



Preventing biofilm formation and microbial contamination in water filtration

Innovative catalytic technology ensuring long-lasting efficacy in accordance with current and future regulatory requirements



COMPLIANCE WITHOUT COMPROMISE

- › AGXX can be used **now and in the future in compliance with the BPR.**



COMPREHENSIVE PROTECTION

- › Competitive advantage: Our technology **boosts filter lifespan, blocks biofilm,** and delivers lasting antimicrobial efficacy validated by ASTM E2149.



INTEGRATION MADE SIMPLE

- › Effortlessly infuse AGXX for **optimal filtration, seamlessly integrating** into all activated carbon forms and filter media.



CONTINUOUS LIFETIME PROTECTION

- › **Long-lasting** antimicrobial efficacy validated by in-use testing.



PROVEN EFFICACY

- › Confirmed **efficacy surpassing 99.999 % (Log 5)** against all microorganisms.



INNOVATIVE ANTIMICROBIAL SOLUTIONS FOR ENHANCED FILTER PERFORMANCE

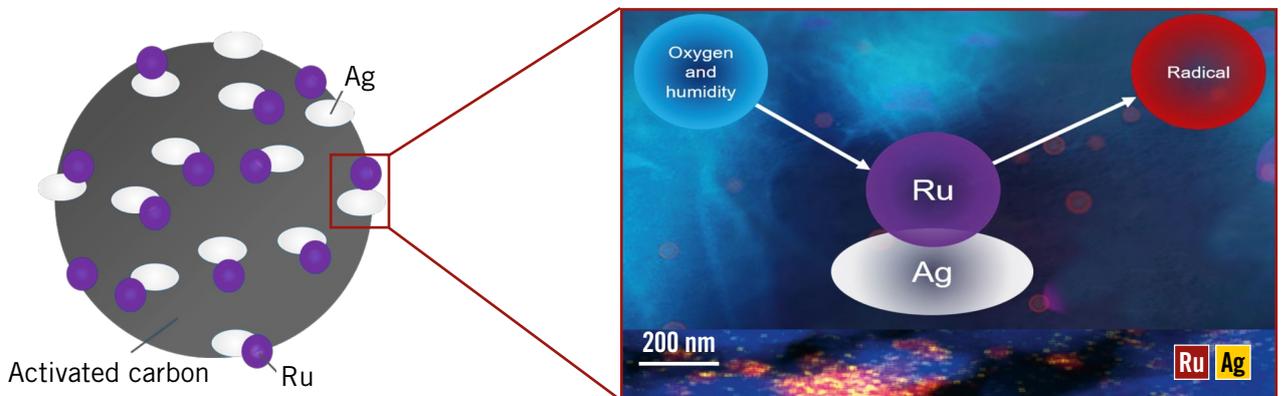
Filters play a vital role in removing particulates and microorganisms from liquids and gases. However, they are susceptible to microbial contamination and biofouling, which not only spread

pathogens but also degrade filter performance. This presents a significant challenge in maintaining the efficiency and safety of filtration systems.

AGXX – THE REGULATORY COMPLIANT SOLUTION AGAINST BACTERIA, VIRUSES AND OTHER MICROORGANISMS.

AGXX is an innovative antimicrobial technology that operates in a fundamentally different manner than conventional biocides, particularly silver technologies. Unlike traditional antimicrobial technologies, AGXX does not rely on the release

of silver ions or any other toxic or environmentally harmful substances. Instead, AGXX functions through the catalytic conversion of humidity and oxygen into reactive oxygen species (ROS), which ultimately eliminates microorganisms and odors.

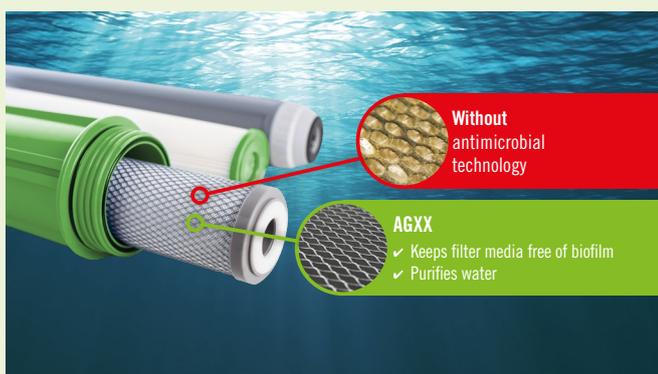


The effectiveness of AGXX has been demonstrated against over 130 microorganisms, including antibiotic-resistant germs such as MRSA. Additionally, AGXX exhibits excellent odor and allergens elimination efficacy as well as

antimicrobial efficacy against bacteria that are resistant to conventional silver technologies, such as certain *E. coli* strains. Furthermore the technology prevents from biofilm formation on any water filters.

