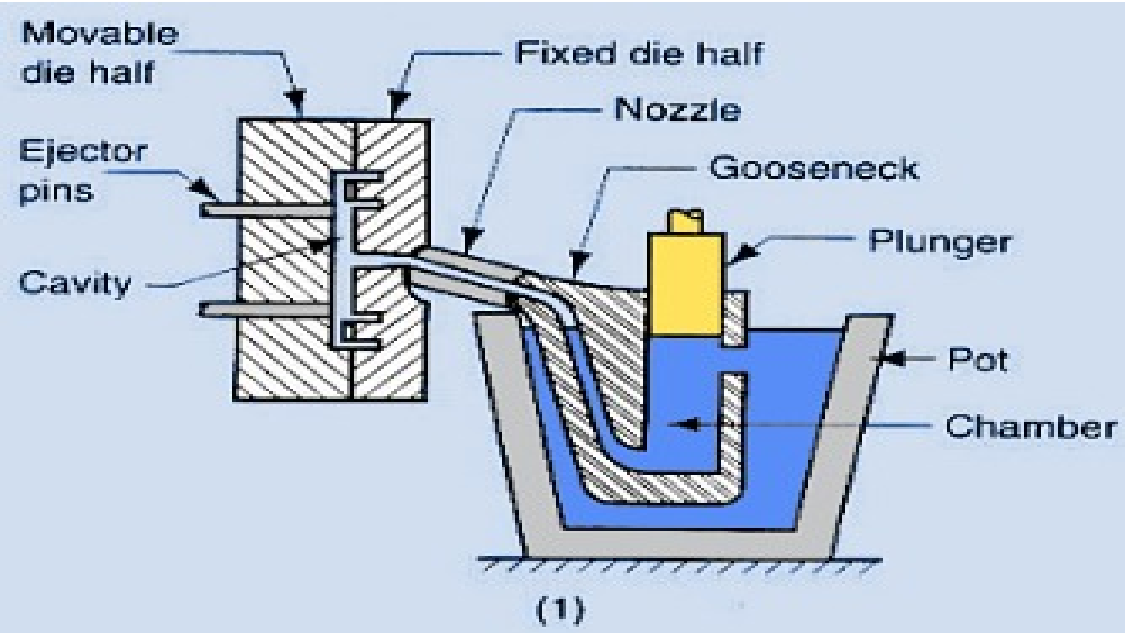
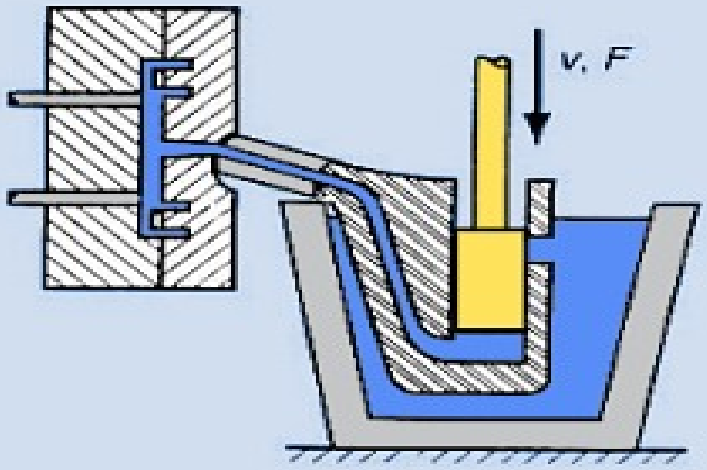
Pressure Die casting



(1)



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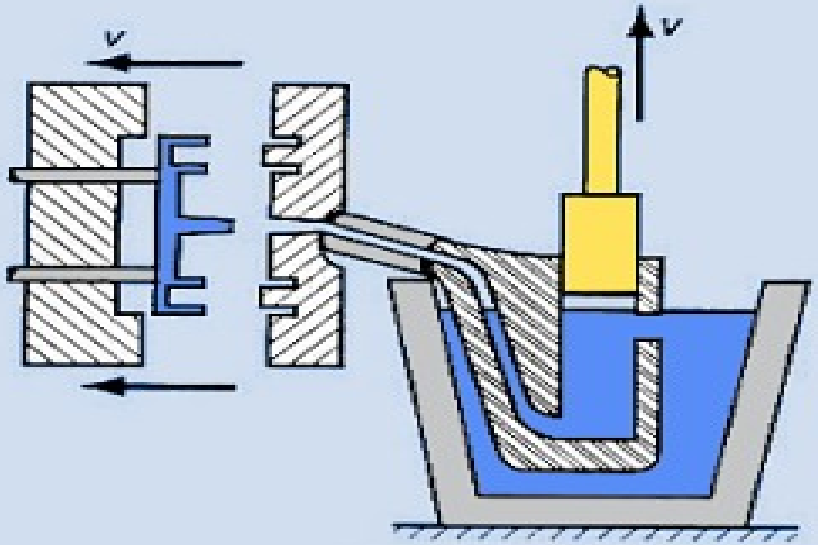

