

SATRA Technology Centre Ltd Wyndham Way, Telford Way, Kettering, Northamptonshire, NN16 8SD United Kingdom Tel: +44 (0) 1536 410000 Fax +44 (0) 1536 410626 email: <u>info@satra.co.uk</u> www.satra.co.uk

Customer details:

etails: Raychem RPG (P) Ltd SATRA reference: SPC0253199 /1701/1 1/62 MG Road, Near Bharat Petroleum Pump Off Western Express Highway Post Sativali, Bassein Taluka, Vasai East Dist Thane Maharashtra India 401 208 Date of report: 5 May 2017 Samples received: 6 January 2017

For the attention of: Chandrama Kalgutkar

Date(s) work 9-26 January & 24 carried out: March – 5 April 2017

TECHNICAL REPORT

Subject:

Samples of class 00 insulating gloves for EN 60903/IEC 60903 testing with AZC special category protection

Replaces report SPC0253199/1701/1 issue 2 date 31 January 2017

Conditions of Issue:

This report may be forwarded to other parties provided that it is not changed in any way. It must not be published, for example by including it in advertisements, without the prior, written permission of SATRA.

Results given in this report refer only to the samples submitted for analysis and tested by SATRA. Comments are for guidance only.

A satisfactory test report in no way implies that the product tested is approved by SATRA and no warranty is given as to the performance of the product tested. SATRA shall not be liable for any subsequent loss or damage incurred by the client as a result of information supplied in the report.

The uncertainty of the results (UoM) in this report is based on a standard uncertainty multiplied by a coverage factor k=2, which provides for a confidence level of approximately 95%.

Report signed by: Position: Department: Dave McKeown PPE Technologist Safety Product Testing

(Page 1 of 11)

Illioun



Work requested

Samples of insulating gloves, see Table 1 and figures 1 & 2, were received by SATRA for testing in accordance with IEC 60903:2014.

Table 1 – Samples received

Date of submission	Sample description as stated by the client	Classification marking	Sizes submitted for testing	Colour of samples submitted	Approximate weight of a single sample
January 2017	Insulating glove	Class 00 Category AZC	Size 9	Red	45g



Signed Villioun



Conclusion

Table 2 - Summary of results

Standard	Clause / Property	Result	
	4.2 Classification	Pass	
	4.3.1 Composition	Pass	
	4.3.2 Dimensions	Pass	
	4.3.3 Thickness	Pass	
	4.3.4 Workmanship and finish	Pass	
	4.4 Mechanical, climatic and environmental requirements	Pass	
	4.5 Electrical requirements		
	4.6 Marking	Not assessed	
	4.7 Packaging	Not assessed	
	4.8 Instructions for use	Not assessed	
	5.5.2 Tensile strength and elongation at break	Pass	
	5.5.3 Resistance to mechanical puncture	Pass	
IEC 60903:2014	5.5.4 Tension set	Pass	
	5.6 Dielectric tests	Pass	
	5.7 Ageing test	Pass	
	5.8.1 Low temperature test	Pass	
	5.8.2 Flame retardancy test	Pass	
	5.9.1 Category A - Acid resistance	Pass	
	5.9.2 Category H - Oil resistance	Not assessed	
AP' AP'	5.9.3 Category Z - Ozone resistance	Pass	
Nº 1 Nº	5.9.4 Category C - Extremely low temperature resistance	Pass	
-01' -01	5.9.5 Category F – Leakage current resistance	Not applicable	
120 120	5.10.1 Composite gloves – Abrasion resistance	Not applicable	
X NY .	5.10.2 Composite gloves – Cutting resistance	Not applicable	
	5.10.3 Composite gloves – Tear resistance	Not applicable	

Note A – Clauses marked as 'not assessed' must be addressed in full before an EC type examination certificate can be issued

Testing

Testing was carried out in accordance with IEC 60903:2014.

In addition to individual conditioning requirements, all samples were conditioned for at least 24 hours in a conditioned environment maintained at (23 ± 2) °C and (50 ± 5) % relative humidity. Testing was carried out within the same environment or within 5 minutes of removal.

Gloves were claimed to be of Class 00 insulating type, with additional protection according to special properties categories AZC.

