



AM H13

Tool steel for laser powder bed fusion

General material description

AM H13 is a nitrogen gas atomized, good flowable spherical powder for additive manufacturing. It is a Cr-Mo-V alloyed hot work tool steel, which after hardening and tempering exhibits very good resistance to thermal shock and thermal fatigue. Due to excellent high temperature strength, it is fit for hot pressing tools, extrusion and casting dies. Due to high wear resistance, the alloy is also well fit for cold working tools like punches.

Equivalent materials:

- DIN 1.2344
- X40CrMoV5-1
- AISI H13

Chemical composition, % (typical values)	
Element	Content, %
Cr	5.2
Mo	1.5
V	1.0
Si	1.0
C	0.35
Mn	0.3
O	0.05
N	0.04
Fe	Balance



Typical powder properties		
Nominal particle range	20–53 µm (max 5% over- and undersize)	MPIF05, ASTM B214, ISO4497
Hall flow	13 s/50 g	MPIF03, ASTM B213, ISO4490
Apparent density	4.2 g/cc	MPIF04, ASTM B212, ISO3923/1

Typical mechanical properties			
Surface condition	As-printed ¹		Machined ²
Heat treatment	Stress Relieve ³	Heat Treated ⁴	Heat Treated ⁴
Z-direction - Build direction			
UTS (MPa)		1550	1570
YS (MPa)		1370	1390
Elongation (%)		5	3
X/Y-direction – Perpendicular			
UTS (MPa)			1580
YS (MPa)			1390
Elongation (%)			5



Non etched, as printed microstructure

Heat treatment:

Pre Heat to 850 °C, hold for 1 hour. Austenitizing at 1010–1030 °C for 1 hour, air quench.
Tempering at 540–620 °C for 1 hour then cooled to below 50 °C. Repeat 3 times.

Standard packaging:

20 kg (4x5 kg, 1 L PE bottles packed in cardboard box)

(Other tailored particle sizes and packaging are available under conditions)