Road courses, dirt tracks, off-road, strips ... midgets, modifieds, cars or trucks ... it doesn’t matter where or what you race. Miller has the equipment to help you build, modify and repair. This tool is designed to aid you in the selection of the right welding product to suit your needs. It highlights racing components commonly fabricated and typical materials used, and offers general welding tips along with machine recommendations. Though a stock-car style race car is pictured in the examples, the materials across all forms of motorsports are common, with the variable usually being material thickness.
CONSIDERATIONS WHEN PURCHASING WELDING EQUIPMENT

**Material type** you plan on welding — steel, aluminum, 4130, stainless, titanium, etc.

**Material thickness** (maximum and minimum) will determine what amperage capacity the machine needs to run.

**Input power** available — 120V, 240V, single- or three-phase

**Operator skill level** will help determine the complexity or feature set to look for in a machine.

**Preferred process** — MIG or TIG

**Output capacity** (hobby, light production or manufacturing) will help determine the duty cycle requirements for the machine.
Click on any of the text callouts to learn more!
ENGINE/COOLING/EXHAUST

To work with the thick metal of cylinder heads and the thin metal of radiators — and everything in between — you need a versatile welder with a wide range of output capabilities, plus the arc adjustability to perfectly match every job.
When many dozens of welds all work together and help the chassis respond to the stresses of racing like it’s made of a single piece of metal — that’s when you know you used the right welder for the job.
Maintaining proper suspension geometry under challenging conditions is a team effort — and strongly welded suspension components are key players.

**Recommended Products**

**Millermatic® 211**
Ideal for light to medium MIG welding, including fabrication, body hanging, chassis building/repair and more.

**Syncrowave® 210**
Ideal for TIG welding spoilers, brake duct work, light aluminum brackets, 4130 material, dry sump tanks, radiators, seats, exhaust and header tubes, roll bars, and body supports.
REAR SUSPENSION

Properly welded rear axle housings, lower control arms, trailing arms, track bars and wheelie bars have many different jobs, but one common goal: maximizing traction and power delivery.

**Wheelie Bars (Drag)**
- Typical material: 4130 Cr-Mo, grade 9 titanium
- Recommended process: TIG (DC-)
- Filler metal: ER80S-D2 (4130), ER71T-9 (titanium)

**Lower Control Arms, Trailing Arms and Track Bars**
- Typical material: mild steel
- Recommended process: MIG, TIG (DC-)
- MIG filler metal: .030-.035 in. ER70S-6; TIG filler metal: ER70S-2, ER80S-D2

**Rear Axle Housing**
- Typical material: mild steel
- Recommended process: MIG, TIG (DC-)
- MIG filler metal: .035 in. ER70S-6; TIG filler metal: ER70S-2, ER80S-D2

**RECOMMENDED PRODUCTS**

**Dynasty® 280 DX**
TIG welds anything the Dynasty 210 can, plus aluminum intakes, turbo systems, spindles and rear axle housings.

**Millermatic® 255**
MIG welds material up to 1/2-inch thick for chassis building/repair, suspension systems, exhaust tubing, frame jigs and fixture making. Ideal for manufacturing or heavier fabrication like off-road trucks or rock crawlers.
FINISH FAB

Finish fabrication materials vary widely in metal types, thickness and amperage needs — so make sure you have a versatile welder that never compromises on arc quality.

Duct Work
- Typical material: 3003 aluminum
- Recommended process: TIG (AC)
- Filler metal: 4043, 1100

Seat/Safety
- Typical material: 5052 aluminum
- Recommended process: TIG (AC)
- Filler metal: 5356

Bumpers, Rub Rails and Nerf Bars
- Typical material: mild steel, 4130 Cr-Mo, 304 stainless
- Recommended process: MIG, TIG (DC)
- MIG filler metal: .030 in. ER70S-6 (mild steel); TIG filler metal: ER80S-02 (4130), ER308L (304 stainless)

RECOMMENDED PRODUCTS

Multimatic® 220 AC/DC
Best all-around multiprocess machine. Great for MIG welding chassis and roll cages; TIG welding steel and aluminum components like 4130 suspension parts, radiators, tanks and mounts up to 1/4-inch thick.

