



# THERMAL CUTTING

**OXY-FUEL**, plasma and laser cutting are a group of thermal processes that cut by annealing the material up to ignition and melting at very high temperatures. As in welding, thermal cutting produces a heat affected zone. Although pre-heating is not essential, it can provide benefits.

**Oxyfuel cutting** is the most used industrial thermal cutting process as it is able cut material thicknesses from 0.5mm to 250mm. The equipment is easy to use, is low cost and can be used manually or through mechanisation.

**Plasma arc cutting** is where a constricted arc is formed between the electrode and the workpiece by a copper nozzle with a very fine bore, which

increases the temperature and velocity of the plasma through from the nozzle. The plasma temperature is higher than 20,000°C and the plasma velocity reaches the speed of sound.

During cutting, the plasma gas flow is increased, so that the deeply penetrating plasma jet cuts through the material and molten material is removed in the efflux plasma.

**Laser Cutting** is where a focused laser beam is used to melt material in a localised area and is often automated with offline CAD / CAM systems controlling either 3-axis flat bed systems or 6-axis robots for three dimensional laser cutting.

It produces very accurate profiles with a fine clean square edge and is gradually replacing both oxyfuel and plasma cutting. ■

Image courtesy of: Victor Technologies Europe