



TITLE:
SPECIFICATION FOR HAND PROTECTION

Part 1: Protective Gloves

Document No.	01/027-1 KP1/6C/13/TSP/03/017-1
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ANNEX A: *Guaranteed Technical Particulars (to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records for previous five years, four customer reference letters, details of manufacturing capacity, the manufacturer's experience and copies of complete type test certificates and type test reports for tender evaluation, all in English Language)*

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FOREWORD

This specification has been prepared by the Standards Department in collaboration with Human Resource Services Department; Safety, Health & Work Environment (SHE) Department of The Kenya Power and Lighting Company Limited (KPLC/Kenya Power) and The Kenya Electrical Trade & Allied Workers Union (KETAWU). The specification lays down requirements for – Protective Gloves. It is intended for use by Kenya Power in purchasing of these items.

The supplier shall submit information which confirms manufacturer's satisfactory service experience with products which fall within the scope of this specification.

1. SCOPE

- 1.1. This document specifies the design and performance, methods of test, marking and user information for protective gloves for use in Industrial Work (Electrical and Mechanical) by Kenya Power company employees.
- 1.2. The specification covers performance requirements for the gloves designed to protect the wearer's hands. The scope of this specification shall include:
 - a) Mechanical gloves
 - b) Welding gloves
 - c) Drivers gloves
 - d) Cotton work gloves
 - e) Linesman's gloves
- 1.3. The specification stipulates the minimum requirements for the Protective Gloves in the company and it shall be the responsibility of the supplier to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the Protective Gloves for The Kenya Power & Lighting Company.
- 1.4. This specification does not purport to include all the necessary provisions of a contract.

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- 4.2.1.2. Protective gloves shall offer the greatest possible degree of protection in the foreseeable conditions of end use. When seams are included, the strength of these seams shall not reduce the overall performance of the gloves.
- 4.2.1.3. All protective gloves shall not cause any harm to the user. The pH of each glove shall be between 3.5 and 9.5 and the Chromium (VI) content shall be below detection (< 3 ppm).
- 4.2.1.4. Care instructions manual shall be provided; the levels of performance shall not be reduced after the maximum recommended number of cleaning cycles.

4.3. SPECIFIC DESIGN REQUIREMENTS

4.3.1. Mechanical Gloves

4.3.1.1. General

- 4.3.1.1.1. The protective gloves - mechanical gloves shall be designed, manufactured and tested to clause 4.2, BS EN 388 and the requirements of this specification.
- 4.3.1.1.2. It shall be a five-finger glove designed to provide protection to all of the hand up to the wrist. The coverage shall be continuous except for a slit on the ulnar surface of the palm to aid putting on and taking off the glove.
- 4.3.1.1.3. The gloves shall provide protection against the following mechanical risks: abrasion, blade cut, tear, puncture resistances.
- 4.3.1.1.4. Each glove shall have a performance level 3:5:4:4:3 in accordance with BS EN 388 and Table 1; representing abrasion, blade cut, dexterity, tear and puncture properties respectively.

Table 1: The levels of performance of mechanical gloves to BS EN 388

Test	Unit	Performance level	Requirement
Abrasion resistance	Number of cycles	3	2000
Blade cut resistance	Index	5	20.0
Dexterity*	mm	4	6.5
Tear resistance	N	4	75

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Table 2: Sizing of gloves in accordance with BS EN 420

Glove size	Fits hand size	Hand circumference (mm)	Hand length (mm)	Minimum length of glove A (mm)	Palm width B mm
6	6	152	160	220	105
7	7	178	171	230	110
8	8	203	182	240	120
9	9	229	192	250	126
10	10	254	204	260	130
11	11	279	215	270	135

