APP MEDICAL

APP MATERIAL DATA SHEET – BIOIMPLANTABLE ALLOYS*

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 for Bioimplantable Alloys. Bioimplantable Alloys are a family of Cobalt-chromium alloys commonly used for the implantation of MIM components in the medical device and orthopedic industry. 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	Hardness	Alloy Features	Applications
F-75 (ASTM F2886)	25 HRC	High strength, superior corrosion resistance, non-magnetic, biocompatibility	Prosthetic replacements (hips, knees, etc.) bone plates, screws, rods, heart valves
MP35N (ASTM F562)	8 HRC		

ALLOY COMPOSITION

Alloy	C	Mn	Si	Cr	W	V	Ni	Mo	Co	Cu	Fe
MIM F-75	0.35 Max	1.00 max	-	27-30	–	–	0.50 Max	5-7	Bal	–	0.75 Max
MIM MP35N	0.025 Max	0.15 Max	-	19-21	–	–	33-37	9-10.5	Bal	–	1.00 max

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 F-75 - Hipped	7.8	520	1000	40	-	25 HRC	190
MIM MP35N	8.3	400	900	10	-	8 HRC	-

COMPARISON OF MIM F75 AND CAST F75

Material	YS (MPa)	UTS (MPa)	Elongation (%)	Reduction in Area (%)	Macro Hardness
MIM F-75	520	1000	40	25	25 HRC
MIM F-75 Minimum(ASTM F2886)	480	825	10	10	-
Cast F-75 Typical	550	880	16	18	25-35 HRC
Cast F-75 Minimum	450	665	8	8	25-35 HRC

Donald F. Heaney, Powder Injection Molding of Implantable Grade Materials, *Proceedings of MSEC:2006 ASME International Conference on Manufacturing Science and Engineering*, October 8-11, 2006, Ypsilanti, MI, paper no. MSEC2006-21049.

John L. Johnson and **Donald F. Heaney**, Metal Injection Molding of Co-28Cr-6Mo, *Medical Device Materials III* , ASM, 2006.

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