
*Draft Indian Standard***SMALL INCINERATORS FOR SANITARY NAPKINS-
GUIDELINES AND GENERAL REQUIREMENTS**

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ICS 13.030.10

Solid Waste Management Sectional
Committee, CHD 33

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FOREWORD

(Formal clauses to be added later)

Sanitary waste disposal has become an increasing problem in India as the plastic used in disposable sanitary napkins are not bio-degradable and lead to health and environmental hazards. Used sanitary napkins are often disposed of in dustbins or open surfaces, thereby giving rise to various contagious diseases or when disposed in toilets they block the sewage system.

To overcome this common problem, a sanitary napkin incinerator machine is used to scientifically destroy the used napkins, thereby reducing the harm to the environment. The machine burns the used napkins and reduces it to ash.

A sanitary napkin incinerator machine is used to dispose used sanitary napkins safely. Hence, need was felt for standardization on small incinerators for sanitary napkins.

This standard has been drawn based on guidelines available currently. However, in the present guidelines, there is no technical detail about the temperature range in small incinerators. Further, no ISO standard available on the subject.

1 SCOPE

1.1 This Standard covers the guidelines and general requirement of electrically or plasma heat operated Small incinerators for Sanitary Napkins for use in educational institutions, offices, public toilets, small factories with minimum capacity of 150 to 200 napkins per day.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 DEFINITIONS

For the purpose of this standard, the following definitions shall apply.

3.1 Sanitary Napkin — Sanitary napkin is an absorbent material typically consist of 6 to 10 layes of different material which is used to absorb fluid discharged during menstruation. Typical materials used in sanitary napkin include inner soft cotton or non-woven cloth layer, soft cotton pad (cellulose pad/absorbent paper), a layer of super absorbent polymer, a non-absorbent type plastic upper layer (polyethylene layer), non sticking paper coated with silicone and organic gums.

3.2 Incineration — Incineration means an engineered process involving burning or combustion of solid waste to thermally degrade waste materials at high temperatures.

3.3 Household Bio-Medical Waste (Including Domestic Sanitary Waste) — A part of dry waste generated during the medication/treatment at home including sanitary napkins, diapers, etc.

4 MATERIAL, DIMENSION AND CONSTRUCTION

4.1 Size of sanitary napkin incinerator machine will depend upon the quantity of the napkins required to be burned per cycle or per day. The maximum size of the machine shall not be more than width (30 inch), depth (12 inch) and height (36 inch) excluding exhaust pipe. The weight of the machine including the accessories shall not be more than 25 kg. The other size, dimension and weight of the machine shall be as per the agreement between the buyer and the seller.

4.2 The machine may be wall mounted or floor mounted with separate stand or directly on the floor. The machine shall be wall mounted with easily removable mounting accessories.

4.3 The machine may be top/side/front loading as per the agreement between buyer and seller. There shall be ceramic insulated door of minimum 4 x 4 inches size for the loading of material. The door locking shall be latch or magnetic type.

4.4 The cabinet and their parts shall be constructed with strength and rigidity adequate to withstand normal conditions of handling, transport and usage. The cabinet and door shall be constructed from mild steel sheet of 1.2 mm thickness confirming to IS 1079 or cold rolled close annealed (CRCA) sheet of minimum 1.2 mm thickness confirming to IS 513 (Part 1). The cabinet and the door shall be powder coated as per IS 13871 for adequate strength and corrosion resistance.

4.5 The external body of the machine shall be insulated with minimum 2.0 mm insulation of ceramic. The external body temperature of the incinerator machine during normal operations shall not exceed 27 °C or above the ambient temperature.

Ceramic insulation may be of refractory ceramic fiber type or insulating fire bricks type which shall withstand a temperature range between 600 °C to 1200 °C, having high thermal stability, resistance to tearing and cracking, low heat storage capacity, smoke free and shall be classified non-carcinogenic and exempted from classification and labelling regulation. RC Fiber is more preferrable considering the low weight requirement of the incinerator unit.

For fire door, it is recommended to use ceramic fiber blankets having a density between 64 to 128 kg/m³. Insulation thickness may be calculated on the basis of the specific heat capacity of the product selected.

4.6 The wire used in the cord/cable shall conform to IS 694 and the electronic push button shall conform to IS/IEC 61058-1.

4.7 The emission outlet pipe shall be made of 2 inch galvanized iron (GI) pipe and shall conform to IS 1239 Part 1. It shall be located at the top of machine or rear side of the machine. The length of the exhaust pipe shall be sufficient to allow the pipe to lead outside of the toilet and at a height of at least 2 meters above the building.

Note: It is recommended to insulate the outlet pipe with ceramic blanket insulation as this pipe will get red hot in its not insulated.

4.8 The machine shall have extractable and re-deployable type ash tray. Interlocks or other suitable fastening mechanism shall be installed to prevent ash removal tray from opening while burning is in progress or while the furnace temperature is at max operational temperature.

4.9 The incinerator chamber may be furnace type cylinder or ceramic type heater containing coil with single or double chamber.

Considering the high temperature of 1200 °C, required for incineration, it is recommended to use a heating wire diameter between 1.2 to 1.4 mm, the wire being inserted in a groove on a ceramic plate or embedded inside a ceramic matrix. The terminals of the wire must be protected against oxidation as continuous on and off operations lead to thermal fatigue and oxidation at the terminal connections.

Note: It is recommended to use Kanthal elements for long life and low maintenance costs.

5 GENERAL REQUIREMENT

5.1 Sanitary napkin incinerator machine shall not suffer any damage or corrosion to any component during warranty period when working under the following atmospheric conditions.

