

6. Describe manual TIG welding process (such as basic principles of fusion welding; the major parts of the welding equipment and their function)

Fusion welding is where two pieces of metal are heated so much they are melted together and can be done with filler wire to make the weld stronger. A fusion weld consists of four elements. Heat, shielding, filler material and distance. To be able to weld you must have pretty much every single bit of equipment as one is just as important as the other. First of all, the tungsten, this is used to point the electricity (heat) the way you want it to go. Secondly, the ceramic, this is used to protect the tungsten and everything else inside the torch. Many people also use it for balance during some welds. Thirdly, the gas, this is used to keep the weld clean. Fourthly, the gas passage, this lets the gas out. Fifthly, the earthing cable, this completes the circuit and is the heart of the machine. Without this the set could not work up and would be useless.

7. Describe the types, selection and application of filler wires and welding electrodes

When it comes to TIG welding there are many types of filler wire and can be tricky when it comes to choosing the right one. For example, you can use 309L wire to weld mild steel/ low alloy steels to stainless steel. 308L wire is usually used on austenitic steels like 301, 302, 304 and 305. 316L wire should be used for 316 standard metals.

8. Describe the reasons for using shielding gases, and the types and application of the various gases

We use shield gases such as pure argon or pure helium to take impurities out of the air such as moisture which could possibly make weak points in the solid weld. There are other types of shield gases such as oxygen and carbon dioxide but they are used for other types of welding as they are both active gases. Not only that, as protects and cleans the weld, it will cool down the torch and help prevent injuries or equipment from melting, cracking or burning. When it comes to TIG welding, The gas is called "inert" gases not "active" gases hence the name "tungsten inert gas" this is inert gases as the gas does not react with the molten weld.

9. Describe the gas pressures and flow rates (in relationship to the type of material being welded)

As a rule of thumb, it is necessary to set the gas pressure at around 10-12 PSI. This is pretty much perfect as the gas will be able to keep the weld nice and cool and is able to keep up with any average amps. Also this PSI can also keep the ceramics cool and help prevent it from cracking. What if I use higher amps? Well, if you are welding with higher amps due to thicker plate/pipe I recommend you make the PSI higher. This will release more gas meaning you can weld faster and the weld will still be clean from any impurities. What about lower amps and thinner plate/sheet/pipe? When you are going to weld this kind of material you can save lots of gas by turning it down to about 7-10 PSI.

10. Describe the types of welded joints to be produced (such as lap joints, corner joints, tee joints and butt welds)

I will be producing three of these welds for the practical side of my TIG. One type of weld I will be doing is the tee joint. I can do this with sheet or plate. This is one probably the easiest weld as it is continuous and only has one tricky part which is the beginning where you have to free hand weld for a little bit. When it comes to the tee joint you can do this without any filler wire (autogenously) or with filler wire. The second weld I will be doing is the lap joint. Yet again this can be hard at the start of the weld as there is nothing you can lean the