

Product Information

MODEL HWP-50E Hot Wire Process

- Contoured Wave AC
- High Capacity Feed Head
- Increased Deposition Rate
- Simple to Use
- Custom-designed Torch
- Dual-Axis Wire Positioner

Introduction

The hot wire process is used in applications where a high deposition of the filler wire is desired. The process is used primarily with the GTAW (TIG) or the PAW (Plasma) welding process.

Hot wire welding provides deposition rates more normally associated with the GMAW (MIG) welding process but with the added advantages offered by GTAW (TIG) and PAW (Plasma) welding.

These advantages include better control of the heat input because the welding current is independent of the wire feed speed. This leads to reduced dilution in overlay welds and better side wall fusion in deep groove welds.

Description

A complete Jetline hot wire system consists of:

- Contoured-wave hot wire power supply
- Hot wire power control
- Heavy-duty wire drive unit
- Wire feed speed control
- Hot wire torch
- Hot wire torch positioner assembly

The hot wire system is supplied as a completely integrated package with all the necessary inter-connecting cables and hoses. The system has universal fittings to allow it to fit on any GTAW (TIG) or Plasma (PAW) torch and is supplied in a "ready-to-weld" condition.



Contoured-Wave Hot Wire Power Supply

This unique power supply is manufactured by Jetline Engineering specifically for the hot wire process. The system features a contoured-wave, AC output. Experience has shown that the use of an AC power supply enhances the hot wire deposition and reduces arc-blow problems experienced with conventional hot wire systems using DC hot wire power.

The output of the power supply is controlled using a solid-state control module. This module contours the AC waveform to create one which closely simulates a sine wave. The use of sinusoidal AC voltage greatly improves the flow of the hot wire into the weld pool. Frequency is adjustable from 50 to 200 Hz. This waveform permits higher wire feed speeds and currents leading to increased deposition rates and welding speeds.

The power supply provides up to 200 amps of hot wire current at voltages which are adjustable from 2 to 15 VAC. The voltage is regulated by a potentiometer on the hot wire power control or may be controlled by a remote 0 to 10 VDC signal. Meters are provided to indicate hot wire voltage and current, and a gas purge button is supplied.

Heavy-Duty Wire Drive Unit

The wire drive unit consists of a four-roll feedhead driven by a high capacity, DC motor. The wire drive unit is mounted on a base which also supports the wire reel holder. A wire straightener is supplied as standard with the system.

The wire feed speed is regulated by the 9629HW microprocessor control and is adjustable from 12 to 600 IPM (30 to 1,525 cm/min). This control permits wire inching, wire speed ramp up at the start and wire retract at the end of the weld.

HWP-50E HOT WIRE PROCESS

Hot Wire Torch

The hot wire torch is designed to guide the wire into the weld pool and to conduct the AC hot wire current to it. The torch includes gas shielding; this serves to protect the heated wire as it enters the weld pool. The torch is rated at 200 amps AC.

Hot Wire Torch Positioner Assembly

Correct entry of the wire into the weld pool is critical in the hot wire process. This positioner is designed to fit onto the welding torch. It is fitted with three axes of movement. One axis is pre-settable; this sets the angle at which the wire enters the weld pool. The other two axes have adjustment screws which permit them to be moved during welding. One screw adjusts the cross seam position of the wire relative to the weld pool, the other sets the entry position of the wire closer or further away from the welding electrode.

The hot wire process is designed to combine the quality of GTAW (TIG) or Plasma (PAW) welding with a high deposition rate and a smaller heat affected zone.

Principle

The hot wire process produces a high quality weld at a high deposition rate. The system uses higher wire feed speeds than those used in conventional cold wire feeding. For the wire to enter the weld pool without undesirable chilling of the pool, it is electrically preheated. The preheat is created by applying an AC current to the wire prior to its entering the weld pool. Current is applied as the wire passes through a contact tip in the hot wire torch. Because the wire is preheated, the hot wire torch provides gas coverage for the wire. This gas coverage is additional to the gas shielding of the welding arc.

For optimum results, the wire is fed into the weld pool at a steep angle, approximately 50° to 60° from the horizontal and 0.15" to 0.2" (4 to 5 mm) behind the tungsten electrode. Wire stick out from the torch would normally be set at about ¾" to 1" (19 to 25 mm). This distance combines optimum heating of the wire and wire position control.

Applications

The hot wire process is used for applications which have high quality requirements such as are found in the fabrication of pressure vessels and parts for the nuclear industry. Welds of this nature are generally radiographed, ultrasonically inspected or liquid penetrant checked. Applications include thicker, multi-pass welds in ¼" (6 mm) and thicker material. Diameters as small as 3" (75 mm) can be welded with the hot wire process. Large diameters with heavy walls are generally more suited to the submerged arc welding process. However, on these large welds, the first three to eight passes may be best applied with the hot wire process to establish a high quality base for the weld.

The hot wire process is used for joining a wide range of materials including carbon and alloy steels, stainless steels, nickel alloys and combinations of these materials. Aluminum and copper alloys are unsuited for the process due to their low resistance to the heating current.

In addition to joining, the process is well suited for cladding and buttering operations. The deposited surface is clean, with no spatter, oxides or slag. Dilution can be kept to a minimum.

Specifications

Power

Output: 200 amps, 50 to 200 Hz AC at 15 volts

Input: 380/415/440/460 volts
Three phase, 50/60 Hz, 2.4 KVA

Dimensions

HWP-200E Power Supply

Height: 16" (400 mm)
Width: 16" (400 mm)
Depth: 22" (560 mm)
Weight: 145 lbs (66 Kg)

WF-50 Wire Feeder

Height: 8" (200 mm)
Width: 8" (200 mm)
Depth: 22" (560 mm)
Weight: 20 lbs (9 Kg)

9629HW Control

Height: 8" (125 mm)
Width: 10" (250 mm)
Depth: 6" (150 mm)
Weight: 7 lbs (3 Kg)

See Jetline price list for complete ordering information

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