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GMAW (MIG Welding)

Fast, Clean, and Efficient Welding

What is GMAW?

- GMAW stands for **Gas Metal Arc Welding**
- Uses a **continuous wire electrode**
- Shielded by a **protective gas** (like argon or CO₂)
- Commonly called **MIG welding**



How It Works

When the trigger is pulled, a wire electrode feeds through the welding gun. An electric arc forms between the wire and the metal, creating heat that melts both the wire and the base metal. This forms a weld pool that cools and hardens into a strong joint.



Advantages

- Fast and efficient
- Easy to learn
- Clean welds (little slag)
- Good for thin metals

Disadvantages

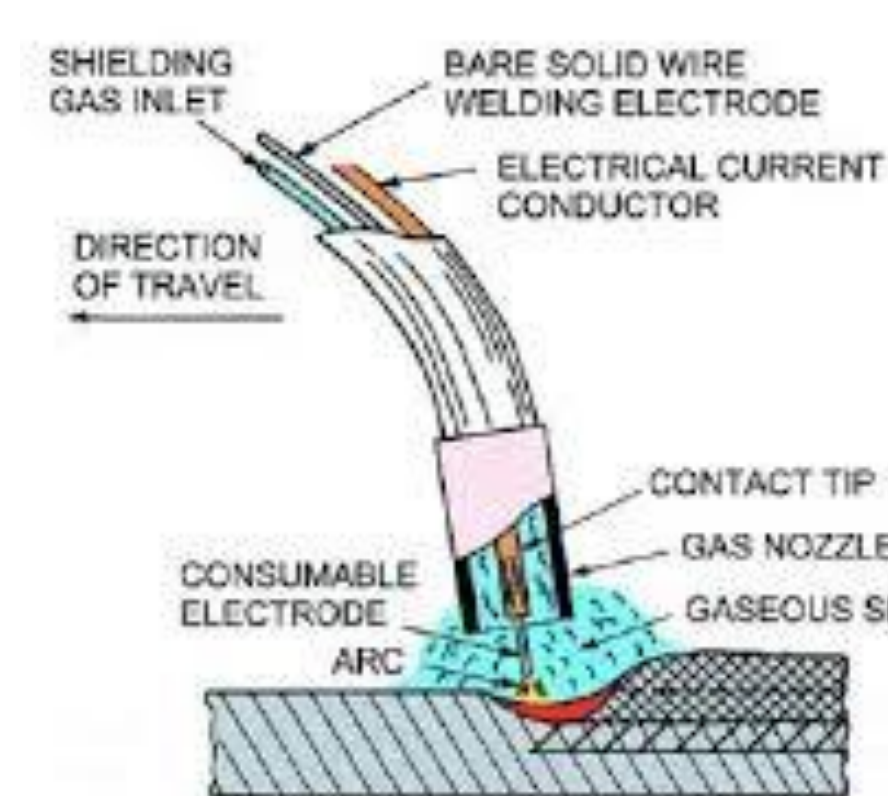
- Doesn't work well in wind (gas blows away)
- Equipment can be expensive
- Not ideal for very thick metal

Equipment Needed

- Power source (welding machine)
- Wire feeder
- Welding gun
- Ground clamp
- Shielding gas tank

Safety Precautions

- Always wear a welding helmet with proper shade
- Use gloves and flame-resistant clothing
- Work in a well-ventilated area
- Keep flammable materials away



3. Contact Tip

The copper tip touching the wire.

Its jobs are:

- Transfer electrical current into the wire
- Guide the wire smoothly toward the weld

Because copper conducts electricity very well, it efficiently powers the arc.

4. Shielding Gas Inlet

This brings shielding gas into the welding gun.

Common gases:

- Argon
- CO₂
- Argon/CO₂ mix

The gas flows around the weld area.

5. Gas Nozzle

The outer cup surrounding the wire.

Purpose:

- Directs shielding gas around the weld puddle
- Protects the hot metal from air contamination

Without shielding gas, oxygen and nitrogen from the air would weaken the weld.

1. Bare Solid Wire Welding Electrode

This is the welding wire fed through the gun.

- It acts as the **electrode**
- It also becomes the **filler metal** that joins the pieces together
- The wire continuously feeds automatically from a spool

Think of it as a metal “pen” that melts while you weld.

2. Electrical Current Conductor

This supplies electricity to the wire.

- The welding machine sends current through the wire
- The wire becomes electrically “live”

That electrical energy creates the welding heat.