MARQUETTE® CORPORATION
5075 Wayzata Boulevard • Minneapolis, Minn. 55416

Power Twin

OPERATING AND MAINTENANCE INSTRUCTIONS

A.C.-D.C. ARC WELDER

MODEL 12-100 (12MOO10)

Printed in U.S.A.

620-50294

MARQUETTE®

THE *Quality* WELDER

Your MARQUETTE welder is a fine piece of equipment, carefully engineered, constructed of the finest materials and thoroughly tested before being delivered to you. It will provide the ultimate in performance, convenience and reliability.

In order that you may utilize to the fullest extent the capabilities of superior performance that your MARQUETTE welder will provide, we ask that you please:

CAREFULLY READ AND FOLLOW THE INSTRUCTIONS OUTLINED IN THIS PAMPHLET

Please fill in the following information so that you will have a complete record of your welder. If you have any occasion to correspond with the dealer or the factory about this welder, please be sure to give all the information that you have filled in.

MODEL	SERIAL NUMBER	DATE OF PURCHASE

WARRANTY

Marquette Corporation warrants this equipment to the original user against defective material and workmanship for a period of one year from date of purchase.

Claims for repair labor and/or material will be considered upon receipt of a Warranty Claim Tag signed by the Distributor who sold the equipment.

Marquette's responsibility under this warranty is limited to the repair or replacement of the defective part or parts, and the Company reserves the right to determine whether the part or parts failed because of defective material, workmanship, or other causes. Failure caused by accident, alteration, misuse, or improper packaging of return units is not covered by this warranty.

All warranty repairs must be done at a Marquette Factory Service Center or at an Authorized Service Depot. Any repair to the equipment other than at a Factory Service Center or Authorized Service Depot voids this warranty.

All equipment sent in for repair must be shipped transportation prepaid, and the repaired unit will be returned transportation collect.

The rights under this warranty are limited to the original user and may not be transferred to subsequent owners.

If problems concerning the operation of this equipment arise at any time, communicate with your distributor or the MARQUETTE district manager in your territory, or contact the factory at 5075 Wayzata Blvd., Minneapolis, Minn. 55416.

INTRODUCTION

This manual has been published to enable you to properly install and operate your Model 12-100 arc welder.

This model is designed to operate on 230 volt, 60 cycle AC lines unless specified on nameplate on welders.

INSTALLATION AND OPERATION

Upon receipt of this welder examine it to be sure it has not been damaged during shipment. If any part has been damaged to transit, place a claim with the Transportation Company immediately. Check all parts received against shipping list and original purchase order.

The Marquette Model 12-100 Arc Welder comes equiped with flexible rubber-covered No. 3 ground cable, attached snap-type ground clamp and No. 3 welding cable with insulated electrode holder, 3-wire power cable and plug, wall receptacle, welding helmet with shade No. 10 lens, instruction book, welding electrode assortment and Marquette "Guide to Better-Welding."

NAME PLATE

The specification plate, located on the welder, bears the name, model number, serial number, and electrical rating. The electrical rating includes the primary voltage, frequency, and rated input amperes, the secondary rated (output) voltage and current; the maximum open circuit secondary voltage, duty cycle, and phase.

POWER SUPPLY

The Marquette Model 12-100 Arc Welder, being of a transformer design, is built for operation on alternating current power lines only. Connecting this machine to direct current, or to lines having a voltage and frequency differing from the nameplate specifications may result in serious damage to the transformer windings. The voltage drop, at rated load, should not exceed 5% on a 230 volt line. Providing they meet local wiring regulations, the following wire sizes, when used on short runs, will be adequate for good welder performance.

Model No.	Line Voltage	
12-100	220 - 230 V	440 - 460 V
	8 AWG	10 AWG

Notify your power company before connecting welder to power supply line, and consult a competent electrician about new wiring you may need in order to comply with local wiring regulations.

POWER SYSTEMS

The Marquette Model 12-100 Arc Welder operates only on single phase current but may be connected to any AC system provided two supply wires and a ground wire are used and these wires carry the specified nameplate voltage. (See page 3.)

FUSE REQUIREMENTS

Arc Welders draw an intermittent load from the power supply and have to be fused to permit momentary short circuit currents to pass without burning out fuses. The recommended size fuse to use is listed below.

