



Disinfectant cleaner based on Triameen® Y12D-30 antimicrobial

Guideline formulations with GLDA
and selected surfactants for surface
disinfection and cleaning

Nouryon

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We are a leading producer of fatty amine based products. Triameen® Y12D-30 antimicrobial represents a highly effective biocidal amine with broad spectrum microbiological properties. It is an aqueous dilution containing 30% of Triameen® Y12D = N-(3-aminopropyl)-N-dodecylpropane-1,3-diamine (described as "diamine", CAS 2372-82-9 in the review program of the Biocidal Product Regulation for disinfectant Product Types 2, 3, 4).

We also produce a wide range of chelating agents. They are known to boost the efficacy of biocidal formulations by extracting metal ions from the cell membrane of microorganisms, making them more vulnerable for biocidal attack. Next to this our chelating agents are powerful builders. They enhance the cleaning power of a cleaner/detergent by catching the hard water ions, dissolving inorganic scales and removing calcium ions that bind most dirt to surfaces. One of the best chelating agents to use for this purpose is GLDA (Tetrasodium Glutamate Diacetate, CAS 51981-21-6), a chelating agent with superior environmental and (eco) toxicological properties and sold under the name Dissolvine® GL-47-S chelating agent.

As expert in cleaning, we are producing a wide range of specialty surfactants and co-surfactants with excellent soil removing properties.

Primary surfactants are an essential ingredient in cleaning formulations. They increase the penetration of the cleaning solutions by reducing the surface tension. The narrow range ethoxylates BeroI® 260 and BeroI® 266 (both C₉-C₁₁ alcohol ethoxylates) have targeted properties to improve degreasing performance at lower use concentrations.

Co-surfactants/hydrotropes are used in cleaning formulations to solubilize the primary surfactant and some even strongly support their cleaning power as additional effect. To this latter kind of co-surfactants belong the amphoteric Ampholak® YJH-40 (sodium caprylimino-dipropionate) as well as our new BeroI® Nexxt (C₁₂-C₁₄ alkyl methyl amine oxide ethoxylate).

In an intensive research project on optimization of cleaning and biocidal properties we developed two Disinfectant Cleaner Formulations based on Triameen® Y12D-30 antimicrobial as biocidal active substance (patent filed).

Formulation 1

Ingredient	%
Triameen® Y12D-30 antimicrobial	3.34
Dissolvine® GL-47-S chelating agent	5.00
BeroI® 266 surfactant	10.00
Ampholak® YJH-40 surfactant	5.50
Water, demineralized	76.16

Formulation 2

Ingredient	%
Triameen® Y12D-30 antimicrobial	3.34
Dissolvine® GL-47-S chelating agent	5.00
BeroI® 260 surfactant	10.00
BeroI® Nexxt surfactant	9.00
Water, demineralized	72.66

Microbiological efficacy data

EN 13697 (Quantitative non-porous surface test for the evaluation of bactericidal and/or fungicidal activity of chemical disinfectants used in food, industrial, domestic and institutional areas)

Test strains for bactericidal activity: Staphylococcus aureus, Enterococcus hirae, Escherichia coli, Pseudomonas aeruginosa
Test strain for yeasticidal activity: Candida albicans

Dirty conditions: 3.0 g/l Albumin

Contact time: 5 minutes

Passing criteria for bactericidal activity: log 4 reduction

Passing criteria for yeasticidal activity: log 3 reduction

Formulation 1 and 2 both passed at a concentration of 7.5%, which corresponds to 750 ppm of biocidal active substance



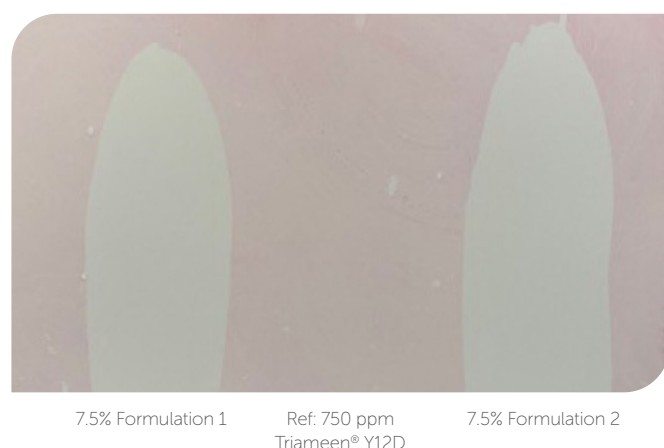
Cleaning results according to black box test

The black box test is a procedure on cleaning without mechanical action.
10 ml of the cleaning solutions are poured over pre-soiled surfaces and left for 30 seconds before rinsing with demineralized water.
Soil removal is evaluated visually.

Both guideline formulations were diluted with demineralized water to 7.5% representing the use concentration for biocidal efficacy according to EN 13697. As cleaning reference, a solution of Triameen® Y12D alone at the same level of active substance (750 ppm) was tested.

Black box test on used cooking grease on ceramic tiles for kitchen application

Soiled plates not aged



Black box test on diesel train engine soil on metallic plates for heavy duty industrial application

Soiled plates not aged



Cleaning results according to Sheen scrub test

The mechanical cleaning performance of the formulations was tested by using the Sheen scrubber.
About 3 ml of the formulation was applied to a cloth and a weight of 300 g was applied to all scrub tests.

Sheen scrub test on Lambert soil on ceramic tiles for kitchen application

Soiled plates aged 4 hours at 100°C

The cleaned areas are highlighted in black frames



Physical and chemical properties

Both guideline formulations were diluted with demineralized water to 7.5% representing the use concentration for biocidal efficacy according to EN 13697. As reference, a solution of Triameen® Y12D antimicrobial alone at the same level of active substance (750 ppm) was tested.

	7.5% Formul. 1	7.5% Formul. 2	Ref: 750 ppm Triameen® Y12D
Cloud point, °C	35	54	>80
pH	10.5	10.9	10.5
Wetting, sec ¹	0	0	153
Viscosity ²	2.46	1.89	1.59
Foaming 0 min (mm) ³	183	>200	165
Foaming 1 min (mm) ³	183	>200	165
Foaming 5 min (mm) ³	105	>200	150

1. Wetting, measured according to Draves
2. Viscosity, measured with a Brookfield viscometer using spindle 18 at 100 RPM
3. Foam height and stability: Cylinders containing the formulations were rotated for one minute at 40 rpm. The foam height was measured immediately after rotation and after 1 and 5 minutes

Contact us directly for detailed product information and sample request
website | nouryon.com/markets/cleaning
email | cleaning@nouryon.com

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Nouryon is a global, specialty chemicals leader. Markets and consumers worldwide rely on our essential solutions to manufacture everyday products, such as personal care, cleaning goods, paints and coatings, agriculture and food, pharmaceuticals, and building products. Furthermore, the dedication of more than 8,200 employees with a shared commitment to our customers, business growth, safety, sustainability and innovation has resulted in a consistently strong financial performance. We operate in over 80 countries around the world with a portfolio of industry-leading brands. Visit our website and follow us @Nouryon and on LinkedIn.

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