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# Design and Development of a Sanitary Napkin Incinerator

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**_Abstract_**

*Improper disposal of menstrual waste presents serious health and environmental risks, especially in rural areas with limited access to proper sanitation and waste management systems. Without adequate facilities, used menstrual products are often discarded in open spaces, water bodies, or burned, leading to pollution, foul odors, and the spread of infections. The lack of awareness, infrastructure, and stigma surrounding menstruation further worsens the issue, making it crucial to promote safe, sustainable disposal methods and comprehensive menstrual hygiene education in these communities. These challenges are compounded by the lack of efficient waste management systems, leading to pollution and associated health risks. Addressing this critical issue is essential for safeguarding public health and promoting environmental sustainability. This paper introduces a novel, energy-efficient sanitary napkin incinerator designed for rural settings. Featuring an advanced temperature control circuit, the incinerator ensures complete combustion while minimizing harmful emissions like dioxins and furans. The proposed design focuses on affordability, accessibility, and adherence to technical standards, making it an ideal solution for educational institutions and community settings. By providing a safe and sustainable approach to menstrual waste disposal, this project aims to foster cleaner and healthier environments.*

**Keywords:** Sanitary napkin, incinerator, combustion, menstrual hygiene, healthier environments

## INTRODUCTION

The improper disposal of menstrual waste has become a critical public health and environmental issue, especially in developing countries like India, where access to effective waste management systems remains limited. With sanitary napkins being the most widely used menstrual hygiene product among women, their disposal presents substantial challenges due to their composition, which often includes non-biodegradable materials like plastics and super-absorbent polymers. These materials are resistant to natural decomposition, persisting in the environment for years and contributing significantly to land and water pollution. Traditional waste management practices, such as deep burial and open burning, are commonly employed in the absence of proper disposal systems but are far from adequate [1–3]. Deep burial can lead to soil contamination, leaching toxic chemicals into groundwater over time. Open burning, on the other hand, releases harmful pollutants, including dioxins and furans, which pose severe health risks such as respiratory problems and long-term toxic exposure. These practices not only fail to address the non-biodegradable nature of sanitary napkins but also exacerbate environmental degradation and threaten

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public health, highlighting the urgent need for innovative and sustainable waste management and public health protection [4–7]. This paper introduces a comprehensive design for an advanced sanitary napkin incinerator, offering a safe, hygienic, and environmentally friendly solution for the effective disposal of used sanitary products. Recognizing the inadequacies of conventional disposal and incineration methods, the proposed design incorporates state-of-the-art technologies to optimize performance while addressing the health and environmental challenges posed by traditional approaches [7]. The incinerator is tailored to meet the needs of communities, particularly in resource constrained settings, ensuring both practicality and sustainability. The advanced design integrates innovative features, such as energy-efficient temperature control systems, to achieve precise regulation of combustion temperatures. This ensures complete combustion of sanitary waste, thereby significantly reducing the release of harmful emissions like dioxins and furans which are the major pollutants linked to conventional incineration methods [8–10]. Furthermore, the design focuses on enhancing combustion efficiency while reducing operational costs, making it an accessible solution for widespread use. By emphasizing environmental responsibility and user-friendly operation, the proposed incinerator serves as a significant step toward sustainable menstrual waste management and public health protection [5]. In addition to its technical advancements, this work places significant emphasis on the critical issues of accessibility and affordability, particularly in rural areas where resources for proper waste management are often scarce [6]. Rural populations, who are typically underserved by conventional waste disposal infrastructure, face greater challenges in managing menstrual waste effectively. Our study includes a thorough comparative analysis of existing waste management systems, evaluating a range of incineration methods. By advocating for the adoption of improved and efficient incineration practices, the research calls for a shift toward sustainable waste management methods in both urban and rural contexts. Ultimately, this work contributes to the ongoing discourse on sustainable waste management, providing valuable insights into how effective menstrual waste disposal solutions can play a key role in promoting cleaner, healthier environments and improving public health outcomes across communities [7, 9].

## LITERATURE REVIEW

A growing body of research has highlighted the negative environmental and health impacts associated with improper disposal of sanitary products, emphasizing the need for more sustainable and efficient solutions. High-temperature incineration has been shown to significantly reduce waste volume and effectively decompose harmful components. The review highlights the necessity for incinerator designs that are not only efficient but also accessible and user-friendly, aligning with global public health initiatives. In addition to the technical aspects of incineration, the literature also addresses the health implications associated with emissions from waste incineration. Concerns regarding the release of harmful pollutants, such as dioxins and particulate matter, necessitate the implementation of advanced technologies that minimize these emissions. The review advocates for the development of low-cost incineration solutions that can manage sanitary waste while also recovering energy, thus promoting sustainable waste management practices [1, 8].