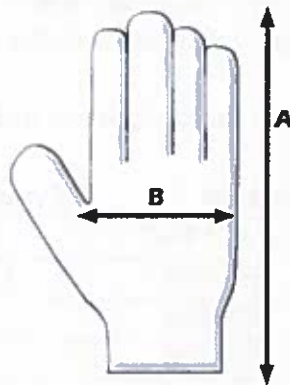


Fig. 1: Glove sizing



Fig. 3: Illustration of a mechanical resistant glove

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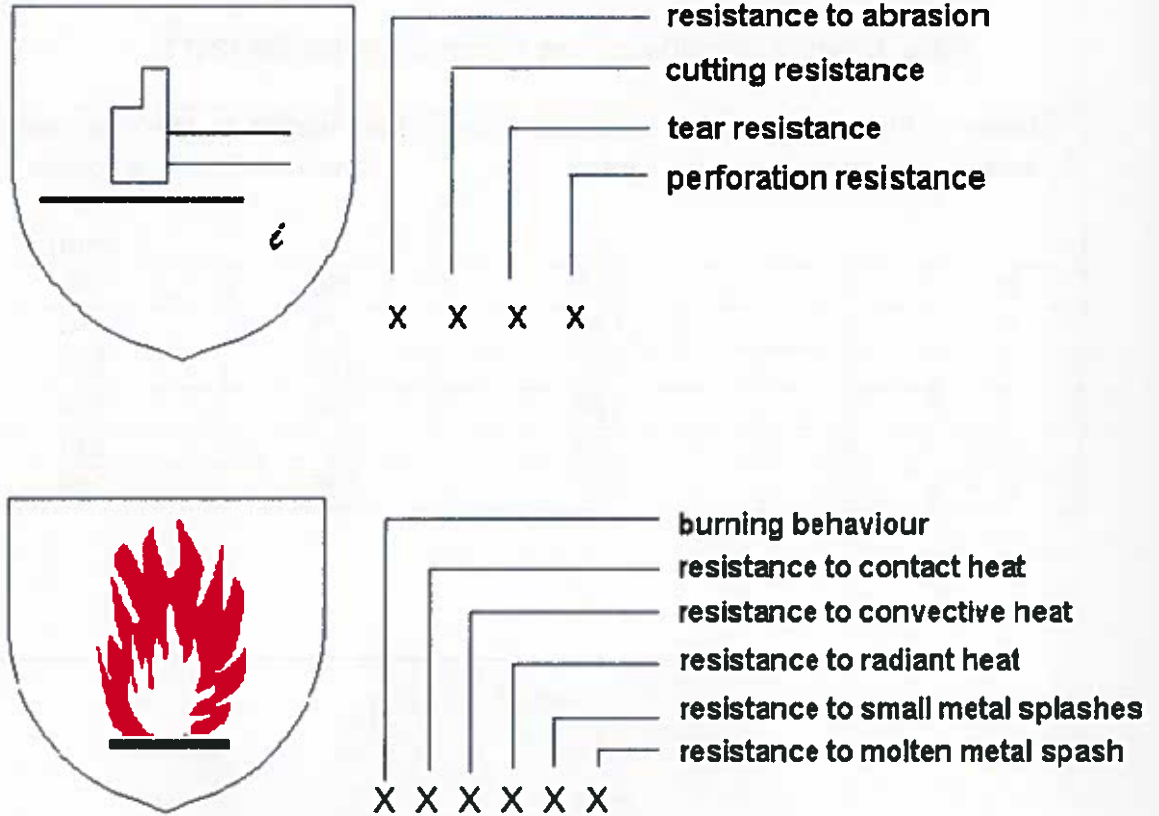


Fig. 4: Pictogram for welder gloves

4.3.2.2. Material

The welder's gloves shall be made from high dexterity natural leather such as flexible goatskin, pigskin or side-split leather or equivalent with a cotton fleece lining and at least 110mm cuffs and some with a para-aramid synthetic fiber (Kevlar®) sewing or palm patches.

4.3.2.3. Sizes

The sizes shall be as per BS EN 12477 and Table 4 and shall resemble the Fig. 4 in shape and appearance.

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- 4.3.3.1.2. It shall be a five-finger glove designed to provide protection to all of the hand up to the wrist. The coverage shall be continuous except for a slit on the ulnar surface of the palm to aid putting on and taking off the glove.
- 4.3.3.1.3. The gloves shall provide protection against the following mechanical risks: abrasion, blade cut, tear, puncture resistances.
- 4.3.3.1.4. Each glove shall have performance level 3:5:4:3 in accordance with to BS EN 388 representing abrasion, blade cut, tear and puncture properties respectively.

Table 5: The levels of performance of mechanical gloves to BS EN 388

Test	Unit	Performance level	Requirement
Abrasion resistance	Number of cycles	3	2000
Blade cut resistance	Index	5	20.0
Dexterity*	mm	4	6.5
Tear resistance	N	4	75
Puncture resistance	N	3	100

*pin that can be picked up with gloved hand 3 times / 30 seconds (mm)

- 4.3.3.1.5. The gloves shall protect the wearer from mechanical risks and shall be designed to offer grip, dexterity and have anti-static properties.
- 4.3.3.1.6. The mechanical properties shall be shown by a pictogram for mechanical risk as shown in Fig. 6 below followed by four performance levels numbers.

