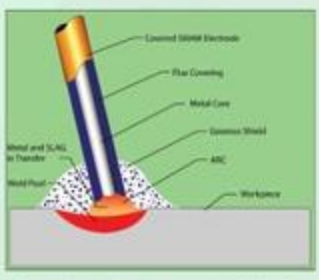
BASIC WELDING KNOWLEDGE

Manual metal arc welding was first invented in Russia in 1888. It involved a bare metal rod with no flux coating to give a protective gas shield. Now the shielded metal arc welding process is the most popular arc welding process. It has maximum flexibility and can weld many metals in all position from near minimum to maximum thickness. The investment for equipment is relatively small. It is used in manufacturing and in field work for construction and maintenance. This process can be used to weld steels and some of the nonferrous metals. Its major use is for joining steels, including low-carbon steels, high strength steels, quenched and tempered steels, high-alloy steels, stainless steels, corrosion-resistant steels, and for welding cast iron and malleable irons.

When an arc is struck between the metal rod (electrode) and the workpiece, both the rod and workpiece surface melt to form a weld pool. Simultaneous melting of the flux coating on the rod will form gas and slag which protects the weld pool from the surrounding atmosphere. The slag will solidify and cool and must be chipped off the weld bead once the weld run is complete (or before the next weld pass is deposited). The process allows only short lengths of weld to be produced before a new electrode needs to be inserted in the holder. Weld penetration is low and the quality of the weld deposit is highly dependent on the skill of the welder.



It is used for welding nickel and nickel alloys and to a lesser degree for welding copper and some copper alloys. It can be, but rarely is, used for welding aluminum. It is not used for welding magnesium, the precious metal, or the refractor metals. Shielded metal arc welding is also used for surfacing.Combining two piece of steel. This is SMAW welding process in the flat position which is known as square butt joint.

Available Models

Inverter IGBT

AC Transformer

DC Transformer

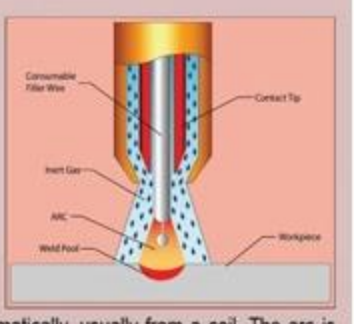
Inverter DC

MIG Welder

BASIC WELDING KNOWLEDGE

It was developed in the late 1940s for welding aluminum and has become very popular. This process, also called MIG "metal inert gas" welding is show. There are many variations depending on the type of shielding gas, the type of metal transfer, the type of metal welded, and so on. It has been given many names: for example, MIG welding, CO2 welding, fine wire welding, spray arc welding, pulse arc welding, dip transfer welding, short circuit arc welding, and various name. Process that uses an arc between a continuous filler metal electrode and the weld pool.

Gas Metal Arc Welding (GMAW) is an arc welding process that uses an arc between a continuous filler metal electrode and the weld pool. The process is used with shielding from an externally supplied gas and without the application of pressure.



The gas metal arc welding process utilizes the heat of an arc between a continuously fed consumable electrode and the work to be welded. The heat of the arc melts the surface of the base metal and the end of the electrode. The melted off the electrode is transferred through the arc to the work where it becomes the deposited weld metal. Shielding is obtained from an envelope of gas, which may be an inert gas, or a mixture.

The shielding gas surrounds the arc area to protect it from contamination from the atmosphere. The electrode is fed into the arc automatically, usually from a coil. The arc is maintained automatically and travel and guidance can be manually or by machine. The metal being welded dictates the composition of the electrode and the shielding gas. The shielding gas and the type and size of the electrode affects the type of metal transfer. The metal transfer mode is one way of identifying the variations of the process.

Cannot Melt - This is because the selection of cold condition (weak current) or torch manipulation not precise.
To solve this problem, enhance the current and make sure the pola is exact.

Good Weld - The result of last weld was good without deformity. It can be with MIG weld when using the rigth condition. The wrong procedure of weld will cause the bad welds. The common problem that always occur and the way to prevent it has been shown in the reference.

Sprinkling - The result of cleavage that are blew out from short-circuited filter in process to transfer or the level of outpouring that are a little bit more from metal drop.

The sprinkling can control with adding induction (for bounded the current of top short circuit) get less the current using Argon/CO2 shielding gas. The result from the circuit was short from dip transger.

Bad Series Performance - This is because the selection of current is wrong. Voltage of the system was overload and the technique is false. Overload or 'peaky' welds was exist when the hot level is low.

Seepage - Cause of the most common deformity was Nitrogen existence in the iron or Nikel and Hidrogen in the alluminium. Hidrogen was exist from surface of contamination. Make sure the weld wire was covered from the contamination as long in storage.

