

Brief Introduction of Covered Welding Rods for Stainless Steel

Stainless steel welding rods divided two categories and one is chromium (Cr) stainless steel welding rods another is chromium nickel (CrNi) stainless steel welding rods.

Chromium stainless steel welding rod

The weld joint of chromium stainless steel welding rod has corrosion resistance to oxidizing acid, organic acid, atmosphere and so on, also it has ability of heat resistant so it is used for welding structures of industries of power plant, chemical and petroleum. The chromium stainless steel is lower weldability and it is important to choose right welding rod, use right welding technology and heat treatment.

1) Welding martensitic stainless steel

Martensitic stainless steel including medium chromium stainless steel that contains 5%-9%Cr and high chromium stainless steel that has 12%Cr. This kind of stainless steel has hardenability trend and it will be high hardness texture of martensitic and bainite after welding thus brittleness and residual stress of the weld joint will be increased and coldcrack would effect in the weld metal. To avoid crack the weldment must be preheated to 300°C before welding and heat preservation for interpass in welding then it must be high tempering after welding when it is hot.

2) Welding 13%Cr high chromium stainless steel

The hardenability of this kind chromium stainless steel is high so the weld joint easy be crackle. Using same type welding rod of CHK202 (E410-16) or CHK207 (E410-15) the weldment must be preheated to 300°C or more and after welding 700°C tempering it then cooling it slowly. If the weldment can not be PWHT, should choose chromium nickel stainless steel welding rod CHS107 (E308-15) or CHS207 (E316-15) for welding.

3) Welding 17%Cr high chromium stainless steel

To improve weldability and corrosion resistance this kind chromium stainless steel is added right amount stabilizing elements of Ti, Nb and Mo hence its weldability is better than 13%Cr high chromium stainless steel. Same type welding rod of CHK307 (E430-15) is recommended and the weldment should be preheated to 200°C and after welding it should be 800°C tempering. If the weldment could not be PWHT, chromium nickel stainless steel welding rod CHS107 (E308-15) or CHS207 (E316-15) is recommended.

Chromium nickel stainless steel welding rod

This category of welding rod has good corrosion resistance and good inoxidizability so it is widely applied to structures of industries of chemical, fertilizer, petroleum, food and medical devices. Be subjected to reduplicate heating in welding, carbide separate out from the base metal easily to reduce corrosion resistance and mechanical properties of the weld metal thus welding chromium nickel stainless steel it is important to choose welding rod based on work condition of the welded structure, mainly is work temperature and medium.

1) There are two types of coating flux of ordinary stainless steel welding rod, one is lime-titania another is low hydrogen. Although the lime-titania one can

be applied by both AC and DCEP but DCEP is recommended since use AC current the core wire much easy to be red than use DCEP and arc penetration will be weaker, use AC, in this case the root of weld joint will be incomplete penetration. The weld metal of low hydrogen type stainless steel welding rod has better crack resistance so it is suitable for welding structures that binding force is big.

2) To avoid intercrystalline corrosion in heating the electricity for stainless steel welding should lower 20% than the carbon steel welding rod. When welding the arc length should be shorter, fast cooling interpass and narrow weaving welding is recommended.

3) Please check contains of ferrolites in stainless steel weld metal form the attached diagrams of SCHAEFFLER, DELONG and WRC-1992 in this book.