MIG WELDING SETTINGS CHART

Starting wire speed, voltage and amps for mild steel from 24 gauge to 5/16 in: solid wire with C25 or CO2, and gasless flux core.

STEEL THICKNESS	SOLID WIRE (ER70S-6), SHORT CIRCUIT DCEP: gun on +. Gas 30–40 CFH.					GASLESS FLUX CORE (E71T-11) DCEN: gun on −. No gas.		
	Amps	Wire in	Wire speed in/min	Volts C25	Volts 100% CO2	Wire in	Wire speed in/min	Volts
24 gauge* 0.024 in	24	0.023	85	15–16	17	0.030	50	13–14
22 gauge 0.030 in	30	0.023	105	15–16	17	0.030	50	13–14
20 gauge 0.036 in	36	0.023	125	15.5–16.5	17.5	0.030	60	13–14
18 gauge 0.048 in	48	0.030	95	15.5–16.5	17.5	0.030	80	13–14
16 gauge 0.060 in	60	0.030	120	15.5–16.5	17.5	0.035	70	15–16
14 gauge 0.075 in	75	0.030	150	16–17	18	0.035	80	15.5–16.5
12 gauge 0.105 in	105	0.030	210	17.5–18.5	19.5	0.035	105	16–17
1/8 in 3.2 mm	125	0.030	250	18.5–19.5	20.5	0.035	135	16.5–17.5
10 gauge 0.135 in	135	0.030	270	19–20	21	0.035	160	17–18
3/16 in* 4.8 mm	188	0.045	190	19–20	21	0.045	130	18–19
1/4 in* 6.4 mm	200	0.045	200	19–20	21	0.045	130	18–19
5/16 in* 7.9 mm	200	0.045	200	19–20	21	0.045	130	18–19

Starting points for mild steel: run a test bead on scrap of the same thickness and tune. Your machine's door chart comes first if it has one. Rows with * have a note below.

SET UP

Solid wire: DCEP
Gun on the positive (+) terminal, ground clamp on negative (−). Gas 30–40 CFH (14–19 L/min), set on a flowmeter.

Gasless flux core: DCEN
Gun on negative (−), ground clamp on positive (+). The flux shields the weld.

Contact tip to work
Solid wire 3/8–1/2 in (1/2–3/4 in for 0.045 in). Gasless 1/2 in to 5/8 in.

TUNE BY SOUND

Too low
The wire stubs into the plate, spatters and leaves a tall bead.

Too high
The arc hisses, wanders and undercuts.

Right
A steady crackle, like bacon frying, and a flat bead that ties into both edges.

Numbered voltage taps?
Take the tap from the chart in the machine's door, set the wire speed from this table, then tune by sound.

ROWS WITH *

24 gauge
Less current than any MIG wire is rated for: use the lowest settings and test on scrap first. Gasless: use a smaller wire or short tack welds.

3/16 in, gasless
One pass suits a fillet weld up to about 3/16 in; bevel a butt joint and weld it in several passes.

1/4 and 5/16 in
Past the top of Lincoln's data for 0.045 in wire: weld in several passes and bevel butt joints. For heavy plate, gas-shielded flux core (E71T-1) or spray transfer suits better.

Sources: amps, wire size and wire speed from Miller Electric, "MIG Welding: Setting the Correct Parameters" (2025) and the Millermatic 252 owner's manual. Voltage and contact tip distance from Lincoln Electric's SuperArc L-56 (ER70S-6) data sheet, short circuit on 100% CO2, with its advice to set 1–2 V lower for C25. Gasless from Lincoln's Innershield NR-211-MP (E71T-11) data sheet. Gas flow from Lincoln Electric. Compiled by Welding Tribe, November 2026. Free to print for your shop or class.