RAS
materials + technologies

Technical Product Data

agpure® W10

Anti allergic, non toxic antibacterial and fungicidal additive for film-forming substrates like paints, coatings, resins, polymers and other dispersions.

DESCRIPTION

ag**pure® W10** is an aqueous silver nanoparticle dispersion for the antimicrobial functionalization of surfaces and bulk materials. Due to the high surface to volume ratio of nanoparticles only low levels of metallic silver are necessary for a high and long lasting antimicrobial performance. The biocidal effect of ag**pure® W10** is based on the controlled release of silver ions.

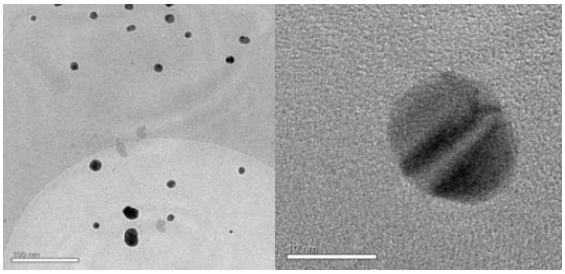

Figure: Electron microscope images of agpure® nanoparticles. (Scale: left=100 nm, right=10 nm).

ag**pure® W10** is highly recommended for aqueous or water tolerant products as well as for solid products with tolerance for aqueous additives. For other product forms special ag**pure®** types are available. Please ask our experts.

TYPICAL APPLICATION AREAS

Non sensitizing, permanent active fungicidal paints, coatings, polymers and plaster.
Antibacterial resins and silicones, varnishes, coatings and materials in hygienic applications in medicine, agriculture, food-processing and -handling, water treatment, air ducts, public areas and in the sanitary sector.
Sealings, sealants and piping that are resistant against microbial settling.
Coatings for packaging paper and polymers.
Medical coatings of implants, bone cement and antiseptic wound covers.
Antimicrobial glass or ceramic equipment.
Antimicrobial treatments in agriculture, food processing and infection control areas.

FEATURES / BENEFITS

Products properly equipped with antimicrobial ag**pure® W10** are non-toxic to humans and animals.

In contrast to other biocides ag**pure® W10** is non sensitizing and non allergic to humans in skin contact.

Due to the slow and controlled release of biocidal silver-ions from ag**pure® W10** the antimicrobial effect is persistent. Products containing ag**pure® W10** can be protected against microbial soiling for a lifetime without being toxic to humans or the environment.

ag**pure® W10** exhibits strong activity against all gram-positive and gram-negative bacteria. Its activity is unaffected by antibiotic-resistance of strains, yeast and fungi. So ag**pure® W10** is a valuable mean fighting multiresistent germs in hospitals, surgeries, agriculture and in food processing.

ag**pure® W10** itself does not induce or propagate bacterial resistance.

ag**pure® W10** silver nanoparticles exhibit a yellow colour due to the plasmon effect. Please consider possible influences on product colour. For applications that are very sensitive for even slight colour changes there are special ag**pure®** product forms available. Ask our experts.

ag**pure® W10** is free of any inorganic fillers. It can be used for very small structures like microfibers or for very thin coatings.

PRODUCT FORMS

Article no.:	APW010
Appearance:	dark orange liquid
Available container sizes:	1 kg, 5 kg, 25 kg

SPECIFICATIONS

Silver concentration	10,0 ± 0,50 %wt.
pH-value	7,0 - 9,0

TYPICAL PROPERTIES

Clear, agile, aqueous nanoparticle dispersion	
Water content	75 %
Density	1,1 kg/dm^3
Colour	dark orange
Mean silver particle size	15 nm
d_{99} (99% silver particles smaller as)	20 nm
Stability (dark, cool storage)	3 years

USE RECOMMENDATIONS

Miscibility

ag**pure® W10** is miscible with water at any ratio. Precipitation or agglomeration will not occur with pure water. Such dispersions show excellent stability.

In case of addition of other solvents, salts or solids, agglomeration might occur. Preliminary tests are recommended to assess compatibilities with other components.

ag**pure® W10** has a negative zeta potential.

Dispersing agpure® W10
Please keep to the following instructions to handle agpure® W10 properly:

- Don't use saturated or highly concentrated saline solutions.
- Dispersions will not stable at pH-values below 4.
- Mix vigorously; the use of dispersing instruments (e.g. ULTRA-TURRAX®) is recommended if the dispersion is not satisfying.

A small amount of clumping and/or settling during shipping and storage might occur. Shaking by hand is usually enough to redisperse particles within the dispersion.

Recommended dosage and antimicrobial testing
Depending on the concentration of agpure® W10 in the product, the wettability of the surface, potentially interfering additives and the selection of the test method for antimicrobial activity you can achieve a microbial reduction of 90% up to 99,999% (reduction value: 1 - 5 log steps). Due to this variety of influencing parameters we cannot recommend one concentration for all applications.

Typical concentrations range from 50 mg/kg to 1000 mg/kg silver in the surface layer of the product. When calculating the appropriate agpure® W10 dosage for your product, you have to take into account that agpure® W10 contains 10 %wt. agpure® nanosilver.

agpure® is a long-term shield against microbial growth. It is not a sterilizing agent and does not have long range effects. International research institutes typically use the listed test methods to determine the antimicrobial action of agpure® products:

Rigid surfaces:
JIS Z 2801:2000 or ISO 22196:2007
Textiles:
JIS L 1902:2002 or DIN EN ISO 20743:2007

We have a huge experience in developing and testing agpure® formulations - please ask our experts for application specific dosage recommendations and for the application appropriate test method.

HANDLING & SAFETY

agpure® W10 requires no special safety measures, provided the usual precautions for handling chemicals are observed.

Keep container tightly closed. Avoid release to the environment. Dried up product may be spontaneously flammable, treat endangered areas with sprinkling water.

For more detailed information please refer to the material safety data sheet and our technical information sheet.

REGISTRATION

agpure® is official OECD (NM-300 K silver) and BAM standard reference material.

CA-substance-no. 7440-22-4 "elementary silver (nanoform)"

Negotiable according to european biocidal products regulation (BPR) Nr.528/2012, listed in article 95, annex II

Applied BPR (N-73054) product types (PT)
PT 2: disinfectants and algaecides not intended for direct application to humans or animals,
PT 4: food and feed area, and
PT 9: fibre, leather, rubber and polymerised materials preservatives.

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