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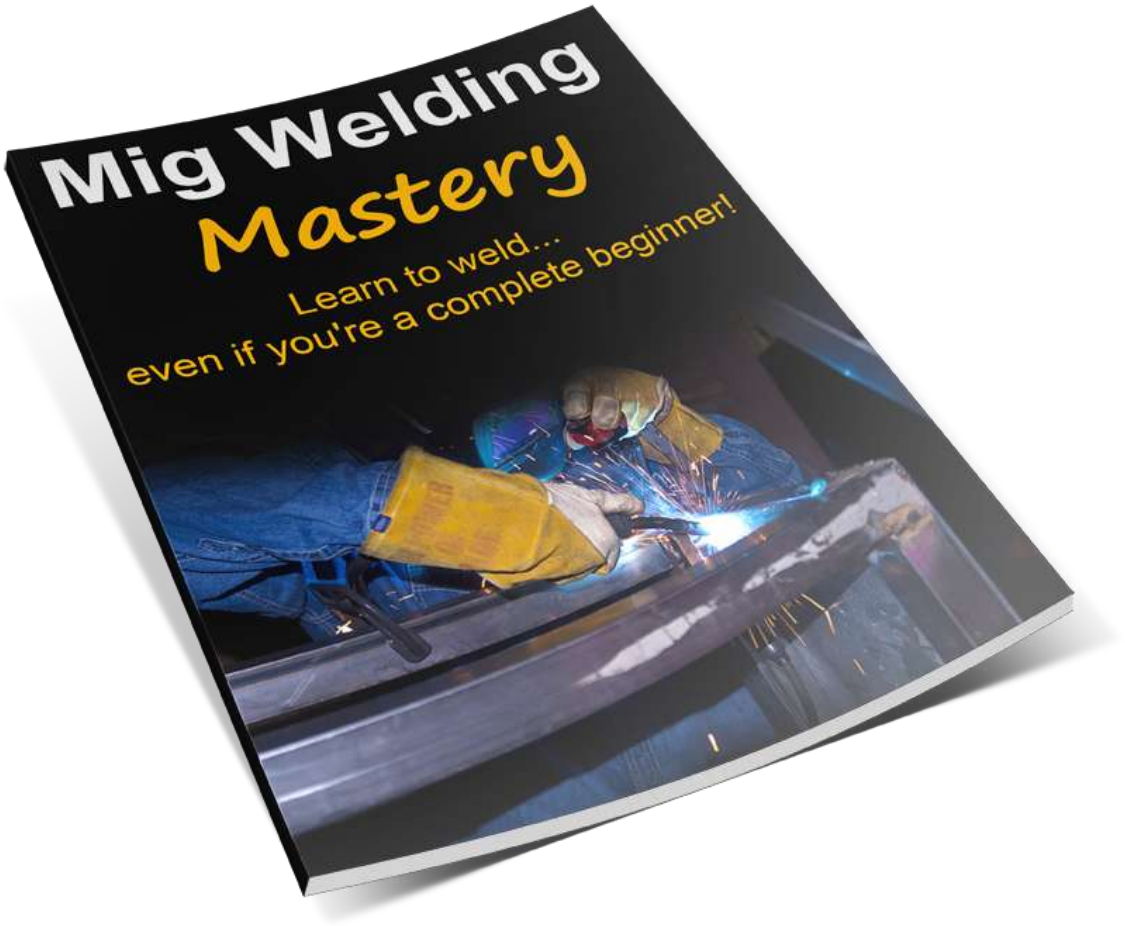
WELDING
FOR BEGINNER WELDERS



By Garrett Strong

www.MakeMoneyWelding.com

MIG Welding Mastery

Hi and thanks for downloading ***"MIG Welding Mastery"***

My name is Garrett Strong, owner of MakeMoneyWelding.com.

In the following pages I'm going to give you a detailed walk-through of how to start laying your first weld beads with your MIG welder, so you can get started welding your first project as soon as possible.

I was a beginner welder 8 years ago and now I want to share with you the tips, techniques, and strategies I've learned about how to make great welds with your MIG welder, and ultimately how to make lots of money doing it.