Learn More >>
There are a lot of different ways to finish ... but only one driver finishes first. A good support team — and good support equipment — can make all the difference in getting that win.

**SUPPORT EQUIPMENT**

Cool Down Units, Crash and Generator Carts

Command and Pit Boxes

Tire and Gas Carts

- Typical material: mild steel frames and 3003, 5052, 6061 aluminum subassemblies
- Recommended process: MIG or TIG (AC)
- MIG filler metal: .030-.035 in. ER70S-6 (mild steel); TIG filler metal: 4043, 4943, 5356 (aluminum)

**Fusion® 160**

Up to 6,500 watts of auxiliary power and 160 amps of DC stick welding output.

**Bobcat™ 225/250**

Bobcat: Up to 11,000 watts of auxiliary power and 225 amps of DC stick welding output.

**Multimatic® 200**

A great MIG, TIG, stick machine for light to medium fabrication that is highly portable and runs easily off of a 4,500-watt generator.

**Spectrum® 375/625 X-TREME™**

Great for body repair; floor pans; trimming hood, roof, and deck lids; cutting frames and CNC component parts.
SAFETY EQUIPMENT

The most popular line of safety gear in the motorsports/performance industry, ready to meet all your needs — because nothing is more important than your safety and health.

Digital Elite™ Series Welding Helmets

Popular helmets with a large viewing area. Includes ClearLight™ Lens Technology for high-definition optics and X-Mode™ to electromagnetically sense the weld even if light sensors are blocked by frame or suspension parts.

Digital Infinity™ Series Welding Helmets

The industry’s largest viewing area. Includes ClearLight™ Lens Technology for high-definition optics and X-Mode™ to electromagnetically sense the weld even if light sensors are blocked by frame or suspension parts.

Weld-Mask™ Head and Face Protection

Great for welding in confined areas where traditional helmets are a tight fit — like inside roll cages or under vehicles.

Weld-Mask™ 2 Head and Face Protection

Great for welding in confined areas where traditional helmets are a tight fit — like inside roll cages or under vehicles. Also accepts LPR-100™ half mask respirators.

Safety Glasses

Optimal eye coverage, style and increased comfort for all-day wear.

LPR-100™ Half Mask Respirator

Respiratory protection during welding — and the intense grinding required in custom fabrication.

WeldX™ Jacket

Top-of-the-line lightweight weld jacket made with Miller-exclusive carbon-fiber material for superior protection.

Metalworker Gloves

Great for metal fabrication and mechanic work.

Multi-Task Gloves

Perfect for MIG welding, TIG welding and performance industry metal fabrication.

TIG Gloves

Comfortable protection from a thinner glove: It’s easier to feel and manipulate TIG filler metal.

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Comfortable protection from a thinner glove: It’s easier to feel and manipulate TIG filler metal.
**Millermatic® 211**

120/240-volt input, 30- to 230-amp DC output. Used for MIG welding material up to 1/4-inch thick. Ideal for light to medium fabrication, body hanging, chassis building/repair and components. Inverter technology reduces weight and input power requirements, making this unit a great at-track welder that will operate using a 5,000-watt generator.

**Typical setup/skill level 2**
- .030 in. ER70S-6, 75/25 argon/CO₂ at 20-25 cfh

**MILLER EQUIPMENT CAPABILITIES PROCESS**

**Skill level index:** 1 (beginner) to 5 (expert)

**Millermatic® 212**

208- to 240-volt input, 30- to 210-amp DC output. Used for MIG welding material up to 3/8-inch thick. A great welder for all-around shop use, body hanging, chassis building/repair, suspension systems, exhaust tubing, frame jigs and fixtures. Auto-Set™ automatically provides the right setting for mild steel. Fan-On-Demand™ cooling system helps prolong unit life.

