



DRAFT TANZANIA STANDARD

TWO-STROKE CYCLE GASOLINE ENGINE OIL-SPECIFICATION

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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 two-stroke cycle gasoline engine 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 lubricating oils (hereinafter referred to as “two-stroke oils”) to be used in two-stroke-cycle spark-ignition gasoline engines which employ a crankcase scavenging system and are used in transportation, leisure and utility applications, such as motorcycles, snowmobiles and chainsaws.

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.

ISO 3987, Petroleum products — Determination of sulfated ash in lubricating oils and additives

ISO 3771, Petroleum products — Determination of base number perchloric acid potentiometric titration method

ISO 2719, Determination of flash point Pensky-Martens closed cup method

ISO 24153, Random Sampling and randomization procedures

ASTM D 1500, Standard test method for color of petroleum products

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

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

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

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

ASTM D 892, Standard test method for foaming characteristics lubricating oils

ASTM D 874, Standard test method for Sulfated Ash from Lubricating Oils and Additives

ASTM D 93, Standard test method for Flash Point by Pensky-Martens Closed Cup Tester

ASTM D 2896, Standard test method for Base Number of Petroleum Products

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 6749 Standard Test Method for Pour Point of Petroleum Products (Automatic Air Pressure Method)

ASTM D 6304 Standard Test Method for Determination of Water in Petroleum Products, Lubricating Oils, and Additives by Coulometric Karl Fischer Titration

ASTM D 4951 Standard Test Method for Determination of Additive Elements in Lubricating Oils by Inductively Coupled Plasma Atomic Emission Spectrometry

ASTM D 5185 Standard Test Method for Multielement Determination of Used and Unused Lubricating Oils and Base Oils by Inductively Coupled Plasma Atomic Emission Spectrometry

TZS 668, Petroleum Industry –Terminology

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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 lubricity

ability of a lubricant to minimize friction between, and damage to, metal surfaces in relative motion under load.

NOTE: Lubricity is a qualitative term.

3.2 candidate oil

two-stroke oil whose performance is subject to evaluation in the test method

3.3 reference oil

prepared two-stroke oil, of known performance, which is used for comparison to categorize the performance of a candidate oil

3.4 initial torque index

relative average output torque of the reference oil and the candidate oil at 200 °C in the lubricity test

3.5 detergency

property of an engine oil to prevent and/or remove deposits from the surfaces of an engine resulting in a degree of cleanliness of the interior engine parts with respect to deposits, such as varnish and carbon, originating from the engine oil or the fuel

3.6 exhaust smoke

visible emissions which consist of solid particulates and aerosol droplets from unburned or partially burned engine oil and/or fuel and which are emitted from an exhaust pipe

3.7 exhaust system blocking

accumulation of deposits, usually from unburned portions of the engine oil and/or fuel, in an exhaust system consisting of cylinder exhaust port, exhaust pipe and muffler

4 Requirements

4.1 General requirements

4.1.1 Two-Stroke Cycle gasoline engine oil shall be visually clear and bright

4.1.2 Two-Stroke Cycle gasoline engine oil shall meet at least performance requirements of **JASO FC, ISO- L-EGC, API TC** or equivalent specifications

4.2 Specific requirements

Two-stroke cycle gasoline engine 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 two-stroke-cycle gasoline engine oils

S/N o.	Property	Requirement	Test method and equivalent
i	Colour	Shall be distinctively Coloured or colourless	ASTMD 1500
ii	Specific gravity at 15 °C, min.	0.850	ASTM D1298/4052
iii	Kinematic viscosity mm ² /s at 40 °C min	report	ASTM D 445/7042
iv	Kinematic viscosity mm ² /s at 100 °C min	6.5	ASTM D 445/7042
v	Viscosity index. min.	90	ASTMD 2270
vi	Flash point, °C, min.	70	ASTMD 93 ISO 2719
vii	Pour point, °C (max)	-20	ASTM D 97//ASTM D 6749
viii	TBN (mg KOH/g), min	1.0	ASTM D 2896 ISO 3771
ix	Sulphated ash, (% wt), max %	0.25	ASTM D 874/ISO 3987
x	Water content (ppm) max	500	ASTM D 6304
xi	Foam tendency/foam stability	No foam at 95 °C	ASTMD 892
xii	Exhaust smoke, min	85	JASO M342
xiii	Exhaust system blocking, min	90	JASO M343
xiv	Elemental analysis mass %		
XV	Calcium Barium Magnesium Zinc Boron Phosphorus Sulphur	report	ASTM D 4951/5185

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
- iv) Date of manufacture and expiry date
- v) Net content,
- vi) Performance level e.g. **JASO FC, ISO- L-EGC, API TC**

5.2 Packaging

Two-stroke-cycle gasoline engine oils shall be packed in suitable containers and shall be properly sealed to avoid leakage.

6 Sampling

Sampling of Two-stroke-cycle gasoline engine oils shall be done accordance to ISO 24153

Annex A
(Informative)

Table A.1: JASO M345:2003 specification for 2-stroke engine oil performance

Test Method	Evaluated Performance	Test Requirement		
		FB	FC	FD
JASO M340	Lubricity	>95	>95	>95
JASO M340	Initial Torque	>98	>98	>98
JASO M341 1 hour	Fundamental Part Detergency	>85	>95	n/a
	Piston Skirt Part Detergency	n/a	n/a	n/a
JASO M341 3 hours	Fundamental Part Detergency	n/a	n/a	>125
	Piston Skirt Part Detergency	n/a	n/a	>95
JASO M342	Exhaust Smoke	>45	>85	>85
JASO M343	Exhaust smoke blocking	>45	>90	>90
ASTM D 874	Sulfated Ash Mass Percent	<0.25%	<0.25%	<0.18%
ASTM D 83	Flash point	>70°C	>70°C	>70°C
ASTM D 445	Kinematic Viscosity at 100°C	>6.5 cst	>6.5 cst	>6.5 cst

Table A.2: ISO 13738 specification for 2-stroke engine oil performance

Test Method	Evaluated Performance	Test Requirement		
		L-EGB	L-EGC	L-EGD
JASO M340	Lubricity	>95	>95	>95
JASO M340	Initial Torque	>98	>98	>98
JASO M341 1 hour	Fundamental Part Detergency	>85	>95	n/a
	Piston Skirt Part Detergency	>85	n/a	n/a
JASO M341 3 hours	Fundamental Part Detergency	n/a	n/a	>125
	Piston Skirt Part Detergency	n/a	>90	>95
JASO M342	Exhaust Smoke	>45	>85	>85
JASO M343	Exhaust smoke blocking	>45	>90	>90
ASTM D 874	Sulfated Ash Mass Percent	<0.25%	<0.25%	<0.18%
ASTM D 83	Flash point	>70°C	>70°C	>70°C
ASTM D 445	Kinematic Viscosity at 100°C	>6.5 cst	>6.5 cst	>6.5 cst

Bibliography

- [1] ISO 13738:2011, *Lubricants, industrial oils and related products (class L)*
- [2] *Family E (Internal combustion engine oils) Specifications for two-stroke-cycle gasoline engine oils (categories EGB, EGC and EGD)*
- [3] *JASO M340, Two-stroke-cycle gasoline engine — Engine oils — Lubricity test procedure*
- [4] *JASO M341, Two-stroke-cycle gasoline engine — Engine oils — Detergency test procedure*
- [5] *JASO M342, Two-stroke-cycle gasoline engine — Engine oils — Smoke test procedure*
- [6] *JASO M343, Two-stroke-cycle gasoline engine — Engine oils — Exhaust system blocking test procedure*

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