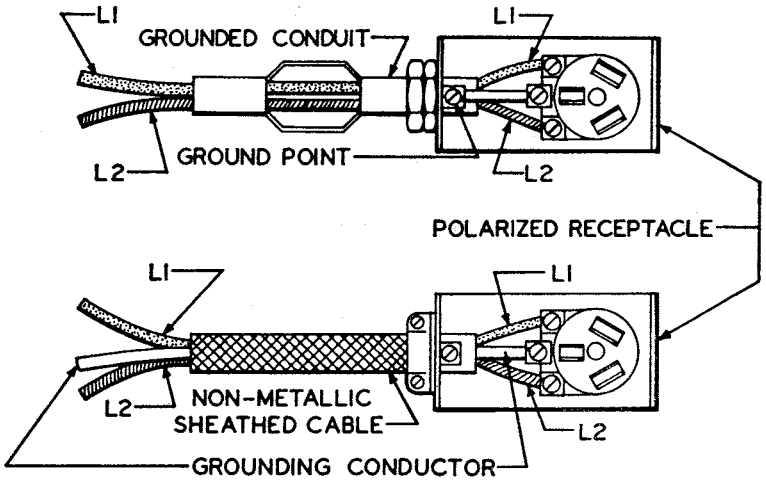
Model No.	Line Voltage	
12-100	220 - 230 V	440 - 460 V
	70 amp	35 amp

CONNECTING YOUR WELDER

Marquette welders come equipped with a 3-wire polarized receptacle. This receptacle fits the 3-wire plug-in-cap on the welder cable. Three wires must enter this outlet receptacle . . . only two of the wires, however, carry current and are to be attached to the two outside terminals of the receptacle. These wires supply single phase current to the transformer for welding. The third wire is the ground wire and is essential for grounding all exposed non-current carrying metal parts, the core of the transformer, and the core of the reactance coil.

Connect single phase power lines L1 and L2 to the outside terminals of the receptacle as shown in illustration. The center terminal of the receptacle must be connected to an effective ground, such as a water pipe or grounding rod, in one of the following ways: (1) by means of the grounded metal enclosure of the conductors feeding the machine or (2) by means of a grounding conductor run with the circuit conductors.

Note: Line Leads L1 & L2 connect to single phase power or to one phase of a 2 or 3 phase circuit.



SPECIFICATIONS FOR MODEL 12-100 WELDER											
Model Stock No.	Electrode Range	Open Circuit Volts	Primary Volts*	Cycle Phase*	Input Amps.*	Input KW	Input KVA	Sec. Arc Volts	Sec. Arc Amp	Net Weight	Shipping Weight
12-100	1/16" to 7/32"	80 (Max.)	230	60 Single	52	9.36	14.50	25	AC 20-235 DC 15-175	187	214

*Unless otherwise indicated on welder nameplate.

GENERAL INFORMATION

LOCATING WELDER—Choose a location for the machine where it is dry, light and convenient to your work. Ventilation around the machine should be reasonably good, as cooling of the transformer depends on free circulation of air up and through the cabinet. Do not cover the machine so as to obstruct the air passing through the cabinet and out the back.

OPERATION—Operator should be familiar with both welding machine and fundamentals of arc welding before attempting to weld. (See "Basic Principles of Welding", last section).

WELDING CABLES—The welder is supplied with two flexible welding cables. Both cables have a tapered plug on one end which fits into sockets or taps on the welder panel. A light turn or twist of the plug, when inserted, will provide a perfect contact between the tapered surfaces and insure a tight connection. Always keep the plug connections tight, or the high current they carry may tend to cause over-heating. Never make or break the plug connections when current is flowing in the cables as burning and pitting of the contact surfaces will result.

ELECTRODE HOLDER—Attached to one end of the electrode cable is a fully insulated electrode holder. The holder is of the self-gripping type requiring no adjustment for different size welding electrodes. It also permits holding a welding electrode at various angles without the rod slipping or turning.

