LANXESS
Energizing Chemistry

Product Information

N-2000 Antimicrobial

Preparation of Dodecylguanidine Hydrochloride (DGH) in glycol

N-2000 Antimicrobial

Uses

For the control of algae, bacteria and fungi in a wide range of industrial process waters.
For the preparation of biocidal products for industrial preservation.
For the preservation of technical preparations compatible with cationic actives.

Chemical and physical data

Active ingredient:	approx. 35 % Dodecylguanidine Hydrochloride (DGH)
Product description:	clear to light turbid, light yellow to blue-green solution

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Density (25 °C):	0.94 - 1.02 g/ml
Boiling point:	108 °C
pH (25 °C):	2 - 6
Solubility:	miscible with water

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.

Storage

If correctly stored and kept in the original sealed container, the shelf life is at least 24 months.
Store the product between 15 °C and 40 °C. During long-term storage a slight precipitate may form. This is not the active ingredient and performance is not affected.

Material Compatibility

Compatible materials of construction for storage tanks include high density, or cross-linked polyethylene, fiberglass coated with isophthalic polyester resin or Bisphenol A fumarate resin. Compatible materials for pump “liquid ends”, gaskets, and piping include polyethylene or flexible PVC, polypropylene. As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing) by the user in advance to determine suitability.

Application

N-2000 Antimicrobial is a 35 % active solution of Dodecylguanidine Hydrochloride (DGH) in Dipropylene Glycol/Propylene Glycol. DGH is a non-oxidizing, liquid, nitrogen-based organic for use in aqueous industrial systems as a broad spectrum biocide, effective in controlling bacteria, yeast and fungi.

LANXESS suggests dosage ranges from 25 to 1000 ppm of N-2000 Antimicrobial to inhibit the growth of microorganisms in aqueous systems. Exact levels will depend on the components, storage time, temperature, microorganism, and should be determined through laboratory testing.

N-2000 Antimicrobial is effective over a broad pH range and does not contain or release formaldehyde. It inhibits the growth of bacteria, yeast and fungi efficiently. The liquid formulation is easy to handle and compatible with many preservatives and fungicides. It is effective at low concentrations, especially against sulfate reducing bacteria. N-2000 Antimicrobial is non-corrosive to metallurgy at use concentrations. As it is non-oxidizing, it will not be consumed by reducing substances in water.

The approved dosage level ranges are provided in the chapter “Dosage recommendations” further below, but variables such as pH, temperature, initial germ count or intended storage time of the product to be preserved should be taken into account.

Dosage recommendations

MATERIAL PRESERVATION:

The exact amount of preservative for a given formulation will depend on the composition, storage time, temperature, etc., and can be determined by appropriate testing based on formula weight. Dosage levels refer to N-2000 Antimicrobial as delivered (calculated on finished material):

Detergents:
Based on the chemistry of DGH, N-2000 Antimicrobial is preferably suitable in cationic or non-ionic surfactants.
Softeners: 100 - 1000 ppm
Non-ionics: 100 - 1000 ppm

Adhesives:
Automobile adhesives tapes: 250 - 1000 ppm
Glues: 250 - 1000 ppm
Nonfood packaging adhesives: 250 - 1000 ppm
Wallpaper: 250 - 1000 ppm
Wood glue: 250 - 1000 ppm

Paints and coatings:
Paints and coatings: 250 - 1000 ppm
Coatings systems: 250 - 1000 ppm

Pulp and paper mill processing chemicals:
Add N-2000 Antimicrobial directly to the material to be preserved prior to manufacturing into the finished product. The dosage rate will depend upon the material to be preserved and the storage time. The usual addition should be 250 - 1000 ppm.
Do not use for adhesives or coatings that involve direct or indirect food, or human drinking water contact application. Dosage levels (calculated on finished material):
Adhesives: 250 - 1000 ppm
Alum: 250 - 1000 ppm
Defoamers: 250 - 1000 ppm
Emulsions: 250 - 1000 ppm
Papermill coatings: 250 - 1000 ppm

INDUSTRIAL PROCESS WATER SYSTEMS:

Industrial recirculating water cooling towers:
For use only in: Auxiliary and Standby Commercial and Industrial Systems that maintain effective misteliminating components, Brewery Pasteurizer Water and Industrial Recirculating Water, Cooling Towers. Badly fouled systems must be cleaned before treatment is begun.

SLUG OR INTERMITTENT METHOD:
Initial dose: When system is noticeably fouled apply 50 - 100 ppm repeat until control is achieved.
Subsequent dose: When control is evident, apply 25 - 50 ppm every three days or as needed.

CONTINUOUS METHOD:
Initial dose: When system is noticeably fouled, apply 25 - 50 ppm per day.
Subsequent dose: Apply a feeding rate maintaining 20 - 40 ppm of N-2000 Antimicrobial in the circulating water.

Registration / Approval / Recommendation

Up-to-date information on the registration status of our products can be obtained from:

LANXESS Deutschland GmbH
Business Unit Material Protection Products
Regulatory Affairs
50569 Cologne / Germany
E-Mail: Regulatory-Support-Biocides@lanxess.com

Precautions

The precautions generally recommended for handling chemicals should be observed, e. g. wearing of safety goggles, protective gloves and dust-mask. If the product comes into contact with skin, the affected area should be washed off immediately with soap and plenty of water; splashes in the eyes should be rinsed out immediately with plenty of water. If irritation persists, medical attention should be obtained. Soiled clothing should be changed at once.

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

Use biocides safely. Always read the label and product information before use.

Labelling

This product information must be used in conjunction with the currently valid safety data sheet for the product which indicates labelling according to the relevant provisions for classification & labelling on EU Level.