Electrical testing was carried out using AC voltage at 50 Hz (in accordance with clauses 5.6.1.4.2 and 5.6.1.4.3 for proof & withstand tests respectively), with gloves submerged in tap water (specific resistivity less than or equal to 100Ω ·m).

Signed Villioun



TECHNOLOGY

Table 3 - IEC 60903:2014 clause 4.2 Classification - Special properties

Category		Resistant to
	А	Acid
	Н	Oil
	Z	Ozone
	R	Acid, oil, ozone
	С	Extremely low temperature
	F	Leakage current
NOTE 1	Category R combines the c	aracteristics of categories A, H and Z.
NOTE 2	Category F is for long glove	s only.
NOTE 3	Any combination of catego	es may be used.

Table 4 - IEC 60903:2014 clause 4.3.2 Dimensions - Standard lengths of gloves

Class			Standard length mm ^b		
00	280	360	-	-	800 a
0	280	360	410	460	800 ^a
	$\nabla - \nabla$	360	410	460	800 a
2		360	410	460	800 ^a
3	00°	360	410	460	800 ^a
4		7	410	460	800 a

^a Long gloves.

^b The tolerance in length shall be ± 15 mm for any class, except for long gloves where permissible variation shall be ± 20 mm.

For contour-cuff gloves, the difference between the maximum and minimum lengths shall be 50 mm \pm 6 mm except for *long gloves* where this difference shall be 100 mm \pm 12 mm.

Table 5 – IEC 60903:2014 clause 4.3.3 Thickness - Maximum thickness of the gloves

· · · · · · · · · · · · · · · · · · ·	PThi	ckness
Class		mm
01' - 01' - 01'	Gloves	Composite gloves
00	0.50	1.8
0	1.00	2.3
	1.50	2.8
2	2.30	3.3
3	2.90	3.6
4	3.60	4.2

Long gloves may require additional thickness which shall not exceed 0.6 mm.

Gloves of categories A, H, Z and R may require additional thickness which shall not exceed 0.6 mm.

Signed Illioun

Table 6 - IEC 60903:2014 clause 5.6 Electrical requirements - Proof test and withstand test

Class	Proof test voltage kV rms		Maximum proof test current ^{b, c} mA rms Glove length mm				
		280	360	410	460	800	
00	2.5	12	14	N/a ^a	N/a ^a	18	5
0	5	12	14	16	18	20	10
1	10	N/a	16	18	20	22	20
2	20	N/a	18	20	22	24	30
3	30	N/a	20	22	24	26	40
4	40	N/a	N/a	24	26	30	50

^a N/a = Not applicable.

TECHNOLOGY

^b Gloves which, during tests, show proof test current values equal to or less than the values indicated in this Table will, during normal use, have actual leakage current values much lower than the threshold of ventricular fibrillation. This is because the contact area with water during these tests is much greater than the contact area of the hand on the inside of the glove and the contact area of the glove with live electrical parts of equipment handled during normal use. Moreover, the proof test voltage is higher than the recommended maximum use voltage.

^c For routine tests, the proof test current values given by this Table shall be reduced by 2 mA.

able 7 - IEC 60903:2014 claus	se 5.9.5 Category F	- Leakage current	resistance requirements
-------------------------------	---------------------	-------------------	-------------------------

Class	Test voltage kV rms	Maximum leakage current mA rms	
00	Under consideration	ATT ATT	
$00^{\circ},00^{\circ},00^{\circ}$	Under consideration)' = 0'	
	10	10	
2	20	10	
3	30	10	
4	40	10	

