



**DRAFT TANZANIA STANDARD**

---

**Solid waste: Management of health care waste.**

FOR STAKEHOLDERS' COMMENTS

**TANZANIA BUREAU OF STANDARDS**

---

## **Foreword.**

The waste produced during health-care activities have a higher potential for infection, injury and hazardous in nature than any other type of waste. Inadequate and inappropriate handling of health-care waste may have serious public health consequences and a significant impact on the environment. Sound management of health-care waste is thus a crucial component of environmental health protection

This Tanzanian standard provides a detailed practical guideline on handling of health care wastes.

In the preparation of this Tanzania Standard, assistance was derived from.

*Safe management of wastes from health-care activities, edited by Y. Chartier et al. – 2nd ed. World Health Organization, 2014.*

*National standards and procedures for health care waste management, MoHCDGEC,2017.*

FOR STAKEHOLDERS' COMMENTS

## **1. Scope**

This Tanzania standard describes the management of health care wastes from generation; segregation, storage, transportation, treatment by incineration and autoclaving to final disposal.

This Tanzania standard applies to wastes arising from activities such as medical, dental, veterinary practice, pathology and pharmaceutical laboratories, health care and supported care services, medical emergency services, blood banks, mortuaries, saloons, tattooing and body piercing establishments.

## **2. Normative references**

The following standards contain provisions, which, through reference in this text, constitute provisions of this Tanzania Standard. All standards are subject to revision, and parties to agreements based on this Tanzania Standard are required to investigate the possibility of applying the most recent editions of the standards below:

*TZS 1681:2014(1st Ed)/ EAS 491:2008- Incineration plant for the destruction of hospital waste — Specification*

*TZS 1682:2014(1st Ed)/ EAS 492:2008 - Incineration plant for the destruction of hospital waste — Method of test and calculation for the performance*

*TZS 1683: 2014/ EAS 493: 2008-Incineration plant for destruction of hospital waste —Method for specifying purchasers' requirements*

## **3. Terms and definition**

For the purpose of this Tanzania Standard, and the normative references, unless the context specifically indicates otherwise, the following terms and phrases shall have the meanings respectively ascribed to them by this section.

### **3.1 healthcare facility**

a hospital, a health centers, a dispensary, a clinic, a nursing home, a health post, and other health related facility

### **3.2 health care waste**

waste generated from healthcare facilities, research centers, saloons and veterinary centers; including infectious waste, pathological waste, sharps, pharmaceutical waste, Genotoxic waste, coagulated blood waste and expired medicines, drugs and cosmetics.

### **3.3 infectious waste**

any waste that contain pathogen in sufficient quantity to pose a serious threat to public health, such as cultures from laboratories, waste from surgeries and autopsies on patients with infectious diseases, waste from patients in isolation wards or undergoing hemodialysis and waste associated with infected animals

### **3.4 non-infectious waste**

Waste of similar in nature to domestic and office waste like kitchen waste, food remains, office papers and packaging materials and any other items that can be scavenged

### **3.5 pharmaceutical waste**

expired, unused, spilt and contaminated pharmaceutical products, prescribed and proprietary drugs, vaccines and sera that are no longer required, and, due to their chemical or biological nature, need to be carefully disposed of

### **3.6 saloon**

includes a barber shop, hair dressing saloon, beauty salon, pedicure, massage center and any other premises used for the related purposes.

### **3.7 sanitary landfill**

An engineered method of disposing of solid waste on land in a manner that protects the environment; by spreading the waste in thin layers, compacting it to the smallest practical volume, covering it with soil by the end of each working day, constructing barriers to infiltration, and evacuating the gases produced

### **3.8 sharps**

objects or devices having sharp points or protuberances or cutting edges capable of piercing the skin or having potential to cause harm.