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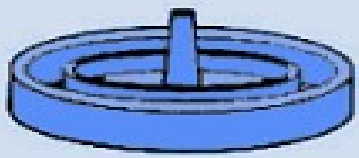
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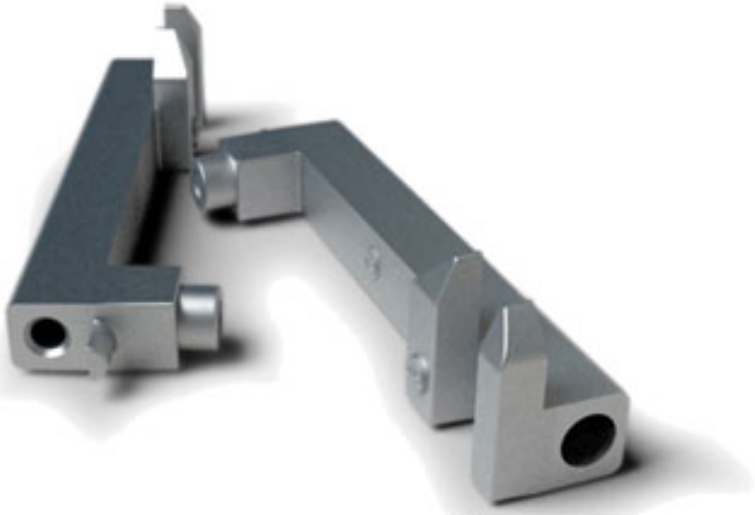
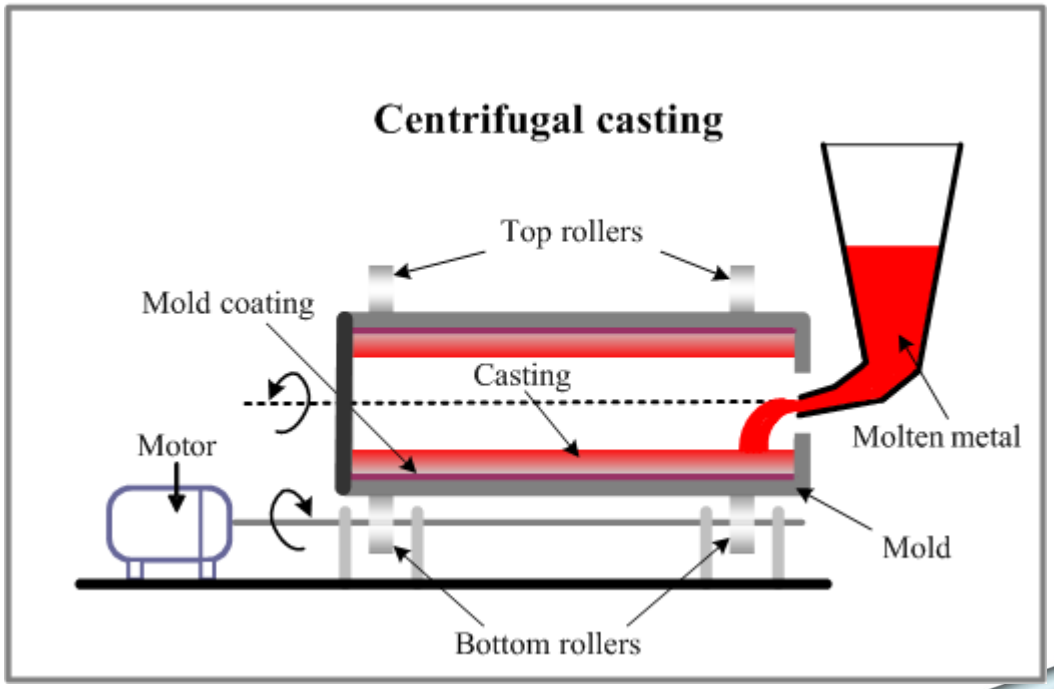
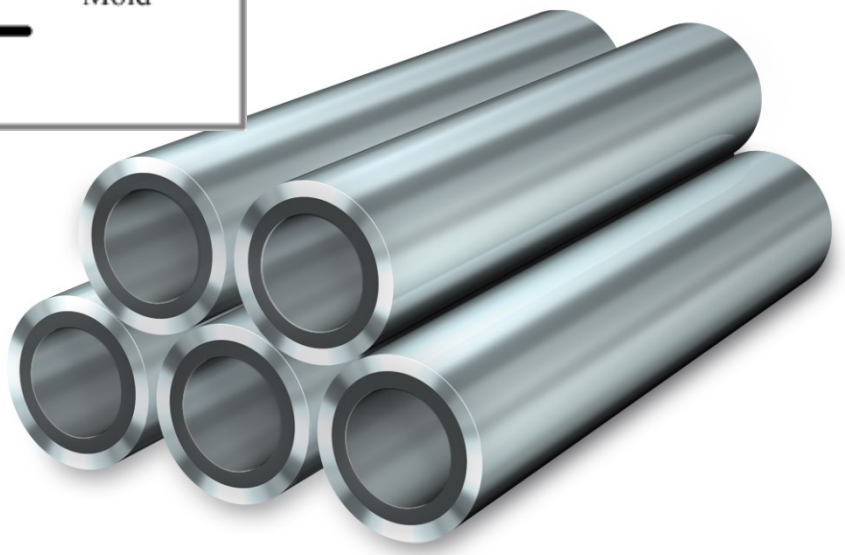
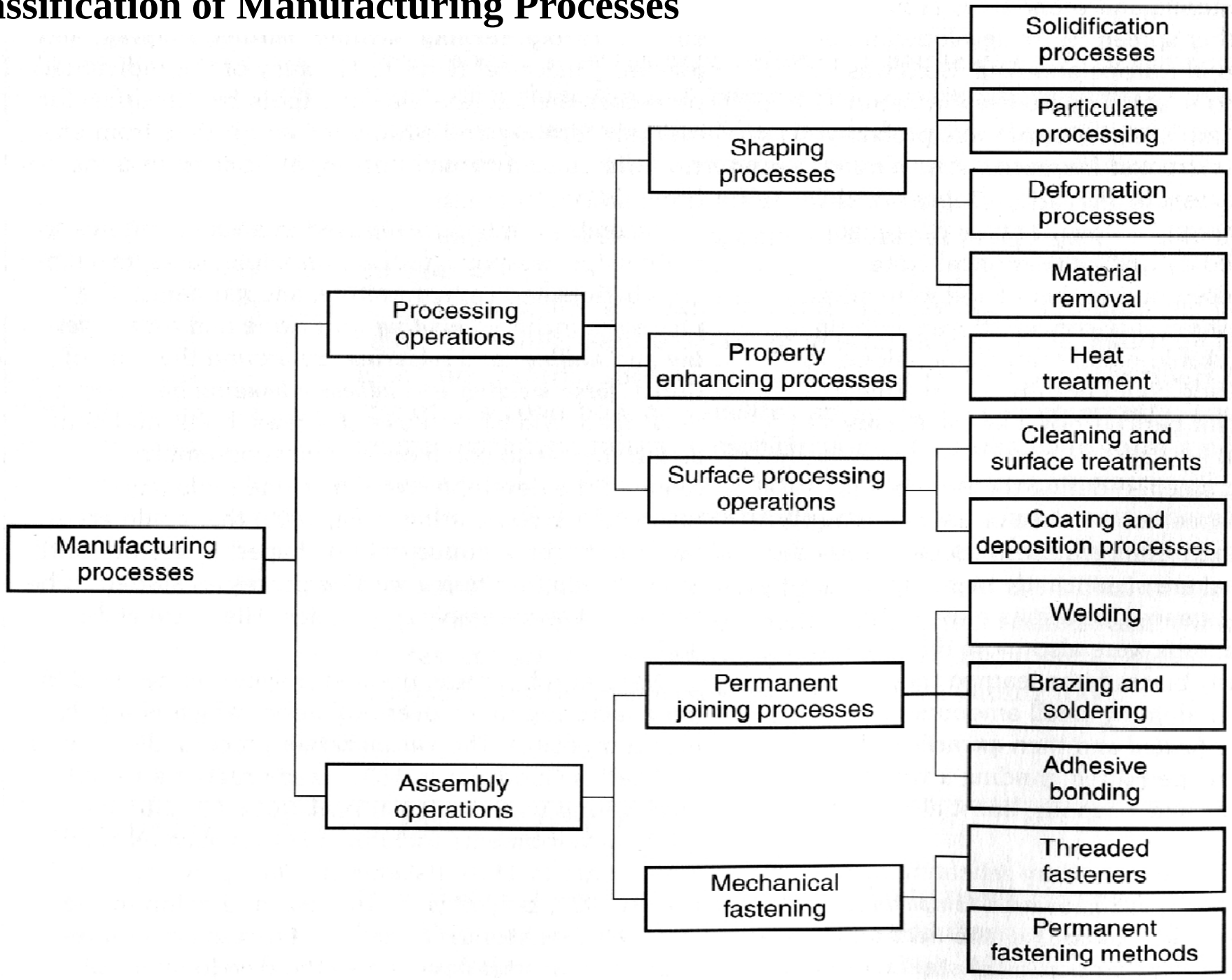


