



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 EQUIPIVENT

**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



# 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.





#### **Intake Manifolds**

- ·Typical material: 3003 or 6061 aluminum
- · Recommended process: TIG (AC)
- · Filler metal: 4043, 4943



#### **Aluminum Radiators, Heat Exchangers and Tanks**

- ·Typical material: 3003, 5052, 6061 (fittings, bungs, necks)
- · Recommended process: TIG (AC)
- · Filler metal: 4043, 4943



#### **Cylinder Head Repair**

- ·Typical material: billet or A356 cast aluminum
- · Recommended process: TIG (AC)
- · Filler metal: 4043, 4943



- Typical material: mild steel, 304 or 321 stainless, Inconel
- · Recommended process: TIG (DC-)
- · Filler metal: ER70S-2 (mild steel), 308 or 347 (stainless steel), 309 (stainless to mild steel), 625 (Inconel)



#### **Oil Pans**

- ·Typical material: mild steel, 3003 aluminum
- · Recommended process: TIG (DC-steel) (AC-aluminum)
- · Filler metal: ER70S-2 or ER80S-D2 (steel), 4043 or 4943 (aluminum)



#### **RECOMMENDED PRODUCTS**

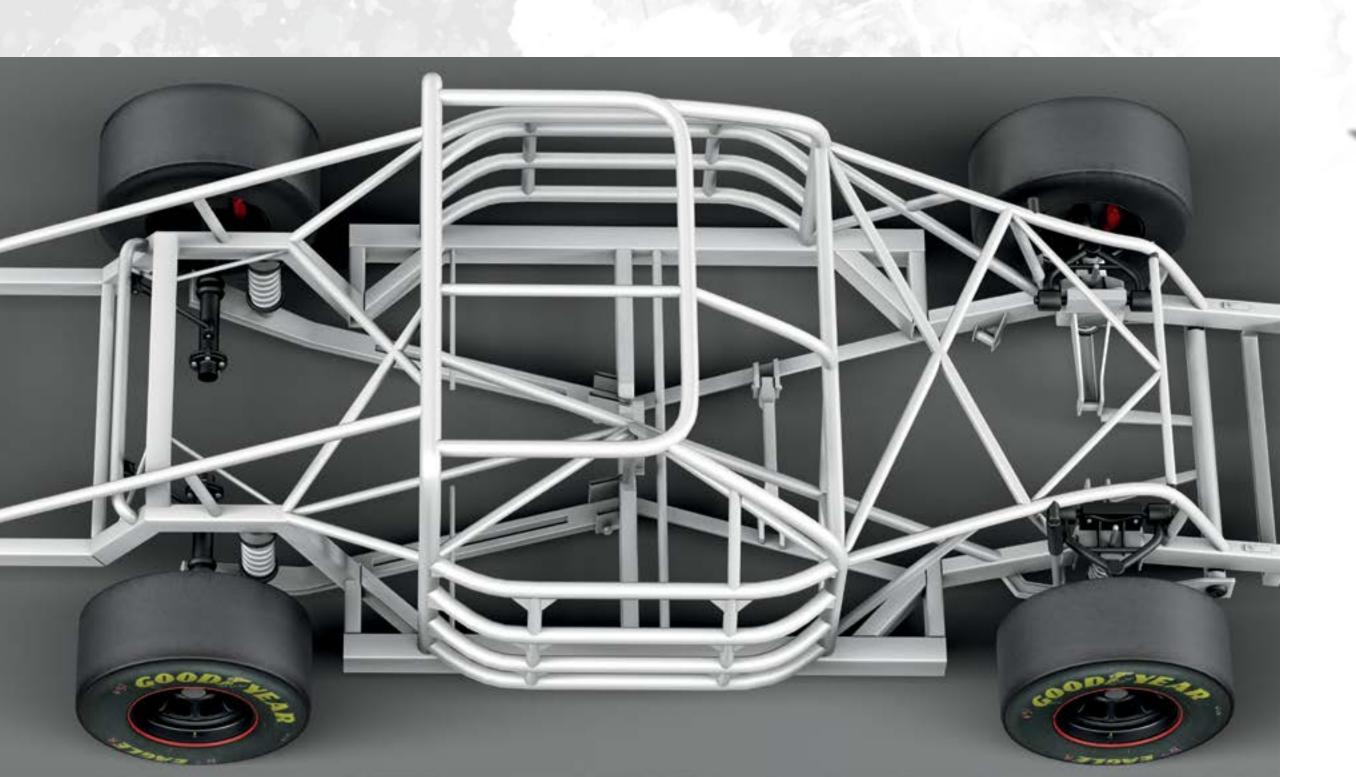


### Dynasty®400

One of the most advanced, versatile TIG welders available excellent for repairing cylinder heads and engine blocks.

