# WEEK -1 REPORT Internship – Centum Electronics Limited

Name: Asif Muhammad Sadhik

Day 1 – Induction Program.  
  
Centum electronics is an electronics based company founded by Mr. Apparao which makes its product for Aerospace and defence sector mainly. Centum electronics has three units:-

1. SEBU
2. EMS
3. T & S

Centum has its roots at Europe, Asia and US.. with 55% income from Europe, 15% from US and 30% from Asia.

Centum guarantees its products for at least 25+ years. Major customers of Centum electronics are ISRO, Airbus, Rafael, Indian Ministry of Defence and etc.  
Centum holds high standard and dedication for its customer satisfaction.

The induction program was handled by Mr Jaison.

Day – 2 Production and Process

* Two type of manufacturing methods
  + BTP (Built to Print)
  + BTS (Build to Spec)
* The manufacturing process starts by preparing the soldering paste.
* According to the application, different soldering paste can be used.
* The soldering paste is laid on top of the desired location or placement on the pcb through a stencil. The stencil ensures the placement of the soldering paste at its accurate position.
* Once soldering paste is laid on, the accuracy of the solder placement and its thickness is analysed by an analyser (KOH YOUNG).
* The analyser is programmed using a software.
* Once the solder is analysed, the components are placed on top of the desired location with a pick and placer machine. The pick and placer is designed with a software. The location is mapped by X,Y coordinates. The changes can be doned through the software in case the design of the pcb changes.
* The placed board goes through the reflow for heating process and let the solder melt and attach to its placement. The reflow mechanism is divided into 10 heat zones. Each for sequential increment of temperature and the last two are for cooling down.
* The PCB is baked for removing the moisture.

The topic on process is covered by Mrs Asha.

* Production Process start with inferring and understanding the demands of the customer.
* The customer can give either BTS or BTP order. In BTP, the customer will provide every design, components and every aspects regarding the product, which the team has to manufacture. In BTS, only the vital requirements are given, left all should be designed by the team.
* Once the demands are retrieved, the design is analysed.
* The raw materials, resources and technology all are researched and sorted out by the industrial engineer.
* Then the procedures for making the product will be laid out which the manufacturing and assembly team has to follow while making the product (SOP).

Hybrid Micro- Circuit : -  
Hybrid Microcircuits (HMCs) are compact, high-reliability electronic circuits where multiple components—such as resistors, capacitors, semiconductors, and even integrated circuits (ICs)—are assembled together on a ceramic or glass substrate to form a single functional module.

* Ceramic is used for HMC due to its non-conductive properties and its resistivity to temperature.
* On the ceramic substrate, the path for is fired.
* On it the chip resistors, capacitors and other components are placed.
* The wire is bounded to the I/O ports from the HMC.
* Later a layer of epoxy and sealing is done for its protection for environmental variations such as difference in temperature, pressure, shock and etc.
* The topic on HMC is covered by Mr Narasimman and Mrs Beena.

Day 3 – Testing and Screening

Equipment Briefing:-

Equipment introduced:

1. DC power supply
2. LCR equipment
3. Multi meter
4. Cathode ray Oscilloscope
5. Function generator

On board components:

1. SMP components
2. Leaded components
3. Chip resistors and capacitors
4. Leaded resistors and capacitors\
5. Heat sink

* The wires used to connect the different components have either a male plug of pointed pins or female socket with inward socket.
* The testing region’s first two section are for testing the input and output electrical parameters. Here the voltage, current and similar parameters are measured and looked after.
* The component called Jig is used to check the or test the desired output.
* The Jigs are inhouse designed and built components for testing the certain products.
* Some of the jigs used are for testing the electrical parameters, RF reading and others.
* The RF testing check for the RF transmittance and receiving. Here the input amplitude and frequency is forwarded as input and at the output the harmony, noise margin and gain are mapped with required output values.

Testing procedure with jigs

* The power supply is provided to the Jigs, then from the jigs it goes to the precision capacitance and resistance box from where the precise input goes to the component. From the component, each output is connected back to the Jig to monitor the output.
* Various types of tests:-
  + Electrical test
  + Burn in test (high temperature)
  + Thermal Cycle (Both high temperature and low temperature)
  + Leak test – Gas leak and liquid teak test
  + Vibration test – sin,random and bump test.

In x,y,z directions. Max g force is 75grms

Day 3 on testing and Screening is covered by Mrs Sohana and the topic on Quality management is covered by Mr Harish.

DAY – 4 Visit to EMS

Electronic Manufacturing Solutions

EMS is the mass production plant of centum electronics located at the Bengaluru Aerospace Park. The EMS is about 20x larger area compared to SEBU giving it’s the area for mass production and machinery handling. The EMS is more specialised in BTP and SEBU is specialised in customized production.

Apart from the SMT machines EMS has a variety of other machineries for the fast manufacturing of its products.

Some of the machineries found at EMS are:-

* Wave Soldering Machine - A Wave Soldering Machine is an essential piece of equipment used in the mass production of printed circuit boards (PCBs), especially for through-hole components. It provides a fast and reliable way to solder multiple connections simultaneously by passing the board over a wave of molten solder.
* Vertical Storage System - A Vertical Storage System is an automated or semi-automated storage solution that utilizes vertical space instead of horizontal floor area to store, retrieve, and organize components or tools, commonly used in manufacturing, warehousing, and assembly environments.
* HASS testing :- Highly Accelerated Stress Screening
* FTP : - Flying Probe Test
* X- Ray Testing

Some of the products manufactured at EMS are:-

* Public announcement units for metro
* Flight recorder (Black Box)
* Rafael radar
* Power Supply
* In flight entertainment system
* Load distributor (ABB)

Day 4 at EMS is handled by Mr Subramani.

The first week of the internship at Centum Electronics provided a comprehensive overview of the company’s operations, core values, and high-reliability manufacturing standards. This foundational week helped us understand the workflow, quality standards, and precision-driven culture at Centum, setting the stage for deeper technical engagement in the weeks to come.