



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT - PROTECTIVE
CLOTHING**

Part 6: Dustcoat

Doc. No.	KP1/6C.1/TSP/01/025-6
Issue No.	1
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0.1 Circulation List

NO.	COPY HOLDER
1	Manager, Standards
Electronic copy (pdf) on KPLC server currently: http://172.16.1.40/dms/browse.php?fFolderId=23	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2015-11-05	New Issue	Michael Apudo	Dr. Eng. Peter Kimemia

FOREWORD

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This specification has been prepared by the Standards Department in collaboration with Human Resource Services Department; Safety, Health & 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 personal protective equipment (PPE) – Dust coats. It is intended for use by Kenya Power in purchasing these PPEs.

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

1. SCOPE

- 1.0. This document specifies the general requirements for dustcoat to be worn over every day clothes to protect the wearer from direct contact with dusty/dirty and harmful surfaces/materials. It shall be suitable for use in the warehouse/store, laboratory/testing area, control room, electronics workshop, printing room, drawing office and out in the field.
- 1.1. It also specifies the requirements for protection, ergonomic characteristics, innocuousness, mechanical properties, marking and information for users. It also describes the appropriate test methods.
- 1.2. The specification stipulates the minimum requirements for dustcoat 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 dustcoat for The Kenya Power & Lighting Company.
- 1.3. The specification does not purport to include all the necessary provisions of a contract.

2. REFERENCES

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) apply.

ISO 105-A02: Textiles -- Tests for colour fastness -- Part A02: Grey scale for assessing change in colour

ISO 105-E04: Textiles -- Tests for colour fastness -- Part E04: Colour fastness to perspiration

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- ISO 5077: Textiles. Determination of dimensional change in washing and drying
- ISO 3175-1 & 2: Textiles – Professional care, drycleaning and wetcleaning of fabrics and garments -- Part 1: Assessment of performance after cleaning and finishing-- Part 2: Procedure for testing performance when cleaning and finishing using tetrachloroethene
- ISO 6330: Textiles – Domestic washing and drying procedures for textile testing
- ISO 15797: Textiles – Industrial washing and finishing procedures for testing of workwear
- EN 340: Protective clothing: General requirements
- EN 13402-3: Sizes and designations of clothes; --Measurements and designations
- KS 541-1: Kenya Standard - Woven Fabrics for Uniforms - Specification: Part 1 – Cotton, Man-made Fibres and Blends.
- KS 08-439: Kenya Standard Method for Determination of Resistance of Fabrics to Penetration by Water (Hydrostatic Head Test).
- KS 08-269: Kenya Standard Method for Determination of Crease Recovery of Fabrics.
- KS 836-1 & 2: Classification and terminology of stitches and seams — Part 1: Types-Ready made garments. --Part 2: Seam types.
- KS ISO 13935-1: Textiles – Seam tensile properties of fabrics and made-up textile articles -- Part 1: Determination of maximum force to seam rupture using the strip method
- KS 1469: Kenya Standard Specification for Work Wear and Career Wear.

3. TERMS AND DEFINITIONS

- 3.0. The definitions given in the reference standard shall apply.
- 3.1. Kenya Power Logo – As per sample available with Human Resource Services Department of Kenya Power.

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4. REQUIREMENTS

4.1. Operating Conditions

The Protective Clothing shall be suitable for use in Electrical and Mechanical Work, outdoors in tropical climate under the following conditions:

- a) Altitudes of up to 2200m above sea level,
- b) Humidity of up to 95%,
- c) Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C,
- d) Heavy saline conditions along the coast and

4.2. General requirements

- 4.2.1. The material, design, innocuousness, comfort and ageing of the dustcoat in this specification shall conform to the requirements of EN 340 for protective clothing.
- 4.2.2. Appropriate means for adequate adjustment systems or adequate size ranges shall be provided so as to enable dustcoat to be adapted to the morphology of the user and shall ensure that no parts of the body get uncovered by expected movements by the wearer
- 4.2.3. The dustcoat shall provide users with a level of comfort consistent with the level of protection against hazard which is provided, the ambient conditions, the level of the user's activity, and the anticipated duration of use of the protective clothing. The dustcoat construction shall not:
 - a) Have rough, sharp or hard surfaces that irritate or injure the user;
 - b) Be so tight that blood flow is restricted;
 - c) Be so loose and/or heavy so that it interferes with movements.