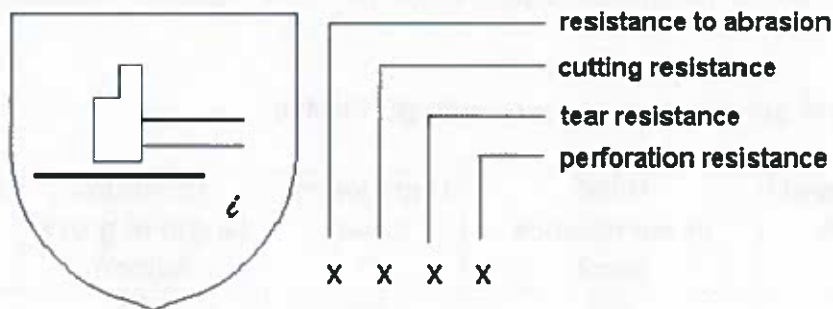


Fig. 6: Pictogram for driver's gloves

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Glove size	Fits hand size	Hand circumference (mm)	Hand length (mm)	Minimum length of glove A (mm)	Palm width B mm
10	10	254	204	255	130
11	11	279	215	260	135

4.3.4. Cotton work gloves

4.3.4.1. General Requirements

- 4.3.4.1.1. The protective gloves – cotton work gloves shall be designed, manufactured and tested to BS EN 420, BS EN 388 and BS EN 7318 and the requirements of this specification.
- 4.3.4.1.2. It shall be a five-finger glove designed to provide protection to all of the hand up to the wrist. The coverage shall be continuous except for a slit on the ulnar surface of the palm to aid putting on and taking off the glove. The palm shall be coated with rubber or PVC as shown in Fig. 8.
- 4.3.4.1.3. The gloves shall provide protection against the following mechanical risks: abrasion, blade cut, tear, puncture resistances.
- 4.3.4.1.4. Each glove shall have performance level 2:1:2:1 in accordance with to BS EN 388 representing abrasion, blade cut, tear and puncture properties respectively and as shown in Table 7.

Table 7: Performance requirements of cotton work gloves

Test	Unit	Performance level	Requirement
Abrasion resistance	Number of cycles	2	500
Blade cut resistance	Index	1	1.2
Dexterity	mm	4	6.5*
Tear resistance	N	2	25
Puncture resistance	N	1	20

*pin that can be picked up with gloved hand 3 times / 30 seconds (mm)

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4.3.5. Linesman's gloves

4.3.5.1. General design

- 4.3.5.1.1. The linesman's gloves shall be a gauntlet type glove that conforms to all the provisions of clauses 4.2 and 4.3.1.1 for mechanical and innocuousness properties.
- 4.3.5.1.2. The glove shall be designed, manufactured and tested to BS EN 420 and BS EN 388 standards.
- 4.3.5.1.3. The glove shall be designed to a performance thumb/palm patch, which reinforces critical-wear areas with a double layer of leather.
- 4.3.5.1.4. The linesman's gloves shall have a performance level 3:5:4:3 in accordance with BS EN 388 and Table 2 of clause 4.3.1.1; representing abrasion, blade cut, tear and puncture properties respectively and the mechanical properties pictogram shall be as per Fig. 1 of clause 4.3.1.1.

4.3.5.2. Materials

- 4.3.5.2.1. The gloves shall be made from select heavyweight grain horsehide leather or equivalent that has been treated with a fluoro-chemical water-repellent emulsion for excellent water, oil, and stain-repellent properties. (The soft, breathable qualities of the leather are not affected by this water-repellent treatment.)
- 4.3.5.2.2. The back of the leather cuffs shall possess a heavy-duty high visibility fluorescent-yellow fabric strips and retro-reflective silver strips for greater night-time visibility in accordance with ISO 20471 requirements. Fig 9 demonstrates an illustration of a linesman glove.
- 4.3.5.2.3. The linesman's gloves shall be sewn with a para-aramid synthetic fibre Kevlar® thread for extra seam strength.

4.3.5.3. Size designation

The length of the gauntlet cuff shall range from 80mm to 150mm for sizes 6 to 11 of Table 1.

