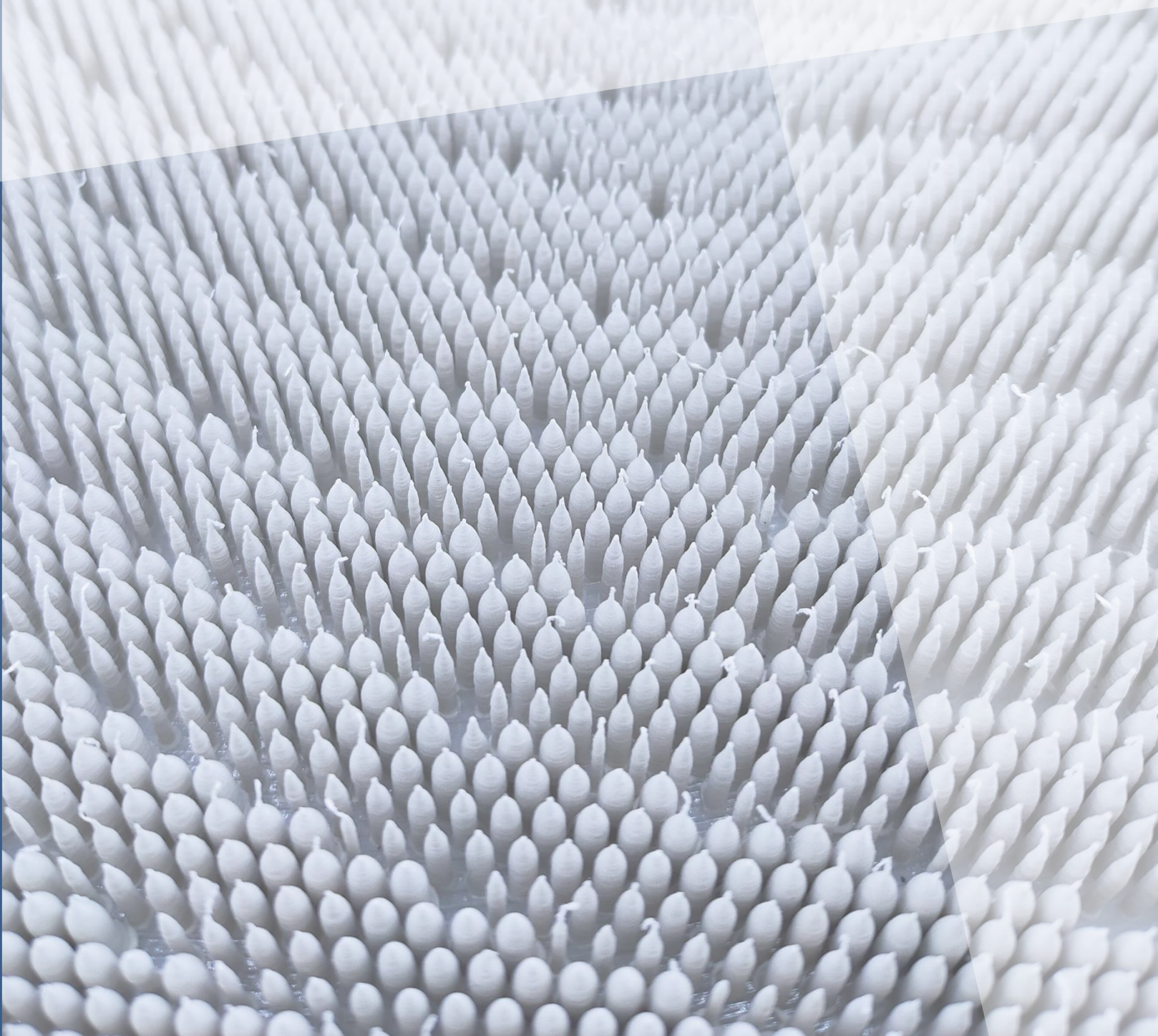


# ***zetamix $\epsilon$***

***High permittivity materials for  
3D printing***



## Zetamix Epsilon Filaments



### PRODUCT DESCRIPTION

Zetamix Epsilon filaments are used for 3D printing.  
Diameter available: 1.75 mm and 2.85 mm

### IDENTIFICATION

Trade name	Zetamix Epsilon $\epsilon = 2.2$	Zetamix Epsilon $\epsilon = 4.5$	Zetamix Epsilon $\epsilon = 7.5$
Chemical name of raw material	Polyoleofine	Polyoleofine	Polyoleofine
Binding proportion (vol) %	100	70	60
Binding proportion (mass) %	100	35	26
TiO <sub>2</sub> proportion (vol) %	0	30	40
TiO <sub>2</sub> proportion (mass) %	0	65	74

## TYPICAL PROPERTIES OF THE FILAMENT

	$\epsilon = 2.2$	$\epsilon = 4.5$	$\epsilon = 7.5$
Mass fluidity index [g/10 min]	16	16	16
Volumetric fluidity index [cm <sup>3</sup> /10 min]	5	5	<u>5</u>
Moisture Absorption 24 hours [%]	<0.1%	<0.1%	<0.1%
Moisture Absorption , 7 days [%]	<0.3%	<0.3%	<0.3%
Shor D	56	56	56

## PROPERTIES

Zetamix	$\epsilon = 2.2$	$\epsilon = 4.5$	$\epsilon = 7.5$
<b>Dielectric properties</b>			
Dielectric constant *	2.2 ( $\pm 0.2$ )	4 ( $\pm 0.5$ )	7.5 ( $\pm 0.5$ )
Loss tangent	$< 1.10^{-3}$ ( $\pm 5.10^{-4}$ )	$\approx 1.10^{-3}$ ( $\pm 5.10^{-4}$ )	$\approx 1.10^{-3}$ ( $\pm 5.10^{-4}$ )
<b>Physical properties</b>			
Specific gravity	1.00	2.00	2.30
Water absorption, max.	<0.3%	<0.3%	<0.3%

\* Dielectric constant between 1 and 50 GHz.  
 $\pm 5\%$  between  $-50^{\circ}\text{C}$  to  $+110^{\circ}\text{C}$

## PROPERTIES

	$\epsilon = 2.2$	$\epsilon = 4.5$	$\epsilon = 7.5$
<b>Mechanical properties</b>			
Tensile strength	23 MPa	23 MPa	23 MPa
Flexural strenght	25 MPa	25 MPa	25 MPa
Flexion at break	3.2%	3.2%	3.2%
Elongation at break	3.1%	3.1%	3.1
<b>Impact properties</b>			
Charpy impact test (KJ/m <sup>2</sup> )	11.86	11.86	11.86
<b>Thermal properties</b>			
Heat deflection temperature	110°C	110°C	110°C

Disclaimer : The results presented above are for information and do not constitute a legally binding Material Safety Data sheet (MSDS). Moreover, values are significantly dependent on printing and debinding parameters, operators experience and surrounding conditions. Any descriptions, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product.