

Report on Industrial Visit to



Date: 17.04.2025

Participants: B.Tech Mechanical, VI Semester B Section - 25 students

Coordinator:

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Dr. N. Ravikumar, Asst. Prof. Sr. Gr., Mechanical

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Location: Thejo Engineering Ltd. Unit-1, 176/3, Alingivakkam Post, Irulipattu Village, Ponneri Taluk, Chennai – 600 067.



Overview:

The students from III Year Mechanical Engineering B Section of B.S Abdur Rahman Crescent Institute of Science and Technology embarked on an industrial visit to the manufacturing facility of Thejo Engineering Ltd. located in Ponneri, Chennai on 17.4.25. An Airconditioned bus was provided by the institute for the travel to the industry from the institute. Our faculty members Dr. A. Arockia Julias and Mr. S. Loganathan accompanied the students.

The primary objective of the visit was to provide students with practical insights into the operations and manufacturing processes of a leading industrial organization, focusing on Rubber products manufacturing.

Upon arrival, the students were warmly welcomed by their staff, provided refreshment and ushered into the rubber products manufacturing plant. The students were able to visualize and understand, the following aspects.

A guided tour of the manufacturing plant was conducted by their staff Dr. Murali Manohar, where students witnessed various stages of rubber gasket and liners used in the ball milling machines.

The tour also included visits to the testing section, where students learned about their commitment to innovation and quality practices in developing new products.

Insights of the visit:

During the visit, students had gained knowledge and exposure in many Basic of manufacturing process as listed below.

- Compression moulding of Rubber
- Casting of Poly Urethane
- Vulcanization
- Injection moulding
- Autoclave drying
- Extrusion
- Steam boiler
- Pressure relief valves

Students visited the testing facilities centre and learnt about the structural strength, tensile strength, extent of deformation, stiffness, rigidity and various mechanical properties of different products whose properties are interlinked with each other.

Students were also given insights on the design aspects of mould used for different products and their engineering analysis including FEA.

Facilities available for manufacturing of GRATOR ball mill liners:

1. Material Preparation:
 - a. Rubber: They start by preparing a specialized rubber compound that's mixed with additives to enhance wear resistance. This compound is tested to ensure it meets the required standards for flexibility and durability.
 - b. Polyurethane (PU): PU material is also prepared for the filtering screens. Thejo ensures this material has the right properties for abrasion resistance and flexibility.
2. Steel Frame Preparation:

Steel Core: They cut and clean steel frames or cores that will be embedded within the rubber. This steel core provides the necessary structural support for the liners.
3. Rubber Molding and Formation:

Molding: Thejo uses molds to shape the rubber around the steel frames. This is done through compression or injection molding, which ensures the rubber forms a strong bond with the steel and takes the correct shape for the ball mill liner.
4. PU Screen Manufacturing:

Forming Screens: They process PU into thin sheets or screens, using casting or extrusion methods. These screens are cut to fit the specific needs for filtering within the liners.

Fitting Screens: The PU screens are then carefully fitted into designated cavities or slots within the rubber liners.
5. Vulcanization:

Heating: Thejo places the assembled liners, with the steel frames and PU screens, into a vulcanization press or autoclave. They heat the liners to cure the rubber, ensuring it bonds firmly to the steel and achieves the desired strength and flexibility.
6. Cutting and Shaping:

Trimming: After vulcanization, they trim the liners to remove any excess material and cut them to the exact dimensions needed for the ball mill.
7. Finishing: Additional surface finishing is done to ensure the liners have a smooth, high-quality surface.

Students Learning outcome

1. Overview of Operations

- **Facilities:** The visit showcased Thejo Engineering's state-of-the-art manufacturing facilities, including areas for material preparation, molding, and vulcanization.
- **Processes:** Observed the comprehensive manufacturing processes for products like ball mill liners, rubber coatings, and PU screens.

2. Manufacturing Insights

- **Material Preparation:** Gained insights into the preparation of specialized rubber compounds and polyurethane materials used in their products.
- **Steel Frame Integration:** Learned about the process of integrating steel frames with rubber linings and the methods used to ensure strong adhesion and durability.
- **Molding and Vulcanization:** Witnessed the use of advanced molding and vulcanization techniques to shape and cure rubber and composite materials.

3. Product Details

- **Ball Mill Liners:** Saw how the rubber skeleton and PU filtering screens are combined to create high-performance liners for ball mills.
- **Custom Solutions:** Observed the customization capabilities for different industrial applications, including various shapes, sizes, and material properties.

4. Quality Control

- **Inspection Procedures:** Learned about the rigorous quality control measures, including testing for hardness, flexibility, and wear resistance.
- **Testing Methods:** Saw the equipment and techniques used for ensuring product quality and performance.

5. Technological Advancements

- **Innovation:** Noted the use of innovative technologies and processes, such as advanced vulcanization presses and precision molding techniques.
- **R&D Focus:** Gained understanding of their research and development efforts aimed at improving product performance and developing new solutions.

6. Environmental and Safety Practices

- **Sustainability:** Observed Thejo's commitment to sustainable practices in material sourcing and waste management.
- **Safety Standards:** Noted adherence to safety regulations and best practices in the manufacturing process.

Overall outcomes of the Visit:

The industrial visit proved to be exceptionally successful, exceeding expectations in terms of educational value and experiential learning.

Acknowledgement

We thank the management and officials of Thejo Engineering Ltd., for giving us this opportunity to visit their manufacturing unit and providing us various insights on the fabrication of rubber products.

We also thank the management and officials of our institute for arranging a wonderful industrial visit and providing us transport facility.