Material Datasheet

Meltio Invar

Material Group: Nickel Iron Alloy

This alloy gets its name thanks to its extremely low coefficient of thermal expansion, from -250°C up to about 200°C. This feature makes it an ideal choice for measuring equipment, cryogenic applications and molds for the manufacturing of composite components for aerospace use.

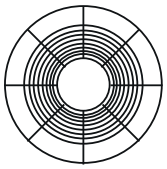
Nomenclature Standards

Material Nº_____ 1.3990

Chemical Composition

C	Ni	Fe	Mn	Nb	Ti
0.35	36	Base	1	2.5	1.0

Spool Specs



Diameter	1 mm
Weight	15 kg
Volume	1851 cm³
Density	8.1 g/cm³
Spool Type	BS300

Applications

Aerospace industries

Tools and prototypes

Mechanical Properties

Results show Meltio's wire LMD 3D printed specimens to perform at the same level as conventional manufacturing methods, with low deviations and near isotropic properties between vertical (XZ) print orientations.

		Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (HV-30)
Wrought Properties		448	241	31	127
Meltio as Built	**XZ**	522 ± 14	337 ± 22	24 ± 2	147

Printing Parameters Used

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

Tomography

In this tomography we can observe the internal structure of the material and see its good density, absence of porosity or internal defects that put at risk the structure of the sample.
The resolution used for the CT inspection is 24 micrometros por pixel.

Shielding gas: Argon > 99.996% purity.

Machine Used: Meltio M450

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

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