



TANZANIA STANDARD

Universal Tractor Transmission Oil (UTTO) — 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 17, *Lubricant and Oils 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.

Universal Tractor Transmission Oil (UTTO) — Specification

1 Scope

This Tanzania Standard specifies performance requirements, sampling, and test methods for Universal Tractor Transmission Oil (UTTO), engineered for shared fluid reservoirs used in transmissions, differentials, wet brakes, hydraulic systems and power steering of agricultural tractors and light-to-medium off-road equipment.

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.

ASTM D92, *Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester*

ASTM D97, *Standard Test Method for Pour Point of Petroleum Products*

ASTM D130, *Standard Test Method for Corrosiveness to Copper from Petroleum Products by Copper Strip Test*

ASTM D445, *Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)*

ASTM D892, *Standard Test Method for Foaming Characteristics of Lubricating Oils*

ASTM D2270, *Standard Practice for Calculating Viscosity Index from Kinematic Viscosity at 40 °C and 100 °C*

ASTM D2896, *Standard Test Method for Base Number of Petroleum Products by Potentiometric Perchloric Acid Titration*

ASTM D4052, *Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter*

ASTM D4057, *Standard Practice for Manual Sampling of Petroleum and Petroleum Products*

ASTM D4177, *Standard Practice for Automatic Sampling of Petroleum and Petroleum Products*

ASTM D6749, *Standard Test Method for Pour Point of Petroleum Products (Automatic Air Pressure Method)*

ASTM D7042, *Standard Test Method for Dynamic Viscosity and Density of Liquids by Stabinger Viscometer*

ISO 11158, *Lubricants, industrial oils and related products (class L) — Family H (Hydraulic systems) — Specifications for categories HH, HL, HM, HV, HG and HR*

TZS 4, *Rounding off numerical values*

TZS 668, *Petroleum industry — Terminology*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in TZS 668 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses: — ISO Online Browsing Platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1 wet brake

a braking assembly immersed in an oil bath where the lubricant provides cooling and friction modification to ensure smooth, noise-free operation and retardant force without chatter

3.2 shared fluid reservoir

single, integrated fluid compartment on a piece of machinery that supplies lubricant to multiple distinct mechanical and hydraulic subsystems simultaneously

3.3 Grade Low Viscosity (LV)

Fluid that is thinner and flows more freely than standard tractor fluid particularly at cold temperatures, that falls below SAE 10W-30 or 80W viscosity grade.

3.4 Grade Standard (ST)

Refer to most wide used multipurpose UTTO designed for all weather of operations in moderate climate e.g 10W-30 or 80W viscosity grade.

4 Performance levels

UTTO oil shall meet or exceed the following performance benchmarks:

- i. Gear Performance: API GL-4.
- ii. Braking Performance: (e.g., John Deere J20C, Volvo WB 101, Massey Ferguson CMS M1145, Caterpillar T0-2 and equivalent).

5 Requirements

5.1 General requirements

5.1.1 The oil shall consist of high-quality refined base oils blended with functional additives, including anti-wear, extreme pressure, and friction-modifying agents.

5.1.2 The oil shall be homogeneous, clear, and free from water, suspended sediments, or mechanical impurities that could clog hydraulic filters or actuation valves.

5.1.3 The oil shall demonstrate high shear stability to maintain adequate film thickness and viscosity under heavy mechanical loads.

5.2 Specific requirements

Universal Tractor Transmission Oil (UTTO) shall comply with the technical limits specified in Table 1 when tested in accordance with the indicated methods.

Table 1 — Specific requirements for Universal Tractor Transmission Oil (UTTO)

S/No	Property/Characteristic	Requirement		Test Method
		Grade Low Viscosity (LV)	Grade Standard (ST)	
i.	Appearance	Bright and clear, free from visible contamination		Visual
ii.	Kinematic viscosity at 100 °C, (cSt)	6.9 to < 9.3	9.3 – 12.5	ASTM D445 ASTM D7042
iii.	Kinematic viscosity at 40 °C, (cSt)	–report	–report	ASTM D445
iv.	Viscosity Index, <i>min.</i>	120	120	ASTM D2270
v.	Density at 20 °C, kg/L,	report	report	ASTM D4052
vi.				
vii.	Flash point (COC), °C, <i>min.</i>	190	210	ASTM D92
viii.	Pour point, °C, <i>max.</i>	-40	-30	ASTM D97 ASTM D6749
ix.	Copper strip corrosion (3 h at 100 °C), rating, <i>max.</i>	1b	1b	ASTM D130
x.	Brookfield viscosity at -25 °C, Cp/mPa.s,max	150 000	150 000	ASTM 2983
xi.	Foaming tendencies & stability, mL/mL, <i>max.</i> — Sequence I — Sequence II — Sequence III	50	50	ASTM D892
		50	50	ASTM D892
		50	50	ASTM D892
		50	50	-

6 Packaging, marking and labelling

6.1 Packaging

6.1.1 Universal Tractor Transmission Oil (UTTO) shall be packaged in clean, dry, sound, and securely sealed containers constructed of materials that do not react with or affect the product quality.

6.1.2 The containers shall protect the fluid against physical damage, atmospheric moisture ingress, oxidation, and contamination during transportation, handling, and storage.

6.2 Marking and labelling

Each container shall be legibly and indelibly marked in English and/or Kiswahili with the following minimum information:

- a) Product name as **"Universal Tractor Transmission Oil (UTTO)"**
- b) Viscosity designation, explicitly declaring the product grade as **"Grade Low Viscosity (LV)"** or **"Grade Standard (ST)"** or equivalent;
- c) Commercial brand name or trade mark;
- d) Name and physical address of the manufacturer, blender, or packer;
- e) Net content by volume (in liters, L) or mass (in kilograms, kg);
- f) performance level (API GL-4)
- g) Batch or lot identification number;
- h) expiration or recommended shelf-life period;
- i) Country of origin.

7 Sampling

Sampling of Universal Tractor Transmission Oil (UTTO) for testing and compliance inspection shall be carried out in accordance with **ASTM D4057** (manual sampling) or **ASTM D4177** (automatic sampling).