

# Proto-pasta

Technical Data Sheet Rev. 1

## Magnetic Iron PLA

Proto-pasta Rustable Magnetic Iron Metal PLA Composite is actually ferromagnetic. It responds to magnets and behaves similarly to pure iron! Encapsulated in plastic, the iron maintains a stable matte, cast metal finish as printed, but can be rusted when desired.

- Weighted feel with 1.5x the density of standard PLA
- Rustable to create modern artifacts in a few easy steps
- Attracts magnets (neodymium type recommended for strongest attraction)
- Induction at magnetic saturation about 0.15 Tesla
- Relative (to air) Permeability - between 5 and 8 independent of frequency up to 1 MHz
- Permeability - between 62E-7 and 100E-7 H/m independent of frequency up to 1 MHz

Magnetic Iron PLA is slightly more brittle than standard PLA and requires extra care when handling.

Magnetic Iron filament is more abrasive than standard PLA and may require nozzle replacements and 1st layer adjustments. (try a wear-resistant and/or larger diameter nozzle for increased service intervals)

## Material Properties

Properties	Value/Description
Base material	PLA
Characteristics	low odor, non-toxic, renewably sourced
Molecular structure	Amorphous
Additives	Metal Powder
Max particle size	250 microns
Density	approx. 1.85 g/cc
Length	approx. 224 m/kg (1.75 mm) & 84 m/kg (2.85 mm)
Min bend diameter	35 mm (1.75 mm) & 55 mm (2.85 mm)
Glass transition (Tg) onset	N/A
Melt point (Tm) onset	approx. 155 deg C (310 deg F)
Max use	N/A

*Use limit is geometry, load & condition dependent*

## Print Settings

(Based on Ultimaker s5 .15mm Profile)

Setting	Value
Nozzle Temperature [°C]	192
Heated Bed Temperature [°C]	60
Print Speed [mm/s]	20-30
Flow Rate/Extrusion Multiplier [%]	100
Extrusion Width [mm]	.65 (.05mm larger than nozzle size)
Volume Flow Rate [mm³/s]	2-3

*Results may vary based on print settings as well as print quality*

For a more in-depth look at magnetic iron PLA please view [proto-pasta.com/iron](http://proto-pasta.com/iron)