KENYA STANDARD

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ICS 61.060

Second Edition

Specification for general purpose rubber boots

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Kenya Industrial Research and Development Institute (KIRDI)

Kenya Association of Manufacturers (KAM)

Bata Shoes Company

Dedan Kimathi University of Technology(DeKUT)

Technical University of Kenya (TUK)

Environmental Institute of Kenya (EIK)

Kenya Leather Development Council (KLDC)

Department of Veterinary Services (DVS)

Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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Foreword

This Kenya Standard was prepared by the Leather and Leather Products Technical Committee under the guidance of the Standards Projects Committee, and it is in accordance with the procedures of Kenya Bureau of Standards.

In this second Edition, the format of presentation has been updated and the standard has also undergone. some minor revision.
This standard cancel and replaces KS 03-390:1983, specification for general purpose rubber knee boots for adults.

In the preparation of this standard, assistance was derived from the following publications:

BS 5145 Lined industrial rubber boots.

ISO/R 36: 1957 Determination of adhesion strength of vulcanized rubbers to textile fabrics.

IS 3400: 1975 Methods of test for vulcanized rubbers.

IS 3738: 1975 Specification for industrial and safety rubber knee boots.

Acknowledgement is made for the assistance derived from these sources.

DKS 03-391:2024

Specification for general purpose rubber boots

1 Scope

This Kenya Standard specifies the requirements, test methods and sampling for general purposes gumboots made of rubber.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 37, *Rubber, vulcanized - Determination of tensile stress-strain properties.*

ISO 48*, Vulcanized rubbers - Determination of hardness (Hardness between 30 and 85 IRHD).*

ISO 176*, Plastics - Determination of loss of plasticizers - Activated carbon method.*

ISO 458-1*, Plastics - Determination of stiffness in torsion of flexible materials - Part 1: General method.*

ISO/TR 463*, Dial gauges reading in 0.01 mm, 0.001 in and 0.000 1 in.*
ISO 10335, *Rubber, and plastics footwear - Nomenclature*.

ISO 4643, *Moulded plastics footwear — Lined or unlined poly (vinyl chloride) boots for general industrial use — Specification*

ISO 5423, Moulded plastics footwear — Lined or unlined polyurethane boots for general industrial use — Specification

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 19952:2005 apply.:

4 Requirements

4.1 General requirements

The lining shall be made of suitable fabric material.

4.1.2 The boots shall be made in sizes 3 to13.

4.1.3 The minimum height of the boot, when measured on the inside at the back of the boot from the insole to the top (*see* Figure 1), shall be as shown in Table 1.

Table 1. Height of the rubber gumboots, in mm

	MEN'S	WOMEN'S
Half knee	180-239	153-203
Short knee	240-329	204-279
Knee	330-429	280-380

4.2 Materials

4.2.1 Upper materials shall be of rubber conforming to physical requirements given in Table 3.

4.2.2 The rubber-mix of the material shall be made of natural rubber, synthetic rubber or a combination of both.

4.3 COMPONENTS

4.3.2 The rubber components shall comply with the physical requirements specified in Table3.

4.4 Weathering Test – All rubber components shall be capable of withstanding ageing in an air-oven at a temperature of 100 ± 1 ^{0}C for a period of 24 h according to the procedure given inISO 1419[1], without developing any brittleness or tackleness.

NOTE: For the purpose of this test, the test pieces may be entire articles or pieces cut from them.

4.5 Leakage Test – On immersion in water, gumbootsshall show no sign of leakage in the form of damp patches on the inside surface when in accordance with KS ISO 20344.

Table 2 - Minimum thickness

s/n	Boot component	Minimum thickness, mm				Test method
	Boot upper	1.5 of which not less than 1.0 shall be ofPVCor PU compound				
1	Foxing a) at the heel b) elsewhere	4.0 3.0				
2	Boot bottom	Over cleats		Between cleats		
		Men	Women	Men	Women	

1

	a) full thickness b) outsole only	12.0 8.0	10.0 6.0	7.0 3.0	5.0 2.5	ISO 4643
3	Heel a) full thickness b) wearing surface to filier block	25.0 9.0	20.0 4.0	19.0 3.0	14.0 2.5	

TABLE 3. PHYSICAL REQUIREMENTS FOR INDIVIDUAL, RUBBER COMPONENTS

S/No.	Characteristic		Requirements			Test methods
			Upper	Foxing	Soling	
1.	Relative density, max.		1.4	1.4	1.5	KS ISO 2420
2.	Hardness, IRHD		50 – 60	50 – 60	60 – 70	KS ISO 48(1-5)
3.	Flex resistance number of cycles, min	Initial crack	150000	-	50000	KS ISO 4643
		600 per cent growth	-	-	65000	
4.	Tensile strength , Mpa, Min.		7		7	
5.	Elongation at break, %, min.		300		300	

4.6 FINISH

Boots shall be either matt or gloss finished.