Signed Illioun

Results

SA

Table 8 – IEC 60903:2014 Test results: Mandatory tests

TECHNOLOGY

S.2.1 General Gloves may be lined or unlined Gloves are unlined N/A Pass 5.2.1 General Shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer Colour: Red N/A Pass 5.2.1 General The gloves have an exterior covering, it shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer Gloves are made of elastomer N/A Pass 5.2.2 Classification The gloves covered by this standard shall be designated as follows: - by class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3) Class marking: 00 N/A Pass 5.2.3 Dimensions See Table 4 Glove ref. 1 Length (mm) 1 365 2 ±0.3 mm Pass 5.2.4 Thickness See Table 5 Glove ref. 3 Length (mm) 1 0.42 2 ±0.016 mm Pass 5.2.5 Workmanship and finish Gloves shall be free on both inner and outer surfaces from harmlul physical irregularities that can be detected by through test No apparent harmful physical irregularities N/A Pass	Clause / Test	Requirement	Test results	UoM (See Note B)	Result
5.2.1 General They may have an exterior covering and may be specially compounded to reduce the effects of chemical attack. If gloves have an exterior covering, it shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer Gloves may be manufactured with or without cull roll Colour: Red N/A Pass 5.2.1 General Shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer Gloves may be manufactured with or without cull roll Gloves are made of elastomer N/A Pass 5.2.2 The gloves covered by this standard shall be designated as follows: - by class, a class 0.00, class 0, class 1, class 2, class 3 and class 4; - by paceial properties, by the addition of a suffix to the class of the glove (see Table 3) Clave ref. Length (mm) N/A Pass 5.2.3 See Table 4 1 365 ±0.3 mm Pass 5.2.4 Thickness See Table 5 Glove ref. Length (mm) 1 0.42 5.2.5 Gloves shall be free on both inner and oute surfaces from harmful physical irregularities that can be detected by thorough test No apparent harmful physical irregularities N/A Pass		Gloves may be lined or unlined	Gloves are unlined		
5.2.1 General covering and may be specicially compounded to reduce the effects of chemical attack. If gloves have an exterior covering, it shall be of a contrasting colour to assist in visual inspection Colour: Red N/A Pass 5.2.1 General Gloves are made of elastomer Gloves may be manufactured with or without cuff roll Gloves are made of elastomer Gloves do not have a cuff roll N/A Pass 5.2.2 Classification The gloves covered by this standard shall be designated as follows: - by class, as class 00, class 0, class 1, class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3) Class marking: 00 N/A Pass 5.2.3 Dimensions See Table 4 1 365 - 3 N/A Pass 5.2.4 Thickness See Table 5 Glover eff. - 1 Length (mm) - 1 ±0.316m Pass 5.2.5 Workmanship and finish Gloves shall be free on both inregularities that can be detected by thorough test No apparent harmful physical irregularities N/A Pass		They may have an exterior			
5.2.1 General special tack. If gloves in effects of chemical attack. If gloves have an exterior covering, it inspecial inspection Colour: Red N/A Pass 5.2.1 General shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer N/A Pass Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer N/A Pass Stationer Gloves are made of elastomer Gloves are made of elastomer N/A Pass 5.2.2 The gloves covered by this standard shall be designated as follows:		covering and may be			
5.2.1 Generalchemical attack. If gloves have an exterior covering, it shall be of a contrasting colour to assist in visual inspection Gloves ma made of elastomer Gloves may be manufactured with or without cuff rollColour: RedN/APassGloves are made of elastomer Gloves may be manufactured with or without cuff rollGloves are made of elastomer Gloves do not have a cuff rollN/APassThe gloves covered by this standard shall be designated as follows: - by class 0, class 1, class 0, class 1, class 2, class 3 and class 2, class 3 and class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Length (mm) 10.42 220.38 3±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		specially compounded to			
5.2.1 General have an exterior covering, it shall be of a contrasting colour to assist in visual inspection N/A Pass 5.2.1 General have an exterior covering, it shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer N/A Pass Gloves are made of elastomer Gloves Gloves are made of elastomer Gloves Social for the gloves covered by this standard shall be designated as follows: • by class, as class Class marking: 00 N/A Pass 5.2.2 Class 0, class 1, class 2, class 3 and class 4; • by special properties marking(s): AZC N/A Pass 5.2.3 Dimensions See Table 3 Glove ref. Length (mm) 1 365 5.2.4 Thickness See Table 5 Glove ref. Length (mm) 1 0.42 5.2.4 Thickness See Table 5 Glove ref. Thickness - mean of 10 measurements (mm) 1 0.42 5.2.5 Workmanship and finish Gloves shall be free on both inner and outer surfaces from harmful physical irregularities N/A Pass		chemical attack If gloves	Colour: Red		
5.2.1 General shall be of a contrasting colour to assist in visual inspection Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Class full arregularites are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Class marking: 00 N/A N/A 5.2.2 Dimensions See Table 4 Special properties marking(s): AZC N/A 5.2.4 Thickness See Table 5 Glove ref. 3 3 3 4 4 3 3 5 0 4 1 6 0 4 1 6 0 4 2 3 3 3 3 5 0 4 1 6 0 4 1 6 0 4 1 6 0 4 1 6 0 4 1 6 0 4 1 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5040	have an exterior covering, it	Colodin ricd	N 1/A	_
