

## **‘Green Dispo’ eco-friendly sanitary napkin incinerators: Reaching all corners of the country**

Scientists from International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, an autonomous institute under the Department of Science & Technology, Govt. of India in collaboration with M/s. Sowbal Aerothermics, Hyderabad, and CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nagpur, have developed an ecofriendly high-temperature sanitary napkin incinerator ‘Green Dispo’.

The technology has been extended to develop the high-temperature incinerators and patented (IP 200787), and these are being installed in schools, colleges, government offices, and public places.



**Green Dispo – Model I**



**Green Dispo – Model II**

The ‘Green Dispo’ incinerator developed by ARCI - M/s. Sowbal Aerothermics-CSIR NEERI team generates instant heat up to temperatures greater than 800°C, which helps in complete combustion of sanitary pad wastes with minimum flue gas emissions. The ‘Green Dispo’ is manufactured in two models, which operate at 800±50°C (Model-I) and 950±50°C with a secondary combustion chamber (Model II), respectively with less flue gas emissions and improved energy efficiency unlike the presently available incinerator operating at around 300°C resulting in harmful air emissions.

In India, over 1 billion used sanitary pads are being disposed of every month. With increased awareness about menstrual hygiene, this number is likely to increase. Inappropriate disposal of menstrual waste is a major problem leading to diseases and other adverse effects. The majority of sanitary pad waste about (60-70%) is cellulose(C<sub>6</sub>H<sub>10</sub>O<sub>5</sub>). Accordingly, in their process of developing the incinerator ARCI team evaluated burning characteristics of pad and estimated the amount of air required for incineration using the cellulose combustion reaction  $C_6H_{10}O_5 + 6O_2 \rightarrow 6CO_2 + 5H_2O$ .

The developed unit can efficiently burn the pads with high moisture content and super absorbent polymers (SAP). The exhaust concentration of Total Particulate Matter (TPM), CO, SO<sub>2</sub>, NO<sub>x</sub> was observed to be  $46.1 \pm 6.7 \text{ mg/m}^3$ ,  $74.0 \pm 4.5 \text{ mg/m}^3$ ,  $38.6 \pm 5.9 \text{ mg/m}^3$ ,  $1.3 \pm 0.4 \text{ mg/m}^3$ , respectively with less than 5% ash per napkin, meeting standards under Waste Management Rule 2016 (CPCB).

The industrial partner M/s. Sowbal Aerothermics specializes in ceramic honeycomb-based energy-efficient air heaters based on ARCI's honeycomb technology, and extended the expertise jointly, to concentrate the heat using multi-channeled and oriented ceramic element holders. CSIR-NEERI provided scientific expertise to control the flue gas emissions and improving energy efficiency.

Market seeding and sensitization across the country through more than 300 installations of 'Green Dispo' units in schools, colleges, government, and public places, etc., has recently been completed by ARCI team and 'Green Dispo' with its innovative features, user-friendly and eco-friendly attributes, is expected to have a large market potential that will benefit the country at large in sanitary waste management.

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