

## CASE STUDY

### Smart Design Meets Sustainability: Reinventing the Composter Bin



#### ► Introduction

With sustainability becoming a central focus across industries, the demand for efficient and durable composting solutions has been steadily increasing. However, traditional composter bin designs presented several challenges – high material costs, corrosion-prone components and time-consuming assembly processes that limited overall cost efficiency.

A leading waste management equipment manufacturer approached us, seeking a partner capable of enhancing the value and functionality of their composter bin through design innovation and process optimisation. We undertook the project with a clear objective to develop a cost-effective, durable and high-performance solution that aligns with the principles of sustainability and manufacturing efficiency.

#### ► Key Challenges

During the initial review, our team identified multiple operational and design challenges:

- **High Material Costs:** The existing design used costly stainless-steel components such as plates, rods and pipes, significantly increasing production costs.
- **Extended Assembly Time:** The complicated design and use of non-standard parts resulted in longer assembly durations and higher labour costs.
- **Rust and Durability Issues:** Metal parts were prone to corrosion, affecting product longevity and appearance.

## ► Solutions

To address these challenges, our team implemented a series of design, process and material-based improvements:

- **Material Substitution:** Replaced all stainless-steel components with durable plastic alternatives, including:
  - a. SS plate → FRP sheet
  - b. SS pipe → Rotomoulded plastic pipe
  - c. SS strip → Plastic nut
  - d. Metal rod → Nylon rope
- **Standardisation:** Introduced standard methods for drilling, assembling and using in-mould brass inserts, ensuring consistency across all production lots.
- **Design Optimisation:** Unified two breather sizes into a single optimised design to simplify inventory and assembly.
- **Process Improvement:** Conducted performance trials and validations to ensure durability, functionality and customer satisfaction before full-scale implementation.



## ► Results

### Tangible Results

- **Cost Reduction:** The redesigned solution delivered considerable cost savings per unit, enhancing the customer's competitive advantage in the market.
- **Assembly Efficiency:** Assembly time reduced by one hour per unit, enabling quicker production cycles and faster dispatch.
- **Improved Durability and Handling:** Product weight decreased by 7 kg, improving handling and transportation.
- **Rust-free Performance:** Replacement of metal with plastic eliminated corrosion issues entirely.

### Intangible Benefits

- Elevated product aesthetics and market appeal.
- Strengthened customer competitiveness through value-added innovation.
- Improved sustainability by reducing metal usage and overall carbon footprint.

## ► Conclusion

This project showcases the power of collaboration in addressing customer challenges – delivering tangible cost efficiencies, elevated performance and greater product value. It stands as a testament to our dedication to engineering excellence and customer-driven innovation, driving lasting progress in sustainable manufacturing.