Centrifugal Casting





Classification of Manufacturing Processes



Welding

Welding : coalescence of metals

With/without

a. Heat b. Pressure c. Filler

Fusion Joining

solid state bonding

Beam welding processes

welding will continue to be the preferred method by which metals and engineered materials are joined into world class products.
Superior performing products by the virtue of
advanced joining technologies

Oil and Gas

Power

Aerospace

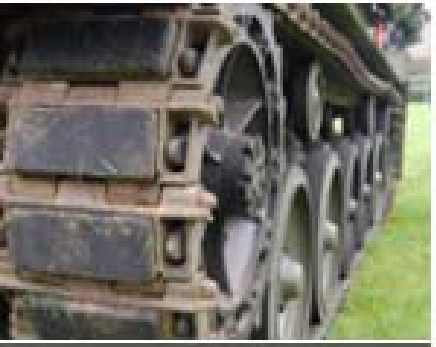
Engineering and Fabrication

Automotive

Rail

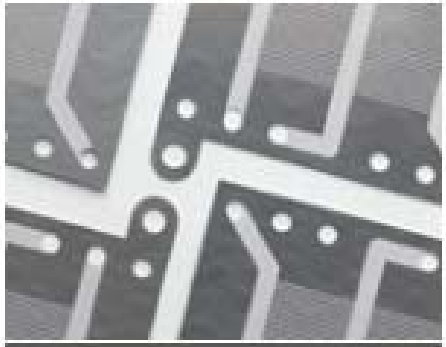
Shipbuilding

Off Highway



Defence

Equipment. Consumables and Materials



Electronics and Sensors

Medical

Welding and Allied processes

- Oxy fuel Gas Welding
- Arc welding
- Resistance welding
- Solid state welding
- Radiant energy welding
- Thermit welding
- Soldering
- Brazing
- Gas cutting

Arc Welding

- Carbon Arc
- Shielded Metal Arc
- Gas Tungsten Arc
- Plasma Arc
- Gas Metal Arc
- Electro slag and Electro gas welding

Resistance Welding

- Spot
- Seam
- Projection
- Percussion
- Flash butt
- Induction

Solid State Bonding

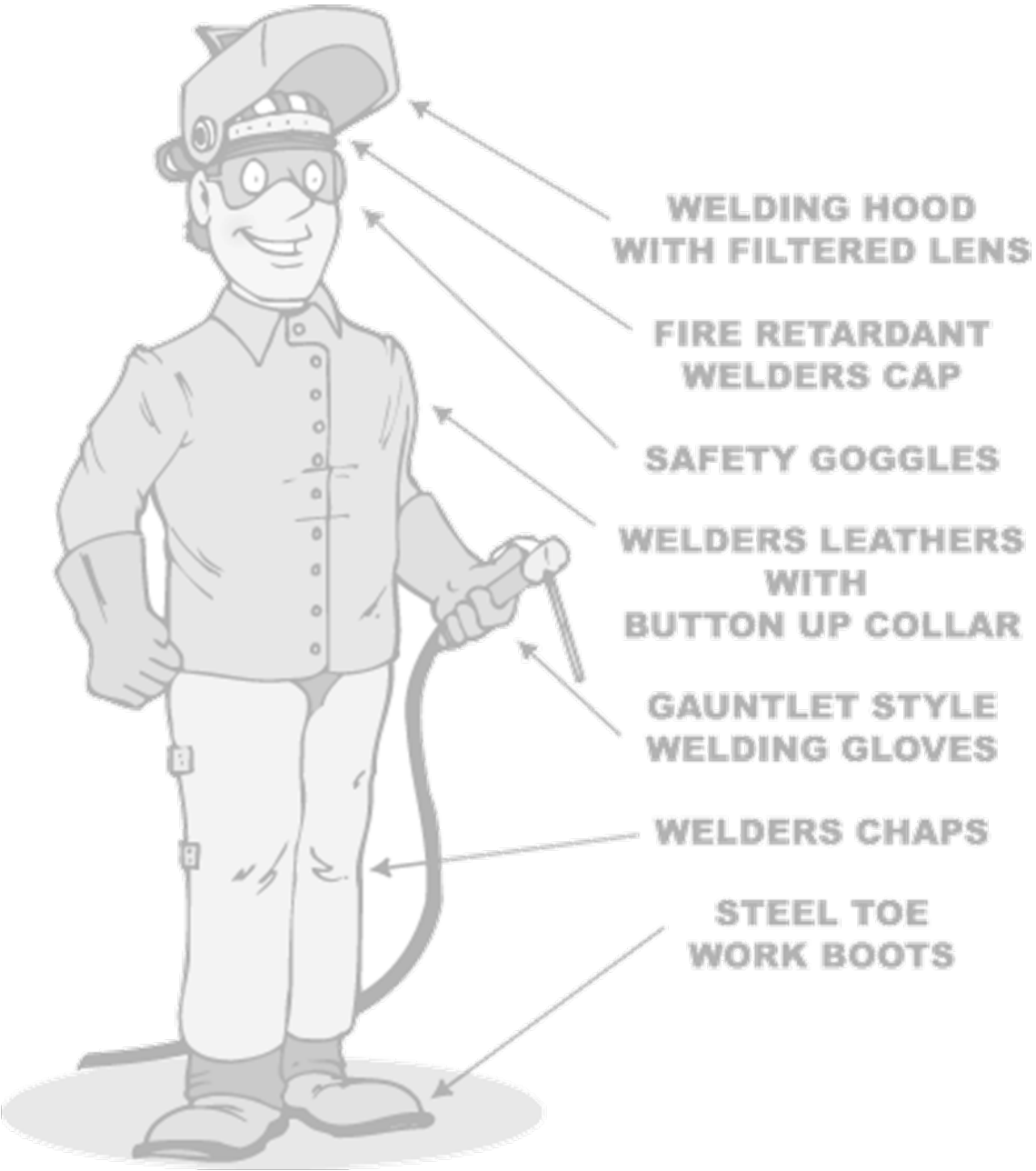
- Forge
- Friction
- Friction stir
- Ultrasonic
- Diffusion
- Explosive

Radiant Energy

- EBW
- LBW
- Micro wave

Allied processes

- Soldering
- Brazing
- braze welding
- Gas cutting
- Arc cutting
- Metal spraying