If you have any questions you can contact me at Garrett@MakeMoneyWelding.com

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MIG Welding Basics

If you're brand new to MIG welding, MIG stands for **Metal Inert Gas**. It's an arc welding process that uses a constant feeding wire as the welding electrode.

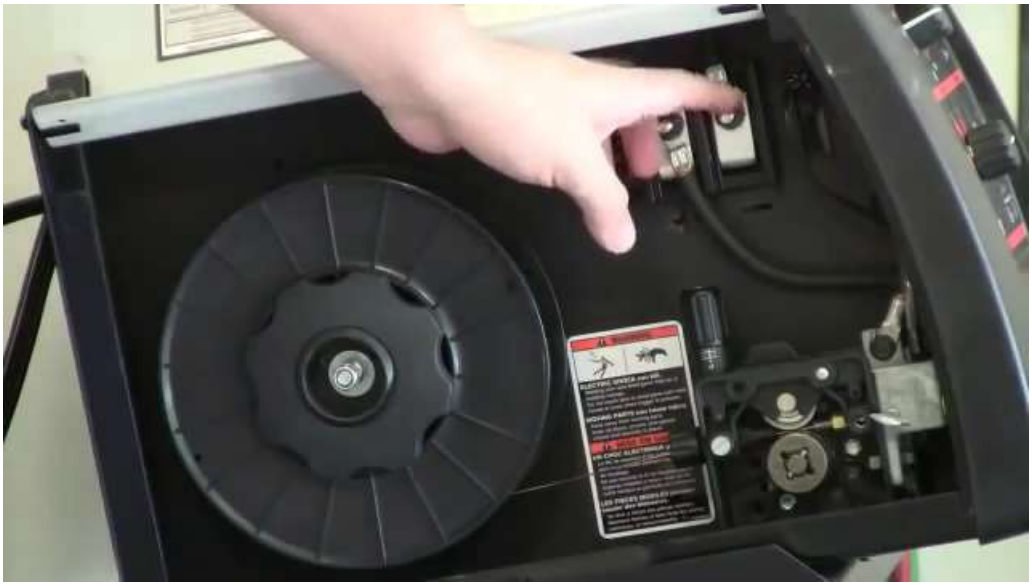
You can choose to either use gas with your mig welder (this is why it's called metal inert gas), or you can use flux core wire that doesn't require shielding gas.

The shielding gas simply acts to protect the weld puddle from the atmosphere which can cause damage to the weld.

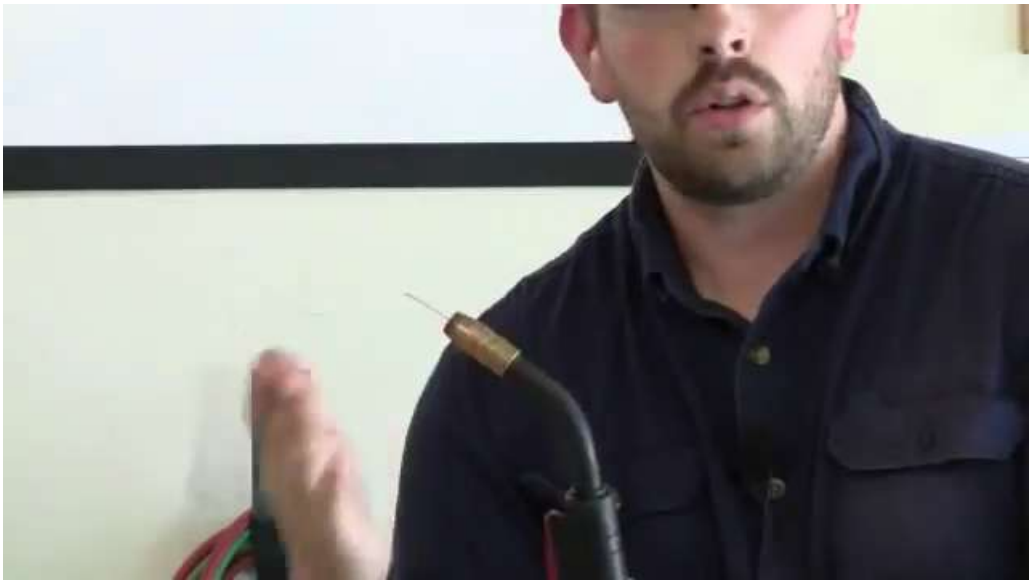
The wire for a MIG welder comes on a spool and is placed inside the MIG welding machine.

