

ABSTRACT

Laser welding itself was challenging as there was no formal data available much on the internet and due to material properties, it gets much harder to laser weld due to its high reflection, thermal conductivity, and low absorption. It gets more difficult for a person to found the correct way to weld at what speed and power. However, I glad that my industrial training in **“Sahajanand laser technology ltd. sector 26, Gandhinagar 382024”** has provided me the resources to make that possible with effective measurements.

I came to know about different operations arranged in sequence to meet the product completion on time. Many technologies were seen on the premises and all the machines and operations differed from each other. Moreover, the company used its own laser cutting machine (LCM) to produce their laser cutting machine (LCM), laser marking, and laser welding machine. Laser welding includes various criteria before actually welding two metals together. The welding parameter differs from material to material. In this report, some images and weld quality were mentioned according to standards and review in detail. The ion lithium battery has had 22 cells connected in parallel connection. The plate was kept on those terminals and then welded. While doing this experiment we observe the linear working of laser machine, power vs depth relationship

The machine capacity was capable of up to 3 kW in 3 directional axis the moment was in x, y, and z-direction. The laser head can only move in the z-direction and rest in the x and y direction as 3-d printer machine. The machine was capable of performing the 10,000-feed rate speed (mm/min). The major task was to found the power, distance between the weld material to beamed head, cycle time, the speed with the percentage of duty cycle, and penetration of weld bend. After analysing the review paper and working practically on the machine one can find the parameters according to requirement. The defects in the weld are identified and tried to eliminate. After finding the parameters according to the requirements of the company we need to do this on an actual lithium-ion battery. The plate of AL is kept on battery and then they both are welded using a laser machine. The fixture was also designed by the company to reduce gaps during welding. Overall, the plate thickness was mm and the terminal thickness was 1.5mm. overall the thickness of laser welding is 3mm and its position to weld is spot/lap weld. One needs to be accurate while doing laser welding because if the weld line goes in the wrong direction/more penetration achieves formerly needs then the liquid lithium-ion will come out from that battery any battery will be damaged. There were some recent developments were going on laser welding and trying to make a library to find out the perfect welding parameters for different material.

IMPORTANT KEYWORDS:

- Aluminum material
- Laser welding
- Power
- Depth of penetration
- Lithium-ion battery