<http://www.esabna.com/euweb/mig_handbook/592mig1_1.htm>

Introduction to GMAW

In Gas Metal Arc Welding (GMAW), also known as Metal Inert Gas (MIG) welding, an electric arc is established between the workpiece and a consumable bare wire electrode. The arc continuously melts the wire as it is fed to the weld puddle. The weld metal is shielded from the atmosphere by a flow of an inert gas, or gas mixture. [Figure 1-1](http://www.esabna.com/euweb/mig_handbook/592mig1_3.htm)shows this process and a portion of the welding torch. The mig welding process operates on D.C. (direct current) usually with the wire electrode positive. This is known as ”reverse” polarity. ”Straight” polarity, is seldom used because of poor transfer of molten metal from the wire electrode to the workpiece. Welding currents of from 50 amperes up to more than 600 amperes are commonly used at welding voltages of 15V to 32V. A stable, self correcting arc is obtained by using the constant potential (voltage) power system and a constant wire feed speed. Continuing developments have made the mig process applicable to the welding of all commercially important metals such as steel, aluminum, stainless steel, copper and several others. Materials above .030in. (.76 mm) thick can be welded in all positions, including flat, vertical and overhead. It is simple to choose the equipment, wire electrode, shielding gas, and welding conditions capable of producing high-quality welds at a low cost. **Basic Mig Welding Process**