



APP MATERIAL DATA SHEET – MIM STAINLESS STEELS*

As a leader in metal injection molding for the last 20 years, we pride ourselves on our material expertise. This guide walks you through typical material properties. Need help choosing the best option? Let our application experts take a closer look. Call us at 814-342-5895 or email us at engineer@4-app.com.

FEATURES AND APPLICATIONS

Grade	Microstructure	Alloy Features	Applications
17-4PH	Precipitation Hardening	Strength, Heat Treatable, corrosion resistance	Firearms, Medical Devices (mechanical joints, suturing jaws, wound forceps), Hand & Power Tools, Sporting Goods, Electronics, Aerospace, Automotive, Fiber Optic Connectors, and Consumer Goods.
316L	Austenitic	Superior Corrosion resistance, ductility, nonmagnetic	
420,440C	Martensitic	Hardness, wear resistance, heat treatable	
430L	Ferritic	Magnetic stainless steel with resistance to atmospheric corrosion and general oxidation	

ALLOY COMPOSITION

Element	MIM 17-4PH SS	MIM 316L	MIM 420	MIM 440	MIM 430L
C	0.07 max	.03 max	.15-.4	.9-1.25	.05 (max)
Si	1.0 max	1.0 max	1.0 max	1.0 max	1.0 max
Cr	15.5-17.5	16-18	12-14	16-18	16-18
Mo	-	2-3	-	.75 max	-
Mn	1.0 max	2.0 max	1.0 max	1.0 max	1.0 max
Fe	Bal.	Bal.	Bal.	Bal.	Bal.
Ni	3-5	10-14	-	.6 max	-
Cu	3-5	-	-	-	-
Nb	0.15-0.45	-	-	-	-

TYPICAL MATERIAL PROPERTIES

Material	Density (g/cm ³)	YS (MPa)	UTS (MPa)	Elongation (%)	Unnotched Charpy impact energy (J)	Macro Hardness	Young's modulus (GPa)
MIM 17-4 PH	7.6	740	900	6	100	27-32 HRC	190
MIM 17-4 PH (H900)	7.6	1100	1200	4	100	38-42 HRC	190
MIM 316L	7.6	180	520	40	140	67 HRB	190
MIM 420 (heat treated)	7.4	1200	1370	-	30	44 HRC	190
MIM 440 (heat treated)	7.5	1600	1250	1	4	55 HRC	190
MIM 430L	7.5	230	410	25	110	65 HRB	190

*Handbook of Metal Injection Molding , 2nd ed. 2019. D.F. Heaney, founder and CEO of Advanced Powder Products. ISBN:9780081021521