

Wire and Welding products

HAYNES
International



HASTELLOY® C-2000® Welding Data

General Information:

- Safe working conditions should be established prior to welding. Welders should be properly protected, confined spaces should be avoided, and adequate ventilation should be provided. The recommendations of ANSI/ASC Z49.1, "Safety in Welding and Cutting", should be followed.
- Surfaces to be welded, and adjacent areas, should be cleaned and degreased thoroughly prior to welding.
- The Ni-Cr-Mo alloys exhibit low penetration characteristics, therefore adequate joint access (weld angle) and minimal land are suggested.
- The interpass temperature should be held below 93°C (200°F), and excessive heating should be avoided (especially on this parts).
- The weld metal is viscous (sluggish), and therefore some torch manipulation is usually necessary; increasing the current (amperage) will not substantially increase the fluidity of the weld puddle.
- Oxyacetylene and submerged-arc welding are not recommended.
- Covered electrodes from a new (unopened) can require no drying; however, unused electrodes should be stored in an oven weld in the temperature range 121°C (250°F) to 204°C (400°F).
- A backing gas of 100% argon should be used for the root pass during gas-tungsten arc or gas-metal arc welding; for shielded-metal arc welding, grinding of the back side of the root pass is necessary.
- For gas-tungsten arc welding, a constant-current power supply, equipped with a high frequency start and downslope control, is recommended; torches with gas diffuser lenses provide the optimum gas coverage.
- Post-weld stress relieving at approximately 650°C (1202°F) is inappropriate for the Ni-Cr-Mo alloys; normally a post-weld heat treatment is not necessary, but, if stresses must be relieved, a full solution anneal at 1149°C (2100°F) is recommended, followed by water quenching.
- If more than 1% of an oxidizing shielding gas is used during gas-metal arc welding, then grinding of the weld bead between each pass is recommended.
- Water-cooled torches are recommended for gas-metal arc spray transfer and synergic transfer (above 120A).

Typical Flat Position Parameters(Manual):

<u>Electrode Diameter mm (in)</u>	<u>Shielded-Metal Arc Arc Voltage V</u>	<u>Welding Current A</u>
2.4 (3/32)	22-24	55-75
3.2 (1/8)	22-24	80-100
4.0 (5/32)	22-25	125-150
4.8 (3/16)	24-26	150-180

<u>Joint Thickness mm (in)</u>	<u>Tungsten Electrode* & Filler Wire Dia. mm (in)</u>	<u>Gas-Tungsten Arc Welding Current A</u>	<u>Arc Voltage V</u>
0.8-1.6 (1/32-1/16)	1.6 (1/16)	15- 80	9-12
1.6-3.2 (1/16-1/8)	1.6 or 2.4 (1/16 or 3/32)	50-115	9-12
3.2-6.4 (1/8-1/4)	2.4 or 3.2 (3/32 or 1/8)	75-150	10-13
>6.4 (>1/4)	2.4 or 3.2 (3/32 or 1/8)	95-180	10-13

* 2% thoriated tungsten; 100% argon shielding gas - flow rate 12-17 l/min (25-35 cfr/hr)

	<u>Gas-Metal Arc</u>				
	<u>Wire Diameter mm (in)</u>	<u>Shielding Gas*</u>	<u>Welding Current A</u>	<u>Arc Voltage V</u>	<u>Travel Speed mm/min (in/min)</u>
Short Arc	0.9 (0.035)	2-5	70-90	18-20	200-250 (8-10)
	1.1 (0.045)	2-5	100-150	19-22	200-250 (8-10)
Fixed Pulse	1.1 (0.045)	2-4	120-150	18-20	250-380 (10-15)
Variable Pulse (Synergic)	0.9 (0.035)	2-4	50-125	-	250-380 (10-15)
	1.1 (0.045)	2-4	100-175	-	250-380 (10-15)
Spray	1.1 (0.045)	1 & 3	190-250	30-32	250-380 (10-15)

* Acceptable shielding gases (not in order of preference): 1. 100% argon, 2. 75% argon + 25% helium, 3. argon + helium + CO₂ (NiCoBRITETM), 4. argon + helium + CO₂ (Helistar® SS), 5. helium + argon + CO₂ (Helistar A-1025) Polarity: SMAW and GMAW-DCRP, Electrode Positive, GTAW-DCSP, Electrode Negative

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