

SAW – Submerged Arc Welding Wire

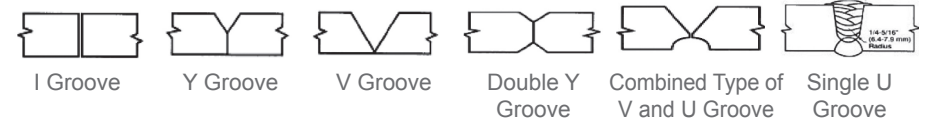


Welding Notes

SAW (Submerged Arc Welding) is suitable when demanding high quality and high efficient applications. Depending on the selection of flux, the Si content in stainless steel SAW weld metal tends to be higher than in other welding process to lead heat shrinkage or cracking, therefore it is not appropriate for full austenite stainless steel or stainless steel with ferrite number under 4 FN such as 310.

1. Groove Type

a. Groove type referred to the chart below:



b. Double sided groove for thick work to prevent deformation.

c. Proper control welding parameters to result easy slag removal.

2. Welding Parameters

- Welding parameters like welding current and voltage, welding speed, wire diameter shall proceed according to welding procedure specification. In principle, high electrical current must be avoided to prevent detriment of weld metal mechanical properties and excessive deformation etc.
- When comparing to low carbon steel, stainless steel has lower heat conducting rate, higher electrical resistance to have 25~30% melting rate and lower melting point along with deeper penetration when dealing with the same groove type. So its required welding current is only 80% that of low carbon steel.
- Wire extension length greatly affects the melting rate, arc stability, bead appearance and mechanical properties etc; careful scrutiny of tip wear condition is essential in order to achieve good welding results.

3. Precautionary Measures

To apply low heat input welding for preventing the produce of Chromium Carbide precipitation resulting hot crack due to sluggish cooling rate.

Proper groove width for better controlling the weld metal Ferrite content ($\geq 5\text{FN}$).



GS308 / GS308L

AWS A5.9 ER308(L)
JIS Z 3324 YS308(L)**Applications:**

- Suitable for welding of SUS304, 302, 305.

Typical chemical composition of wire (wt%)

Wire diameter (mm)	C	Si	Mn	Ni	Cr
308	0.05	0.48	1.95	9.7	19.9
308L	0.03	0.47	1.41	10.2	19.8

© Note: refer to page C28 welding notes.

GS309 / GS309L

AWS A5.9 ER309(L)
JIS Z 3324 YS309(L)**Applications:**

- SUS309S
- Carbon steels, low alloy steels to stainless steels.
- Hardening type alloy steels to stainless steels.

Typical chemical composition of wire (wt%)

Wire diameter (mm)	C	Si	Mn	Ni	Cr
309	0.06	0.45	1.64	13.5	24.3
309L	0.03	0.40	1.45	13.4	24.2

© Note: refer to page C28 welding notes.

GS316 / GS316L

AWS A5.9 ER316(L)
JIS Z 3324 YS316(L)**Applications:**

- Suitable for welding of SUS316/ 316L.

Typical chemical composition of wire (wt%)

Wire diameter (mm)	C	Si	Mn	Ni	Cr	Mo
316	0.05	0.54	1.60	13.3	19.7	2.29
316L	0.03	0.52	1.55	13.2	19.7	2.32

© Note: refer to page C28 welding notes.