**Typical setup/skill level 2**
- .030 in. ER70S-6, 75/25 argon/CO₂ at 20-25 cfh
- .035 in. 4043 aluminum, 100% argon at 25-35 cfh

**MILLER EQUIPMENT CAPABILITIES PROCESS**

**Millermatic® 255**

208- to 240-volt input, 30- to 300-amp DC output. Used for MIG and pulse MIG welding material up to 1/2-inch thick with the highest output in its class. Great for chassis building/repair, suspension systems, exhaust tubing, frame jigs and fixture making. Digital readouts and independent voltage and wire speed adjustment make this the professional, experienced welder's choice. Adapts easily to spool gun for aluminum MIG welding. Removable, built-in running gear for easy, lightweight portability; digital meters; Fan-On-Demand™ cooling system helps prolong unit life.

**Typical setup/skill level 2**
- .035 in. ER70S-6, 75/25 argon/CO₂ at 20-25 cfh
- .035-1/16 in. 4043 aluminum, 100% argon at 25-35 cfh

**MILLER EQUIPMENT CAPABILITIES PROCESS**

See how these machines compare to others in the Miller welding & racing lineup >>
Multimatic® 200
120/240-volt input. Up to 200 amps of multiprocess MIG, TIG and stick welding. Perfect for light to medium fabrication and at-track support. Portable 29-pound machine with high-impact composite case, will run off a 5,000-watt generator.

Typical setup/skill level 2–3
- MIG: .030 in. ER70S-6, 75/25 Argon/CO₂ at 20–25 cfh
- TIG: 3/32 in. ceriated tungsten, 100% argon at 15–22 cfh
- Stick: 1/8 in. E7018, 90–150 amps

Skill level index: 1 (beginner) to 5 (expert)

Multimatic® 215
120/240-volt input. 20 to 230-amp DC output. Up to 230 amps of welding power for MIG, up to 210 amps for TIG and up to 200 amps for stick. Perfect for light to medium fabrication, body fabrication, chassis and suspension building. Auto-Set™ Elite automatically provides the right weld settings for various materials. This portable, 36-pound machine is a great all-in-one mobile powerhouse that will operate using a 5,500-watt generator.

Typical setup/skill level 2–3
- MIG: .030 in. ER70S-6, 75/25 argon/CO₂ at 20–25 cfh
- TIG: 3/32 in. ceriated tungsten, 100% argon at 15–22 cfh
- Filler metal: 1/16–3/32 in. ER70S-2 for steel; ER80S-D2 for 4130 Cr-Mo
- Stick: 1/8 in. E7018, 90–150 amps

Multimatic® 220 AC/DC
120/240-volt input. Up to 230 amps of welding power for MIG, up to 200 amps for stick and up to 210 amps for TIG. AC and DC output for aluminum and steel alloys. Best all-around machine for motorsports, aftermarket fabrication and auto restoration. Can be easily powered by the Fusion 160 welder/generator. Auto-Set™ Elite in all processes automatically provides the right weld settings for various materials. QuickTech™ feature allows you to keep a MIG gun and TIG torch connected at the same time; it automatically switches processes when either device is triggered.
Syncrowave® 210
120/240-volt input, 5- to 210-amp AC/DC output. Used for light- to medium-duty TIG welding of aluminum and steel up to 1/4-inch thick; well suited for material up to 3/16-inch thick. Pro-Set™ preset controls allow easy setting of weld parameters. Ideal for spoilers, brake duct work, light aluminum brackets, 4130 material, dry sump tanks, radiators, seats, exhaust and header tubes, roll bars, and body supports. Built-in running gear for easy transportability.

Typical setup/skill level 3–4
- Steel: 3/32 in. ceriated tungsten, 100% argon at 15–20 cfm
- Aluminum: 3/32 in. ceriated tungsten, 100% argon at 15–22 cfm
- Filler metal: 1/16–3/32 in. ER70S-2 for steel; 1/16–3/32 in. 4043, 4943 or 5356 for aluminum

Dynasty® 210 DX
120- to 480-volt input, 1- to 210-amp AC/DC output. At 47 pounds, this unit is portable, yet very powerful. Used for TIG welding material up to 1/4-inch thick, the Dynasty 210 DX is versatile enough for nearly any motorsports TIG fab work. Pro-Set™ preset controls allow easy setting of weld parameters. Great for spoilers, brake duct work, aluminum brackets, dry sump tanks, radiators, seats, exhaust and header tubes, roll bars, suspension systems, 4130 material, body supports and valve covers.

