METALS FOR PRINTING

m4p type10-SDX

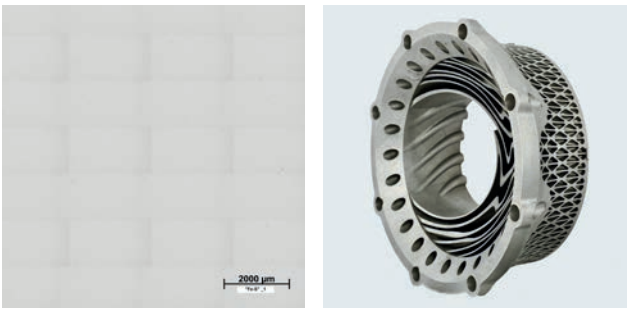
Fe-base for Laser Powder Bed Fusion

Description, properties and applications

m4p type10-SDX is a steel alloy from the category **Superduplex**. Duplex is a term used in materials science for microstructures that have a **two-phase structure** of **ferrite** and **austenite**. Thus, they combine the advantages of both microstructures and enable materials with the best **mechanical strength properties** and excellent **corrosion resistance**. The increase in „Duplex" grades leads to the „Superduplex" steel grade of m4p type10-SDX, whose **pitting corrosion resistance** reaches **PREN values >40** due to the highest chromium and molybdenum contents in combination with nitrogen. Due to the ferrite content, the strength values - in particular higher **yield strengths** - are significantly higher than for fully austenitic materials. The combination of highest corrosion resistance and high strength is a major aspect in some demanding applications **(oil and gas industry or onshore and offshore industry)** to design **safety relevant components.** With the aid of m4p type10-SDX, for example, **wall thicknesses** can be reduced or the **service life** of components can be increased, with significantly higher corrosion resistance or strength compared to standard stainless grades.

m4p type10-SDX can be processed very well in the laser-based powder bedding process and by varying the process temperature or optional **post heat treatment**, the material properties can be adjusted as required. For further information, m4p will be at your service.

Powder characteristics



Images: Microsection; Outlet body O&G ball valve

Chemical analysis [wt.%]		
Element	Min	Max
C	<0.03	
Si	<0.8	
Mn	<1.2	
Cr	24.0	26.0
Ni	6.0	8.0
Mo	3.0	5.0
N	0.24	0.32
Fe	Base	

Other limited elements: O, Cu, P, S

Additive manufacturing and material characteristics

(>99.9% rel. density; volume rate 13.7 cm³/h, layer thickness 40µm; EOS M290)

	Tensile strength Rm [N/mm²]	Yield strength Rp0.2 [N/mm²]	Elongation at break A_5 [%]	PREN-Value [-]
as-built sample orientation ↕	1,265 - 1,310	1,100 - 1,145	6 - 9	42 - 44
heat-treated (solution annealed) sample orientation ↕	835 - 865	560 - 590	31 - 36	42 - 44

www.metals4printing.com

GERMANY
m4p material solutions GmbH · Germany
Mittelweg 13, 39130 Magdeburg
T +49 391 72149-40
E sales@metals4printing.com

AUSTRIA / INTERNATIONAL
m4p material solutions GmbH · Austria
Gewerbestraße 4, 9181 Feistritz i. R.
T +43 4228 93053-0
E sales@metals4printing.com