colour to assist in visual inspection Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves are made of elastomer Gloves do not have a cuff rollGloves Gloves do not have a cuff roll5.2.2 ClassificationThe gloves covered by this standard shall be designated as follows: - by class, as class 0.0, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00 Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 413665 2±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Length (mm) 1±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Uniference 3±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	5.2.1 General	shall be of a contrasting		N/A	Pass
Image: spectrum elastomer Gloves are made of elastomer Gloves may be manufactured with or without cuff rollGloves are made of elastomer Gloves do not have a cuff rollGloves elastomer Gloves do not have a cuff roll5.2.2 ClassificationThe gloves covered by this standard shall be designated as follows: - by class, as class 00, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00 Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365 1±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Length (mm) 10.442 2±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Thickness - mean of 10 measurements (mm) 10.442 2±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		colour to assist in visual			
Gloves are made of elastomer Gloves may be manufactured with or without cuff rollGloves are made of elastomer Gloves do not have a cuff rollSolution of the standard shall be designated as follows: - by class, as class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00 N/AN/APass5.2.2 ClassificationN/APassN/APass5.2.3 DimensionsSee Table 4Clove ref. glove (see Table 3)Length (mm) 1365 3±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Length (mm) 10.42 3±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Length (mm) 10.42 3±0.016 mmPass5.2.5 Workmanship and finishGlove shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testN/APass		inspection			
Cloves do chack of c		Gloves are made of	Gloves are made of elastom	or	
Gloves may be manufactured with or without cuff rollGloves do not have a cuff rollThe gloves covered by this standard shall be designated as follows: - by class, as class 0.0, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00N/APass5.2.3 DimensionsSpecial properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Length (mm) 1365 3±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Thickness - mean of 10 measurements (mm) 1±0.016 mmPass5.2.4 ThicknessGlove shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by through testNo apparent harmful physical irregularitiesN/APass		elastomer	Cloves are made of clastom		
Manufactured with or without cuff rollGloves do not have a cuff rollThe gloves covered by this standard shall be designated as follows: - by class, as class 0.0, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00N/APass5.2.2 		Gloves may be			
See Table 5Class marking: 005.2.4 ThicknessSee Table 5Gloves collage 1 3M/APass5.2.5 Workmanship and finishGloves shall be free on both irregularities that can be detected by thorough testGlove net harmful physical irregularitiesN/APass		manufactured with or	Gloves do not have a cuff ro		
5.2.2 Classification by class, as class 00, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3) Class marking: 00 N/A Pass 5.2.3 Dimensions See Table 4 Special properties marking(s): AZC N/A Pass 5.2.4 Thickness See Table 5 Glove ref. 2 Length (mm) 1 ±0.3 mm Pass 5.2.4 Thickness See Table 5 Glove ref. 2 Thickness - mean of 10 measurements (mm) ±0.016 mm Pass 5.2.5 Workmanship and finish Gloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough test No apparent harmful physical irregularities N/A Pass		The cloves covered by this			
5.2.2 Classificationby class, as class 0.0, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00N/APass5.2.3 DimensionsSee Table 4Special properties marking(s): AZC 1M/APass5.2.3 DimensionsSee Table 4I365 2±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Length (mm) 110.42 220.38 3±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref. 3Thickness - mean of 10 measurements (mm) 1±0.016 mmPass5.2.4 ThicknessSee Table 50.41 60.42±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		standard shall be			
5.2.2 Classification- by class, as class 00, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Class marking: 00N/APass5.2.3 Dimensions- by special glove (see Table 3)Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.4 ThicknessSee Table 53365±0.316 mmPass5.2.4 ThicknessSee Table 510.42 20.38 3±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		designated as follows:			
5.2.2 Classification00, class 0, class 1, class 2, class 3 and class 4; - by special properties, by the addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.4 ThicknessSee Table 510.42±0.016 mmPass5.2.4 ThicknessSee Table 510.42±0.016 mmPass5.2.5 Workmanship and finishGlove shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		- by class, as class	Class marking: 00	107 10	1
5.2.2 Classificationclass 2, class 3 and class 4; by special properties, by the addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.4 ThicknessSee Table 510.422365195.2.4 ThicknessSee Table 510.4220.38±0.016 mmPass5.2.4 ThicknessSee Table 510.410.4220.38±0.016 mmPass5.2.4 ThicknessSee Table 510.410.42±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by throough testNo apparent harmful physical irregularitiesN/APass	1 m	00, class 0, class 1,	oldoo hidiniigi oo	NI VI	
