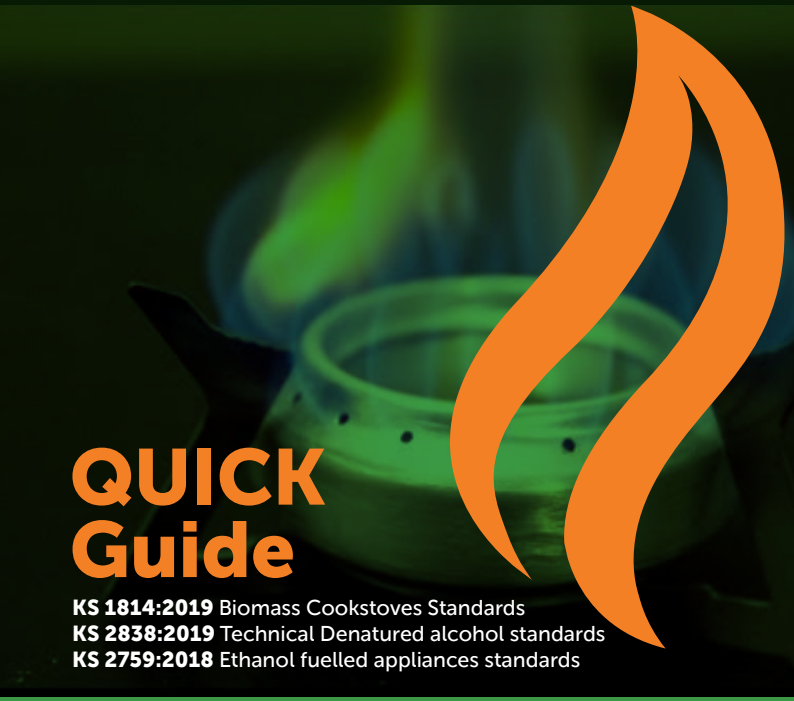

QUICK Guide

KS 1814:2019 Biomass Cookstoves Standards
KS 2838:2019 Technical Denatured alcohol standards
KS 2759:2018 Ethanol fuelled appliances standards

CCAK
CLEAN COOKING
ASSOCIATION OF KENYA

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Introduction

This Quick Guide Booklet is compiled by The Clean Cooking Association of Kenya (CCAK), which is the sector champion, convener and advocator for the clean cooking sector in Kenya. CCAK works in collaboration with Kenya Bureau of Standards (KEBS), Kenya Industrial Research Development Institute (KIRDI), ministerial departments, private sector, relevant NGOs and the sector members to ensure access and adoption of the clean cooking stoves and fuels in Kenya. This Quick Guide Booklet comprises of three approved sector standards: Biomass Stoves – Performance requirements, Denatured Technical Alcohol for use as cooking and appliance fuel – Specifications and Ethanol fueled cooking appliances — Specification. The booklet guide is not and should not be used as a replacement of the Kenya Standards but as a general information tool to understand the Standards as Published. Users are encouraged to have a copy of the Kenya Standards when using this Booklet Guide.

Acknowledgment

Clean Cooking Association of Kenya (CCAK) in collaboration with SNV Netherlands Development Organisation, GROOTS Kenya and sector stakeholders are working towards enhancing an enabling environment for the thriving of clean cooking fuel businesses and fuel adoptions through advocacy, institutional strengthening, evidence creation and dissemination under the Voice for Change Partnership Project (V4CP Project) funded by the Dutch Ministry of Foreign Affairs.
The Kenya Bureau of Standards (KEBS) Technical Committees under the guidance of the Standards projects Committee who were involved in the formulation of these standard documents are hereby acknowledged and recognized for the efforts put in place to ensure that the clean cooking sector is streamlined and protected against the harmful operations.

1.

Quick Guide
KS 1814:2019

Biomass Stoves:
Performance requirements

Standard Summary

The standard specifies the performance requirements for biomass stoves.

