

COVID-19 WASTE MANAGEMENT FACTSHEET

These factsheets follow Resolution 8 on Sound management of chemicals and waste and Resolution 7 on Environmentally sound management of waste of the Fourth United Nations Environment Assembly.



COVID-19
RESPONSE



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How to choose your waste management technology to treat COVID-19 waste

**NO UNCONTROLLED DUMPING,
NO OPEN BURNING**

Protect the environment and our health

For more information visit unep.org or contact **Kevin Helps** (Head, GEF Unit, Chemicals and Health Branch, UNEP) kevin.helps@un.org

“Prioritising waste management during such challenging times is critical not only to the health of the planet, but also to human health”

Rolph Payet, Executive Secretary of Basel, Rotterdam, and Stockholm Convention



1 Countries develop an **inventory of the national waste management facilities**, that should maximize the use of existing facilities. Check the inventory factsheet for more information.



2 Countries select environmentally sound options for waste treatment using the **UNEP Sustainability Assessment of Technologies (SAT) guidance** on Best Available Technology and Best Environmental Practices (BAT/BEP).

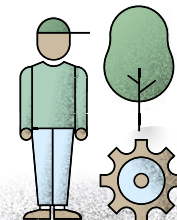
UNEP SAT criteria:



Assess the potential environmental, health and safety risks to workers and beneficiaries, as well as to the environment and biodiversity.

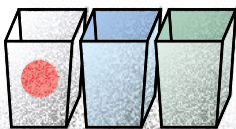


Respect national and local regulations on handling hazardous waste material.

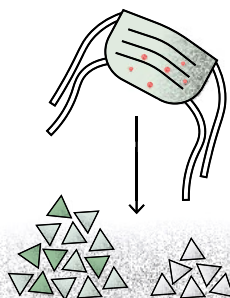


Consider social, economic, environmental, and technical risks and restrictions associated with technology choices

SAT methodology covers the full chain of medical waste management



From **simple technologies** for source segregation and primary disposal ...





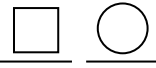

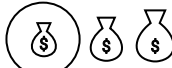

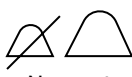



... to **complex technologies** for destruction or recovery of materials.

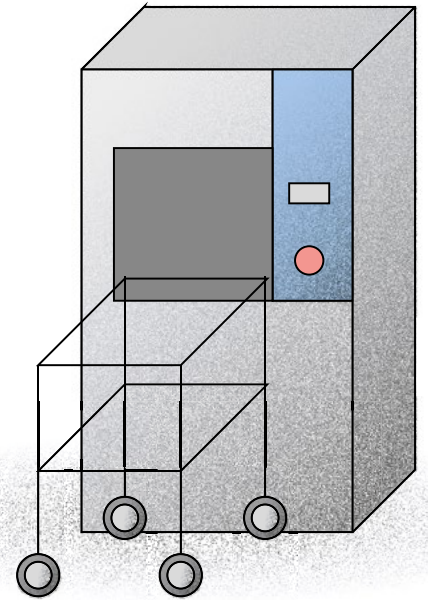
Any process should be in compliance with the [Guidance Manual by UNEP IETC](#), with the [Stockholm Convention Guidelines](#), and with [WHO guidelines](#).

Preferred technologies:

1 Autoclave

Pressure and vacuum using high temperature steam

Criteria	 <u>Pros</u>	 <u>Cons</u>
Condition	 Static or mobile	 Transport of waste
Cost	 Low	
Scale of technology	 200 to 10,000 L per cycle	 No waste volume reduction
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • bedding and personal protective equipment • clinical laboratory waste • reusable instruments • waste sharps • glassware 	<ul style="list-style-type: none"> • No volatile and semi-volatile organic compounds • No chemical waste • No chemotherapeutic or mercury waste
Pollution control	 Reduced air pollution	Odors
Time scale	 30-60 mins per cycle	Remaining waste must be landfilled
Complexity	 Simple	No waste volume reduction













