



DRAFT TANZANIA STANDARD

Off-Road Gear Oil- Specification

DRAFT FOR PUBLIC COMMENTS

0 Foreword

This Draft Tanzania Standard is being developed by the Lubricants and Oil Technical Committee under the supervision of the Chemicals Divisional Standards Committee and it is in accordance with the procedures of the Bureau.

This Draft Tanzania Standard is the first edition of Off-Road Gear Oil- Specification

For the purpose of deciding whether a particular requirement of this Tanzania Standard is complied with, the final value observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with TZS 4 (see clause 2).

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1 Scope

This Draft Tanzania Standard specifies requirements, sampling and test methods for off-road gear oil- lubricants intended for the lubrication of hydraulic systems, power shift, axles and final drives of non-automobile equipment including but not limited to excavator, cranes, backhoes and bulldozers that are used for mining activities, construction activities and other off-road application.

2 Normative references

The following referenced documents are indispensable for the application 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 D 92, *Standard test method for flash and fire points by Cleveland open cup*

ASTM D 97, *Standard test method for pour point of petroleum products*

ASTM D 2270, *Standard practice for calculating viscosity index from kinematic viscosity at 40 and 100 °C.*

ASTM D 445/7042, *Standard test method for kinematic viscosity of transparent and opaque liquids*

ASTM D 1298, *Standard Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method*

ASTM D 4052, *Standard test method for density and relative density of liquids by digital density meter*

ISO 24153, Random Sampling and randomization procedures

TZS 668, Petroleum Industry -Terminology

3 Terms and definitions

For the purpose of this Tanzania Standard the following definitions and those in TZS 668 (see clause 2) shall apply:

3.1 additives

Materials added to base oil, usually in small amount to impart or enhance desirable properties or to suppress undesirable properties.

3.2 lubricant

Any substance which when interposed between two surfaces in relative motion, reduces friction or increases wear resistance.

3.3 Gear oil

Any fluid lubricant used in gears (gearboxes) for reduction of friction and wear of the gear tooth surfaces and removal of the heat.

3.4 Off-road

off public road or highway or on rough ground, away from normal roads

4 Requirements

4.1 General requirements

4.1.1 Off-road gear oil shall be visually clear and bright

4.1.2 Off-road gear oil shall meet at least performance requirements of caterpillar TO-4 or equivalent specifications

4.2 Specific requirements

Off-road gear oil shall conform to the specific requirements given in Table 1 when tested in accordance with the methods prescribed therein.

Table 1: Specific requirements for off-road gear oil

1	2	3	4	5	6	
S/n	SAE Viscosity Grade	10W	30	50	60	Test method
Properties						
i.	Density @ 29.5°C, kg/m ³	To be reported				ASTM D1298/4052
ii.	Kinematic viscosity at 40 °C, mm ² /s					ASTM D 445/7042
	Min.	38	85	190	295	
	Max.	50	100	225	388	
iii.	Kinematic viscosity at 100 °C, mm ² /s					ASTM D 445/7042
	Min.	5.5	10	17	21.9	
	Max.	8.5	12.6	20	27	
iv	Viscosity Index, Min	90	90	90	90	ASTM D 2270
v	Flash point, °C Min	200	215	220	230	ASTM D 92
vi	Pour Point, °C Max	-30	-21	-9	-9	ASTM D 97

Table 1

5 Labelling and packaging

5.1 Labelling

The following information shall appear on the label of container(s) in English/Swahili or as agreed between the manufacturer and purchaser

- i) Manufacturer's name and address,
- ii) Name of the products, trade mark/name if any,
- iii) Batch number and date of manufacture
- iv) Net content,
- v) Performance level
- vi) Viscosity grade
- vii) Expiry date

5.2 Packaging

Off-road gear oil shall be packed in suitable containers as agreed between supplier and purchaser, including but not limited to drums and plastic jerry cans. They shall be properly sealed to avoid leakage.

6 Sampling

Sampling of off-road gear oil shall be done accordance to ISO 24153

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