When you first setup your MIG machine you'll have to feed this wire through the rollers. These rollers clamp down on the wire and feed it out through the MIG gun.

As far as setup goes, that's about all there is to setting up a MIG welder, and that's why they're so great for beginners.



You can see the wire spool in this image, and if you look closely you'll see the wire being fed into the rollers. Once it reaches the end of the MIG gun, it melts and becomes the actual weld bead.



MIG welding is similar to stick welding in that you must ground the work piece with the ground clamp before you start the weld.

The process of MIG welding is much faster than stick welding because you have a continuous wire being fed, and you don't have to stop and change out spent electrodes.

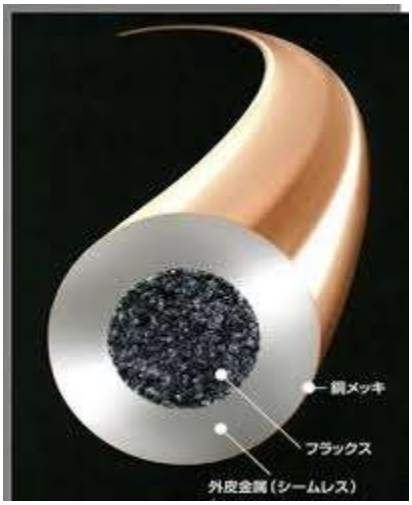
The MIG welding method was popularized in industry when manufacturers needed a fast method of welding.

MIG welding is by far the easiest way to start welding due to its simplicity. Besides some metal fit up and preparation, you are ready to weld with a MIG welder right out of the box.

There are 2 types of MIG welding processes. The first is called FCAW (Flux Core Arc Welding), and the second is called GMAW (Gas Metal Arc Welding).

FCAW (Flux Core Arc Welding)

Flux core arc welding uses a welding wire with the flux inside the wire. So, unlike using a stick welding electrode where the flux is on the outside, with FCAW the flux is on the inside of the wire.



Like stick welding, this flux produces a protectant slag that has to be chipped away after the weld has been made.

Below are two pictures showing completed welds. The one on the left has a flux coating that needs to be chipped away.

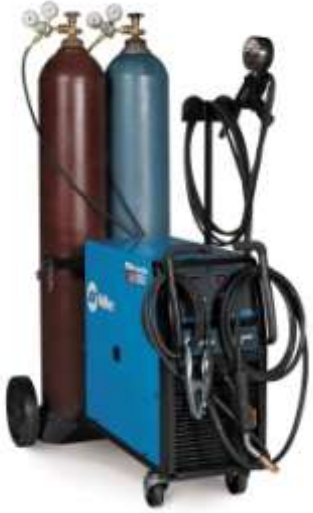
Unlike the MIG (Metal Inert Gas, a.k.a. GMAW) process, the flux core arc welding process can be used in windy conditions because there is no shielding gas to get blown away.

If you did try to use the gas metal arc welding process in the wind, it would blow away your shielding gas and you would end up with porosity in your welds. (See bottom weld)

GMAW (Gas Metal Arc Welding)

The gas metal arc welding process uses a solid wire with no flux. It uses a shielding gas to protect the weld puddle. It produces nicer welds with less weld spatter than FCAW, and it's better suited for welding in a shop with low winds.

This process involves using a gas cylinder with a CO2/Argon mix to shield the weld puddle from the atmosphere. There is no slag to chip off the weld with this process, and it makes an overall prettier weld.



Once the gas flow pressure has been set on the cylinder regulator, you're good to go.

All you have to do is aim the welding wire where you want it and squeeze the trigger. This does two things. It feeds the wire out of the machine, and it blows shielding gas into the weld puddle.

