

# Resistance Welding



# Resistance Welding

- A liquid state welding process
- Is a thermo-electric process
  - Uses electric resistance to generate heat

# Working Principal

- Heat is generated by passing current through a electric resistance
- Amount of heat produced is depend on
  - Resistivity of the material
  - Surface conditions
  - Current Supplied
  - Time

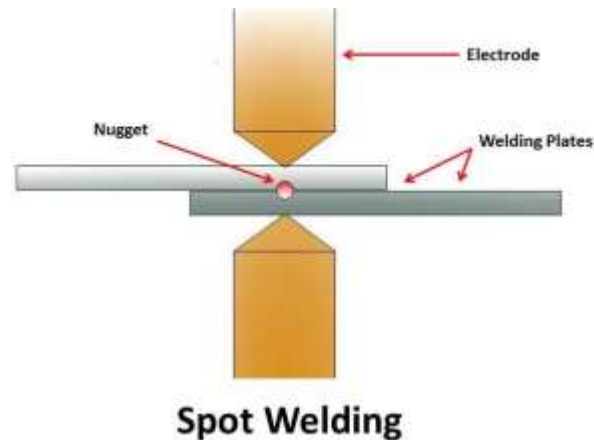
$$H = I^2RT$$

# Types of RW

- Spot Welding
- Seam Welding
- Projection Welding
- Flash Butt Welding

- # Spot Welding

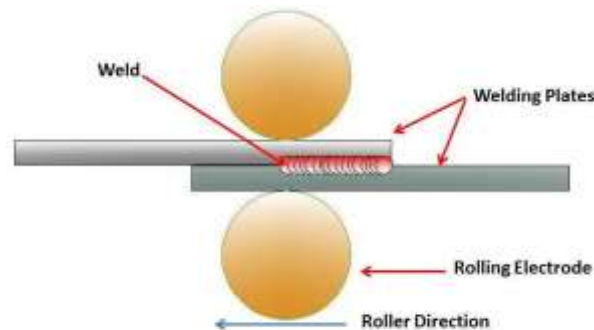
- Simplest type of resistance welding
- Two copper electrodes with anvil faces



- Create a circular nugget ( 4-7 mm )

# Seam Welding

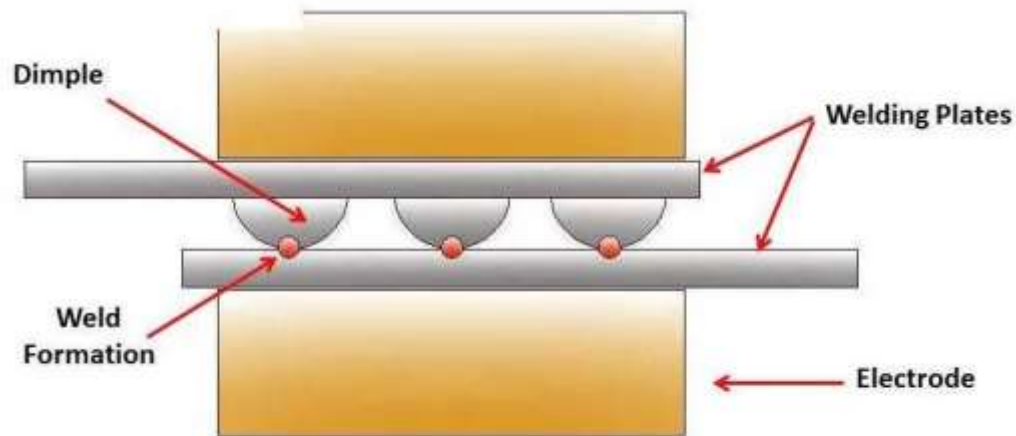
- Also known as Continuous Spot Welding
- A roller type electrodes are used
- Create a continuous weld joint



- The time and movement of electrode is controlled
  - Weld overlap and work piece does not get too hot
- Used to create air tight joints

# Projection Welding

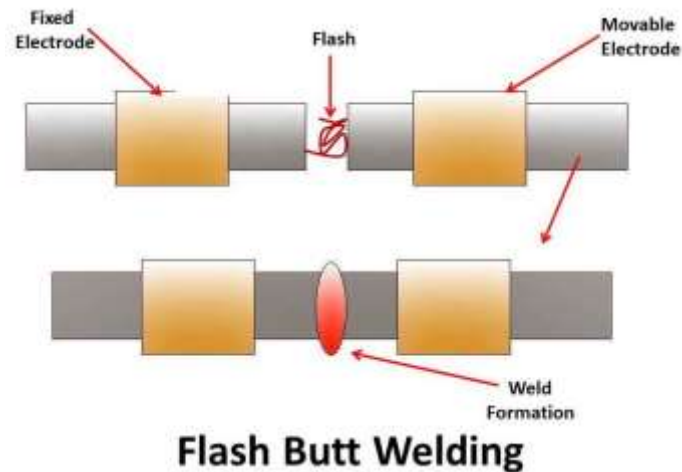
- Dimple is produced on work piece
- Flat electrodes



**Projection Welding**

# Flash butt Welding

- Used to weld tubes and rods in steel industries
- Work pieces are clamped in the electrode holders
- high pulsed current in the range of 100000 ampere
- Electrodes – One is Fixed and other is movable





# Applications

- Resistance welding
  - automotive industries
- Projection welding
  - production of nut and bolt
- Seam welding
  - produce leak prove joint required in small tanks, boilers etc.
- Flash welding
  - welding pipes and tubes

# Advantages

- It can weld thin (0.1 mm) as well as thick (20mm) metals.
- High welding speed.
- Easily automated.
- Both similar and dissimilar metals can be weld.
- The process is simple and fully automated so does not required high skilled labor.
- High production rate.
- It is environment friendly process.
- It does not require any filler metal, flux and shielding gases.

# Disadvantages

- High equipment cost.
- The thickness of work piece is limited due to current requirement.
- It is less efficient for high conductive materials.
- High electric power required.
- Weld joints have low tensile and fatigue strength.

Thank You!