Its objectively purposed to:

a. Control the quality of biomass stoves being marketed in the country.
b. Increase the use as energy saving biomass stoves.
c. Conserve forests and protect the environment through sustainable use.
d. Improve the living standards and health of stove users.

Standard Content

1. What is KS 1814?
2. Who does it apply to?
3. Why uses the standard?
4. Detailed composition of the standard
5. Additional reading/reference

What is KS1814:2019?

- It is Government standard, under Kenya Bureau of Standards (KEBS)
- The Standard illustrates the specific requirements for biomass stoves. It's a guidance to both the domestic and institutional stoves that utilize solid biomass fuels derived from organic products of agriculture and forest systems.
- The standard's guidelines have to be taken into action by all the sector players.
- Compliance is key and is about what we must do.

Who does it apply to?

- The KS 1814:2019 applies to all sector players who distribute, produce or handle both domestic and institutional biomass stoves.
- The KS 1814:2019 is a mandatory standard and has to be observed by all biomass stoves sector players.

Why use the standard?

KS 1814:2019 provides for the sector performance requirements for biomass stoves.

Detailed Composition of the standard?

The KS 1814:2019 has ten sections, in addition to the standard annexures, namely;

- **a.** Scope
- **b.** Normative reference
- **c.** Terms and definitions
- **d.** Symbols and abbreviations
- **e.** Durability requirements
- **f.** Safety requirements
- **g.** Thermal performance requirements
- **h.** Emissions
- **i.** Workmanship and finish
- **j.** Marking, packaging, storage and usage

a) Standard scope?

The standard specifies on the performance requirements for both domestic and institutional stoves that utilize solid biomass fuels derived from organic products of agriculture and forest systems.

b) Standard normative reference.

KS 1814:2019 has referenced KS ISO 19867-1, Clean Cookstoves and clean cooking solutions – Harmonized laboratory test protocols – Part 1: Standard test sequence for emissions and performance, safety and durability

c) Standard Terms and definitions.

This section explains the definition to various biomass cookstoves related terms. The terms and definitions in the KS ISO 19867-1 have been approved to apply to the standard. These are captured in pages 1,2,3, and 4 of the KS 1814:2019.

d) Standard Symbols and abbreviations.

Symbols used in the standard document have been defined under this section. These should apply for the purpose of the KS1814:2019.

e) Durability requirements

KS 1814:2019 has specified requirements for the cladding material thickness and protection against corrosion. Ceramic liner material and firing temperatures have as well been outlined in this section.

Additionally, specifications and requirements for the pot rests, insulation, water jackets, working life and the prohibition of use of hazardous materials as referenced from the EMCA Act has been explained under this section

f) Safety requirements

Safety of the biomass stove has been captured under this section in various perspectives. The following components of safety have been well specified: Sharp edges and points, cookstoves tipping, containment of fuel, obstructions near cooking surface, surface temperature, heat transmission to surroundings, chimney and chimney building, flames surrounding the cook pot and flames/ fuel exiting fuel chamber.

g) Thermal performance requirements

A reference has been made under this section to the test methodology under the KS ISO 19867-1. The section specifies thermal efficiency for charcoal ceramic, wood ceramic cookstoves and for both the firewood and charcoal metallic stoves.
The standard specifies the minimum thermal efficiency for the forced draft stoves which shall not be less than 45% for domestic biomass stoves and 45 % for institutional biomass stoves.

Minimum cooking power for charcoal and firewood stove has been specified in accordance with KS ISO 19867-1

h) Emissions

The standard captures emission components under page 7-8. Test methodology specified to be in accordance with KS ISO 19867-1. Maximum emissions for the PM2.5 and CO have been specified in Table 3-Stove emission requirements. (Ceramic firewood, Ceramic charcoal and charcoal, firewood others). This as well captured the gasifier stoves emissions specifications are explained.
All institutional stoves shall be fitted with chimney and to focus on fugitive emissions with CO and PM2.5. Emission.

i) Workmanship and finish

Defects on cookstoves and protection against corrosion are explained in this section. This shall ensure the stoves are in good appearance, durability, performance and safety aspects during use.

j) Marking, packaging, storage and usage

This section elaborates on the information to be displayed on marking the stoves both portable and non-portable. They should be legibly and indelibly marked in a prominent position. For the packaging, this should comply with the user requirements. Refer to page 8 for required information for marking and packaging.