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www.protectedbylanxess.de

Preventol®

LANXESS
Energizing Chemistry

Product Information

PREVENTOL® D 7

PREVENTOL® D 7

Uses

For the preservation of aqueous coatings, polymer dispersions, filler suspensions, solutions and dispersions of adhesives and thickeners, concrete additives, oil emulsions, polishes etc.
For the preservation of surfactants, detergents and cleaners.
As a slimicide in water systems for paper machinery (wet-end) and for the preservation of raw materials and auxiliaries for paper manufacture.
For water treatment of industrial cooling water systems.

Chemical and physical data

Composition:	liquid formulation of approx. 1.5 % isothiazolinones

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Density (20 °C):	approx. 1.02 g/cm³
Vapour pressure (20 °C): Vapour pressure (50 °C):	approx. 23 mbar approx. 121 mbar
Solidification point:	approx. -1 °C
Boiling point:	approx. 100 °C
Flash point:	> 100 °C (DIN 51755)
Solubility:	miscible with water and lower alcohols
pH-value (1 % in demin. water):	4 - 6
Stability range:	pH approx. 2.5 - 9.0

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.

Storage

If correctly stored and kept in the original sealed package at room temperature the shelf life is 1 year. The product should be protected from heat (temperature should not exceed 40 °C) and from frost.

PREVENTOL® D 7

Applications

With its broad spectrum of activity, good solubility in water and low acute toxicity, Preventol® D 7 is a versatile preservative which is easy to use.

Preventol® D 7's spectrum of activity covers bacteria, including formaldehyde-resistant species, fungi, yeast and algae.

Preservation
Preventol® D 7 can be incorporated at any stage of the production process but is best added to the feedwater first.

However, if higher temperatures (> 40 °C) or pH (> 9) values are likely to occur during the manufacturing process, the product should be added at the end of the process or to the finished product. In this case take care to homogeneously distribute the preservative within the product to be protected. Because of its low viscosity, in the most cases Preventol ® D 7 can be used undiluted. The product can also be unproblematic pre-dissolved in water. The use of Preventol ® D 7 in the preservation of aqueous formulations does not generally cause any undesirable side-effects. In contrast to preservatives containing active ingredients which split off formaldehyde, Preventol ® D 7 is highly suitable for the preservation of products which contain protein (e. g. casein).

It is advisable to carry out compatibility tests before Preventol® D 7 is used in new products or applications. Our Technical Service Laboratories would be happy to provide assistance with such tests.

Slime prevention
Owing to its broad bactericidal effectiveness Preventol® D 7 is an ideal product for preventing slime building up in the water systems of paper machines and other process water systems. It can be directly added to the primary circuit, the machine chest or the headbox. In the case of heavily contaminated units shock treatment is recommended, or, alternatively, continuous addition in small amounts. The recommended dosage range of Preventol ® D 7 is 100 - 400 g/tonne paper or cardboard.

Water treatment
Preventol® D 7 has a broad spectrum of activity against microorganisms which cause the formation of slime deposits. It is effective in preventing the build-up of biofilms in all sorts of water systems. Losses through heat transfer are thereby avoided and specified flow rates can be maintained. Sustained control of slime deposits also helps to reduce corrosion rates and to minimise the risk of contamination with pathogenic germs.

Suggested additions

in % (calculated on total formulation)

Preservation:

Polymer dispersions	0.05 - 0.2
Emulsion paints	0.1 - 0.25
Adhesive dispersions	0.05 - 0.2
Plasters and mortars	0.05 - 0.2
Printing inks	0.1 - 0.25
Filler dispersions, pigment slurries	0.05 - 0.15
Thickener stock solutions	0.1 - 0.2
Glues (starch, dextrin and cellulose derivatives)	0.1 - 0.2
Glues (casein)	0.1 - 0.3
Concrete additives	0.1 - 0.3
Detergents	0.05 - 0.15

Paper industry:

Slime prevention	100 - 300 g/tonne paper produced (for regular use) 200 - 400 g/tonne paper produced (for heavily contaminated systems)
Preservation of auxiliaries	0.05 - 0.1

Water treatment:

Cooling water treatment	100 - 400 ppm shock treatment

Registration / Approval / Recommendation

EC:
Recommendations XIV and XXXVI of the Plastics Commission of the German Federal Health Office (BgVV) approve the use of these active ingredients to protect plastic dispersions against putrefaction and as a slimicide in the manufacture of paper and cardboard for food packaging.

Switzerland:
Preventol® D 7 carries the registration number CHZB0104.

USA:
The constituents of Preventol® D 7 are approved by the Food and Drug Administration (FDA).

Canada:
All ingredients are listed in CEPA / DSL.

"All Lanxess Biocides, depending on their concentration and labeling, are in accordance with the requirements of the Nordic Swan and the European Ecolabel for indoor paints and varnishes."

"Within the usual concentration levels Preventol® D 7 is "Blue Angel"-compliant in terms of the RAL UZ 102."

Up-to-date information on the registration status of our products can be obtained from:

LANXESS Deutschland GmbH
Business Unit Material Protection
Regulatory Affairs
51369 Leverkusen / Germany
Fax: (+49 214) 30-7 23 39

Precautions

Preventol® D 7 is a clear, lowviscosity solution. Skin contact and inhalation of vapour should be avoided. The precautions generally recommended for handling of chemicals have to be observed, e. g. wearing of safety goggles, protective gloves and protective clothing. If the product comes into contact with the skin, the affected area should be washed immediately with large amounts of soap and plenty of water; splashes in the eyes should be rinsed out immediately with plenty of water. If irritation persists, medical attention should be obtained. Contaminated clothing should be changed immediately.