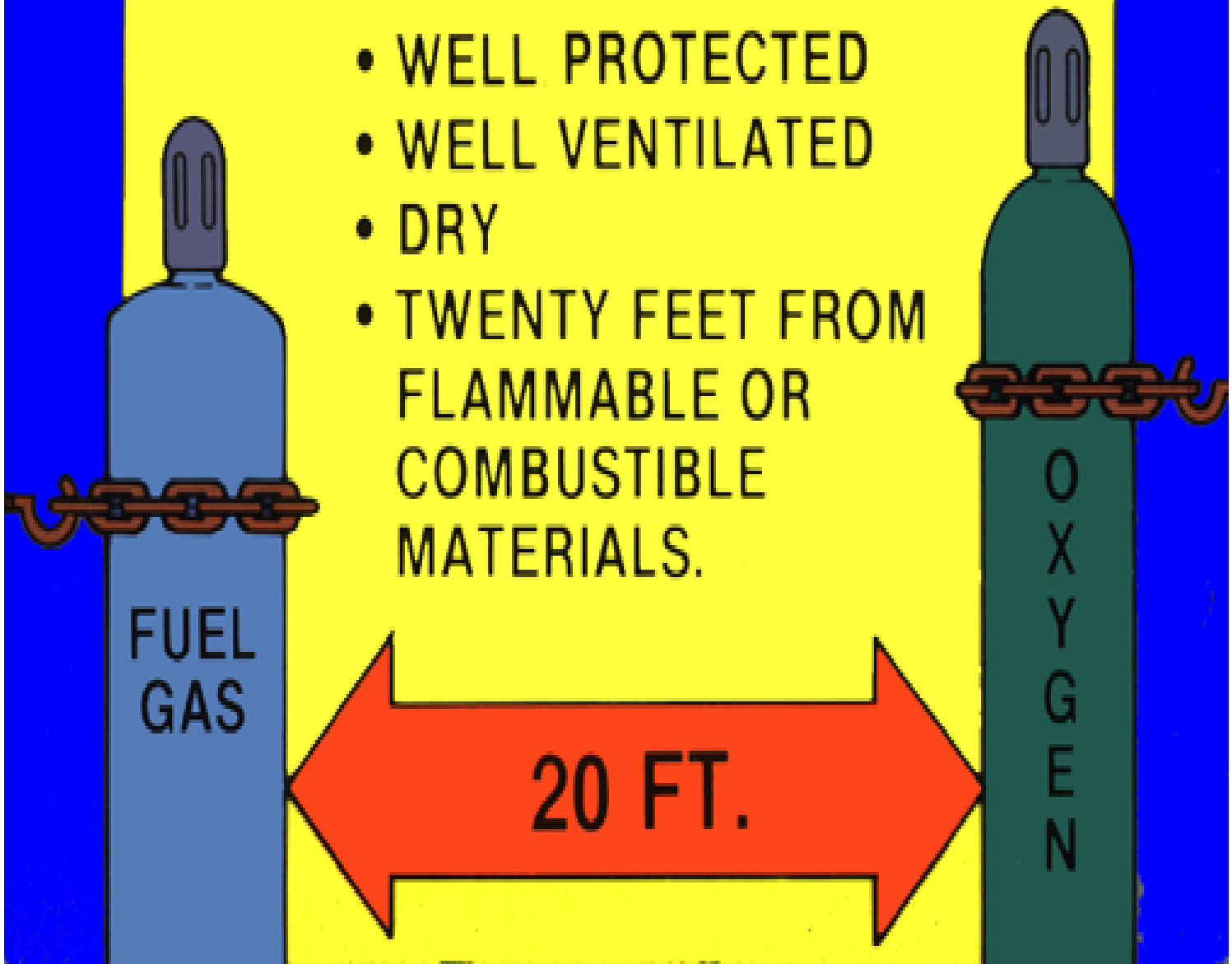

WELDING HOOD
WITH FILTERED LENS
FIRE RETARDANT
WELDERS CAP
SAFETY GOGGLES
WELDERS LEATHERS
WITH
BUTTON UP COLLAR
GAUNTLET STYLE
WELDING GLOVES
WELDERS CHAPS
STEEL TOE
WORK BOOTS

Oxyacetylene Welding (OAW)

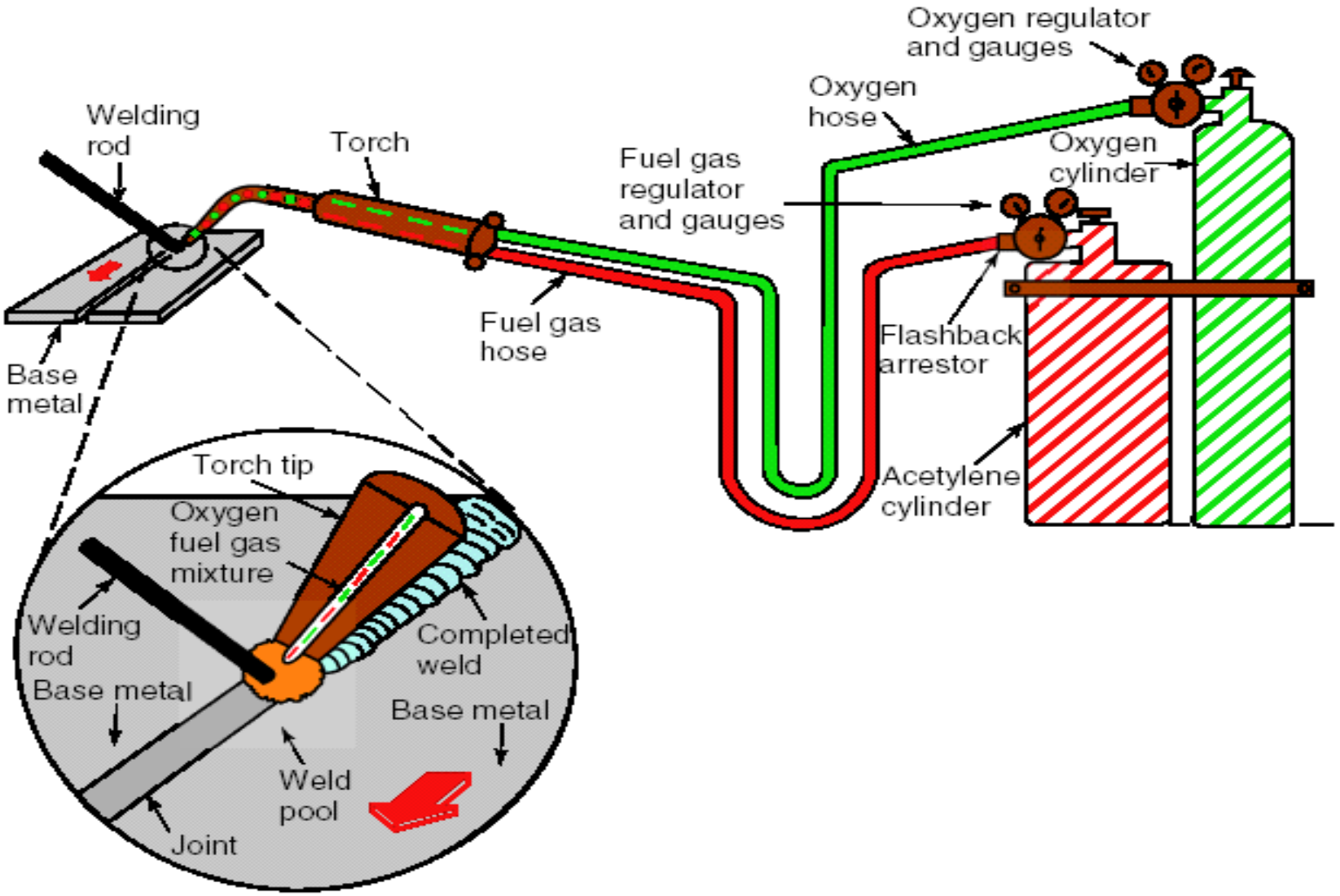
Fuel Gas	Formula	Oxygen to fuel gas combustion ratio	Flame tempearture (degree centigrade)
Acetylene	C_2H_2	2.5	3080
Propane	C_3H_8	5.0	2526
Natural gas	CH_4	2.0	2540
Hydrogen	H_2	0.5	2660