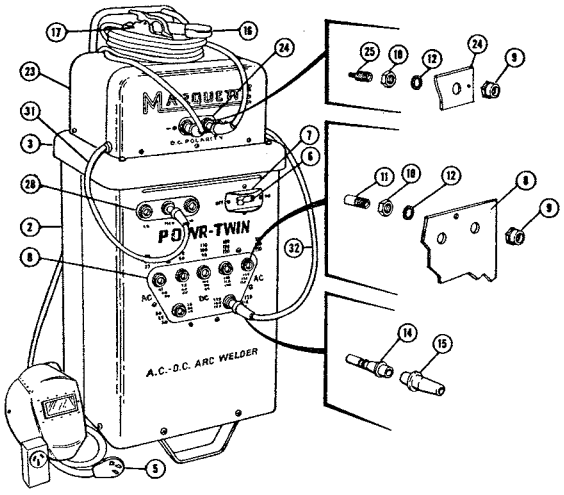
WORK CLAMP - Attached to the work cable is a clamp that can easily be fastened to the work, or welding table at some convenient point. The clamp must always be clamped to a clean spot. This is important to a good electrical connection that can carry the welding current from the welding electrode back through the work cable to tne work lead terminal on the welder.

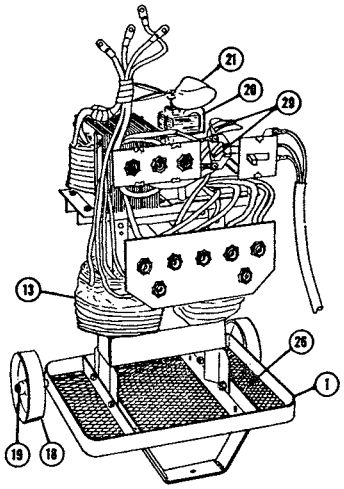
SELECTION OF PROPER WELDING CURRENT FOR AC WELDING

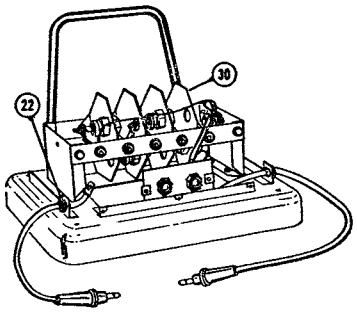
There are three terminal panels on the front of the welder. One is the electrode panel and is marked according to the range of ampere output. The second one is the work panel and is marked HI, MED., and LO. The third one is the DC current panel and is marked + and —.

For AC welding the electrode cable is plugged into one of the seven taps on the electrode panel and

PARTS LIST







The following parts list and the above illustrations completely identify all parts of the Marquette Model 12-100 Welder. Use this list when ordering replacement parts.

NOTE

Do not use item number on illustrations when ordering replacement parts, use part number.

ORDERING INSTRUCTIONS

To avoid delays and assure correct replacement parts, always include the following information with the parts order:

1. Model and serial number
2. Part number and part description
3. Quantity of part(s) desired

ITEM	PART NO.	DESCRIPTION	NO. REQ'D.
1	617-49632	Welded Base Assy.	1
2	617-49181	Cabinet Assy.	1
3	617-50296	Cover Assembly	1
4	619-55511	Specification Plate	1
5	633-47678	Power Cord Set	1
6	627-47671	Power Switch	1
7	610-47914	Switch Guard	1
8	613-51874	Electrode Terminal Panel	1
9	699-40529	Terminal Nut	12
10	699-50763	Terminal Post Nut	12
11	~~638-50765~~	Terminal Post	10
12	699-50976	Terminal Post Lockwasher	12
13	618-51741	Transformer Assembly	1
14	638-40704	Cable Plug	4
15	649-40703	Cable Plug Insulator	4
16	634-47843	Electrode Cable Assembly	1
17	634-47842	Ground Cable Assembly	1
18	629-40074	Wheel (Cast Iron)	2
19	699-47849	Wheel Retaining Ring	2
20	617-46861	Fan Motor	1
21	626-59883	Fan Blade	1
22	665-41047	Strain Relief Bushing	2
23	617-50776	Cabinet Assembly	1
24	613-51462	Terminal Panel	1
25	638-47774	Terminal Post	2
26	668-50316	Base Screen	1
28	613-40222	Work Term. Panel	1
29	610-40161	Fan Connector	2
30	617-52130	Rectifier Diode Bridge Assy.	1
31	617-50297	Short Jumper Cable Assy.	1
32	617-51836	Long Jumper Cable Assy.	1

(11) 611 ~ 71201

For Parts Prices, refer to current Parts Price List. ALL PARTS FOB Shipping Point.
Manufacturer reserves the right to make changes in Design, Construction or Materials as necessary.

