

SANDVIK 22.12.HT WELDING WIRE

DATASHEET

Sandvik 22.12.HT is an austenitic filler material for welding the high temperature steel grade Sandvik 253 MA*, UNS S30815. It is characterized by high creep strength, good resistance to oxidation and good weldability.

STANDARDS

- Wnr: 1.4829

Please note that the Werkstoff Nr. corresponds to the base material of the grade.

CHEMICAL COMPOSITION (NOMINAL) %

Chemical composition (nominal) %

C	Si	Mn	P	S	Cr	Ni	Mo	N	Ce
0.08	1.6	0.5	≤0.025	≤0.015	21	10	≤0.3	0.17	0.06

WELD METAL CHARACTERISTICS

Austenitic matrix with a ferrite content of 6FN according to the WRC-92 diagram.

MECHANICAL PROPERTIES

Temperature	°C (°F)	20 (68)	600 (1112)	800 (1472)	1000 (1832)
Yield strength, R _{p0.2}	MPa (ksi)	360 (52)	-	-	-
Tensile strength, R _m	MPa (ksi)	580 (84)	-	-	-
Elongation, A	%	40	-	-	-
Impact strength, Charpy V	J (ft/lb)	120 (89)	-	-	-
Hardness, Vickers	HV	180	-	-	-
Creep rupture strength, 5 x 10 ⁵ h	.	.	100	15	5

PHYSICAL PROPERTIES - ALL WELD METAL

Temperature °C	20	100	300	500
Thermal conductivity, W/m	14.5	16	17.5	21

- Thermal expansion per °C, from 20 °C (68°F) to 400°C (750°F) 17.6 x 10⁻⁶
- Density, g/cm³, at 20°C (68°F), 7.8

CORROSION RESISTANCE - ALL WELD METAL

Sandvik 22.12.HT has good resistance to oxidation and can be used in air up to 1150°C (2100°F).

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 ¹⁾				
1.2 (0.047)	3-10 (118-394)	150-250	23-31	18 (38)

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 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 (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

Recommended welding flux is Sandvik 15W.

* 253 MA is a trademark owned by Outokumpu OY.

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.