4.2.4. Colour fastness

The colour fastness to perspiration of protective clothing material to ensure user hygiene (e.g. no skin staining) shall be determined in accordance with EN ISO 105-A02 and shall be at least grade 4 of the Grey scale for the colour change of the specimen. The test shall be conducted in accordance with EN ISO 105-E04.

4.2.5. Dimensional change due to cleaning

- 4.2.5.1. If the manufacturer's instructions indicate that garments can be washed or dry cleaned, the test procedure for dimensional change for washing of protective clothing

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material shall be carried out in accordance with ISO 5077 and for dry cleaning in accordance with ISO 3175-1.

- 4.2.5.2. Changes in dimension due to cleaning of material for dustcoat shall not exceed $\pm 3\%$ in either length or width.

4.2.6. Washing and dry cleaning methods

- 4.2.6.1. If care labelling or manufacturer's information allows domestic washing or dry cleaning and/or finishing, then the material shall be washed in accordance with EN ISO 6330 or dry cleaned in accordance with EN ISO 3175 -2 and/or finally finished.
- 4.2.6.2. If industrial washing and/or finishing is allowed, then the protective clothing shall be washed in accordance with ISO 15797.
- 4.2.6.3. If washing is permitted as well as dry cleaning, then the sample shall only be washed. If domestic and industrial washing is permitted, then industrial washing shall be carried out with the specified number of processes in accordance with ISO 15797.

4.3. Specific Requirements

4.3.1. Material

The dustcoat shall be made of 65% polyester and 35 % cellulose material complying with KS 541 – Part 1 and having the physical characteristics given in Table 1 below. The material used shall have a crease recovery angle of at least 120°.

Table 1: Physical Characteristics of Fabric for Dust Coat as per KS 541:1

Fabric Reference	Fibre Composition	Weave	Threads/cm		Mass g/m ²	Breaking Load, N		Tear Strength, N	
			warp	weft		warp	weft	warp	weft
PC 6	65% polyester 35% cellulose	Plain	31	22	240	1210	810	89	98

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4.3.2. Manufacture

4.3.2.1. Seams

4.3.2.1.1. All visible seams (i.e. those that are visible on the surface or inside the garment) shall be seam type 1.01.01 overedged, sewn in one or more operations; as described in KS 836-2. There shall be no raw edges, but a single row of stitching shall be permitted where the edges have selvages.

4.3.2.1.2. For hidden seams (e.g. inside collar) seam type 1.01.01 as described in KS 836-2; shall be used.

4.3.2.1.3. The minimum seam allowance shall be 0.8 cm for all fabrics.

4.3.2.2. Stitching

4.3.2.2.1. The stitching shall be multi-thread chain stitch, type 401, 506 or 514 as described in KS 836-1.

4.3.2.2.2. There shall be not less than 3.2 and not more than 4 stitches per centimetre.

4.3.2.2.3. For the side, sleeve head, sleeve, shoulder, yoke, side pockets and pocket bags, stitching shall be one of the following, combination stitch, (401, 504), as described in KS 836-1.

4.3.2.3. Seam strength

Seams shall have a minimum strength of 185 N for load bearing seams and 135 N for all other seams when measured using the method described in KS ISO 13935-1.