Classificationclass 4; by special properties, by the addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): AZCN/APass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref.Length (mm) 1±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm) 1±0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)±0.016 mmPass5.2.4 ThicknessSee Table 510.42±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	5.2.2	class 2, class 3 and			Base
-by special properties, by the addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): A2C Image: Addition of a suffix to the class of the glove (see Table 3)Special properties marking(s): A2C Image: Addition of a suffix to the class of the glove (see Table 3)Image: Addition of A Image: Addition of A See Table 4Glove ref.Length (mm) 1Image: Addition of A See Table 4Image: Addition of A Image: Addition of A See Table 4Glove ref.Length (mm) 1Image: Addition of A See Table 4Image: Addition of A Image: Addition of A See Table 4Image: Ad	Classification	class 4;		170	rass
See Table 5Glove ref.Length (mm)±0.3 mmPass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.3 DimensionsSee Table 42365±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)10.425.2.4 ThicknessSee Table 510.4220.3810.415.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularities that can be detected by thorough testN/APass		- by special	Special properties marking(s):	AZC	1.2
Addition of a suffix to the class of the glove (see Table 3)Glove ref.Length (mm) 365 2+0.3 mmPass5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.4 DimensionsGlove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 530.41 6-0.42+0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		properties, by the		Mr.	Nr.
5.2.3 DimensionsSee Table 4Glove ref.Length (mm) 3 65+0.3 mmPass5.2.3 DimensionsSee Table 41365+0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 510.425.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	Al at	addition of a suffix		-x7 ~ _x7	
5.2.3 DimensionsSee Table 4Glove ref. 2Length (mm) 365 2±0.3 mmPass5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref. 2Thickness - mean of 10 measurements (mm)±0.016 mmPass5.2.4 ThicknessSee Table 510.42 20.38 3±0.016 mmPass5.2.4 ThicknessSee Table 520.38 3±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	0, 00,	to the class of the		01.001	00
5.2.3 DimensionsSee Table 41365 2±0.3 mmPass5.2.3 DimensionsSee Table 41365±0.3 mmPass5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 510.42 220.38 3+0.016 mmPass5.2.4 ThicknessSee Table 520.38 30.41 40.39 5±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		giove (see Table 3)	Glove ref		N 12
5.2.3 DimensionsSee Table 41300 2±0.3 mmPass23653365115.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)10.42 220.38 310.016 mmPass5.2.4 ThicknessSee Table 530.4110.42 210.016 mmPass5.2.4 ThicknessSee Table 530.4110.42 2110.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	500	r Mr. Mr	1 365	NA MA	
5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm) 1+0.016 mmPass5.2.4 ThicknessSee Table 520.38+0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	Dimensions	See Table 4	2 365	±0.3 mm	Pass
5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of 10 measurements (mm)+0.016 mmPass5.2.4 ThicknessSee Table 510.42 20.38 3+0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	Dimensions	O_0 , '' O_0 , '' O_0	2 305		011
5.2.4 ThicknessSee Table 5Glove ref.Thickness - mean of to measurements (mm) 1±0.016 mmPass5.2.4 ThicknessSee Table 520.38±0.016 mmPass5.2.4 ThicknessSee Table 530.41±0.016 mmPass5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	K C K		Thickness - mean	of 10	<u> </u>
5.2.4 ThicknessSee Table 510.42±0.016 mmPass5.2.4 ThicknessSee Table 510.42±0.016 mmPass50.4140.3950.41660.4260.420.4160.425.2.5Gloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		MA' MA'	Glove ref. measurements (r	nm)	. NP
5.2.4 Thickness See Table 5 2 0.38 ±0.016 mm Pass 5.2.4 Thickness See Table 5 2 0.38 ±0.016 mm Pass 5 0.41 4 0.39 5 0.41 4 0.39 5 0.41 6 0.42 5 0.41 6 0.42 0 10 5 0.41 6 0.42 0 10 10 5 0.5 0.41 6 0.42 10 10 10 5 0.5 0.41 6 0.42 10 10 10 10 5 0.5 0.41 6 0.42 10	1 1		1 0.42		10
5.2.4 Thickness See Table 5 3 0.41 ±0.016 mm Pass 5.2.4 Thickness See Table 5 3 0.41 ±0.016 mm Pass 5 0.41 6 0.42 1 1 1 5.2.5 Gloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough test No apparent harmful physical irregularities N/A Pass	0	1 0 0 1	2 0.38		
5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	5.2.4 Thickness	See Table 5	3 0.41	±0.016 mm	Pass
5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	NP' N	AL 'AL 'A	4 0.39		
5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass		1 Nº . 1 Nº	5 0.41		1
5.2.5 Workmanship and finishGloves shall be free on both inner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	~~~``	201' - 01' - 0	6 0.42	011	21
5.2.5 Workmanship and finishinner and outer surfaces from harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	1.6.1	Gloves shall be free on both		12212	0
Workmanship and finishfrom harmful physical irregularities that can be detected by thorough testNo apparent harmful physical irregularitiesN/APass	525	inner and outer surfaces		X , X ,	
and finish detected by thorough test	Workmanship	from harmful physical	No apparent harmful physic	al N/A	Pass
detected by thorough test	and finish	Irregularities that can be	irregularities		
	N 120.	and inspection		0, 00,	00