Available Models

MIG Inverter

Pulse MIG

Tapping Switch

MIG Tapping Switch with External Feeder

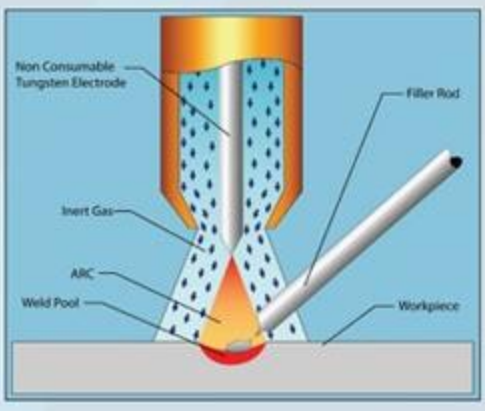
Thyristor

BASIC WELDING KNOWLEDGE

The process developed in the late 1930s as heliarc or TIG welding, to weld nonferrous metals, particularly magnesium and aluminum, and to joint "hard to weld" metals. TIG stands for "tungsten inert gas welding" .This process allows the welder extreme control for precision work. Heat can be controlled very closely and the arc be accurately directed.

GTAW (Gas Tungsten Arc Welding) is used in many welding manufacturing operations, primarily on thinner materials. It is very useful for maintenance and repair work and for welding unusual metals.

Gas tungsten arc welding is widely used for joining thin wall tubing arc welds are usually of extremely high quality. The manual method of applying is used for the greatest majority of work. However, both mechanized and automatic welding, but they have limited application.



Gas tungsten arc welding (GTAW) is an arc welding process that used an arc between a tungsten electrode (non-consumable) and the welding pool. The process is used with shielding gas and without the application of pressure. Filler metal may or may not be used.The arc develops intense heat, approximately 11,000 F (600 c), which melts the surface of the base metal to from a molten pool.

Filler metal is not added when thinner materials, edge joints and flange joints, are welded. This is known as autogenous welding. For thinker material an externally fed or "cold" filler rod is generally used. The arc area is protected from the atmosphere by the inert shielding gas, which flow the nozzle of the torch.

The shielding gas displaces the air, so that the oxygen and the nitrogen of the air do not come in contact with the molten metal or the hot tungsten electrode. As the molten metal cools, coalescence occurs and the parts are joined. The resulting weld is smooth and uniform and require minimum finishing.

Available Models

DC Inverter Pulse

AC/DC Thyristor Pulse

AC/DC Inverter Pulse

TIG Inverter

SPOT Welder

BASIC WELDING KNOWLEDGE

Spot welding is one of the oldest welding processes. It can be used on very thin foils or thick sections but is rarely used above about 6mm thickness. It is used in a wide range of industries but notably for the assembly of sheet steel vehicle bodies where more than 100 million welds are made per day in South East Asia (SEA) alone. High quality welds can also be made in stainless steels, nickel alloys, aluminium alloys and titanium for aerospace application.

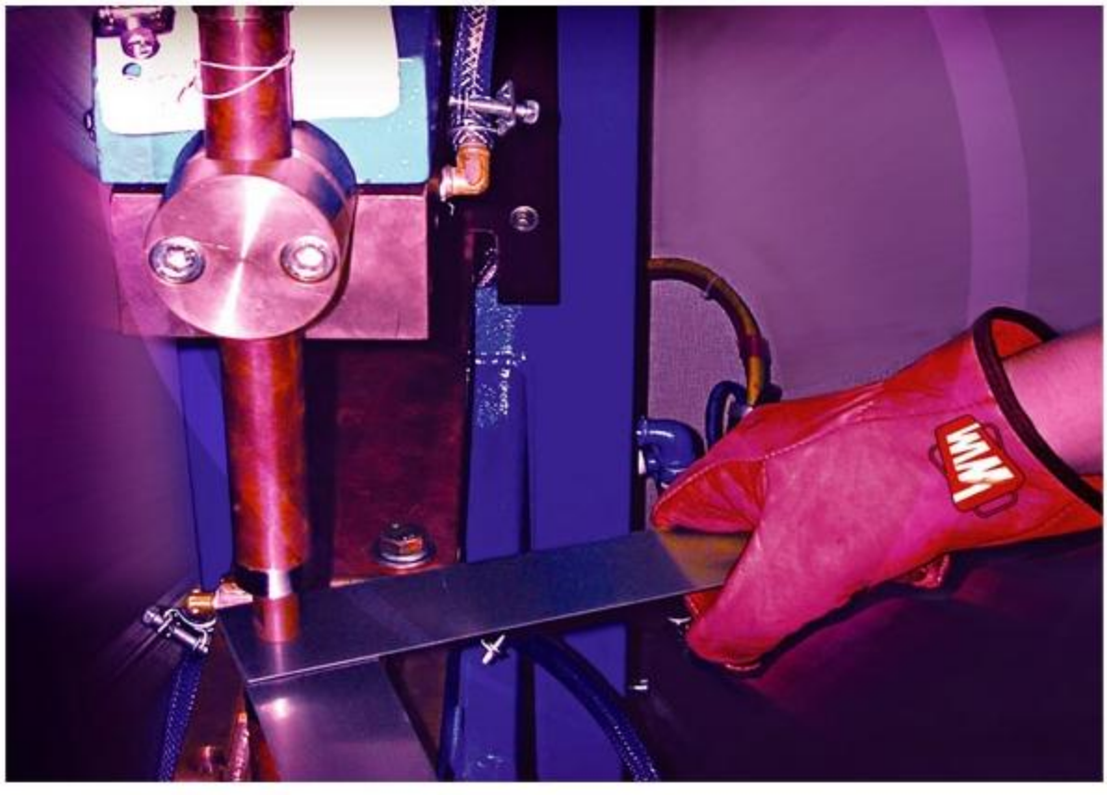
Spot welding is one of a group of resistance welding processes that involve the joining of two or more metal parts together in a localised area by the application of heat and pressure.The heat is generated within the material being joined by the resistance to the passage of a high current through the metal parts, which are held under a pre-set pressure. The process is used for joining sheet materials and uses shaped copper alloy electrodes to apply pressure and convey the electrical current through the workpieces.