### Traditional Approaches to Menstrual Waste Disposal

Traditional incinerator models for menstrual waste disposal, have been widely used due to their perceived simplicity and effectiveness. These systems typically consist of a single combustion chamber equipped with a basic heating element, often controlled by a standard thermostat. While they serve the primary function of reducing waste volume through combustion, traditional models are characterized by significant limitations that hinder their overall efficiency and environmental safety. The reliance on a single chamber design restricts airflow and oxygen availability, which are critical for achieving complete combustion. This often results in incomplete oxidation of waste materials, leading to the production of harmful by-products such as carbon monoxide, dioxins, and particulate matter. Moreover, traditional incinerators are known for their high energy consumption, as they operate at elevated power levels to maintain combustion temperatures. The lack of advanced temperature control mechanisms contributes to significant fluctuations in combustion conditions, further exacerbating the issues of incomplete combustion and increased emissions [1, 2].

 

### Inadequacies of Conventional System

The traditional waste management system's significant challenges, primarily due to inadequate temperature control. Conventional small-scale incinerators often rely on basic thermostats, leading to temperature fluctuations that result in incomplete combustion of waste materials. This inconsistency not only hinders the effective breakdown of organic and inorganic compounds but also contributes to the release of harmful emissions. Another critical issue is the design of traditional systems, which typically utilize a single combustion chamber with a single heating coil. This design limits the ability to control the combustion process across different stages, making it unsuitable for achieving complete combustion. Consequently, this inefficiency can lead to health risks and environmental contamination. Furthermore, traditional systems often lack advanced control mechanisms for regulating current and temperature, which can result in operational inefficiencies and increased emissions. The absence of technological integration restricts the effectiveness of waste management practices and fails to meet modern environmental standards. Additionally, cultural beliefs and societal norms significantly influence menstrual hygiene practices and disposal methods, complicating the implementation of effective waste management solutions and underscoring the need for community engagement and education [3, 4]. To address the inefficiencies in traditional sanitary napkin incinerators, implementing advanced temperature control systems is crucial. By utilizing accurate thermostats and automated controls, temperature fluctuations can be minimized, ensuring complete combustion of waste materials. Another effective solution involves transitioning to a multi-chamber combustion design, which allows for better control of the combustion process at different stages. This design facilitates the effective incineration of both organic and inorganic components, thereby improving overall waste management efficiency. Initiatives that raise awareness about the importance of safe disposal practices can help mitigate health risks associated with improper waste management. Furthermore, collaboration with policymakers and local governments can facilitate access to affordable incineration technologies, enabling the implementation of scalable models that align with broader environmental and public health goals.

## OBJECTIVE

The primary objective of the proposed work is to develop a sanitary napkin incinerator that safely and hygienically disposes menstrual waste, preventing the environmental impact caused by improper disposal practices. This includes designing a circuit that ensures combustion temperatures, achieving complete combustion and minimizing the release of harmful substances. Additionally, the work aims to improve energy efficiency by ensuring that the proposed design consumes less energy compared to traditional incinerators.

## PROPOSED SYSTEM

The incinerator system utilizes a multi-chamber combustion design that allows for better control of the incineration process, ensuring complete combustion of both organic and inorganic materials. Advanced circuit controls and automated mechanisms regulate temperature and current, optimizing operational efficiency and minimizing harmful emissions.

### Control Circuit Design

The circuit design focuses on creating an efficient and reliable circuit that enhances the operation of sanitary napkin incinerators. Effective incineration requires maintaining high combustion temperatures to ensure complete waste burning. The incinerator is built with high-quality, heat-resistant materials such as stainless steel or mild steel to withstand these temperatures. Central to this design is the thermal coil, which converts electrical energy into heat for the incineration process. The Figure 1 shows the incinerator circuit design. The circuit incorporates a stable 12V AC power supply, timers, relays, and voltage regulators to manage the heating elements, ensuring precise control over the incineration process and optimizing energy consumption. The system is powered by a single-phase line (L) and neutral (N). It includes Robocraze 220V SCR voltage regulators (Vr1, Vr2) for voltage control and Fotek solid-state relays (SSR) (R1, R2, R3) rated for 80-250VAC / 24-380VAC with a capacity of 25A.