# CHASSIS

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.





#### Body

- Typical material: mild steel
- · Recommended process: MIG or MIG spot
- · Filler metal: .024 in. ER70S-6

#### **Full Chassis and Roll Cage**

- ·Typical material: mild steel or 4130 Cr-Mo
- Recommended process: MIG or TIG (may depend on sanctioning body rules)
- · MIG filler metal: .030-.035 in. ER70S-6 (mild steel); TIG filler metal: ER70S-2 (mild steel), ER80S-D2 (mild steel/4130)





### Dynasty® 210 DX

Versatile enough for nearly any motorsports TIG fab work up to 1/4-inch thick.

**Learn More >>** 



### Multimatic® 235

A great Multiprocess MIG-STICK-DC TIG welder for body hanging, chassis building/repair, suspension systems, exhaust tubing, frame jigs and fixtures.

# FRONT SUSPENSION

Maintaining proper suspension geometry under challenging conditions is a team effort — and strongly welded suspension components are key players.





#### **Upper Control Arms**

- ·Typical material: mild steel, 4130 Cr-Mo
- · Recommended process: TIG (DC-)
- · Filler metal: ER70S-2 (mild steel), ER80S-D2 (4130)



#### **Lower Control Arms**

- ·Typical material: mild steel, 4130 Cr-Mo
- · Recommended process: MIG, TIG (DC-)
- · MIG filler metal: .030-.035 in. ER70S-6 (mild steel); TIG filler metal: ER70S-2 (mild steel), ER80S-D2 (mild steel/4130)



#### **Spindles**

- Typical material: mild steel, 4130 tubular fabricated, 4140 Cr-Mo solid
- · Recommended process: MIG, TIG (DC-)
- · MIG filler metal: .030-.035 in. ER70S-6 (mild steel); TIG filler metal: ER70S-2 (mild steel), ER80S-D2 (4130/4140)





