MEETU-RAJ
INDUSTRIES

An ISO 9001:2008 Certified Company

METAL INJECTION MOLDING

About us

MeetuRaj group established in 1976, have built up Good Reputation dealing in all feild of sewing machinery, Plating chemicals and many more. Associate with best reputed organization.As concern to plating chemicals we are serving wide range of products to Electroplating industries Viz. Gold, Silver ,Nickel etc. for last decade. It is a family constituting Proprietorship.

The Founder Mr. Narendra Joshi with his brothers and his two sons Mr. Mitesh Joshi & Mr. Deepesh Joshi, highly Energetic,young Self reliant rich in technical/commercial knowledge moving with the spirit behind this enterprise now it have entered in manufacturing.

With Mr. Deepesh Joshi proprietor of the firm handing very passionate way with his quite and discovering all process having graduation production engineering background from mumbai and the post graduation in robotics engineering and keeping firm for decade in development and profitable ideas.

Being an manufacturing unit we are ever ready to serve our reliable customer the best and assure you our prompt services all the time.

MeetuRaj Industries wishes to forward integrate by manufacturing metal. Components using MIM Technologies and best process where today engineering world wide accepted and awarded green technology.

Certification

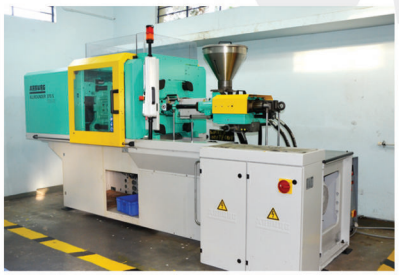
ISO/TS 9001:2008 is the required QMS standard for the respected industries supplier base. Any industries supplier who supplies a component or system that ends up in an industries must be certified, along with any industries supplier.

Using the Plan - Do - Check - Act (PDCA) approach, ISO 9001 provides Meeturaj industries with the management tools to improve our business performance, such as defining policy and objectives, monitoring and measuring processes and product characteristics, specifying corrective and preventive actions and encouraging continuous improvement.




MIM Process Overview

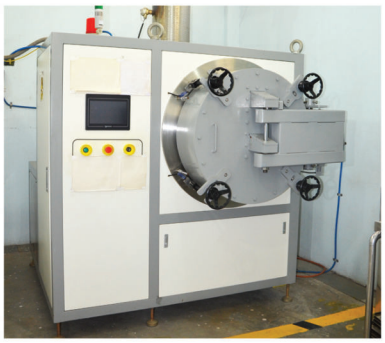
Molding



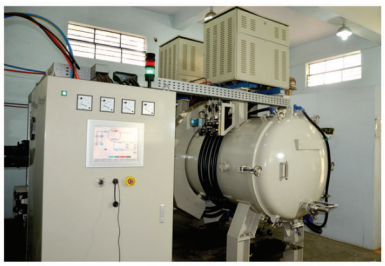
Injection molding is identical in equipment and technique to how plastic injection molding takes place. The pelletized feedstock is fed into a machine where it is heated and injected into a mold cavity under high pressure. The part (now termed green) is allowed to cool and then ejected form the mold so the process can repeat. Since only the binders melt (to carry the metal powders), the entire process happens at about 200° C. The tooling can be of multiple cavities for high production rates. The mold cavity is sized approximately 20% larger to compensate for shrinkage that takes place during sintering. The shrinkage change is precisely known for each material.

Sintering

De-binding is a process where the binder materials are removed from the molded component. This process is usually done in several steps whereby the majority is removed before the sintering step, leaving behind only enough binder to handle the parts into the sintering furnace. De-binding can be accomplished by multiple methods, the most popular being solvent extraction. After de-binding the part is now semi-pourous which allows the remaining binder to easily escape during sintering.



De-Binding



The debound parts are placed on ceramic setters which are loaded into a high temperature, atmosphere controlled furnace. The parts are slowly heated in a protective atmosphere to drive out the remaining binders. Once the binders are evaporated, the part is heated to high temperature where the void space between the particles is eliminated as the particles fuse together. The part shrinks isotropically to its design dimensions and transforms into a dense solid. The sintered density is typically greater than 97% of theoretical for most materials. The high sintered density gives the product properties that are similar to wrought materials.

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Why MIM is the Best Solution

Cost Effective Design Flexibility

- Allows the freedom to manufacture complicated shapes that would be considered cost prohibitive by other methods.
- Provides for the manufacture of micro-sized parts in high volumes.
- Capable of producing features that cannot be achieved by investment casting such as small holes, thin walls and fine surface detail.
- Achieves net shape features such as internal and external threads, profiled holes and finely detailed surface textures, knurling, engravings and markings.
- Production scalability that allows from thousands to millions of parts, quickly and efficiently.
- Material Variety and Integrity
- Superior strength, magnetic, and corrosion properties due to high density achieved when compared to conventional powdered metal, plastics and die-casting.
- Net shape components from otherwise hard to process materials like Superalloys, Tungsten alloys and Titanium.
- Isotropic and homogeneous microstructure for uniform material properties.
- Capability to create alloys that are not available in wrought or cast form.
- Ability to make engineered density materials for weight critical applications.

