

# SC-91K2 Cored

FLUX CORED ARC WELDING CONSUMABLE FOR WELDING OF LOW-TEMPERATURE SERVICE STEEL

# HYUNDAI WELDING CO., LTD.

AWS A5.29	E91T1-K2C
EN ISO 17632-A	T 50 4 1.5Ni P C 1
SC-91K2 Cored is des 600MPa grade high st A517.	signed for the welding of low alloy steel such as rength steels HY-80, and ASTM A710, A514,
SC-91K2 Cored is a re with CO2 shielding ga low temperature rang qualities, heat input welding condition. W good in all position w crack resistance is exe	utile type flux cored arc welding wire to be used as. Deposited weld metal toughness is good at ge down -40°C. To achieve good weld metal must be controlled, not to exceed general elding arc is stable and bead appearance is velding. Diffusible hydrogen content is low and cellent
<ol> <li>Proper preheating(5 be used in order to in weld metal when plates.</li> <li>One-side welding d wrong welding para</li> <li>Use 100% CO<sub>2</sub> ga</li> </ol>	0~150°C) and interpass temperature must release hydrogen which may cause cracking electrodes are used for medium and heavy efects such as hot cracking may occur with meter such as high welding speed. s.
	<ul> <li>AWS A5.29</li> <li>EN ISO 17632-A</li> <li>SC-91K2 Cored is des 600MPa grade high strator.</li> <li>SC-91K2 Cored is a rewith CO2 shielding galow temperature rang qualities, heat input welding condition. We good in all position we crack resistance is exercised.</li> <li>Proper preheating (5 be used in order to in weld metal when plates.</li> <li>One-side welding data when plates.</li> <li>Use 100% CO<sub>2</sub> gata</li> </ul>

Method by AWS Spec.

# Mechanical Properties & Chemical Composition of All Weld Metal

## Welding Conditions

20

[Joint Preparation & Layer Details]

Diameter(mm)	: 1.2mm
Shielding Gas	: 100% CO <sub>2</sub>
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 260~280 / 29~31
Stick-Out(mm)	: 20~25
Pre-Heat(℃)	: R.T.
Interpass Temp.(℃)	$: 150 \pm 15$
Polarity	: DC(+)

#### Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Im (Jo	pact Test oule)	
SC-91K2 Cored	YS(MPa)	TS(MPa)	EL(%)	<b>−20</b> ℃	<b>−40</b> ℃	
	620	650	27.0	110	60	
AWS A5.29 E91T1-K2C	≥ 540	620~760	≥ 17	≥ <b>27J at</b> –18℃		

## Chemical Analysis of all weld metal(wt%)

Consumable	С	Si	Mn	Р	S	Ni	Мо
SC-91K2 Cored	0.04	0.35	1.25	0.013	0.012	1.55	0.09
AWS A5.29 E91T1-K2C	≤ 0.15	≤ 0.80	0.50~1.75	≤ 0.03	≤ 0.03	1.0~2.0	≤ 0.35

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# Mechanical Properties & Chemical Composition of All Weld Metal

## Welding Conditions

[Joint Preparation & Layer Details]

Diameter(mm)	: 1 <b>.4mm</b>
Shielding Gas	: 100% CO <sub>2</sub>
Flow Rate(ℓ /min.)	: 20
Amp./ Volt.	: 290~310 / 29~32
Stick-Out(mm)	: 20~25
Pre-Heat(℃)	: R.T.
Interpass Temp.(℃)	: 150±15
Polarity	: DC(+)

#### Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Im (Jo	pact Test pule)	
SC-91K2 Cored	YS(MPa)	TS(MPa)	EL(%)	<b>−18</b> ℃	<b>−40</b> ℃	
	622	651	27.1	113	61	
AWS A5.29 E91T1-K2C	≥ 540	620~760	≥ 17	≥ <b>27J at</b> –18℃		

## Chemical Analysis of all weld metal(wt%)

Consumable	С	Si	Mn	Р	S	Ni	Мо
SC-91K2 Cored	0.04	0.35	1.26	0.013	0.012	1.56	0.09
AWS A5.29 E91T1-K2C	≤ 0.15	≤ 0.80	0.50~1.75	≤ 0.03	≤ 0.03	1.0~2.0	≤ 0.35

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Method by AWS Spec.

