HASTELLOY® C-2000® Welding Guide

Typical Welding Parameters - Flat Position:

	Electrode Diameter		Arc Voltage	Welding Current
	in	mm	volts	amps
SMAW	3/32	2.4	22-24	55-75
	1/8	3.2	22-24	80-100
	5/32	4.0	22-25	125-150
	3/16	4.8	24-26	150-180

POLARITY: SMAW-DCRP-Electrode Positive

	Joint Thickness		Tungsten Electrode Diameter		Filler Wire Diameter	Welding Current	Arc Voltage
	in	mm	in	mm	in	amps	volts
GTAW	1/32-1/16	0.8-1.6	1/16	1.6	1/16	15-90	9-12
	1/16-1/8	1.6-3.2	1/16 or 3/32	1.6 or 2.4	1/16 or 3/32	50-115	9-12
	1/8-1/4	3.2-6.4	3/32 or 1/8	2.4 or 3.2	3/32 or 1/8	75-150	10-13
	>1/4	6.4	3/32 or 1/8	2.4 or 3.2	3/32 or 1/8	95-180	10-13

*2% Thoriated tungsten
Shielding gas 100% argon, flow rate ~ 25 ft^3/h (12 L/min)
POLARITY: GTAW-DCSP-Electrode Negative

	-	Wire Diameter		Shielding* Gas	Welding Current	Arc Voltage	Travel Speed	
	-	in	mm	-	amps	volts	in/min	mm/min
GMAW	Short Arc	0.035	0.9	2,3,4,5	70-90	18-20	8-10	200-250
		0.045	1.1	2,3,4,5	100-150	19-22	8-10	200-250
	Fixed Pulse	0.045	1.1	2,3,4	120-150	18-20	10-15	250-380
		-	-	-	Peak 250-300	-	-	-
	Variable Pulse (syngeric)	0.035	0.9	2,3,4	50-125	-	10-15	250-380
		0.045	1.1	-	100-175	-	10-15	250-380
	Spray	0.045	1.1	1,3	190-250	30-32	10-15	250-380

Flow Rate ~ 35 ft^3/hr (16 L/min)
POLARITY: GMAW-DCRP-Electrode Positive
* Acceptable shielding gases (not in order of preference): 1. 100% argon, 2. 75% argon + 25% helium, 3. argon + helium + CO_2 (NiCoBRITETM), 4. argon + helium +CO_2 (Helistar® SS), 5. helium + argon + CO_2 (Helistar A-1025)Polarity: SMAW and GMAW-DCRP, Electrode Positive, GTAW-DCSP, Electrode Negative

Suggested Practice:

•Establish safe working conditions prior to the start of welding. Areas to consider should include protection of personnel, ventilation, and welding in confined spaces. The recommendations of the American National Standard ANSI/ASC Z49.1, "Safety in Welding and Cutting", should be followed.

•The welding surface and adjacent area on each side of the joint should be thoroughly cleaned and degreased prior to welding.

•Oxy-acetylene welding and cutting are not recommended.

•Covered electrodes used from an unopened can require no further drying. Unused electrodes should be stored in a temperature controlled oven held in the range 250-400°F (121-200°C).

•Backing gas (100% argon) should always be used for the root pass when welding by either GTAW or GMAW. For SMAW, grinding of the back side of the root pass is necessary.

•For optimum corrosion resistance of the finished weldment, excessive heat input should be avoided by:

- minimizing weave bead techniques (i.e. use 'stringer' beads with some manipulation).

- avoiding slow travel speeds, especially on thin parts.

- controlling interpass temperatures, generally 200°F (93°C) or less.

•For GTAW, a constant-current power supply equipped with a high frequency start and down slope control is recommended. Torches with gas diffuser lenses provide the optimum gas coverage.

•Post-weld stress relieving in the 1200°F (650°C) range is not recommended for HASTELLOY C-276 alloy. If required, solution heat-treatment of this material is accomplished at 2050°F (1121°C) for an appropriate time followed by a water quench or rapid air cool (depending on section thickness).

•If shielding gases containing CO_2 are used during GMAW welding, grinding of the weld bead between each pass is recommended.

•Water cooled torches are recommended for GMAW spray transfer and synergic transfer (above 120 amps) modes.