Choosing the Correct Welding Electrode

Written by Dustin Saunders and published on Weld My World (a welding blog)

When it comes to shielded metal arc welding (SMAW), no matter the project, electrode selection is one of the most important things to consider. There are several things you should consider when selecting an electrode.

◆ What is the base metal?
◆ What type of joint is it?
◆ Do you need more filler or more weld penetration?

Fortunately, the American Welding Society has created a system of identification that’s relatively simple. Generally, you’ll see something on the electrode like E 7018. The E simply stands for electrode.

The first two digits indicate the tensile strength; in this case it’s rated at 70,000 psi. If you happen to have a rod with five digits instead of four, the extra digit is just part of the tensile strength. For example, E 11018 would have 110,000 psi.

The third digit tells you about the position it can be used in. It will be either 1, 2, or 3.
◆ 1 - being all positions
◆ 2 - for flat and horizontal
◆ 3 - for flat only.

The last digit refers to the coating. It will be anything between 0 and 8
◆ 0 is cellulose with a sodium silicate binder, useable with DCRP
◆ 1 is cellulose with a potassium silicate binder, useable with AC or DCRP
◆ 2 is titania with a sodium silicate binder, useable with AC or DCRP
◆ 3 is titania with a potassium silicate binder, useable with AC, DCSP, or DCRP
◆ 4 is an iron powder titania, useable with DCSP, or DCRP
◆ 5 is a calcium carbonate sodium, useable with DCRP
◆ 6 is calcium carbonate potassium, useable with AC or DCRP
◆ 7 is an iron powder, iron oxide, useable with AC, DCSP, or DCRP
◆ 8 is iron powder with calcium carbonate, useable with AC or DCRP

Two of the most commonly used electrodes are E 6010, and E 7018.
◆ E 6010 is good for welds requiring deep penetration. It works well on dirty or rusted metal.
◆ E 7018 is good when you require more filler material such as in V joints.

Sometimes it’s good to do the root pass with the 6010, and then fill it with 7018. Of course, everything really just depends on the project. Projects using thicker metals will require thicker diameter electrodes. Hopefully with this extra knowledge, selecting the proper electrode will be a little easier.