

## forAM® 16MnCr5 20-53 GA

Low carbon case hardening steel powder for Additive Manufacturing

**forAM 16MnCr5 GA** is a nitrogen gas atomized, good flowable and spreadable spherical powder for additive manufacturing. It is a multi-purpose case hardening steel for high core strength combined with good wear resistance.

Typical applications are gears and other mechanical parts that are highly stressed and prone to wear.

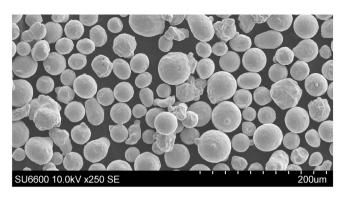
**Equivalent materials:** 

- ≫ 16MnCr5
- ≫ 1.7131
- ≫ SAE 5115
- ➢ AISI 5115

For more information on forAM product line and other of Höganäs products, please contact your local sales representative.



Chemical composition, (typical values)			
Element	Content, %		
Cr	1.0		
Mn	1.1		
Si	0.3		
С	0.16		
0	0.07		
Fe	Balance		



Typical powder properties				
Nominal particle range	20-53 µm (max 5% over and under size)	MPIF05, ASTM B214, ISO4497		
Hall Flow	14 s/50 g	MPIF03, ASTM B213, ISO4490		
Apparent Density	3.9 g/cm <sup>3</sup>	MPIF04, ASTM B212, ISO3923/1		
Tap Density	4.7 g/cm <sup>3</sup>	ASTM B527, DIN3953, ISO3953		

## **Mechanical properties**

Surface condition is machined				
Heat treatment	SR <sup>(1)</sup>	Core hardened <sup>(2)</sup>		
Printed in Z-direction – Build direction				
UTS (MPa)	990	1,090		
<b>YS</b> (MPa)	890	720		
Elongation (%)	5.2	13		
IE Notch in Y direction (J)	115			





As polished

Core

Surface Case depth

Case hardened<sup>(3)</sup>

Stress Relived - Build direction

Hardness 450-500 HV

850-900 HV

~0.65 mm

Heat treatment	SR <sup>(1)</sup>	Core hardened <sup>(2)</sup>			
Printed in X/Y-direction – Perpendicular					
IE Notch in Y direction (J)	130				
Hardness (HV10)	325				

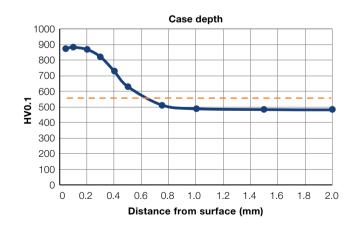
(1) Stress relieved at 250 °C in Ar for 1 h.

 (2) Austenitized at 850 °C in vacuum followed by a gas quench, Tempered at 200 °C in air.

(3) Carburized at 900 °C at 0.95% C-pot followed by oil quench, Tempered at 180 °C in air.

## Standard packaging:

20 kg (4x5 kg, 1 L PE bottles packed in cardboard box) (Other tailored particle sizes, and packaging eg. 200 kg / 500 kg Flexbag, are available under conditions)



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At Höganäs, we have designed our high-quality 3D printing metal powders for the special requirements of additive manufacturing. Manufacturers all over the globe achieve optimal results with our products and value them for the following characteristics: excellent flowability, good spherical shape, controlled oxygen and nitrogen content, full and high packing density and perfect reproducibility.