of 32ºB, at (23 ± 2) ºC. Then wash the samples with water and dry for (2 ± 0.5) h at 70 ° C approx.

SAMPLE Nº	12	13
Proof test voltage (kV)	20.2	20.2
Maximum proof test current (mA)	9.5	9.3
Test Time (s)	180	180
Overcoming Dielectric Tests	YES	YES

>>>

RESULTS

Pre-Treatment Exposure to contamination category H: (24 ± 0.5) h. Immersed in liquid 102 at (70 ± 2) ° C and then dried with a cloth.

SAMPLE Nº	15	16
Proof test voltage (kV)	20.1	20.1
Maximum proof test current (mA)	9.8	9.3
Test Time (s)	180	180
Overcoming Dielectric Tests	YES	YES

Pre-Treatment Exposure to contamination category Z: conditioned in an oven for (3 ± 0.5) h. At 40 ± 2 ° C and an ozone concentration of (1 ± 0.01) mg / m3 at atmospheric pressure of 1013 mbar, and stored at (23 ± 2) ° C and (50 ± 5) RH for 48 ± 0.5) H.

SAMPLE Nº	17	18
Proof test voltage (kV)	20.1	20.1
Maximum proof test current (mA)	9.5	9.4
Test Time (s)	180	180
Overcoming Dielectric Tests	YES	YES

>>>

RESULTS

Requirement for evaluation of dielectric test according to EN 60903: 2003 (point 5.3).

Class	Alternating current test					
	Proof test voltage (kV)	Maximum proof test current (mA)				Withstand test voltage (kV)
		Length of glove (mm)				
		280	360	410	≥ 460	
00	2.5	12	14	N.A.	N.A.	5
0	5	12	14	16	18	10
1	10	N.A.	16	18	20	20
2	20	N.A.	18	20	22	30
3	30	N.A.	20	22	24	40
4	40	N.A.	N.A.	24	26	50

N.A.:Not applicable.

PASS

///

The test was carried out at APPE Laboratory located at Polígono Industrial Santiago Payá C/Filá Benimerines, 25 B – 03801 Alcoy (Alicante).

RESULTS

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

Standard
EN 60903:2003 point 8.3.1
Apparatus
INSTRON Dynamometer
Gauge length
50 mm
Gauge length
(500±50) mm/min
Mounting Laxo
Atmosphere for conditioning and testing
Temperature (23±2) ºC **Relative humidity** (50±5) %
Nº of specimens
4
Conditioning date
29/11/2018
Test date
03/12/2018

Reference	Maximum average Load (MPa)		C.V. (%)	Average Elongation at break (%)		C.V. (%)
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)	28.84	**28.70**	7.3	847.09	**709.49**	13.13
	28.62			683.46		
	31.25			662.35		
After thermal aging (168h to 70º±2C)	26.10			645.07		

Remark
The expanded uncertainty of maximum force is ±5% of the value of the measured for a probability of coverage of 95%.

REQUISITE ACCORDING TO STANDARD EN 60903:2003 POINT 5.4.
The average tensile strength and elongation at break should not be less than 80% of the values obtained by gloves that have not been exposed to oil. The residual elongation should not exceed 15%

PASS

_____///

RESULTS

FLAME RETARDANCY TEST

Standard
EN 60903:2003 (point 8.6.2)

Apparatus
Equipment testing of dielectric equipment.

Test date
16/11/2018 - 04/12/2018

Test room conditions for testing

Initial (04-12-2018)
Sample 3: Temperature: 22.5 °C, Relative humidity of 45.7 %.
Final
Sample 3: Temperature: 22.5 °C, Relative humidity of 46.1 %.

Sample pre-conditioning
2 h at a temperature of 21.4 ° C and relative humidity 51.1%.

Observation or deviation of the standard

Description of the sample
Insulating glove black class 2 and category RC.

Reference
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

SAMPLE Nº	The flame reaches the reference lines during the observation period.
3	NO

Requirement for evaluation of flame resistance for insulating gloves according to standard to EN 60903: 2003 (point 5.5.2).

Test piece obtained from gloves shall withstand the propagation of the flame: The reference line on the specimen shall not reach 55 mm from its end within 55 s after flame removal.

PASS

_____///

The test was carried out at APPE Laboratory located at Polígono Industrial Santiago Payá C/Filá Benimerines, 25 B – 03801 Alcoy (Alicante).

RESULTS

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

Standard
EN 60903:2003 point 8.3.1
Apparatus
INSTRON Dynamometer
Gauge length
50 mm
Gauge length
(500±50) mm/min
Mounting Laxo
Atmosphere for conditioning and testing
Temperature (23±2) ºC **Relative humidity** (50±5) %
Nº of specimens
4
Conditioning date
29/11/2018
Test date
03/12/2018

Reference	Maximum average Load (MPa)		C.V. (%)	Average Elongation at break (%)		C.V. (%)
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)	24.98	**25.33**	2.0	632.65	**634.94**	0.51
After acid	25.69			637.24		

Remark
The expanded uncertainty of maximum force is ±5% of the value of the measured for a probability of coverage of 95%.

