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ME 46200 : Manufacturing

Homework 3: Investigate High Frequency Welding and how non-ferrous metals are welded.

High-frequency welding (HFW) is a metal welding technique which utilizes high-frequency electricity. Although it is usually applied to carbon steel, it can also be used on non-ferrous metals like copper and aluminum.

Overview of the Process

1. Current Induction:

Metal workpieces undergo electrical stimulation to produce high-frequency AC.

2. Heating:

Heat produced by induced current softens the edges of the metal.

3. Joining Edges by Forcing:

To weld, softened edges are forced together under pressure.

4. Cooling:

Rapid cooling of the welded junction creates a strong bond.

Non-Ferrous Metals in HFW

- Copper and Aluminum:

Since non-ferrous metals have a high electrical conductivity, HFW is useful for welding them.

- Modifications to the Process:

A few parameters may need to be changed for the best non-ferrous metal welding. While the basic principles of HFW apply to non-ferrous metals, adjustments may be needed in terms of power settings, equipment design, and process parameters to optimize the welding of non-ferrous materials.

To sum up, HFW is flexible and can be modified to weld non-ferrous metals like copper and aluminum by