

GMAW Electrode Characteristics

GMAW welding uses a continuously fed consumable wire electrode from a spool.

- The wire electrode serves as filler material for the weld, but unlike SMAW (stick) electrodes, mig electrodes don't contain flux
- Although shielding is mostly done with an external gas, elements like **manganese** and **silicon** are often added to the wire to act as deoxidizers. Manganese also increases the weld's strength
- **Molybdenum** and **nickel** are sometimes added to low-alloy wires. These elements increase the weld's strength and hardness without decreasing its ductility (the ability to bend without breaking) Nickel also provides corrosion resistance to the weld
- Most GMAW electrodes have a **copper** coating to protect the electrode from outside elements, helps conduct electricity from the contact tip to the wire electrode and lessens friction between the contact tip and the wire

GMAW Electrode Classification

- The GMAW electrodes AWS label, located on the outside of the spool or package, provides detailed information about its characteristics
- They are labeled as such;
 - ERXXS-X
 - “E” stands for electrode, while “R” indicates filler rod. This is because in addition to serving as the electrode and filler for GMAW (mig), these same wires are made into rods and used as filler metal for GTAW (tig)
 - The first two “Xs” represent the tensile (stretched) strength in 1,000ths psi

- “S” means solid wire, indicating it does not contain additional elements in the core
- The last “X”, the suffix, is a number showing the amount of deoxidizers in the wire (silicon and manganese are the most common used in GMAW wire)
- The suffix is what determines which base metals suit the electrode best. GMAW electrodes are often referred to as “S”, followed by their suffix (ex: ER70S-6 is frequently called “S-6”)