Technical Guide 2

Safe disposal and Incinerators

WHAT SHOULD BE ACHIEVED

- What Should Be Achieved
- Use of approved design standards (size, siting, chimney above 4 m) and assure quality of construction
- When burning waste, a trained operator must be in constant attendance
- Proper operation is critical to achieving the desired combustion conditions and emissions, e.g., appropriate start-up and cool-down procedures; achievement and maintenance of a minimum temperature, use of appropriate loading/charging rates (both fuel and waste), properly disposal of ash.
- Maintain safety for operator, but also avoid any contact by unauthorized persons
- Allocate enough funds to build incinerators in schools, but also for operation and maintenance.

How to choose an incinerator?

- What are the types of materials?
- What is the amount you collect at school? Consider girls taking pads home or being absent during their menstruation days.
- What is then the operating frequency (daily, weekly, monthly)
- Maximum burning efficiency
- Maximum Emission control
- What are the funds available
- What are operation requirements (budgets, skills of labour, additional fuels, etc.)
- Are there special maintenance requirements (skilled, frequency, budgets, etc.)
- What are the site specifications

Criteria	A - Manually Operated, Fire & fuel based Incinerators(single / double chamber, fuel based)	Electric incinerators
Description	• A permanent simple furnace of solid construction. • Waste is placed on a fixed grate.	• Commercially available incinerators specifically for sanitary napkins.
Description	• Operating temperature reaches up to 300°C. • May need to add kerosene or similar fuel to maintain combustion.	• Usually require electricity for start up and operation.
Capacity	• For schools and smaller units • Burning once or twice in a week	• Varying sized: models for 30-200 pads/ day available
Advantage	• If built well, are a low cost and reliable option • Can include burning of other wastes	• Certified quality • Range of capacities

Criteria	A - Manually Operated, Fire & fuel based Incinerators(single / double chamber, fuel based)	Electric incinerators
Disadvantage	• Need to be well built to assure 100% burning effectiveness	• High investment costs • High maintenance costs (electricity) • Reliability a concern
Cost range	• 2,000 INR onwards	• 20,000 INR onwards
Examples	Options A1 to A2	Options B1 to B5

In the following some options available on the Indian market.

Please note: we don't make any advertisement for any companies or products.

A. Manually Operated Fire Based Incinerators

A1. Sanitary Napkin Incinerator for Girls Toilet Estimate

Description

- Has a lower firing chamber (for firing and ash collection)
- A middle incinerator chamber for stacking used napkins
- A top unit for emission control (for smoke and gas)
- A opening from the toilet wall with flap for dropping the napkins
- Ash collected on steel wire gauge fitted in incinerator chamber
- Used napkins and other wastes are fired on weekly basis
- Made of brick masonry, hence locally constructed
- Attached to the outer wall of toilet; can be constructed separately
- Height should be about 4 feet for easy and proper drop
- Flooring of chamber is provided with inward slope of 1:5
- Chimney cowl should have shape that will avoid entry of rainwater

Capacity:

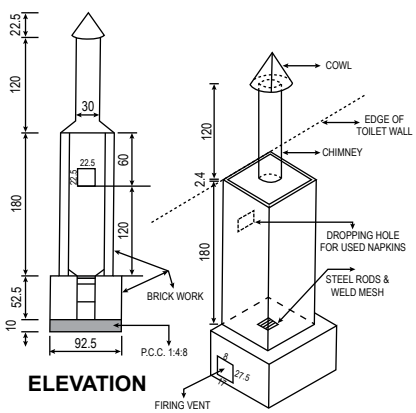
- Approximately 200 Napkins per day

Cost:

- INR 5,000 to 6,000

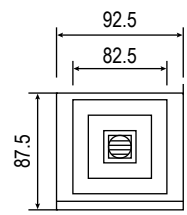
Size:

- As given in design layout

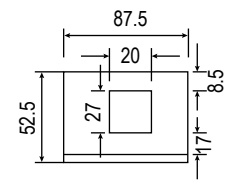


ELEVATION

ISOMETRIC VIEW



PLAN



FIRING FACE

(All dimensions in centimeters)

S.No.	Item	Units	Unit Rate, INR	Total Cost, INR
1	Earth work (all soil type)	0.21 Cum	550.00	115.50
2	Sand (Ramming, Consolidating etc.)	0.07 Cum	850.00	59.50
3	P. C. C. 1:4:8	0.07 Cum	1600.00	112.00
4	Brick work with 1:6 cement mortar	0.88 Cum	2600.00	2288.00
5	Plastering 12 mm (1:5 cement mortar)	5.87 Sqm	150.00	880.50
6	Dropping Hole-Inlet (22.5cmx22.5cm)	1 LS	150,00	150.00
7	Chimney 120 cm long, 30 cm Diameter	1 LS	600.00	600.00
8	Iron Rods 8 mm Diameter, 23 cm long	10 LS	10.00	100.00
9	Weld mesh (1"x1") 30 cm x 60 cm	1 LS	100.00	100.00
10	Painting Outer Wall	5.87 Sqm	100.00	587.00
Total, INR				**4992.50**
(Mason & Labour: 1 Man-day each)				**@ 5,000**