Raychem RPG (P) LtdSATRA Reference:SPC0253199 /1701/1 issue 3Date:5 May 2017(Page 6 of 11)

Signed Villioun

Δ

TECHNOLOGY

Clause / Test	Requirement	. 7	Test results		UoM (See Note B)	Result
5.5.2 Tensile strength and elongation at break	Average tensile strength shall be ≥ 16 MPa Average elongation at break shall be ≥ 600 %	Thickness (mm) 1 0.54 2 0.42 3 0.43 4 0.28 Mean	Tensile strength (MPa) 18.4 27.8 25.3 31.2 25.7	Elongation at break (%) 746 833 739 697 754	See Table 10 ±1%	Pass
5.5.3 Resistance to mechanical puncture	Each measured value shall be greater than 18 N/mm	Sample 1 2	Puncture r (N/m 43. 51.	esistance nm) .4 .6	±2.5%	Pass
5.5.4 Tension set	Tension set shall not exceed 15%	Specimen 1 2 3 Mean	Tension 1.3 1.3 1.3 1.3	set (%) 3 3 3 3 3	See Table 10	Pass
5.6 Dielectric tests	See Table 6	Sample cu 1 2 3 Sample Po 1 2 3	Proof test Leakage rrent (mA) 4.9 5.9 4.6 /ithstand test tential (kV) 5 5 5	Potential (kV) 2.5 2.5 2.5 Puncture? No No	See Table 10	Pass

Signed Illioun

SATRA TECHNOLOGY

TECHNICAL REPORT

Clause / Test	Requirement	Test results	UoM (See Note B) Result
	After ageing at 70°C for 168 hours: Lowest value of tensile strength shall be ≥ 80 % of unaged value	Tensile strengthTensile strength (MPa)Mean unaged value (MPa)% of unaged value125.74 2 27.42 3 27.92>100 >100 >100	(See Note B)
5.7 Ageing test		4 25.79 >100 Tension set	See Pass
	Tension set shall not exceed 15 %	Specimen Tension set (%) 1 1.9 2 1.3 3 1.9	
	Gloves shall pass the dielectric proof test (without moisture conditioning)	Proof testLeakage current (mA)Potential (kV)13.62.523.92.5	DGY
5.8.1 Low temperature test	No tear, break or crack shall be visible on the gloves Each glove shall pass the dielectric proof test (without moisture conditioning)	Test temperature: -25°CTearsBreaksCracks1NoNoNo2NoNoNo3NoNoNo3NoNoNo9Proof testLeakage current (mA)Potential (kV)13.92.534.11	N/A See Table 10
5.8.2 Flame retardancy test	Flame shall not reach the reference line 55 mm from the edge within 55 s of flame withdrawal	Flame application time: 10 s Flame did not reach reference line Afterflame time = 0s	±0.4s Pass

