

Brief Information of Covered Welding Rods for Low Alloy Steel

There are three categories of covered welding rods belong to low alloy steel welding rods, according to Chinese National Standard GB/T 5118-1955:

- 1) The covered welding rod for structure steels, which tensile strength of deposited metal is higher than 500MPa, i.e. 50kgf/mm², except the series of Mn-Si one.
- 2) Molybdenum and chromium-molybdenum pearlitic heat-resisting one.
- 3) The one suitable for cryogenic steels.

On the basis of chemical composition, mechanical properties and requirement of the crack resistance of the base metal to choose low alloy steel welding rods, meanwhile the factors of configuration of welded structure, work condition, strained condition and performance of welding machines should be considered. It is better to do welding procedure qualification and welding experiment to choose welding rods.

Low alloy structure steel covered welding rods

To choose low alloy structure steel covered welding rod should consider factors as follows: corresponding tensile strength with the base metal of weldment, the weldability of base metal, the transitivity of chemical composition of base metal as well as dimensions, configuration, groove and strained condition of the welded structure. When cooling speed fast, the strength of weld metal will increase a lot then the weld joint easy crack and in this case the welding rod that tensile strength lower than the base metal one should be chosen. The much lower tensile strength welding rod should not be chosen when multi-layer welding for the thick plate or the weldment need to be normalizing treatment after welding. With regard to the weld joint that higher requirement of plasticity, low temperature impact toughness and crack resistance the basic welding rod or high tensile strength one should be chosen. For the medium carbon steel one or cast iron one it is better to choose extra-low hydrogen high toughness welding rod and preheating could be applied for the weldment.

Mo and Cr heat-resisting welding rods

To adapt to different requirement the common alloy elements in the pearlitic heat-resisting steels are Cr, Mo, V, Nb and so on. Normally the weldment need be preheated before welding and it should be tempered after welding since the pearlitic heat-resisting steels are lower weldability due to the combined action of carbon and alloy elements in the steel the weld metal easy to be quench hardening.

It should based on the median elements of two welded metals to choose welding rod, when dissimilar steels welding, and to take the appropriate temperature of preheating before welding and PWHT according to the one that weldability is lower.

Low hydrogen heat-resisting welding rod is recommended when welding thick wall tubes that made by heat-resisting steels.

Cryogenic steel welding rods

As needed, cryogenic steels are classified -40°C, -70°C, -90°C, -100°C, -196°C and -253°C, etc. Please choose corresponding welding rod in accordance with the working temperature of weldment.