



TCD 209:2021  
ICS: 13.040.50

## DRAFT ZANZIBAR NATIONAL STANDARD

### Air quality — Vehicular exhaust emissions limits

DRAFT FOR STAKEHOLDERS COMMENT

ZANZIBAR BUREAU OF STANDARDS

## **National Foreword**

This draft Zanzibar standard is proposed to be adopted from Tanzania Standard, TZS 983: 2019, Air quality — Vehicular exhaust emissions limits. It is presented to Soil and Air Quality Technical Committee (TCE2) in order to be analysed and commented.

This draft Zanzibar National standard has been developed by Soil and Air Quality Standards Technical Committee (TCE2). In accordance with ZBS general procedures, this draft standard is presented to the public in order to receive any technical and editorial comment concerns.

This draft Zanzibar National standard is identical to Tanzania Standard, TZS 983: 2019, Air quality — Vehicular exhaust emissions limits.

### **Technical Committee Representatives**

This Draft Zanzibar National Standard was prepared by Soil and Air Quality Standards Technical Committee which consist of representatives from the following organizations:

State University of Zanzibar (SUZA)  
Zanzibar Milling Corporation (ZMCL)  
Zanzibar Urban Municipal Council (ZUMC)  
Zanzibar Environmental Management Authority (ZEMA)  
Zanzibar Agriculture Research Institute (ZARI)  
Department of Environment (DoE)  
Tanzania Meteorological Authority (TMA)  
Department of Occupational Health and Safety (DOSH)  
Ministry of Health (MoH)  
Zanzibar Bureau of Standards-Secretariat

Zanzibar Bureau of Standard (ZBS)  
P.O.Box 1136  
Zanzibar  
Tel: +255 24 2232225  
Fax: +255 24 2232225  
E-mail: [info@zbs.go.tz](mailto:info@zbs.go.tz)  
Web: [www.zbs.go.tz](http://www.zbs.go.tz)



## TANZANIA STANDARD

---

Air quality — Vehicular exhaust emissions limits

DRAFT FOR STAKEHOLDERS COMMENT

---

**TANZANIA BUREAU OF STANDARDS**

---

## **TZS 983: 2019**

This Tanzania Standard was published under the authority of the Board of Directors of Tanzania Bureau of Standards on 2019-06-15.

Tanzania Bureau of Standards (TBS) is the statutory national standards body for Tanzania established under the Standards Act No. 3 of 1975, which was repealed and replaced by the Standards Act No. 2 of 2009.

The Environmental Management Divisional Standards Committee, under whose supervision this Tanzania Standard was prepared, consists of representatives from the following organizations:

Ministry of Industry and Trade  
\*National Environmental Management Council (NEMC)  
Tropical Pesticides Research Institute (TPRI)  
Sokoine University of Agriculture (SUA)  
\*Vice President's Office-Division of Environment (VPO-DoE)  
Tanzania Electric Supply Company Limited (TANESCO)  
\*Ardhi University  
Tanzania Portland Cement Company (TPCC)  
Cleaner Production Centre of Tanzania (CPCT)

The organizations marked with an asterisk (\*) in the above list, together with the following were directly represented on the Technical Committee entrusted with the preparation of this Tanzania Standard:

Tanzania Industrial Research and Development Organization (TIRDO)  
Tanga Cement Company  
Occupational Safety and Health Authority (OSHA)  
Tanzania Commission for Science and Technology (COSTECH)

Tanzania Bureau of Standards  
P o Box 9524  
Dar es Salaam  
Tel: +255 (22) 2450206/2450949/2450298  
Fax: +255 22 2450298  
E-mail: info@tbs.go.tz

**ISBN: 9976-64-849-9**

## Air quality — Vehicular exhaust emissions limits

### 0 Foreword

Emissions from motor vehicles are significant source of air pollution. The problem of vehicular emissions is compounded by the fact that the pollutants are emitted at ground level which is in close proximity to the breathing zones of people.