Signed Illioun

Table 9 - IEC 60903:2014 Test results: Clause 5.9 Tests on gloves with special properties

TECHNOLOGY

Clause / Test	Requirement		Test results		UoM (See Note B)	Result
S	After immersion in sulphuric acid	Tensile strength after acid exposure (MPa) 23.77 26.79	Mean un- unexposed tensile strength (MPa) 25.68	% of un- exposed tensile strength 93 >100		
5.9.1 Category A - Acid resistance	solution: Tensile strength and elongation at break values shall be ≥ 75 % of unaged values Gloves shall pass the dielectric proof test	22.19 23.43 Elongation after acid exposure (%) 736 1028 729	Mean un- unexposed elongation (%) 754	86 91 % of un- unexposed elongation 8 >100 97	See Table 10	PASS
MA' 11	(without moisture conditioning)	734 Le curr 1 2	Proof test eakage ent (mA) 4.2 4.7	97 Potential (kV) 2.5 2.5	MA TT	X - M
A 17 20		Tensile strength after oil exposure (MPa)	Tensile strength Mean un- exposed tensile strength (MPa)	n % of un- exposed tensile strength	×201	22 2
5.9.2 Category H - Oil resistance	After immersion in Oil: Tensile strength and elongation at break values shall be ≥ 50 % of unaged values	Elongation after acid exposure (%)	Not assessed Mean un- unexposed elongation (%)	% of un- unexposed elongation	See Table 10	Not assessed
× 2017 M	Gloves shall pass the dielectric proof test (without moisture conditioning)	Le curr 1	Not assessed Proof test eakage ent (mA)	Potential (kV)	MAN	ATT NOT

Raychem RPG (P) LtdSATRA Reference:SPC0253199 /1701/1 issue 3Date:5 May 2017(Page 9 of 11)

Signed Illioun

SATRA TECHNOLOGY

TECHNICAL REPORT

Clause / Test	Requirement	2 22	est results	UoM (See Note B)	Result	
5.9.3 Category Z - Ozone resistance	After ozone conditioning: Gloves shall exhibit no cracks Gloves shall pass the dielectric proof test (without moisture conditioning)	1 2 Lea currei 1 3 2 1 No	Cracks preser No No Proof test kage ht (mA) .9 0.3 te C	nt? ential (kV) 2.5 2.5	See Table 10	Pass
5.9.4 Extremely low temperature test	No tear, break or crack shall be visible on the gloves Each glove shall pass the dielectric proof test (without moisture conditioning)	Test teTears1No2No3NoLeacurren1424	mperature: -40 Breaks No No Proof test kage Pot (mA) .4	D°C Cracks No No ential (kV)	N/A See Table 10	Pass
		3 4	.3	2.0		

Additional Information / Notes

Table 10 – Additional uncertainty of measurement information

Clause / Test	Test / Property	UoM (see Note B)					
5.6 Electrical requirements	Current (mA)	Current range (mA)	Voltage range (kV)				
			2.5 – 5.0	5.0 - 10.0	10.0 - 20.0	20.0 - 30.0	
		0-5	±1.190	±0.604	±0.316	±0.184	
		5 – 10	±2.506	±1.266	±0.656	±0.364	
		10 – 20	±5.012	±2.532	±1.306	±0.722	
		20 – 30	±7.518	±3.796	±1.958	±1.08	
5.5.2 / 5.5.4 Tensile strength / Tension set	Peak force (N)	NP.	NPY .	±2.5%	NA.	AN.	
	Sample thickness (mm)	±0.016 mm					

Note A – Clauses marked as 'not assessed' must be addressed in full before an EC type examination certificate can be issued

Note B – 'UoM' denotes estimated Uncertainty of Measurement for stated test results. This uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%

Note C – glove inadvertently tested at a voltage of 5kV rather than 2.5 kV. Leakage current is below the specification level but nevertheless higher than if it were tested at 2.5 kV

Signed Illioun



TERMS AND CONDITIONS OF BUSINESS

GENERAL

Work done or services undertaken are subject to the terms and conditions detailed below and all other conditions, warranties and representations, expressed or implied are hereby excluded.