TLV: 0.05 mg/m³ for the mixture 5-chloro-2-methylisothiazolinone/2-methylisothiazolinone.

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

Use biocides safely. Always read the label and product information before use.

Labelling

This product information must be used in conjunction with the currently valid safety data sheet for the product which indicates labelling according to the German Hazardous Substances Regulation and the corresponding EU Directive.

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Business Unit Material Protection
51369 Leverkusen/Germany
www.protectedbylanxess.com

Edition: 2013-04-11

Preventol®

LANXESS
Energizing Chemistry

Product Information

Preventol® DP 1021

A Solution of Dodecyl guanidine hydrochloride and 2-Bromo-2-nitropropane-1,3-diol

LANXESS Corporation • 111 RIDC Park West Drive • Pittsburgh, PA 15275 • Phone: 1-800-LANXESS • www.mpp.us.lanxess.com
This document contains important information and must be read in its entirety.
Edition: 2017-05-08

Preventol® DP 1021

EPA Registration No.39967-136

Uses

A bactericide and fungicide used in a wide range of industrial process water systems, pulp an paper mill systems, water flood injection waters, fracking fluids, drilling and workover fluids, gas production systems, gas storage wells, hydrotesting, pipeline pigging and scrapping operations and material preservation.

Chemical and physical data

Active ingredient:	approx. 31 % active solution of a solution of dodecyl guanidine hydrochloride and 2-bromo-2-nitropropane-1,3-diol
Product description:	clear to yellow liquid

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Density:	1.18 g/ml
pH:	4.5
Solubility:	soluble in cold water

*These items are provided as general information only. They are approximate values and are not considered to be part of the product specifications.

Storage

Store in a cool, dry place in tightly closed original containers. Store away from incompatible materials. Keep container tightly closed when not in use. If stored properly, Preventol® DP 1021 has shelf life of 1 year.

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Edition: 2017-05-08

Preventol® DP 1021

Spectrum of activity

Minimal Inhibitory Concentration (MIC) in ppm of Preventol® DP 1021

Bacteria	MIC (ppm) Preventol® DP 1021
Enterobacter aerogenes	100
Klebsiella pneumonia	50
Proteus vulgaris	20
Pseudomonas aeruginosa	50
Serratia marcescens	50

Mold	MIC (ppm) Preventol® DP 1021
Alternaria mimicula	50
Aspergillus niger	50

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Edition: 2017-05-08

Preventol® DP 1021

Application

Preventol® DP 1021 is a microbiocide containing both dodecyl guanidine hydrochloride and 2-bromo-2-nitropropane-1,3-diol. Preventol® DP1021 is a broad spectrum biocide that is effective against bacteria, fungi, and algae. Preventol® DP1021 is also effective against sulfate reducing bacteria and acid producing bacteria, which are commonly associated with microbially influenced corrosion (MIC).

Preventol® DP 1021 is easily incorporated into most systems and is compatible with cationic and non-ionic raw materials. Preventol® DP 1021 will not adversely affect product physical properties or performance and should not impart odor or color to most final products.

Preventol® DP 1021 is temperature stable up to 65 °C (149 °F) or pH stable up to 8.5 in the finished application. Incorporation of Preventol® DP 1021 into the finished application below these critical conditions is recommended to ensure maximum microbial protection.

Preventol® DP 1021 should be stirred into the finished application until uniform distribution of the biocide is achieved.

Water Treatment and Oil & Gas Applications: In order to obtain microbiological control of the water, badly fouled system must be cleaned prior to treatment with Preventol® DP 1021. Preventol® DP1021 should be added to the water system where optimum blending of the product is achieved. At use concentration, Preventol® DP 1021 has little or no foaming.

The approved dosage level ranges are provided in the chapter “Directions for Use” further below, but variables such as pH, temperature, composition of the finished product, initial microbial count or the intended storage time of the product to be preserved should be taken into account.

Material Compatibility

Preventol® DP 1021 is compatible with high quality stainless steel. Compatibility tests are recommended for other metallic materials. Plastic materials like PVC, PE, HDPE, and PTFE are compatible and suitable for handling and storage of Preventol® DP 1021.

As with any product, use of the products mentioned in this publication in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.

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Edition: 2017-05-08

Preventol®

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Preventol® DP 1021

Directions for use

It is a violation of Federal law to use this product in a manner inconsistent with its labelling.
The weight of Preventol® DP 1021 to be used is based on the total weight of the product to be protected.

Application	Dosage Level (ppm)
Industrial Recirculating Water Cooling Towers	
Slug or Intermittent	
Initial dose	50 - 350
Subsequent dose	87.5 - 115
Continuous	
Initial dose	87.5 - 115
Subsequent dose	87.5 - 115
Air Washing System	
Slug or Intermittent	
Initial dose	50 - 350
Subsequent dose	87.5 - 115
Continuous	
Initial dose	87.5 - 115
Subsequent dose	87.5 - 115
Pulp and Paper Mill Systems	
Initial dose	
Heavily contaminated	40 - 280
Slug dose	10 - 88
Subsequent dose	
Heavily contaminated	40 - 280
Slug dose	10 - 88
Pulp and Paper Mill Processing Chemicals, Adhesives, and Coatings	35 - 350
Adhesive Systems (Non-Food Contact Paper)	175 - 350
Paints, Coatings, and Stains	476 - 2,380
Pigments, Dyes, and Filler Suspension	476 - 2,380
Polymer Dispersion and Emulsions	476 - 2,380

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Preventol® DP 1021

Application	Dosage Level (ppm)
Oil Field Water Systems	
Slug or Intermittent	
Initial dose	50 - 350
Subsequent dose	350
Continuous	
Initial dose	115
Subsequent dose	87.5 - 115
Oil Recovery Drilling Fluids	
Slug or Intermittent	
Initial dose	115
Subsequent dose	87.5 - 115
Water Flood Injection Water	
Initial dose	87.5 - 350
Subsequent dose	87.5 - 350
Fracture Fluids	87.5 - 350
Drilling, Completion and Workover Fluids	
Initial dose	87.5 - 350
Maintenance dose	87.5 - 350

Registration / Approval / Recommendation**

USA:EPA Registration No. 39967-136

The use of Preventol® DP 1021 is subject to the limitations of these regulations and other applicable regulations.