Typical setup/skill level 3–4
- Steel: 3/32 in. ceriated tungsten, 100% argon at 15–20 cfm
- Aluminum: 3/32 in. ceriated tungsten, 100% argon at 15–22 cfm
- Filler metal: 1/16–3/32 in. ER70S-2 for steel; 1/16–3/32 in. 4043, 4943 or 5356 for aluminum

Dynasty® 280 DX
208- to 575-volt input, 1- to 280-amp AC/DC output. Used for TIG welding material up to 3/8-inch thick, this unit is great for light to heavy motorsports fabrication work with an output range of 1 to 280 amps. Pulsed DC TIG capable. Will handle anything the Dynasty 210 can, plus aluminum intakes, turbo systems, spindles and rear axle housings. Pulsed DC TIG capable. Variable frequency and function ranges plus extended balance adjustments give this unit an exceptional arc.

Typical setup/skill level 4
- Steel: 1/16–3/32 in. ceriated tungsten, 100% argon at 13–18 cfm
- Aluminum: 1/16–3/32 in. ceriated tungsten, 100% argon at 15–20 cfm
- Filler metal: 1/16–3/32 in. ER70S-2 or ER80S-D2 for steel; 1/16–3/32 in. 4043, 4943 or 5356 for aluminum

Dynasty® 400
Great for material 5/8 inch and less, with a low end of 3 amps. Independently change AC polarity amperage, frequency and balance of AC wave to give complete arc focus and control. Lightweight inverter-based unit draws less primary power and can be plugged into 50-amp receptacles, giving it mobility unavailable to larger units. This is the most advanced and versatile unit available. Excellent for cylinder heads and engine blocks.

Typical setup/skill level 4–5
- Steel or aluminum: 3/32 in. ceriated or lanthanated tungsten, 100% argon at 15–20 cfm
- Filler metal: 1/16–3/32 in. ER70S-2 or ER80S-D2 for steel; 1/16–3/32 in. 4043, 4943 or 5356 for aluminum

Miller Equipment Capabilities Process

Skill level index: 1 (beginner) to 5 (expert)
Bobcat™ 225
Delivering up to 225 amps of DC stick welding power, the Bobcat welder/generator also produces up to 11,000 watts of generator power to drive multiple tools, air compressors, plasma cutters and even welders like the Multimatic® 200 or 215. At a continuous 4,000-watt power draw, this Bobcat welder/generator's 12-gallon fuel capacity allows it to run for 14 hours.

Typical setup/skill level 2
• Stick: 1/8 in. to 5/32 in. 7018

Spectrum® 375/625 X-TREME™
Excellent for cutting material up to 3/8 inch (375 model) or 5/8 inch (625 model). Low heat-affected zone (HAZ) gives no warpage of cutting area. Great for body repair and trimming floor pans, frames, and hood, roof and deck lid blanks. The Spectrum 625 also has the ability to fit a machine cut torch for CNC tables.

Typical setup/skill level 1

Fusion 160
Welder/generator with 160 amps of DC stick welding power and up to 6,500 watts of generator power for tools or even MIG/TIG and plasma cutters. Even while generating 3,000 watts of continuous power, this unit’s 6.25-gallon fuel capacity delivers 7.5 hours of runtime. Industry-exclusive PowerShift technology lets you use the Fusion 160’s engine to stick weld outdoors or generate AC power to run other equipment, including Miller welders — indoors, the Fusion 160’s stick welder can operate on 120/240-volt utility power using the multi-voltage plug (MVP™). OR use the PowerShift receptacle to power up other Miller equipment that uses the MVP power cord system. Easy operator controls and electric start make this a perfect support machine.