BASIC PRINCIPLES OF ARC WELDING

BASIC PRINCIPLES OF ARC WELDING

A DEFINITION OF WELDING

As defined by the American Welding Society:

> A weld is made when the separate pieces of metal to be joined combine and form one piece as they are heated to a sufficiently high temperature to cause softening or melting. Pressure may be used to force the pieces together, or filler metal may be added to fill the joints. The melting point of the filler metal must be above 800° F or have approximately the same melting point as the base metal.

Metallic arc welding with the transformer welder is based on the fact that when one side of the welding circuit is attached to the work, which then is brought into contact with an electrode connected to the other side, an arc will be established. When the arc is properly controlled, the metal from the electrode will pass through the arc and be deposited on the work. When the electrode is moved along the work at the correct speed, the metal will deposit a uniform layer called a bead. Sufficient temperature is generated by the arc to cause the electrode metal and the parent metal to fuse, resulting in a sound weld.

THE ELECTRIC ARC

Electricity flows along an unbroken conductor path called a circuit. When this circuit is broken, the electric current (amperage) ceases to flow unless the electrical pressure (voltage) becomes sufficiently high to jump the gap. When the electricity jumps the gap a momentary "spark" is formed. In welding, the continuously flowing "spark" is called an arc. The amount of current and the force of the voltage present determines the length, heat and intensity of the arc.

CURRENT

The electric current used for welding may be direct current (DC) or alternating (AC).

Alternating current constantly changes its direction of flow. The alternating current commonly used in this country operates at 60 cycles . . . meaning it goes through a complete cycle of change in direction of flow, from positive to negative and back to positive, 60 times per second.

The exact welding current selected for a job depends upon the size of the pieces to be welded, size and type of electrode and the position of welding. Generally a lower current will be sufficient for welding on a small part than would be necessary to weld on a large piece of the same thickness. Similarly with a given size of electrode, a lower current should be used on thin metals than on the heavier sections.

EXAMPLE

The following chart shows typical examples of how current selection is determined by rod size and welding position.

Recommended Amperages

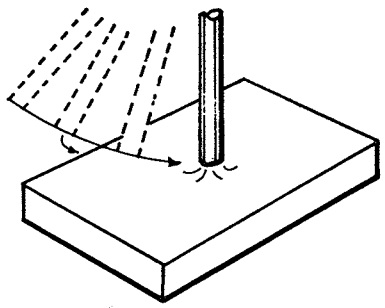
	Diameter	5/64"	3/32"	1/8"	5/32"	3/16"	7/32"	1/4"
AMPS	Flat	20-55	20-75	75-130	100-175	150-225	175-250	200-375
	Vertical	20-55	20-65	75-115	100-150	150-200	.....	.....
	Overhead	20-55	20-65	75-115	100-150	.....	.....	.....

AC WELDING CHARACTERISTICS

Striking the AC arc creates a very high temperature at the point of the arc. The arc core develops a temperature of about 8000 degrees fahrenheit. Under the intense heat developed a small part of the work to be welded and the tip of the electrode are brought to a molten state. The molten parent metal of the piece to be welded is agitated by the arc flame. This agitation, or puddling action, is caused by the alternating effect of the current as it changes its direction. The alternating or pulsating characteristic of the arc insures that the valuable alloying elements in the electrode covering, the electrode core metal, and the parent metal are evenly distributed. In addition, the pulsating action of the arc tends to send to the surface of the molten pool the non-metallic slag of low specific gravity. The result is a uniform dense weld which is stronger than the parent metal.

WELDING

Before attempting to weld on an actual job there are several basic techniques to be mastered. The first step is striking the arc. First, however, the operator should see that he is protected from the direct rays of the arc by proper protective equipment. (See page 12.)



SCRATCHING METHOD

There are two methods of striking the arc, the "scratching method", and the "tapping method". In the scratching method the striking end of the electrode is dragged across the work much as you would do when striking a match. When the electrode touches the work the welding current starts. If held in this position the electrode would "freeze" or weld itself to the work. To prevent this the electrode is withdrawn from the work immediately after contact has been

PREPARATION OF WORK

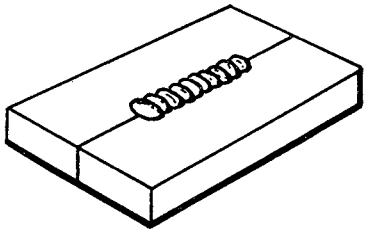
Before starting a weld the metal should normally be clean, free from oil, water, corrosion and other foreign matter. Sometimes it is necessary to shape the edges of the pieces to be welded in a form that will allow the electrode metal to better fuse with the parent metal. This shaping is usually in the form of a "V". Beveling of the metals to be joined will be discussed below.

