

METAL SOLUTIONS

EOS ToolSteel CM55

Material Data Sheet

EOS TOOLSTEEL CM55

EOS ToolSteel CM55 is a cobalt free ultra high strength steel for tooling and engineering solutions. Its alloying elements and moderate carbon content form a strong and stable structure for demanding applications. The properties of this steel make it suitable for cold- and hot-working tools. Producing mechanical engineering and powertrain components is well suited for this steel.

MAIN CHARACTERISTICS

- Cobalt free
- High strength and hardness
- Stable for use in elevated temperatures

TYPICAL APPLICATIONS

- Cold working tools
- Hot working tools
- Parts for mechanical engineering
- Powertrain components

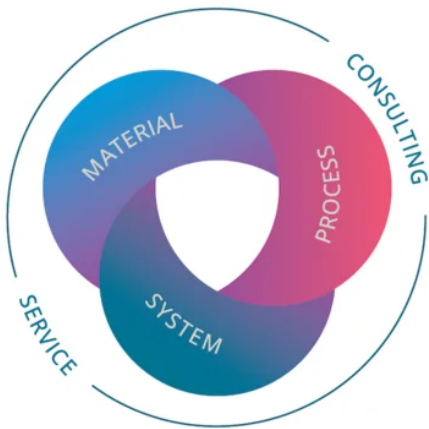
The EOS Quality Triangle

EOS uses an approach that is unique in the AM industry, taking each of the three central technical elements of the production process into account: the system, the material and the process. The data resulting from each combination is assigned a Technology Readiness Level (TRL) which makes the expected performance and production capability of the solution transparent.

EOS incorporates these TRLs into the following two categories:

- Premium products (TRL 7-9): offer highly validated data, proven capability and reproducible part properties.
- Core products (TRL 3 and 5): enable early customer access to newest technology still under development and are therefore less mature with less data.

All of the data stated in this material data sheet is produced according to EOS Quality Management System and international standards



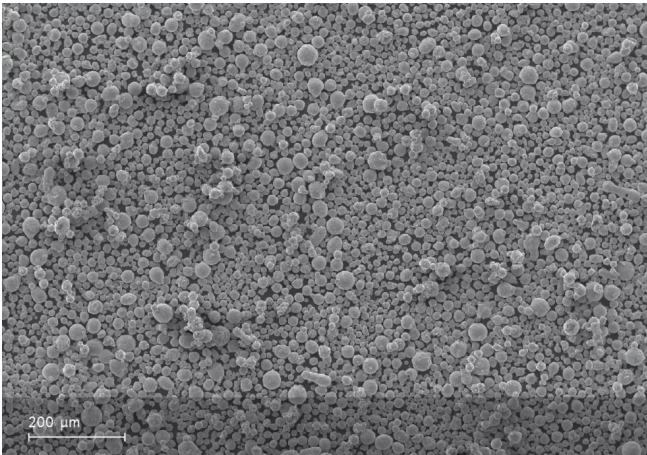
POWDER PROPERTIES

Powder Chemical Composition (wt.-%)

Element	Min.	Max.
Fe		Balance
Cr	5	8
Ni	5	8
Mo	0.5	1.2
Al	2	2.6
V	0.1	0.25
C	0.1	0.25

Powder Particle Size

GENERIC PARTICLE SIZE DISTRIBUTION	15 - 63 µm
------------------------------------	------------



SEM micrograph of EOS ToolSteel CM55 powder

HEAT TREATMENT

Description

EOS ToolSteel CM55 can be heat treated to different hardness levels by adjusting the aging temperature. Final state of use is achieved by a two step heat treatment. First step is hardening where a strong martensitic microstructure is formed. The final hardness and strength is obtained in an aging treatment where strengthening phases and precipitates form.

Steps

1. Hardening

2 hours in 950 °C measured from the part when thoroughly heated through. Rapid gas cooling or quenching in oil. Cooling to room temperature before aging treatment.

2. Aging

4 hours in 550 °C - 630 °C depending on the desired hardness. Hold time when parts have thoroughly heated through. Air cooling or equivalent cooling rate. Peak strength and hardness is achieved by aging at 550 °C, stated data in this document represents this state. For lower hardness and strength choose aging temperature according to the graph below.

HEADQUARTERS

EOS GmbH
Electro Optical Systems

Robert-Stirling-Ring 1
82152 Krailling / Munich
Germany

Tel.: +49 89 893 36-0
Email: info@eos.info
URL: www.eos.info

This powder has not been developed, tested or certified as a medical device according to Directive 93/42/EEC (MDD) or Regulation (EU) 2017/745 (MDR) and is not intended to be used as a medical device, in particular for the purposes specified in Art. 2 No. 1 MDR. Insofar as you intend to use the powder as raw material for the manufacture of pharmaceutical products or medical devices (e.g. as raw material which as a material must meet the requirements of Annex 1, Chapter II MDR), the responsibility and liability for all analyses, tests, evaluations, procedures, risk assessments, conformity assessments, approval and certification procedures as well as for all other official and regulatory measures required for this purpose shall lie solely with you both with regard to the pharmaceutical product and/or medical device manufactured by you and with regard to the properties, suitability, testing, evaluation, risk assessment, other requirements for use of the powder as raw material. In this respect, the limitations of liability pursuant to our General Terms and Conditions and the system sales or material contracts shall apply.

Part properties are provided for information purposes only and EOS makes no representation or warranty, and disclaims any liability, with respect to actual part properties achieved. Part properties are dependent on a variety of influencing factors and therefore, actual part properties achieved by the user may deviate from the information stated herein. This document does not on its own represent a sufficient basis for any part design, neither does it provide any agreement or guarantee about the specific properties of a material or part or the suitability of a material or a part for a specific application.

The achievement of certain part properties as well as the assessment of the suitability of this material for a specific purpose is the sole responsibility of the user. Any information given herein is subject to change without notice.

Status as of 20.05.2024. Subject to technical modifications. EOS is certified according to ISO 9001.

EOS®, Additive Minds®, AlumiDE®, AMQ®, CarbonMide®, DirectMetal®, DMLS®, EOSAME®, EOSINT®, EOSIZE®, EOSPACE®, EOSPRINT®, EOSTATE®, EOSTYLE®, FORMIGA®, LaserProFusion®, PA 2200®, PrimeCast® and PrimePart® are registered trademarks of EOS GmbH Electro Optical Systems in some countries. For more information visit www.eos.info/trademarks.