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DRAFT TANZANIA STANDARD

Reclaimed rubber — Specification

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TANZANIA BUREAU OF STANDARDS

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Foreword

This Tanzania Standard was published under the authority of the Board of Director of Tanzania Bureau of Standards.

Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania established by the Standards Act Cap. 130.

Tanzania Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. The Technical Committees work under the supervision of Divisional (sectoral) Committees. The Standards are developed in accordance with the Guide and Procedure for Development of Tanzania Standards and TZS 0, Guide for presentation of Tanzania Standards.

Tanzania Standards are subject to review, to keep pace with science and technological advances. Users of the Tanzania Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

This Tanzania Standard was developed under the supervision of the Chemical and Healthcare Divisional Standards Committee [*CHDC*]. The Technical Committee responsible for the standard is CHDC 14 – Rubber and rubber products.

The reporting of the results of a test or analysis made in accordance with this Tanzania Standard, if the final value, observed or calculated is to be rounded off, shall be done in accordance with TZS 4.

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Reclaimed rubber — Specification

1 Scope

This draft standard specifies requirements, sampling and test method for seven different classes of reclaimed 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.

FTZS 1541/ISO 1795:2017 Rubber, raw natural and raw synthetic — Sampling and further preparative procedures

TZS 1544/ISO 248-1: 2011 Rubber, raw — Determination of volatile matter content — Part 1: Hot-mill method and oven method

TZS 1530 / ISO 247: 2006 Rubber - Determination of ash

TZS 753/ISO 37:2005 Rubber, vulcanized or thermoplastic – Determination of tensile stress-strain properties

EN 16143 Petroleum products — Determination of content of Benzo(a) pyrene (BaP) and selected polycyclic aromatic hydrocarbons (PAH) in extender oils — Procedure using double LC cleaning and GC/MS analysis

ISO 9924-1 Rubber and rubber products — Determination of the composition of vulcanizates and uncured compounds by thermogravimetry — Part 1: Butadiene, ethylene- propylene copolymer and terpolymer, isobutene-isoprene, isoprene and styrene-butadiene rubbers

ISO 9924-3 Rubber and rubber products — Determination of the composition of vulcanizates and uncured compounds by thermogravimetry Part 3: Hydrocarbon rubbers, halogenated rubbers and polysiloxane rubbers

ISO 1407 Rubber — Determination of solvent extract

ISO 1408 Rubber — Determination of carbon black content — Pyrolytic and chemical degradation methods

ISO 289-1 Rubber, unvulcanized — Determinations using a shearing-disc viscometerPart 1: Determination of Mooney viscosity

IEC 62321-4 Mercury in polymers, metals and electronics by CV-AAS, CV-AFS, ICP-OES and ICP-MS

IEC 62321-5 Cadmium, lead and chromium in polymers and electronics and cadmium and lead in metals by AAS, AFS, ICP-OES and ICP-MS

IEC 62321-6 Polybrominated biphenyls and polybrominated diphenyl ethers in polymers by gas chromatography — Mass spectrometry (GC-MS)

IEC 62321-7 Hexavalent chromium, Section 2 Determination of hexavalent chromium (Cr (VI)) in polymers and electronics by colorimetric method

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ASTM D792 Standard test methods for density and specific gravity(Relative density) of plastics by displacement

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
reclaimed rubber
recovered rubber from rejects and/or end-of-life/use rubber-products such as tyre, tubes and moulded products.

4 Classification of reclaimed rubber

The reclaimed rubber shall be classified as given below according to the raw material used and the quality of the reclaimed rubber (Table 1).

Table 1- Classification of reclaimed rubber

S/N	Classification	Abbreviation	Material
1	Whole tyre rubber reclaimed	WTR-R	End-of-Life tyre (ELT) rubber from automobiles such as truck, bus and passenger car, etc.
2	Whole tyre rubber reclaimed - coarse finish	WTR-C	End-of-Life tyre (ELT) rubber from automobiles such as truck, bus and passenger car, etc
3	Whole tyre rubber reclaimed - low Mooney	WTR-LM	End-of-Life tyre (ELT) rubber from automobiles such as truck, bus and passenger car, etc
4	High tensile tread reclaimed rubber	HTT-R	Tyre tread rubber (tread peeling) from automobile such as truck, bus, etc.
5	Tube reclaimed rubber - natural rubber (NR)	TRR-N	Rubber from tyre tubes principally made of natural rubber.
6	Tube reclaimed rubber – isobutylene -isoprene rubber (IIR)	TRR-I	Rubber of tyre tubes principal made of isobutylene - isoprene rubber.
7	EPDM reclaimed rubber - ethylene propylene diene monomer (EPDM)	EPDM-R	Rubber of scrap profiles/other products principal made of ethylene propylene diene

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			monomer rubber.

