HYUNDAI WELDING

Rev. 02

SW-316HBF

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF 18% Cr-12% Ni-2% Mo STAINLESS STEEL

HYUNDAI WELDING CO., LTD.

SW-316HBF

❖ Specification

AWS A5.22	E316HT1-1
JIS Z3323	TS316H-BiF-FC1
EN ISO 17633-B	T 316H F M21/C1 2

❖ Applications

SW-316HBF is designed for welding of 18%Cr-12%Ni-2% Mo stainless Steels for high temperature service.
This product is used primarily for welding type 304H base metal.

❖ Characteristics on Usage

These wires are suitable for all position welding and has easier re-arcing, beautiful bead appearance and better slag removability. The operators benefit from a fast freezing slag system which assists them with good performance not only in flat and horizontal but also in all welding position.

❖ Note on Usage

Use 100% CO_2 gas or Ar+20%CO_2

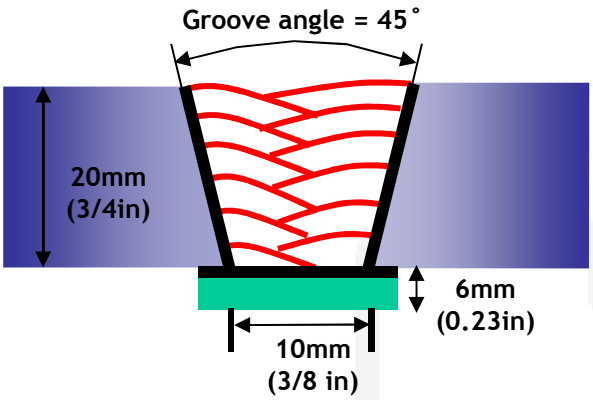
❖ Packing

Diameter	1.2mm (0.045in)	1.4 (0.052in)	1.6 (1/16in)	
Spool *including ball pac	5kg (11lbs)	12.5kg (28lbs)	15kg (33lbs)	20kg (44lbs)

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.2mm(0.045in)
Shielding Gas	:	100% CO2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	210/30
Stick-Out(mm)	:	20(3/4 in)
Pre-Heat(℃)	:	R.T . ℃(°F)
Interpass Temp.(℃)	:	≤150℃(302°F)
Polarity	:	DC(+)

❖ Mechanical Properties of All weld metal

Consumable	Tensile Test		CVN Impact Test J(ft · lbs)	
SW-316HBF	TS (Mpa/ksi)	EL (%)	-20℃ (-4°F)	-60℃ (-76°F)
	577(83)	41.8	70(51.6)	60(44.2)
AWS A5.22 E316HT1-1	≥520	≥ 30	Not Specified	

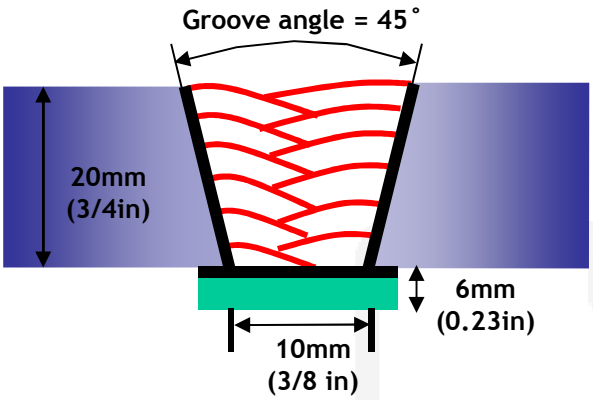
❖ Chemical Analysis of All weld metal(100% CO2 gas)

Consumable	Chemical Composition (%)								
	C	Si	Mn	P	S	Ni	Cr	Mo	Cu
SW-316HBF	0.056	0.71	1.64	0.016	0.008	12.5	18.2	2.75	0.02
AWS A5.22 E316HT1-1	0.04 ~0.08	≤1.0	0.5 ~2.5	≤0.04	≤0.03	11.0 ~14.0	17.0 ~20.0	2.0~ 3.0	≤0.75

Mechanical Properties & Chemical Composition of All Weld Metal

❖ Welding Conditions

Method by AWS Spec.



[Joint Preparation & Layer Details]

Diameter(mm)	:	1.2mm(0.045in)
Shielding Gas	:	Ar+200% CO2
Flow Rate(ℓ /min.)	:	20~22
Amp./ Volt.	:	210/29
Stick-Out(mm)	:	20(3/4 in)
Pre-Heat(℃)	:	R.T . ℃(°F)
Interpass Temp.(℃)	:	≤150℃(302°F)
Polarity	:	DC(+)

❖ Mechanical Properties of All weld metal

Consumable	Tensile Test		CVN Impact Test J(ft · lbs)	
SW-316HBF	TS (Mpa/ksi)	EL (%)	-20℃ (-4°F)	-60℃ (-76°F)
	575(84)	41.9	70(51.6)	60(44.2)
AWS A5.22 E316HT1-1	≥520	≥ 30	Not Specified	

❖ Chemical Analysis of All weld metal(100% CO2 gas)

Consumable	Chemical Composition (%)								
	C	Si	Mn	P	S	Ni	Cr	Mo	Cu
SW-316HBF	0.052	0.71	1.54	0.016	0.008	12.5	18.2	2.59	0.02
AWS A5.22 E316HT1-1	0.04 ~0.08	≤1.0	0.5 ~2.5	≤0.04	≤0.03	11.0 ~14.0	17.0 ~20.0	2.0~ 3.0	≤0.75

Mechanical Properties & Chemical Composition of All Weld Metal

❖Bead Appearance

Horizontal Fillet(2F, PB) , Base : STS 304L(6mm,0.23in)	Fillet Vertcal up(3F, PF) , Base : STS 304L(6mm,0.23in)	
		
100% CO2(220A/30V)		
		
Ar+20% CO2(220A/28V)	100% CO2(160A/25V)	Ar+20% CO2(160A/24V)

❖ δ – Ferrite No.

Consumable	Shielding Gas	Diagram			FERITSCOPE MP-30 * (FISCHER)
		Schaeffler	Delong	WRC(1992)	
SW-316HBF	100% CO_2	3.8	7.7	3.7	3.0~8.0
	Ar+20% CO_2	3.4	7.1	3.3	

Welding Efficiency & Proper Welding Condition

❖ Deposition Rate & Efficiency

Consumable (size)	Shielding Gas	Welding Conditions		Wire Feed Speed m/min (in/min)	Deposition Efficiency(%)	Deposition Rate kg/hr(lb/hr)
		Amp. (A)	Volt. (V)			
1.2mm (0.045 in)	100%CO_2	210	30	12(472)	86~88	4.6(10.1)
	Ar-20%CO_2	210	29	12(472)	87~89	4.8(10.6)
1.6mm (1/16 in)	100%CO_2	290	33	8.9(350)	86~88	5.5(12.1)
	Ar-20%CO_2	290	32	8.9(350)	87~89	5.(12.6)
Remark					Deposition efficiency =(Deposited metal weight/Wire weight used)×100	Deposition rate =(Deposited metal weight/Welding time,min.)×60

❖ Proper Current Range

Consumable	Shielding Gas	Welding Position	Wire Dia.	
			1.2mm (0.045 in)	1.6mm (1/16 in)
SW-316HBF	100%CO_2 or Ar-20~25%CO_2	F	160~220Amp	250~290Amp
		HF	160~220Amp	250~290Amp
		V-Up & OH	140~180Amp	-