Up to date information on the registration status of our products can be obtained from:

LANXESS Corporation
Business Unit Material Protection
Regulatory Affairs
111 RIDC Park West Drive
Pittsburgh, PA 15275-1112

Preventol® DP 1021

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

Health & 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, *e.g., material safety data sheets and product labels.* Consult your LANXESS Corporation representative or contact the LANXESS Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

Precautions

When handling Preventol® DP 1021, general recommendations for handling any chemicals should be observed, e.g. wearing of protective clothing, safety goggles, and protective gloves. Skin contact and vapor inhalation should be avoided. If the product comes into contact with the body, the affected area should be washed immediately with plenty of soap and water (e.g. product that has been splashed in the eyes should be rinsed out immediately with plenty of water). If irritation persists, the affected individual should obtain medical attention. Contaminated clothing should be removed and properly cleaned or disposed.

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

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This document contains important information and must be read in its entirety.
Edition: 2017-05-08

Preventol®

LANXESS
Energizing Chemistry

Product Information

PREVENTOL® IT 14

PREVENTOL® IT 14

Uses

Concentrate for the preservation of aqueous systems such as water circuits, metal-working emulsions, polymer dispersions, aqueous coatings, filler suspensions, solutions and dispersions of thickeners and glues, oil emulsions, concrete additives, polishes etc.

Raw material for the manufacture of biocidal formulations.

Chemical and physical data

Composition:	aqueous formulation of approx. 14 % isothiazolinones (CMIT/MIT)

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Density (20 °C):	approx. 1.3 g/cm^3
Solidification point:	approx. -33 °C
Boiling point:	approx. 100 °C
Solubility:	miscible with water and lower alcohols
pH:	1.0 - 4.0

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.

Storage

Stored properly in cool conditions (not above 40 °C) and in sealed orginal containers the product has a shelf life of 1 year.

PREVENTOL® IT 14

Application

With its broad spectrum of activity, good solubility in water and generally good compatibility, Preventol® IT 14 is a versatile preservative which is easy to use.
Preventol® IT 14's spectrum of activity covers bacteria, including formaldehyde-resistant species, fungi, yeast and algae.
Preventol® IT 14 can be incorporated at any stage of the production process but is best added already to the feedwater. If higher temperatures (> 40 °C) or pH values (> 9) are likely to occur during the manufacturing process, the product should be added at the end of the process. However, in this case care should be taken to distribute the preservative homogeneously within the product to be protected to ensure an even effect. Because of its low viscosity, Preventol ® IT 14 can be used undiluted or with water added.
It can also be pre-dissolved in alcohols or alcohol/water mixtures. The use of Preventol® IT 14 in the preservation of aqueous formulations does not generally cause any undesirable side-effects. In contrast to preservatives which contain active ingredients that release formaldehyde, Preventol ® IT 14 is ideal for preserving products containing proteins (e.g. casein).
Before Preventol® IT 14 is used in new products or applications, it is advisable to carry out compatibility trials and test its microbiological effectiveness.

Suggested additions in % (calculated on total formulation)

The usual addition in the preservation of aqueous systems lies in the range 0.01 - 0.02 %.

Registration

For up-to-date information on the registration status of this product, please ask your sales responsible for the current registration overview.

Precautions

When handling Preventol® IT 14 the precautions generally recommended for handling chemicals must be observed, e.g. wearing of safety goggles, protective gloves and protective clothing.

If the product comes into contact with the skin, the affected area should be washed immediately with large amounts of soap and plenty of water; splashes in the eyes should be rinsed out immediately with plenty of water. If irritation persists, medical attention should be obtained. Contaminated clothing should be changed immediately.

TLV: 0.05 mg/m³ for the mixture 5- chloro-2-methylisothiazolinone/2- methylisothiazolinone

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

Use biocides safely. Always read the label and product information before use.

Labelling

This product information must be used in conjunction with the currently valid safety data sheet for the product which indicates labeling according to the German Hazardous Substances Regulation and the corresponding EU Directive.

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Preventol®

LANXESS
Energizing Chemistry

Product Information

PREVENTOL® P 91

In-can preservative based on bronopol/isothiazolinones (9:1), VOC-free

PREVENTOL® P 91

Use

For the preservation of aqueous coatings, polymer dispersions, synthetic adhesives, fountain solutions, cleaners and detergents and other water-based chemical-technical preparations.

Chemical and physical data

Composition:	liquid formulation based on approx. 9 % 2-bromo-2-nitro-1,3-propanediol and approx. 1 % isothiazolinones (CMIT/MIT)

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Density (20 °C):	1.0 – 1.1 g/cm³
Vapour pressure (20 °C): Vapour pressure (50 °C):	26 mbar 130 mbar
Viscosity (20 °C):	1.27 mPa · s (DIN 53019)
Pour point:	-1 °C (DIN ISO 3016)
Boiling point (1013 mbar):	from 100 °C (DIN 53171)
Flash point:	cannot be determined (water based system)
pH:	< 5
Solubility:	completely miscible with water

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.

