INDUSTRIAL VISIT REPORT Department of Mechanical Engineering APSIT, Thane.



A Report

On

"INDUSTRIAL VISIT TO BRICK & BYTE INNOVATIVE PRODUCTS PVT. LTD."

TE/Mech/Sem-V/CBCGS/ (A. Y. 2018-19) Date of Visit – 20th October, 2018

INTRODUCTION

Brick & Byte is a premier Indian multi-national company with more than two decades expertise of experience in providing Integrated Advance Engineering Services & Solutions.

Our Integrated Engineering Services (Concept to Manufacturing) include Integrated Engineering Services (Concept to Manufacturing) in Embedded and Mechanical Engineering domains, mechanical designing, manufacturing, embedded designing and electronic manufacturing.

IT Services including Software Applications, Mobile Applications and SAP custom web application development, mobile development, SAP implementation, product management, UI/UE designing, cloud computing, etc.. We support offshore as well as onsite development model.

Manufacturing services including sheet metal fabrication, Rapid Prototyping, Precision Manufacturing and Finishing Processes. It covers operations like CNC punching, bending, assembling, fabrication, powder coating, etc.

Renewable Energy services include EPC for setting up Solar plants, Solar thermal applications, rural electrification and Solar system for water pumps.

Our Solutions & Products include Transport & Toll products, Machine-to-Machine (M2M) solutions, and Smart Metering solutions. When we visited the company they were manufacturing electric cabinets for VERTIV ENERGY PVT. LTD. The guide showed us different operations required to make the cabinet. The step by step operations performed were

1) Punching

The punching operation was performed on a sheet of Mild Steel of thickness 1.2 mm and size 1900*1250 mm. The machine used for punching was FINN POWER. The machine had a tonnage of 56 tons. It had 20 tools on turret. The machine had a brush bed. There was another machine with roller bed. It was an automatic machine on which program was inserted to do the operation. The programming software used was NCX express and the software used is Siemens or Fanuc. The % utilization of the sheet was 85.6%. Time required to punch one sheet was 7.49 minutes. The machine performed operation on 60 sheets per day.



FINN POWER



ROLLER BED



PUNCHED SHEET

2) Bending

After punching the sheet is sent to the next station where bending operation is performed on it. In bending the sheet is bent in the form of cabinet. For the operation 4 workers were required. 4 of them holded the sheet and then pushed it up against the die. One worker operated the machine with his foot on foot clamp. The machine used for bending was **Amada FB3-1030**. The machine was a hydraulic operated press. It had a capacity of 100 tons. There we saw different types of dies like simple dies and dies with radius. It was also a CNC machine and a program was used to do the bending at proper distance. We saw the different components of the machine like back gauge, bending die, bending punch etc. another machine used was **Bystronic AFM EP100.** It also had a capacity of 100 tons.



AMADA 1030



BENDING PUNCHES FOR BEND WITH RADIUS



BEND COMPONENTS



BENDING DIE AND PUNCH WITH BACK GAUGE

3) Fabrication

After bending several components of the cabinet the parts were sent to fabrication department. There the workers did fitting of the parts with hammers and other tools. After fitting, to make the joint secure it was sent to the welding station. The worker performed Metal Inert Gas Welding. The gas used was carbon dioxide. The metal wire used was of M.S and was plated. It was 0.8 mm thick wire. The nozzle of the welding gun was made of copper. Nozzle gel was applied on the component when there was a break between the weld so that the welding has a good finish. For further finishing, the weld was ground with a grinding machine. Another welding used was stud welding. It uses high electric current and force to do the welding.



MIG

STUD WELDING

4) <u>Powder coating</u>

The welded and semi assembled components were sent for powder coating and paint. Powder coating was done in a different company so the parts were sent for powder coating and finished parts were received with paint done.

5) Final assembly

The final assembly was done on the first floor of the company. There all the parts were brought together like the body, door, wires, nuts and bolts, rivets shelf, glass etc. operations like nut insertions, riveting, clamping were done in this section. The tools used for clamping and riveting were pneumatic operated tools. And then final product was ready.



FINAL PRODUCT

6) Inspection

The inspection and quality control department checks the final products and looks for any flaws or damages before delivering the product. Inspection is done on every stage of manufacturing. If any mistake in the production is found like dimension mistake or defects in welding, the product is rejected. After the inspection the product is packed and sent to the company. This is how the production took place.

This all was observed in the industrial visit. The participants of the Industrial Visit wish to thank **Prof. Nikhil V. Khatekar**, Subject in charge of Press Tool Design, and **Prof. Nikhil D. Desai** to show all aspects of Sheet Metal working and various other processes, making the visit a valuable learning experience.



THANK YOU