



Welding

POE B5

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Welding

➤ Welding is a process that joins materials like metals, glass, or thermoplastics by causing fusion using heat and pressure depending on the method using.

➤ Many energy sources can be used for welding.

Ex. gas flame, an electric arc, a laser, an electron beam, friction, and ultrasound.

➤ There are over 70 kinds of methods for welding, and the most common kind is the shielded metal arc welding.

Shielded Metal Arc Welding

- ▶ SMAW is a method of joining two or more materials with electrically generated heat using a consumable electrode covered with a flux.
- ▶ Set up the machine

Depending on the metal thickness and electrode diameter, set the amperage of around 90-120 amps and choose the correct electrode for it.

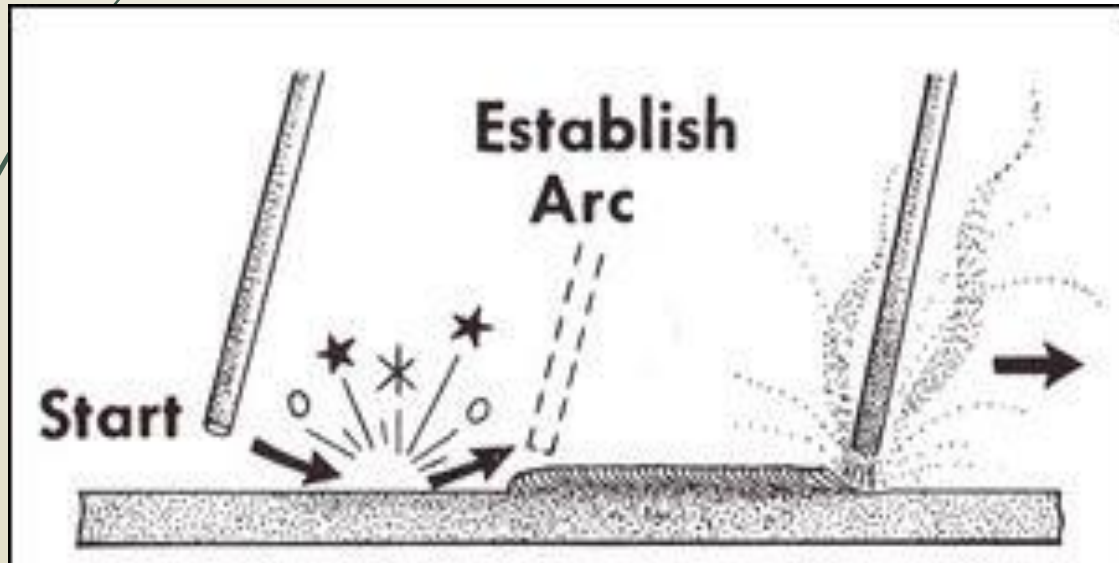


Steps for Shielded Metal Arc Welding

- Step 1: Strike an arc

You need to strike an arc by quickly brushing the rod against the piece of metal that you are going to weld like a match.

You will see a bright arc that is constant and stable if done correctly.



Steps for Shielded Metal Arc Welding



► Step 2: Begin welding

Begin welding by pulling the rod towards you in a zig-zag motion. Distance between the rod and the material should be maintained around $1/16$ in.

You will need to be careful that the rod will continue to get shorter because metal from the rod is melting across the arc and onto the metal being welded.

Steps for Shielded Metal Arc Welding

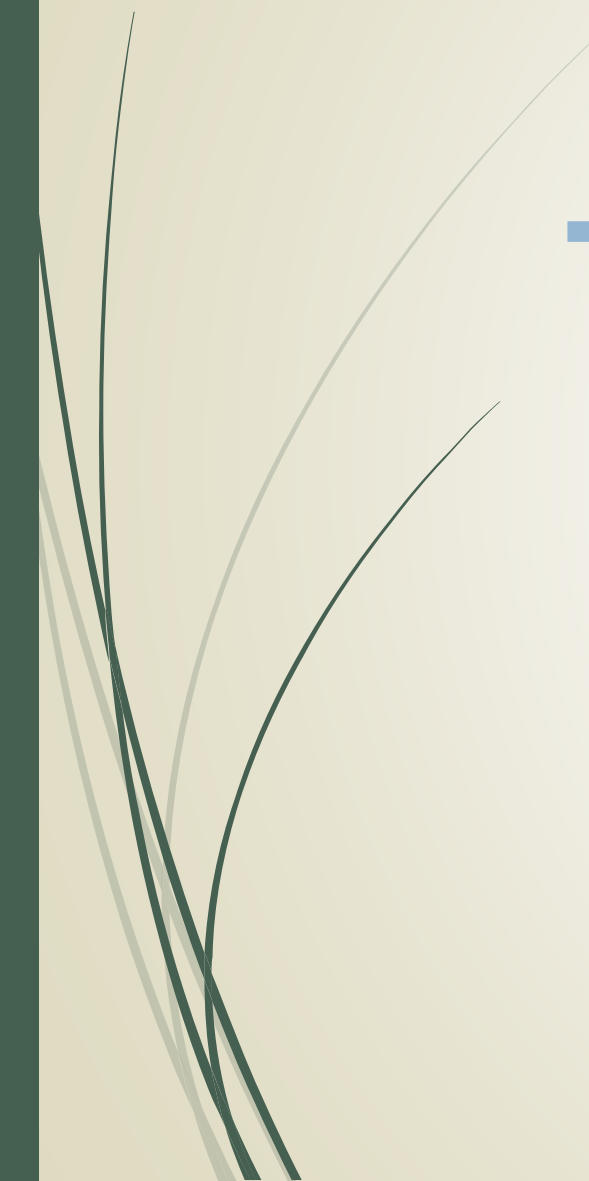
- ▶ Step 3: Remove slags

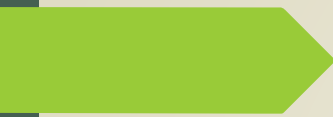
After the welding is done, use the slag hammer to strike the weld you just made. Then the slag should chip away from the weld showing the actual surface you made. At last, use the wire brush to clear off the remaining slag you just hammered.