Storage

If correctly stored and kept in the original sealed package, the product has a shelf life of 24 months. Storage temperatures below 0 °C and above 45 °C should be avoided.

PREVENTOL® P 91

Application

Preventol® P 91 is a combination product based on bronopol and isothiazolinones. By combining these two active ingredients, it is possible to achieve a broad and balanced spectrum of activity against bacteria (aerobic and anaerobic), mould fungi and yeast.
In its supply form Preventol® P 91 is a virtually colourless liquid with a scarcely perceptible inherent odour. This preservative has unlimited miscibility with water, lower alcohols and glycols, thereby allowing easy and flexible processing. Owing to the fact that it is a water-borne formulation this product does not contain any VOCrelevant components. It should be noted, however, that this benefit goes hand in hand with a low frost resistance (pour point – 1 °C). In winter, therefore, measures must be taken to ensure frost-free storage.
The ideal pH for the use of Preventol® P 91 ranges from slightly acidic to slightly alkaline. Higher pH values (> 8.5 – 9) and the presence of, for example, sulphurous compounds (Dithionite, mercaptans etc.) may impair the stability of the active ingredients contained in Preventol ® P 91.
Such decomposition reactions are accelerated by increased temperatures, so that generally a temperature of approx. 45 °C should not be exceeded.
Preventol® P 91 is distinguished by a relatively rapid onset of action. This enables the effective prevention of subsequent microbial damage and also of the formation of enzymes (e.g. in coatings, dyestuffs or thickeners) from the very beginning.
Because of the large number of preservation problems which occur in practice it is advisable to carry out preliminary tests on compatibility and biological effectiveness for each new application.
The required additions are given below, but influencing variables such as pH, initial germ count or intended duration of storage of the product to be preserved should also be taken into account.

Material Compatibility

Preventol® P 91 is only compatible with high quality stainless steel types (e.g. 1.4571), for any other metalic materials careful compatibility testing is recommended. Generally, materials based on plastic (PVC, PE, HDPE, PTFE) are regarded as safe for handling this product.

Recommended additions in % by wt.

Examples calculated on total formulation:

Glues and adhesives	0.05 – 0.20
Emulsion paints	0.05 – 0.25
Polymer dispersions	0.05 – 0.20
Pigment slurries	0.02 – 0.06
Cleaners, detergents	0.05 – 0.20
Fountain solutions	0.05 – 0.20 (in the ready-to-use solution)

PREVENTOL® P 91

Registration / Approval / Recommendation

Up-to-date information on the registration status of our products can be obtained from:

LANXESS Deutschland GmbH
Business Unit Material Protection Products
Regulatory Affairs
50569 Cologne / Germany
E-Mail: Regulatory-Support-Biocides@lanxess.com

Precautions

Contact of Preventol® P 91 with the skin should be avoided, as should the inhalation of vapours. The precautions generally recommended for handling chemicals should be observed, e.g. wearing of protective clothing, protective gloves and protective goggles. If the product comes into contact with skin, the affected area should be washed immediately with plenty of water and soap; splashes in the eyes should be rinsed out immediately with plenty of water. If irritation persists, medical attention should be obtained. Soiled or soaking clothing should be changed at once.

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

Use biocides safely. Always read the label and product information before use.

Labelling

This product information must be used in conjunction with the currently valid safety data sheet for the product which indicates labelling according to the relevant provisions for classification & labelling on EU Level.

LANXESS Deutschland GmbH
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Preventol®

LANXESS
Energizing Chemistry

Product Information

Preventol® Z

for the sugar industry

Preventol®

LANXESS
Energizing Chemistry

Preventol® Z

Uses

Food processing aid for the sugar industry. Preventol® Z prevents sugar degradation by Leuconostoc species, thereby improving the cost-effectiveness of the sugar extraction process.

Chemical and physical data

Composition:	liquid formulation of approx. 40 % sodium dimethyl dithiocarbamate

Specification

The specification parameters can be found in the currently valid product specification.

Characteristic data*

Viscosity:	approx. 4.8 mPa-s (20 °C)
Crystallisation point:	approx. 5 °C
Solidification point:	approx. –5 °C DIN 51556
Flash point:	not possible to carry out due to the vapour pressure of the water
Vapour pressure:	approx. 20 mbar (20 °C)
Ignition temperature:	> 500 °C DIN 51794
Stability range:	pH 7 - 13
Solubility:	miscible with water and lower alcohols in any ratio

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.

Storage

If correctly stored and kept in the original sealed package, the shelf life is 2 years. Avoid temperatures under +10 °C and over 40 °C. The product is sensitive to frost below +5 °C. Below +10 °C, parts of the product may crystallise, which can be solved by warming up the product to 35 - 40 °C. During storage a small amount of sediment may form.

Preventol® Z

Application

The metabolism of thermophilic bacteria may cause sugar loss during Saccharose extraction from sugar beet or sugar cane. The use of food processing aid is necessary to prevent the cost-effectiveness of the sugar extraction process being significantly reduced. The range of microorganisms in raw sugar cane juice normally comprises around 60 - 70 % Leuconostoc and Bacillus strains, 10 % other bacteria and yeasts. The Leuconostoc species are responsible for the biggest losses in the sugar extraction process. Owing to the heterogeneous composition of microorganisms, the degradation of saccharose occurs in varying ways, which makes the assessment of saccharose loss very complex. Preventol® Z containing sodium dimethyl dithiocarbamate has a broad spectrum of activity against Microorganisms.