 

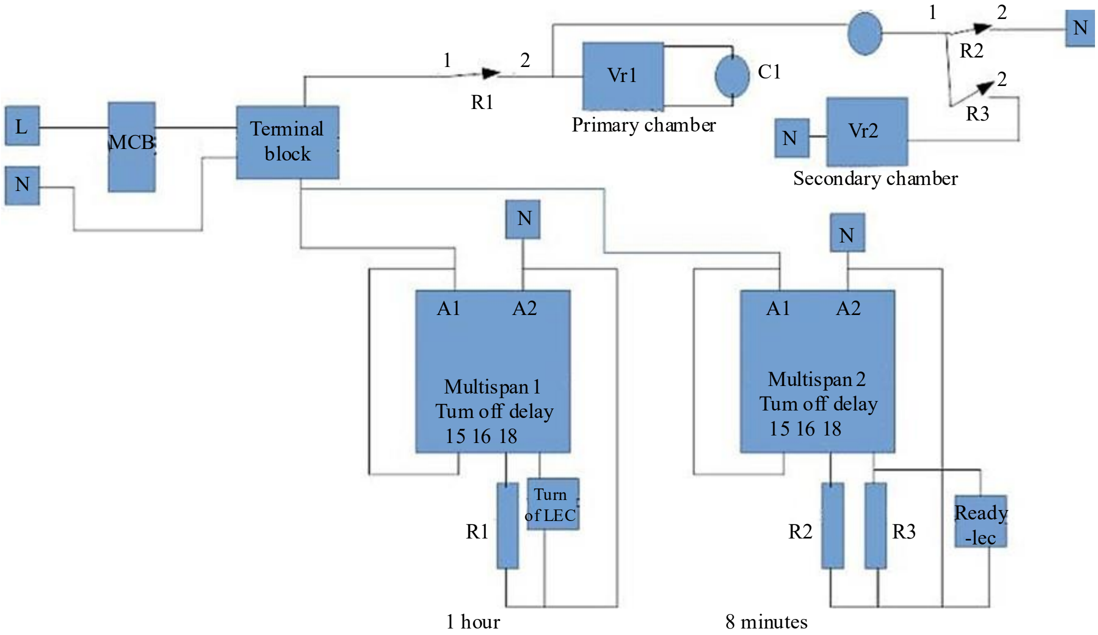


**Figure 1.** Incinerator circuit design.

The timing functions are managed by Multispan T1-41 timers (Timer1, Timer2), while Nichrome 80 heating coils (C1, C2) are used as the primary heating elements for efficient thermal operation. Relays, timers, and voltage regulators are essential components in the system for efficient control and operation. Relays allowing low-power circuits to control high-power devices safely and effectively. Timers provide precise control over the activation and deactivation of circuits, enabling automation in processes such as heating, cooling, or sequential operations. Voltage regulators ensure a stable and consistent voltage supply to connected components, protecting them from fluctuations that could lead to malfunction or damage. Together, the system ensures sequential heating, optimizing energy efficiency, preventing overheating, and enabling controlled processing conditions in each chamber. This design incorporates relays as switches and heating coils as thermal energy sources, making it suitable for applications requiring precise temperature management. By utilizing timers and relays, the circuit can dynamically adjust the heating process, preventing temperature fluctuations that often lead to incomplete combustion. This innovative approach not only improves the reliability and safety of the incineration process but also contributes to the longevity of the system, making it a more sustainable solution for waste disposal. By focusing on energy efficiency, effective temperature control, and pollution reduction, this design provides a hygienic and environmentally friendly method for disposing of sanitary napkins.

**Structural Design**

The development of a medium-scale incinerator prototype is undertaken with a well-engineered design approach, adhering to the production guidelines established by the Solid Waste Management Committee. The design process prioritizes key constraints, including optimizing size and dimensions, selecting appropriate materials, and ensuring an efficient and functional chamber design. The schematic diagram of the proposed incinerator shows in Figure 2. It has a foundation, primary chamber, secondary chamber, exhaust opening and a chamber opening. The system is designed with maximum dimensions of 30 inches in width, 12 inches in depth, and 36 inches in height, with a total weight, including accessories, not exceeding 25 kg. The machine can be wall-mounted or floor mounted with a separate stand, or placed directly on the floor, providing flexibility in installation. A ceramic-insulated loading door with a minimum size of 4 x 4 inches facilitates safe material loading. During normal operations, the external body temperature of the incinerator is maintained below 27°C, ensuring safe and efficient performance.