2. PRICES

Prices are based on current material and production costs, exchange rates, duty and freight and are subject to change without notice.

3. DELIVERY ESTIMATES

Delivery estimates are made in good faith and date from receipt of a written order and full information to enable us to proceed. While SATRA or its subsidiaries (hereafter referred to as "SATRA") make every effort to fulfil them, such estimates are subject to unforeseen events and if not maintained, cannot give rise to any claim. Offers "ex stock" are subject to prior sale.

4. CANCELLATION AND RETURNS

Cancellation of orders for goods, services, training or consultancy is only acceptable by prior agreement of SATRA and a charge will normally be made.

5. CLAIMS

Claims for errors, shortages etc should be notified within 10 days of date of receipt. In the event of goods damaged in transit, packing materials should be retained for examination; otherwise no liability can be accepted.

6. PAYMENT TERMS

Payment terms are net 21 days from date of invoice. Failure to comply with the terms of payment may result in delayed delivery of goods and services and a review of the Customer's credit account. Should the customer become subject to an administration order, or becomes bankrupt or goes into liquidation, SATRA has a right to cancel any contract and discontinue any work. SATRA reserves the right to adjust US Dollar and Euro sales price where customer exceeds credit terms and where the exchange rate has moved more than 10% since invoicing.

7. RETENTION OF TITLE

All goods remain the property of SATRA until paid in full. Under no circumstances will a customer's purchase order override SATRA's Retention of Title clause. In the case of software, the ownership of the software remains with SATRA. Payment of invoices in full will entitle the customer to use the software under licence until (a) they cease to be a member of SATRA or (b) they cease trading. In both instances, the licence shall then revert to SATRA.

3. GUARANTEE

All goods manufactured by SATRA are guaranteed both as regards material and workmanship. Any part returned carriage paid, within twelve months from date of supply and found defective, will be repaired or replaced at SATRA's option free of charge. SATRA admits no liability for loss, damage or delay consequent on any defect in any goods supplied by SATRA.

. TEST REPORTS

Results given in test reports refer only to samples submitted for analysis and tested by SATRA. A satisfactory test report in no way implies that the product tested is approved by SATRA and no warranty is given as to the performance of the product tested. SATRA shall not be liable for any subsequent loss or damage incurred by the Customer as a result of information supplied in a test report.

10. TEST SAMPLES

Unless otherwise agreed in advance, test samples will be disposed of 6 weeks after the date of the final report. If required, samples can be returned at the Customer's expense.

11. RESPONSIBILITY

Every effort is made to ensure accuracy in description, drawings and other information in correspondence, catalogues, etc but no warranty is given in this respect and SATRA shall not be liable for any error therein. SATRA carries out all tests and/or advises only on the basis that the same are carried out, made or given without any responsibility whether for negligence or otherwise. SATRA and its servants or agents will not be liable for any damage or loss direct or indirect of whatsoever kind, whether or not the same results directly or indirectly from negligence on the part of SATRA or its servants or agents.

12. CONFIDENTIALITY

Unless specifically excluded in the terms of an individual contract between SATRA and its Customer, the following shall apply to all reports, advice, drawings, photographs, specifications or data:

- The above shall not be disclosed to third parties or used in litigation without the consent of SATRA.
- Where SATRA has given consent to disclosure, the Customer shall draw the attention of the third party to these terms of business and the basis on which SATRA undertakes test, reporting and advising. The Customer shall indemnify SATRA for any failure to do so.
 The above items are submitted to the Customer as confidential documents. Confidentiality shall continue to apply after completion of the
- business, but shall cease to apply to information or knowledge which may come into the public domain.

CONSTRUCTION AND ARBITRATION

The laws of England shall govern all contracts and the parties submit to exclusive jurisdiction of the courts of England, unless otherwise agreed.

Issue Date: 1st October 2009

Signed Nickioun