AGXX for Water Filtration

- › Prevent biofilm formation in a regulatory compliant way



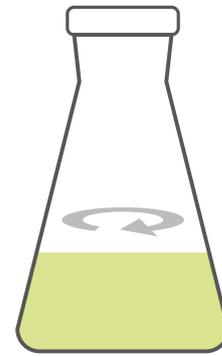
AGXX for Air Filtration

- › Prevent settlement of allergens, odors and microorganisms on filter media

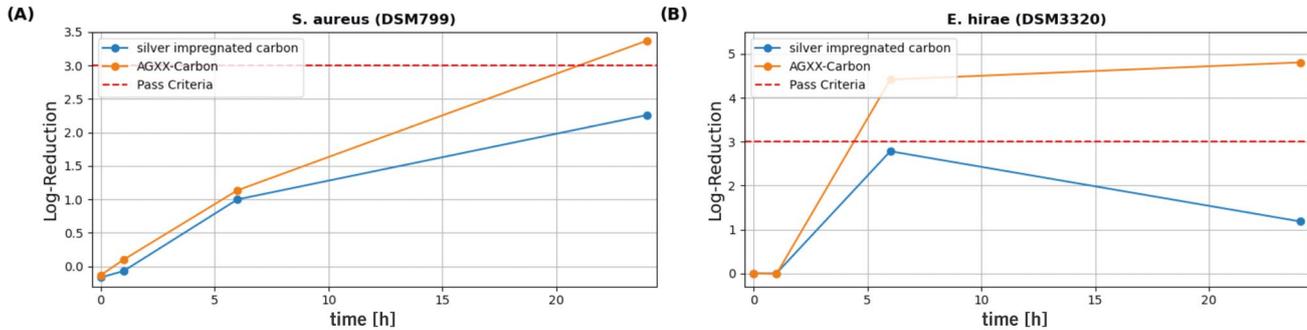


ANTIMICROBIAL EFFICACY – COMPARISON

Parameter	ASTM E 2149 (mod)
Duration	1, 6, 24 h
Microorganisms	<i>S. aureus</i> , <i>E. hirae</i>
Pass criteria	>Log 3
Incubation Conditions	37 °C / 150 rpm
Initial cell count	3×10^5 CFU/mL



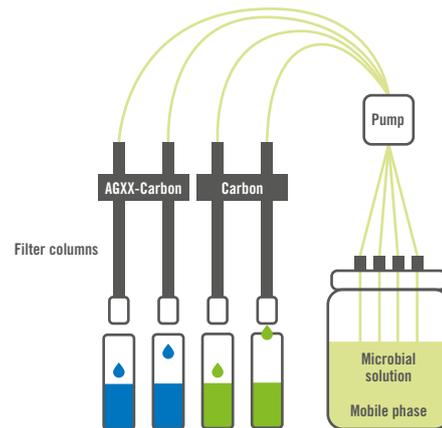
AGXX-Carbon vs. silver impregnated carbon (conventional silver technology)



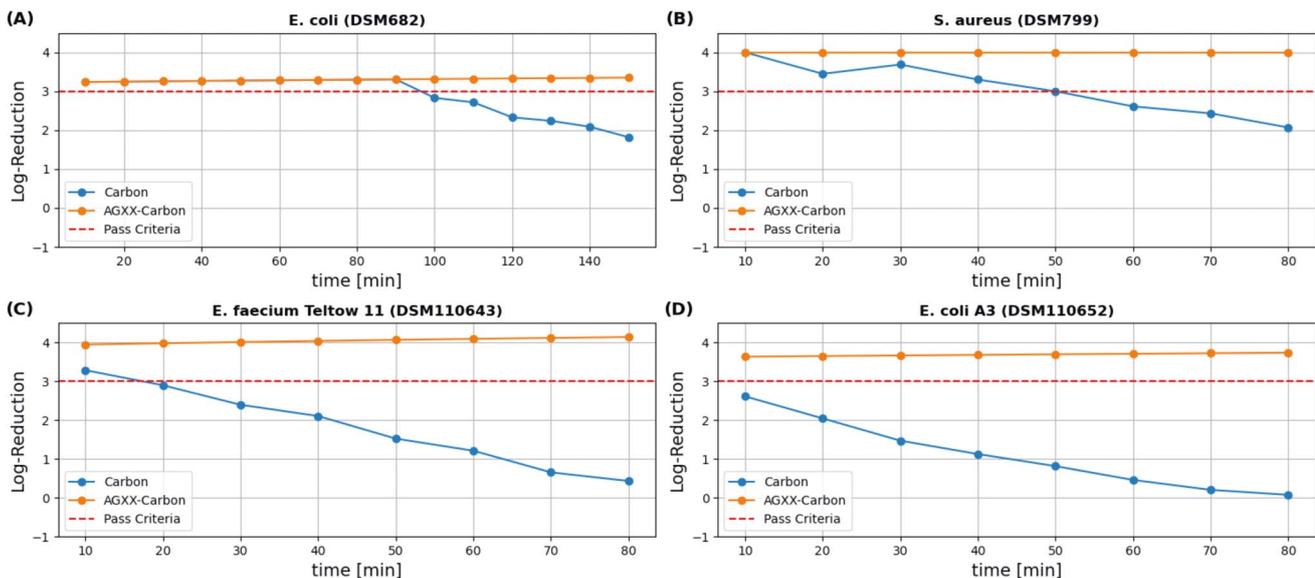
- AGXX-Carbon shows a significant **higher efficacy** in mod. ASTM E 2149 tests (shake flask test) against *S. aureus* (A) and *E. hirae* (B) than commercial **silver impregnated carbon**

