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Tech Talk

We at UNIBRAZE would like to welcome you to our first publication of the UNIBRAZE ***Tech Talk***. This newsletter will be published periodically via email. Archives can be found at www.unibraze.com. ***Tech Talk*** will be covering a range of topics on various welding products, applications, metallurgy, techniques, and economics. Feel free to comment on the newsletter via email to leroy@unibraze.com or call 1-877-233-1375. Suggestions for topics are always welcome.

To start off our newsletter, we'll begin with a basic understanding of the different types of filler metals.

Filler Metals…. Which one should I use?

It's amazing how many different types of filler metals you can use to put two pieces of material together. Unfortunately, not all of these filler metals will give the results the customer is looking for. It is for this reason that filler metal selection is critical to the life of the part.

As an example, you could have a part that can handle a tremendous amount of corrosion but if you weld it together with the wrong filler metal, the part could have premature corrosion within months…. if not days. Or if you use a filler metal that has a lower tensile strength than the parent material, you could get failure in the weld affected of your weld when the part becomes subject to load. There have been many instances where wrong filler metal selection has caused both personal and business mishap. To avoid this from happening, you need to select not only the proper filler metal for the parent steel that you are welding, but also for the application that it is intended for.

Some other things to be looked at are the heat input that the parent material can handle without destroying its specific characteristics. Some parent materials can not handle high heat inputs while welding, or they will become too hard (CrMo materials). Special weld procedures are required to weld these materials.

This list could go on and on, so we'll start by looking at individual filler materials. We'll do this by using the AWS specifications to break down the different types of filler metals.

Electrode Specifications:

Most arc welding electrodes are classified by means of filler metal specifications prepared by a joint committee of the American Welding Society (AWS). These specifications are shown on table 1

Table 1

AWS Specifications:

5.1 Carbon Steel Electrodes for Shielded Metal Arc Welding
5.2 Carbon and Low Alloy Steel Rods for Oxyfuel Gas Welding
5.3 Aluminum and Aluminum Alloy Electrodes for Shielded Metal Arc Welding
5.4 Stainless Steel Electrodes for Shielded Metal Arc Welding
5.5 Low Alloy Steel Electrodes for Shielded Metal Arc Welding
5.6 Covered Copper and Copper Alloy Arc Welding Electrodes
5.7 Copper and Copper Alloy Bare Welding Rods and Electrodes
5.8 Filler Metals for Brazing and Braze Welding
5.9 Bare Stainless Steel Welding Electrodes and Rods
5.10 Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods
5.11 Nickel and Nickel Alloy Welding Electrodes for Shielded Metal Arc Welding
5.12 Tungsten and Tungsten Alloy Electrodes for Arc Welding and Cutting
5.13 Solid Surfacing Welding Rods and Electrodes
5.14 Nickel and Nickel Alloy Bare Welding Electrodes and Rods
5.15 Welding Electrodes and Rods for Cast Iron
5.16 Titanium and Titanium Alloy Welding Electrodes and Rods
5.17 Carbon Steel Electrodes and Fluxes for Submerged Arc Welding
5.18 Carbon Steel Filler Metals for Gas Shielded Arc Welding
5.19 Magnesium Alloy Welding Electrodes and Rods
5.20 Carbon Steel Electrodes for Flux Cored Arc Welding
5.21 Composite Surfacing Welding Rods and Electrodes
5.22 Stainless Steel Electr. for Flux Cored Arc Welding & Flux Cored Rods for GTAW
5.23 Low Alloy Steel Electrodes and Fluxes for Submerged Arc Welding
5.24 Zirconium and Zirconium Alloy Welding Electrodes and Rods
5.25 Carbon and Low Alloy Steel Electrodes and Fluxes for Electroslag Welding
5.26 Carbon and Low Alloy Steel Electrodes for Electrogas Welding
5.27 Copper and Copper Alloy Rods for Oxyfuel Gas Welding
5.28 Low Alloy Steel Electrodes and Rods for Gas Shielded Arc Welding
5.29 Low Alloy Steel Electrodes for Flux Cored Arc Welding

In our next issue, we will look at the filler metals that fall under the AWS specification 5.1 "Carbon Steel Electrodes for Shielded Metal Arc Welding".