

Flux-Cored Wire for YS550 MPa Class High Strength Steels

TRUSTARC™ DW-A65Ni1



AWS A5.29 E91T1-GM
EN ISO 18276-A-T 55 5 Mn1Ni P M 2 H5

Product Features

- Titania based all positional flux cored wire with Ar-CO₂ shielding gas.
- Suitable for the welding of Y.S.:550MPa class high tensile steels.
- Excellent CVN toughness down to -50°C.
- Meet NACE MRO175 requirement for chemistry of Ni<1%.

Applications: Steel construction for high tensile strength, Oil & Gas upstream, pipeline

Performance of all weld metal

Mechanical properties of all weld metal

0.2%P.S. (MPa)	T.S. (MPa)	EL (%)	RA (%)	Charpy absorbed energy:J (Brittle fracture:%)			FATT (°C)
				-60°C	-50°C	-40°C	
611	670	23	68	72 (30)	102 (12)	96 (11)	<-60
				58 (41)	70 (36)	95 (14)	
				62 (35)	81 (30)	91 (11)	
				Ave.64 (35)	Ave.84 (27)	Ave.95 (12)	

280A-29V, Shielding gas: 80%Ar-20%CO₂ (25 l/min.),
Pre-heating temp: 100~110, Inter-pass temp:140~160, Heat input: 1.4kJ/mm

Diffusible hydrogen content

Diffusible hydrogen content (ml/100g)

1	2	3	4	Ave.
2.9	3.0	3.5	3.6	3.3

According to AWS A4.3 (Gas chromatography method)
Shielding gas: 80%Ar-20%CO₂, 25 l/min., 230A-25V

Chemical composition of all weld metal (%)

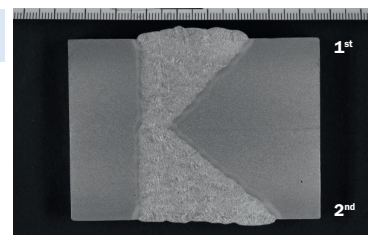
C	Si	Mn	P	S	Ni	Mo	Ti	B
0.05	0.33	1.51	0.009	0.008	0.95	0.16	0.055	0.0037

Performance of thick plate weld joint

Welding condition and Groove preparation

Wire	TRUSTARC DW-A65Ni1, 1.2mm ø
Base Material	Tensile strength 610MPa class steel 60mm thick
Welding position	Vertical upward (3G)
Dimension of groove	<p>After welding 1st side, the groove of 2nd side was machined to the shape of 45° groove angle, 30mm groove depth.</p>
Welding parameters	200A-24V
Shielding gas	80%Ar-20%CO ₂ , 25 l/min
Pass sequence	1st: 19passes - 9layers 2nd: 22passes - 9layers
Pre-heating temperature	100~110°C
Inter-pass temperature	140~160°C
Average heat input	1.5kJ/mm
Average cooling rate	22.1 °C/sec.
PWHT	None (As-welded)

Macro Structure



Mechanical properties of weld joint

Location	Tensile properties				CVN toughness			FATT (°C)
	0.2%P.S. (MPa)	T.S. (MPa)	EL (%)	RA (%)	Absorbed energy: J (Brittle fracture: %)			
					-60°C	-50°C	-40°C	
Face	652	711	20	66	47(41)	74 (33)	101 (13)	<-60
					61 (41)	75 (26)	116 (3)	
					69 (34)	90 (22)	99 (17)	
Center	679	728	26	66	69 (34)	57 (38)	101 (11)	<-60
					57 (44)	76 (34)	89 (19)	
					55 (48)	64 (31)	92 (16)	
Back	659	714	24	64	80 (25)	94 (21)	93 (17)	<-60
					88 (21)	82 (25)	98 (11)	
					84 (22)	79 (28)	90 (11)	
					Ave.84 (23)	Ave.85 (24)	Ave.94 (13)	

*) Size of tensile specimen: dia.=6.0mm, G.L.=24mm

*) Charpy V-notch impact test. Size of specimen: 10x10mm, 2mm notch

*) Face: 7mm from 2nd side, Center: t/2, Back: 7mm from 1st side