

## APP MATERIAL DATA SHEET – MIM LOW-ALLOY 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 for MIM low-alloy steels. Low-alloy steels exhibit superior mechanical properties to plain carbon steels due to the addition of alloying elements. MIM low-carbon steels can achieve higher densities and greater mechanical properties over castings. Need help choosing the best option? Let our application experts take a closer look. Call us at [814-342-5898](tel:814-342-5898) or email us at [engineer@4-app.com](mailto:engineer@4-app.com)

### FEATURES AND APPLICATIONS

Grade	Alloy Features	Applications
2200,2700,8620,9310	Case Hardenable	Firearms, Consumer Goods, General Industrial, Wood and Metal Cutting
400 Series	General Purpose	
52100	High Wear Resistance	

### ALLOY COMPOSITION

Element	MIM 4605	MIM 4140	MIM 4340	MIM 2700 (FN08)	MIM 2200 (Fe-2Ni)	MIM 52100	MIM 8620	MIM 9310	MIM 430L
C	.4-.6	.3-.5	.3-.5	.1 max	.1 max	.8-1.2	.15-.23	.2 max	.05 (max)
Si	1.0 max	.6 max	.5 max	1.0 max	1.0 max	-	1.0 max	-	1.0 max
Cr	-	.8-1.2	.6-1.2	-	-	1.3-1.6	.4-.6	.3-.8	16-18
Mo	2-.5	.2-.3	.5 max	.5 max	.5 max	-	.15-.25	.1-.25	-
Mn	-	1.0 max	.8 max	-	-	.25-.45	.7-.9	-	1.0 max
Fe	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.	Bal.
Ni	1.5-2.5	-	1.25-2.0	6.5-8.5	1.5-2.5	-	.4-.7	2.5-3.5	-
Cu	-	-	-	-	-	.025 max	.035 max	.025 max	-
Nb	-	-	-	-	-	.025 max	.040 max	.025 max	-

### TYPICAL MATERIAL PROPERTIES

Material	Density (g/cm <sup>3</sup> )	YS (MPa)	UTS (MPa)	Elongation (%)	Unnotched Charpy impact energy (J)	Macro Hardness	Case Hardened	Young's modulus (GPa)
MIM 4605 HT	7.55	1480	1650	1	55	43-48 HRC	-	210
MIM 4140 HT	7.5	1200	1600	5	75	43-48 HRC	-	200
MIM 4340 HT	7.5	1100	1200	6	-	40-45	-	-
MIM 2700	7.6	250	400	12	175	69 HRB	50-56 HRC	190
MIM 2200	7.6	125	280	35	135	45 HRB	56-62 HRC	190
MIM 52100 HT	7.5	1100	1500	2	-	55-62 HRC	-	-
MIM 8620	7.5	130	320	25	-	100 HRB	-	-
MIM 9310	7.5	350	540	15	-	375 HV1	56-62 HRC	-

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