### Millermatic<sup>®</sup> 211

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

**Learn More >>** 

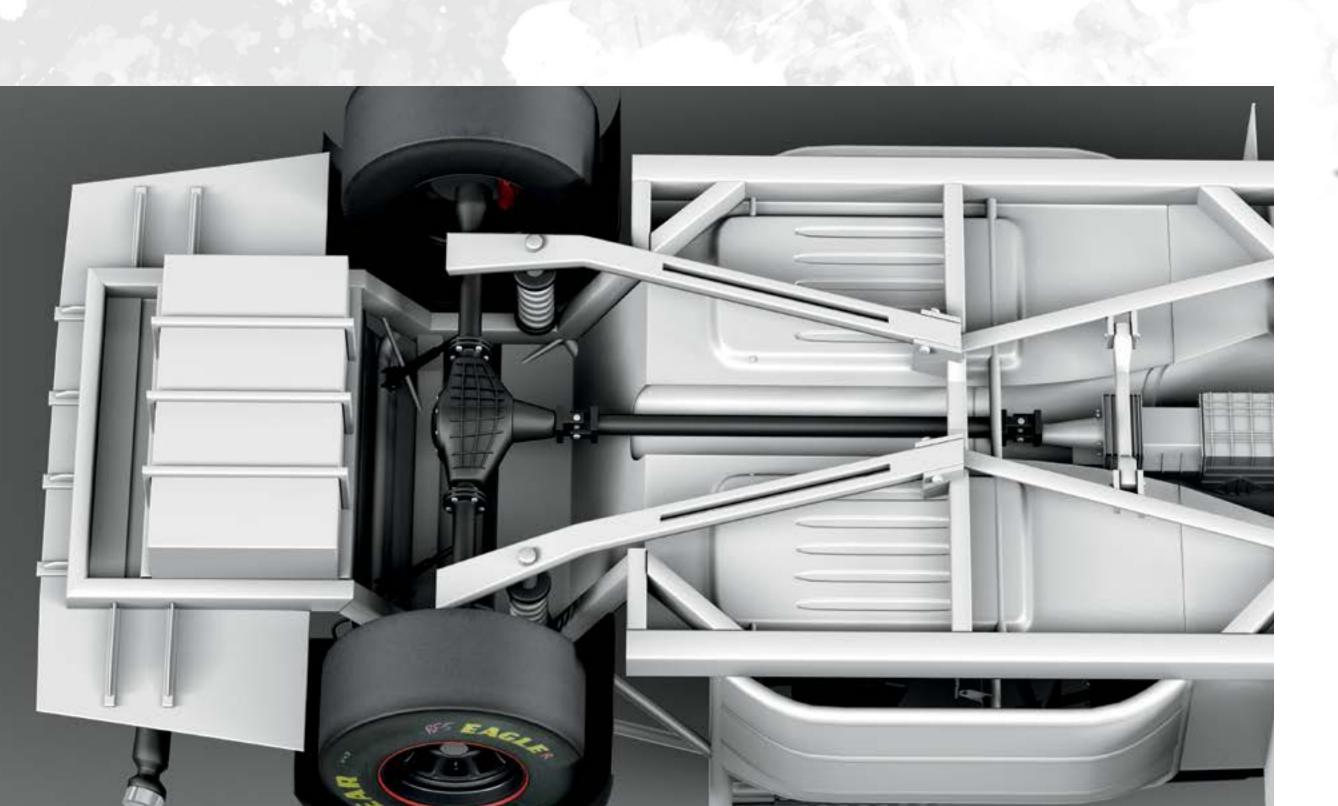


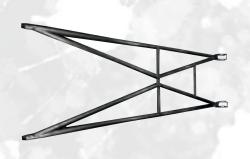
### Syncrowave® 210

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), ERTI-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.