- a) Temperature — Any temperature between minus 10°C and 50°C;
- b) Humidity — 20 to 100 percent relative humidity without reference to temperature; and
- c) Wind Velocity — Up to 50 km/h.

5.2 The machine shall be single switch operation after loading. The maximum cycle duration (including cooling time) per cycle shall be max 30 min. The operation temperature shall be between 300°C to 400°C and the combustion shall take place at approximate 300 °C temperature. During the incineration operation, the outer body temperature shall not adversely affect the user or surrounding.

5.3 The incinerator machine shall burn the loaded napkin completely. The machine capacity to burn napkin per cycle may vary from 5-20. The total ash generation per cycle shall not exceed 1 gm per 5 napkins/cycle. Ash shall be collected in separate tray and ensure stack on that tray. The residual ash shall be landfill in a safe and controlled manner.

Note: It is recommended to include an air inlet with a draft fan supplying minimum 10 Liter per minute of Air blow for complete combustion of the material inside incinerator. Insufficient air for combustion will lead to black smoke, pollution etc.

5.4 The residence time for gaseous products in the combustion chamber will be designed to be at least 2 seconds to ensure complete combustion.

5.5 The emission from incinerators shall comply the emission standards prescribed in SWM Rules, 2016 or as per Central Pollution Control Board (CPCB) issued from time to time. Prior to installation of incinerator machine, the manufacturer shall provide the test certificate from NABL accredited laboratory for compliance of emission standards set by CPCB. The emission test report must include data for Dioxins and Furans apart from the other parameters prescribed by CPCB.

5.6 Suitably designed pollution control devices such as filters, scrubbers etc. shall be fitted inside the incinerators to achieve emission limits if necessary.

6 OPERATING INSTRUCTION AND MAINTENANCE

6.1 Each machine shall have an operation manual that clearly list operating instructions, directions for installation, the recommended maintenance schedule and cleaning instruction in English/Hindi and regional language.

6.2 A preventive maintenance manual with instructions for routine and preventive maintenance checks and servicing shall be provided by the manufacturer in English/Hindi and regional language.

6.3 The display screen shall indicate the operating temperature on the machine. The temperature display should be a PID controller with automatic cut off once the set temperature is achieved. The temperature controller can adjust the temperature desired. There should be a temperature sensor inside the incineration chamber to control the inside temperature. The temperature sensor should be placed inside a steel tube and protected from direct fire from incineration. The temperature sensor must be placed at least 2 inches above the bottom grate of the incinerator.

6.4 Do's and Don'ts instruction shall be plated or printed on the machine on front side.

6.5 The manufacturer shall give minimum one year warranty for machine or as agreed between buyer and seller.

7 SAFETY AND PROGRAMING FEATURES

7.1 The sanitary napkin incinerators machine shall operate on 220 Volts \pm 10 percent, 50 Hz power supply. There shall be inbuilt protection against normal voltage fluctuation. The electrical components in the machine shall conform to the safety requirements according to IS 302 (Part 1). There shall be in-built protection against Overload and an overload protector must be included in the control panel.

7.2 Electrical wiring and connections shall conform to the requirement of IS 732 and also to the *Indian Electricity Act, 1910* and *Indian Electricity Rules, 1956*. All electrical joints shall be electrically and mechanically secure.

7.3 Auto power & thermal cut-off after each cycle or after overheating (beyond max operational temperature) shall be there for safety of user.

7.4 An audible and visible alarm shall be installed to warn the operator/user when the temperature of the machine exceed the safe limits of operation or timer shall be provided to cut off the entire heating system as safety for user.

7.5 The personnel protective equipment for user/operator for operating the incinerator shall be provided by the manufacturer.

7.6 The training for operating the machine shall be provided by the manufacturer.

8 MARKING

8.1 Each sanitary napkin incinerator machine shall be legibly and indelibly marked with following information:

- a) Name of manufacturer and brand name or trade mark;
- b) Serial number;
- c) Date of manufacturing and country of manufacture;
- d) Capacity;
- e) Dimension and Weight;
- f) Power/Voltage; and
- g) Any other information as required by buyer or by law/regulations in force.

8.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

9 PACKAGING

The packaging of the machine shall be in suitable corrugated material to protect the product from damage during shipment and storage. This package could be constructed of materials, such as carton board, polyester or other safe materials that provide sufficient protection to the product.

10 SAMPLING

10.1 Unless otherwise agreed to between the supplier and the purchaser, the sampling plan as given in **10.1.1** shall be followed.

10.1.1 In case incinerator machine is assembled from the components manufactured to the requirements of various Indian Standards and an adequate proof through the record of tests is submitted to the buyer, the single sampling plan with inspection level II and acceptable quality level (AQL) of 1 percent as given in Table 1 and Table 2 of IS 2500 (Part 1) shall be followed.

ANNEX A*(Clause 2)***LIST OF REFERRED INDIAN STANDARDS**

<i>IS Number</i>	<i>Title</i>
302 (Part 1): 2008	Safety of household and similar electrical appliances: Part 1 General requirements
513 (Part 1): 2016	Cold reduced carbon steel sheet and strip part 1 cold forming and drawing purpose
694: 2010	Polyvinyl chloride insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages up to and including 450/750 V
732: 2019	Code of practice for electrical wiring installations
1079: 2017	Hot-rolled carbon steel sheet, plate and strip — Specification
1239 (Part 1): 2004	Steel tubes, tubulars and other wrought steel fittings — Specification Part 1 Steel tubes
2500 (Part 1): 2000	Sampling inspection procedures: Part 1 Attributes sampling plan indexed by Acceptance Quality Level (AQL) for lot by lot inspection
13871: 2021	Powder coatings — Specification
IS/IEC 61058-1: 2000	Switches for appliances Part 1 General requirements