

Material Datasheet

Meltio Nickel 625

Material Group: Nickel Alloys

A Ni-based superalloy with excellent mechanical properties at a wide range of temperatures. Among superalloys, Ni625 excels for its weldability, making it an ideal choice for cladding or repair of components working at high temperatures or requiring increased corrosion protection.

Nomenclature Standards

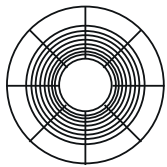
AWS A 5.9 _____	ERNiCrMo-3
EN ISO 14343-A _____	S Ni 6625 (NiCr22Mo9Nb)
Material N° _____	2.4831

Nickel 625

Chemical Composition

	Ni	C	Si	Mn	Cr	Fe	Mo	Nb	S
Base		0.02	0,2	0.2	22	1	9	3.3	0.01

Spool Specs



Diameter	1 mm
Weight	15 kg
Volume	1829 cm ³
Density	8.2 g/cm ³
Spool Type	BS300

Stainless Steel 316L Substrate

Chemical Composition

	Fe	C	Si	Mn	Cr	Ni	Mo
Base		0.02	0.9	1.7	18.5	12	2.7

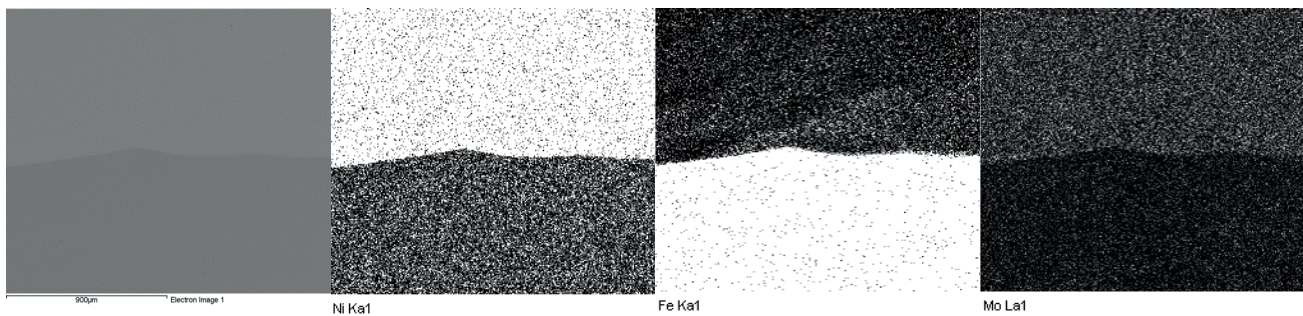
Elemental Mapping of Nickel 625 Cladding on Stainless Steel 316L

Cladding under Electron Beam Microscope

Iron EDX Map:

Nickel EDX Map:

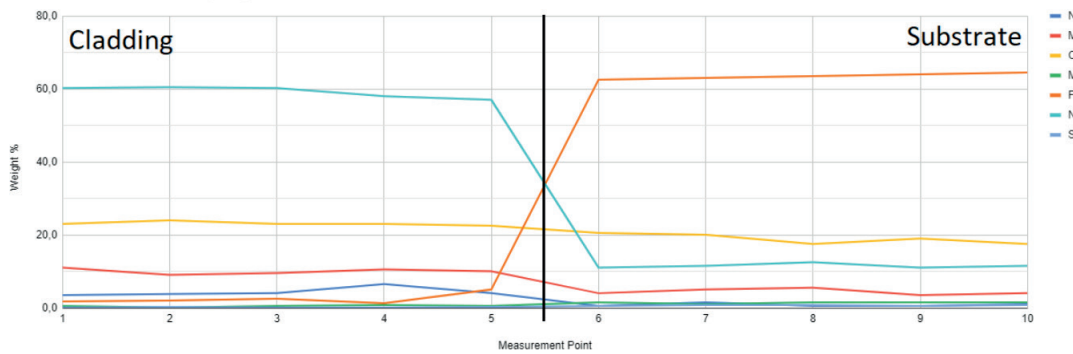
Molybdenum EDX Map:



Nickel 625 Cladding Elements

Measurement	Nb	Mo	Cr	Mn	Cr	Ni	Si
1	3.5	11.0	23.0	0.5	1.8	60.3	0.1
2	3.8	9.0	24.0	0.1	2.0	60.5	0.2
3	4.0	9.5	23.0	0.5	2.5	60.3	0.1
4	6.5	10.5	23.0	0.8	1.3	58.0	0.1
5	4.0	10.0	22.5	0.5	5.0	57.0	0.2
6	0.5	4.0	20.5	1.5	62.5	11.0	0.5
7	1.5	5.0	20.5	1.0	63.0	11.5	0.8
8	0.5	5.5	17.5	1.5	63.5	12.5	0.8
9	0.5	3.5	19.0	1.5	64.0	11.0	0.5
10	1.0	4.0	17.5	1.5	64.5	11.5	0.8

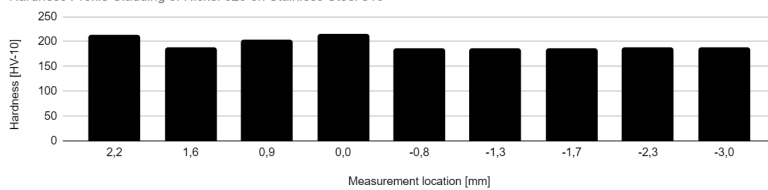
Element Concentration by Depth



* Nickel 625 cladding on Meltio 316L Stainless steel. Both Materials deposited using Meltio Wire LMD.

Hardness Profile

Hardness Profile Cladding of Nickel 625 on Stainless Steel 316



Hardness Profile

Hardness (HV10)	Distance (mm)	Material
212	2.2	Nickel 625
186	1.6	
201	0.9	
213	0.0	Interlayer
184	-0.8	Stainless Steel 316L
184	-1.3	
185	-1.7	
187	-2.3	
187	-3.0	

Printing Parameters Used

Print Speed	Deposition Width	Layer Height	Laser Power
600 mm/min	1 mm	0.8 mm	1100 W

Shielding gas: Argon > 99.996% purity.

Machine Used: Meltio M450

Laser System: 6x200W Fiber coupled diode lasers. 976nm wavelength.

* Data represent typical reference values from Worught and Cast material classification compared to Meltio (M450) horizontal (XY) and vertical (XZ) specimens extracted from 3D printed walls and tensile tested according to UNE EN ISO 6892-1

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