Tips

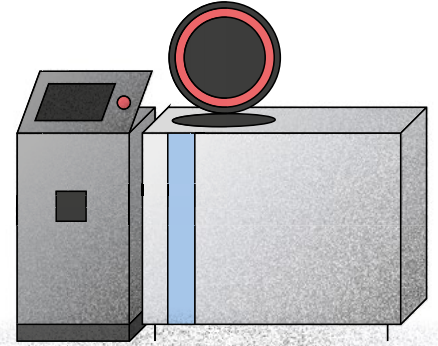
- Pair it with shredding of material to reduce volumes
- Break down personal protective equipment before sending it to landfill to prevent waste picking

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Sterilization

Using microwave steam processes with integrated shredding

Criteria	 <u>Pros</u>	 <u>Cons</u>
Condition	 Static or mobile	 Transport of waste
Cost	 Medium	
Scale of technology	 30 to 500 L per cycle	 No waste volume reduction
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • bedding and personal protective equipment • clinical laboratory waste • reusable instruments • waste sharps • glassware 	<ul style="list-style-type: none"> • No volatile and semi-volatile organic compounds • chemical waste • chemotherapeutic or mercury waste
Pollution control	 Negligible to no air emissions	
Time scale	 30-250 kg per hour in cycles of 30-60 mins	Remaining waste must be landfilled
Complexity	 Simple	Regular maintenance














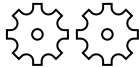
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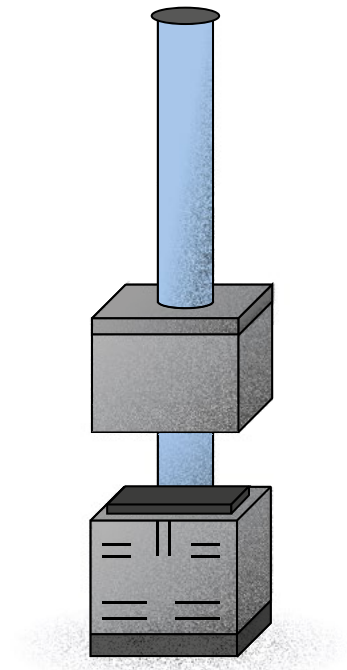
- Use a HEPA filter to avoid toxic contaminants releases
- Re-bag reduced waste volumes before sending them to landfill

Secondary preferred technologies

3 Twin Chamber Incineration

High temperature (>850°C) combustion with significant volume reduction (95%)

Criteria	 <u>Pros</u>	 <u>Cons</u>
Condition	  Static or mobile	 Transport of waste
Cost	   Medium	Higher capital and operational costs
Scale of technology	 kg 50 kg to 2,000 kg per hour	
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • bedding and personal protective equipment • human anatomical wastes • chemical wastes • laboratory waste 	<ul style="list-style-type: none"> • No chlorinated plastic waste • aerosol containers • heavy metals
Pollution control	 <ul style="list-style-type: none"> • Acceptable emissions and 90% volume reduction • Secondary combustion chamber, temperature controls and air pollution control equipment 	<ul style="list-style-type: none"> • Poor emissions if the equipment is low quality, incl. potential of formation and release of PCDD/PCDF
Time scale	 8-hour cycles receiving multiple batches of waste	
Complexity	 Mandatory training	Regular maintenance










Tips

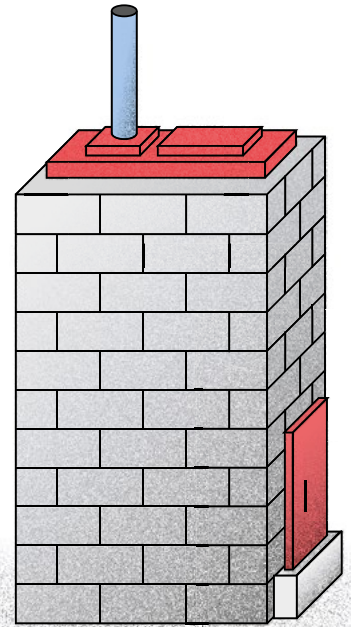
- Have a cool down cycle to enable safe ash removal
- Encapsulate hazardous ash waste
- Make sure emissions controls are in place
- To address the potential of formation and release of byproducts such as PCDD/PCDF, refer to the [Stockholm Convention Guidelines](#).