Vehicular emission contributes significantly to ambient concentrations of pollutants such as carbon monoxide, oxides of nitrogen, sulphur dioxide, and particulates. At sufficiently high concentrations, these pollutants can cause health problems as well as degrading the environment and quality of life.

In particular, diesel-driven vehicles emit particulates that are very fine and a large proportion of them are less than 2.5 microns in size. These fine particulates are generally known as PM<sub>2.5</sub> and they can penetrate the deeper recesses of human lungs and cause respiratory problems.

With increasingly growing number of vehicles, it is therefore imperative to have a stringent programme to control smoke emission from vehicles to ensure that ambient air quality remains healthy.

This Tanzania Standard together with other initiatives such as Global Fuel Efficiency Initiative (GFEI) that include the use of cleaner fuel, such as unleaded petrol and diesel with low sulphur content of below 0.05 % could enable achieving the goal of having healthy ambient air quality.

In the preparation of this Tanzania Standard, considerable assistance was derived from the following sources

EU Directive 96/69/EC exhaust emissions limits for passenger cars and light commercial vehicles

EU Directive 91/542/EEC Stage II for Heavy Duty Vehicles (Category N<sub>2</sub>)

EU Directive 97/24/EC emission limits for motorcycles and scooters

This second edition cancels and replaces the first edition (TZS 983: 2007) which has been technically revised.

In reporting the results of a test or analysis made in accordance to this Tanzania Standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 (see clause 2)

### 1 Scope

This Tanzania Standard gives permissible limits of some common pollutants found in exhaust emissions of motor vehicles, namely carbon monoxide, suspended particulate matters (SPM), oxides of nitrogen, and hydrocarbons. The standard covers all types of vehicles namely, passenger cars, light commercial vehicles, heavy-duty vehicles, and two and four strokes motorcycles and scooters.

## **2 Normative references**

For the purpose of this Tanzania Standard the following references shall apply:

TZS 4: 2009, *Rounding off numerical values*

TZS 672: 2001, *Unleaded petrol (gasoline) for motor vehicles — Specification*

TZS 674: 2001, *Automotive diesel fuel — Specification*

TZS 698: 2003, *Road vehicles — Code of practice for inspection and testing of used motor vehicles for road worthiness*

TZS 836-1: 2004, *Air Quality — General Considerations — Vocabulary*

TZS 836-2: 2004, *Air Quality — General Considerations — Particle size fraction definitions for health-related sampling*

TZS 985: 2019, *Road vehicles — Measurement methods for exhaust gas emissions during inspection or maintenance*

ISO 3930/OIML (R 99<sup>1</sup>), *Instruments for measuring vehicle exhaust emissions*

## **3 Terms and definitions**

For the purpose of this Tanzania Standard, the following definitions shall apply:

### **3.1 Ambient air**

An outdoor air to which people, plants, animals or material may be exposed.

### **3.2 Suspended particulate matter**

Airborne particles of 10 microns or less in diameter.

NOTE: This is also the inhalable fraction (PM 10)

### **3.3 Black smoke**

Visible (black) aerosol usually resulting from combustion.

### **3.4 Emission limit**

Highest permissible quantity of pollutants released into the air from a pollution source, expressed as the concentration of pollutants in relation to one unit of production or to the degree of air pollution caused by these sources (e.g., dark color of smoke).

### **3.5 Immission**

Transfer of pollutants from the atmosphere to a receptor

#### 4 Vehicular exhaust emission limits

The vehicular exhaust emission limits for categories of vehicles stipulated in this Tanzania Standards shall be as shown in table 1 to table 5.

**Table 1 — Emission limits for passenger cars (>2.5 tonnes)**

Compound	Limit (g/km)	
	Diesel	Petrol (Gasoline)
Carbon Monoxide (CO)	2.72	2.72
Hydrocarbons (HC)	–	0.20
Hydrocarbons and Nitrogen Oxides (HC+NO <sub>x</sub> )	0.97	0.97
NO <sub>x</sub>	0.50	0.15
Particulate Matters (PM)	0.14	-

NOTE: Limits shall be determined by methods conforming to TZS 985 and/or Flue gas analyzers conforming of TZS 986.