### **3.9 waste disposal**

Intentional burial, deposit, discharge, dumping, placing or release of any waste material into or on any air, land or water. Disposal is undertaken without the intention of retrieval

### **3.10 waste treatment**

any method, technique or process for altering the biological, chemical or physical characteristics of waste to reduce the hazards it presents and facilitate, or reduce the costs of, disposal. The basic treatment objectives include volume reduction, disinfection, neutralization or other change of composition to reduce hazards

## **4. Requirements.**

The health care waste that are generated within a health care facility shall always follow an appropriate and well-identified stream from their point of generation until their final disposal. This stream is composed of

several steps that include: generation, segregation collection and on-site transportation, on-site storage, off-site transportation (optional), treatment and disposal of the health care waste.

step	location	healthcare waste stream	key points
0		waste minimization	<i>purchasing policy; stock management; recycling of certain types of waste...</i>
1	in medical unit	generation	
2		segregation at source	<i>one of the most important steps to reduce risks and amount of hazardous waste</i>
3	in health facility	collection + on-site transport	<i>protective equipment; sealed containers; specific easy to wash trolleys</i>
4		on-site storage	<i>lockable easy to clean storage room; limited storage time of 24-48 hours</i>
5		on-site treatment / disposal	<i>adequate storage room; limited time of max 48 hours</i>
6	outside of health facility	off-site transport	<i>appropriate vehicle and consignment note; HCF is informed about final destination</i>
7		off-site treatment / disposal	<i>appropriate vehicle and consignment note to ensure...</i>

#### 4.1. Generation of health care waste.

The quantity of health care waste generated shall always be minimized and precautions must be taken during their handling. There shall be sustainable stock purchasing policy, stock management policy, and recycling of certain types of wastes.

#### 4.2. Segregation of health care waste

- i. Waste segregation shall always take place at the source, that is at the ward bedside, Operation Theatre, Medical Analysis Laboratory, or any other room or ward in the hospital where the waste is generated and by the staff who generate it.
- ii. Waste segregation shall be safe and guaranty the absence of infectious health care waste in the domestic waste flow.
- iii. Waste segregation shall be regularly monitored to ensure that the procederes are respected.
- iv. Standard color coded waste bins and liners shall be used for waste segregation.
- v. Standard colors recommended are Red for highly infectious wastes, Yellow for infectious wastes, Black or Blue for non-infectious wastes as shown in Annex IV.
- vi. Store each segregated waste in the receptacle corresponding to its coded color.
- vii. Color coded waste bins with appropriate bin liners, needle cutters, sharps containers, or other waste storage container shall be placed within reach of staff, at most within 1m at every functional unit.

- viii. Standard safety boxes shall be provided and used for storage of sharps waste.
- ix. Safety box shall not be filled beyond 75% of its capacity.
- x. Health care waste shall not be sorted after it has been placed in the bin or container.
- xi. Health care waste shall not to be mixed with any other type of waste
- xii. In case mixed waste shall be treated according to the nature of hazardous waste (e.g. infectious waste) that it contains.
- xiii. Instructions shall be displayed against each waste bins on proper waste storage in every functional unit
- xiv. labels shall be provided on each waste bin to direct users on proper waste storage.

#### **4.3.Storage of health care waste**

- i. All waste collected in health care facility shall be stored in storage bay prior to disposal.
- ii. Storage bay shall be located within the health care facility at a distance accessible by all departments/ units.
- iii. Storage bay shall not cause or create nuisance in a work environment.
- iv. Pathways to the bay shall be paved to ease transportation
- v. The site of the storage bay shall not be water logged
- vi. Storage bay shall be located close to the treatment or disposal site
- vii. Appropriate color coded containers shall be used to store waste until it is transported for final treatment or disposal on or off-site.
- viii. Each category of waste shall be stored separately.
- ix. Bags and containers shall be leak proof.
- x. Size of the storage bay shall depend on amount of waste generated in health care facility
- xi. Storage bay shall have impervious floor and walls.
- xii. Storage bay shall have adequate ventilation
- xiii. Walls of the storage bay shall be plastered and painted with wash and wear light colored paint.
- xiv. Storage bay shall have a lockable door
- xv. The structure shall be provided with different rooms for storage of highly infectious waste, Infectious waste, sharps, recyclable materials, and pathological waste
- xvi. The storage bay shall be fenced
- xvii. Storage bay shall have a durable roofing material
- xviii. Storage bay shall have proper drainage system
- xix. Radioactive Waste storage shall follow atomic energy regulations
- xx. Storage bays shall maintain frequency of removal depending on the volume and nature of the waste
- xxi. Cleaning equipment, PPEs, waste bags and containers shall be located conveniently close to the storage area.

