

TMDA/DMC/MRE/G/011
Rev.#01

TANZANIA MEDICINES AND MEDICAL DEVICES AUTHORITY



**GUIDANCE FOR PRODUCTION OF ALCOHOL-BASED HAND SANITIZERS
UNDER PUBLIC HEALTH EMERGENCY PREPAREDNESS**

April, 2020

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TABLE OF CONTENTS

Acknowledgement.....	3
Foreword.....	4
Introduction.....	5
Glossary of terms.....	6
1. Background.....	7
2. Scope of application.....	7
3. Preparations.....	8
3.1. Materials required (small volume production).....	8
3.2. Final product formula.....	9
3.3. Procedures for preparations.....	10
3.4. Quality control.....	10
4. Labeling information.....	11
5. Production and storage facilities.....	11

Acknowledgement

I wish to take this opportunity to thank all who in one way or another assisted in preparation and review of this guidance document. Special thanks are extended to the following TMDA staff who participated in developing and finalization of this document: Mr. Felchism Apolnary, Ms. Engerasia Mtui, Dr. Elirehema Mfinanga and Mr. Mujtaba Ratansi.

The Authority is truly indebted for their tireless efforts and rapid response in collecting and amassing the information for readers to construe what has been delineated in this guidance document.

We would also like to thank the Office of Compliance in the Center for Drug Evaluation and Research at the Food and Drug Administration, USA and the World Health Organization (WHO) whose documents served as important references in drafting of this guidance. We truly extend our appreciation to these organizations for making their guidelines easily available for adoption and/or adaptation.

Lastly but not the least, the TMDA Management team is acknowledged for its constructive inputs and endorsement of the guidance document.

Amsallah

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Foreword

According to the Tanzania Medicines and Medical Devices Act, Cap 219, manufacturers of antiseptics including alcohol-based hand sanitizers should meet the acceptable standards of quality, safety and efficacy. These standards are set to ensure that the products to be marketed in Tanzania, function as intended particularly in prevention against spread of diseases.

This is the first edition of the guidance for production of alcohol-based hand sanitizers published by TMDA. This guidance document is prepared to assist production of alcohol-hand sanitizers to meet the drastic increased demand of hand sanitizers which is one of the recommended measures to contain further spread of the COVID-19 disease caused by coronavirus (SARS-CoV-2).

The guidance contains minimal requirements for compounding of alcohol-based hand sanitizers. Production of alcohol-based hand sanitizers, particularly by the emerging manufacturers should be in accordance with this guidance which illustrates simple procedures for preparation of hand sanitizers. Adherence to this guidance will ensure that alcohol-based sanitizers meet specifications set for quality, safety and efficacy. These products are targeted to play a major role in prevention against the COVID-19 disease.



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Introduction

Due to the global Coronavirus Disease 2019 (COVID-19) outbreak, the use of hand sanitizers is recommended as one of the precautionary measures to contain further spread of the virus to the community. As a result of this recommendation, the demand of hand sanitizers has increased drastically. In view of the above and in light of the public health emergency preparedness, the Tanzania Medicines and Medical Devices Authority (TMDA) is issuing this guidance for compounding of alcohol-based sanitizer products.

This guidance is being implemented without prior public comment and the document is immediately in effect, however, it remains subject to comment in accordance with the TMDA's Quality Management System.

This guidance describes the needed materials and step by step procedures for formulation as well as control of quality parameters during preparation of alcohol-based hand sanitizers.

The guidance has five (5) sections:-

- Background
- Scope of application
- Preparations
- Labeling information
- Production and storage facilities

Glossary of terms

“Act” means the Tanzania Medicines and Medical Devices Act, Cap 219.

“Active substance” means a biologically or chemically active substance or compound that is intended to be used in the manufacture of a product as an active compound (ingredient).

“Antiseptic” means a product that inactivates, reduces, prevents or arrests growth of microorganisms with the inherent intent to mitigate or prevent disease on the skin or mucous membrane (mouth washes only)

“Authority” means the Tanzania Medicines and Medical Devices, or the acronym “TMDA” established by Section 4 of the Act.

“Hand Sanitizer” means a product that reduces the level of microorganisms present on the hands by significant numbers, e.g. 99.9% or more, or to acceptable levels.

“Manufacturer” means a person or firm that is engaged in the manufacture of hand-sanitizer product(s).

“Rubs” means antiseptic products to be used without water.

“Specifications” means the combination of physical, chemical, biological and microbiological test requirements that determine whether antiseptic or disinfectant product is suitable for the intended use.