Overall, I would say that if you're just starting out then buying a MIG welder that will perform both GMAW and FCAW is a good start.

Anyone, and I mean anyone can learn to MIG weld in an afternoon.

The new MIG machines on the market today make it so simple to MIG weld because all you have to do is aim the MIG gun, pull the trigger, and you're welding.

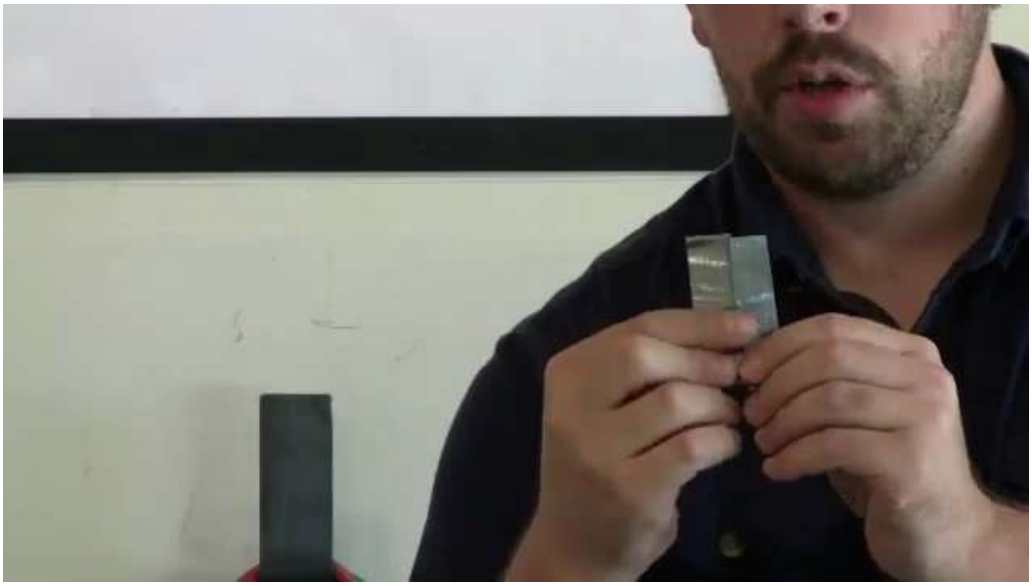
Of course, there are some other things you'll need to know like welding joints, welding positions, etc.

But, if you pick up a stick welder and try to start welding you're going to be struggling to even lay a bead for a few days because stick welders are extremely difficult to start your weld if you're a beginner.

How To Lay A Perfect MIG Weld

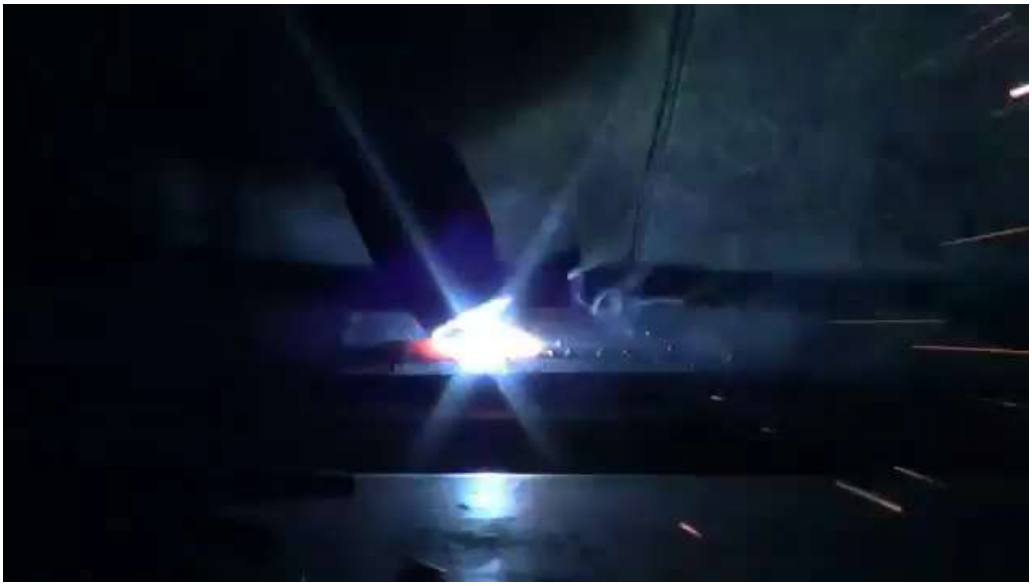
Below I've got 2 pieces of metal I'll be running a bead across. You can see I've taken the time to grind the mill scale of the metal before welding.