TYPES OF WELDS

A wide variety of welds may be made by the arc process. The type of weld or joint to use on any particular job will be determined by the nature of the work itself. Some jobs require strength of the welded parts as their main objective while others may require the welded joint to be leakproof. These various welds can be classified as belonging to one of the five general types of joints, namely: butt joints, tee joints, lap joints, edge joints and corner joints.

BEAD WELD

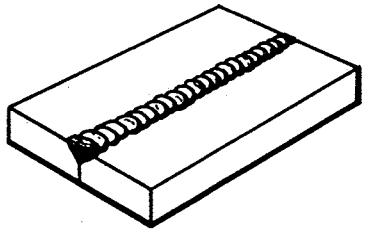
This type of weld is made by depositing a metal bead while advancing the electrode at a uniform rate. If the electrode is moved too slow, the bead will be higher and wider than is desirable and may cause an overlapping condition. However, if the electrode is moved too rapidly, the material to be welded will not be properly heated to allow the deposited metal to penetrate to sufficient depth to obtain proper fusion. Move the electrode just fast enough to maintain the arc at the forward edge of the crater. The amount of heat used and the rate of movement will determine the penetration obtained.



BEAD WELD

BUTT WELD

Welds of this class are made by bringing two pieces together edge to edge, with one surface of each piece on the same plane. The weld is then made along the line where these two surfaces meet. The plain type of butt joint does not require that the edges be beveled before welding. This type is satisfactory for light work such as sheet metal welding. On slightly heavier material the plates should be separated sufficiently to permit thorough penetration of the joint. On still heavier material it is necessary to bevel one side of each piece. This is called a single bevel weld. For the greatest strength on heavy plates the double-bevel edge is used. This is called a double-bevel weld. This latter type is more economical because less metal is removed in the beveling operation and consequently less weld metal is needed for "fill" when joining the pieces.



BUTT WELD

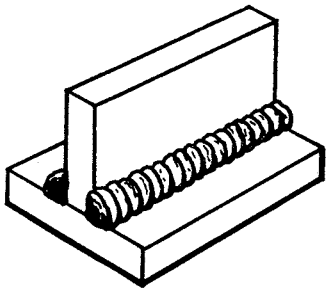
SINGLE VEE

DOUBLE VEE

(USED ON HEAVIER WORK)

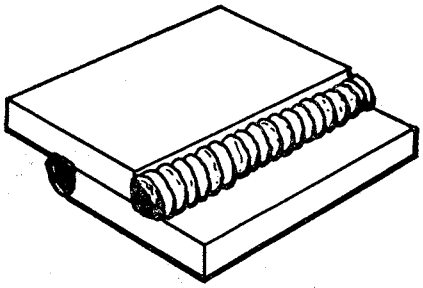
FILLET WELD

A fillet weld is a bead of metal, usually of triangular cross section, laid in the corner formed by two surfaces at right angles to each other. The fillet may be large or small depending on the requirements of the job. In making the fillet weld the weld deposit should be equally divided between the two plates.



LAP WELD

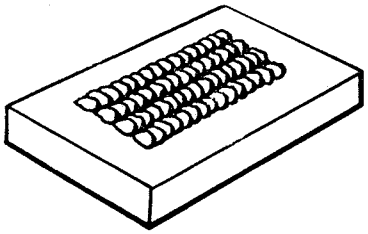
A lap weld is made by joining two sections of metal, one lapped over the other, and a fillet weld joining the edge of one to the face of the other. Usually in this type of joint two fillets are used so that the overlapping pieces are held on both sides at both overlapping edges.