Advantages of Metal Injection Molding

- Ability to Produce small, higly complex shapes in high voluems
- A wide varitey of alloys with Proprtties similer to wrought metal
- Net shape feature with find detail and good tolerance control
- Nearly unlimited shape capability in hard to process material
- Achive complexity that is cost prohibitive by any other route

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Material Catalogue

Low Alloy Steel							
Material Grade	**Alloy Composition (wt %)**	**Condition**	**UTS**	**Yield Strength**	**Elongation**	**Hardness**	**Density**
FN 02	C - ≤ 0.1% Ni – 1.9-2.2% Fe – Balance	**Sintered**	260 MPA	150MPA	25%	90-110 HV 10	7.5g/Cm3
		Heat Treated					
FN 0205	C – 0.4-0.6 % Ni – 1.9-2.2% Fe - Balance	**Sintered**	380 MPA	170MPA	3%	100-150 HV 10	7.5g/Cm3
		Heat Treated	800 MPA	700 MPA	5%	300 HV 10	
			1200 MPA	1000 MPA	2%	600 HV 10	
4605	C – 0.4-0.6% Ni – 1.5-2.5% Mo – 0.2-0.5% Si - ≤ 1.00% Fe – Balance	**Sintered**	600 MPA	400MPA	75%	150 HV 10	7.5g/Cm3
		Heat Treated	1300 MPA	1100 MPA	5%	390 HV 10	
			1100 MPA	1500 MPA	2%	600 HV 10	
Fn 08	C - < 0.1% (0.4-0.6) Ni – 7.5 - 8.5 % Fe – Balance	**Sintered**	380 MPA	210MPA	15%	90-140 HV 10	7.5g/Cm3
		Heat Treated	1250 MPA	1100 MPA	3%	600 HV 10	
8620	C – 0.12-0.23 % CR – 0.4-0.6% MO – 0.15-0.25 % Ni – 0.4 - 0.7 % Fe – Balance	**Sintered**	650 MPA	400MPA	3%	190-230 HV 10	7.4g/Cm3
		Heat Treated				650-800 HV10	7.4g/Cm3
42 cr Mo4	C – 0.35-0.45 % Cr – 0.9-1.2 Mo – 0.15-0.13 Fe – Balance	**Sintered**	650 MPA	400MPA	3%	130-230 HV 10	7.4g/Cm3
		Heat Treated	1450MPA	1250MPA	2%	450 HV10	
100 Cr 6	C – 0.8-1.05 % Cr – 0.9-1.2 Mo – 0.15-0.13 Fe – Balance	**Sintered**	900 MPA	500MPA	5%	230-290 HV 10	7.4g/Cm3
		Heat Treated				700 HV10	
1010	C - ≤ 0.15% Mo – 0.3-0.66 SI - ≤ 0.4 P - ≤ 0.045 S - ≤ 0.045 Fe – Balance	**Sintered**	400 MPA	230MPA	26%	690 HV 10 740 HV 10	7.5g/Cm3
		Heat Treated					
8740	C – 0.45-0.55% Ni – 0.5-0.8 % Cr – 0.4-0.6 % Mo – 0.25-0.40% Fe – Balance	**Sintered**	530 MPA	860MPA	8%	190-210 HV 10	7.5g/Cm3
		Heat Treated	1400 MPA	1600MPA	5%	510 HV 10	7.5g/Cm3

Soft Alloy Steel							
Fe Si 3	C – ≤ 0.1% Si – 2.5-3.0 % Fe – Balance	**Sintered**	300 MPA	400MPA	20%	120-160 HV 10	7.5g/Cm3
		Heat Treated					

±- Variation in value would be remain in considerable limit.

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Material Catalogue

Stainless and Heat Resistant Steel							
316 L	C – < 0.03 % Cr – 16-18 % Ni – 10-14 % Mn – <2 % Mo – 2-.3% Si - < 1.00% Fe – Balance	Sintered	180 MPA	510MPA	50%	120 HV 10	7.9g/Cm3
		Heat Treated					
P.A.N.A.C .E.A	C - < 0.2% N - 0.75-0.90 Cr – 16.5-17.5 % Ni - < 0.01 Mo – 0.35% Mn – 10-12% Si - < 1% Fe – Balance	Sintered	690 MPA	1090 MPA	35%	270-300 HV 10	7.5g/Cm3
		Heat Treated					
17 4 ph	C – < 0.07 % Cr – 15-17.5 % Ni – 3.5 % Cu – 3.5 % Si - < 1.00% Nb – 0.15- 0.45 % Fe – Balance	Sintered	720 MPA	950 MPA	6%	320 HV 10	7.6g/Cm3
		Heat Treated					
420 W	C – 0.35-0.5 % Cr – 12-14 % Ni – 0.07-0.10% Mo – < 0.65% Si - < 1.00% Nb – 1.0-2.0 Fe – Balance	Sintered	650 MPA	800 MPA	1%	600HV 10	7.6g/Cm3
		Heat Treated					
310 N	C - 0.2% max Ni – 0.25% max Cr – 16.5-17.5% Mo – 3.0-3.5% Mn – 10-12% SI – 1% max Fe – Balance	Sintered	790 MPA	450MPA	20%	50-60 HV 10	7.7g/Cm3
		Heat Treated					