AGXX IN WATER FILTRATION

Parameter	Filtration Test
Test volume	150 ml
Test matrix	Hard water
Soiling	Yes
Pass criteria	>Log 3
Incubation Conditions	37 °C / 150 rpm
Initial cell count	3×10^5 CFU/mL



AGXX-Carbon vs. Non-functionalized carbon



- AGXX-Carbon shows **excellent efficacy** against four water-relevant microorganisms
- Non-functionalized carbon** does **not** meet the pass criteria (Log-reduction >3)
- Stress-test did **not** effect the efficacy of AGXX-Carbon

DIFFERENT FORMS AND CARRIERS

AGXX particles are available in a variety of types and sizes, as well as different carrier materials, allowing easy integration into filter media such as activated carbon (powder, granules, pellets), polymers and textiles.

AGXX-Carbon

- › Carrier: activated carbon (powder, granules, pellets)
- › D₅₀: 50 µm – 3 mm



Powder



Granules



Pellets

Others

AGXX-Hybrid Suspension

- › Carrier: inorganic, e.g. Al₂O₃
- › D₅₀: 0.3 – 10 µm (according to your needs)

AGXX-Hybrid Powder

- › Carrier: inorganic, e.g. Al₂O₃
- › D₅₀: 0.3 – 10 µm (according to your needs)

AGXX-Cellulose

- › Carrier: cellulose
- › D₅₀: 50 µm

ABOUT HERAEUS

Heraeus is a family-owned global technology group headquartered in Hanau, Germany. The company's roots go back to a family pharmacy started in 1660. Today, the group bundles diverse activities in four Business Platforms: Metals and Recycling, Healthcare, Semiconductor and Electronics, as well as Industrials. In the 2023 financial year, the group generated revenues of € 25.6 billion with approximately 16,400 employees in 40 countries.

ABOUT HERAEUS PRECIOUS METALS

Heraeus Precious Metals is globally leading in the precious metals industry and covers the value chain from trading to precious metals products to refining and recycling. It has extensive expertise in all platinum group metals as well as gold and silver. With more than 3,000 employees at 17 sites worldwide, Heraeus Precious Metals offers a broad portfolio of products that are essential for many industries such as the automotive, chemicals, semiconductor, pharmaceutical, hydrogen and jewelry industry.



Sustainability at Heraeus Precious Metals

ESG Ratings and Validations

EcoVadis rates companies' performance in four categories: environment, labor and human rights, ethics, and sustainable procurement. Our operations at our German headquarters in Hanau received a Platinum Rating in 2024, ranking us among the top 1% of all companies evaluated.



CDP promotes standardized disclosures and rates companies' climate, water, and forest performance. In 2024 Heraeus Precious Metals submitted its climate disclosures and received a B rating.



We are committed to realize the potential of precious metals as responsibly as possible.

We underline this commitment with our pledge to responsibility: **precious to us.**

Our pledge to RESPONSIBILITY

- RESOURCES** are precious to us. We conserve resources and promote a circular economy.
- CLIMATE** is precious to us. We decarbonize our business.
- PEOPLE** are precious to us. We prioritize people's well-being and interests.

Contact

Heraeus Precious Metals GmbH & Co. KG
Heraeusstrasse 12-14
63450 Hanau, Germany
Phone +49 6181 35-3157
agxx@heraeus.com
www.herae.us/agxx

Use biocidal products with care.
Always read label and product information before use.