**Table 2 — Emission limits for light commercial vehicles, g/km**

Compound	Limit (g/km)	
	Diesel	Petrol (Gasoline)
<b>Category 1 (&lt;1305 kg)</b>		
CO	2.72	2.72
HC	–	0.20
HC+NO <sub>x</sub>	0.97	0.50
NO <sub>x</sub>	0.50	0.15
PM	0.14	-
<b>Category 2 (1305-1760 kg)</b>		
CO	5.17	5.17
HC	-	0.40
HC+NO <sub>x</sub>	1.40	1.40
NO <sub>x</sub>	0.65	0.30
PM	0.19	-

NOTE: Limits shall be determined by methods conforming to TZS 985 and/or flue gas analyzers conforming of TZS 986.

**Table 3 — Emission limits for medium commercial vehicles, (>1760 kg)**

Compound	Limit (g/km)	
	Diesel	Petrol (Gasoline)
CO	6.90	6.90
HC+NO <sub>x</sub>	1.70	1.70
NO <sub>x</sub>	0.78	0.78
PM	0.25	-

NOTE: Limits shall be determined by methods conforming to TZS 985 and/or flue gas analyzers conforming of TZS 986.

**Table 4 — Emission limits for Heavy Duty (HD) diesel engines**

Pollutant	Limit
CO	4.5 g/kWh
NOx	1.1 g/kWh
HC	8.0 g/kWh
PM	0.612 g/kWh
Smoke	0.15 g/m
NOTE: Limits shall be determined by methods conforming to TZS 985 and/or flue gas analyzers conforming of TZS 986.	

**Table 5 — Exhaust emission limits for 3 and 2-wheel vehicles**

Emission limits for 3 — Wheel gasoline vehicles	
Pollutant	Limit (g/km)
CO	4.0
HC+NOx	2.0
Emission limits for 2 — Wheel gasoline vehicles	
Pollutant	Limit (g/km)
CO	2.00
HC+NOx	3.60
NOTE: Limits shall be determined by methods conforming to TZS 985 and/or flue gas analyzers conforming of TZS 985.	

DRAFT FOR STAKEHOLDERS COMMENT



## **Annex A (informative)**

### **Vehicle emission test types and equipment**

#### **A.1 Acceleration Simulation Mode (ASM-2 test)**

An emissions test for vehicles Model Year 1995 and older that uses a dynamometer (a set of rollers on which a test vehicle's tires rest) which applies an increasing load or resistance to the drive train of a vehicle, thereby simulating actual tailpipe emissions of a vehicle as it is moving and accelerating. The ASM-2 is comprised of two phases:

PHASE A: The 50/15 mode-in which the vehicle is tested on the dynamometer simulating the use of 50 % of the vehicle's available horsepower at a constant speed of 15 mph

PHASE B: The 25/25 mode-in which the vehicle is tested on the dynamometer simulating the use of 25 % of the vehicle's available horsepower at a constant speed of 25 mph

#### **A.2 On-Board Diagnostics (OBD)**

Computer system installed in a vehicle by the manufacturer which monitors the performance of the emission control equipment, fuel metering system, and ignition system to detect malfunction or deterioration in performance that would be expected to cause the vehicle not to meet emissions standards.

#### **A.3 Two Speed Idle (TSI)**

A tailpipe test that tests vehicles for carbon dioxide (CO<sub>2</sub>) in addition to hydrocarbons (HC) and carbon monoxide (CO) and is comprised of two phases: (1) high speed test [2200-2800 Revolution Per Minutes (RPMs)] for the first phase of the emissions test; then, (2) tested at idle (350-1200 RPMs.)

DRAFT FOR STAKEHOLDERS COMMENT