LAP WELD

PADDING WELD

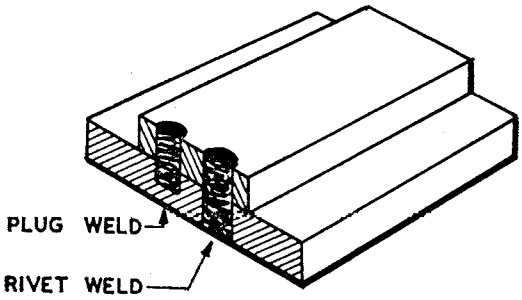
Padding welds are used to build up weld metal to any desired height. This type of weld is made with a series of overlapping beads to form a smooth surface.



PADDING WELD

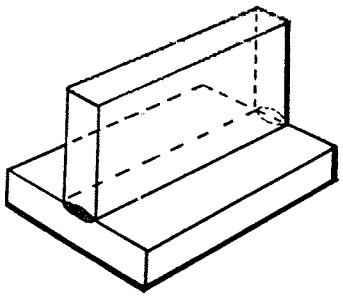
PLUGS & RIVET WELDS

Occasionally there is a demand for the plug weld type of joint. This joint is made by welding through a hole in a metal plate to fasten it to another plate below. When the weld is clear through both plates it is known as a "rivet" weld. Where it is desired to salvage a piece that has holes incorrectly placed this method of welding is found to be useful.



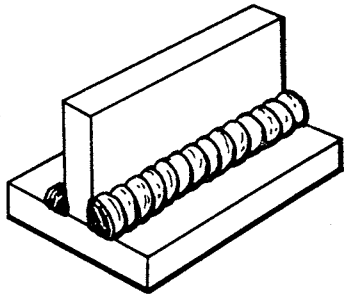
TACK WELD

The tack weld consists of spotting two plates together at intervals in order to keep them in proper alignment until the permanent weld can be made.



TEE WELD

This weld consists of welding plates or shapes at right angles to each other by means of fillets equal in cross section to the plates or shapes to be jointed.

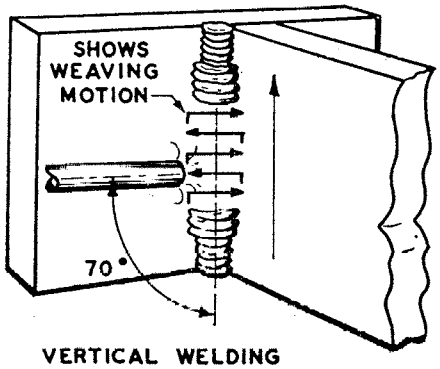


"ALL POSITION" ELECTRODES

It is easiest to weld in the downward position where gravity assists the arc stream. This position should be chosen wherever possible. Specially formulated electrodes are available for welding in the vertical and overhead position in addition to downward welding. These electrodes for AC arc welding are usually referred to as all-position electrodes. To successfully do vertical, horizontal and overhead work these electrodes should be used, as they have certain constituents in the coating which assist the metal particle flow across the arc stream and consistently deposit welds having good penetration or fusion, comparable in every way with welds made in the downward position.

VERTICAL WELDING

Vertical welding may be accomplished by either welding up or down. Frequently both methods are employed where more than one pass is necessary to complete the weld. An all position electrode should be selected as not all welding electrodes can be used for vertical welding. Heat settings should be approximately 10 per cent lower than would be selected for flat position welding.



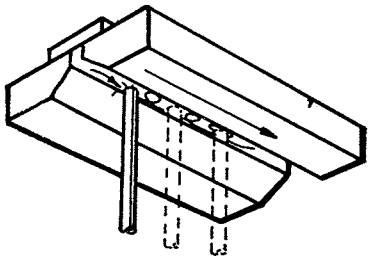
VERTICAL WELDING

If vertical down welding is employed the arc is struck at the top with the electrode slanting below the horizontal about 20 degrees. The speed of travel should be fast enough to prevent the metal and slag from becoming too fluid, as it will then tend to flow out of the craters and cause interference with the arc. For best results a short arc should be used.

The rod movement in vertical up welding is in the form of an inverted "U" shaped with the deposition of the metal taking place at the downward sweep of the rod, the upward movement tending to preheat the metal.

