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THE KENYA POWER AND LIGHTING CO. LTD

SPECIFICATION *for* TRANSFORMER GASKET

REVISION RECORD

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SPECIFICATION FOR TRANSFORMER GASKET

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FOREWORD

This specification has been prepared by the Research and Development Department in consultation with the Electrical Plant Section both of KPLC and it lays down requirements for Transformers Gaskets.

The specification is intended for procurement of materials and does not include provision of contract.

INTRODUCTION

This specification was prepared to establish and promote uniform requirements for Transformer Gaskets. The specification lays down the minimum requirements for materials acceptable for evaluation.

1. SCOPE

- 1.1 This specification is for Nitrile Rubber Cork Gaskets for use in the Electrical Industry.
- 1.2 The specification covers gaskets used in oil transformers and switchgear.

2. REFERENCES

The following documents were referred to during the preparation of this specification; in case of conflict, the requirements of this specification take precedence.

ASTM F104-88: Standard Classification System for Non-metallic Gasket Materials

ASTM D1415-88: Standard Test Methods for Rubber Property – International Hardness

ASTM F152-87: Standard Test Methods for Tension Testing of Non-metallic Gasket Materials

ASTM F146-88: Standard Test Methods for Fluid Resistance of Gasket Materials

ASTM F36-88: Standard Test Methods for Compressibility and Recovery for Gasket Materials

BS 148-1984: Specification for Unused Mineral Insulating Oils for Transformers and Switchgear

3. DEFINITIONS

The definitions given in the reference standards apply.

4. REQUIREMENTS

4.1 Operating Conditions

- 4.1.1 The Gaskets shall be suitable for use in tropical conditions at altitudes of upto 2200m above sea level, temperatures of -1°C to 40°C and humidities of up to 95%.

4.2 Design and Construction

4.2.1 Materials

The gasket shall be suitable for sealing applications in transformers and switchgear.

It shall be of premium quality, medium hardness jointing based on Nitrile Rubber Cork composition that withstands high pressures and high bolt loads particularly in transformers and switchgear.

Laminates of thinner cork sections shall not be allowed.

4.2.2 Features

The gaskets shall be of the following minimum features:

- a) High pressure applications in switchgear and transformers
- b) Withstand high bolt loadings
- c) High resistance to BS 148 and IEC 296 transformer oils
- d) Maximum operating temperature in liquids of 110°C
- e) Retain flexibility down to -25°C

4.2.3 Physical Properties

The gaskets shall have the following minimum physical properties (tested to ASTM procedures)

- a) Hardness, IRHD: **70 to 75** (ASTM D1415)
- b) Tensile Strength, Mpa min: **2.45** (ASTM F152)
- c) Compressibility @ $2.8\text{N}/\text{mm}^2$, %: **20 to 30** (ASTM F36)
- d) Recovery, minimum %: **85** (ASTM F36)

- e) Fluid resistance, % volume swells in BS 148 Transformer Oil, 14 days @ 90°C: +2 (ASTM F146)

4.3 Instructions and Marking

- 4.3.1 Manufacturer's instructions for use and inspection shall be submitted in the English language.
- 4.3.2 Each gasket shall, at regular intervals, be marked legibly and indelibly with the following information:
 - a) Name or trade mark of the manufacturer
 - b) Type reference

4.4 Sizes

The gaskets shall be 3mm (1/8 inch) or 6.4mm (1/4 inch) in thickness as specified and shall be supplied in sheets measuring 1.2m x 1.2m.

Tolerances (on thickness) shall be $\pm 0.25\text{mm}$ and $\pm 0.38\text{mm}$ respectively. This is in accordance with ASTM F104.

5. TESTS

- 5.1 Tests for the gaskets shall be in accordance with ASTM procedures.
- 5.2 Copies of previous test certificates certified by the relevant National Testing Authority of the country of manufacturer shall be submitted for Tender Evaluation. *This requirement is mandatory.*

In the case of tender award certified test reports for the gaskets to be supplied shall be sent to KPLC for approval before shipment of the goods. The test reports shall be certified by the relevant National Testing Authority of the country of manufacture. *This requirement is mandatory.*

- 5.3 The Tenderer shall submit a clause by clause statement of compliance with these specifications. Relevant copies of the manufacturer's brochures and catalogues indicating material details, suitable application, tensile strength, hardness, compressibility, recovery and relevant fluid resistance properties shall be submitted to support the tender and shall be clearly marked to indicate the item and type reference numbers of the gaskets offered. *This requirement is mandatory.*
- 5.4 The manufacturer's declaration of conformity to reference standards, quality assurance certification and list of previous customers (for similar goods) and their

addresses outside the country of manufacture shall also be submitted. *This requirement is mandatory.*

6. TECHNICAL EVALUATION OF TENDERS

Only tenders meeting the mandatory requirements shall be considered for detailed technical evaluation.

7. INFORMATION (*In case of Tender Award*)

Two sets of drawings and technical details shall be submitted to KPLC for approval before manufacture of the gaskets commences. KPLC undertakes to submit their comments or approval for the drawings and technical details within three weeks of receiving the daft copies. *This requirement is mandatory.*