

CRAFTSMAN CRIBSHEET

Powder Bed Printing for the Shop

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Powder bed printing has been around for a while but has typically been available for high end printers. The raw material is a powder which is fused together with heat or a chemical binder. In general, parts must be post processed to complete the part. Typically, loosely bound material (green-highlighted

section) will be heat-treated and washed to reach the finished condition. Metal can be printed using this method. Prints can also be hollow like FDM. Tolerances $\pm .015"$ can be achieved but dimensional change during heat treatment can make tight tolerances challenging. 

Material	Tensile Strength (psi)	Young's Modus (psi)	Percent Elongation (%)	Yield Strength	Hardness
17-4PH Sintered	170,100	22,045	7%	102,977	36 HRC
17-4PH (H900)	178,400	24,656	13%	152,289	38 HRC
316L Sintered	67,442	-	44%	24,656	57 HRB
316L Wrought	70,343	27,992	40%	24,656	95 HRB Max
Inconel 625 Sintered	110,954	-	42%	48,442	7 HRC
Inconel 625	128,000	30,022	50%	66,700	22 HRC (Annealed)
D2 Tool Steel Sintered and HT	248,594 Compressive Yield Strength	25,816	-	-	55 HRC
D2 Tool Steel HT	261,000 – 290,000 (319,083 Compressive Yield Strength)	30,458	5.1%	217,500	62 HRC

*All data presented above is for reference. Mechanical properties can vary based on raw material used, 3d printer specifications, and heat treat post processing. Presented as a general guideline to the above materials.
Items in green are for comparison to standard materials