

## forAM<sup>®</sup> 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.

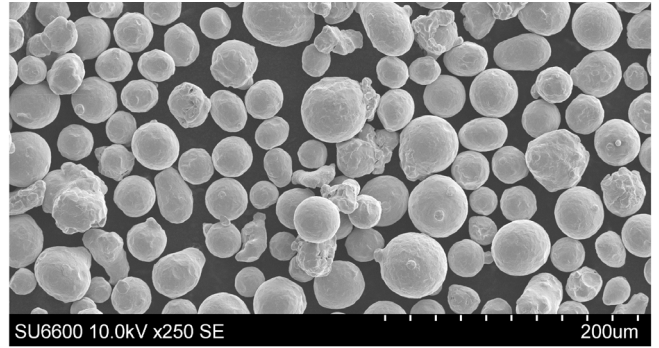
Typical applications are gears and other mechanical parts that are highly stressed and prone to wear.

### 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.

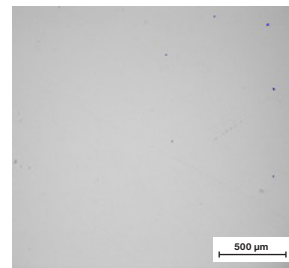
Chemical composition, (typical values)	
Element	Content, %
Cr	1.0
Mn	1.1
Si	0.3
C	0.16
O	0.07
Fe	Balance



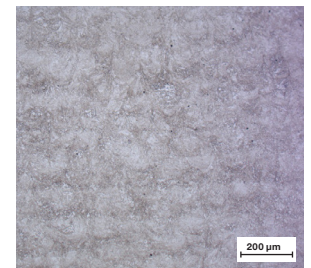
Typical powder properties		
Nominal particle range	20-53 µm (max 5% over and under size)	MPIF05, ASTM B214, ISO4497
Hall Flow	14 s/50 g	MPIF03, ASTM B213, ISO4490
Apparent Density	3.9 g/cm <sup>3</sup>	MPIF04, ASTM B212, ISO3923/1
Tap Density	4.7 g/cm <sup>3</sup>	ASTM B527, DIN3953, ISO3953

## 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
YS (MPa)	890	720
Elongation (%)	5.2	13
IE Notch in Y direction (J)	115	



As polished



Stress Relieved - Build direction

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	

Case hardened <sup>(3)</sup>	Hardness
Core	450-500 HV
Surface	850-900 HV
Case depth	~0.65 mm

- (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)