# Mechanical Properties & Chemical Composition of All Weld Metal

# Welding Conditions

[Joint Preparation & Layer Details]

Diameter(mm)	: 1.6mm	
Shielding Gas	: 100% CO <sub>2</sub>	
Flow Rate(ℓ /min.)	: 20	
Amp./ Volt.	: 310~330 / 31~	33
Stick-Out(mm)	: 20~25	
Pre-Heat(℃)	: R.T.	
Interpass Temp.(℃)	: 150±15	
Polarity	: DC(+)	

# Mechanical Properties of all weld metal

Consumable	Tensile Test			CVN Im (Jo	pact Test oule)	
SC-91K2 Cored	YS(MPa)	TS(MPa)	EL(%)	<b>−18</b> ℃	<b>−40</b> °C	
	624	653	27.1	112	65	
AWS A5.29 E91T1-K2C	≥ 540	620~760	≥ 17	≥ <b>27J at</b> –18℃		

# Chemical Analysis of all weld metal(wt%)

Consumable	с	Si	Mn	Р	S	Ni	Мо
SC-91K2 Cored	0.04	0.36	1.26	0.013	0.012	1.55	0.09
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Method by AWS Spec.

# **Welding Efficiency**

#### Deposition Rate & Efficiency

Consumable	Welding C	onditions	Dependition Efficiency (%)	Deposition Pate(kg/br)		
(size)	Amp.(A)	Volt.(V)				
	200	24	84~86	2.4		
SC-91K2 Cored	250	27	84~86	3.3		
1.2mm	300	31	84~86	4.5		
	350	35	85~87	5.3		
CC 01K2 Corred	250	27	84~86	3.3		
1 4mm	300	31	84~86	4.5		
1.4mm	350	35	85~87	5.4		
	280	31	85~87	3.5		
SC-91K2 Cored	330	33	85~87	4.6		
1.6mm	350	34	86~88	5.4		
	400	38	86~88	5.7		
Remark		Deposition efficiency =(Deposited metal weight/ Wire weight used)×100	Deposition rate =(Deposited metal weight/ Welding time,min.)×60			

\* Shielding Gas : 100%CO<sub>2</sub>

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# **Diffusible Hydrogen Content**

## Welding Conditions

Diameter(mm)	:	1.2	Amps(A) / Volts(V)	:	280 / 31
Shielding Gas	:	100% CO <sub>2</sub>	Stick-Out(mm)	:	20
Flow Rate( ℓ /min.)	:	20	Welding Speed	:	45 cpm
Welding Position	:	1G	Current Type & Polarity	:	DC(+)

## Hydrogen Analysis Using Gas Chromatography Method

Hydrogen Evolution Time	:	72 hrs	Analysis Temp.	:	25 °C
Evolution Temp.	:	25 °C	Exposure Condition	:	80%RH-25℃
Barometric Pressure	:	780 mm-Hg			

## Result(ml/100g Weld Metal)

X1	X2	X3	X4
6.49	7.13	5.49	6.25

## Average Hydrogen Content 6.34 ml | 100g Weld Metal

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# **Proper Welding Condition**

# Proper Current Range

Consumable	Shielding	Welding Position	Wire Dia. (mm)			
	Gas		1.2mm	1.4mm	1.6mm	
SC-91K2 Cored	100%CO <sub>2</sub>	F & HF	200~300Amp	250~350Amp	280~380Amp	
		V-Up & OH	140~240Amp	160~260Amp	180~260mp	
		V-Down	250~310Amp	260~320Amp	280~340Amp	

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# **Approvals**

# **\* AUTHORIZED APPROVAL DETAILS**

Welding Position	Register of shipping & Size(mm)							
	KR	ABS	LR	BV	DNV	GL	NK	
All V–Down	_	AWS A5.29 E91T1-K2C (-40℃≥50J) 1.2	_	_	_	_	_	

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