

# CONCEPTLASER

a GE Additive company

## CL 20ES Stainless steel

*Stainless steel (powder), chemical composition according to 1.4404, X 2 CrNiMo 17 13 2, 316L*

With an appropriate approval\* CL 20ES can be used for the production of functional parts or components for pre-production moulds.

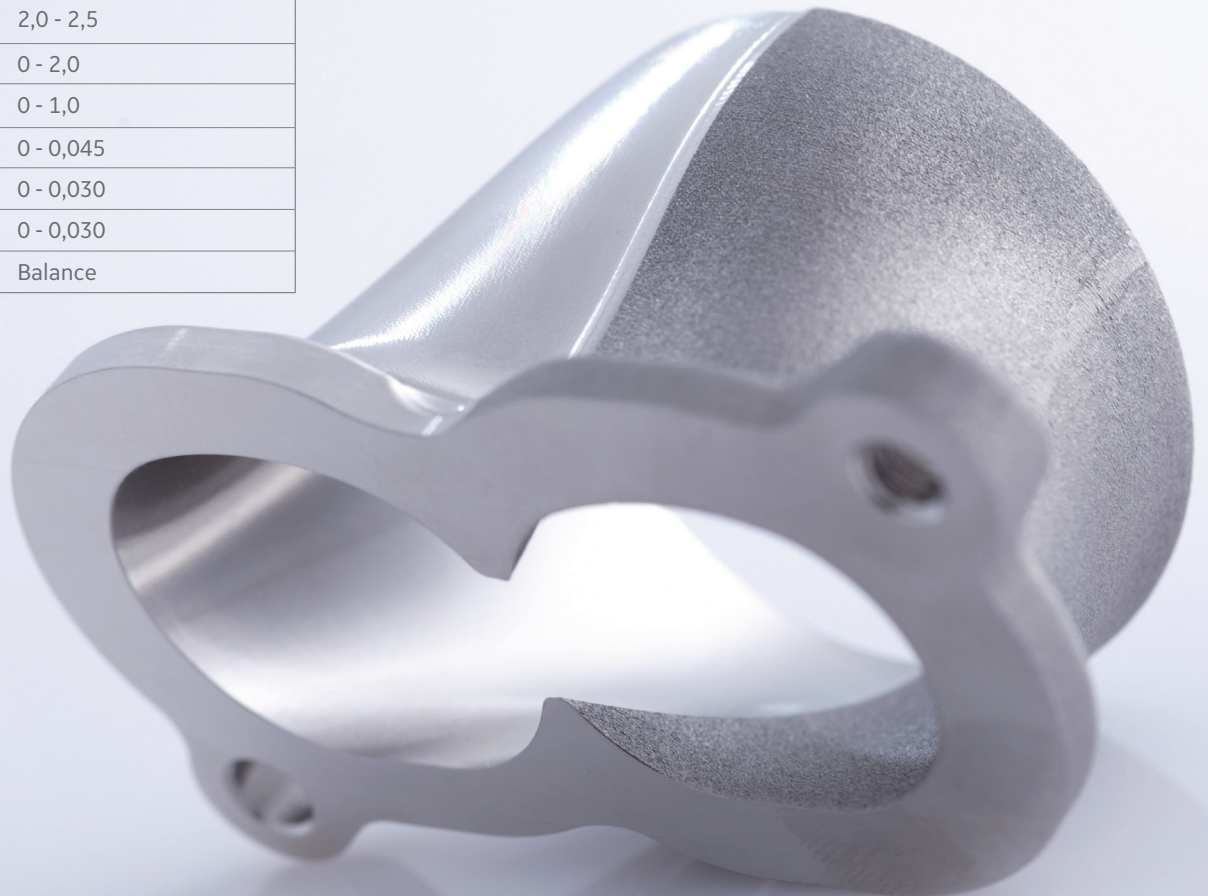
26

Fe

55,847

### CHEMICAL COMPOSITION

Component	Indicative value (%)
Cr	16,5 - 18,5
Ni	10,0 - 13,0
Mo	2,0 - 2,5
Mn	0 - 2,0
Si	0 - 1,0
P	0 - 0,045
C	0 - 0,030
S	0 - 0,030
Fe	Balance



## RANGE OF APPLICATION

With an appropriate approval\* CL 20ES can be used for manufacturing acid- and corrosion resistant prototypes, unique or series production parts in the following fields: Plant engineering, automotive industry, medical technology, jewellery and components for moulds.

## TECHNICAL DATA AFTER RECOMMENDED HEAT TREATMENT

	90° (upright)	45° (polar angle)	0° (horizontal)
Yield strength $R_{p0,2}$ <sup>1</sup>	374 ± 5 N/mm <sup>2</sup>	385 ± 6 N/mm <sup>2</sup>	330 ± 8 N/mm <sup>2</sup>
Tensile Strength $R_m$ <sup>1</sup>	650 ± 5 N/mm <sup>2</sup>	640 ± 7 N/mm <sup>2</sup>	529 ± 8 N/mm <sup>2</sup>
Elongation A <sup>1,2</sup>	65 ± 4 %	63 ± 5 %	63 ± 5 %
Young's modulus <sup>3</sup>	ca. 200 · 10 <sup>3</sup> N/mm <sup>2</sup>	ca. 200 · 10 <sup>3</sup> N/mm <sup>2</sup>	ca. 200 · 10 <sup>3</sup> N/mm <sup>2</sup>
Thermal conductivity $\lambda$ <sup>3</sup>	ca. 15 W/mK	ca. 15 W/mK	ca. 15 W/mK
Hardness <sup>4</sup>	20 HRC	20 HRC	20 HRC
	<sup>1</sup> Tensile test at 20°C according to DIN EN 50125 <sup>2</sup> By using a special heat treatment a higher elongation can be achieved. <sup>3</sup> Specification according to the material manufacturer's data sheet. <sup>4</sup> Hardness test according to DIN EN ISO 6508		

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## MICROSECTION

Test piece (x 20 magnification)



Test piece (x 100 magnification)



## STRESS RELIEF HEAT TREATMENT

Optional for parts that are sensitive to warpage: Heat up in 3 hours to 550°C. Maintain temperature for 6 hours. Subsequently allow the component cooling down in the oven or at ambient atmosphere.

## MICROSTRUCTURE

Components made from stainless steel CL 20ES display a homogeneous, dense structure after they are manufactured by means of the metal laser melting process LaserCUSING®.

All of the specified figures are approximate figures. The figures which are provided reflect the current level of our knowledge and are dependent on process and machine parameters. The information provided on this material data sheet is therefore not binding and is not deemed to be certified.

\* The approval is branch-specific and/or application-specific and it must be, therefore, carried out by the consumer/user. Approval of materials by Concept Laser GmbH is not available.

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