Temporary stop gap solutions

4 Brick built De-Montfort Incinerators

Homemade twin chamber high temperature (>850°C) combustion with volume reduction

Criteria	 <u>Pros</u>	 <u>Cons</u>
Condition	 Static	
Cost	 Low	Short life span (3-5 years)
Scale of technology	 15-50 kg	
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • Personal protective equipment • chemical and laboratory wastes 	<ul style="list-style-type: none"> • No chlorinated plastic waste • No aerosol containers • No heavy metals
Pollution control		Initial incineration will produce black smoke due to fuel source Potential of formation and release of PCDD/PCDF
Time scale	 6-hour cycles with 1-3 batches of waste	
Complexity	 Simple	











Tips

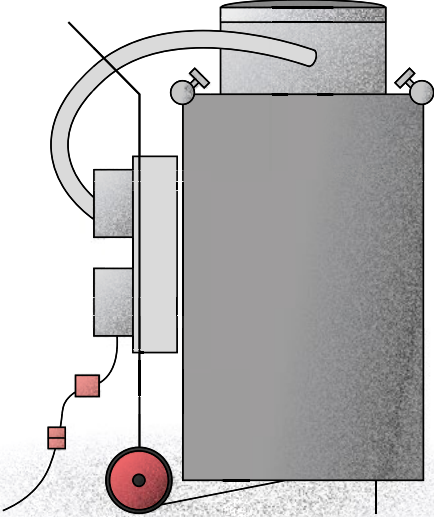
- Use good design quality material to build a [safe model](#).
- Operate well to maintain acceptable emissions.
- Avoid overloading
- Have a cool down cycle to enable safe ash removal
- To address the potential of formation and release of byproducts such as PCDD/PCDF, refer to the [Stockholm Convention Guidelines](#).

5

Barrel incinerators with air induction

Low volume medium high temperature (>650°C) combustion with volume reduction

Criteria	 Pros	 Cons
Condition	 Mobile	
Cost	 Low	Short life span (2-3 years)
Scale of technology	 8-25 kg per hour	
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • Personal protective equipment • chemical and laboratory wastes 	<ul style="list-style-type: none"> • No chlorinated plastic waste • No aerosol containers • No heavy metals
Pollution control	 Air induction cyclonic system	<ul style="list-style-type: none"> • Poor feedstock may lead to poor emissions • Potential of formation and release of PCDD/PCDF
Time scale	 6-hour cycles with multiple batches of waste	
Complexity	 Use operating manual	











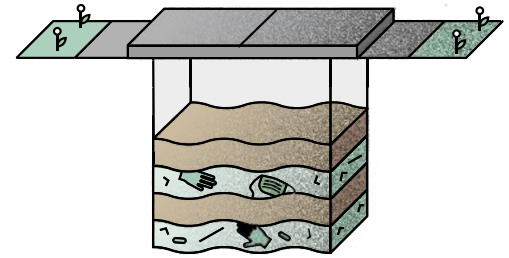
 **Tips**

- Temporary back-up technology to ease overburden of waste materials
- Suitable for remote sites
- Have a cool down cycle to enable safe ash removal
- Fly ash easily removed
- To address the potential of formation and release of byproducts such as PCDD/PCDF, refer to the [Stockholm Convention Guidelines](#).

Emergency solutions

6 Onsite Pit Burial Lowest form of disposal

Criteria	 <u>Pros</u>	 <u>Cons</u>
Condition	 Static	
Cost	 Low	Short term solution
Scale of technology	 5-10 tonnes of waste	
Suitable for	<ul style="list-style-type: none"> • Soiled wastes • Personal Protective equipment • Clinical laboratory waste • Disposable instruments 	<ul style="list-style-type: none"> • No liquid wastes
Pollution control	 No emissions	<ul style="list-style-type: none"> • Potential for leachate and releases to water and land
Time scale	 Short	Will be filled in quickly
Complexity	 Layers of waste with daily soil cover until full	



- Secure the site from waste pickers
- Site it away from water abstraction points, waterways, crops and communities
- Use gauze cover to avoid vermin and odors
- Never conduct open burning