

# Modification and Fabrication of Seam Welding Machine

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**Abstract-** Resistance seam welding process is used the heat generated from the resistance to the flow of current. This heat is used to obtain the weld. Seam welding process requires continuous flow of current. Hence large current consumption is one of the drawback of this process, which is try to remove by make a small machine for LAB of collages. The objective of this project is to reduce the power consumption of the collages by limiting the current usages of seam welding machine.

## 1.INTRODUCTION

### Resistance Welding Process

Resistance welding is a group of welding processes where in combination is produced by the heat obtained from resistance of the work to the flow of electric current in a circuit of which the work is a part, and by the application of pressure. Heat is developed in the part to be welded and pressure is applied by the welding machine through the electrodes. There is no external heat source. No fluxes or filler metals are used. Current for resistance welding is usually supplied through a welding transformer which transforms the high-voltage, low-amperage power supply to usable high amperages at low voltages. Pressure, or more properly, the electrode force, is supplied either by air or oil pressure through cylinders, mechanically by cams, manually by foot or hand levers through linkages or some other means.

### Heating Fundamental

In an electrical conductor, any current flow creates heat. The three factors that affect the heat generated in resistance welding are expressed in the formula

Where

$H = I^2 R T$  H = heat generated in joules

I = current in amperes

R = resistance of the work in ohms

T = time of current flow in seconds

The formula shows that the heat generated is proportional to the square of the welding current and directly proportional to the resistance and the time. The total heat generated is partly used to make the weld and partly lost to the surrounding metal.

### 1.1 Literature Review

1. Shaikh Ozair<sup>1</sup>, et.al(2018) In this research paper author give the statement ,In the previous seam welding machine author found the some problem such as, electrode wearing over hitting on machine and to solve the problem by to increase the proper tip dressing ,to chromium coating on electrode and to provide cooling system.

2. Vijayan.S.N, et.al(2017) In this research paper author give the statement ,In the previous seam welding machine author found the some problem such as, root welding from inside avoided and no more root grinding from inside .

3. K.H.Inamdar ,et.al (2017) In this research paper author give the statement, In the previous seam welding machine author found the some problem such as, seam welding properties and to contribution of welding current toward nugget width is 78.38%.

4. Hairol Nizam, et.al (2016) In this research paper author give the statement in this pervious seam welding machine author found the some problem such as, weld off set part and to reduce noise of seam welding machine.

5. Gajanan S. Gaikwad, et.al(2016) In this research paper author give the statement ,In the previous seam welding machine author found the some problem such as, high current and welding of different material like aluminum sheet metal . The relationships between tensile strength and three controllable process such as welding current, electrode force, and welding time.

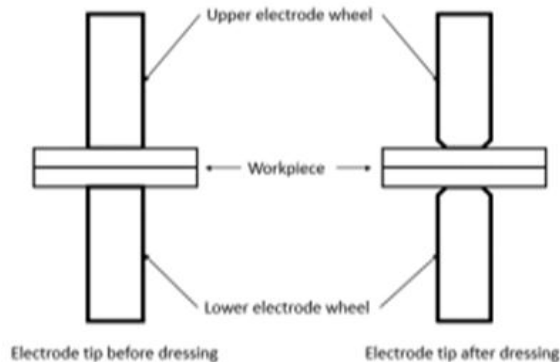
## 2. WORKS ON PROJECT

### Scope of works

This experimental work aims at reducing the power consumed by the seam welding machines by reducing the current consumption of the machines. It is carried out at “NIT polytechnic” in Nagpur. The investigations are carried out to identify the parameters that are causing the increase in the power consumption of the machine. After identifying the required parameters we try to optimize the parameters by making suitable changes in the seam welding machine.

### Problem identification

It takes very high voltage and current. Electrode wear and tear problem. High heat produce during welding. It cannot weld the thickness of plate more than 3mm.



### Effect of electrode force on welding current

The air pressure is required to clamp the workpiece and apply proper electrode pressure to obtain satisfactory weld. The air pressure required by the seam welding machine is 0.5 – 1.5 kg/cm<sup>2</sup>. Electrode conveys the force and welding current to desired location. According to theoretical analysis, large of electrode force may easily induce surface expulsion. Small electrode force will result in improper clamping of the workpiece and disruption to the current flow resulting in increased usage of current. The measure of electrode force have been fixed initially by the manufacturers of the seam welding machines. The pressure gauge of the seam welding machine was malfunctioning giving improper or at times no reading. The pressure gauge was recalibrated according to the given requirement of company resulting in proper clamping of the workpiece.

### Effect of area of contact

Area of contact is the contact area between the seam welding electrode wheel and the workpiece being welded. The large contact area results in low current density and low contact resistance. Hence, the current is inversely proportional to the contact area between the electrodes and the workpiece. The contact area is reduced when the electrode dressing is done for removal of impurities accumulated on the electrode wheel. Electrode tip dressing after every 75 tanks are welded. As the contact area between the electrode wheel and the workpiece was reduced, the current density increased with increasing the contact resistance. Hence, as the contact area was reduced, the current required for completion the weld increased.

### Transformer Efficiency

Seam welding transformer used in the Mechelonic seam welding machines is a core type moulded transformer having capacity 5vA. It has three taps for DC supply. The power factor of the transformer was less than 1. The transformer on investigation was found to be earthed. Hence, it was not transferring the current with full efficiency

## 3. CONCLUSION

we conclude that in this project we try to solve the problem of cost of power consumption and efficiency of machine , cost of machine . Make a small model for collages to take a practical on it , in low cost . We are able to modified previous machine and prepare a new seam welding machine , which work on low voltage and current and we increase a welding strength on work piece .We develop the knowledge about seam welding machine and learn various research paper on seam welding machine and able to identify the problem on it and try to remove .

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