5 Marking

5.1 Rubber gumboot

The rubber gumboot shall be legibly and indelibly marked with the following:

a) size and fitting number;
b) batch number;
c) manufacturer's name or registered trade mark and address;
d) country of Manufacture/origin.

5.2 Bulk packaging

Each bulk package (bale) shall be legibly and indelibly labelled with the following information:

a) name of product as “Rubber gumboot”;

b) quantity;

c) manufacturer or local supplier’s name and/or registered trademark and address;

d) country of manufacture/origin.

6 Packaging

The rubber gumboots shall be packed in a suitable material to avoid contamination and damage during transportation and storage.

7 Sampling

Sampling and acceptance criteria should be as given in annex A

Annex A
(normative)

Sampling and criteria for conformity

A.1 **Definitions**

A.1.1 **Lot**

All gumboot pairs in a consignment belonging to the same pattern/design and batch of manufacture

A.1.2 **Defect**

A fault or failure of a gumboot pair to meet the requirements of this standard.

A.1.3 **Defective footwear**

A gumboot pair with one or more defects as mentioned in this standard.

A.2 **Scale of sampling**

A.2.1 Samples shall be selected and examined for each lot separately for ascertaining the conformity of the gumboot to the requirements of this standard.

A.2.2 Gumboot shall be considered to be of different lots if they differ in shape and design.

A.2.3 The number of gumboot pairs to be selected from any lot shall depend on the size of the lot and shall be in accordance with Columns 1 and 2 of Table A.1.

A.3 **Method of selection**

A.3.1 Gumboot to be selected from the lot shall be chosen at random. To ensure randomness the procedure in A.3.2 shall be used.

A.3.2 When the gumboot pairs in a lot are not packed in a number of cases (boxes), the sampling shall be as follows:

Starting from any gumboot pair in the lot, count the pairs as 1,2, etc---up to *r* and so on in one order. Every r^{th} pair thus counted shall be withdrawn to constitute a sample (*r* is an integral part of N/n where N is the lot size and n is the sample size). This procedure shall be stopped as soon as the required number of pairs is obtained.

For example, if a sample of 125 pairs is to be selected from a lot of 3,000 pairs, compute *r* as equal to integral part of 3,000/125=24. Starting from any pair, the footwear shall be counted in one order and every 24^{th} pair shall be withdrawn.

A.3.3 When the gumboot pairs in a lot are packed in different cases (boxes), a suitable number of boxes (not less than 30 percent of the total boxes in the lot) shall be first chosen at random. For each of the boxes so chosen, an approximately equal number of pairs shall be picked up from its different parts so as to obtain the required number of pairs.

For example, if a lot consists of 1 000 pairs of gumboots packed in 50 boxes, each containing 20 pairs, choose more than 15 boxes at random. If it is decided to open 20 boxes, then 4 pairs shall be picked up from different parts of each of the 20 boxes to give a total of 80 pairs as specified in Table 1.

Table A.1 — Scale of sampling and permissible number of defects

No. of gumboot pairs in a lot	Samples for visually observed defects (pairs)	Permissible no. of defectives (pairs)	Sample size for laboratory testing (pairs)	Permissible no. of defectives (pairs)
(1)	(2)	(3)	(4)	(5)
Up to 50	13	0	2	0
51 to100	20	1	3	0
101 to 300	32	1	3	0
301 to 500	50	2	5	1
501 to 1000	80	3	6	1
1001 to 3000	125	5	7	2
3001 and above	200	7	8	3

A.4 All randomly selected gumboot pairs (Table A.1, Column 2) shall be inspected for visually observed defects, i.e.

i) Difference in shape, design and colour.

ii) Odd pairing and incorrect size.

iii) Distorted shapes.

iv) Faulty jointing and adhesion of sole, heel, toe guard, toe cap and insole.

v) Finish not even and unpolished.

A.5 The number of defective gumboots pairs shall not exceed the permissible number given in Table A.1, Column 3. If, however, the number of defective pairs exceeds the permissible number of defectives, the lot shall be rejected.

A.6 In case the lot has been found satisfactory for visually observed defects, sample pairs for laboratory testing (Table A.1, Column 4) shall be taken from among those drawn (Table A.1, Column 2). The pairs shall be chosen at random and tested for dimensional, physical and chemical characteristics. If the number of defective gumboot pairs is less than or equal to the corresponding permissible number of defectives given in Table A.1, Column 5, the lot shall be declared to have met the requirements of this standard. Otherwise, if the defective gumboot pairs are more than the corresponding permissible number of defectives the lot shall be rejected.