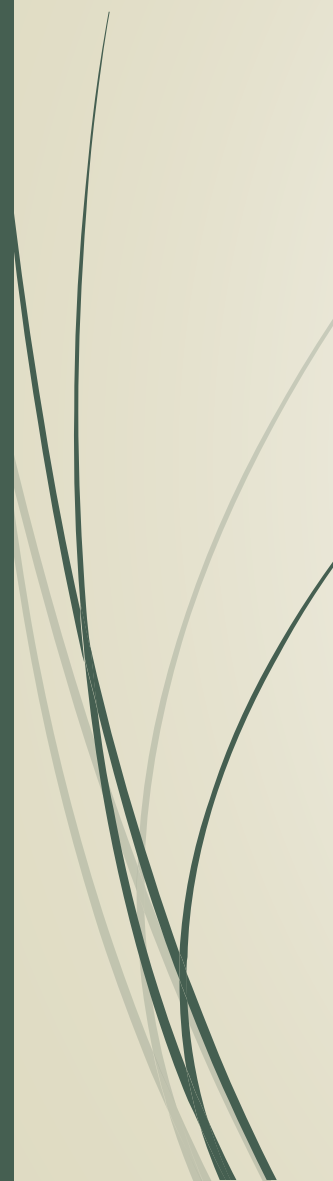


When is welding preferred

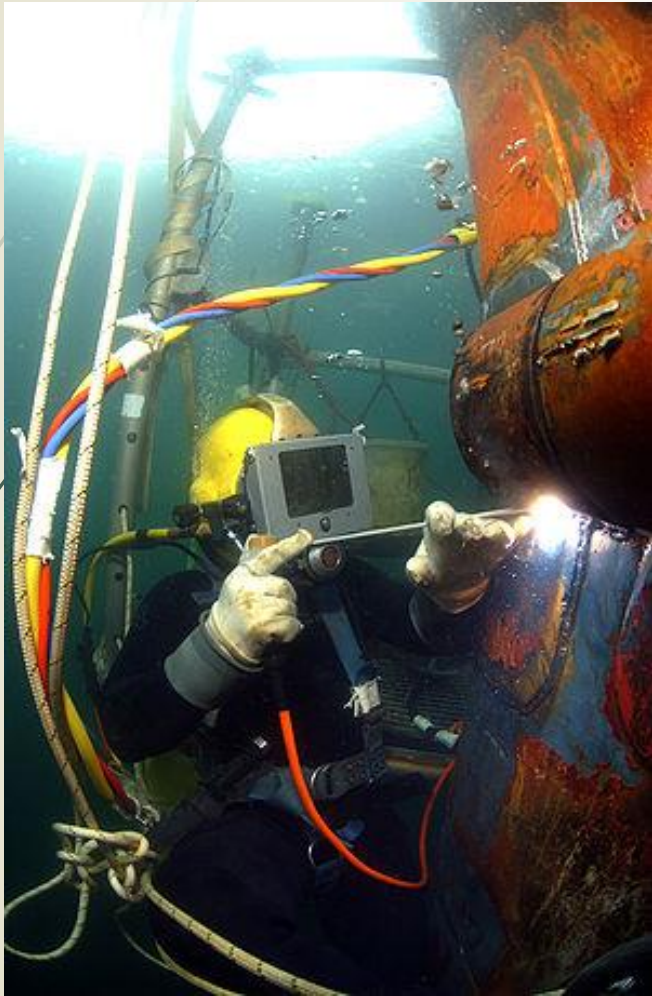
- ▶ Welding is preferred when you want to put material (metal, glass, thermoplastics) together very strong, because welding melts the base material. and it can be even stronger than the base material if use a filler material.
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Advantage	Disadvantage
portability of equipment	Requires frequent stop and start to change electrode
Joint will have great strength	Very hot
Adaptable to confined spaces and remote locations	Very bright
Less material required (only base material needed minimum)	



Fun Fact



- ▶ You can do an underwater welding using a waterproof electrode



Example of welded products



Made by glass welding



Car being welded by welders



Yard art made by welding



Citations



- ▶ Welding Processes. (2016). Retrieved April 9, 2016, from Praxair website: <http://www.praxair.com/industries/welding-and-metal-fabrication/welding-processes>
- ▶ Austin, G. (2012). Welding VS Other Methods. Retrieved April 9, 2016, from Welding Classroom website: <http://weldingclassroom.org/index.php/welding-info/welding-vs-other-methods/>
- ▶ Welding - Overview of Types and Hazards. (2016, April 5). Retrieved April 9, 2016, from Canadian Centre for Occupational Health and Safety website: https://www.ccohs.ca/oshanswers/safety_haz/welding/overview.html



Video URL

▶ <https://youtu.be/I1P5GuVHFQA?t=97>