INDOOR CYLINDER STORAGE:

- WELL PROTECTED
- WELL VENTILATED
- DRY
- TWENTY FEET FROM FLAMMABLE OR COMBUSTIBLE MATERIALS.



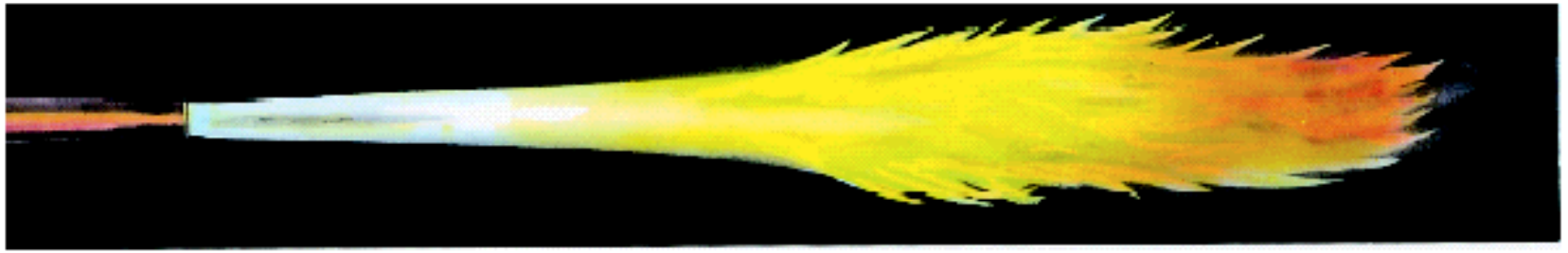
Oxyacetylene Welding (OAW)



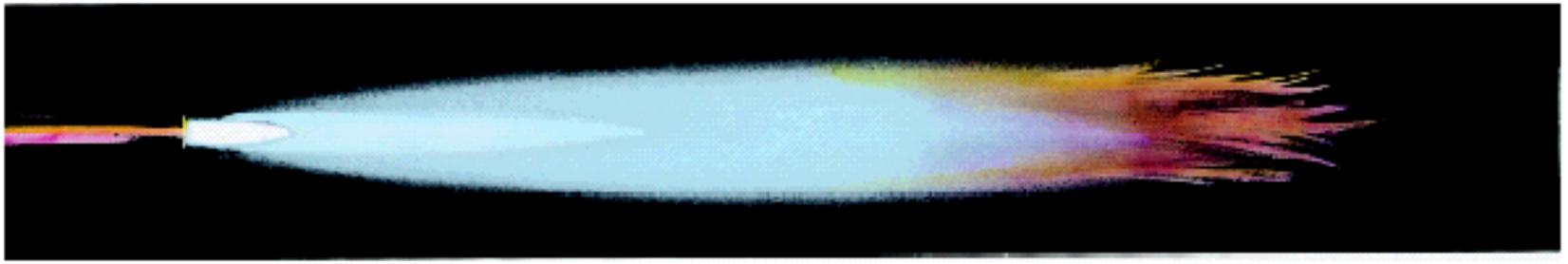
Flame Settings

- There are three distinct types of oxy-acetylene flames, usually termed:
  - Neutral
  - Carburizing (or “excess acetylene”)
  - Oxidizing (or “excess oxygen”)
- The type of flame produced depends upon the ratio of oxygen to acetylene in the gas mixture which leaves the torch tip.

Pure Acetylene and Carburizing Flame profiles

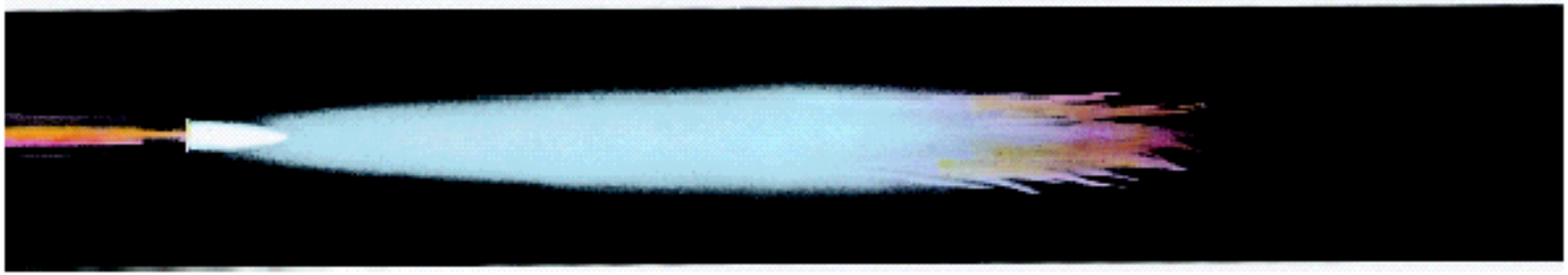


Acetylene Burning in Atmosphere
Open fuel gas valve until smoke clears from flame.



