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Sandvik 22.8.3.L

(Welding wire)

Sandvik 22.8.3.L is a duplex stainless filler metal for welding duplex stainless steels such as Sandvik SAF 2205 and Sandvik SAF 2304. Corrosion resistance is equal to 904L in most applications. The grade can also be used for joining Sandvik SAF 2205 or Sandvik SAF 2304 to carbon steel.

STANDARDS

- AWS ER2209
- EN number 22 9 3 N L

Product standards

- EN ISO 14343
- ASME/AWS SFA5.9

Approvals

CE, DNV, TÜV

CHEMICAL COMPOSITION- FILLER METAL

CHEMICAL COMPOSITION, WT%

C max	Si	Mn	P max	S max	Cr	Ni	Mo	N
0.020	0.5	1.6	0.020	0.015	23	9	3.2	0.16

CHEMICAL COMPOSITION- ALL-WELD METAL

The data below is typical for non heat treated all-weld metal made by MIG welding with a shielding gas of Ar + 2%O₂.

CHEMICAL COMPOSITION, WT%

C max	Si	Mn	P max	S max	Cr	Ni	Mo	N
0.020	0.5	1.5	0.020	0.015	23	9	3	0.14

The data below is typical for non heat treated all-weld metal made by SAW, Flux 15W.

CHEMICAL COMPOSITION, WT%

C max	Si	Mn	P max	S max	Cr	Ni	Mo	N
0.020	0.7	1.2	0.025	0.015	22.5	9	3	0.15

MICROSTRUCTURE - ALL-WELD METAL

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

MECHANICAL PROPERTIES - ALL-WELD METAL

MIG AND TIG

Temperature	° C	20	-20
Yield strength, R _{p0.2}	MPa	600	-
Tensile strength, R _m	MPa	750	-
Elongation, A	%	25	-
Impact strength, Charpy V	J	160	100
Hardness, Vickers	HV	240	-

SAW, FLUX 15W

Temperature	° C	20	-40
Yield strength, R _{p0.2}	MPa	650	-
Tensile strength, R _m	MPa	770	-
Elongation, A	%	33	-
Impact strength, Charpy V	J	90	85

PHYSICAL PROPERTIES - ALL-WELD METAL

Thermal conductivity, W/m °C, at 20 °C	16
Thermal expansion per °C, from 20° to 400°C	14.5x10 ⁻⁶
Density, g/cm ³ , at 20 °C	7.9

CORROSION RESISTANCE- ALL-WELD METAL

Sandvik 22.8.3.L is resistant to intergranular corrosion and pitting. It also has good resistance to stress corrosion cracking, especially in environments containing H₂S.

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, mm	Wire feed, m/min	Current, A	Voltage, V	Gas, l/min
Short-arc welding				
0.8	4-8	40-120	15-19	12
1.0	4-8	60-140	15-21	12
Spray-arc welding				
1.0	6-12	140-220	23-28	18
1.2	5-9	180-260	24-29	18
1.6	3-5	230-350	25-30	18
Pulsed-arc welding ¹⁾				
1.2	3-10	150-250	23-31	18

¹⁾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 gas](#) of argon or helium should be used to prevent oxidation of the weld metal.

Submerged-arc welding

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

Wire diameter, mm	Current, A	Voltage, V
2.0	200-300	28-32
2.4	250-400	28-32
3.2	300-450	29-34
4.0	350-500	30-35

For recommended flux, Sandvik 15W, see Sandvik brochure, Stainless Welding Products, reference S-236, page 25.

DISCLAIMER:

Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice. This datasheet is only valid for Sandvik materials.