HYUNDAI WELDING

Rev. 04

SW-2209 Cored

FLUX CORED ARC WELDING CONSUMABLE
FOR WELDING OF DUPLEX STAINLESS STEEL

HYUNDAI WELDING CO., LTD.

SW-2209 Cored

❖ Specification

AWS A5.22	E2209T1-1/-4
JIS Z3323	TS2209-FB1
EN ISO 17633-A	T 22 9 3 N L M21/C1 2

❖ Applications

SW-2209 cored is designed for welding of Duplex stainless steels like 2205

❖ Characteristics on Usage

SW-2209 Cored is a titania type flux cored wire for all position Welding with CO2 & Ar+CO2 mixed shielding gas. This wire is designed for Duplex stainless steels.
Arc stability is excellent, so spatter loss is low and slag covering is Uniform with good removability

❖ Note on Usage

Use 100% CO_2 gas or Ar+20~25% CO2 gas

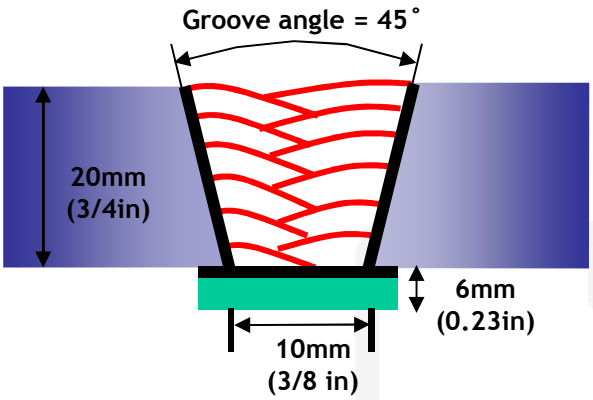
❖ Packing

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-2209 Cored	TS (Mpa/ksi)	EL (%)	-20℃ (-4°F)	-50℃ (-58°F)
	830(120)	29.0	45(33.2)	35(25.8)
AWS A5.22 E2209TX-X	≥690	≥ 20	Not Specified	

❖ Chemical Analysis of All weld metal(wt%)

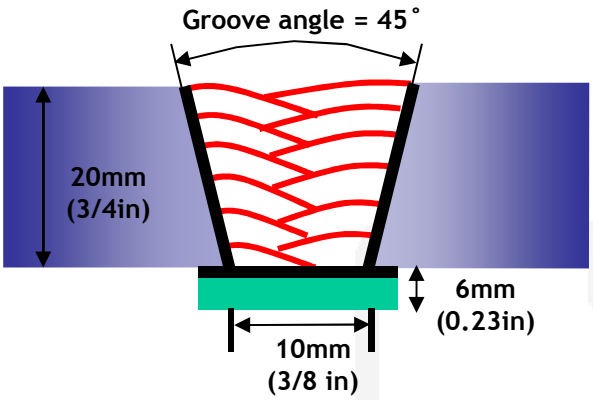
Consumable	Shielding Gas	Chemical Composition (%)									PREN
		C	Si	Mn	P	S	Ni	Cr	Mo	N2	
SW-2209 Cored	100%CO2	0.03	0.60	0.70	0.022	0.006	8.7	23.0	3.30	0.13	36
AWS A5.22 E2209TX-X		≤0.04	≤1.0	0.5~2.0	≤0.04	≤0.03	7.5~10.0	21.0~24.0	2.4~4.0	0.05~0.20	

* PREN(Pitting resistance equivalent Number): Cr+3.3Mo +16N

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-2209 Cored	TS (Mpa/ksi)	EL (%)	-20℃ (-4°F)	-50℃ (-58°F)
	840(121)	27.0	44(32.4)	35(25.8)
AWS A5.22 E2209TX-X	≥690	≥ 20	Not Specified	

❖ Chemical Analysis of All weld metal(wt%)

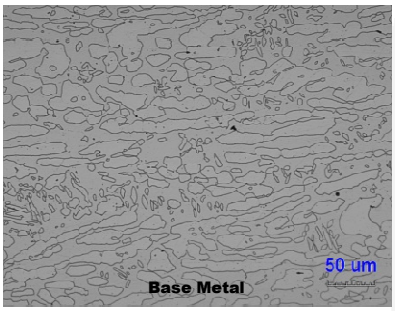
Consumable	Shielding Gas	Chemical Composition (%)									PREN
		C	Si	Mn	P	S	Ni	Cr	Mo	N2	
SW-2209 Cored	Ar+ 20% CO2	0.03	0.5	1.1	0.010	0.009	8.8	23.3	3.7	0.11	37.5
AWS A5.22 E2209TX-X		≤0.04	≤1.0	0.5~2.0	≤0.04	≤0.03	7.5~10.0	21.0~24.0	2.4~4.0	0.05~0.20	

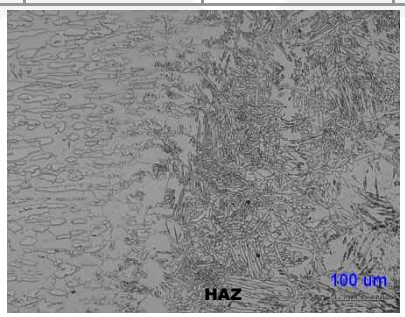
* PREN(Pitting resistance equivalent Number): Cr+3.3Mo +16N

Mechanical Properties & Chemical Composition of All Weld Metal

❖ δ – Ferrite No.

Consumable	Shielding Gas	Diagram		
		Schaeffler	WRC(1992)	FERITSCOPE MP-30
SW-2209 Cored	100% CO2	59	55	50~55
	Ar+20% CO2	60	67	50~55





❖ Pitting Corrosion test(ASTM G48-A)

Consumable	Weight(g)			Pitting
	Before	After	Weight loss	
SW-2209 Cored	95.7401	95.7399	0.0002	No pitting
UNS S31803 (Base metal)	95.8437	95.8436	0.0001	No pitting

❖ Bending test(Base Metal: UNS S31803)

Side (Non-Crack)

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)
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)
SW-2209L Cored	100%CO_2 or Ar-20~25%CO_2	F	160~220Amp
		HF	160~220Amp
		V-Up & OH	140~180Amp

Bead Appearance & Approval

❖ Bead Appearance

<table>
<tr><th colspan="2">Horizontal Fillet(2F, PB) , Base : STS 304L(6T)</th><th colspan="2">Fillet Vertcal up(3F, PF) , Base : STS 304L(6T)</th></tr>
<tr><td colspan="2">  </td><td rowspan="3">  </td><td rowspan="3">  </td></tr>
<tr><td colspan="2">100% CO2(220A/30V)</td></tr>
<tr><td colspan="2">  </td></tr>
<tr><td colspan="2">Ar+20% CO2(220A/28V)</td><td>100% CO2(160A/25V)</td><td>Ar+20% CO2(160A/24V)</td></tr>
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❖ Approvals

Consumable	Shielding Gas	BV	DNV
SW-2209 Cored	M21	UP (KV -20℃≥41J) 1.2	- Duplex stainless steel 1.2