



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 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 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 penetration 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 interchangeably on austenitic 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/MIN) | Gas Lens Body CFH (L/MIN) | Standard Body CFH (L/MIN) | Gas Lens Body CFH (L/MIN) |
| .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.