4.4. Size designation

4.4.1. Protective clothing shall be marked with its size based on body dimensions measured in centimetres.

4.4.2. Measurement procedures and the designation of dimensions shall correspond to EN 13402-3:2004. The size designation of each garment shall comprise the control dimensions in terms of waist or chest or bust girth as per Table 2 & 3 and height as per clauses 4.1 (women) and clause 4.2 (men) of EN 13402-3:2004

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Table 2: Standard sizes for women as per EN 13402

Letter code	S		M		L		XL		XXL	
Bust	84	88	92	96	100	104	110	116	122	128
Range	82-90		90-98		98-106		107-119		119-131	
All measurements are in millimetres										

Table 3: Standard sizes for men as per EN 13402

Letter code	S		M		L		XL		XXL		XXXL	
Chest	88	92	96	100	104	108	112	116	120	126	132	138
Range	86-94		94-102		102-110		110-118		118-129		129-141	
All measurements are in millimetres												

4.5. Finish

- 4.5.1. The dust coat shall be long sleeved, with collar and with five front buttons. It shall have a central seam (sewn in double lines) and an overlapping cut at the bottom.
- 4.5.2. The dust coat shall be in navy blue colour for store keepers and white for all other users. The quantities required of each colour shall be specified in the tender.
- 4.5.3. The dust coat shall have three front patch pockets comprising one chest pocket (145x145mm) and two hip pockets (160x175mm). A tolerance of ± 10 mm shall be allowed on these dimensions.
- 4.5.4. The dustcoat shall have the following markings:
- Kenya Power Logo shall be embroidered on the left chest area above the pocket. The logo shall be 65mm by 65mm with a tolerance of ± 5 mm.
 - The dustcoat shall also have 'Kenya Power' letters embroidered in reflective yellow colour centered at the back (as per approved sample). The dustcoat dimensions of the marking at the back shall be 200mm length and 60mm height, with a tolerance of ± 5 mm.
 - The logo shall be in full Kenya Power logo colours for the white dust coat and yellow colour for the navy blue dust coat.

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4.6. QUALITY MANAGEMENT SYSTEM

- 4.6.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the requirements for protection, ergonomic characteristics, innocuousness, mechanical properties, marking of the dustcoat, will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- 4.6.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

- 5.1. The dustcoat shall be inspected and tested in accordance with all the standards in clauses 2.0 & 4, Table 1 and the requirements of this specification. It shall be the responsibility of the supplier to perform or to have performed all the tests specified.
- 5.2. Copies of previous **Test Reports confirming conformity to clause 4 requirements for the dustcoat 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 for the third party testing laboratory shall also be submitted with the tender (all in English Language).
- 5.3. Test Reports for the dustcoat to be supplied under the contract shall be submitted to The Kenya Power & Lighting Company for approval before shipment/delivery.
- 5.4. The dustcoat shall be subjected to acceptance tests in accordance with all the standards in 2.0 & 4, Table 1 and the requirements of this specification at the manufacturer's workshop before dispatch. Acceptance tests shall be witnessed by at least two (2) Tender Processing Committee members appointed by The Kenya Power and Lighting Company Limited (KPLC). Routine and Sample Test Reports for the dustcoat to be supplied shall be submitted to KPLC for approval before delivery of the goods.
- 5.5. On receipt of the dustcoat KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to KPLC, dustcoat which upon examination, test or use fail to meet any of the requirements in the specification

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6. MARKING AND PACKING

6.1. Marking

6.1.1. Each dustcoat shall be marked with the following information in English Language, which shall be permanently attached to the garment and remain perfectly legible.

- (i) A means of identifying either the manufacturer or his authorized representative within the EC, for example trade mark.
- (ii) The product's commercial name, style code or other means of identification.
- (iii) The size designation.
- (iv) A brief description of the level of protection offered.
- (v) A warning that no item of clothing can offer full protection.
- (vi) Care instructions (care label symbols including negative symbols where appropriate).
- (vii) The standard of manufacture

6.1.2. If the user information includes cleaning instructions the labelling shall be visually examined after it has been cleaned five times using the cleaning treatment recommended in those instructions. The labelling shall still be perfectly legible after these cleaning treatments.

6.2. Packing

6.2.1. The packaging which immediately contains the dustcoat shall be marked with the information specified in clause 6.1.1 (i), (ii), (iii) and (iv), and shall indicate where the wearer information and instructions for use can be found.

6.2.2. The dustcoat shall be packed in a clean, sound and dry containers made of a material, which does not affect the product it protects from excessive loss of moisture and contamination.

