POLYDEF Ag+ 3D CPE HT

PRODUCT DATA SHEET

POLYDEF Ag+ 3D CPE HT is a polymer granulate with silver (Ag) particles designed for 3D printing (FDM/FFF) and imparts bactericidal and fungicidal properties to the finished prints.
The presence of silver in the protected polymer ensures a biocidal effect by inhibiting the metabolic pathways of microorganisms, contributing to the elimination of sources of unpleasant smells and the extension of the lifetime of the material. The additive is environmentally friendly, does not affect the physical properties of the polymers and does not cause degradation of the protected material. The component provides long-lasting microbiological protection (microbiological efficacy of ≥ 99.98%), as well as enhances the safety and attractiveness of the product. The additive is also very stable at high temperatures and in high humidity compared to traditionally used biocides.

General information
POLYDEF Ag+ 3D CPE HT provide antimicrobial properties and should not affect the basic colour or surface finish of the product. The active substances do not degrade or leach. The additive is designed to exhibit constant activity throughout the product life cycle.

Test procedure
The analysis is a quantitative test designed to assess the performance of antimicrobial properties. Test samples are incubated with a bacterial suspension for 24 hours at 37°C. The average number of viable bacterial cells and the percentage reduction of the selected microorganism are then calculated.

Microbiological efficacy
Microbiological efficacy Microbiological properties were subjected to testing in accordance with ISO 22196 *Measurement of antibacterial activity on plastics and other non-porous surfaces,* against the following microorganisms:

- Escherichia coli ATCC 8739
- Staphylococcus aureus ATCC 6538

The reduction efficacy of more than 90% has been confirmed.

Storage
The granules have been developed in a manner that ensures the highest stability during storage and use.
Be aware that silver-containing materials may be sensitive to light and electromagnetic fields. Insufficiently mixed product may cause discolouration in the finished goods, which is why it is the responsibility of the manufacturer of the final component to fully assess it under normal conditions of use.

Before use
It is important, as with all chemicals, to read the product data sheet before use.
Before applying the product, always ensure that you have the latest information. For more information, contact us at kontakt@smartnanotech.com.pl.

PRODUCER:
Smart Nanotechnologies S.A.
Karola Olszewskiego 25,
32-566 Alwernia, Polska

smartnanotech.com.pl
phone: +48 12 25 89 395

POLYDEF Ag+ 3D CPE HT

POLYMER MATRIX DATA SHEET

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PHYSICAL PROPERTIES			
Parameter	**Standard**	**Value**	**Unit**
Density	ASTM D 792	1.18	g/cm³
MECHANICAL PROPERTIES			
Parameter	**Standard**	**Value**	**Unit**
Tensile Stress @ Yield	ISO 527	43	MPa
Tensile Strength @ Break	ISO 527	58	MPa
Elongation @ Yield	ISO 527	7	%
Elongation @ Break	ISO 527	185	%
Tensile Modulus	ISO 527	1548	MPa
Flexural Modulus ISO 178	ISO 178	1495	MPa
Flexural Strength	ISO 178	59	MPa
Izod Impact Strength, Notched			
23°C	ISO 180	93	kJ/m²
-40°C		20	
THERMAL PROPERTIES			
Parameter	**Standard**	**Value**	**Unit**
Deflection Temperature			
0.455 MPa (66 psi)	D 648	99	°C
1.82 MPa (264 psi)	D 648	85	

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REPORT

Evaluation of the biocidal properties of CPE HT-based composites

Materials and methods:

The experiment was performed according to ISO 22196: Plastic - Measurement of antibacterial activity on plastics and other non-porous surfaces.

Test microorganisms:

- *Escherichia coli* (ATCC 8739)
- *Staphylococcus aureus* (ATCC 6538)

Number of viable bacteria in the inoculum:

- *Escherichia coli* –7.5×10^5 cfu·cm^{-3}
- *Staphylococcus aureus* – 7.5×10^5 cfu·cm^{-3}

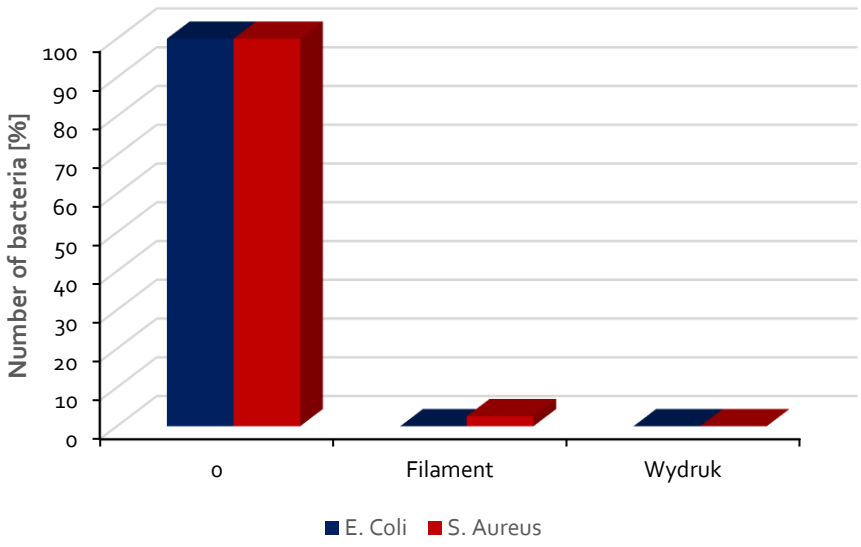
Contact time:

- 24 hours

Table 1 Antimicrobial activity and reduction of bacteria on tested surfaces.

Dosage	*E. coli*		*S. aureus*	
	Antimicrobial activity [log]	Reduction in number of bacteria [%]	Antimicrobial activity [log]	Reduction in number of bacteria [%]
Filament	6.1	100	1.5	97.4
Inprint	6.1	100	4.9	100

Graph 1. Antimicrobial activity and reduction of bacteria on tested surfaces.



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POLYDEF

LINE OF BIOCIDAL ADDITIVES FOR POLYMERS

ACTIVE SILVER PROTECTION by POLYDEF

Biocidal additives containing
silver particles for polymers

MODERN TECHNOLOGY

SAFE FOR HEALTH

DURABILITY OF USE

MANY POSSIBLE APPLICATIONS

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