4.7 TRIMMING OF MATERIAL

It is a term used for describing the manufacturing process of using a laser to adjust the operating parameters of an electronic circuit

Process of Laser Trimming

Laser trimming is the controlled alteration of the attributes of a capacitor or a resistor by a laser action. Selecting one or more components on the circuit and adjusting them with the laser .The trim changes the resistor or capacitor value until the nominal value has been reached. Usually laser is used to burn away small [portions of resistor, raising the resistance value. The burning operation can be conducted while the circuit is being tested by automatic test equipment, leading to extremely accurate final values for trimming of resistors. The resistance value of a film resistor is defined by its geometric dimensions as well as the resistor material. A lateral cut in the resistor material by the laser narrows the current flow path and increases the resistance value. The same effect is obtained whether the laser changes a thick film or a thin film resistor on a ceramic substrate.

Types of Trim:
Passive Trim:

It is the adjustment of a resistor to a given value

Active Trim

If the trimming adjusts the whole circuit output is called active trim. During the trim process, the corresponding parameter is measured continuously and compared to the programmed nominal value. The laser stops automatically when the value reaches the nominal value.

Construction and Working:

The resistor to be trimmed is kept inside a [pressurized chamber below the surface of the tempered pressure glass. The laser beam is made to fall on the resistor arrangement and the change of value continuously monitored. After perfect arrival of nominal value, the next resistor arrangement is put into the experimental set up.

Advantages:

- Better cleanliness when compared to conventional method of abrasive trimming. Better control of final resistance. Result in a higher yield the larger fraction of the resistor are obtained within the prescribed tolerance