

QUALITY GUARDS.



Technical application bulletin
Kalaguard® SB

QUALITY WORKS.

LANXESS
Energizing Chemistry

SODIUM BENZOATE PRESERVATIVE

The first and only sodium benzoate preservative for home care, registered under BPR in Europe and EPA FIFRA in the U.S.

- **Globally Trusted:** Effective up to pH 7.0 with established history of use in food and personal care
- **Green and Nature Identical:** Listed for use by Ecolabel, Nordic Swan, and Ecocert; readily biodegradable
- **Excellent Chemistry Profile:** Non-sensitizing and complimentary to formulations with skin-friendly attributes
- **Highest Quality Available:** Virtually odorless and colorless and free of irritating impurities

Many traditional preservatives are facing scrutiny and regulatory restrictions. Alternative options for homecare have been very limited, leading to many formulation challenges. While sodium benzoate is already well known and trusted as an additive in food, personal care, and pharmaceuticals, homecare formulators can now also take advantage of its efficacy, economy, and consumer friendly profile. **Kalaguard® SB** is listed as “verified to be of low concern” on the EPA Safer Choice Ingredients List (SCIL) and classified as a low risk substance by the European Commission, preferred over classical biocides to encourage the use of products with a more favorable environmental or human or animal health profile.

Form:

White grains, dust-free

Purity:

99.9% minimum

Efficacy:

In efficacy tests for a fabric conditioner, hand dishwash liquid, and general purpose cleaner, shown on the following page, **Kalaguard® SB** demonstrated the ability to economically and effectively control bacteria, yeast, and mold at 0.1–1.25%, at pH levels up to 7.0.



PRESERVATION EFFICACY

Methodology

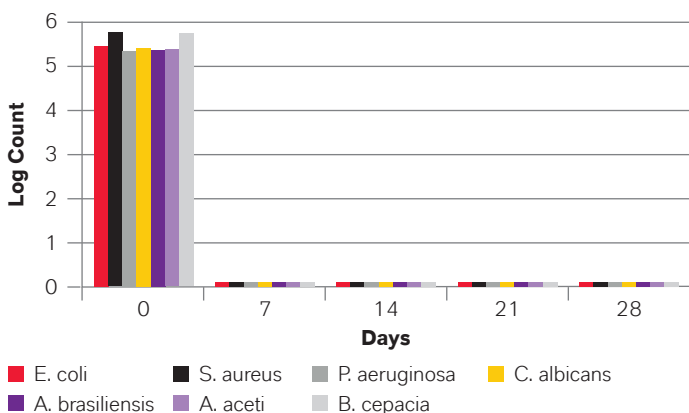
To determine preservation efficacy within a formulation, model formulations were inoculated with several undesirable and potentially harmful microorganisms. Colony forming units (CFU) of each microorganism were counted at required time intervals to determine preservation efficacy. Methods utilized include European Pharmacopoeia Efficacy of Antimicrobial Preservation (EP) and Personal Care Products Council Microbiology Guidelines M-3 (PCPC M-3).

Formulations were inoculated with $>1.0 \times 10^5$ CFU/ml of some or all of the following microorganisms:

- *Aspergillus brasiliensis* (filamentous mold)
- *Escherichia coli* (gram-negative bacterium)
- *Candida albicans* (yeast)
- *Pseudomonas aeruginosa* (gram-negative bacterium)
- *Staphylococcus aureus* (gram-positive bacterium)
- *Acetobacter acetii* (gram-negative bacterium)
- *Burkholderia cepacia* (gram-negative bacterium)

Fabric Softener, pH 3.0–0.1% Kalaguard® SB

Method: PCPC M3 (double inoculation, initial and 7 day)



Model Formulations

Fabric Conditioner, pH 3.0

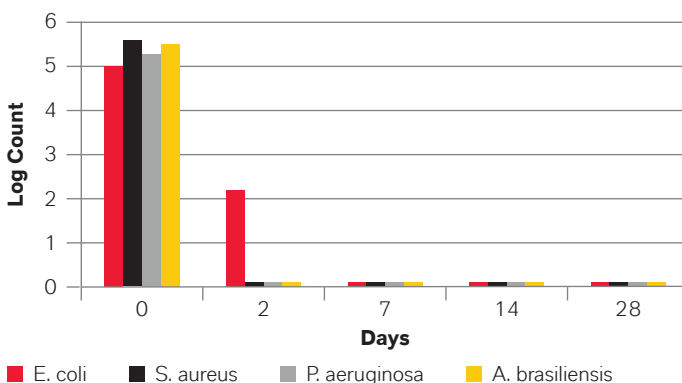
Ingredient	Function	Wt %
Water	Carrier	Quantity Sufficient
Kalaguard® SB	Preservative	0.1
Methyl bis[ethyl (tallowate)]-2-hydroxyethyl ammonium methyl sulfate	Surfactant	5.0
Phosphoric Acid	pH Adjuster	to pH 3.0