- xxii. A separate storage room/compartment for different categories of waste shall be provided.
- xxiii. Pathological waste shall not be stored and must be disposed of immediately.

#### **4.4. Transportation of healthcare waste.**

##### **4.4.1. On-site transportation.**

- i. Different types of waste shall be transported separately in designated trolleys or wheelbarrows.
- ii. Trolleys and wheeled bins shall be cleaned and disinfected by the recommended disinfectants at the end of each working day.
- iii. Consignment forms for hazardous waste shall be correctly and thoroughly filled in and safely kept.
- iv. The pathways for transportation shall be paved to facilitate easy transportation.

##### **4.4.2. Off-site transportation**

Vehicles used to transport healthcare wastes shall fulfill the following design criteria

- i. The vehicle shall have separate compartments for empty plastic bags, protective clothing, cleaning equipment, tools, and disinfectant, and shall have special kits for spill management.
- ii. The hazard sign shall be displayed on the vehicle or container
- iii. The vehicle shall be marked with the name and address of the waste carrier company and an emergency telephone number.
- iv. Be fitted with loading and offloading equipment.
- v. Use refrigerated containers/vehicles if the storage time exceeds the recommended limits or if transportation times are long.
- vi. The vehicle shall be licensed by relevant authority to carry health care wastes.

#### **4.5. Treatment of health care waste.**

- i. Health care waste shall be treated before disposal.
- ii. Onsite treatment shall be done within the health care facility.
- iii. Offsite treatment of health care wastes shall be done at registered treatment facility.
- iv. Health care facility management shall evaluate safety, effectiveness and environmental soundness of the treatment methods.
- v. Appropriate PPE shall be used when operating a treatment facility.
- vi. The treatment facility shall be operated by a competent personnel.

##### **4.5.1. Non incineration technology (Autoclaving).**

- i. When operating a gravity flow autoclave, health care waste shall be subjected to a temperature, pressure and time as specified by the manufacturer.

- ii. The entire load of health care waste must be autoclaved again if the standards are not met.
- iii. Each autoclave shall have graphic or computer recording devices which will automatically and continuously monitor & record dates, time of day, load identification number and operating parameters throughout the entire length of the autoclave cycle
- iv. Validation test (Biological test) shall be conducted after autoclaving
- v. Check autoclave if clean, gasket intact and previous shift has not reported any problems
- vi. Scheduled routine test shall be performed.
- vii. Weigh and record waste for processing shall be conducted.
- viii. Tag each waste bag with autoclave tape, with the date of processing written on it
- ix. Place waste in autoclave, along with chemical integrator, self-contained biological indicator,
- x. When waste is cool enough to handle, remove from autoclave and place in the appropriate storage area for disposal.
- xi. Record treatment parameters, test results and any other relevant data.

#### **4.5.2. Incineration technology.**

- i. An incinerator shall have two chambers: Primary and secondary chambers.
- ii. It shall be capable of destructing waste into ashes by 95%.
- iii. Fuel burners shall be used.
- iv. Emission shall conform to national and international standards
- v. Design, selection and efficiency of incinerators shall conform to TZS1681, TZS 1682, and TZS 1683 respectively.

### **4.6. Disposal of health care wastes.**

#### **4.6.1. Placenta pit**

- i. Shall be located within the health care facility compound.
- ii. Shall not be located in water logged area.
- iii. Shall be fenced.
- iv. Pathways to the placenta pit shall be paved for accessibility.
- v. Provide running water nearby the placenta pit and a soap for hand washing.

#### **4.6.2. Ash Pit**

- i. An appropriate site for the pit shall be selected on site or offsite.
- ii. The site shall be as close to the incinerator as possible, in a secure, non-public area that cannot be accessed by animals.
- iii. The pit shall be reinforced to prevent collapse and paved to prevent seepage.
- iv. When the pit is full, it shall be covered with soil by 50cm from the top and sealed permanently.
- v. The ash shall be cool enough to be handled safely.