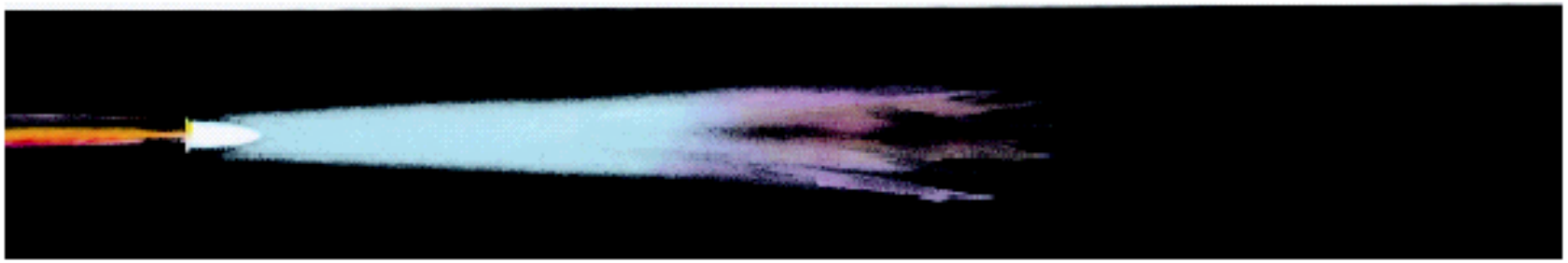
Carburizing Flame
(Excess acetylene with oxygen.) Used for hard-facing and welding white metal.

Neutral and Oxidizing Flame Profiles



Neutral Flame

(Acetylene and oxygen.) Temperature 5589˚F (3087˚C). For fusion welding of steel and cast iron.



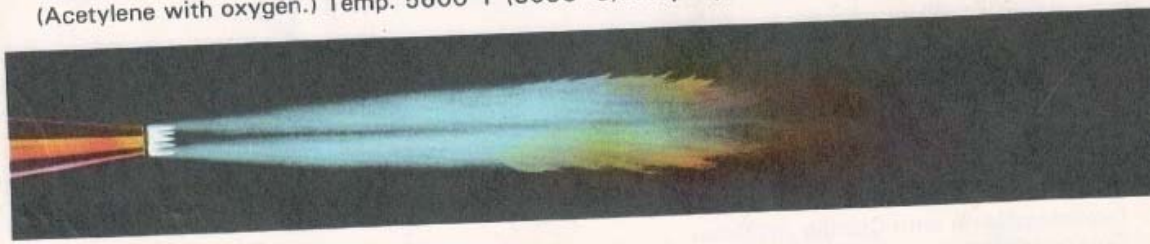
Oxidizing Flame

(Acetylene and excess oxygen.) For braze welding with bronze rod.

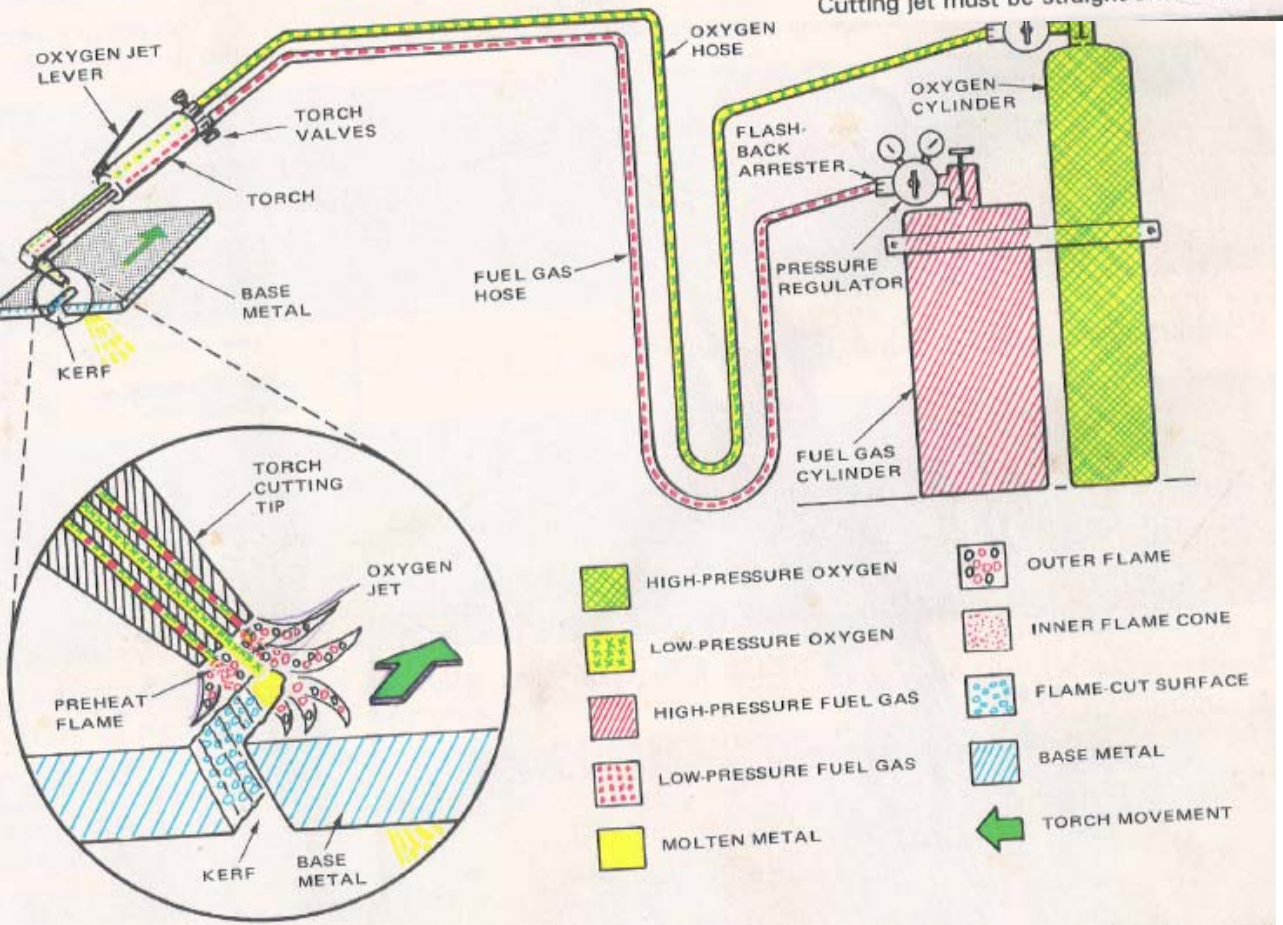
Flame definition

- The **neutral** flame produced when the ratio of oxygen to acetylene, in the mixture leaving the torch, is almost exactly one-to-one. It's termed "neutral" because it will usually have no chemical effect on the metal being welded. It will not oxidize the weld metal; it will not cause an increase in the carbon content of the weld metal.
- The **excess acetylene Carburizing** flame as its name implies, is created when the proportion of acetylene in the mixture is higher than that required to produce the neutral flame. Used on steel, it will cause an increase in the carbon content of the weld metal.
- The **oxidizing flame** results from burning a mixture which contains more oxygen than required for a neutral flame. It will oxidize or "burn" some of the metal being welded.