Suggested additions

Preventol® Z should be dosed at the points where increased microorganism growth is particularlym arked. Important metering points may be the juice tanks in the mills. Experience has shown the application concentration to lie between 15 and 25 ppm Preventol ® Z in the raw juice.
When determining the application concentration of Preventol® Z, it is necessary to take into account the quality of the raw materials being processed and the hygienic conditions, for example in the mills.

Registration

For up-to-date information on the registration status of this product, please ask your sales responsible for the current registration overview.

Precautions

When handling Preventol® Z, the precautions generally recommended for handling chemicals should be observed, e. g. wearing of safety goggles, protective clothing and protective gloves.
If the product comes into contact with the skin, the affected area should be washed immediately with soap and plenty of water; splashes in the eyes should be rinsed out immediately with plenty of water. If irritation persists, medical attention should be obtained. Contaminated clothing should be changed immediately.

The current safety data sheet should be observed. This contains further information on labelling, transport and storage as well as information on handling, product safety, toxicity and ecology.

Use biodides safely. Always read the label and product information before use.

Preventol® Z

Labelling

This product information must be used in conjunction with the currently valid safety data sheet for the product which indicates labelling according to the German Hazardous Substances Regulation and the corresponding EU Directive.

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QUALITY PERFORMS.

Monopersulfate Compound
General Technical Attributes.

Oxone™

QUALITY WORKS.

LANXESS
Energizing Chemistry

MONOPERSULFATE COMPOUND
PRODUCT INFORMATION

What is Oxone™?

Oxone™ monopersulfate compound is a white, granular, free-flowing peroxygen that provides powerful non-chlorine oxidation for a wide variety of industrial and consumer uses.

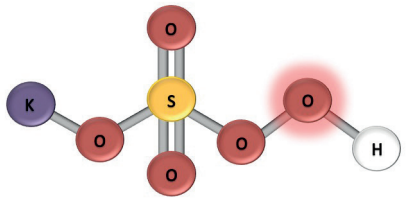
The active ingredient of Oxone™ is potassium peroxymonosulfate, $KHSO_5$ (CAS 10058-23-8), commonly known as potassium monopersulfate, which is present as a component of a triple salt with the formula $2KHSO_5 \cdot KHSO_4 \cdot K_2SO_4$ (pentapotassium bis(peroxymonosulphate) bis(sulphate), [CAS 70693-62-8]).

The oxidizing power of Oxone™ is derived from its peracid chemistry; it is the first neutralization salt of peroxymonosulfuric acid H_2SO_5 (also known as Caro's acid).

Applications*

- Swimming pool shock oxidizer
- Printed wiring board microetchant
- Repulping aid for wet-strength resin destruction
- Odor control agent in wastewater treatment
- Bleach component in denture cleanser and laundry formulations
- Disinfectant active ingredient
- Other uses, where its combination of powerful oxidation and relative safe handling properties are of value

*As with any product, use of Oxone™ in a given application must be tested (including field testing, etc.) by the user in advance to determine suitability.



Standard Potential

The standard electrode potential (E°) of $KHSO_5$ is given by the following half cell reaction:

$$HSO_5^- + 2H^+ + 2e^- \longrightarrow HSO_4^- + H_2O \quad E^0 = 1.85V$$

The thermodynamic potential is high enough for many room temperature oxidations, including:

- Halide to active halogen
- Oxidation of reduced sulfur and nitrogen compounds
- Cyanide to cyanate
- Epoxidation of olefins
- Baeyer-Villiger oxidation of ketones
- Copper metal to cupric ion
- Ferrous to ferric ion
- Manganous to manganic ion

Stability

Oxone™ is a very stable peroxygen in the solid state and loses less than 0.5% (relative) of its activity per month when stored under recommended conditions. However, like all other peroxygens, Oxone™ undergoes very slow disproportionation with the liberation of heat and oxygen gas.

Figure 1: Effect of Storage Temperature on Long-Term Stability of Acidic Oxone™ Solutions (120 g/L, pH 1.6)

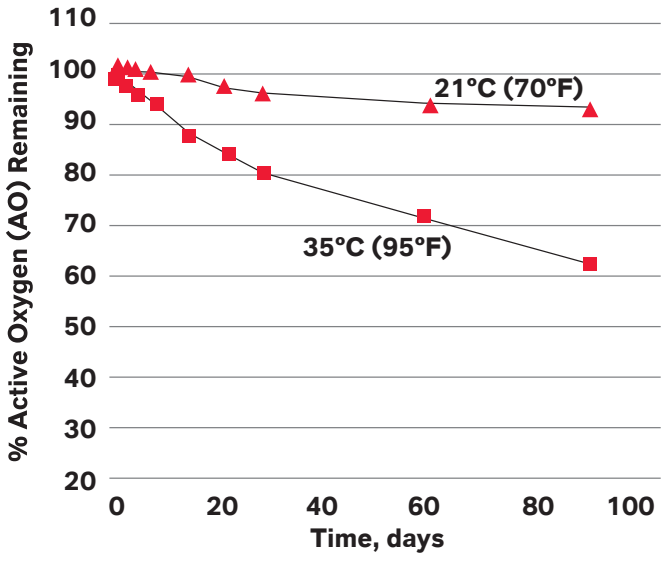
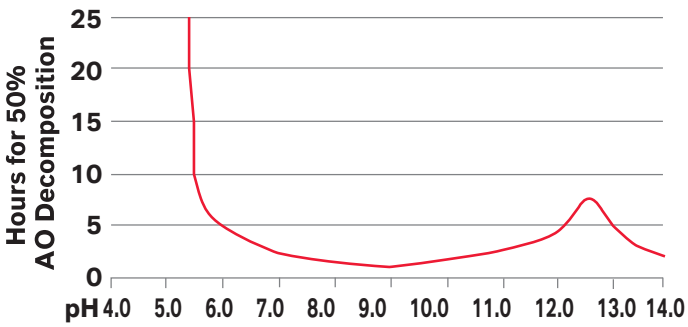


Figure 2: Effect of pH on Oxone™ Solution Stability (3 wt% Solution at 32°C [90°F])



If a decomposition is associated with high temperature, decomposition of the constituent salts of Oxone™ may generate sulfuric acid, sulfur dioxide, or sulfur trioxide.