1. Background

Currently, there is an ongoing outbreak of respiratory disease caused by a novel coronavirus that was first detected in Wuhan City, Hubei Province, China, and that has now been detected in many locations internationally, including Tanzania. The virus has been named “SARS-CoV-2” and the disease it causes has been named “Coronavirus Disease 2019” (COVID-19). SARS-CoV-2 has demonstrated the ability to spread rapidly, which could lead to significant impacts on healthcare systems and cause community disruption.

The potential public health threat posed by COVID-19 has been reported to be high globally and the disease has now been declared as a pandemic by WHO.

Hand hygiene is an important part of the response to combat the spread of SARS-CoV-2 and consequently the COVID-19 disease in Tanzania. Washing hands often with soap and water at least for 20 seconds is essential, especially after going to the bathroom, before eating, and after coughing, sneezing or blowing one’s nose. If soap and water are not readily available, it is recommended using an alcohol-based hand sanitizer that contains at least 60 percent alcohol.

To assist users, the presence of 60 percent alcohol in the hand sanitizers can be confirmed by the information provided on the product’s label. It is understood that some consumers are currently experiencing difficulties accessing alcohol-based hand sanitizers containing at least 60 percent alcohol. There is also information that some consumers are producing hand sanitizers for personal use; the Authority lacks information on the methods being used to prepare such products and whether they are safe for use on human skin. Furthermore, it is recognized that compounders, relative to untrained consumers, are more familiar with standards and methods for producing these products.

Therefore, because of the high demand, TMDA requests all compounders to prepare the alcohol-based hand sanitizers using the ingredients that are consistent with WHO recommendations.

2. Scope of application

This document will be applied by manufacturers for production of the alcohol-based hand sanitizers for the health emergency preparedness of COVID-19 disease so as to meet the public demands. It should be noted that this guidance should not be used by untrained personnel as it could lead to unnecessary repercussions. The alcohol-based hand sanitizer formulations recommended in the guidance are for preparation up to a maximum volume of 50 litres.

3. Preparations

3.1. Materials required (small volume production)

3.1.1. Ingredients

Reagents for formulation 1:	Reagents for formulation 2:
Ethanol 96%	Isopropyl alcohol 99.8%
Hydrogen peroxide 3%	Hydrogen peroxide 3%
Glycerol 98%	Glycerol 98%
Sterile distilled or boiled cold water	Sterile distilled or boiled cold water

Note:

- a) Glycerol: used as humectant, but other emollients may be used for skin care, provided that they are cheap, widely available and miscible in water and alcohol and do not add to toxicity, or promote allergy.
- b) Hydrogen peroxide: used to inactivate contaminating bacterial spores in the solution and is not an active substance for hand antiseptics.
- c) Any further additive to both formulations should be clearly labelled and be non-toxic in case of accidental ingestion.
- d) A colorant may be added to allow differentiation from other fluids, but should not add to toxicity, promote allergy, or interfere with antimicrobial properties. The addition of perfumes or dyes is not recommended due to risk of allergic reactions.

3.1.2. Equipment

- a) 10-litre glass or plastic bottles with screw-threaded stoppers, or
- b) 50-litre plastic tanks (preferably in polypropylene or high density polyethylene, translucent so as to see the liquid level), or
- c) Stainless steel tanks with a capacity of 80–100 litres (for mixing without overflowing)
- d) Wooden, plastic or metal paddles for mixing
- e) Measuring cylinders and measuring jugs
- f) Plastic or metal funnel
- g) 100 ml plastic bottles with leak-proof tops
- h) 500 ml glass or plastic bottles with screw tops
- i) An alcoholometer: the temperature scale is at the bottom and the ethanol concentration (percentage v/v) at the top

3.2. Final product formula

Examples of formulations that can be used for alcohol-based hand sanitizers are described in the tables 1 and 2 below which include a 10 L batch size preparation of hand-sanitizers that is intended to achieve 80%v/v of Ethanol and 75%v/v of Isopropyl Alcohol at release.

