

Kushed Procedures

Electric Arc Stick Welding

M6

- Electric Stick Arc Welding Equipment – CIG Transarc Easywelder
- Electric Arc Welder – Powermac Weldmate
- Portable Electric Arc Welder – Telwin Tecnica 1000





The Shed provides items such as welding masks and gloves.

Members are required to provide their own footwear, eyewear, hearing protection and masks.

Safety

This is a very high priority for our Shed members. There are some aspects that are mandatory under our insurance policies and some which the The Shed requires members to adhere to for everyone's benefit.

The Shed Safety Induction

It is a requirement of attendance at The Shed that members have reviewed the Safety Induction Presentation

Personal Protective Equipment

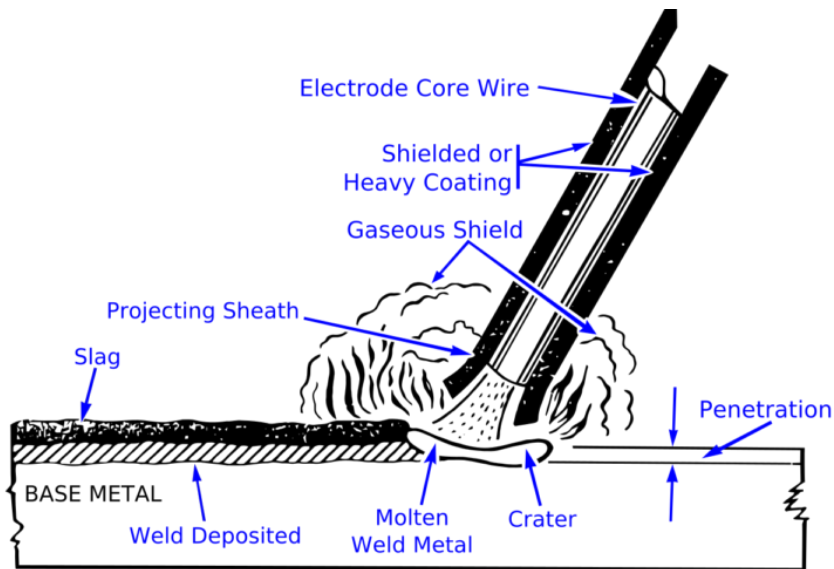
This is required in various forms depending upon the equipment being used or the activity being undertaken.

Protective eyewear is always mandatory when using machinery.

The Shed schedules a Coordinator and a First Aid Safety Officer for each day of attendance and their safety directions are final and must be adhered to.

Stick welding (SMAW or Shielded Metal Arc Welding) is one of the most popular welding processes along with MIG and TIG. It's a simple procedure that is popular with outdoor welders due to it not being affected by wind – unlike MIG and TIG welding which uses gas cylinders.

Stick welding is performed by striking an electric arc between a metal electrode and the work piece. An electric current passes through the electrode and melts it into the work piece and forms a weld pool. The electrode is covered in a layer of flux which melts and protects the weld pool from being contaminated by the atmosphere (in the same way a shielding gas protects it in MIG and TIG).



The flux creates a layer of slag to be formed on top of the weld bead which will need to be chipped off and brushed down once the weld is complete.



Choosing your Electrode

There are hundreds of different types of stick electrode out there, and you'll need to choose the right one that matches your welding project.

The most popular are 6010, 6011, 6012, 6013, 7014, 7024 and 7018. When you're working on mild steel, any E60 or E70 electrode will do the job.

7018 are probably the most popular electrode of all these and produce really strong welds but 6013 are a good choice for beginners.

Advantages of Stick Welding

- Stick welding is portable. A small stick welder can perform on thick metal, isn't very heavy, and you don't require a wire feeder or any additional equipment like a gas cylinder.
- Stick welding is the best choice for outdoor conditions. Welding with gas won't produce good results in windy conditions.
- It is easier to master than TIG welding but does require some skill.
- You can weld on metal with mill scale or rust.

Disadvantages of Stick Welding

- It requires more skill than MIG as you need to keep the electrode a certain distance from the metal as it burns down.
- It produces a lot more spatter and slag.
- Increased cleanup time results in decreased efficiency.
- The weld will not be as intricate or high quality as TIG.



To understand which electrode to choose you need to understand what each of the 4 numbers mean.

The first two digits show the minimum tensile strength. For example, a 60,000 psi tensile strength electrode will start with 60. This will need to match the base metal strength properties.

The third digit indicates which positions the electrode can be used when welding. Number one represents the ability to be used in any position, whilst number 2 can only be used in flat position.

The fourth digit tells you the current that you can use for the electrode, and the coating on the electrode. We have a reference chart for that below.

| Digit | Type of Coating | Weld Current |
|-------|--------------------------|----------------|
| 0 | Cellulose Sodium | dcep |
| 1 | Cellulose Potassium | ac, dcep, dcen |
| 2 | Titania sodium | ac, dcen |
| 3 | Titania potassium | ac, dcep, dcen |
| 4 | Iron Powder Titania | ac, dcep, dcen |
| 5 | Low hydrogen sodium | dcep |
| 6 | Low hydrogen potassium | ac, dcep |
| 7 | Iron powder iron oxide | ac, dcep |
| 8 | Iron powder low hydrogen | ac, dcep, dcen |



Correct PPE is vital

PRE-OPERATIONAL SAFETY CHECKS

- Locate and ensure you are familiar with all machine operations and controls.
- Check workspaces and walkways to ensure no slip/trip hazards are present.
- Ensure the work area is clean and clear of grease, oil and any flammable materials.
- Keep the welding equipment, work area and your gloves dry to avoid electric shocks.
- Ensure electrode holder and work leads are in good condition.
- Start the fume extraction unit before beginning to weld.
- Ensure other people are protected from flashes by closing the curtain to the welding bay or by erecting screens.



POTENTIAL HAZARDS

- Electric shock.
- Fumes.
- Radiation burns to eyes or body.
- Body burns due to hot or molten materials.
- Flying sparks.
- Fire.

DON'T

Do not use faulty equipment. Immediately report suspect equipment to a coordinator
Do not use bare hands and never wrap electrode leads around yourself

OPERATIONAL SAFETY CHECKS

- Keep welding leads as short as possible and coil them to minimise inductance.
- Ensure work return earth cables make firm contact to provide a good electrical connection.
- Ensure the electrode holder has no electrode in it before turning on the welding machine.
- Ensure current is correctly set according to electrode selection

ENDING OPERATIONS AND CLEANING UP

- Switch off the machine and fume extraction unit when work is completed.
- Remove electrode stub from holder and switch off power source.
- Hang up electrode holder and welding cables. Leave the work area in a safe, clean and tidy state.