7. DOCUMENTATION

7.1. The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Copies of the Manufacturer's catalogues, brochures, drawings and technical data;
- c) Details of the manufacturer's experience;
- d) Copies of required test reports by a third party testing laboratory accredited to ISO/IEC 17025 and a copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;

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- e) Manufacturers letter of authorization, QMS certificate and other technical documents required in the tender.
- f) Packaging details (including packaging materials).
- g) The dustcoat shall be supplied with information and instructions for use. Instructions shall be precise, comprehensible and in English language. They shall contain at least the following information:
 - (i) the information required in Clause 7;
 - (ii) the full address of the manufacturer or his authorized representative;
 - (iii) a statement of the intended use of dustcoat;
 - (iv) protective material and zones of specific impact protection provided;
 - (v) advice about wearing other PPE to obtain the protection desired, for example, shin protection can be provided by impact protectors fitted into trousers;
 - (vi) a warning about the limits of protection provided by dustcoat;
 - (vii) instructions on how to clean and care for dustcoat;
 - (viii) instructions on how to examine dustcoat for signs of wear and degradation;
 - (ix) the suggested lifetime of dustcoat; instructions on actions to be taken when wear or damage is apparent to identify dustcoat which are no longer suitable to use;

7.2. The supplier shall submit recommendations for use, care, storage and routine inspection/testing procedures, all in the English Language, during delivery of the dustcoat to KPLC store.

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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, four customer reference letters, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)

Tender No.

Clause	Description	KPLC Requirements	Guaranteed Technical Particulars offered	
	Name of Manufacturer & Country of manufacture		specify	
	Type/Model Reference Number		specify	
1	Scope	Dustcoat to be worn over every day clothes to protect the wearer from direct contact with dusty/dirty and harmful surfaces/materials	specify	
2	Standards of manufacture		specify	
4.	Operating condition	As per clause 4.1	specify	
	Design standard	EN 340		
	Construction	Long sleeved, with collar and with five front buttons. It shall have a central seam (sewn in double lines) and an overlapping cut at the bottom		
	Material of manufacture			
	Fabric reference	PC 6 as per KS 541-1 or equivalent	Specify and attach test report	
	Fabric composition	65% polyester and 35% cellulosic		
	Weave	Plain		
	Thread per centimetre	Warp		31
		Weft		22
	Mass, g/m ²	240		
	Breaking load, N	Warp		1210
		Weft		810
	Tear strength, N	Warp		89
		Weft		98
Colour fastness	At least grade 4 as per EN ISO 105-A02			
Dimensional change	±3%			
Manufacture				
Seams	Visible seams – Type 1.01.01 overegded		Specify and attach test report	
	Hidden seams – Type 1.01.01			
Stitching	Types	Muliti-thread chain stitch type 401, 504, 506 or 514 as per KS 836-1 or equivalent		

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	Seam strength, N	No. Load bearing points Others	3.2 to 4 stitches per cm 185 135	Specify and attach test report	
	Colour	Storekeepers Others	Navy blue White		
	Pockets	Chest pocket Hip pockets	145 x 145mm ±10mm 160 x 175mm ±10mm		
	Logo	As per clause 4.4.4			
	Size designations as per Table 2 & 3				Attach drawing and test report
	Finish				
4.5.	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	
5.1	Test standards and responsibility of carrying out tests			provide	
5.2	Copies of Type Test Reports submitted with tender			provide	
5.3	Test reports to be submitted by supplier to KPLC for approval			provide	
5.4	Replacement of rejected assembly tools.			specify	
6.1	Marking			specify	
6.2	Packing			specify	
7.1	Documents submitted with tender			provide	
7.2	Documents to be submitted by supplier to KPLC for approval before manufacture			provide	
8.0	Manufacturer's Guarantee and Warranty			provide	
9.0	List catalogues, brochures, technical data and drawings submitted to support the offer			provide	
10.0	List customer sales records and reference letters submitted to support the offer.			provide	
11.0	List Test Certificates submitted with tender			provide	
12.0	List test reports of the wrenches to be submitted to KPLC for approval before shipment			provide	
13.0	Statement of compliance to specification (indicate deviations if any & supporting documents)			provide	

.....
Manufacturer's Name, Signature, Stamp and Date

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