 

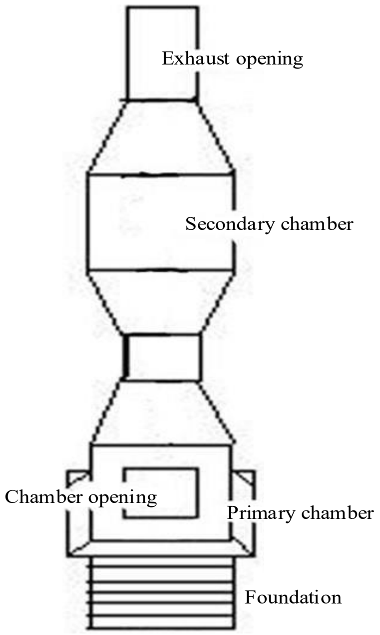


**Figure 2.** Schematic design of incinerator.

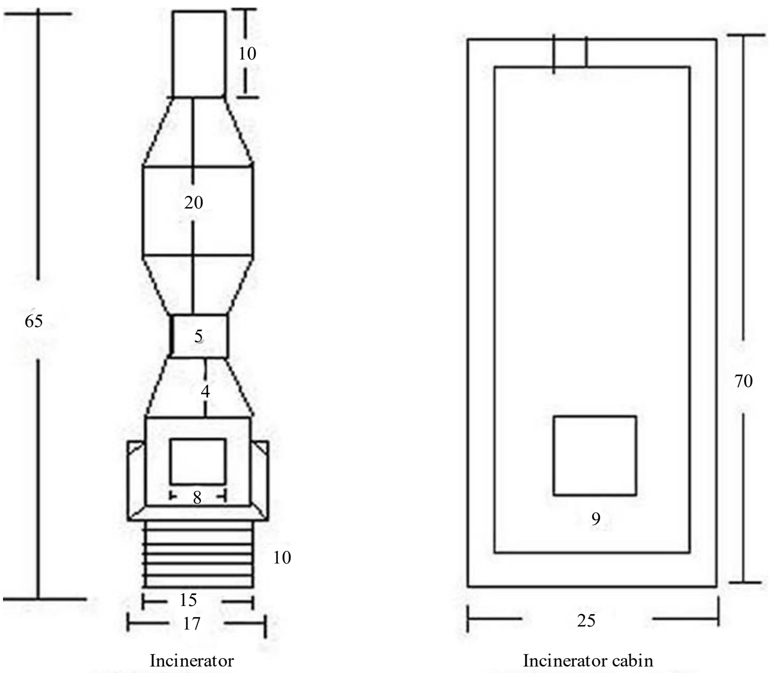


**Figure 3.** Design of incinerator with cabinet.

The incinerator has a total height of 65 cm which serves as the main body, measuring 17 cm in width. Inside, the primary chamber and secondary chamber are included. There is a squared opening in the primary chamber of 8 cm. Additionally, the system includes an exhaust opening with a height of 10 cm, an air outlet with a width of 5 cm and a foundation with width of 15 cm and height of 10 cm. The incinerator cabin structure measures 25 cm in width and 70 cm in height. This enclosure houses the critical combustion chambers where the waste undergoes controlled burning. The dimensions of the cabin are crucial for ensuring adequate space for the combustion process and maintaining optimal operating conditions as indicated in the accompanying Figure 3. These dimensions and features contribute to the overall design and functionality of the incinerator, ensuring efficient waste processing and combustion.

Material selection is crucial for the durability and safety of the incinerator. The incinerator body is constructed from mild steel or stainless steel and insulated with a minimum of 2.0 mm ceramic insulation, utilizing either refractory ceramic (RC) fiber or insulating fire bricks (IFB). The cabinet is made from mild steel sheets or cold-rolled close annealed (CRCA) sheets with a minimum thickness of 1.2 mm, conforming to IS 1079 and IS 513 (Part 1). The emission outlet pipe is a 2-inch galvanized iron (GI) pipe compliant with IS 1239 Part 1. Additionally, the incinerator and cabin are covered with borosilicate material for enhanced safety and performance [9].

The incinerator chamber is designed to handle the disposal of 20 sanitary napkins per cycle. The standard size of a sanitary napkin ranges from 18–24 cm in length, 6–10 cm in width, and 0.3–1 cm in thickness, resulting in a volume of 32.4 $cm^3$ to 240 $cm^3$ per napkin. For 20 pads, the total volume ranges from 648 $cm^3$ to 4800 $cm^3$. Based on the maximum volume, the primary chamber is designed with a minimum capacity of 4800 $cm^3$, while the secondary chamber is configured to retain at least 80% of the primary chamber’s volume, ensuring efficient waste processing. Overall, the design underscores the need for adherence to safety standards and innovative design principles.