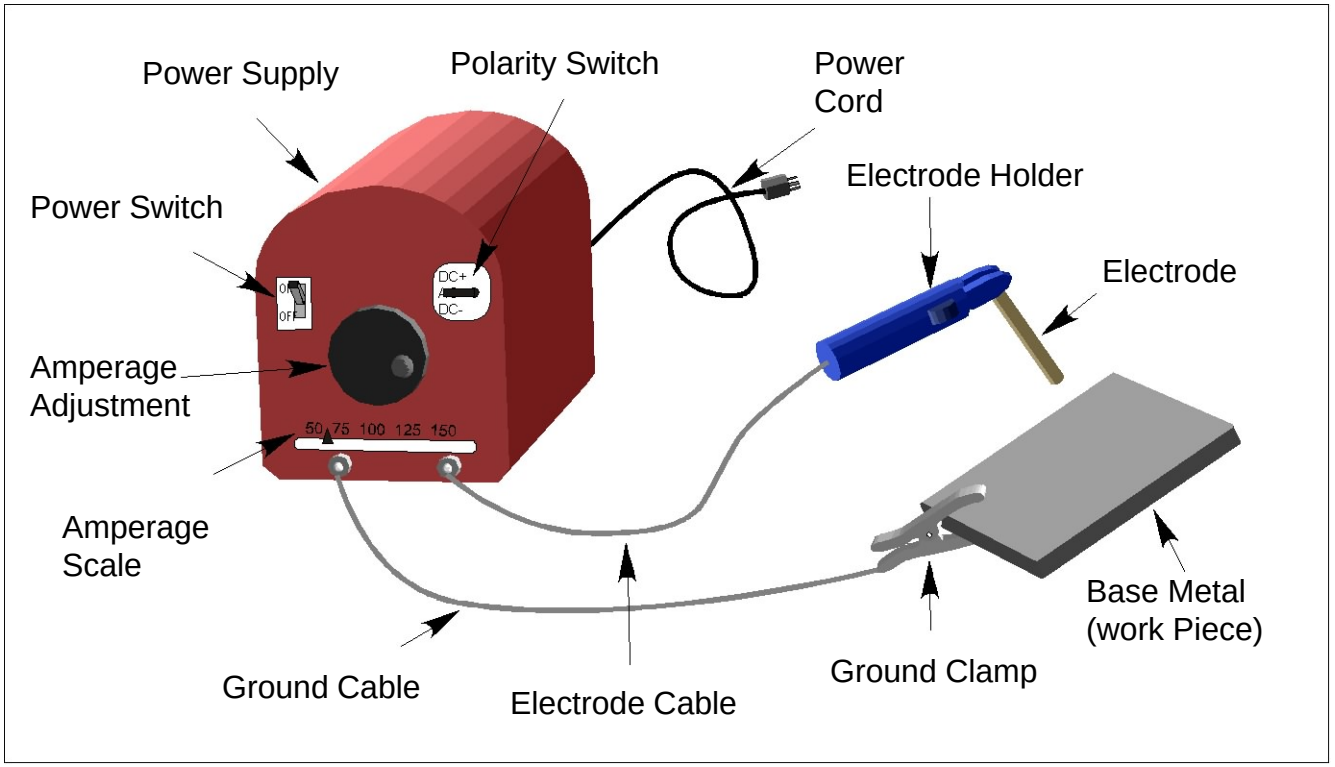
Neutral Flame
(Acetylene with oxygen.) Temp. 5600 °F (3093 °C). Proper preheat adjustment for cutting.

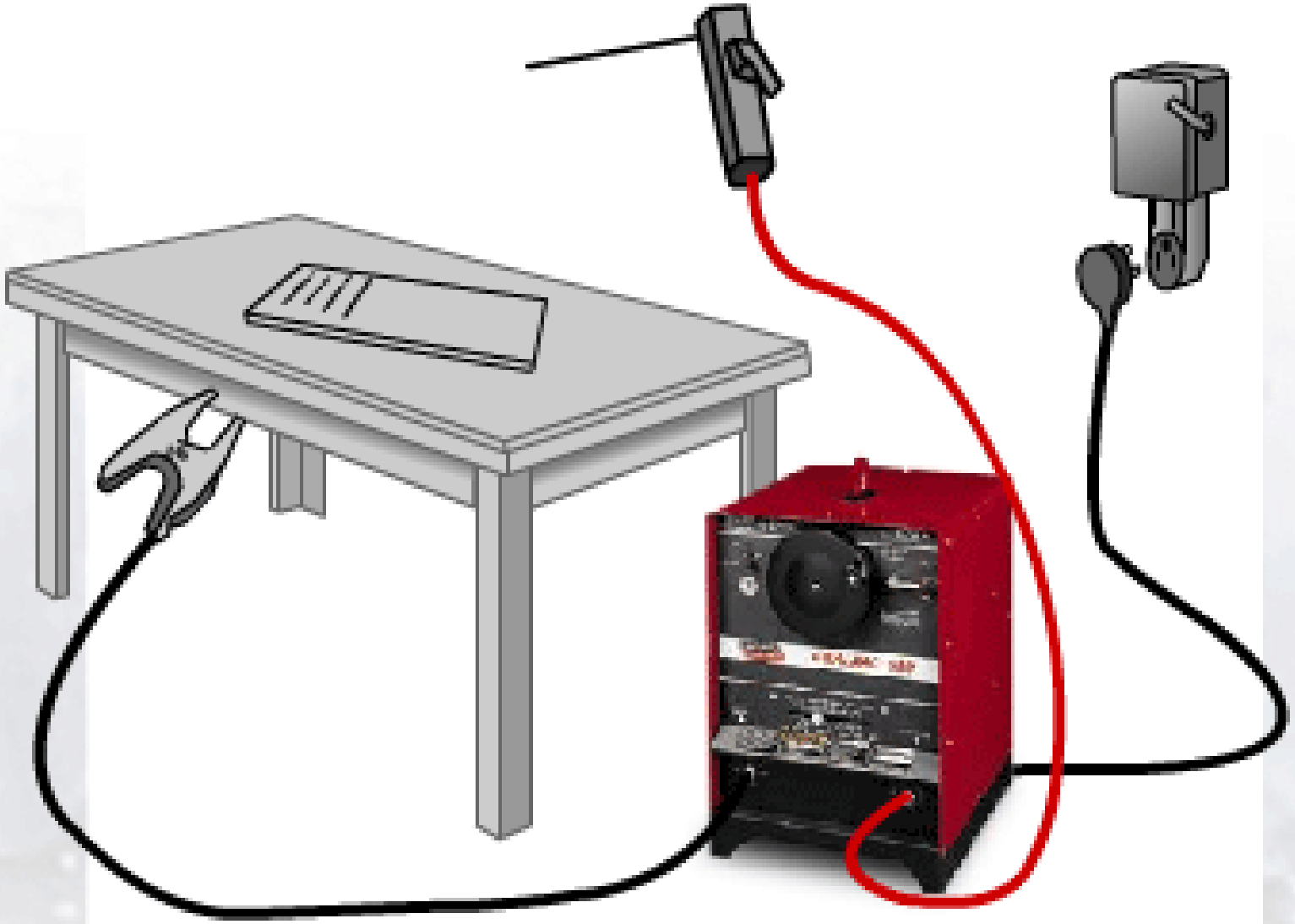


Neutral Flame with Cutting Jet Open
Cutting jet must be straight and clear.

