

# STUD WELDING STEP-BY-STEP

Practical Sign got together with The Dickinson Group to look at the steps involved in stud welding, a common method of mounting cut out letters. When mounting cut out letters you need to consider the method of attaching the studs. You can use CO2 welding, brazing (brass), gluing, drilling, tapping, silicon, etc. In any of these methods you need to repolish the surface, expect with glue. Glue has a 24-hour drying time and if the surface wasn't clean the stud can pop off.

Stud welding saves time and looks professional, especially if a person is trained and the stud welding machine is set correctly. It is also serviceable with neon behind it. Diametres of 3, 4, 5, 6 and 8mm can be welded. Studs that are 6 - 50mm can be welded. So we looked at how you would mount cut out letters that are either laser or router cut.

## What you need:

- 1220V capacitor discharge machine.
- Set of copper chucks of different diameters that hold the studs in place.
- Vice grips.
- Standard stud gun.
- A clear work bench or area big enough for the size letters. The machine is positioned under the work bench and everything is done on top.

The above items would normally come with the purchase of a stud welding machine, except for the work bench.

## Step by Step

1. Do a set up weld on scrap material to ensure the settings are correct.



2. Earth the letter on a non-conductive base. Earths are put opposite each other.



3. Ensure that the machines voltage is set to the correct stud diameter.



4. You can measure and mark where you want the stud.

5. Put stud in standard stud gun.



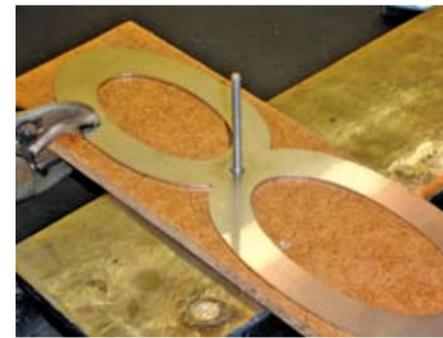
6. Make sure the gun is at 90 degree angle to the letter and pull the trigger.



7. Remove the gun straight up at the 90 degree angle when finished.



8. You can wipe off the black mark left behind with a soft cloth.



9. After the weld is done, should the settings be correct, there should be a small spatter around the weld.



10. Do a visual inspection of the weld

## Tips

1. Ensure that you put enough studs on your letters. This quantity is determined by the size and application of the letters. Consider the wind and any other factors that will affect your signage. It is advised to have four or more studs if the letters are going up outside.
2. You can also do a Bend Test on the scrap material that you did first to check that the settings were correct. Take pliers or a tube over the stud and

bend it. A strong weld should break above the weld.

3. When welding aluminium, it must be pure and welded before it is anodised. If it is anodised, you need to sand it or clean it off.
4. Mild steel, stainless steel and brass studs can be welded to dissimilar metals with the exception of aluminium.

## What actually happens?

### THE PROCESS



### Capacitor Discharge Stud Welding.



### Drawn-Arc Stud Welding.

The stud has a pip on the top. There is an international spec for this pip; it cannot be too long or too short. The pip is the catalyst in the process of stud welding. The preset power is sent to the pip that melts due to the voltage. The spring in the gun then forces it down into the molten metal. The face of the letter is not affected due to the localised temperature.

## Time taken

Each weld is done in milli-seconds. Applications for stud welding Signage industry (cut out letters), sheet metal, metal enclosures, pots, pans, telephones, etc.

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