Kenya Power

SPECIFICATION FOR ALUMINUM WINDING WIRE

A Document of the Kenya Power & Lighting Co. Ltd
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0.1 CIRCULATION LIST

COPY NO.	COPY HOLDER
1	
2	

0.2 AMENDMENT RECORD

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2026-06-10	New issue	D. ACHIENGI DEA	

FOREWORD

This specification has been prepared by Electrical plant workshop Department of The Kenya Power and Lighting Company Limited (KPLC) and it lays down requirements for Aluminum winding wire.

Aluminum winding wire is intended for use by the Electrical plant workshop Department for rewinding transformers.

This specification was prepared to establish and promote uniform requirements for Aluminum winding wire to be used at Kenya Power and Lighting Company Ltd.

There are no other specifications in this series.

This specification stipulates the minimum requirements for Aluminum winding wire acceptable for use in the company and it shall be the responsibility of the suppliers and manufacturers to ensure that the offered design is of the highest quality and guarantees excellent service to KPLC, good workmanship and good engineering practice in the manufacture of the Aluminum winding wire for KPLC.

Users of Kenya Power specifications are responsible for their correct interpretation and application.

1. SCOPE

1.1. This specification is for Enameled Round Aluminum Winding Wire without a bonding layer for use by company's Electrical Plant Workshop Department.

(The size required to be specified for each tender)

2. NORMATIVE REFERENCES

The following standards contain provision which, through reference in this text, constitute provisions of this specification. For dated editions the cited edition will apply; for undated editions the latest edition of the referenced document shall apply.

IEC 60317 Specifications for particular types of winding wires –Part 0-3: General requirements – Enameled round aluminum wire

IEC 60851 (all parts), *Winding wires – Test methods*

ISO 9001:2015 Quality Management systems – Requirements

ISO/IEC 17025:2017 General Requirements for the competence of testing and calibration laboratories

3. DEFINITIONS AND ABBREVIATIONS

For the purpose of this specification the definitions and abbreviations given in the reference standards shall apply together with the following abbreviations.

3.1. ABBREVIATIONS

KPLC- Kenya Power and Lighting Company Limited

ISO – International Organization for Standardization.

Kg –Kilogram

KV – Kilovolt

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

4.1.1 The Aluminum Winding Wire shall be suitable for use inside the transformer oil complying with BS-148 and IEC 60296 and at temperature up to 150 °C

4.2. DESIGN AND CONSTRUCTION(Characteristics)

4.2.1. The conductor shall be electrolytic high conductivity annealed aluminum

4.2.2. The resistivity of aluminum at 100°C shall be taken as 0.0355 μΩ.M

4.2.3. The density of aluminum at temperature of 100°C shall be taken as 2,685 kg/m^3.

4.2.4. The specific heat of aluminum at 100°C shall be taken as 928 J/Kg. °C

4.2.5. The wires shall be designed and manufactured to comply with IEC 60317-0-3

4.2.6. The wire shall be enamelled round Aluminum wires suitable for windings in electrical equipment.

4.2.7. The wire shall be grade 2 as per IEC 60317-0-3 and without a bonding layer

4.2.8. The wire shall be within the limits set in IEC 60317-0-3 for dimensions, electrical resistance, elongation, springiness, flexibility heat shock, cut through, resistance to abrasion, resistance to solvents, breakdown voltage, continuity of insulation, temperature index, resistance to refrigerants, solderability, dielectric dissipation factor, loss of mass and resistance to transformer oil

4.3. Dimensions: The wires shall be in sizes SWG 8-32(0.2743-4.0640mm in diameter)

4.4. Quality Management System

The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the raw material, manufacturing process, tests 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 9001:2015.

The Manufacturer's Declaration of Conformity to reference standards and copies of quality management certifications including copy of valid and relevant ISO 9001: 2015 certificate shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

5.1. Aluminum winding wire shall be inspected and tested in accordance with the requirements of IEC 60851, IEC 60172 and this specification. It shall be the responsibility of the manufacturer to perform or to have performed all the tests specified. Tenderers shall confirm the manufacturer's capabilities in this regard when submitting tenders. Any limitations shall be clearly specified.

NOTE List the tests that will be done by the manufacturer and those that will be sub-contracted. List equipment that will be used to carry out the tests by the manufacturer. Name the test lab that manufacturer will sub-contract and the equipment that will be used. Calibration status of all equipment listed must be supported by the calibration certificates.

5.2. Copies of previous Test Reports issued by own or a third-party testing laboratory that is accredited to ISO/IEC 17025:2005 or 17025:2017 confirming compliance of the aluminum winding wires offered shall be submitted with the offer for evaluation (all in English Language). A copy of the **accreditation certificate** and the **scope of accreditation** of the testing laboratory shall also be submitted. Any translations of certificates or test reports into English language shall be signed and stamped by the Testing Authority that carried out tests. Copies of test reports for the aluminum wire offered to be submitted for tender evaluation shall include the following tests:

5.2.1. Dimension determination

5.2.2. Electrical Resistance

5.2.3. Breakdown Voltage

5.2.4. Continuity of Insulation

5.2.5. Elongation

5.2.6. Springness

5.2.7. Flexibility and adherence

5.2.8. Resistance to abrasion

5.2.9. Heat bonding

5.2.10. Resistance to solvents

5.2.11. Resistance to transformer oil

5.2.12. Heat shock

5.2.13. Cut through

Test Reports for enameled round aluminum wire within the range of sizes SWG 8-32(0.2743-4.0640mm in diameter) shall be accepted as representative for any of the enameled round aluminum wire in the tender.

