

SMAW Electrodes for High Tensile & High Yield Strength Steels

Welding Notes

Special purpose low alloy steel, most commonly in forms of high tensile and high yields strength steels, forms weld metal with extremely low Hydrogen content and excellent low temperature impact toughness (-50°C). It is mostly applicable for high strength or military steel structures such as HY80, HY100, and similar steel types.

1. Preheat, Inter-pass and PWHT Temperature

For low alloy high tensile and high yield strength steel's welding pre-heat and post heat temperature, please see chart below. The preheating process for smaller weldment can cover the entire body. In a large structure setting, preheat should begin at the welding point covering an area about 5 times the weldment thickness using heating equipment for local preheat.

Low Alloy High Tensile & High Yield Strength Steel Preheat, Inter-pass and PWHT Requirement

Product name	Preheat and inter-pass Temperature (°C)	PWHT Temperature × time (°C × 1hr)
GL98M , GL108M GL118M , GL128M	95~120	No need

2. Recommending low electrical current (low heat input)

To prevent the burning loss of alloy elements due to serious oxidation, welding current should not exceed the product recommended limits.

3. Short arc welding technique

High tensile and high yield strength steel SMAW Electrodes are mostly classified as low hydrogen type; thus, short arc technique should be observed during welding in order to prevent permeation of N₂ and O₂ into the arc creating blow hole and alloy elements burning loss. If weaving is necessary, the weaving width should not exceed 3 times of the core wire diameter. During welding, the arc starting point should be 1~2 cm behind the welding start point. Once the arc starts, pull it back to the welding start point to begin welding to avoid the occurrence of blow hole. This is known as the forehand & backhand arc starting technique.

4. For more information, please consult page A6 SMAW Electrode welding notes for mild and high tensile strength steel.