5 Requirements

5.1 Description

Smoothly refined reclaimed rubbers are to be available either in sheet form or extruded profile in the form of a rod. That material shall be dusted to avoid sticking with each other. The reclaimed rubber shall be free from any metal piece.

5.2 Material

The material shall comply with the requirements of the test method prescribed in Table 2.

Table 2 Requirements for reclaimed rubber

S/N	Parameter	WTR-R	WTR-C	WTR-LM	HTT-R	TRR-N	TRR-I	EPDM-R	Test method
i.	Volatile matter, percent by mass, Max	1.0	1.0	1.0	1.0	1.0	1.0	1.0	TZS 1544
ii.	Acetone extract, percent by mass, Max	16.6	16.6	16.6	16.6	15	12	35	ISO 1407
iii.	Ash content, percent by mass, Max	9	9	9	9	28	7	20	TZS 1530
iv.	Carbon black, percent by mass	27 ± 3	27 ± 3	27 ± 3	28 ± 3	20 ± 5	32 ± 4	28 ± 4	ISO 1408
v.	Rubber hydrocarbon, percent by mass, Min	47	46	48	48	42	50	25	ISO 9924-3
vi.	Relative density	1.14±0.02	1.14±0.02	1.14±0.02	1.13±0.03	1.25 ± 0.05	1.14 ± 0.02	1.20, Max	ASTM D792
vii.	Mooney viscosity ML (1 + 4) at l00 ºC	40 ± 10	50 ± 10	20 ± 35	50 ± 10	35±10	37±8	35 ± 10	ISO 289-1
viii.	Tensile strength, N/mm^2, Min	4	3.5	4	7.5	3.5	7.5	6	TZS 753
ix	Elongation at break, percent, Min	200	150	200	250	200	480	275	TZS 753
x	Total organic content, percent	65 ± 5	65 ± 5	65 ± 5	65 ± 5	55 ± 5	60± 5	-	ISO 9924-1
xi	Calcium carbonate, percent	4 ± 1	4 ± 1	4 ± 1	2 ± 1	10± 2	4 ± 1	-	ISO 9924-1
xii	Heavy metals and substances, *Max*, percent by	-	-	-	-	-	-	-	-

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	weight								
	a) Lead	-	-	-	0.1	-	-	-	IEC 62321-5
	b) Mercury	-	-	-	0.1	-	-	-	IEC 62321-4
	c) Cadmium	-	-	-	0.01	-	-	-	IEC 62321-5
	d) Hexavalent chromium	-	-	-	0.1	-		-	IEC 62321-7
	e) Polybrominated biphenyls (PBB)	-	-	-	0.1	-		-	IEC 62321-6
	f) Polybrominated diphenyl ethers (PBDE)	-	-	-	0.1	-		-	IEC 62321-6
xiii	Polycyclic aromatic Hydrocarbons (PAH)	-	-	-	-	-		-	EN 16143
	a) Benzo(a)pyrene (BaP)	-	-	-	<1 mg/kg	-	-	-	-
	b) Sum of the Benzo(e) pyren (BeP), Benzo(a)anthracene (BaA), Chrysen (CHR), Benzo(b)fluoranthene (BbFA), Benzo(j)fluoranthene(BjFA), Benzo(k)fluoranthene(BkFA), Dibenzo(a,h)anthracene (DBAhA)	-	-	-	<1 mg/kg	-	-	-	-

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6 Packaging and Labelling

6.1 Packaging

6.1.1 The reclaimed sheets shall be packed in 25 kg or 50 kg bales.

6.1.2 The material shall be wrapped suitably as agreed to between the purchaser and the supplier.

6.2 Labelling

Each package shall be legibly and indelibly labelled in English and/or Swahili with the following information.

a) Name and physical address of manufacturer and/or registered trademark;

b) Name of the product as, “Reclaimed rubber”;

c) Class of reclaimed rubber

d) Net mass of bale;

e) Month and year of manufacture

f) Batch or lot number; and

g) Instruction for storage, use and disposal.

Note: TRR-I bales should be labelled with blue strip to avoid any mix up with WTR-R, WTR-C, WTR-LM, HTT-R, TRR-N or EPDM-R.

7 Sampling

7.1 Sampling shall be done in accordance with FTZS 1541/ISO 1795:2017

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Bibliography

[1] IS 7490, *Reclaimed rubber - Specification*

[2] IS 6306, *Method of test for reclaimed rubber*

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