The reason you do that is because the weld puddle runs much smoother.



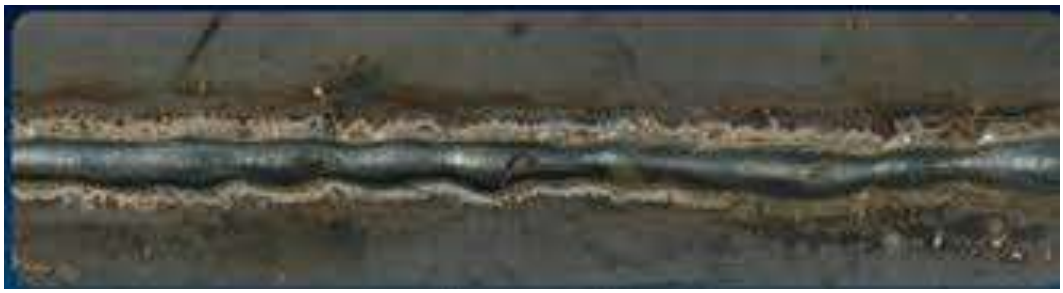
The thing to keep in mind when running a MIG weld bead is gun angle. Remember to always keep your gun angled at about a 15 degree angle, and move the weld puddle forward at a rate of about 1 inch every 5 seconds.

One of the most common mistakes beginners make is trying to rush the weld puddle. Remember, you want to weld as hot as you can without burning through you material.

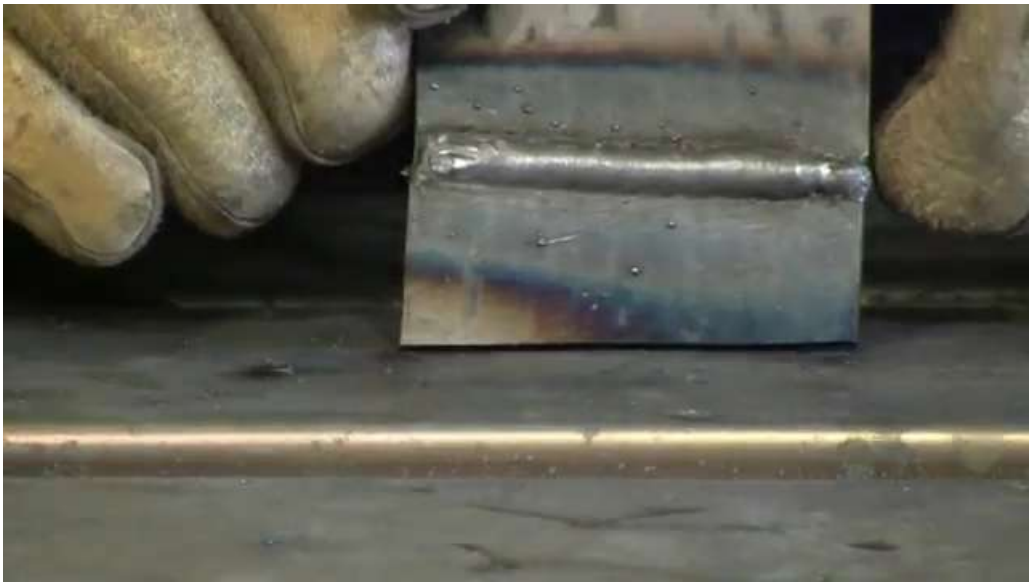


If your weld bead looks long and skinny like below, it means you're going too fast.

You need to slow down and take your time.



When you're finished with your weld bead, it should look something like this.