A2. Sanitary Napkin Incinerator for Girls Toilet Estimate (For average rural school @ 100 users)

Description

- Simple technology, safe, cost effective incinerator
- Incinerator is user friendly and manually operated
- Comprises of two chambers
- An emission control system along with a door for firing
- A lower firing chamber for firing and ash collection
- There is an opening in the toilet wall
- Opening for disposal of soiled napkins into the chamber
- Soiled napkin drops on the wire gauge in the chamber
- Dropped napkins are fired on weekly basis
- Made of brick masonry, hence locally constructed

Capacity:

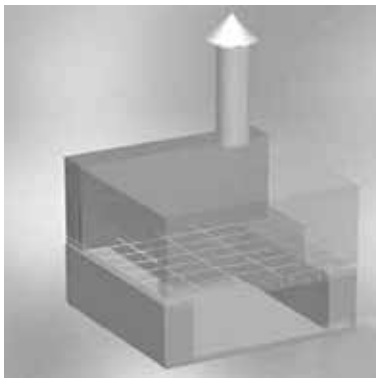
- For a rural school

Cost:

- INR 3,000

Size:

- 3’ x 3’ x 3’



S.No.	Item	Units	Unit Rate, INR	Total Cost, INR
1	Bricks	250 Nos	4.00	1000.00
2	Cement	2 Bags	200.00	400.00
3	Sand	1 Cft	150.00	150.00
4	Weld wire Mesh	9 Sqft	10.00	90.00
5	Skilled Unskilled Labour	2 Nos	600.00	600.00
6	AC pipe	6 Feet	400.00	400.00
7	Washing and Painting		200.00	200.00
Total, INR				**2840.00**

B. Electrically Operated Incinerators

B1. Napkinci Jumbo / Wall Mountable Sanitary Napkin Destroyer

Description

- Instant disposal in a scientific and hygienic way
- Front opening door for easy operation
- Inside refractory lining giving excellent heat retention
- The ash is collected in an Ash Collection Tray at the bottom
- Just Start and Forget
- Burns and Stops automatically
- Complete burning of napkins
- Only less than 5% ash per napkin generated
- Specially designed to destroy bulk amount of napkin wastes

Capacity:

- Approximately 1000 Napkins per day

Cost:

- INR 20000 to 25000 (to be confirmed with the manufacturer)

Size:

- Can be modified as per requirement

B2. Sanitary Napkin Incinerator–Napkinci Nano G (MS powder coating & Stainless Steel)

Description

- Instant disposal in a scientific and hygienic way
- Top Sliding Door for easy operation
- Easy and convenient to installation
- Wall mountable inside the toilet
- Inside refractory lining giving excellent heat retention
- The ash is collected in an Ash Collection Tray at the bottom
- Just Start and Forget - Burns and Stops automatically
- Complete burning of napkins
- Only less than 5% ash per napkin generated
- Specially designed to destroy bulk amount of napkin wastes
- Available in MS powder coating & stainless steel SS for longer life

Capacity:

- Approximately 50 Napkins per day

Cost:

- INR 32,000 to 40,000 (to be confirmed with the manufacturer)

Size:

- Height 17“ x Width 17” x Depth 11”

B3. REPROCIDE Sanitary Napkin Destroyer

Description

- Immediate destroying of napkins with fully automatic feature
- Sheet metal housing, Epoxy coated for superior finish
- Top loading for easy operation
- Meant for continuous operation
- Incorporated with micro controlled temperature
- Controller with digital indicators
- Wall mountable inside the toilet and mobile
- Provided with insulation to avoid thermal loss
- Provided with an emission outlet
- Ash outlet can directly be connected to drains
- Fitted with unique thermal heating ceramic system

Capacity:

- Continuous flow type

Cost:

- INR 25,000 to 30,000 (to be confirmed with the manufacturer)

Size:

- Height 90 cm x Width 49 cm x Depth 49 cm

Used in Southern India - Chennai, Vellore, Pondicherry, Bangalore, Kerala, Trivandrum, Coimbatore

B4. Electrical Incinerator JKA 230EI

Description

- Immediate destroying of napkins
- Robust construction and easy installation
- Virtually smoke and smell free with secondary burners.
- High temperature refractory lining
- Quick heat up time and lesser operational time
- Trouble free operation and maintenance
- **Designed to meet standards of Central Pollution Control Board**

Capacity:

- Continuous flow type

Cost:

- INR 35,000 to 40,000 (to be confirmed with the manufacturer)

Size:

NA but Capacity mentioned is 15 to 20 Kgs

B5. Electrical Incinerator JKA 230N

Description

- Instant disposal in a very scientific and hygienic way
- Front Opening Door with Automatic Door Closer
- The ash is collected in an Ash Collection tray
- Just Start and Forget Burns and Stops Automatically
- Specially designed to destroy upto 20 napkins at a time
- Inside SS covering for maximum lifetime
- Outside Mild Steel Metallic Spray Painting
- Fully Automatic and Electrically operated
- Complete burning of napkins
- Less than 5% ash per Napkin is generated

Capacity:

- Approximately 200 Napkins per day

Cost:

- INR 35,000 to 40,000 (to be confirmed with the manufacturer)

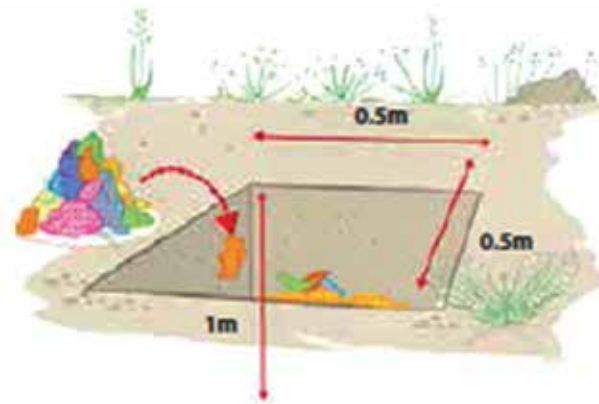
Size:

- NA

Other disposal mechanisms

Deep burial

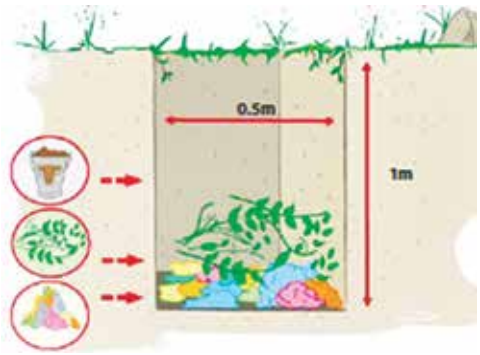
Burying in a deep pit requires physical work and space, but if practiced it a very low cost option. Disadvantages are that burial has limitations during the rainy season and high water table areas. As well it might create issues like shame or inconvenience in the beginning.



Design, operation and management:

- Once the used absorbent material is put inside the burial pit, it should be covered with soil or sand. It should not be kept exposed to open air
- The pit should be constructed at a distance of about 5 to 7 meters from drinking water source
- Depending upon the number of users the size can vary
- **Minimum Specification:**
  0.5 m x 0.5 m x 1.0 m, or even better 1.0 m x 1.0 m x 1.0 m (l x b x d)

Composting

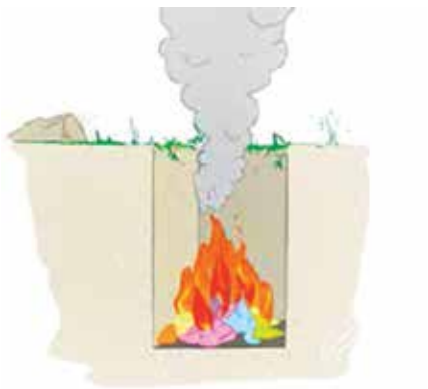


Used paper, tissues, cloth based absorbents and even some sanitary napkins ,if they made only of wood pulp and non-woven cotton can be composted. Studies showed that sanitary napkins should be shredded prior to composting. However, experience is still lacking in this area. Commercial disposable pads will not compost, and hence a different disposal solution is required. An advantage of composting or pit burial is that it requires the least maintenance and supervision, however it takes at least 6-12 months. Composting can take place in a pit or in a special composting box, especially recommended in high water table areas.

Design, operation and management:

- Used menstrual absorbent should be mixed and covered with materials such as leaves, dried plants or other bio-degradable material
- The need to be properly moist, which might requires watering during dry periods
- Once the pit is filled, it should be covered properly with soil so as to avoid smell, destruction from rodents, etc.
- **Minimum Specification:**
  0.5 m x 0.5 m x 1.0 m, or even better 1.0 m x 1.0 m x 1.0 m (l x b x d)

Pit burning



Burning of waste and especially of plastic based sanitary napkins is not recommended, as it emits toxic compounds. However plain cotton clothes of degradable sanitary material can be burnt provided that there are no better options available. There are concerns regarding safety, fire hazard and incomplete burning.

Design, operation and management:

- The burning should be carried out at about 1 m depth with some good burning material like dried wood or sometimes kerosene oil or fuel is used
- During the burning, there should be safety measures, such as a dedicated personal and avoid contact by unauthorized students
- **Minimum specification:**
  0.5 m x 0.5 m x 1.0 m; 1.0 m x 1.0 m x 1.0 m (l x b x d)