REQUISITE ACCORDING TO STANDARD EN 60903:2003 POINT 5.6.1
The average tensile strength and elongation at break should not be less than 75% of the values obtained by gloves that have not been exposed to acid.

PASS

_____///

RESULTS

DETERMINATION OF BREAKING STRENGTH AND ELONGATION

Standard
EN 60903:2003 point 8.3.1
Apparatus
INSTRON Dynamometer
Gauge length
50 mm
Gauge length
(500±50) mm/min
Mounting Laxo
Atmosphere for conditioning and testing
Temperature (23±2) ºC **Relative humidity** (50±5) %
Nº of specimens
4
Conditioning date
04/12/2018
Test date
10/12/2018

Reference	Maximum average Load (MPa)		C.V. (%)	Average Elongation at break (%)		C.V. (%)
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)	17.67	**18.61**	7.1	502.12	**491.22**	3.14
After oil	19.55			480.32		

Remark
The expanded uncertainty of maximum force is ±5% of the value of the measured for a probability of coverage of 95%.

REQUISITE ACCORDING TO STANDARD EN 60903:2003 POINT 5.6.2
The average tensile strength and elongation at break should not be less than 50% of the values obtained by gloves that have not been exposed to oil.

PASS

_____///

RESULTS

DETERMINATION OF PH VALUE

Standard
EN ISO 3071:2006

Determination date
11/12/2018

Extractor solution
A - H_2O

pH Extractor solution
7,38

Temperature
21.3 ºC

Reference	pH	Uncertainty
GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)	7.40	± 5 %

///

RESULTS

EXTRACTABLE PROTEINS

Standard: EN 455-3:2015

Test method : Modified Lowry´s method

Test date: 31.10.18 – 08.11.18

Sample reference: GLOVE REF. CHARLESTON ELECTRIFLEX MODIFIED FORMULA CLASS 2 (Y/B)

Batch number [(1)]: ---

Size: --

Results:

Result µg/g	Uncertainly %
65.5	52

Remarks:

- [(1)] Data provided by the Customer.
- According to the standard EN 455-3:2015, if the gloves are labelled indicating a protein content, is not allowed to declare in the label an inferior protein content to 50 µg/g.
- Test covered by accreditation number Nº. 0248, emitted by UKAS

Raquel Muñoz
Chief of Innovation Area

Digitally signed by RAQUEL MUNOZ GONZALEZ - NIF:05895159Y
Date: 2018.12.12 17:40:22 +01:00
Reason: Responsable
Location: Alcoy

LIABILITY CLAUSES

1.- AITEX is liable only for the results of the methods of analysis used, as expressed in the report and referring exclusively to the materials or samples indicated in the same which are in its possession, the professional and legal liability of the Centre being limited to these. Unless otherwise stated, the samples were freely chosen and sent by the applicant.
2.- AITEX shall not be liable in any case of misuse of the test materials nor for undue interpretation or use of this document
3.- The Offer and / or Order to which the applicant gives approval through signature and seal, constitutes the Legally Executable Agreement in which AITEX is responsible for safeguarding and guaranteeing the absolute confidentiality of the management of all the information obtained or created during the performance of the contracted activities.
4.- In the eventuality of discrepancies between reports, a check to settle the same will be carried out in the head offices of AITEX. Also, the applicants undertake to notify AITEX of any complaint received by them as a result of the report, exempting this Centre from all liability if such is not done, the periods of conservation of the samples being taken into account.
5.- AITEX is not responsible for the information provided by customers, which is reflected in the Report, and may affect the validity of the results.
6.- AITEX will provide at the request of the person concerned, the treatment of complaints procedure
7.- AITEX may include in its reports, analyses, results, etc., any other evaluation which it considers necessary, even when it has not been specifically requested.
8.- The uncertainties of the tests, which are made explicit in the Results Report, have been estimated for a k = 2 (probability of coverage of 95%). If not informed, they are available to the client in AITEX.
9. - The original materials and rests of samples, not subject to test, will be retained in AITEX during the twelve months following the issuance of the report, so that any check or claim which, in his case, wanted to make the applicant, should be exercised within the period indicated.
10.- This report may only be sent or delivered by hand to the applicant or to a person duly authorised by the same.
11.- The results of the tests and the statement of compliance with the specification in this report refer only to the test sample as it has been analyzed / tested and not the sample / item which has taken the test sample.
12.- The client must attend at all times, to the dates of the realization of the tests.
13.- According to Resolution EA (33) 31, the test reports must include the unique identification of the sample, and any brand or label of the manufacturer may be added. It is not allowed to re-issue test reports of untested sample names (references), they can only be re-issued for error correction or inclusion of omitted data that were already available at the time of the test. The laboratory can not assume responsibility for declaring that the product with the new trade name / trademark is strictly identical to the one originally tested; This responsibility belongs to the client.