Standard Annexures

The standard is referenced a normative annex and an informative annex. These explains the following:

- **Determination of thermal conductivity of ceramic liner.**
  This normative section explains the general requirements for determining thermal conductivity of ceramic liner, procedure, transient hot wire for comparison and calculations.

- **Default values for PM2.5 and CO**
  This captures the Default emission factors, rates, equivalent concentrations and % homes meeting specified criteria for PM2.5 and for CO.

2.

Quick Guide
KS 2838:2019

Denatured Technical Alcohol for use as cooking and appliance fuel: Specifications

Standard's Summary

The standard elaborates on the usage, composition, identification, test methods and marking requirements for the technical alcohol.

Standard's Content

1. What is KS 2838?
2. Who does it apply to?
3. Why use the standard?
4. Detailed composition of the standard
5. Additional reading/reference

What is KS2838:2019?

- It is Government standard, under Kenya Bureau of Standards (KEBS)
- The Standard illustrates the uses, composition, identification, test methods and marking requirements for technical alcohol which offers affordable clean cooking fuel to low income households replacing the use of paraffin and dirty fuels for lighting and cooking.
- The standard's guidelines have to be taken into action by all the sector players.
- Compliance is key and is about what we must do.

Who does it apply to?

- The KS 2838 applies to all sector players who distribute, produce or handle the technical denatured alcohol.
- The activities have to be in accordance with the current government of Kenya's Customs and Excise Regulations, with an exception for the oral medicine use.

Why use the standard?

KS 2838 provides for the sector requirements for a denatured technical alcohol (characteristics, requirement and the test methods) to ascertain its safety and suitability for household usage for cooking and lighting.

Detailed Composition of the standard?

The KS 2838:2019 has eight sections, namely;

a. Scope
b. Normative reference
c. Terms and definitions
d. Requirements
e. Workmanship
f. Sampling and size sample
g. Packaging
h. Labelling

a) Standard scope?

In the scope, the standard specifies on the usage of the technical denatured alcohol as for cooking and for appliance fuel. The usage must be in accordance with the current Kenya Customs and Excise Regulations with an exception for oral medical use.

b) Standard normative reference.

Three additional standards have been referenced for use with the KS 2838.

c) Standard Terms and definitions.

The standards document has provided definitions for the terms denaturant and the denatured technical alcohol. A denaturant is defined as a completely miscible chemical substance added to alcohol to render it unpalatable and unfit for human consumption, whereas denatured technical alcohol is made by the addition of denaturants.

d) Standard Requirements.

This section of the standard illustrates the necessary composition of the denatured technical alcohol for use as cooking and for appliance fuel. For satisfaction of use, the following has to be tested: Appearance, Density, Alcohol content, pH, colored dye, residue on evaporation, miscibility, water content, acidity, aldehydes and ketones. These characteristics have to be tested in accordance to the methods specified in the standards document in Table1 – Requirements for technical alcohol for use as cooking and appliance fuel.

e) Workmanship, Sampling, Packaging and Labelling

KS 2838 has additional context on Workmanship which protects the denatured technical alcohol from any adulteration or contaminant that may render it unsafe for the specified usage. The section on sampling and sample size is referenced for Annex E of the standard's document KS 2838.

Packaging for the denatured technical alcohol is elaborated to be in safe and suitable containers protected from any foreign substances or odours and any contamination to the product should be protected.

The standard specifies the label requirements as per the KS EAS 38. These shall comprise of the name of the product, name and address of the manufacturer, net contents, names of the denaturant, batch/lot number, minimum ethyl alcohol content, year of manufacture, country of origin and the words "highly flammable" or "highly poisonous"

Standard Annexures

The standard is referenced to five normative annexures. These includes the test for:

- **Determination of residue on evaporation**
  The evaporation content should not exceed 0.01% by volume mass of the 100ml of denatured alcohol tested.