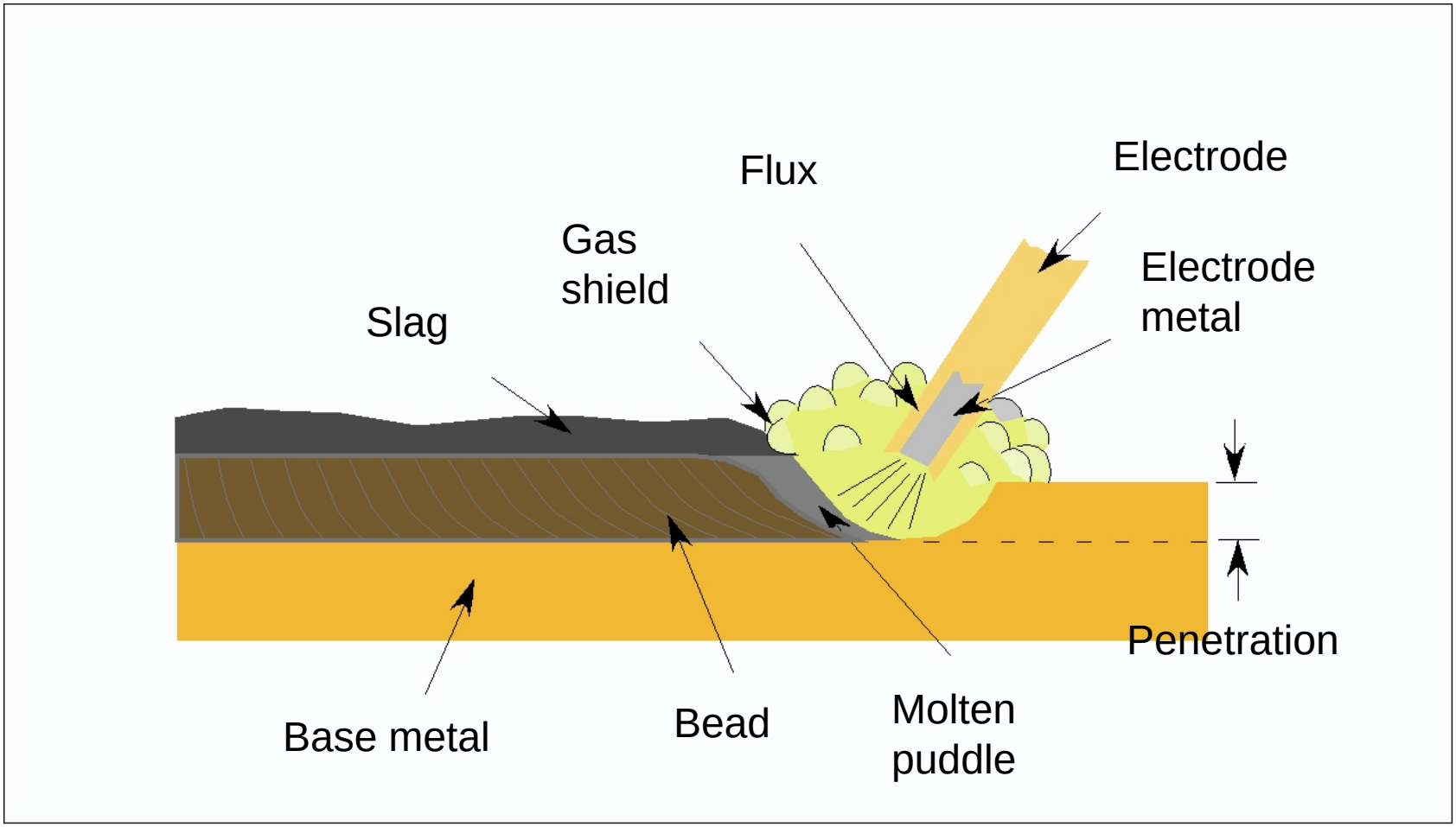


Equipment


Power Supply
Polarity Switch
Power Cord
Power Switch
Electrode Holder
Electrode
Amperage Adjustment
Amperage Scale
Base Metal (work Piece)
Ground Cable
Electrode Cable
Ground Clamp
DC+
DC-
50 75 100 125 150

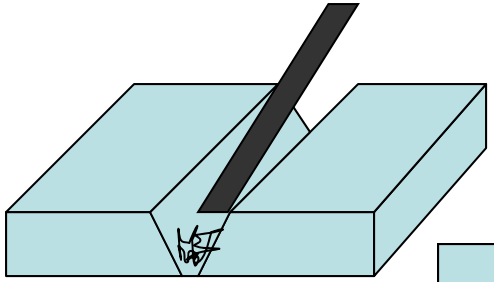


Arc Welding Nomenclature

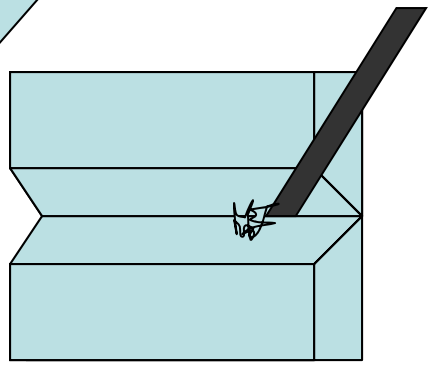


Welding Positions

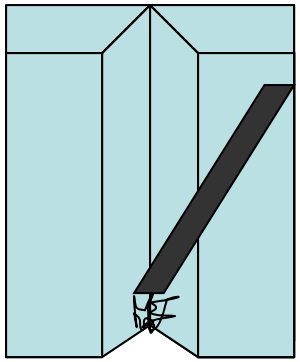
INCREASING DIFFICULTY



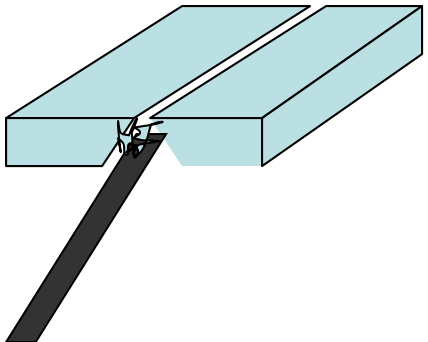
FLAT



HORIZONTAL



VERTICAL



OVERHEAD