Heat is developed mainly at the interface between two sheets, eventually causing the material being welded to melt, forming a molten pool, the weld nugget. The molten pool is contained by the pressure applied by the electrode tip and the surrounding solid metal.

Rule of tumb for single spot

KVA	Thickness (mm)	Material
2.5	0.5 + 0.5	Mild Steel
8	1.0 + 1.0	Mild Steel
15	1.5 + 1.5	Mild Steel
25	2.5 + 2.5	Mild Steel
35	3.5 + 3.5	Mild Steel
50	5.0 + 5.0	Mild Steel
75	7.5 + 7.5	Mild Steel

Spot welding is the most commonly used form of resistance welding. Usually used on sheet metal and in applications having some type of overlapping joint design, resistance spot welds are made from electrodes on both sides of the joint (unlike TIG and MIG spots, which are made from one side only).



Available Models

Portable Mini Spot Welder

MC Series

JPC Series

ACCESSORIES

MMA Accessories

1. a) Electrode Holder Set (300A) Cable Length:
   - I) 3 meter
   - II) 6 meter
   - III) 9 meter
   - IV) 15 meter

b) Earth Clamp Set (300A) Cable Length:
   - I) 3 meter
   - II) 6 meter
   - III) 9 meter
   - IV) 15 meter

MMA Accessories

Terminal Plug TSKM 25 (10-25mm², 200A)
Terminal Plug TSK 70 (35-70mm², 400A)

Panel Socket TEBM25 (10-25mm²)
Panel Socket TBE 35-50-70 (35-70mm²)

Cable Connector

MMA Accessories - Electrode Holder , Earth & G Clamp

Electrode Holder
- a) 200A
- b) 300A
- c) 500A

Earth Clamp
- a) 300A
- b) 400A

G Clamp
- a) 500A (5")
- b) 600A (7")

MMA Accessories - Welding Electrode , Oven & Dryer

ARC Welding Electrode
- I) 6013 Dia = 2.6 mm
- II) 6013 Dia = 3.2 mm
- III) 6013 Dia = 4.0 mm
- IV) 6013 Dia = 5.0 mm

Gouging Torch
Amp 1000 (35%)
Air Pressure 7 bar
Flow 0.70m 3 / min

WIM Electrode Oven

Model:	K - 3008
Input Voltage:	AC 230V
Electrode Capacity:	300LBS (159Kg)
Electrode Length:	450 mm
Work Temperature:	50°C ~ 350°C
Shelved Compartment:	8
Weight:	54 Kg

ACCESSORIES

MMA Accessories

WIM Electrode Dryer

Model:	TRB - 5K	TRB - 10K
Input Voltage:	AC 220V / DC 60~110V	AC 220V / DC 60~110V
Electrode Capacity:	5 kg	10 kg
Electrode Length:	450 mm	450 mm
Max Temperature:	180°C +/- 15°C	180°C +/- 15°C
Overall Size: (LxWxH)	168 x 188 x 635 mm	169 x 188 x 635 mm
Weight:	4.3 kg	4.3 kg

