

MIM Material

MIM Material chemische Werte

Material Group	Alloy Name	UTS MPa	YS (o.2%) MPa	Elong. %	Hardness	Density g /cm3
Low Alloy Steels	8% Ni-Steel	413	255	26	60 HRB	7.6
	MIM 4605 as sintered	689	482	15	90 HRB	7.5
	MIM 4605 heat treated	1653	1446	4	48 HRC	7.5
Austentic Stainless Steel	AISI 316L	482	172	30	65 HRB	7.7
	AISI 304L					7.7
Ferritic SS Stainless Steel	AISI 430	413	241	30	65 HRB	7.5
Martensitic Stainless Steel	AISI 420	1033	1653	8	50 HRC	7.3
	AISI 420 (Premium)	1929			52 HRC	7.6
	AISI 440C (Premium)	1584			59 HRC	7.5
Precipitation Hardening Stainless Steel	17-4 as sintered	827	640	12	25 HRC	7.6
	17-4 PH H900	1240	1102	7	36 HRC	7.6
Duplex Structure Stainless Steel	ASTM A276 (2205)	620	516	27	93 HRB	7.5
Soft Magnetic Materials	Fe-Si	427	262	20	68 HRB	7.5
	Alloy 50	448	158	33	58 HRB	7.7
Copper Based	Cu 100%					8.3
Titanium	Ti-6Al-4V (ANNEALED)	744	716	10		4.2
	Ti-6Al-4V (AGED)	923	827	4		4.2
High Speed Steel	M2	1200	800		65 HRC	7.9
Tungsten Heavy Alloy	WHA				320Hv1	17.8

Material Eigenschaften

Material Group	Alloy Name	C wt%	Cr wt%	Ni wt%	Mo wt%	Cu wt%	Si wt%	Fe wt%	Other wt%
Low Alloy	8% Ni-Steel	0.6 max*		6.5-8.5	0.5 max			balance	
Steels	MIM 46 XX*	0.6 max*		1.5-2.5	0.5 max			balance	
Austenitic	AISI 316L	0.03 max	16-18	10-14	2-3			balance	P 0.045 max, S 0.03 max
Stainless Steel	AISI 304L	0.03 max	18-20	8-12				balance	P 0.045 max, S 0.03 max
Ferritic SS	AISI 430	0-12 max	16-18	30				balance	P 0.04 max, S 0.03 max
Stainless Steel									
Martensitic	AISI 420	0.15 min	12-14					balance	P 0.04 max, S 0.03 max
Stainless Steel	AISI 440C	0.95-1.20	16-18					balance	P 0.04 max, S 0.03 max
Precipitation Hardening	17-4 PH	0.07 max	15.5-17.5	3-5				balance	P 0.04 max, S 0.03 max
Stainless Steel									
Duplex Structure	ASTM A276 (2205)	0.03 max	21-23	4.5-6.5	2.5-3.5			balance	P 0.03 max, S 0.02 max
Stainless Steel									
Soft Magnetic	Fe-Si	0.1 max					2-3	balance	
Materials	Alloy 50	0.1 max		50 nom				balance	
Copper Based	Cu 100%								8.3
Titanium	Ti-6Al-4V (99 nom			6% Al, 4% V, Balance Ti
High Speed Steel	M2	0.8-1.1	3.5-4.5		4.5-5.5			balance	6% W, 2% V
Tungsten Heavy Alloy	WHA			2.5-3.5				0.5-1	W balance

Low Alloy and Alloy Steels	<ul style="list-style-type: none"> • 2% Nickel-Iron (MIM2200) • 7% Nickel-Iron (MIM2700) • 4130 (Cr-Mo steel) • 4340 (Ni-Cr-Mo steel) 	Possess good strength, fatigue resistance, and high surface hardness.
Austenitic Stainless Steels	<ul style="list-style-type: none"> • Type 304L • Type 316L 	Possess excellent cryogenic properties, superior corrosion resistance, and good high-temperature strength.
Ferritic Stainless Steels	<ul style="list-style-type: none"> • Type 430L 	Possess good corrosion, heat resistance, good machinability and magnetic properties.
Martensitic Stainless Steels	<ul style="list-style-type: none"> • Type 420 • Type 440C • 440-XH® Alloy* 	Designed to provide stainless properties with excellent hardness, strength and wear resistance.
Precipitation Hardening Stainless Steels	<ul style="list-style-type: none"> • 15-5 PH • Custom 630 (17-4 PH) 	High strength, toughness and hardness, with excellent corrosion resistance.
Soft Magnetic Materials	<ul style="list-style-type: none"> • 2% Nickel-Iron • 50% Nickel-Iron • 80% Nickel-Iron • Nickel-Zinc Ferrite • 3% Silicon-Iron 	High permeability, low loss magnetic alloys.

Controlled Expansion and Sealing Materials	<ul style="list-style-type: none"> • Carpenter Invar "36"® Alloy* • Carpenter Low Expansion "42"® Alloy* • Carpenter High Permeability "49"® Alloy* • Carpenter HyMu "80"® Alloy* • Kovar® Alloy (F-15 Alloy)* • 50% Nickel-Copper 	Uniform and low thermal expansion alloys.
Tool Steels	<ul style="list-style-type: none"> • Micro-Melt® M2 Alloy* • Micro-Melt® M4 Alloy* 	High hardness and wear resistance, often accompanied by high toughness and resistance to softening at elevated temperature.
Medical Alloys	<ul style="list-style-type: none"> • BioDur® CCM Plus® Alloy* • BioDur® Carpenter CCM® Alloy* 	Non-magnetic, cobalt-chromium-molybdenum alloys exhibiting high strength, corrosion resistance and wear resistance.
Heat-Resistant Alloys	<ul style="list-style-type: none"> • Type 310C • HK30 (Nb) • Pyromet® 718* 	Developed for high temperature and oxidation resistance and where relatively high stresses (tensile, thermal, vibratory, or shock) are encountered.
Titanium	<ul style="list-style-type: none"> • CP Titanium • Ti-6Al-4V 	Lightweight, high-strength, corrosion-resistant material.

<p>Ceramics</p>	<ul style="list-style-type: none"> • Aluminum Oxide (Alumina) • Zirconium Oxide (Zirconia) • Zirconium Oxide stabilized with MgO, CaO, or Y2O3 • Ruby (98% Alumina, 2% CrO) • Zirconia Toughened Alumina • Alumina Toughened Zirconia 	<p>Developed for high hardness and wear resistance.</p>
<p>Cermets</p>	<ul style="list-style-type: none"> • Titanium Carbonitride T10N • Titanium Carbonitride T15N 	<p>High resistance to wear, corrosion and oxidation.</p>