## ANNEX I

### Specifications for PPEs.

Item.	Description and specification
<b>Utility hand gloves</b>	<p><b>Glove design:</b> Hand-specific, designed for dexterity and comfort in addition to protection. Texture in palm area shall provide grip and cleaning sensation to enable safety during janitorial activities.</p> <p><b>Cuff design:</b> Straight cuff for maximum protection from contaminated liquids. Cuff shall reach at least 75mm from the upper arm surface when the elbow is flexed at 90°.</p> <p>Palm thickness Minimum of 0.5 mm/20 mil. Provide good resistance to snags, puncture, abrasion and cuts</p> <p><b>Sizes</b> Up to 7.5”(19.00cm - x-small 7.5 – 8”(20.25cm) – small 8 – 8.5 (21.50cm) – medium 8.5 – 9” (23.00cm) – large Over 9.0” (23.00cm) – x-large</p>
<b>Safety gloves (Puncture and cut protection gloves)</b>	<p>Protect against threats from nails, wire, glass fragments, metal shards, wood splinters, and all types of needles.</p> <p>Recommended for incinerator and waste bay operators</p>
<b>Heavy duty Safety boot</b>	<p><b>Hide:</b> Long-lasting, heat-resistant hard-wearing, lightweight, flexible, rust and corrosion resist Offers heel protection, comfort with odor- reducing, moisture-wicking properties.</p> <p><b>Design specifications:</b> Toe impact protection: Toe impact energy up to 90joules. Siding: Sole construction. Sole puncture protection: Minimum protection of 1,200 newtons. Slip-resistant sole: Deep tread with coefficient of friction &gt;0.</p>
<b>Gum boots</b>	<p>Molded polyvinyl or other plastic to ensure that it is waterproof, Resistant to blood, fluids and easy to disinfect for maximum protection and hygiene.</p> <p>Anti-skid tread prevents slipping.</p> <p>Supposed to be used during health care waste collection and transportation.</p>
<b>Apron.</b>	<p>Made of 20 mil virgin vinyl with electronically heat sealed grommets.</p> <p>Extra-long nylon string ties included to secure apron in a variety of ways.</p> <p>Waterproof and chemical-proof standard.</p>
<b>Safety goggles.</b>	<p><b>Design:</b> Glasses with side protection or goggle.</p>

	<p><b>Lens:</b> Impact- and heat-resistant, molded, and 2.2mm thick with ant-fog coating.</p> <p><b>Heat resistant:</b> Self-extinguishing foam and heat-resistant materials.</p> <p><b>Ventilation:</b> At minimum, four indirect ventilation slots.</p> <p><b>Fit:</b> Wide contact between goggle and face.</p> <p><b>Visibility:</b> Unobstructed peripheral vision.</p> <p><b>Strap:</b> Adjustable support strap</p>
<b>masks</b>	<p>Shall have exhalation valve that reduces heat and humidity, providing a cooler, more comfortable fit while minimizing fogging on eyewear.</p> <p>The RPFN952 has a low profile design with dual fixed straps, adjustable metal nose band, and smooth inner lining, ensuring a secure seal and comfortable fit. Folds flat for easy storage.</p> <p>Sizes: One size</p>
<b>Head gear</b>	<p>Hard enough to protect the operators head from mechanical injuries and any possible splash from liquid waste and chemicals</p>

## ANNEX II

### Specifications for vehicles for transporting healthcare wastes.

ITEM	DESCRIPTION
<b>An example of a vehicle for transportation of sharps</b>	<ul style="list-style-type: none"> <li>• Body capacity: 2.0- 4.5ton</li> <li>• Anti-rust paint</li> <li>• Easy to clean</li> <li>• Incorporate weighing device Anti-corrosion Steel</li> </ul>
<b>An example of a vehicle for transportation of Bio-hazardous waste</b>	<ul style="list-style-type: none"> <li>• Capacity 1.5- 2tons</li> <li>• To carry radioactive waste full packed on special containers /bins</li> <li>• Anti-rust paint</li> <li>• Easy to clean</li> <li>• Incorporate weighing device</li> <li>• Anti-corrosion Steel</li> </ul>
<b>An example of a vehicle for transportation of normal waste (Non -hazardous waste)</b>	<ul style="list-style-type: none"> <li>• Body capacity: 4.5-20(m3)</li> <li>• Anti-rust paint</li> <li>• garbage compactor trucks with a range of loading capacities</li> <li>• Anti-corrosion Steel or High-tensile Steel</li> </ul>
<b>An example of a vehicle for transportation of liquid waste</b>	<ul style="list-style-type: none"> <li>• Suction pumps with capacity of 3-5hp.</li> <li>• Suction horse with non- collapsible mechanism.</li> <li>• Anti-corrosion Steel.</li> </ul>