Tool Steel							
M 2	C – 0.8-1.1% Cr – 3.5-4.5% Mo – 4.5-5.5% w-5.5-6.5% v – 1.5-2.2% Fe – Balance	Sintered	700 MPA	400MPA	1%	55-63 HV 10	7.9g/Cm3
		Heat Treated	900 MPA	700MPA	1%	60-65 HV 10	7.9g/Cm3
S7	C – 0.45-0.7% Cr – 2.5-3.5% Mo – 1.0-1.8% Ni – 0.30 % Max Fe – Balance	Sintered	1750 MPA	1530 MPA	2%	46-53 HRC	7.3g/Cm3
		Heat Treated					

±- Variation in value would be remain in considerable limit.

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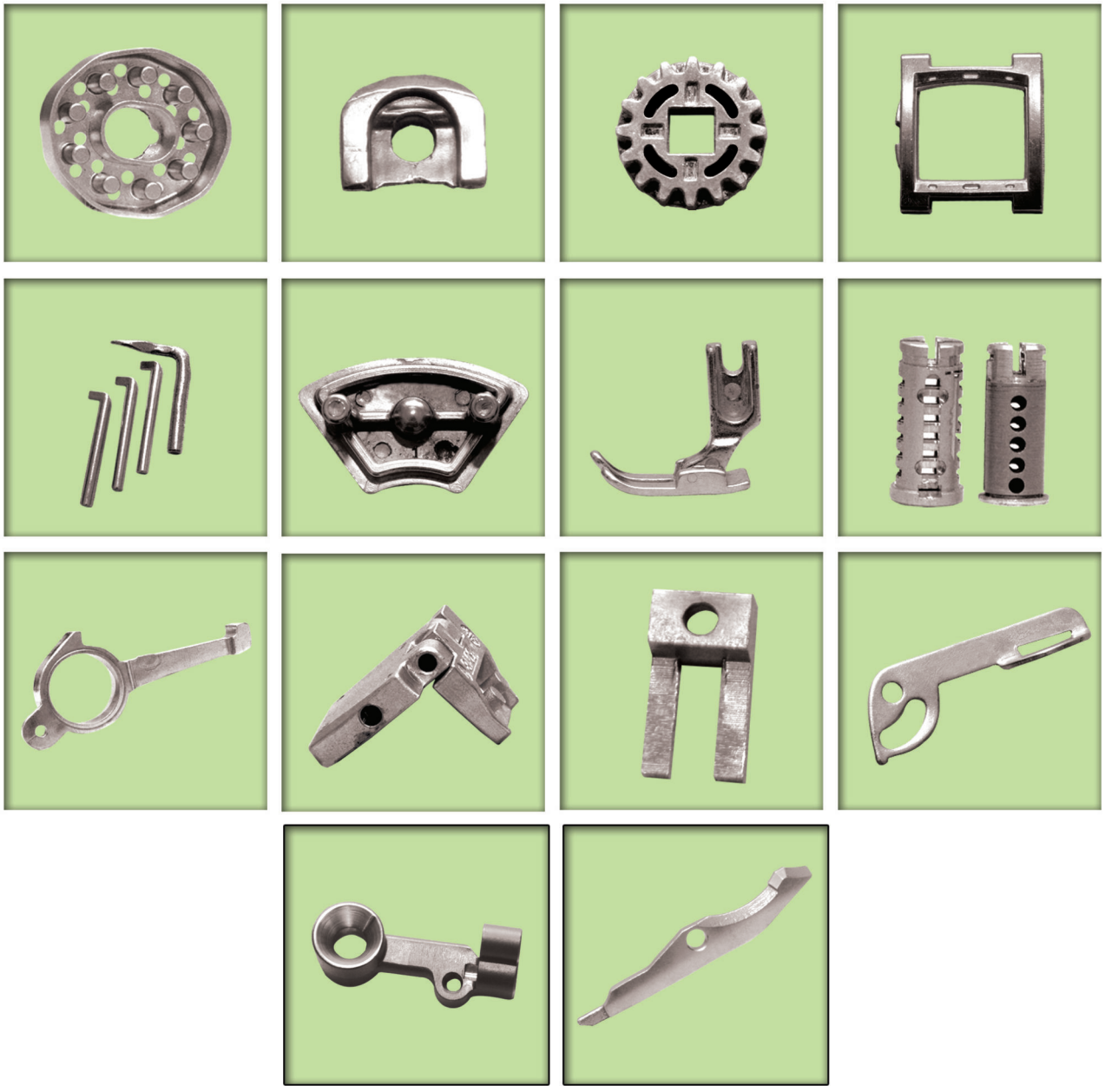
Suitable Industries for MIM

Medical and orthodontic applications | Defence applications | Automotive components

IT, electronics and telecommunication | Domestic appliance | Aerospace industry | Power tools

Watch cases (steel) | Mobile parts | Electrical connectors | Textile parts

Our Achievement in MIM



Contact us

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