The stability is reduced by the presence of small amounts of moisture, alkaline chemicals, chemicals that contain water of hydration, transition metals in any form, and/or any material with which Oxone™ can react. Because the decomposition of Oxone™ is exothermic, the decomposition can self-accelerate if storage conditions allow the product temperature to rise (see Product Safety and Handling bulletin).

Aqueous solutions of Oxone™ are relatively stable when made up at the unmodified pH of the product (Figure 1). The stability is adversely affected by higher pH, especially above pH 7. A point of minimum stability exists at about pH 9, at which the concentration of the mono-anion HSO_5^- is equal to that of the di-anion SO_5^{2-} (Figure 2). Cobalt, nickel, iron and manganese are particularly strong catalysts for the decomposition of Oxone™ in solution; the degree to which catalysis occurs is dependent on the concentrations of Oxone™ and the metal ion.

Product Grades

Oxone™ is available in both granular and liquid* forms. By screening, grinding, or compaction/granulation processing, several granular grades (MPS CMP, PS - 16, and CG) are produced that differ in particle size distribution (Table 3). Liquid products are specially formulated to optimize active oxygen stability. Please contact LANXESS Sales and Support or an Oxone™ technical representative for more information and guidance about which grade of product is best suited for your specific application. *Liquid availability is region-dependent.

Solubility

Oxone™ is highly and readily soluble in water as shown in Table 2. At 20°C (68°F), the solubility of Oxone™ in water is >250 g/L. At concentrations above saturation, potassium sulfate will precipitate, but additional active component, potassium peroxymonosulfate, will remain in solution.

Table 1*: Oxone™ Physical Properties and Typical Analysis

Molecular Weight (Triple Salt)	614.7
Active Oxygen	
Min. %	4.5
Typical Analysis %	4.7
Theoretical % (Triple Salt)	5.2
Active Component $KHSO_5$	
Min. %	42.8
Typical %	44.7
pH, 25°C (77°F)	
1% solution	2.3
3% solution	2.0
Solubility, g/100 cc H_2O, 20°C (68°F)	29.8
Loss on Drying at 60°C (140°F), Max. %	0.1
Stability	
% active oxygen loss/month	<0.5
Standard Electrode Potential (E°), V	+1.85
Heat of Decomposition	
kJ/kg	251
Btu/lb	108
Thermal Conductivity	
W/m•K	0.161
Btu•ft/h•ft²•F	0.093
Purity, %	90.3

* These items are provided as general information only. They are approximate values and are not considered part of the product specifications.

Table 2*: Aqueous Solubility of Oxone™ Monopersulfate Compound

°C	°F	g/100 cc H_2O	wt%	g/L
0	32	11.0	9.9	106
5	41	15.1	13.1	144
10	50	20.8	17.2	197
20	68	29.8	23.0	277
30	86	34.0	25.4	307
40	104	42.0	29.6	357
50	122	43.6	30.4	375
60	140	46.0	31.5	387

* These items are provided as general information only. They are approximate values and are not considered part of the product specifications.

Table 3: Typical Bulk Density* and Particle Size Specification of Oxone™ Product Grades

	MPS CMP	PS - 16	CG
Bulk density			
lb/ft³	72 - 79	75 - 87	56 - 75
g/cm³	1.15 - 1.27	1.20 - 1.40	0.90 - 1.20
Particle size, % Pass Thru (or % Retained, where specified)			
# 14 (1410 µm)	–	–	0 – 4 (% Retained)
# 16 (1180 µm)	–	99 - 100	–
# 20 (850 µm)	100	80 - 100	–
# 30 (600 µm)	95 - 100	63 - 100	–
# < 70 (210 µm)	–	–	0 – 4
# 100 (150 µm)	5 - 35	5 - 33	–
# 200 (75 µm)	0 - 10	0 - 10	–
# 325 (45 µm)	0 - 5	0 - 3	–

Analytical Test Methods

Active Oxygen/Active Component

1. Obtain a representative sample by riffling, quartering, blending, or other means.
2. Carefully weigh (to at least three decimal places) at least two specimens of 0.3 ± 0.05 g each.
3. Add to a 250 mL beaker or Erlenmeyer flask containing a magnetic stir bar: 75 mL deionized water, 10 mL 20 % (v/v) sulfuric acid, and 10 mL 25 % (w/w) potassium iodide solution. (Deionized water and all reagents should be <20°C [≤68°F].) Add a weighed specimen of Oxone™, and stir until dissolved.
4. Immediately titrate the specimen with 0.1 N sodium thiosulfate solution to a pale yellow color. Add 2–3 mL starch indicator solution, which will turn deep blue. Immediately continue the titration to a colorless endpoint that persists for at least 30 seconds.
5. Calculations

$$\% \text{ active oxygen} = \frac{\text{mL thio} \times \text{N thio} \times 0.008 \times 100}{\text{specimen weight (g)}}$$

$$\% \text{ active component } (KHSO_5) = \% \text{ active oxygen} / 0.1053$$

6. Report the average of specimens analyzed.

Loss on Drying

1. Using the sampling procedure described above, weigh at least two 10 ± 0.1 g specimens in tared, approximately 10.2 cm (4 in) diameter, shallow aluminum weighing dishes.
2. Dry for 4 minutes in a Halogen Moisture Analyzer, such as the Mettler Toledo HG63 at 60 ± 0.5°C (140 ± 1.0°F).
3. At the completion of the drying program, the percent loss on drying will be displayed.
4. Remove the specimen, and cool to room temperature. Repeat measurement on second specimen. Report the average of specimens analyzed.

