

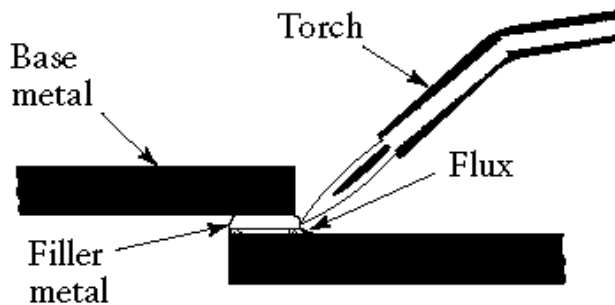
Types of Welding II

Brazing :

It is a low temperature joining process. It is performed at temperatures above 840° F and it generally affords strengths comparable to those of the metal which it joins. It is low temperature in that it is done below the melting point of the base metal. It is achieved by diffusion without fusion (melting) of the base

Brazing can be classified as

Torch brazing
Dip brazing
Furnace brazing
Induction brazing



Advantages

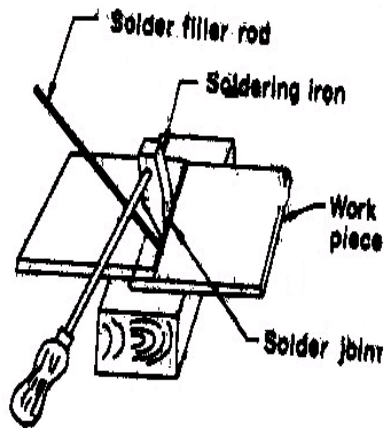
- Dissimilar metals which cannot be welded can be joined by brazing
- Very thin metals can be joined
- Metals with different thickness can be joined easily
- In brazing thermal stresses are not produced in the work piece. Hence there is no distortion
- Using this process, carbides tips are brazed on the steel tool holders

Disadvantages

- Brazed joints have lesser strength compared to welding
- Joint preparation cost is more
- Can be used for thin sheet metal sections

Soldering

- It is a low temperature joining process. It is performed at temperatures below 840°F for joining.
- Soldering is used for,
 - Sealing, as in automotive radiators or tin cans
 - Electrical Connections
 - Joining thermally sensitive components
 - Joining dissimilar metals



Inert Gas Welding

For materials such as Al or Ti which quickly form oxide layers, a method to place an inert atmosphere around the weld puddle had to be developed

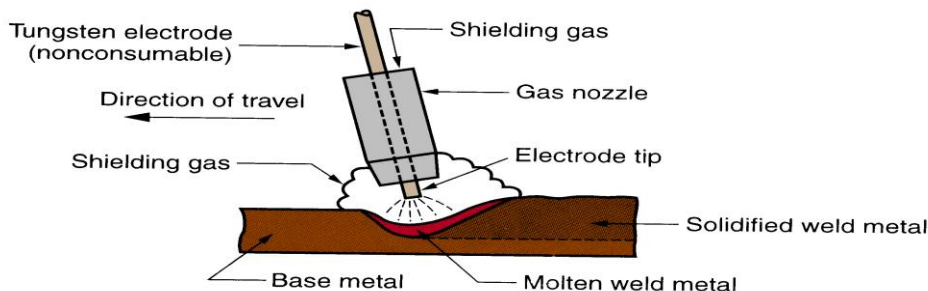
Metal Inert Gas (MIG)

- Uses a consumable electrode (filler wire made of the base metal)
- Inert gas is typically Argon

Gas Tungsten Arc Welding (GTAW)

Uses a non-consumable tungsten electrode and an inert gas for arc shielding

- Melting point of tungsten = 3410°C (6170°F)
- A.k.a. Tungsten Inert Gas (TIG) welding
 - In Europe, called "WIG welding"
- Used with or without a filler metal
 - When filler metal used, it is added to weld pool from separate rod or wire
- Applications: aluminum and stainless steel most common



Advantages

- High quality welds for suitable applications
- No spatter because no filler metal through arc
- Little or no post-weld cleaning because no flux

Disadvantages

- Generally slower and more costly than consumable electrode AW processes