## METHODOLOGY

The methodology section outlines the systematic approach taken to design and develop the sanitary napkin incinerator with control circuit. The methodology encompasses a comprehensive analysis of existing waste disposal practices, followed by the formulation of a design framework that prioritizes energy efficiency, temperature control, and pollution reduction. Key components, including designing the materials used for the incinerator, temperature sensors, heating elements, and control mechanisms, are meticulously selected and integrated to create a robust circuit capable of optimizing the incineration process. This section highlights the rationale behind each decision and the anticipated outcomes of the developed system.

### Incinerator Operation

The design process begins with a thorough analysis of existing incineration technologies to identify their limitations, such as incomplete combustion and high energy consumption. This design uses a development of a dual-chamber incinerator circuit that incorporates advanced materials and temperature control mechanisms, ensuring complete combustion and controlled emissions. The operation of the incinerator circuit in the Figure 4 follows a sequential heating control system upon powering up the circuit via the MCB, current flows to all components, energizing both Multispan timers (Multispan 1 and Multispan 2). Multispan 1 initiates a 1-hour turn-off delay timer and activates Relay R1, powering the Primary Heating Coil (C1) to heat the primary chamber. During this period, the Turn-off LED of Multispan 1 remains illuminated. After 1 hour, Multispan 1 deactivates Relay R1, disconnecting C1 and stopping the primary heating process. Subsequently, Multispan 2 begins an 8-minute turn-on delay. During this delay, Relay R3 remains off, and the Secondary Heating Coil (C2) stays inactive, while the Ready LED of Multispan 2 is illuminated. After the delay, Multispan 2 activates Relay R3, powering C2 to heat the secondary chamber.

The circuit includes a K-type thermocouple for temperature monitoring and Nichrome 80 heating elements for consistent heat delivery. The K-type thermocouple provides real-time temperature data, allowing for precise adjustments to maintain optimal combustion conditions. Nichrome 80 is utilized as the heating material due to its ability to generate sufficient temperature efficiently and reliably. A K-type thermocouple is employed as the temperature sensor, offering a wide temperature range and exceptional durability, making it ideal for maintaining precise thermal control in high-temperature applications. Finally, the methodology emphasizes the importance of creating a system that enhances energy efficiency and minimizes environmental impact. By fine-tuning voltage levels through voltage regulators, the circuit can achieve optimal heat intensity while reducing energy consumption.

 