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5.2. Copies of previous Type Tests Reports issued by a third party testing laboratory that is accredited to ISO/IEC 17025 shall be submitted with the tender for the purpose of technical evaluation. A copy of the accreditation certificate to ISO/IEC 17025 for the same third party testing laboratory used shall also be submitted with the tender document (all in English Language). The type tests shall include:

- a) Material composition
- b) Verification of gloves sizes
- c) Abrasion resistant test
- d) Blade cut resistance test
- e) Tear resistance test
- f) Puncture resistance test

5.3. The protective gloves shall be subject to acceptance tests at the manufacturer's workshop before dispatch. Acceptance tests shall be witnessed by at least two (2) Tender Processing Committee (TPC) members appointed by The Kenya Power and Lighting Company Limited (KPLC). Routine and Sample Test Reports for the protective gloves to be supplied shall be submitted to KPLC for approval before delivery of the goods. The tests to be witnessed shall include;

- a) Material composition
- b) Verification of gloves sizes
- c) Abrasion resistant test
- d) Blade cut resistance test
- e) Tear resistance test
- f) Puncture resistance test

5.4. On receipt of the product, KPLC will perform any of the tests specified in order to verify compliance with this specification. The supplier shall replace without charge to KPLC the protective gloves which upon examination, test or use; fail to meet any of the requirements in the specification.

6.0. MARKING AND PACKING

6.1. MARKINGS

6.1.1. Marking of mechanical gloves shall be in accordance with BS EN 420 and BS EN 388

6.1.2. Marking of welding gloves shall be in accordance with EN 420 and EN 12477:

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- 7.2 The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:
- a) Guaranteed Technical Particulars signed by the manufacturer;
 - b) Design Drawings with details of protective gloves to be manufactured for KPLC.
 - c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfill the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfill the requirements of ISO 9001:2008
 - d) Detailed test program to be used during factory testing;
 - e) Marking details and method to be used in marking the protective gloves;
 - f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the protective gloves for The Kenya Power & Lighting Company;
 - g) Packaging details (including packaging materials).
- 7.3 The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the protective gloves to KPLC stores.

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		Palm width	specify
		Length of cuff	specify
2	Welding gloves		
	Standard of manufacture		specify
	Type designation		specify
	Five finger design with slit at the ulnar surface of the palm		specify
	Performance levels	Electric Isolation	specify
		Abrasion Resistance	specify
		Cut Resistance	specify
		Tear Resistance	specify
		Puncture Resistance	specify
		Burning Behaviour	specify
		Contact Heat	specify
		Convective Heat	specify
		Metal Splashes	specify
		Dexterity	specify
	Material of manufacture	Leather type	specify
		pH value of leather used	specify
		Chromium (IV) content of leather used	specify
		Number of cleaning cycles for the glove	specify
	Thickness of leather and lining		specify
	Coating/lining material		specify
	Technology of manufacture		specify
	Strength of seams used		specify
	Size designation	Glove size	specify
		Hand circumference	specify
		Hand length	specify
		Minimum length of glove	specify
		Palm width	specify
		Length of cuff	specify
3	Drivers glove		
	Standard of manufacture		specify
	Type designation		specify
	Five finger design with slit at the ulnar surface of the palm		specify
	Performance levels	Abrasion resistance	specify
		Blade cut resistance	specify

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		Hand circumference	specify
		Hand length	specify
		Minimum length of glove	specify
		Palm width	specify
		Length of cuff	specify
5	Linesman's gloves		
	Standard of manufacture		specify
	Type designation		specify
	Five finger design with slit at the ulnar surface of the palm		specify
	Performance levels	Abrasion resistance	specify
		Blade cut resistance	specify
		Dexterity	specify
		Tear resistance	specify
		Puncture resistance	specify
	Material of manufacture	Leather type	specify
		pH value of leather used	specify
		Chromium (IV) content of leather used	specify
		Number of cleaning cycles for the glove	specify
	Thickness of leather and lining		specify
	Coating/lining material		specify
	Technology of manufacture		specify
	Strength of seams used		specify
	High visibility material		specify
	Size designation	Glove size	specify
		Hand circumference	specify
		Hand length	specify
		Minimum length of glove	specify
		Palm width	specify
		Length of cuff	specify
7	Quality Management System		
	Quality Assurance Plan		provide
	Copy of ISO 9001:2008 Certificate		provide
	Manufacturer's experience		provide
	Manufacturing Capacity (units per month)		provide
	List of previous customers		provide
	Customer reference letters		provide

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