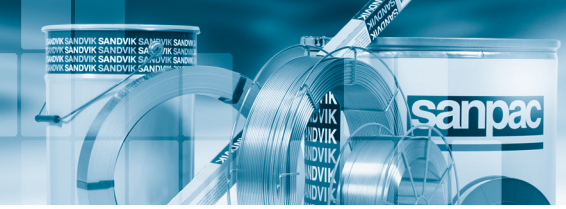

SANDVIK

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Sandvik 24.13.LNb

(Welding wire)

Sandvik 24.13.LNb is a niobium-stabilized overalloyed filler metal suitable for overlay welding of carbon and low-alloy steels, where a type 347 of overlay is required. It is used for gas shielded and submerged-arc welding.

STANDARDS

- AWS ER"309LNb"
- EN number 23 12 Nb

Product standards

- EN ISO 14343
- ASME/AWS SFA5.9

CHEMICAL COMPOSITION - FILLER METAL

CHEMICAL COMPOSITION, WT%

C max	Si	Mn	P max	S max	Cr	Ni	Nb
0.020	0.3	2.0	0.020	0.015	24	12.5	0.8

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%O_2.

CHEMICAL COMPOSITION, WT%

C max	Si	Mn	P max	S max	Cr	Ni	Nb
0.020	0.3	2.0	0.020	0.015	23.5	12	0.75

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	Nb
0.020	0.7	1.2	0.025	0.015	23.5	12	0.7

MICROSTRUCTURE - ALL-WELD METAL

Austenitic matrix with a ferrite content of 13 FN according to DeLong.

MECHANICAL PROPERTIES - ALL-WELD METAL

MIG AND TIG

Temperature	° C	20
Yield strength, $R_{p0.2}$	MPa	400
Tensile strength, R_m	MPa	600
Elongation, A	%	35
Impact strength, Charpy V	J	110
Hardness, Vickers	HV	180

SAW, FLUX 15W

Temperature	° C	20
Yield strength, $R_{P0.2}$	MPa	400
Tensile strength, R_m	MPa	600
Elongation, A	%	35
Impact strength, Charpy V	J	90

PHYSICAL PROPERTIES - ALL-WELD METAL

Temperature °C	20	100	300	500
Thermal conductivity, W/m	14	15	17	18

Thermal expansion per °C, from 20°C (68 °F) to 400°C (750 °F) 18 x 10^{-6}
Density, g/cm^3, at 20 °C (68 °F) 7.9

CORROSION RESISTANCE- ALL-WELD METAL

Overlay welds using Sandvik 24.13.LNb have similar corrosion resistance to type 347, EN 1.4550, base metal.

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	Current	Voltage
mm	A	V
2.0	200-350	28-32
2.4	250-450	28-32
3.2	300-500	29-34
4.0	400-600	30-35

Recommended welding flux is Sandvik 15W.

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.