Overview Of Welding Processes

When I first began welding about 8 years ago I wasn't quite sure what I had gotten myself into. I started out with an oxy acetylene setup, and if you've ever oxy/fuel welded you know how difficult it is.

My weld beads were very sloppy, and most of the time my welds just ended up cracking when tested because I couldn't control the heat from the torch tip.

I continued to practice for many more hours until I got it down. Now, I can lay a weld bead with absolute precision every time with any welding process because I learned how to control the heat.

Welding is the process of joining two metals together. You can weld steel (also known as mild steel), stainless steel, aluminum, titanium, and more.

What you can't do is weld two pieces of metal together without actually penetrating the work piece. What I mean is that although you can make two pieces of metal stick together with an inexpensive welding machine, your welds will only be as strong and as aesthetic as your skill level will allow.

I started out doing it this way and I learned the hard way that in order to make long lasting, beautiful welds you have to take the time to not only practice, but also to clean and fit up the metal for welding.

Sloppy Weld

Nice Weld

There are a lot of bad habits you will likely make that are hard to unlearn if you start out welding the wrong way.

Overview: Welding and brazing

Welding is the process of joining 2 metals together by heating them up to molten hot temperatures, and then manipulating the molten weld puddle to create a weld bead.

That's just the beginning of making a weld though. A lot is involved with welding like metal cleaning, fit up, cutting, making measurements, making sure you're using the correct welding processes, and much more.

Controlling the liquid weld puddle is where lots of practice comes into play.

The heat required to get mild steel to its melting point is around 2700 °F. Each welding process heats the metal to a different temperature.

For example, the heat created from an oxy acetylene torch tip is around 6300 °F, which is plenty of heat to melt the steel.

Arc welding produces a heat at the electrode tip of around 6,000 to 10,000 °F.

I'm going to cover the different welding processes here and tell you what the uses and benefits of each process are.

Blacksmithing

Before there were any arc welding processes or oxy acetylene gases to heat up the metal, there were blacksmiths.

Blacksmiths had to heat up the metal using a heating forge, and rather than bring the metal to a liquid temperature and weld it, they had to hammer the steel together.

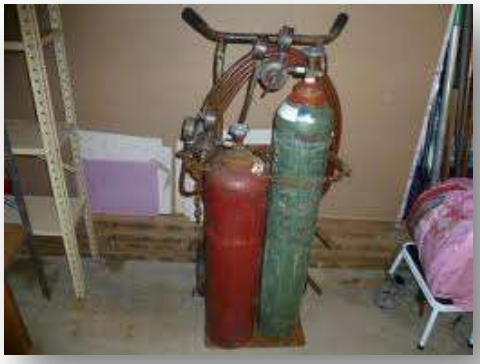
This process fused the metal together, and it's called forge welding. Up until the mid-1800's most welding was done this way.

Even though this process is long and arduous, it's still the same exact concept as gas welding or arc welding.

Essentially you're joining 2 metals together.

Oxy Acetylene Welding

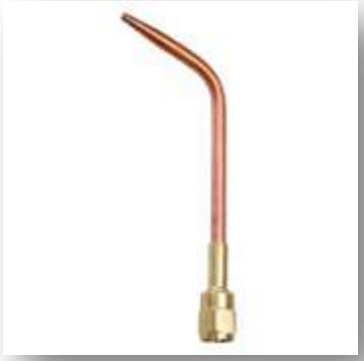
Oxy acetylene welding was developed and used from the mid to late 1800's. This process involves mixing oxygen with acetylene which produces a flame that burns very hot.



Oxy acetylene welding uses high pressure gas cylinders that contain the two gases oxygen and acetylene. The gases are able to be mixed and used for welding through the use of regulators, hoses, the torch mixer, and welding tips.

After turning on the gases and lighting them, they must be adjusted for the correct flame to weld properly.

You must direct the flame at the weld joint and use a filler rod to help make the weld bead.



Now, I may have simplified that a bit because there are a few more steps to oxy acetylene welding. For one you have to choose the proper welding tip for the metal thickness you're working with.

You have to use a bigger tip for thicker metal, and a smaller tip for thinner metal.