## ANNEX III

## Minimum Specifications for Waste Bins and Receptacles

ITEM	DESCRIPTION AND SPECIFICATION
<b>Medium sized waste bin</b>	<ul style="list-style-type: none"> <li>• Capacity: 30 - 45 L</li> <li>• With handle, lid, foot-pedal operated.</li> <li>• Plastic receptacle features: Easy-clean plastic shell and lid.</li> <li>• Large step-on foot pedal operated lid.</li> <li>• Bio-hazard labels included</li> <li>• Weight 4kg. (single box), and Box</li> <li>• dimensions 16" x 16" x 27"</li> </ul>
<b>Large sized waste bin</b>	<ul style="list-style-type: none"> <li>• Capacity: 50 -70 L</li> <li>• With handle, lid, foot-pedal operated, and wheeled.</li> </ul>
<b>Wheeled waste bin</b>	<ul style="list-style-type: none"> <li>• Capacity: 70 -120 L</li> <li>• Designed for mechanical handling.</li> <li>• Rubber-tire wheels.</li> <li>• All bins manufactured to EN 840 European Standard.</li> <li>• Manufactured from high-density polyethylene with UV stabilizer.</li> <li>• Easy to push or pull</li> <li>• Appropriately color coded and properly marked/labeled the type of waste contained therein.</li> <li>• With smooth surfaces, leak proof, made of plastic.</li> <li>• Easy to load and unload</li> </ul>
<b>Mobile bag stand</b>	<ul style="list-style-type: none"> <li>• Triple-stand waste separator for the central separation of waste for recycling at wards, offices, kitchen, etc</li> <li>• Allows workers easy access to bins for segregation at source</li> <li>• For 80 litre bags</li> <li>• Dimensions; 1180 x 460 x 920</li> <li>• Thickness: Metal frame (galvanic zincing) with plastic lid</li> </ul>
<b>Bedside segregation trolley</b>	<ul style="list-style-type: none"> <li>• Designed to hold bins required by a particular ward or workstation</li> <li>• Allows waste segregation at the bedside or other patient treatment site</li> <li>• Made of Non-corrosive materials</li> <li>• Washable</li> <li>• Consist of rubber tyres with brakes</li> </ul>
<b>Bin Trolley (infectious waste)</b>	<ul style="list-style-type: none"> <li>• Capacity to carry 50 - 100kg</li> <li>• Waste collecting trolley, infectious waste</li> <li>• With a ground clearance of not less than 200 mm</li> <li>• Manufactured in a robust and stable way</li> </ul>
<b>Indoor wheeled trolley</b>	<ul style="list-style-type: none"> <li>• Waste collecting trolley for infectious waste</li> <li>• With a ground clearance of not less than 200 mm</li> <li>• Manufactured in a robust and stable way</li> <li>• Must be designed to hold at least 2-3 bins</li> <li>• with capacity of 70 – 120L</li> </ul>

	<ul style="list-style-type: none"><li>• Easy to clean</li></ul>
--	---

FOR STAKEHOLDERS' COMMENTS

**ANNEX IV**

**Color coding for different health care waste categories.**

	highly infectious,	Anatomical waste, blood, body fluids, pathological waste, culture materials, stocks, petri dishes, waste from isolation ward or camp.
	Infectious wastes and sharps wastes-safety boxes.	Used gloves, dressing materials, specimen containers, infusion packages, catheters, urinal bags.  Used Syringes and needles, surgical blades, scalpels, , needles, scalpels, prickers, blades, broken glass (e.g., pipettes, ampoules, vials)
		non-infectious
		Paper, packaging materials, plastic bottles, food remains, boxes, cartons

FOR STAKEHOLDERS' COMMENTS