Typical setup/skill level 2
• DC Stick welding: 1/8 in. 7018 electrode positive 90–150 amps

Skill level index: 1 (beginner) to 5 (expert)
<table>
<thead>
<tr>
<th>Miller Equipment</th>
<th>Process</th>
<th>Pro Racing/Component Manufacturing</th>
<th>Semi-Pro Racing/Occasional Manufacturer</th>
<th>Hobby/Light Industrial</th>
<th>Support Equipment</th>
<th>Input Voltage</th>
<th>Special Features</th>
</tr>
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<tbody>
<tr>
<td>Millermatic® 141</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120V</td>
<td>Auto-Set™ automatically provides the right settings for mild steel</td>
</tr>
<tr>
<td>Millermatic® 211</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120/240V</td>
<td>Inverter with Auto-Set™ automatically provides the right settings for mild steel</td>
</tr>
<tr>
<td>Millermatic® 212</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>208/240V</td>
<td>Built-in running gear, Fan-On-Demand™ cooling system, Auto-Set™ automatically provides the right settings for mild steel</td>
</tr>
<tr>
<td>Millermatic® 255</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>208/240V</td>
<td>Removable, built-in running gear for easy, lightweight portability; digital meters; Fan-On-Demand™ cooling system</td>
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<tr>
<td>Diversion™ 180</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120/240V</td>
<td>AC/DC, simple to use</td>
</tr>
<tr>
<td>Dynasty® 210</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120–480V</td>
<td>AC/DC, pulsed DC TIG, Pro-Set™ preset controls, variable function ranges</td>
</tr>
<tr>
<td>Dynasty® 280</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>208–575V</td>
<td>AC/DC, pulsed DC TIG, Pro-Set™ preset controls, variable function ranges</td>
</tr>
<tr>
<td>Dynasty® 400</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>208–575V</td>
<td>AC/DC, high-speed pulsed DC TIG, variable function ranges</td>
</tr>
<tr>
<td>Syncrowave® 210</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120–240V</td>
<td>AC/DC, built-in running gear, Pro-Set™ preset controls</td>
</tr>
<tr>
<td>Multimatic™ 200</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120/240V</td>
<td>Auto-Set™ Elite automatically provides the right settings for various materials</td>
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<tr>
<td>Multimatic™ 215</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120/240V</td>
<td>Auto-Set™ Elite automatically provides the right settings for various materials</td>
</tr>
<tr>
<td>Multimatic™ 220</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120/240V</td>
<td>Auto-Set™ Elite and QuickTech™ makes for easy setup and fast, trouble-free process changes. AC/DC for welding aluminum and steel alloys.</td>
</tr>
<tr>
<td>Spectrum® 375/625 X-TREME™</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td>120–240V</td>
<td>Portable and lightweight, Auto-Refire™ for cutting expanded or multiple pieces of metal, Fan-On-Demand™ cooling system</td>
</tr>
<tr>
<td>Fusion 160</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td>Provides 6,500 watts of peak power, 120V GFCI and 240V receptacles</td>
</tr>
<tr>
<td>Bobcat™ 225/250</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td>Provides 11,000 watts of peak power, two 120V and one 240V receptacles</td>
</tr>
</tbody>
</table>
PREFERRED PARTNERS

Miller is proud to support the partners listed below who use our products in the manufacture of their components and equipment. Hardworking Miller products and the dedicated people who use them: Together, we build championships.

Chassis and Suspension Components

Jerry Haas Race Cars
jerryhaas.com
636-343-8895

McM Motorsports
mcmoffroad.com
800-209-1053

Detroit Speed, Inc.
detroitspeed.com
704-662-3272

Camburg Engineering
camburg.com
714-848-8880

Right Foot Performance Products
rightfootperformance.net
920-832-2322

Gateway Classic Mustang
gatewaymustang.com
573-732-3541

View Additional Partners >>
Components and Accessories

**Engine Components**

- **JOES Racing Products**
  - joesracing.com
  - 877-267-1525

- **C&R Racing**
  - crracing.com
  - 317-293-4100

- **ButlerBuilt Safety Products**
  - butlerbuilt.net
  - 800-621-7328

**Pit Support Equipment**

- **PAR Racing Engines**
  - parraceengines.com
  - 864-578-5622

- **Nitro Manufacturing**
  - nitromfg.com
  - 704-663-3155

**Support Equipment**

- **Wolfpack Parts**
  - utvwolfpack.com
  - 714-694-3797

- **Pro-Fabrication Exhaust**
  - profabrication.com
  - 704-795-7563

- **Stef’s Fabrication Specialties**
  - stefsperformance.net
  - 732-367-8700
LET'S BUILD.