**Learn More >>** 

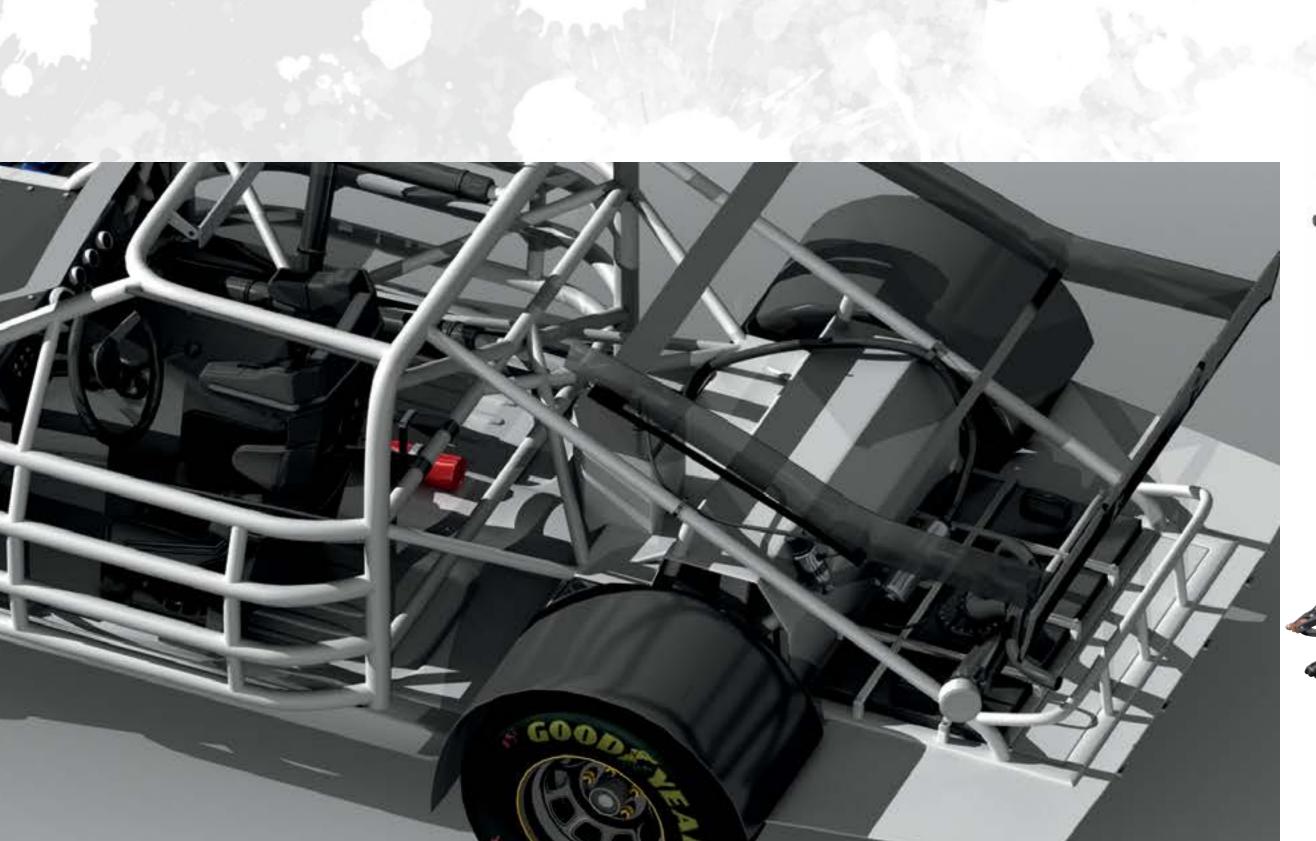


### Millermatic<sup>®</sup> 255

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-D2 (4130), ER308L (304 stainless)





Perfect for light to medium MIG and TIG welding, including body fabrication, chassis work and suspension building.

**Learn More >>** 







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.

# SUPPORT EQUIPMENT

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.





Cooldown 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)

#### **RECOMMENDED PRODUCTS**



### Fusion® 160

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

**Learn More >>** 

### Bobcat<sup>™</sup> 225/260

**Bobcat:** Up to 11,000 watts of auxiliary power and 225 or 260 amps of DC stick welding output.

**Learn More >>** 



### Multimatic<sup>®</sup> 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.

Learn More >>



### Spectrum<sup>®</sup> 375/625 X-TREME<sup>™</sup>

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

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<sup>™</sup> 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<sup>™</sup> 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<sup>™</sup> Head and Face Protection

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



### WeldX<sup>™</sup> Jacket

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



# Weld-Mask<sup>™</sup> 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.



### MetalworkerGloves

Great for metal fabrication and mechanic work.



### Safety Glasses

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



### Multi-Task Gloves

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



### LPR-100<sup>™</sup> Half Mask Respirator

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



### **TIG Gloves**

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



### Millermatic<sup>®</sup> 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

 $\cdot$  .030 in. ER70S-6, 75/25 argon/CO<sub>2</sub> at 20–25 cfh

MILLER EQUIPMENT CAPABILITIES PROCESS





See Specs Online >>

### Multimatic<sup>®</sup> 235

208- to 240-volt input, 20- to 235- amp Multiprocess DC output. Used for MIG and STICK welding material up to 3/8-inch thick and DC TIG welding up to ⁴⁄4 inch. A great welder for all-around shop use, body hanging, chassis building/repair, suspension systems, exhaust tubing, frame jigs and fixtures. Auto-Set Elite™ automatically provides the right setting for all processes. Dual gas solenoids allowing hook up of both MIG and TIG welding gases.

#### Typical setup/skill level 2

- $\cdot$  .030 in. ER70S-6, 75/25 argon/CO<sub>2</sub> at 20 cfh
- · .035-.035 in. 4043 aluminum, 100% argon at 20-25 cfh
- · 3/32 Ceriated tungsten, 100% argon at 15-22 cfh

### MILLER EQUIPMENT CAPABILITIES PROCESS





See Specs Online >>

### Millermatic<sup>®</sup> 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 weld operator'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

- $\cdot$  .035 in. ER70S-6, 75/25 argon/CO<sub>2</sub> 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<sup>®</sup> 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/CO $_2$  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

### MILLER EQUIPMENT CAPABILITIES PROCESS









See Specs Online >>

### Multimatic<sup>®</sup> 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, 38-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/ $CO_2$  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; ER80SD-2 for 4130 Cr-Mo
- · Stick: 1/8 in. E7018, 90–150 amps

### MILLER EQUIPMENT CAPABILITIES PROCESS









See Specs Online >>

# Multimatic<sup>®</sup> 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.

### MILLER EQUIPMENT CAPABILITIES PROCESS









### 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 cfh
- · Aluminum: 3/32 in. ceriated tungsten, 100% argon at 15–22 cfh
- Filler metal: 1/16–3/32 in. ER70S-2 for steel; 1/16–3/32 in. 4043, 4943 or 5356 for aluminum

