13 Al
22 Ti | 24 Cr | 26 Fe | 27 Co | 28 Ni | 29 Cu

X Line 2000R Nickel 625

Parameter for GE Additive’s Concept Laser X Line 2000R

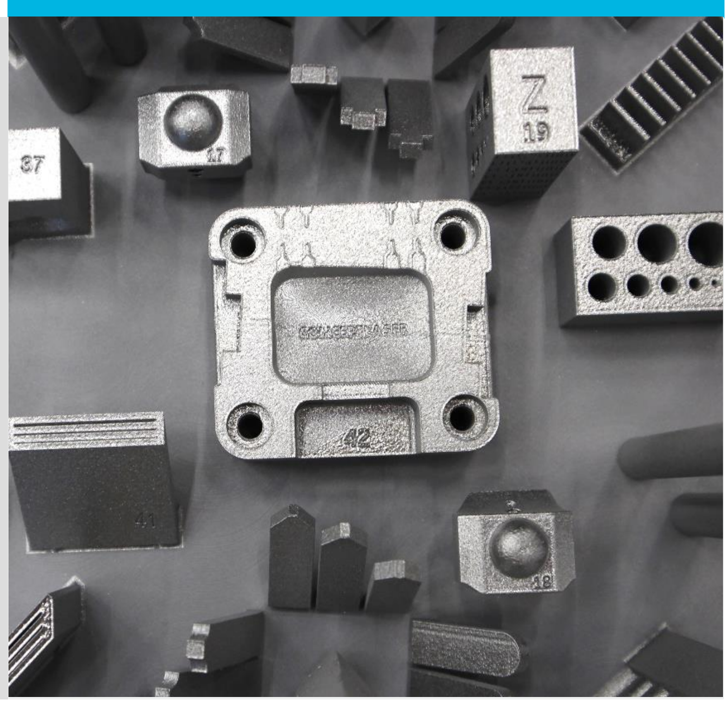
Data in this material datasheet represents material built with 60 µm layer thickness and in an argon atmosphere on a Concept Laser X Line 2000R. Values listed are typical.

Nickel 625

Austenitic nickel-chromium superalloy Nickel 625 possesses excellent resistance to oxidation and corrosion combined with high strength over a wide temperature range from cryogenic temperatures to 982°C. The high (creep) strength is derived by solid-solution hardening of the nickel-chromium matrix, thus no age-hardening has to be applied. The alloy can be readily welded, which makes this alloy suitable for additive manufacturing. Typically, Nickel 625 is widely used in aerospace, marine engineering, chemical processing, oil and gas industry as well as power industry applications.

X Line 2000R Nickel 625

The Nickel 625 parameter for the Concept Laser X Line 2000R is developed leveraging the experience with the alloy on the M2 Series 5 generation. The base parameter is a 60 µm parameter that delivers a good balance between surface quality and productivity. Furthermore, the parameter offers a very high density leading to good strength and elongation properties.



X Line 2000R Nickel 625

With corresponding approval* Nickel 625 can be used for manufacturing components for high-temperature applications.

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POWDER CHEMISTRY

Nickel 625 powder chemical composition according to ASTM F3056 / AMS7000/ UNS N06625
For additional information on Nickel 625 powder, visit https://www.advancedpowders.com/powders/nickel/625.

MACHINE CONFIGURATION

- Concept Laser X Line 2000R
- Argon gas
- Rubber

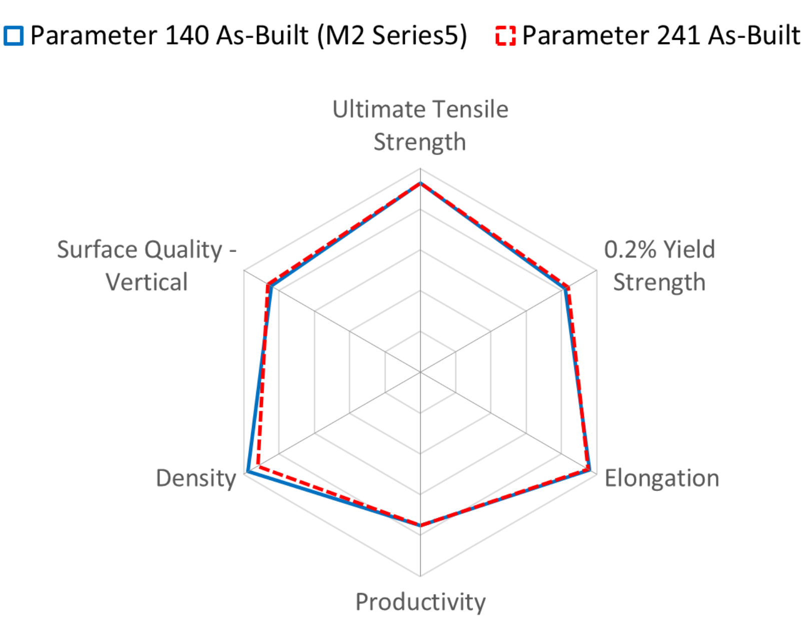
AVAILABLE PARAMETER

- **Base Parameter 241** 60 µm layer thickness, argon gas, rubber recoater

THERMAL STATES

1. As-Built

PARAMETER COMPARISON



Spider Plot is generated by normalizing typical material data (containing both horizontal and vertical data) against a range defined for each material family. For nickel-based superalloy **Nickel 625**, the ranges are as follows: UTS: 0-950 MPa, 0.2%YS: 0-700 MPa, Elongation: 0-50 %, Density: 99-100 %, Productivity: 5-30 cm³/h, Surface Quality: 40-5 µm

TYPICAL BUILD RATE

	(cm³/h)
Typical build rate[1] w/coating	--
Theoretical melting rate[2] bulk per Laser	22.5

[1]Using standard Factory Acceptance Test layout and 2 lasers
[2]Calculated (layer thickness x scan velocity x hatch distance)

PHYSICAL DATA AT ROOM TEMPERATURE

	Surface Roughness Ra** - Overhang (µm) 45°	60°	75°
Upskin	--	--	--
Downskin	--	--	--

	Surface Roughness Ra** (µm)
H	--
V	10

	Relative Density (%)		Hardness (HV10)		Poisson's Ratio	
Thermal State	H	V	H	V	H	V
As-Built	99.9	99.9	--	--	--	--
SR	--	--	--	--	--	--

TENSILE DATA

Tensile testing done in accordance with ASTM E8 and ASTM E21

Test Temperature: RT	Modulus of Elasticity (GPa)		0.2% Yield Strength (MPa)		Ultimate Tensile Strength (MPa)		Elongation (%)		Reduction of Area (%)	
Thermal State	H	V	H	V	H	V	H	V	H	V
As-Built	--	148	--	585	--	880	--	41.0	--	--
SR	--	--	--	--	--	--	--	--	--	--

H: HORIZONTAL (XY) orientation
V: VERTICAL (Z) orientation

* All of the figures contained herein are approximate only. The figures provided are dependent on a number of factors, including but not limited to, process and machine parameters, and the approval is brand specific and/or application specific. The information provided on this material data sheet is illustrative only and cannot be relied on as binding.
** Roughness measurements have been performed according to DIN EN ISO 4287 and DIN EN ISO 4288. In general analysis of the surface quality is strongly dependent on the methodology used and therefore deviations might be observed depending on methodology used. Vertical and horizontal sidewalls have been characterized using a tactile system, overhangs using an optical system.