

# The test results of SF-50WN

May. 2020

1. Foreword

The following is the report on the test results of SF-50WN.

2. Material

The characteristic of the wire is shown in Table 1.

Table 1 Characteristic of the wire

Brand Name	SF-50WN
Wire size	1.2mmφ
Shielding Gas	100%CO <sub>2</sub>

3. Mechanical test of deposited metal

(1) Test plate and groove geometry

The test plate and groove geometry are shown in figure 1.

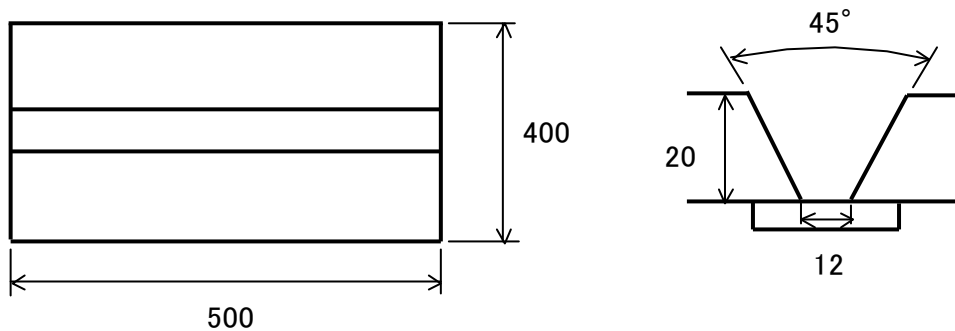


Fig.1 Test plate and groove geometry (steel grade : SM490B)

(2) Welding conditions

Welding conditions are shown in Table 2.

Table 2 Welding conditions

Pass sequence (Pass.No)	Welding Current (A)	Arc Voltage (V)	Travel speed (cm/min)	Wire Extension (mm)	Preheat Temp./Interpass Temp. (°C)	Shielding Gas/ Gas flow rate
5 sequences (10 passes)	270	29	25	20	RT/150	100%CO <sub>2</sub> 25 l/min

(3) Chemical compositions of deposited metal

Chemical compositions of deposited metal is shown in Table 3

Table 3 Chemical compositions of deposited metal (mass%)

C	Si	Mn	P	S	Cu	Ni	Cr
0.04	0.25	0.49	0.008	0.005	0.30	2.70	0.02

(4) Tensile test of deposited metal

The result of tensile test of deposited metal is shown in Table 4

Table 4 Tensile test result of deposited metal

0.2%PS (MPa)	TS (MPa)	EL (%)	RA (%)
444	515	31.0	70
447	522	31.4	70

(5) Impact test

The result of impact test of deposited metal is shown Table 5.

Table 5 The result of impact test deposited metal

Absorbed energy(J)			vTrs (°C)
0°C	-20°C	-40°C	
134	126	131	< -40
134	126	120	
128	128	123	
Ave. 132	Ave. 127	Ave. 125	



4. Transverse tensile test

(1) Test plate and groove geometry

The test plate and groove geometry are shown in Figure 2.

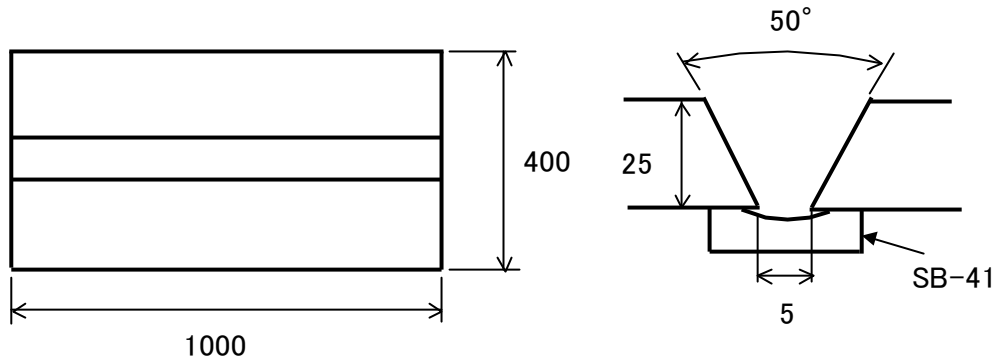


Fig.2 Test plate and groove geometry (400MPa Steel for Ni-added Coastal Weathering Steel)

(2) Welding conditions

The welding condition of vertical up welding with semi-automatic welding is shown in table 6.

Table 6 Welding conditions (Welding position : Vertical up)

Pass sequence	Pass No.	Welding Current (A)	Arc Voltage (V)	Travel Speed (cm/min)	Heat Input (kJ/cm)	Pass sequence
1	1	200	21	9.3	Average. 29.0	<p>5 sequences 7 passes</p>
2	2	220	22	12.8		
3	3	220	22	10.9		
4	4	220	22	10.1		
	5	220	22	8.3		
5	6	210	21	8.5		
	7	210	21	8.3		

- Preheat temp./Interpass temp.(°C) : RT/150
- Shielding Gas and flow rate : 100%CO<sub>2</sub> 、 25 l/min

(3) Chemical composition of weld metal

Chemical composition of weld metal is shown in Table 7.

Table7 Chemical composition of weld metal (mass%)

C	Si	Mn	P	S	Cu	Ni	Cr
0.04	0.34	0.61	0.007	0.004	0.30	2.77	0.06

(4) Transverse tensile test and bending test of weld metal

The result of transverse tensile test and bending test of weld metal is shown in Table 8.

Table 8 Transverse tensile test and bending test of weld metal

Transverse tensile test		Bending test	
TS (MPa)	Fractured Point	Bending Type	Test result
506	Base metal	Face bend	Accepted
504	Base metal	Root bend	Accepted

(5) Tensile test of weld metal

The result of tensile test of weld metal is shown Table 9.

Table9 Tensile test of weld metal

0.2%PS (MPa)	TS (MPa)	EL (%)	RA (%)
484	555	28.8	69

(6) Impact test of weld metal

The result of impact test of weld metal and heat affected zone is shown in Table10.

Table10 Impact test of weld metal and heat affected zone

Notch location	Temperature (°C)	Absorbed energy (J)		
		WM	FL	HAZ 1mm
1/2t	0	120	131	247
		120	156	292
		109	191	148
		Ave. 116	Ave.159	Ave.239

5. Conclusion

As mentioned above, it has been proved that SF-50WN produces the weld metal having excellent mechanical properties and good weldability.

**\* It should be noted that this information is only for reference and no guarantee.**