### MILLER EQUIPMENT CAPABILITIES PROCESS





**See Specs Online >>** 

### 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 4

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

### MILLER EQUIPMENT CAPABILITIES PROCESS





See Specs Online >>

### 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 cfh
- Aluminum: 1/16-3/32 in. ceriated tungsten, 100% argon at 15-20 cfh
- 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





See Specs Online >>

### 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 cfh
- 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



See how these machines compare to others in the Miller welding & racing lineup >>



# Spectrum® 375/625 X-TREME™

Excellent for cutting material up to 3/8 inch (375 model) or 5/8 inch (625 model). Low heat-affect 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

MILLER EQUIPMENT CAPABILITIES PROCESS





**See Specs Online >>** 

### 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. Industryexclusive 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

### MILLER EQUIPMENT CAPABILITIES PROCESS







See Specs Online >>

### Bobcat<sup>™</sup> 225/260

PARTNERS >

Delivering up to 225 amps or 260 amps of DC stick welding power, the Bobcat welder/ generator also produces up to 11,000 watts (12,000 on EFI model) of generator power to drive multiple tools, air compressors, plasma cutters and even welders like the Multimatic® 200 or 215. Remote START/STOP allows for power on demand instead of constant running.

#### Typical setup/skill level 2

• Stick: 1/8 in. to 5/32 in. 7018

### MILLER EQUIPMENT CAPABILITIES PROCESS





See how these machines compare to others in the Miller welding & racing lineup >>

### Miller Product Selector Guide











Miller Equipment	Process	Pro Racing/ Component Manufacturing	Semi-Pro Racing/ Occasional Manufacturer	Hobby/ Light Industrial	Support Equipment	Input Voltage	Special Features
Millermatic® 141				~		120V	Auto-Set™ automatically provides the right settings for mild steel
Millermatic® 211						120/240V	Inverter with Auto-Set™ automatically provides the right settings for mild steel
Multimatic® 235						208/240V	Great all-around shop welder for MIG, STICK, DC-TIG. Auto-Set Elite™ automatically provides the right settings for all processes
Millermatic® 255						208/240V	Removable, built-in running gear for easy, lightweight portability; digital meters; Fan-On-Demand™ cooling system
Diversion™ 180						120/240V	AC/DC, simple to use
Dynasty® 210	<b>T</b>					120-480V	AC/DC, pulsed DC TIG, Pro-Set™ preset controls, variable function ranges
Dynasty® 280	7					208-575V	AC/DC, pulsed DC TIG, Pro-Set™ preset controls, variable function ranges
Dynasty® 400	7				( )	208-575V	AC/DC, high-speed pulsed DC TIG, variable function ranges
Syncrowave® 210	7					120-240V	AC/DC, built-in running gear, Pro-Set™ preset controls
Multimatic™ 200						120/240V	Auto-Set™ Elite automatically provides the right settings for various materials
Multimatic™ 215						120/240V	Auto-Set™ Elite automatically provides the right settings for various materials
Multimatic™ 220		A STATE OF THE PARTY OF THE PAR				120/240V	Auto-Set™ Elite and QuickTech™ makes for easy setup and fast, trouble-free process changes. AC/DC for welding aluminum and steel alloys.
Spectrum® 375/ 625 X-TREME™						120–240V	Portable and lightweight, Auto-Refire™ for cutting expanded or multiple pieces of metal, Fan-On-Demand™ cooling system
Fusion 160							Provides 6,500 watts of peak power, 120V GFCI and 240V receptacles
Bobcat™ 225/260			17				Provides 11,000 watts of peak power, Remote start/stop, 120V and 240V receptacles.

# 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

636-343-8895



**McM Motorsports** 

800-209-1053



Detroit Speed, Inc.

704-662-3272



**Camburg Engineering** 

714-848-8880



Right Foot Performance Products

920-832-2322



**Gateway Classic Mustang** 

573-732-3541

### Components and Accessories



### **JOES Racing Products**

877-267-1525



### **C&R** Racing

317-293-4100



### **ButlerBuilt Safety Products**

800-621-7328





**PAR Racing Engines** 

864-578-5622



### **Wolfpack Parts**

714-694-3797



#### **Pro-Fabrication Exhaust**

704-795-7563



**Stef's Fabrication Specialties** 

732-367-8700

## Pit Support Equipment



Nitro Manufacturing

704-663-3155