OVERHEAD WELDING

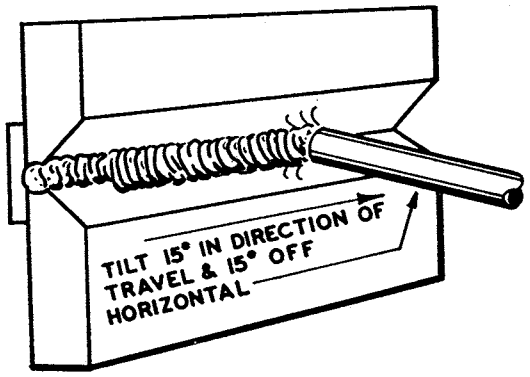
The procedure for this type of work is similar to that for heavy vertical welding. Extreme care should be used to get the proper balance of heat to the size of electrode in doing this class of work. The number of layers of weld deposit depends on the thickness of the weld. The weaving motion for this kind of work should always be in the form of a "U" with the arms in advance of the center. This procedure should be followed whether the weaving is done in wide or narrow layers.



OVERHEAD WELDING

HORIZONTAL WELDING

Only one type of joint falls in the true horizontal weld position and that is the butt weld between two plates in a vertical plane. The horizontal weld is accomplished by moving in a straight line along the joint. Weaving is not recommended when making a horizontal weld. The force of the arc is sufficient to drive the weld metal into the joint.



HORIZONTAL WELDING

Horizontal butt joints on sheet metal up to 1/16" thick can be made from one side. If the seam has numerous gaps, use a back-up strip. Allow a slight gap between sheet metal around ⅛" thick and weld from both sides. All metal 3/16" thick and over should be beveled and welded with a number of passes.

TO THE BEGINNING WELDER

The welding techniques described in this manual were written as a guide for the beginning welder. Upon familiarization with the arc welding process the beginning welder will develop individual techniques with which to accomplish good welds.

PROTECTIVE EQUIPMENT

HEAD AND FACE SHIELD

In order to protect the operator's eyes, face and neck from the direct rays of the arc, it is necessary for him to wear a helmet or fibre shield. The helmet type of shield is preferred over the hand grip type as it leaves both of the operator's hands free. These shields are provided with arc proof glass which prevents the harmful rays from reaching the eyes and face, and at the same time reduces glare. The glass lens should be of the proper shade to provide good visibility without tiring the eyes. To protect the lens against breakage and the spattering of molten weld metal a clear glass is used to cover the exterior side of the lens. The clear glass, if it becomes pitted after considerable use, can be replaced quickly at a small cost as compared to the dark colored lens.

Gas welding goggles must never be worn while arc welding as they do not provide sufficient protection against the arc rays.

GLOVES

Suitable gloves should be worn to protect the hands against "arcburn", and also against burns from molten weld metal. A gauntlet type of glove is preferred. This will also serve as a protection to the hands in handling warm pieces.

APRONS

Sparks and small globules of molten metal are thrown out by the arc, and for this reason it is advisable for the operator to wear a leather apron or some type of protective clothing. Trouser cuffs should be turned down to prevent catching hot particles. Protection to the feet should not be overlooked as small globules of weld metal can cause serious burns to the feet if they fall inside the shoes.

WELDING
ELECTRODE CHART

MILD STEEL ELECTRODES

Marquette	ASTM-AWS Specification No.	Description	Welding Position & Current
POSITIVE-ROD No. 105	E-6010	All-Position, General Purpose electrode for fast, D.C. welding.	F, V, OH, H DCR
RED-ROD No. 130	E-6011	Special All-Purpose electrode for all repair and maintenance welding. Best results even on dirty rusty metal . . . poor fit ups.	F, V, OH, H AC or DC
CODE-ROD No. 120	E-6012	HANDLES EASILY . . . on light sheet metal or heavy steel structures. Features Shallow Penetration with Good Fusion, and readily bridges the gaps on poor fit-up jobs.	F, V, OH, H DCS or AC
PRODUCTION-ROD No. 140	E-6013	All Purpose, All Position for fast, high quality production. GOOD APPEARING WELDS . . . work, has that "professional look", with closely rippled deposit.	F, V, OH, H AC or DC
HY-PRO ROD No. 146	E-6014	All-position high speed production electrode with good penetration and easy slag removal.	F, V, OH, H AC or DC
*MARQ-ROD No. 24	E-6024	High speed powdered metal coated contact type electrode for production welding. Selfstarting, permits "drag" technique for fast flawless welds of excellent appearance.	F, H Fillets AC or DC
PRESTO-ARC No. 15	None	A self starting, with easy re-starting powdered iron electrode. Smooth beads with ideal slag control.	F, H Fillets AC or DC
*PREST-ARC No. 16	None	Stainless type electrode, 19-9 used for chrome plated, stainless, high carbon or galvanized steels. Also designed for Spot Gun.	F AC or DC