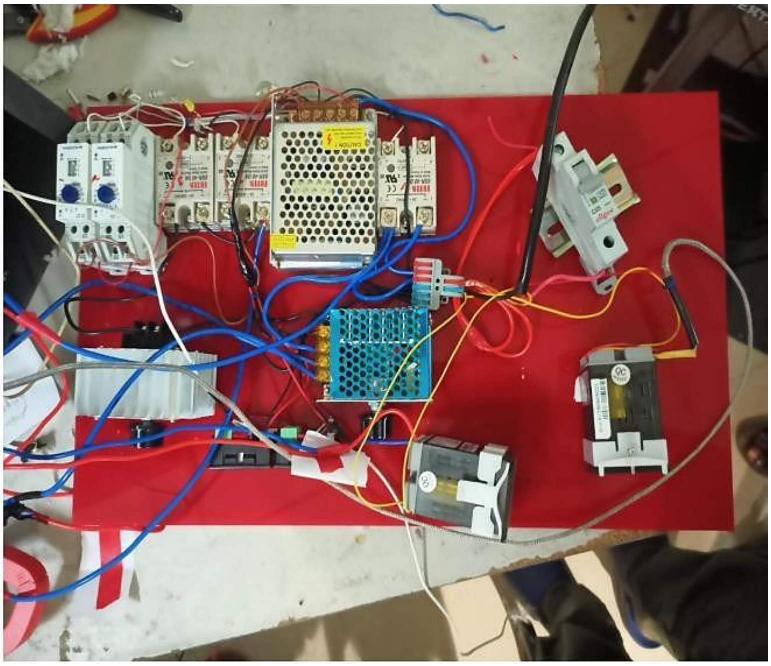

**Figure 4.** Incinerator circuit.

**Operational Mechanism of Chambers**

The chamber system of the sanitary napkin incinerator consists of two distinct chambers: the primary chamber and the secondary chamber, each designed to optimize the incineration process. The primary chamber serves as the initial stage where waste materials undergo preliminary decomposition through heating and drying. This chamber effectively reduces the volume of waste and initiates combustion, allowing for a higher level of initial combustion compared to traditional single-chamber models. The introduction of an intermediate heating stage enhances the efficiency of the incineration process by ensuring that the waste is adequately prepared for the subsequent combustion phase. Following the primary chamber, the pollutants is transferred to the secondary chamber, which is engineered to reach significantly higher temperatures. Figure 5 shows structural design of chambers. The primary chamber has a height of 20 cm, width of 15 cm and length of 18 cm, while the secondary chamber has a height of 20 cm, width of 15 cm and length of 15 cm. There is an air outlet present between the chambers with a diameter and height of 5 unit, respectively. This chamber is equipped with a heating coil that operates under precise control, ensuring that the waste materials are subjected to optimal burning conditions. The primary chamber coil heats up to 450°C, while the secondary chamber coil reaches temperatures of up to 950°C, ensuring efficient combustion. The primary chamber is governed by a 1-hour turn-off delay timer, allowing the heating coil to operate for a full hour before automatically shutting off. Also the system enters a secondary phase, where an 8-minute turn-on delay timer is implemented for the secondary chamber. During this delay, the system prepares the secondary chamber for activation, ensuring a controlled heating process. These timers ensure a sequential and well-regulated heating cycle. By effectively managing airflow and temperature, the chamber system not only facilitates complete combustion but also minimizes harmful emissions, making it a sustainable solution for sanitary waste disposal.

The dual-chamber system achieves complete combustion compared to conventional incinerators, leading to a significant reduction in the volume of waste and the generation of harmful byproducts. The precise temperature control and optimized energy consumption are expected to lower operational costs while ensuring compliance with environmental standards. Additionally, the performance analysis demonstrates a marked decrease in energy consumption, with the proposed circuit design effectively regulating power usage throughout the incineration process. Figure 6 illustrates the incinerator prototype.

 

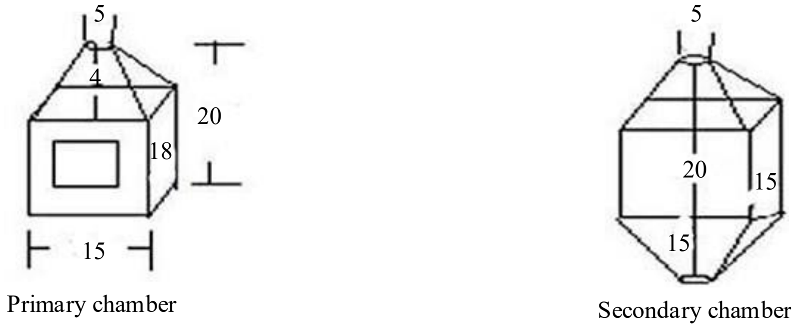


**Figure 5.** Structural design of chambers.

**Figure 6.** Prototype of incinerator.

## RESULT ANALYSIS

The section provides a comprehensive evaluation of the performance and efficiency of the proposed designed, particularly in terms of energy consumption, combustion efficiency, and emission levels. This section aims to highlight the key findings that demonstrate the advantages of the dual-chamber system and its potential impact on sustainable waste management practices. The various metrices are analyzed, including current and energy consumption patterns, temperature stability, and overall operational efficiency. Graphical representations is utilized to visually convey the performance differences between the proposed design and traditional systems, providing clear insights into the benefits of adopting advanced technologies in sanitary waste disposal. The results analysis not only serves to validate the design's effectiveness but also emphasizes its broader implications for public health and environmental sustainability, setting the stage for informed discussions on future applications and improvements. Figure 7 shows the final setup of proposed incinerator.

### Analysis of Current Consumption

Current consumption analysis reveals significant differences between the conventional incinerator system and the newly designed model, particularly in terms of stability and efficiency. The conventional system operates with a peak current draw of approximately 10 amps, regulated by a thermostat that cycles the heating element on and off to maintain temperature. This method results in fluctuating current levels, leading to abrupt spikes and dips in power consumption, which not only increases energy waste but also creates inconsistencies in temperature maintenance. The average effective current, calculated using the RMS value, is approximately 5.77 amps, reflecting the inefficiencies inherent in the conventional system's design. In contrast, the proposed incinerator design incorporates a voltage regulator that stabilizes the current draw at around 4.7 amps. This steady current consumption eliminates the abrupt fluctuations seen in the conventional system, allowing for more consistent power usage and improved energy efficiency. The controlled current profile ensures that the system operates within optimal parameters, reducing energy waste and enhancing overall performance. The analysis indicates that the proposed design's ability to maintain a stable current not only contributes to lower operational costs but also supports better environmental outcomes by minimizing the energy footprint associated with sanitary waste disposal. Overall, the current consumption results underscore the advantages of adopting advanced technologies in incineration systems, highlighting their potential for sustainable waste management.

