

# MIG Welding

Always read and follow the safety precautions and operational instructions in your owner's manual.

1. Keep a 1/4 to 3/8 in stickout (electrode extending from the tip of the contact tube.) (Refer to Diagram 1. Electrode Extensions)
2. For thin metals, use a smaller diameter wire. For thicker metal use a larger wire and a larger machine. See machine recommendations for welding capacity. (Refer to Diagram 4. Welding Wire Thickness Chart)
3. Use the correct wire type for the base metal being welded. Use stainless steel wires for stainless steel, aluminum wires for aluminum, and steel wires for steel.
4. Use the proper shielding gas. CO<sub>2</sub> is good for penetrating welds on steel, but may be too hot for thin metal. Use 75% Argon/25% CO<sub>2</sub> for thinner steels. Use only Argon for aluminum. You can use a triple-mix for stainless steels (Helium + Argon + CO<sub>2</sub>). (Refer to Diagram 2. Penetration Patterns for Steel)
5. For steel, there are two common wire types. Use an AWS classification ER70S-3 for all purpose, economical welding. Use ER70S-6 wire when more deoxidizers are needed for welding on dirty or rusty steel. (Refer to Diagram 6. Welding Wire)
6. For best control of your weld bead, keep the wire directed at the leading edge of the weld pool.
7. When welding out of position (vertical, horizontal, or overhead welding), keep the weld pool small for best weld bead control, and use the smallest wire diameter size you can.
8. Be sure to match your contact tube, gun liner, and drive rolls to the wire size you are using.
9. Clean the gun liner and drive rolls occasionally, and keep the gun nozzle clean of spatter. Replace the contact tip if blocked or feeding poorly.
10. Keep the gun straight as possible when welding, to avoid poor wire feeding.
11. Use both hands to steady the gun when you weld. Do this whenever possible. (This also applies to Stick and TIG welding, and plasma cutting.)
12. Keep wire feeder hub tension and drive roll pressure just tight enough to feed wire, but don't overtighten.
13. Keep wire in a clean, dry place when not welding, to avoid picking up contaminants that lead to poor welds.

14. Use DCEP (reverse polarity) on the power source.

15. A drag or pull gun technique will give you a bit more penetration and a narrower bead. A push gun technique will give you a bit less penetration, and a wider bead. (Refer to Diagram 3. Effect of Electrode Position and Welding Technique)

16. When welding a fillet, the leg of the weld should be equal to the thickness of the parts welded.(Refer to Diagram 10. Recommended Fillet Weld Thickness)

17. Compare your weld to our photos to determine proper adjustments.

Click the thumbnails for a larger image.

Good Weld

Travel

Too Fast

Travel

Too Slow

Voltage

Too Low

Voltage

Too High

Amperage

Too Low

Amperage

Too High

Less Stickout

No gas

See Also:

[MAKING A SOUND MIG WELD](#)

[SUCCESSFULLY WELDING SHEET METAL WITH GMAW AND GTAW](#)

[Take Miller Welds Basic MIG Free eTraining course](#)

MIG Welding - Printable Version (0.9 MB, 2 min 16 sec at 56kb/s)

Guidelines to Gas Metal Arc Welding (GMAW) (0.13 MB, 0 min 19 sec at 56kb/s)

An excellent informational booklet for beginners. Covers a description of the process, how to set up equipment, how to make a weld, conditions that affect weld bead shape, and welding troubleshooting.

16 pages - 5 1/2" x 8 1/2"