Shenzhen Kadam Technology Co., Ltd.

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Kadam® Datasheet for MIM 1010

Product Description

The carbonyl iron powder is based on the nitric acid catalytic debinding system and can be used directly for injection molding material granules to produce 1010 low-alloy steel sintering parts.

Product Standard

Item	Unit	Specification	Test method
Melt flow index (MFI)	g/10min	1000±500	ISO1133
Green part density	g/cm^3	4.92±0.03	ISO3369
Sintering density	g/cm^3	>7.5	ISO3369

Powder Composition (wt%)

C	Mn	Si	Fe
≤0.15	0.3~0.6	≤0.4	Bal.

Standard Processing

Standard injection molding machine for thermoplastic resins, based on the nitric acid catalytic debinding system.

Typical Characteristics After Sintering

Ultimate tensile strength	≥385MPa
Yield strength	≥210MPa
Typical sintering hardness	120~180HV0.2
Elongation	≥25%
Over size factor (OSF) *	1.216±0.003 (Sintering density 7.58-1280℃)

*The hardness of heat treatment and over size factor (OSF) are related to customer process conditions (Especially the sintering temperature) for reference only.

Injection Molding

Injection temperature	Zone 1	Zone 2	Zone 3	Nozzle
	180℃	185℃	190℃	195℃
Mold temperature	90 ~ 125 ℃			
Screw speed	50 r/min			
Injection speed	10 cm^3/s			
Molding pressure	900 bar			
Holding pressure	900 bar			
Holding time	0.1~3 s			

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*As reference for forming conditions, due to differences in molding machine and mold, molding conditions should be adjusted, be sure to ensure the actual temperature is not higher than 200℃, otherwise it will greatly reduce the service life of the raw materials and cause irreversible damage to the material.

Debinding

Recommend the use of the concentration of 98% HNO_3 smoke, 2 stage catalytic debinding temperature 110~145℃ and 160~190℃, the debinding process is finished when a minimal debinding loss of 9.3% is reached. Need to pay attention on the oxygen content in furnace cannot be over 4.5% (volume fraction) in debinding process, it will cause an explosion if exceed; however embryo easily absorbs the moisture in the air after debinding, therefore, it is not recommendable to see whether the debinding craft is finished by identifying its debinding rate, in addition, it is better in mezzanine without POM in the product.

Sintering

A typical sintering cycle is: room temperature to 5℃ per minutes up to 600 ℃, hold for 60 minutes, with 5℃ per minute up to 1280℃ (The characteristics of the sintering furnace are different, the maximum temperature is for reference only. The specific temperature is based on the test result), hold for 180 minutes, and then with the furnace cooling. (Follow the sintering curve)