**Energy Efficiency Analysis**

The energy consumption analysis between the conventional incinerator system and the proposed system in Figure 8 reveals a marked improvement in efficiency, underscoring the benefits of integrating circuit technologies into waste management practices. Over a 1.75-hr operational period, the conventional system consumes a total of 869,250.5 joules (J), primarily due to its reliance on a thermostat for temperature regulation. The abrupt power cycling inherent in this system results in significant energy losses, as a large portion of the electricity consumed is not effectively utilized for the intended heating purposes. In contrast, the proposed incinerator design demonstrates a substantial reduction in energy consumption, utilizing only 708,055 J over the same period [10–12]. This represents an impressive energy savings of approximately 18.6%, attributed to the system's ability to maintain a steady current draw of around 4.7 amps, facilitated by a voltage regulator that minimizes energy waste. The consistent power usage not only enhances the overall efficiency of the incineration process but also contributes to lower operational costs and a reduced ecological footprint. The energy consumption results highlight the potential for significant cost savings and environmental benefits, reinforcing the importance of adopting innovative designs in the pursuit of sustainable waste management solutions [13–15].

**Figure 7.** Final setup of proposed incinerator.

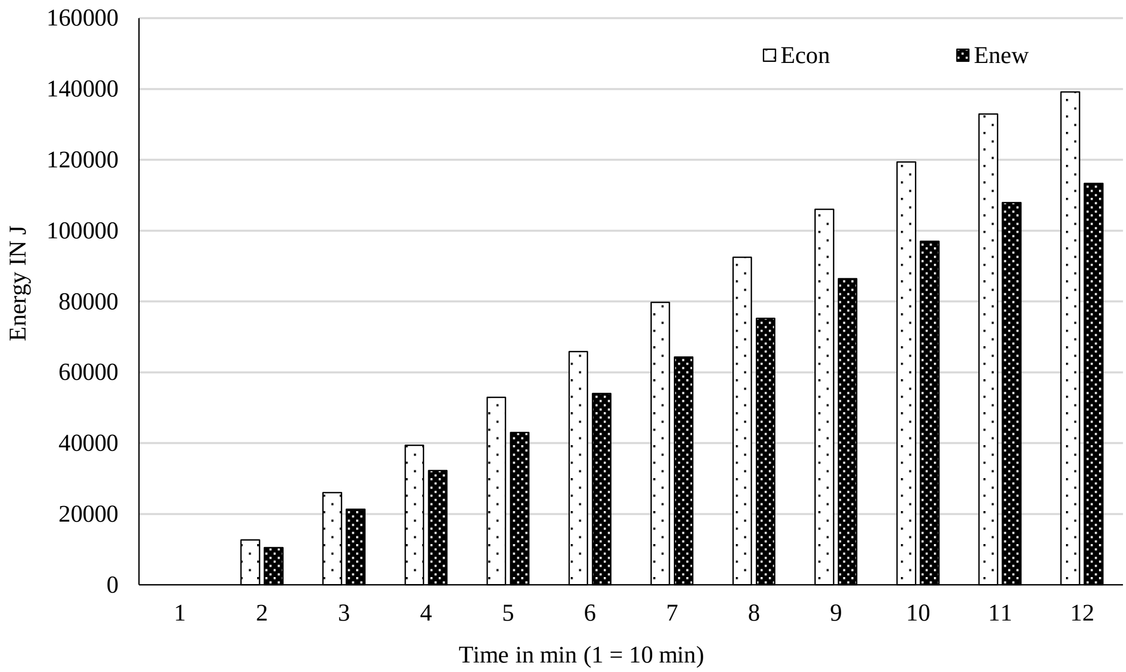


**Figure 8.** Energy consumption graph.

**Emission Control Assessment of the Incinerator System**

The proposed incinerator demonstrates a substantial improvement in emission control compared to conventional single-chamber systems in Table 1. By adopting a double chamber design, the system achieves significant reductions in harmful pollutants. Carbon dioxide (CO2) emissions, for example, are reduced by 600 units, while particulate matter (PM) and volatile organic compounds (VOCs) are decreased by 100 and 25 units, respectively. Notably, emissions of nitrogen oxides (NOx) and sulfur oxides (SOx) are reduced by 50 and 5 units, ensuring a cleaner operational process. Additionally, the system cuts down the release of polychlorinated dibenzo p-dioxins and dibenzofurans (PCDDs/PCDFs) by 0.05 units, addressing critical environmental concerns associated with conventional incineration practices. These reductions highlight the efficiency of the double-chamber system in achieving more complete combustion and minimizing the release of hazardous pollutants [16–18]. The inclusion of advanced temperature control and optimized airflow mechanisms in the design ensures compliance with modern emission standards. By drastically lowering emissions of fly ash and hydrochloric acid (HCL) along with other pollutants, the new system sets a benchmark for sustainable incineration technologies, addressing both public health and environmental challenges.

