

## ICE FILAMENTS ICE-METAL Bronze PRODUCT CARD

ICE Filaments ICE-Metal Bronze is our 80% bronze filled filament which is easy to print, sand & polish. With ICE-Metal Bronze, you can create the most beautiful objects with real metal characteristics, such as a 3x higher weight than PLA, a metal feel & touch and thermo-conductivity. Due to the high percentage of fillers, ICE-Metal Bronze has virtually no shrinkage. A special lubricant increases the flow and prevents ICE-Metal to adhere to the nozzle. Finally all above combined with the correct hardness results in a filament that can be printed on almost every type of FDM 3D printer available on the market with retraction enabled on nozzles  $\geq 0.35\text{mm}$ .

### FEATURES:

- ∞ Approx. 80% bronze content
- ∞ PLA-based, 3 times heavier
- ∞ Metal feel & “cold” touch
- ∞ Quick & easy polishing & post-processing
- ∞ Possibility to print with retraction
- ∞ Works on nozzles  $\geq 0.35\text{mm}$



Printed

Sanded & Polished

Patinated

### COLOURS:

ICE Filaments ICE-Metal Bronze is available from its natural bronze color.



FILAMENT SPECS		
Size	Ø tolerance	Roundness
1.75mm	$\pm 0,05\text{mm}$	$\geq 95\%$
2.85mm	$\pm 0,10\text{mm}$	$\geq 95\%$

MATERIAL PROPERTIES		
Description	Testmethod	Typical value
Specific Gravity	ISO 1183	3,39 g/cc
MFR 190°C/2,16kg	-	n.a.
Tensile strength at yield	ISO 527	18,3 Mpa
Strain at break	ISO 527	8,0%
Tensile Modulus	ISO 527	3990 Mpa
Impact strength – Izod Method 23°C	ISO 180/A	11,3 kJ/m <sup>2</sup>
Printing temperature	ICE FILAMENTS	195 – 220°C
Melting temperature	ISO 294	195°C $\pm$ 10°C
Vicat softening temp	ISO 306	65°C

### ADDITIONAL INFO:

ICE-Metal Bronze can be printed without a heated bed, but if you do have a heated bed the recommended temperature is  $\pm 35 - 60^\circ\text{C}$ .

Storage: cool and dry (15 – 25°C) and away from UV light. This enhances the shelf life significantly.

ICE-Metal Bronze can be used on all common desktop FDM or FFF technology 3D printers.

\* Please consider the use of a hardened steel nozzle when printing with ICE-Metal Bronze. The bronze powder inside makes the filament abrasive and will result in fast wear or regular brass nozzles.

\* Please have a look at the printing, post-processing & other info document for further tips & tricks.

## ICE FILAMENTS ICE-METAL Copper PRODUCT CARD

ICE Filaments ICE-Metal Copper is our 80% Copper filled filament which is easy to print, sand & polish. With ICE-Metal Copper, you can create the most beautiful objects with real metal characteristics, such as a 3x higher weight than PLA, a metal feel & touch and thermo-conductivity. Due to the high percentage of fillers, ICE-Metal Copper has virtually no shrinkage. A special lubricant increases the flow and prevents ICE-Metal to adhere to the nozzle. Finally all above combined with the correct hardness results in a filament that can be printed on almost every type of FDM 3D printer available on the market with retraction enabled on nozzles  $\geq 0.35\text{mm}$ .

### FEATURES:

- ∞ Approx. 80% Copper content
- ∞ PLA-based, 3 times heavier
- ∞ Metal feel & “cold” touch
- ∞ Quick & easy polishing & post-processing
- ∞ Possibility to print with retraction
- ∞ Works on nozzles  $\geq 0.35\text{mm}$



Printed      Sanded & Polished      Patinated

### COLOURS:

ICE Filaments ICE-Metal Copper is available from its natural copper color.

mtc

FILAMENT SPECS		
Size	Ø tolerance	Roundness
1.75mm	$\pm 0,05\text{mm}$	$\geq 95\%$
2.85mm	$\pm 0,10\text{mm}$	$\geq 95\%$

MATERIAL PROPERTIES		
Description	Testmethod	Typical value
Specific Gravity	ISO 1183	3,41 g/cc
MFR 190°C/2,16kg	-	n.a.
Tensile strength at yield	ISO 527	18,3 Mpa
Strain at break	ISO 527	4,5%
Tensile Modulus	ISO 527	4210 Mpa
Impact strength – Izod Method 23°C	ISO 180/A	9,3 kJ/m <sup>2</sup>
Printing temperature	ICE FILAMENTS	195 – 220°C
Melting temperature	ISO 294	195°C $\pm$ 10°C
Vicat softening temp	ISO 306	65°C

### ADDITIONAL INFO:

ICE-Metal Copper can be printed without a heated bed, but if you do have a heated bed the recommended temperature is  $\pm 35 - 60^\circ\text{C}$ .

Storage: cool and dry (15 – 25°C) and away from UV light. This enhances the shelf life significantly.

ICE-Metal Copper can be used on all common desktop FDM or FFF technology 3D printers.

\* Please consider the use of a hardened steel nozzle when printing with ICE-Metal Copper. The copper powder inside makes the filament abrasive and will result in fast wear or regular brass nozzles.

\* Please have a look at the printing, post-processing & other info document for further tips & tricks.