Other Testing Methods for Oxone™

Low concentrations of Oxone™ (approx. 0–20 ppm), which are commonly used in swimming pool treatments, can be measured in the presence of active chlorine by special test kits offered by Taylor (Model K-1518 , Model K-1520) and Lamotte (Model 3330-01). Taylor (Model K-1518) is a titrimetric test kit, whereas Taylor (Model K-1520) and Lamotte (Model 3330-01) are colorimetric.

In the absence of active chlorine, low concentrations of Oxone™ can be measured with a standard DPD-4 test kit; the result must be multiplied by 5.0 to obtain the correct Oxone™ concentration in ppm.

In higher concentrations, Oxone™ can be measured by addition of a known quantity of ferrous ammonium sulfate (in excess), followed by back-titration with standardized potassium permanganate or ceric sulfate solution.

LANXESS
Energizing Chemistry

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Note: The information contained in this publication is current as of March, 2017. Please contact LANXESS Deutschland GmbH to determine if this publication has been revised.

Oxone™ brochure/03.17

ACTICIDE® MV
Product Information

ACTICIDE® MV is a VOC-free, monovalent stabilised, isothiazolinone based biocide for the wet state preservation of aqueous formaldehyde and bivalent metal ion sensitive formulations.

Chemical and Physical Characteristics

Composition:	A formulation of 5-chloro-2-methyl-4-isothiazolin-3-one (CIT) and 2-methyl-4-isothiazolin-3-one (MIT)
Appearance:	Colourless to light yellowish liquid
Odour:	Mild
Refractive Index (20°C):	1.3370 - 1.3430
Density (20°C):	1.015 - 1.035 g/ml
pH (20°C):	3.0 - 4.0
MIT:	0.35 - 0.45%
CIT:	1.05 - 1.15%
Colour:	Max. 2.0
Solubility:	Fully soluble in water, most lower alcohols and glycols
Stability in application*:	Stable over the pH range 2 - 9 and up to 60°C

Note: *These characteristics do not constitute a sales specification*

Biocidal Properties

ACTICIDE® MV has a very broad activity spectrum against the bacteria, moulds and yeasts that may cause infection and deterioration of water based products including the following organisms:

Test Organisms		
Bacteria	**Moulds**	**Yeasts**
Corynebacterium sp.	*Aspergillus niger*	*Saccharomyces cerevisiae*
Escherichia coli	*Penicillium funiculosum*	
Klebsiella sp.		
Proteus penneri		
Pseudomonas aeruginosa		

Applications / Use Levels

ACTICIDE® MV is particularly recommended for the wet state preservation of bivalent metal ion sensitive products such as some polymer emulsions and other formulations. **ACTICIDE® MV** is suitable for the formulation of detergents and cleansers. It may also be used to protect a wide range of other aqueous products including paints, adhesives, ceramic glazes, fillers and sealants and as a tankside additive for ready-diluted metalworking fluids.

Normal use concentrations are in the range 0.05 - 0.4%, depending on the product to be protected and the environmental conditions to which it will be exposed. The precise level required by a specific formulation can be determined by the local **Thor Microbiological Technical Centre**.

Addition / Compatibility

ACTICIDE® MV can be added at any time during production but care should be taken to ensure that external factors have no negative impact on stability of the actives. However, it is advised to add it as early as possible to give protection throughout the production process.

ACTICIDE® MV exhibits no compatibility problems in most practical applications. It may be used in formaldehyde sensitive systems and is particularly suitable for products in which biocides stabilised with bivalent ions such as Mg^{2+} and Cu^{2+} may be incompatible. Due to the large range of possible applications, it is recommended that the stability of the active ingredients, system compatibility and any influences on the product properties during production, storage, transport and in the application are tested prior to use. The use of oxidising, reducing agents and nucleophiles which may adversely affect active ingredient stability should be avoided. Care should be taken to ensure that temperature, pH and redox potential at the point of addition are suitable for stability of the product.

It is generally recommended to routinely test for changes in chemical and physical properties such as discolouration (colour stability), viscosity and odour, for each individual matrix system, as well as the effects of external factors such as pH, moisture, temperature and UV light.

Prior to use, **ACTICIDE® MV** must not be diluted or mixed with other raw materials to avoid negative impact on the active agent. Please contact our **Thor Microbiological Technical Centre** for further information.

Packaging / Storage / Regulatory Approvals

Packaging:	Plastic drums: 30 kg / 200 kg, IBCs: 1,000 kg
Shelf Life:	18 months from production date when stored at approximately 20°C
Availability:	Ex stock in the above packaging
Storage:	Store only in the original container. Keep containers tightly sealed. Prevent release to the environment by adequate secondary containment and use of appropriate spill control procedures.
Regulatory Approvals:	The active substances of **ACTICIDE® MV** have BfR chapters 14 and 36, FDA 21 CFRs 175.105, 176.170, 176.180 and 176.300 and a wide range of other regulatory approvals.

Safety / Labelling / Toxicology

For detailed information on the toxicology and handling of **ACTICIDE® MV** and advice on the labelling of products in which it may be used, please refer to the separate Safety Data Sheet or seek specific advice from **Thor**.

* The data given are time and system dependant.