SHIELD GAS SELECTOR CHART

BASE METAL TYPE	THICKNESS RANGE	WELD TYPE	SHIELD GAS TYPE	CHARACTERISTICS
ALUMINUM ALLOYS AND MAGNESIUM ALLOYS	Thin	Manual	Pure argon	Best arc starts, control of penetration, cleaning and appeaerance on thin gauges.
	Thick	Manual	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
	General Purpose	Manual	Pure argon	Best overall for good arc starts, control of penetration, cleaning and appearance.
	Thin	Mechanized	50 Ar - 50 He	Higher weld speed under 3/4" thick, with good arc stability and starting.
	Thick	Mechanized	Pure helium	Highest weld speeds, deeper penetration with DCSP, demanding arc starting and fixturing requirements, high flow rates needed.
COPPER ALLOYS Cu-NI ALLOYS NICKEL ALLOYS	Thin	Manual	Pure argon	Good control of weld puddle, bead contour, and penetraion on thin gauges.
	Thick	Manual	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
	General Purpose	Manual	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
	Thin	Mechanized	25 Ar - 75 He	Higher weld speed under 3/4" thick, with good arc stability and starting.
	Thick	Mechanized	Pure Helium	Highest weld speeds, deeper penetration with DCSP, demanding arc starting and fixturing requirements, high flow rates needed.
LOW CARBON ALLOYS AND LOW ALLOY STEELS	Thin	Manual	Pure Argon	Best arc starts, control of penetration, cleaning and appearance on thin gauges.
	Thick	Manual	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
	General Purpose	Manual	Pure argon	Best overall for good arc starts, control on penetration, cleaning and appearance.
	Thin	Mechanized	Pure argon	Best overall for good arc starts, control on penetration, cleaning and appearance.
	Thick	Mechanized	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
STAINLESS STEELS AND DUPLEX ALLOYS	Thin	Manual	Argon under 1/16" 95 Ar- 5 H over 1/16"	Argon with hydrogen added increases heat input and improves bead contour with lower gas flows, improves weld puddle wetting and minimizes undercutting.
	Thick	Manual	75 Ar - 25 He	Increase heat input with good arc starts of argon, but with faster welding speeds.
	General Purpose	Manual	Argon or 95 Ar - 5 H	Argon or 95 Ar - 5 H can be used interchangably on austeritic stainless steel.
	Thin	Mechanized	Argon or 85 Ar - 15 H	Argon provides stable arc control, 85 Ar - 15 H doubles argons welding speeds.
	Thick	Mechanized	75 Ar - 25 He or 65 Ar - 35 H	Increase heat input with good arc starts of argon, but with faster welding speeds.
TITANIUM ALLOYS	Thin	Manual	Pure argon	Argon's high density provides optimum shielding and arc stability.
	Thick	Manual	Argon or 75 Ar - 25 He	Argon with helium addition adds penetration for manual welding of thick sections.
	General Purpose	Manual	Pure argon	Best overall for good arc starts, control of penetration, cleaning and appearance.
	Thin	Mechanized	Pure argon	Best arc starts, control of penetration, cleaning and appearance on thin gauges.
	Thick	Mechanized	Argon or 75 Ar - 25 He	Argon with helium increases penetration and welding speed for thick sections.
	Thick	Mechanized	Pure argon	Argon's high density provides needed shielding of exposed areas at back of weld.

GUIDE FOR SHIELD GAS FLOWS, CURRENT SETTINGS AND CUP SELECTION

Electrode Diameter in inches (mm)	Cup Size	WELDING CURRENT (AMPS) - TUNGSTEN TYPE				ARGON FLOW - FERROUS METALS		ARGON FLOW - ALUMINUM	
		AC Pure	AC Thoriated	DCSP Pure	DCSP Thoriated	Standard Body CFH (L/MN)	Gas Lens Body CFH (L/MN)	Standard Body CFH (L/MN)	Gas Lens Body CFH (L/MN)
.020 (0.50)	3,4 or 5	5 - 15	5 - 20	5 - 15	5 - 20	5-8 (3-4)	5-8 (3-4)	5-8 (3-4)	5-8 (3-4)
.040 (1.00)	4 or 5	10 - 60	15-80	15 - 70	20 - 80	5-10 (3-5)	5-8 (3-4)	5-12 (3-6)	5-10 (3-5)
1/16 (1.60)	4, 5 or 6	50 - 100	70 - 150	70 - 130	80 - 150	7-12 (4-6)	5-10 (3-5)	8-15 (4-7)	7-12 (4-6)
3/32 (2.40)	6, 7 or 8	100 - 160	140 - 235	150 - 220	150 - 250	10-15 (5-7)	8-10 (4-5)	10-20 (5-10)	10-15 (5-7)
1/8 (3.20)	7, 8 or 10	150 - 210	220 - 325	220 - 330	240 - 350	10-18 (5-9)	8-12 (4-6)	12-25 (6-12)	10-20 (5-10)
5/32 (4.00)	8 or 10	200 - 275	300 - 425	375 - 475	400 - 500	15-25 (7-12)	10-15 (5-7)	15-30 (7-14)	12-25 (6-12)
3/16 (4.80)	8 or 10	250 - 350	400 - 525	475 - 800	475 - 800	20-35 (10-17)	12-25 (6-12)	25-40 (12-19)	15-30 (7-14)
1/4 (6.40)	10	325 - 700	500 - 700	750 - 1000	700 - 1100	25-50 (12-24)	20-35 (10-17)	30-55 (14-26)	25-45 (12-21)

For pure helium shielding gas, double flow rates shown. For argon-helium mixes with below 30% helium content, use figures shown. Always adjust gas flows to accommodate best shielding results.