

# SANDVIK 23.7.L WELDING WIRE

## DATENBLATT

Sandvik 23.7.L is a duplex stainless filler metal for welding lean duplex stainless steels such as Sandvik SAF 2304, LDX 2101\* and similar. Corrosion resistance is equal to 316L in most applications. This alloy is not alloyed with molybdenum and has found applications for production of Nitric Acid in the fertilizer industry.

### STANDARDS

- ISO 14343: 23 7 L N

### CHEMICAL COMPOSITION (NOMINAL) %

#### Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	N
≤0.020	≤0.7	1.7	≤0.025	≤0.005	23	7	0.3	0.14

### WELD METAL CHARACTERISTICS

Austenitic-ferritic microstructure with approximately 50 FN, calculated from the WRC-92 diagram.

### MECHANICAL PROPERTIES

#### TIG (GTAW) – typical for non-heat treated weld metal

Temperature	°C (°F)	20 (68)	-20 (-4)
Yield strength, R <sub>p0.2</sub>	MPa (ksi)	525 (76)	-
Tensile strength, R <sub>m</sub>	MPa (ksi)	710 (103)	-
Elongation, A	%	25	-
Impact strength, Charpy V	J (ft/lb)	170 (125)	150 (110)
Hardness, Vickers	HV	230	-

#### SAW, Flux 15W

Temperature	°C (°F)	20 (68)	-20 (-4)
Yield strength, R <sub>p0.2</sub>	MPa (ksi)	500 (72.5)	-
Tensile strength, R <sub>m</sub>	MPa (ksi)	600 (87)	-
Elongation, A	%	30	-
Impact strength, Charpy V	J (ft/lb)	100 (74)	90 (66)

### PHYSICAL PROPERTIES

Thermal conductivity, W/m °C, at 20°C (68°F)	16
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Thermal expansion per °C, from 20 to 400°C (68 to 752°F)	14.5x10 <sup>-6</sup>
Density, g/cm <sup>3</sup> (lb/in. <sup>3</sup> ), at 20°C (68°F)	7.9 (0.285)

### CORROSION RESISTANCE

Sandvik 23.7.L is resistant to intergranular and pitting corrosion at the same level as 316L. Resistance to stress corrosion cracking is better than 316L.

### FABRICATION

#### Recommended welding data

##### MIG welding

Electrode positive is used to give good penetration in all types of welded joint. The following table shows common conditions for MIG welding.

Wire diameter	Wire feed	Current	Voltage	Gas
mm (in.)	m/min (in./min)	A	V	l/min (CFH)
Short-arc welding				
0.8 (0.031)	4-8 (157-315)	40-120	15-19	12 (25)
1.0 (0.039)	4-8(157-315)	60-140	15-21	12 (25)
Spray-arc welding				
1.0 (0.039)	6-12 (236-472)	140-220	23-28	18 (38)
1.2 (0.047)	5-9 (197-354)	180-260	24-29	18 (38)
1.6 (0.063)	3-5 (118-197)	230-350	25-30	18 (38)
Pulsed-arc welding <sup>1)</sup>				
1.2 (0.047)	3-10 (118-394)	150-250	23-31	18 (38)

<sup>1)</sup>Pulse parameters: Peak current 300 - 400 A  
Background current 50 - 150 A  
Frequency 80 - 120 Hz

Sandvik can provide recommendations for shielding gases.

Short-arc welding is used with light gauge material of less than about 3 mm, in depositing root runs, and in welding out-of-flat positions.

The higher the inductance in short-arc welding, the higher the fluidity of the molten pool.

Spray-arc welding is normally used for heavier gauge material.

##### TIG welding

The parameters for TIG welding depend largely upon the base metal thickness and the welding application.

Electrode negative and a shielding of argon or helium should be used to prevent oxidation of the weld metal.

Wire diameter	Current	Voltage
mm (in.)	A	V
2.0 (0.078)	200-300	28-32
2.4 (0.094)	250-400	28-32
3.2 (0.126)	300-450	29-34
4.0 (0.157)	350-500	30-35

### Submerged-arc welding

Electrode positive is suggested for joint welding to give good penetration.

Wire diameter	Current	Voltage
mm (in.)	A	V
2.0 (0.078)	200-300	28-32
2.4 (0.094)	250-400	28-32
3.2 (0.126)	300-450	29-34

Recommended welding flux is Sandvik 15W.

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