5.3. Prior to the manufacture of aluminum winding wires on order the purchaser (Kenya Power) reserves the right to inspect the manufacturing facility and the quality management system.

5.4. Upon completion of manufacturing process, the winding wires shall be subject to inspection by two Kenya power Engineers at place of manufacture and tests carried out on samples picked at random in their presence. Test reports shall be completed and made available for approval before shipment/ delivery of the winding wires. KPLC will cater for the accommodation and air travel expenses of their representatives.

5.5. On receipt of the aluminum wire Kenya Power 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 Kenya Power, any spool of Aluminum winding wire which upon examination, test or use fail to meet any or all of the requirements in the specification.

B: GUARANTEED TECHNICAL PARTICULARS (Normative)

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 suppliers' capacity and experience; and copies of complete type test certificates and test reports for tender evaluation, all in English Language)

Tender No. .....

Bidder's name and Address.....

Clause number	DESCRIPTION		Bidder's offer
Manufacturer's Name and address		Specify	
Country of Manufacture		Specify	
		Specify	
1.	Scope	State	
4.	Requirements		
4.1.1	Service Conditions	Specify	
4.2			
4.2.1	Conductor Material and purity	Specify	
4.2.2	Material Resistivity at100 °C	Specify	
4.2.3	Material Density at 100 °C	Specify	
4.2.4	Material Specific Heat at 100 °C	Specify	
4.2.5	Manufacturing Standard	Specify	
4.2.6	Suitability for use	Specify	
4.2.7	Grade	Specify	
	With or without Bonding Layer	Specify	
4.2.8	Electrical Resistance	specify	
	Breakdown Voltage	Specify	
	Continuity of Insulation	specify	
	Elongation	specify	
	Springness	specify	

Clause number	DESCRIPTION		Bidder's offer
	Flexibility and adherence	specify	
	Resistance to abrasion	specify	
	Heat bonding	Specify	
	Resistance to solvents	specify	
	Resistance to transformer oil	specify	
	Heat shock	specify	
	Cut through	specify	
4.3	Conductor Dimension	State	
4.4	Manufacturer Quality Assurance Plan	Attach	
	Manufacture Quality Management Certification	Attach	
5.1	List of tests that can be done by Manufacturer	State	
	Name of sub-contractor Test Lab and the tests it will Carry out	Sate	
	Test equipment calibration certificates	Attach	
5.2	Previous Test reports	Attach	
	Accreditation certificate	Attach	
	Scope of Accreditation	Attach	
5.3	Allow Inspection of the manufacturing Facility and Quality Management system	State compliance	
5.4	Allow for Factory Acceptance tests of the aluminum winding wire	State compliance	
	Test certificates and calibration certificates to be submitted by supplier to KPLC for approval before supply/delivery	Provide	
5.5	Inspection at the stores and replacement of rejected items	State compliance	
6	**MARKING AND PACKING**	State	

6. MARKING AND PACKING

6.1. MARKING AND PACKING

The wire shall be evenly and compactly wound on spools or placed in containers. No spool or container shall contain more than one length of wire

Each spool shall carry a label containing the following information (marked legibly and indelibly):

1. Manufacturer's name and/or trademark.
2. Type of wire and insulation, for instance trade name and/or IEC specification number;
3. Net mass of wire.
4. Nominal dimension(s) of wire and grade of insulation.
5. Date of manufacture
6. Standard to which the wire complies
7. The words "PROPERTY OF KENYA POWER AND LIGHTING COMPANY."

A: DOCUMENTATION AND DEMONSTRATION (Normative)

A.1 The bidder shall submit its tender complete with technical documents for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

a) Fully filled clause by clause guaranteed technical particulars (GTP) signed by the manufacturer.
b) Copies of the Manufacturer's catalogues, brochures, drawings giving all relevant dimensions, Wiring diagram / Schematic Diagram and technical data.
c) Sales records for the last five years and at least four customer reference letters.
d) Details of manufacturing capacity and the manufacturer's experience.
e) Copies of required type test reports by a third-party testing laboratory accredited to ISO/IEC 17025;
f) Copy of accreditation certificate to ISO/IEC 17025 for the third-party testing laboratory and
g) Manufacturer and sub-contracted test lab test equipment and their calibration certificates
h) Manufacturers letter of authorization, ISO 9001 certificate, and other technical documents required in the tender.
i) Manufacturer's warranty and guarantee; subject to 12 months from date of delivery to KPLC stores
j) Operational manual.
k) Service manual.

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Clause number	DESCRIPTION		Bidder's offer
	compactly wound on spools and Labeled with all information in specification	compliance	
A	Delivery time of the aluminum rewinding wire	State	
	Manufacturer's experience	state	
	Manufacturing Capacity (Tonnes per month)	Provide	
	List of previous customers	Provide	
	Customer reference letters	Provide	
	Statement of compliance to specification (indicate deviations if any & supporting documents)	State compliance	

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Manufacturer's Name, Signature, Stamp and Date