

TERMS OF REFERENCE FOR RESEARCH PROJECT

[Solid Waste Management Sectional Committee CHD 33 under Chemical Department, BIS]

1. Title of the Project: Study on Evaluating the Efficacy of Small Incinerators/Thermal Processors for Incineration of Sanitary Napkins

2. Background:

2.1 Sanitary waste disposal is becoming an increasing problem in India as the plastic used in disposable sanitary napkins are not bio-degradable and there are no proper disposal methods for these leading to health and environmental hazards. Used sanitary napkins are often disposed of in dustbins or on open surfaces, thereby giving rise to littering, non-aesthetic conditions and can lead to various contagious diseases. Sometimes, soiled sanitary napkins are disposed off in toilets leading to blocked sewage system.

2.2 To overcome this severe problem, a sanitary napkin incinerator machine is used in common places like public toilets, girl's hostels, schools etc. The machine burns the used napkins and reduces it to ash. However, no data is available the type of emissions resulting from burning of napkins as well as the efficiency of the incinerators. Burning of chlorinated plastics in these sanitary napkins at lower temperature can cause formation of Dioxins and Furans (carcinogens) which is a big concern with these incineration machines.

3. Objective

3.1 To study and collect data on the time and temperature required to achieve minimal formation and emission of pollutants, especially dioxins and furans into the atmosphere. The study shall focus on the temperature actually achieved in the sanitary pad incinerator at different points and measure the gaseous emissions as per prevailing guidelines of CPCB.

3.2 The study shall also include examination of portable incinerators from various brands presently available in the market, their working, pollution potential, durability and material of insulation.

4. Scope:

4.1 To undertake a comparative study of the available literature on the sanitary napkin incinerators which will include guidelines issued by regulators, international standards if any, research paper published on the subject, any study conducted by any organization or any other available sources.

4.2 The literature review shall be done on sanitary napkin incinerators in use in industrialised countries (Japan, UK, European countries, Korea etc.) which should include specifications, environmental impact, price, size etc.

4.3 Analysis of import and export data, and a comparative study on the technical regulations applied in these countries.

4.4 Identifying and collecting the manufacturing base of the sanitary napkin incinerators and testing facilities in the country.

4.5 Analyse and summarize the applicable regulatory requirements for disposal of sanitary napkins.
4.6 Preferably visit to two large and two MSME manufacturing units and a laboratory to understand the manufacturing processes and technologies in use for production and quality control of sanitary napkin incinerators and collect the data on the following:

- a) Manufacturing process
- b) Material and thickness of Insulation used
- c) Pollution potential of the incinerator
- d) In house testing facilities
- e) Incineration temperature actually achieved in the incinerator
- f) Type of pollutants released into the atmosphere and their quantity
- g) Sustainability practices [energy consumption, renewable energy sources, sustainable practices, 3Rs (Reuse, Reduce and Recycle), waste management and disposal mechanisms, carbon footprints]

4.7 Collection of data regarding manufacturing capacities of various sanitary napkin manufacturers in the country.

4.8 Types and concentration of pollutants released into the atmosphere due to incineration of sanitary napkins for every 100 deg C of incineration varying from 300 deg C to 1200 deg C.

4.9 Recommendation on the disposal of ash generated during incineration of sanitary napkins.

4.10 An analysis of the materials of insulation used in the incinerators and the temperature that is achieved.

4.11 Analyse the efficacy of the incinerators and recommend the best probable solution for disposal of soiled sanitary napkins.

4.12 Prepare a detailed analytical report that encompasses all research findings, specifications, recommendations, and guidelines as mentioned in the Scope.

5. Sampling plan:

5.1 Based on the manufacturing capacity of the sanitary napkin manufacturers, samples shall be taken from top 3 large manufacturing units, 3 in the middle and 3 lowest manufacturing units.

5.2 Sampling and analysis shall be done as per the Standard Operation Procedure for sampling of dioxins and furans published by CPCB. Dioxin and Furans shall be tested and analysed through the recognised laboratories and as per the methodologies of CPCB in addition to other pollutants identified if any.

6. Research Methodology:

The project will involve the following research methodologies:

6.1 Conduct literature review as mentioned in the Scope.

6.2 Contact relevant manufacturers, laboratories and R&D bodies of the product in the country for collecting information in respect of the scope.

6.3 Conduct focussed group discussion with quality control personnel.

6.4 Visit to manufacturing units and laboratory as mentioned in the Scope.

6.5 Data Collection:

- a) With help of structured questionnaire collection of feedback from manufacturers exporters and labs as well as users. Surveys or interviews with industry professionals to gather insights
- b) Experimental studies to evaluate the type of pollutants released into the atmosphere at different temperatures.

6.6 Laboratory experiments to assess the performance of incinerators under controlled conditions at different temperature profiles.

7. Deliverables

7.1 A report that encompasses all the research finding, specifications, recommendations as mentioned in the Scope in digital format and hard copy.

7.2 Details of manufacturing base, data collected via survey and summary of discussion and results/ findings shall be appended to the project report.

8. Delivery Milestones and Review Process

Project Timeline: 4 months

8.1 Interim Report covering the review of the literatures and existing stipulations, thereof – within 1 month from the date of award of project from BIS. The proposer may not wait for results of the testing for submission of Interim report.

8.2 Report of site visits and data collected from manufacturing units and laboratory analysis of the sanitary napkins as mentioned in Scope- By end of 3 months from the date of issue of sanction letter by BIS.

8.3 Final report covering all the aspects of the ToR – By end of 4 months from the date of assignment received from BIS.

9. Support BIS will Provide:

9.1 BIS will provide latest editions of International standards required for the project.

9.2 BIS lab resources

NOTE: The proposer should collect and rely on the primary data to the extent possible and may also use peer reviewed publication data to support the finding, wherever necessary.

10. Nodal Point

- Shri Matcha Arun Kumar, Member Secretary of Solid Waste Management Sectional Committee, CHD 33.