- **Miscibility with water**
  The denatured technical alcohol should be miscible when mixed with distilled water.

- **Detection of alkalinity or determination of acidity**
  The test explains the content of the reagent to be used.
  The test results as per the Annex C, shall not have an acidity percentage by mass exceeding 0.010.

- **Determination of aldehydes and ketones**
  The test explains the content of the reagent to be used.
  The test results as per the Annex D, shall not have an Aldehydes and ketones percentage by mass exceeding 0.2.


Packaging for the denatured technical alcohol is elaborated to be in safe and suitable containers protected from any foreign substances or odours and any contamination to the product should be protected.

3.

Quick Guide
KS 2759:2018

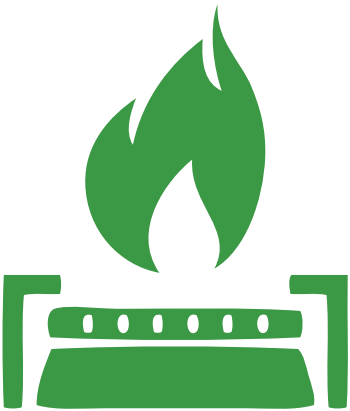
Ethanol fueled cooking appliances: Specification

Standard's Summary

The Standard expounds on the requirements for ethanol fueled appliances for cooking and heat generation in households. This however does not cover the requirements for lamps.

Standard's Content

1. What is KS 2759?
2. Who does it apply to?
3. Why use the standard?
4. Detailed composition of the standard
5. Additional reading/reference



What is KS 2759:2018?

- It is Government standard, under Kenya Bureau of Standards (KEBS)
- The standards illustrate the requirements for ethanol fueled appliances for cooking and heat generation in households with exception for the requirements for lamps.
- The standard's guidelines have to be taken into action by all the sector players.
- Compliance is key and is about what we must do.

Who does it apply to?

- The KS 2759 applies to all sector players who distribute, produce or handle the ethanol fueled appliances.

Why use the standard?

- KS 2759 provides for the sector requirements for ethanol fueled appliances, (materials, construction, performance, finishing, packing, marking,

instructions, warnings, inspection and the test methods) to ascertain its suitability for usage with ethanol fuel for cooking and heating generation in households

Detailed Composition of the standard?

The KS 2759:2018 has eight sections, namely;

a. Scope
b. Normative reference
c. Terms and definitions
d. Requirements
e. Packing, marking, instructions and warnings
f. Inspection and methods of test

a) Standard scope?

In the scope, the standard specifies on the requirements for ethanol fueled appliances for cooking and heat generation, with exception for lamps.

b) Standard normative reference.

Two additional standards have been referenced for use with the KS 2759.

c) Standard Terms and definitions.

The standards document has provided definitions for the terms and definitions which shall apply. These are: “acceptable”, “appliance”, “denatured technical alcohol”, “ethanol gel” and “roll boiling”

d) Standard Requirements.

This section of the standard elaborates the general materials required for the appliances, its construction, performance of the appliance which includes the filling,

ignition, combustion, power output, flame regulator, emissions, rigidity, stability, surface temperature, durability and finish. Additional specific material requirements are also described in the section.

e) Packing, Marking, Instructions and Warning

In this section, KS 2759 specifies on the right packing of the appliances during transportation to prevent damage. Marking, instructions and warning on usage and handling are also provided. These increases visibility, safety and ensure proper use of appliances.

f) Inspections and Method of tests

This section describes the inspection criteria and the test methods. It further elaborates on the test room conditions and preparation of appliances and their inspection. Nine tests have been described in the section which includes: combustion performance test, determination of power output, emission

test, rigidity test, stability test, shutting of the appliance test, surface temperature, durability test and corrosion resistance test for ethanol gel fuel stove.

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QUICK Guide

Biomass Cookstoves Standards
Technical Denatured alcohol standards
Ethanol fuelled appliances standards

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