Table 1: Formulation 1 containing Ethanol

Ingredients	Composition (% v/v)	Amounts (mls) e.g. for 10 L preparation
Ethanol 96%	80	8333 ml
Hydrogen peroxide 3%	0.125	417 ml
Glycerol 98%	1.45	145 ml
Sterile distilled or boiled cold water	Up to the mark	Up to 10 L

Table 2: Formulation 2 containing Isopropyl alcohol

Ingredients	Composition (% v/v)	Amounts (mls) e.g. for 10 L preparation
Isopropyl alcohol 99.8%	75	7515 ml
Hydrogen peroxide 3%	0.125	417 ml
Glycerol 98%	1.45	145 ml
Sterile distilled or boiled cold water	Up to the mark	Up to 10 L

Note:

1. *The compounder should not add other active or inactive ingredients. Different or additional ingredients may reduce the safety and effectiveness of the product.*
2. *The compounder pays particular attention to ensure the Ethanol or Isopropyl alcohol active ingredient is correct and the correct amount of the active ingredient is used.*
3. *Fragrances may be added*
4. *The hand sanitizer is prepared under conditions routinely used by your facility to compound similar non-sterile drugs or cosmetics.*
5. *The hand sanitizer is labeled consistent according to the labeling requirement prescribed in section 5 below.*

3.3. Procedures for preparations

- a) The alcohol for the formula to be used is poured into the large bottle or tank up to the graduated mark.
- b) Hydrogen peroxide is added using the measuring cylinder.
- c) Glycerol is added using a measuring cylinder. As glycerol is very viscous and sticks to the wall of the measuring cylinder, it should be rinsed with some sterile distilled or cold boiled water and then emptied into the bottle/tank.
- d) The bottle/tank is then topped up to the final volume mark with sterile distilled or cold boiled water.
- e) The lid or the screw cap is placed on the tank/bottle as soon as possible after preparation, in order to prevent evaporation.
- f) The solution is mixed by shaking gently where appropriate or by using a paddle.
- g) Immediately divide up the solution into its final containers (e.g., 500 or 100 ml plastic bottles), and place the bottles in quarantine for 72 hours before use. This allows time for any spores present in the alcohol or the new bottles to be destroyed.

3.4. Quality control

- a) Pre-production analysis should be made every time an analysis certificate is not available to guarantee the titration of alcohol (i.e. local production). Verify the alcohol concentration with the alcoholmeter and make the necessary adjustments in volume in the preparation formulation to obtain the final recommended concentration.
- b) Post-production analysis is mandatory if either Ethanol or an Isopropyl Alcohol solution is used. Use the alcoholmeter to control the alcohol concentration of the final solution. The acceptable concentration of Ethanol or Isopropyl Alcohol should be between 60 - 95%v/v. Nevertheless, during batch release, the recommended concentration of $75\% \pm 5\%$ for Ethanol and $77\% \pm 5\%$ for Isopropyl Alcohol content in the solution is advisable to compensate loss by evaporation during storage and in-use period.
- c) Unless justified by stability data, a minimum shelf life of 12 months should be assigned to the finished hand sanitizer.

4. Labeling information

Labeling should be in accordance with the TMDA's *Guidelines for Submission of Documentation for Marketing Authorization of Biocidal (Antiseptics and Disinfectants) Products, First Edition, 2015*. These guidelines are available on TMDA's website (www.tmda.go.tz)

In general product labeling should include the following minimum information written clearly in a readable text in English and/or Swahili language:-

- a) Name of the product;
- b) Name and physical address of the producer or the compounding unit;
- c) Date of production and batch number;
- d) Shelf life: 12 months (data should be submitted to support shelf life of more than 12 months);
- e) The following warning statements:-
 - (i) For external use only;
 - (ii) Flammable: Keep away from flame and heat;
 - (iii) Avoid contact with eyes;
 - (iv) Keep out of the reach of children;
- f) Instruction for use: *Apply a palmful of alcohol-based hand sanitizer and cover all surfaces of the hands. Rub hands until dry;*
- g) Composition: *Ethanol or Isopropanol, Glycerol and Hydrogen peroxide;*
- h) Provision of a space for writing a registration number.

5. Production and storage facilities

The following requirements should be considered for the facilities used during the production and storage of alcohol-based hand sanitizers.

- a) Production and storage facilities should ideally be air conditioned or cool rooms. No naked flames or smoking should be permitted in these areas.
- b) The formulations should not be produced in quantities exceeding 50-litres locally or in central pharmacies lacking specialized air conditioning and ventilation units.
- c) Since undiluted ethanol is highly flammable and may ignite at temperatures as low as 10°C, production facilities should directly dilute it to the above-mentioned concentration. The flashpoints of Ethanol 80% (v/v) and of Isopropyl Alcohol 75% (v/v) are 17.5°C and 19°C, respectively.
- d) National safety guidelines and local legal requirements must be adhered to the storage of ingredients and the final product.

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