Hand Dishwash Liquid, pH 6.0

Ingredient	Function	Wt %
Phase A		
Water	Carrier	Quantity Sufficient
Lauryl / Myristyl Glucoside	Surfactant	4.0
Sodium Laureth Sulfate (2 mole EO)	Surfactant	11.7
Sodium Coco Fatty Alcohol Sulfate	Surfactant	3.0
Phase B		
Kalaguard® SB	Preservative	1.0
Sodium Chloride	Viscosity Builder	1.0
Phase C		
Citric Acid	pH Adjuster	to pH 6.0

Hand Dishwash Liquid, pH 6.0–1% Kalaguard® SB

Method: EP (single inoculation)

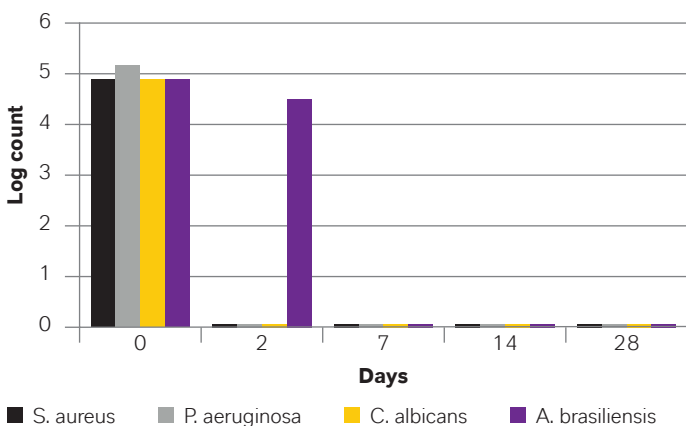


General Purpose Cleaner, pH 7.0

Ingredient	Function	Wt %
Water	Carrier	Quantity Sufficient
Sodium Coco-Sulfate	Surfactant	1.32
Glycerin	Solvent	2.50
Xanthan Gum	Rheology Modifier	0.10
Citric Acid	Chelator	1.00
Kalaguard® SB	Preservative	1.25

General Purpose Cleaner, pH 7.0–1.25% Kalaguard® SB

Method: EP (single inoculation)



pH

The efficiency of Kalaguard® SB is dependent on product acidity. The lower the pH, the more effective Kalaguard® SB will be. At concentrations of 0.1%–1.5%, Kalaguard® SB has a wide range of efficacy in most formulations with pH levels up to 6.5.

User Level

Typically used at 0.1 – 2.5% alone or with other antimicrobials.

% Solubility at 25°C

- Water – 38.0
- Propylene Glycol – 15.0
- Glycerin – >2.0
- Mineral Oil – very low

Surfactant Compatibility

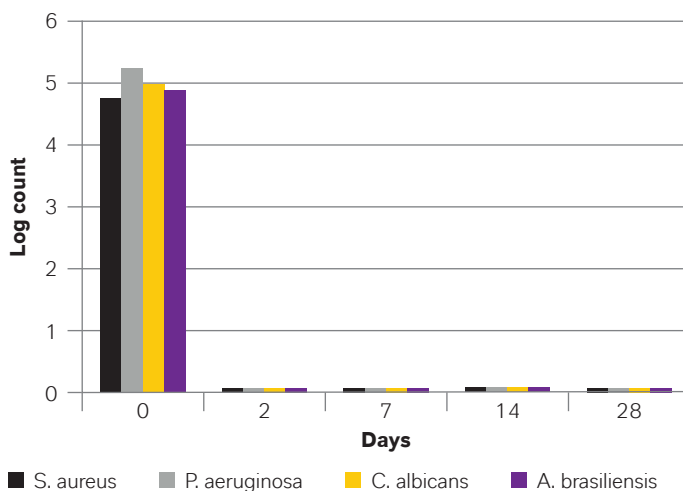
Kalaguard® SB demonstrates compatibility in anionic, cationic, and non-ionic systems. If formulators experience stability issues in cationic surfactant systems, it is recommended to change the order of addition of Kalaguard SB and surfactant. If stability issues persist, it is recommended to lower the concentration of Kalaguard SB.

