



Material data sheet – FlexLine

EOS StainlessSteel CX

EOS StainlessSteel CX is a corrosion resistant iron based powder intended for processing on EOS DMLS systems.

This document provides information and data for parts built using EOS StainlessSteel CX powder (EOS art.-no. 9011-0037) on the following system specifications:

- EOS M 290
- EOSPRINT 1.2
- EOS ParameterSet CX 30 µm FlexLine
(Default Job: *CX_030_FlexM291_100*)

Description

EOS StainlessSteel CX is a tooling grade steel characterized having a good corrosion resistance combined with high strength and hardness.

This material is intended for

- Injection moulding tools and tool parts
- other industrial applications where high strength and hardness are required

Parts built from EOS StainlessSteel CX can be machined, shot-peened and polished in as-built or heat treated status.

Material data sheet - FlexLine

Technical Data

Powder properties

The chemical composition of the powder:

Material composition

Element	Min	Max
Fe	balance	
Cr	11.00	13.00
Ni	8.40	10.00
Mo	1.10	1.70
Al	1.20	2.00
Mn	-	0.40
Si	-	0.40
C	-	0.05

Particle size

Particle > 63 μ m < 0.5 wt.-%

Material data sheet – FlexLine

General process data

Layer thickness	30 µm
Volume rate [1]	3.2 mm ³ /s (11.5 cm ³ /h)

- [1] The volume rate is a measure of build speed during laser exposure of the skin area. The total build speed depends on this volume rate and many other factors such as exposure parameters of contours, supports, up and downskin, recoating time, Home-In or LPM settings.

Physical and chemical properties of parts

The chemical composition of parts:

Material composition	wt-%		
	Element	Min	Max
	Fe	balance	
	Cr	11.00	13.00
	Ni	8.40	10.00
	Mo	1.10	1.70
	Al	1.20	2.00
	Mn	-	0.40
	Si	-	0.40
	C	-	0.05
Part density	7.7 g/cm ³		
Surface roughness after shot peening [2]	R _a (5) µm; R _z (26) µm		

- [2] The numbers were measured at the horizontal (up-facing) and all vertical surfaces of test cubes using a perthometer. Due to the layerwise building the roughness strongly depends on the orientation of the surface, for example sloping and curved surfaces exhibit a stair-step effect.

Material data sheet – FlexLine

Tensile data at room temperature [3]

	As built	Heat treated [5]
Ultimate tensile strength [4]	1080 MPa	1760 MPa
Yield strength, Rp0.2% [5]	840 MPa	1670 MPa
Elongation at break A [5]	14 %	7 %

[3] The numbers are average values and are determined from samples with horizontal and vertical orientation.

[4] Tensile testing according to ISO 6892-1:2009 (B) Annex D, proportional test pieces, diameter of the neck area 5 mm (0.2 inch), original gauge length 25 mm (1 inch).

[5] Heat treatment procedure: 1. Solution Anneal 1 h @ 900°C, Rapid Air Cool (RAC) to Room Temperature
2. Ageing 3h @ 530°C

Hardness data in heat treated status [5]

	Heat treated [5]
Hardness (HRC) [6]	51 HRC

[6] Rockwell hardness (HRC) measurement according to EN ISO 6508-1

Abbreviations

min. minimum
max. maximum
wt. weight

The quoted values refer to the use of this material with above specified EOS DMLS system, EOS Print version, parameter set and operation in compliance with parameter sheet and operating instructions. All measured values are average numbers. Part properties are measured with specified measurement methods using defined test geometries and procedures. Further details of the test procedures used by EOS are available on request. Any deviation from these standard settings may affect the measured properties.

The data correspond to EOS knowledge and experience at the time of publication and they are subject to change without notice as part of EOS' continuous development and improvement processes. EOS does not warrant any properties or fitness for a specific purpose, unless explicitly agreed upon. This also applies regarding any rights of protection as well as laws and regulations.

EOS[®], EOSINT[®], DMLS[®], DirectTool[®] and DirectPart[®] are registered trademarks of EOS GmbH.

©2015 EOS GmbH – Electro Optical Systems. All rights reserved.