TRADEMARK

ACTIVE SILVER PROTECTION BY POLYDEF

Active Silver Protection by Polydef
it is an innovative solution based on silver particles, which allows obtaining antibacterial and antifungal properties. The technology creates a new quality of products and sets a completely new trend on the market due to the possibility of obtaining products with self-disinfecting properties. The benefits of the technology include increasing the product's durability while ensuring the safety of its users.

POLYDEF is a specially designed component for polymers, based on silver particles, ensuring 2 antibacterial and antifungal properties of the final material. Presence of silver in the protected polymer provides a biocidal effect through inhibition of pathogen`s metabolic pathways. Moreover, it contributes to the elimination of the source of unpleasant odor and prolongation of the product lifetime. The additive is environmental-friendly and does not affect the physical properties or induce degradation of the protected material. The component assures long-term antimicrobial protection (effectiveness ≥ 99.98%) and increases safety and attractiveness of the product.

Why silver?
Silver is an element valued for catalytic properties, thermal and electrical conductivity, but primarily for the activity against pathogens - bacteria, viruses, fungi. The high antimicrobial activity of this element has been used since ancient times. At that time, mechanism responsible for high antimicrobial effectiveness of silver were unknown. Nowadays, their multiplicity and operating principles explain not only the efficacy but also the lack of pathogenic cells' ability to create resistance to silver. The last feature is particularly important in current era of the growing antibiotic resistance of many bacterial strains. The development of technology has enabled to use silver particles in a nanometric scale. Such significant granulation of this material affects its distribution, achieving very high antimicrobial activity at very low concentrations. Moreover, silver has relatively low toxicity to humans and animals. All these features make silver the most attractive alternative, both for many drugs and biocides.



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POLYDEF
LINIA BIOBÓJCZYCH DODTAKÓW DO POLIMERÓW

Biobójcze dodatki z cząstkami srebra
do polimerów termoplastycznych
i chemoutwardzalnych

ACTIVE SILVER PROTECTION BY POLYDEF

Where did the idea for use silver in plastics come from?

Silver is mainly associated with precious ore and its use as a noble metal in the manufacture of jewellery, crockery and cutlery. Silver is also used in the manufacture of electronic equipment, where it is valued for its very good electrical conductivity and, in turn, silver's catalytic properties mean that it is used as a catalyst for many oxidation reactions. Not many people know, however, that silver has strong antimicrobial and fungicidal properties, and, what is more, it is harmless to humans. An important aspect of silver's use is that bacteria do not become resistant to its effects, as is the case with antibiotics. At Smart Nanotechnologies, we create silver particles with even better properties due to their strongly developed specific surface area, which allowed us to develop Polydef technology.

What is Polydef technology?

Polydef technology is a specially developed solution based on silver particles to achieve antimicrobial and antifungal properties. The presence of silver in the protected polymers ensures a biocidal effect by inhibiting the metabolic pathways of microorganisms, contributing to their reduction, the elimination of sources of unpleasant smells and the extension of the lifetime of the material. The component provides long-lasting microbiological protection and enhances the safety and attractiveness of the product.

How durable is the antimicrobial protection?

The activity of silver does not change over time, so this guarantees a lasting effect, in contrast to the organic biocides often used, which have a weaker effect and degrade after some time. Thus, the use of silver particles ensures microbiological protection throughout the entire product life cycle while maintaining the safety of plastic products for their users. The effect itself can be achieved by protecting the surface or the entire volume of the product, obtaining products with self-decontaminating properties.

What other advantages does silver have over conventional biocides?

Until now, biocides have been used to protect plastics, i.e. compounds with limited persistence and negative environmental impact. Silver is characterised by its high stability and strong biocidal properties against micro-organisms, while the reduction of its particles to nanometric dimensions enables an increase in the specific surface area and much higher chemical and biological activity than with large particles. For this reason, the use of silver particles makes it possible to achieve a bactericidal effect with a lower concentration of the active substance compared to conventional chemicals, and despite the high cost of the raw material itself, its use in preparations does not significantly affect the final price of the product.

So where can we find solutions based on Polydef technology?

Polymers with biocidal properties are used for components that are particularly susceptible to micro-organisms, such as ventilation pipes, light switches or door handles used in hospitals, waiting rooms, schools or the interiors of public transport vehicles.

Our ambition is to implement products that represent a new standard by protecting them against the growth of pathogenic microorganisms. In addition to medical, construction and transport applications, we are keen to protect the components we use every day.

MODERN TECHNOLOGY
SAFE FOR HEALTH
EXTENDED SERVICE LIFE
MANY POSSIBLE APPLICATIONS

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