Compatibility with Other Preservatives

Kalaguard® SB can be used in combination with other preservatives, chelants, and multifunctional boosters to enhance efficacy and provide other benefits for the manufacturer, such as reduced hazard labeling requirements.

General Purpose Cleaner, pH 7.0–1.00% Kalaguard® SB, 1.00% EDTA, MCIT/MIT 5ppm

Method: EP (single inoculation)



STABILITY AND RHEOLOGY INFORMATION

Color Stability

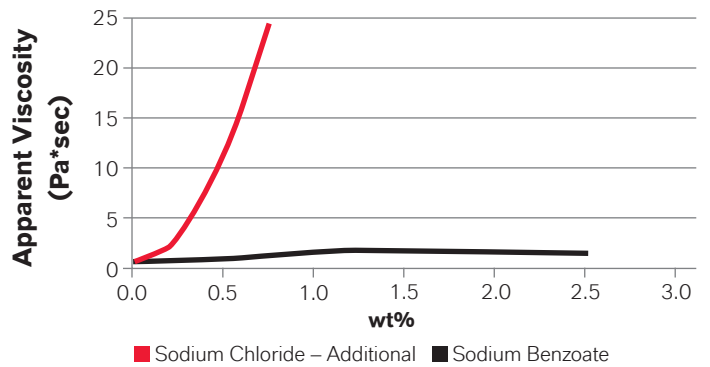
Kalaguard® SB is virtually colorless and resists yellowing, so has minimal impact on color stability in formulations.

Viscosity Stability and Impact on Rheology

Kalaguard® SB generally has little impact on viscosity. Due to its uniform particle size, Kalaguard® SB is also dust-free with high flow. Thickeners used with Kalaguard® SB should be salt-stable.

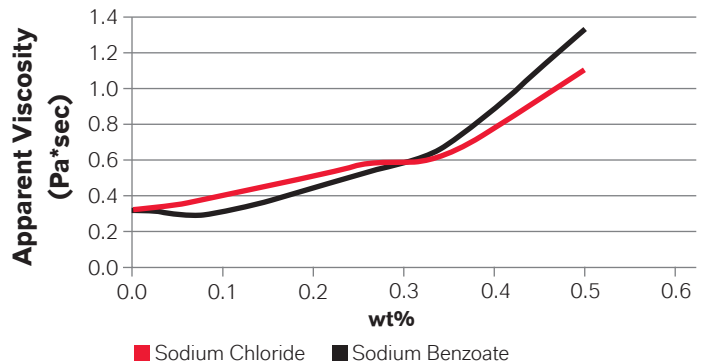
As rheology is highly formulation dependent, formulators are recommended to reach out to LANXESS for technical guidance or questions. In cationic systems, Kalaguard® SB demonstrates similar impact on viscosity to sodium chloride. In anionic systems, Kalaguard® SB controllably builds viscosity.

Viscosity of Hand Dishwash with 1.0% Sodium Chloride



In dishwash liquid, no undesirable effect on viscosity is observed with typical concentrations of Kalaguard® SB.

Viscosity of Fabric Conditioner, 10% Surfactant Active



In fabric conditioner, Kalaguard® SB has a similar impact on viscosity relative to sodium chloride.





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Compliance Information

Kalaguard® SB is registered as an approved preservative (PT 6) under the Biocidal Product Regulation (BPR) 528/2012 and EPA FIFRA. It is the only BPR- and EPA-compliant sodium benzoate preservative available for use in Europe and the U.S. Kalaguard® SB has a maximum inclusion level of 2.95% under BPR and no labeling requirements for end products (at use levels <10.0% per CLP).

Kalaguard® SB complies with European Union Regulation (EC) No 1223/2009 regarding animal testing “on cosmetic products.” LANXESS does not perform animal testing of our materials for their use in cosmetic or homecare products. In instances where animal testing is required for another regulation, such as REACH, every effort is made to ensure that protocols and procedures are consistent with existing, accepted guidelines and meet all relevant animal welfare regulations.

Health and Safety Information: Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms. Consult your LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control. Therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent.

Regulatory Compliance Information: Some of the end uses of the products described in this publication must comply with applicable regulations, such as the FDA, NSF, USDA, CPSC and BfR. If you have any questions on the regulatory status of these products, contact your LANXESS Corporation representative or Regulatory Affairs Manager at LANXESS.

Note: The information contained in this publication is current as of September 2021. Please contact LANXESS Corporation to determine if this publication has been revised.