**Comparative Analysis**

The comparison between conventional incinerator models and the proposed incinerator system reveals significant advancements in design, efficiency, and environmental impact shown in Table 2. Traditional incinerators typically feature a basic single combustion chamber and rely on standard thermostats for temperature control, which often results in incomplete combustion and higher levels of harmful emissions, such as dioxins and furans [18–22]. These systems are characterized by high energy consumption, operating at approximately 10 amps at 230V, leading to elevated operational costs. Furthermore, their limited pollution control measures contribute to potential public health risks, particularly in communities with inadequate waste management infrastructure. In contrast, the new advanced incinerator system incorporates a multi-chamber design and an energy efficient temperature control circuit, optimizing combustion for complete waste destruction. This innovative approach significantly reduces energy consumption to around 5 amps at 230V, enhancing operational efficiency and lowering long term costs. Additionally, the integration of advanced pollution reduction strategies minimizes harmful emissions, promoting better public health outcomes.

 

**Table 1.** Emission control.

| Pollutant | Reduction(%) |
|---|---|
| $CO_2$ | 15.79 |
| CO | 50 |
| PM | 50 |
| VOCs | 50 |
| Nox | 33.33 |
| Sox | 25 |
| HCL | 30 |
| PCDDs/PCDFs | 50 |
| Fly Ash 25 | 25 |

**Table 2.** General comparison.

| Features | Traditional model | Proposed model |
|---|---|---|
| Size | Larger | Modular |
| Design | Single chamber | Multiple chamber |
| Temperature control | Std Temperature control with thermostat limited control | Energy-efficient temperature control |
| Combustion Efficiency | Incomplete combustion | Complete combustion |
| Energy Consumption | Approx 10 amps at 230V Emissions. | Approx. 5 amps at 230V |
| Emission | Higher of emissions levels harmful approx. | Reduced emissions through advanced technology |
| Public Impact Health | Potential health risks due emissions | Enhanced public health safety through reduced emissions |

Designed to be cost-effective and accessible, particularly for rural areas, the new system addresses the limitations of traditional models, offering a more sustainable and environmentally friendly solution for sanitary napkin disposal. Overall, these advancements underscore the potential for improved waste management practices that prioritize both environmental sustainability and public health.

### Key Advantages of Proposed Design

The proposed incinerator offers several significant advantages that enhance its overall performance and sustainability. One of the primary benefits is its improved energy efficiency, achieved through the integration of a voltage regulator and a temperature control circuit [16–18]. This design allows the incinerator to maintain a stable current draw of approximately 4.7A, significantly reducing energy consumption compared to traditional models that often operate at around 10A. As a result, the proposed system not only lowers operational costs but also minimizes the carbon footprint associated with energy production, making it a more environmentally friendly option for waste disposal. The circuit demonstrates a broad range of application versatility across various industries, primarily in the control of air emissions, ensuring compliance with environmental standards. It also plays a significant role in cost effective drying processes for agricultural products such as fish, meat, grains, rice, and spices on plantations [23–25]. Additionally, the circuit contributes to energy-efficient operations in electric ovens, stoves, and heating furnaces, enhancing energy savings and reducing operational costs in these systems [19]. This reduction in emissions contributes to a cleaner environment and mitigates health risks associated with air pollution. Overall, these advantages position the new incinerator as a sustainable and responsible solution for the disposal of sanitary napkins, addressing both environmental and public health concerns.

## CONCLUSION

The article highlights how crucial it is to have efficient incineration and waste management procedures in place, particularly in schools and other educational settings. Effective handling of menstrual waste is crucial in order to avoid health risks like toxic shock syndrome and reproductive illnesses. The work discusses a novel sanitary napkin incinerator which significantly tackles these problems. In general, the results emphasize the significance of sustainable waste management practices in safeguarding public and environmental health. The paper suggests taking preventative actions for effective waste management and disposal in schools, particularly emphasizing incineration.

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