



MIM COMPONENTS FOR THE SPORTS EQUIPMENT



EXPLORING MIM OPPORTUNITY IN GOLF EQUIPMENTS



GOLF WEDGE

MIM Material : **MIM17-4PH**

Part Weight : **290 grams**

Heat Treated condition : **H900**

Swinging weight ratio : **D4**

Hardness : **35 – 40 HRC**

Secondary process : **CNC Milling,
Tweaking, Buffing, Special Process
Finishing, Laser Engraving,
Red & Black Painting**

EXPLORING MIM OPPORTUNITY IN GOLF EQUIPMENTS



SINTERED PART

TURNED PART

FINISHED PART

TUNGSTEN WEIGHT SCREW

MIM Material : **MIM W-Ni Alloy**

Part Weight : **14 grams**

Heat Treated condition : **Solutionsing**
(To achieve Torque 100 in - lbs)

Secondary process : **CNC turning,**
Solutionsing, Buffing, Painting,
Laser Marking

EXPLORING MIM OPPORTUNITY IN GOLF EQUIPMENTS



GOLF CLUB PLATE

MIM Material : **MIM316**

Part Weight : **50 grams**

Hardness : **100 HRB Max**

Secondary process : **Mirror Polishing,
PVD Coating**

MIM MATERIAL DETAILS FOR GOLF APPLICATIONS



MATERIAL	CONDITION	UTS(MPa)	YS(MPa)	DENSITY(g/cm ³)	HARDNESS
SS 17-4PH	Sintered	900	730	7.50	35 HRC max
	Heat Treated(H900)	1220	1100	7.50	35 - 40 HRC
SS 316	Sintered	732	447	7.65	100 HRB max
SS 316L	Sintered	480	160	7.65	100 HRB max
SS 304	Sintered	450	160	7.55	100 HRB max
Titanium Grade 2	Sintered	420	360	4.30	100 HRB max
Titanium Grade 5	Sintered	780	680	4.20	30 HRC max
Tungsten Heavy Alloys	Sintered	-	-	17.50	-

UTS - Ultimate Tensile Strength (MPa)

YS - Yield Strength (MPa)

EXPLORING INVESTMENT CASTING OPPORTUNITY IN GOLF EQUIPMENTS



GOLF HEAD

Part Material : **17-4PH**

Part Weight : **265 grams**

Heat Treated condition : **H900**

Lie Angle : **60°**

Loft Angle : **27°**

Hardness : **35 – 40 HRC**

Secondary process : **Mirror Polish**

CASE STUDIES – SPORTS EQUIPMENT



CASE STUDY – BELAY DEVICE



APPLICATION – ROCK CLIMBING



- Near-net shape achieved in the tool itself with all the complex profile features, eliminating all the secondary machining operations.

SOLUTION

PRODUCT DESCRIPTION

- Material :- MIM 17-4PH
- Weight :- 15 grams
- Segment :- Consumer
- Annual Required :- 30K



**MPIF AWARD
WINNER – 2018**

- Complex profile with features like curved profile , undercut and inclined geometry is difficult for conventional machining.

CUSTOMER PAIN POINTS

CASE STUDY – SPORTS CROSSBOW



APPLICATION – SPORTS CROSSBOW



This component used in trigger mechanism assembly of Professional/Sports Crossbow

- Near-net shape achieved in the tool itself
- Material wastage minimized
- Volumes achieved through multi cavity tool

SOLUTION

PRODUCT DESCRIPTION

- Material :- MIM 4605
- Weight :- 5 grams
- Segment :- Consumer
- Annual Required :- 40K



- Complicated profile
- More Material wastage
- High annual requirement

CUSTOMER PAIN POINTS

CASE STUDY – ASCENDER/DESCENDER



APPLICATION – ROCK CLIMBING



- Near-net shape achieved in the tool itself eliminating all the secondary machining operations.
- Surface finish achieved of 0.8um

SOLUTION

PRODUCT DESCRIPTION

- Material :- MIM 4340
- Weight :- 10 grams
- Segment :- Consumer
- Annual Required :- 80K



- Unable to meet repeatability in achieving sharpness of front face teeth.
- Post machining operation after investment casting is difficult.

CUSTOMER PAIN POINTS

CASE STUDY – SKI BINDING



APPLICATION – SNOW BOARDING



- Near-net shape achieved in the tool itself eliminating all the secondary machining operations.
- Surface finish achieved of 0.6um

SOLUTION

PRODUCT DESCRIPTION

- Material :- MIM 4600
- Weight :- 10 grams
- Segment :- Consumer
- Annual Required :- 80K



- Accumulation of burrs at sharp corner due to post machining after investment casting.
- Difficult to achieve repeatability in Pin Point location with reference to base.

CUSTOMER PAIN POINTS

CASE STUDY – BICYCLE GEAR ASSEMBLY



APPLICATION – BICYCLE GEAR ASSEMBLY



- Implemented robot handling
- Salt Bath nitriding done to increase the surface hardness

SOLUTION

PRODUCT DESCRIPTION

- Material :- MIM 17-4PH
- Weight :- 1.2 grams
- Segment :- Consumer
- Annual Required :- 80K



- Handling and manufacturing
- Continuous wear and tear during gear transmission

CUSTOMER PAIN POINTS

MORE THAN 3000 HEARTS – ONE BEAT

Creating Value :

In-depth technical competence

International presence

Application and Industry Expertise

Long-term Relationships

THANK YOU

www.indo-mim.com

 [/company/indo-mim-pvt-ltd](https://company/indo-mim-pvt-ltd)

 [/indomim](https://indomim)

 infohq@indo-mim.com

 infous@indo-mim.com  infoeu@indo-mim.com  infocn@indo-mim.com  japan@indomim-sales.com