LOW ALLOY STEEL ELECTRODES

*MARQ-ROD No. 7018	Iron Powder E-7018	Powdered iron coated, General Purpose, LOW HYDROGEN electrode for welding High Sulphur Steels, Hardenable Low Alloy, High Tensile Steels, Medium and High Carbon Steels, Cold Rolled Steels and Free Machining Steels.	F, V, OH, H AC or DC
HY-TEST ROD No. 85	E-8011	All-Position Shielded-Arc electrode for welding alloy steels. High Tensile Strength 80,000 to 90,000 psi with extraordinary toughness.	F, V, OH, H AC or DC
HY-TEST ROD No. 110	E-10013	All-Position electrode for Welding High Tensile Steels. BUILD UP for HARD SURFACING . . . makes extremely strong base for hard-surfacing weld metal.	F, V, OH, H AC or DC

STAINLESS STEEL ARC WELDING ELECTRODES

STAIN-ROD No. 308	E-308-16	A.C. or D.C. All position use on 18-8 Stainless and on 11-14% Manganese Steels.	F, V, OH, H AC or DC

HARD SURFACING ELECTRODES

BILD-UP-ROD No. 175	None	Brinell 300-435 as welded contact type electrode.	F, V, H AC or DC
MANG-ROD No. 250	None	Brinell 190-250 As Welded. Work Hardens to 500-600.	F AC or DC
*MANG-NICOL-ROD No. 255	None	Brinell 250-285 As Welded. Work Hardens to over 500.	F AC or DC
*HARD-ROD No. 285	None	Brinell 185-320 As Welded. Work Hardens to 485-500.	F AC or DC
HARD-ROD No. 450	None	Brinell 450-500 As Welded. Work Hardens to 550. For impact and abrasion.	F, V, H AC or DC
*HARD-ROD No. 455	None	Brinell 500 as Welded. Work Hardens to 575.	F, V, H AC or DC
HARD-ROD No. 550	None	Brinell 550-600 as welded. Work Hardens to 625. Excellent for high abrasion.	F, V, H AC or DC
*HARD-ROD No. 555	None	Brinell 550 as Welded. Contact type electrode.	F, V, H AC or DC
HARD-ROD No. 650	None	Rockwell C60-63 As Welded. Increase by liquid quenching.	F, V, H AC or DC

FOR WELDING CAST IRON

BLU-ROD No. 40	STEEL CORE WIRE	All-Position, low cost, easy-to-use Cast Iron electrode for non machineable welding of cast iron.	F, V, OH, H AC or DCR
NICOL-ROD No. 44	MONEL CORE WIRE	All-Position Machineable Cast or Malleable iron electrode that may also be used for welding Cast Iron or Steel . . .	F, V, OH, H AC or DC
*NICOL-ROD No. 99	NICKEL CORE WIRE	Contact-type electrode for machineable welds in case and malleable irons. New Powdered metal coating increases arc stability. Requires less pre-weld and post-weld cleaning.	F, V, OH, H AC or DC
BRONZ-ROD No. 61	BRONZE CORE WIRE	"Arc Brazing" electrode for Brazing Cast Iron, Malleable Iron, Steel, Copper, Silicon Bronze, etc. FOR DIFFICULT JOBS . . . oil-soaked, dirty, rusty or burned cast.	F, V, OH, H AC or DCR
ALUMINUM-BRONZE No. 62	None	Use when high strength, tough ductile, corrosion resistance is needed. Welds alum. bronze, silicon bronze, malleable iron, gray cast.	F, V, H AC or DC

FOR ALUMINUM WELDING

ALUMINUM-ROD No. 71	None	Ideal for all aluminum repairs, and fabrications. Core wire 95% alum. and 5% silicon. Produces smooth weld beads on flat, fillet or vertical jobs.	F, V, H DC (Rev. Pol.)

FOR CUTTING

ARCUT-ROD No. 111	None	Cutting Electrode for Cutting, Gouging, Beveling, Scarfing and Piercing. Cuts through all metals.	F, V AC or DCS

* Metal powder coating, drag or contact type.