MIG Accessories - MIG Wire & Flux Core Wire, Feeder Roller

1.a) Solid Wire: ER70S-6
- I) 0.8 mm
- II) 1.0 mm
- III) 1.2 mm

b) Aluminum Wire 5356
- I) 0.8 mm
- II) 1.0 mm
- III) 1.2 mm

c) Flux Core Wire 71T
E71T-1
- I) 1.2 mm
- II) 1.6 mm

** Alternating Packing: 250kg/Drum (Solid Wire: ER 70S-6)

2. Feeder Roller (40 x 10 x 32)mm
   - a) "V" Type (For Solid wire use)
     - I) 0.8-1.0 mm
     - II) 1.0-1.2 mm
     - III) 1.2-1.6 mm
   - b) 'U' Type (For Aluminum wire use)
     - I) 0.8-1.0 mm
     - II) 1.0-1.2 mm
     - III) 1.2-1.6 mm
   - c) Gear Type (For Flux Core Use)
     - I) 1.0-1.2 mm
     - II) 1.2-1.2 mm

Note: Submerge Arc Wire Also Available (Size: 4.0mm, 25kg/roll)

TIG Accessories - Tungsten Electrode , TIG Rod & Water Cooler

Tungsten Electrode
- I) 1.6 x 150 mm
- II) 2.4 x 150 mm
- III) 3.2 x 150 mm

TIG Welding Rod

WCS-33

Others Accessories

A) Binzel Anti Spatter Spray
B) WIM Nozzle Gel

Welding Helmet
- a) Hand Shield Type
- b) Head Shield Type
- c) Solar Head Shield Type

Welding Hand Glove
- a) Leather Type Green (14")
- b) Semi Leather Type (10")

ACCESSORIES

Plasma Accessories - Electrode

Plasma Cut Electrode
- a) Absplas Cut 70 Electrode
- b) Absplas Cut 110 Electrode
- c) Absplas Cut 150 Electrode

Plasma Nozzle
- a) Absplas Cut 70
- b) Absplas Cut 110
- c) Absplas Cut 150

a) Plasma cutting Guide Kit - Binzel
b) Gas Cutting Guide Kit

Tanjant Roller Guide (for Abscut 110 / 150)

WIM Gas Cutting Tools

Pipe Cutting
Bettle 62
Input 230V
Diameter > 100mm
Cutting thick 6-50mm
Manual
13kg

Straight Cutting Single Torch
Bettle 12A
Input 230V
Cutting thick 6-100mm
Cutting speed 150-800
Circle Cutting 290-504 diameter
10 kg

Straight cutting two torch
Bettle 12A-2
Input 230V
Cutting thick 6-100mm
Cutting speed 150-800
Circle Cutting 1010-1260 diameter
21 kg

Profile Cutting
Bettle 20A
Input 230V
Cutting thick 6-100mm
Cutting speed 50-750
Circle Cutting 600 diameter
56.5 kg

WIM Cutting Torch
THP-1601
Torch head 95°
Length 250 mm
Gas: oxy / acy / propane

WIM Gas Regulators

Gas Regulator:
- a) WIM Oxygen Gas Regulator
- b) WIM Acetylene Gas Regulator
- c) WIM CO2 Gas Regulator
- d) WIM CO2 Regulator C/w Heater (110V)
  WIM CO2 Regulator C/w Heater (220V)
- e) WIM Argon Regulator

ACCESSORIES

SPOT Welder Accessories

1. a) JPC 35/50KVA Electrode Holder "2" type (1/10)
   b) JPC 35/50KVA Electrode Holder "2" type (1/5)

2. Spot Welder Wire Mould Complete Set

3. MC15/25 Electrode "2" type (1/5)
   MC15/25 Electrode (1/5)

4. JPC 35/50KVA Electrode Holder (1/10)
   JPC 35/50KVA Electrode Holder (1/5)
   MC15/MC25 Electrode Holder (1/10)
   MC15/MC25 Electrode Holder (1/5)

5. Spot Welder Tip 52mm (1/10)
   Spot Welder Tip: WIM Origin
   Spot Welder Tip: WIM Origin (1/10)
   Spot Welder Tip: WIM Origin

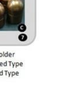
6. Spot Welder mould

7. A) SPOT Cap 1.10 - Tip Holder
   B) SPOT Cap 1.10 - Pointed Type
   C) SPOT Cap 1.10 - Round Type

SPOT Welder Controller

Others Accessories

A) Binzel Anti Spatter Spray
B) WIM Nozzle Gel



Welding Helmet
- a) Hand Shield Type
- b) Head Shield Type
- c) Solar Head Shield Type

Welding Hand Glove
- a) Leather Type Green (14')
- b) Semi Leather Type (10')