Product Information

PREVENTOL® CMK Preservative

p-chloro-m-cresol
EPA Registration No.39967-12

Uses
For the preservation of adhesives, glues, joint cements, polymer dispersions and emulsions, metalworking/cutting fluids, dyes, industrial lubricants, pigments and filler suspensions, materials in the building industry, paint and coatings, paper, textile, photo, oil industries, and leather at all stages of production.

Chemical and physical data*

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>99.9% 3-methyl-4-chlorophenol (chlorocresol, p-chloro-m-cresol)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product description</td>
<td>Colorless to white pellets which may contain traces of a release agent</td>
</tr>
</tbody>
</table>

Specification
The specification parameters can be found in the current product specification.

Characteristic data*

<table>
<thead>
<tr>
<th>Density (20°C)</th>
<th>~1.37 g/cm³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk Density</td>
<td>~630 kg/m³</td>
</tr>
<tr>
<td>Vapor Pressure (20°C)</td>
<td>~0.08 mbar</td>
</tr>
<tr>
<td></td>
<td>~7 mbar</td>
</tr>
<tr>
<td>(100°C)</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>~6.5 (0.1% in water)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>~239°C</td>
</tr>
<tr>
<td>Flash Point</td>
<td>~118°C (DIN 51758)</td>
</tr>
<tr>
<td>Ignition Temperature</td>
<td>~590°C (DIN 51794)</td>
</tr>
<tr>
<td>pH stability range</td>
<td>~1-14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Solubility (20°C)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol</td>
<td>~500 g/l</td>
</tr>
<tr>
<td>10% NaOH</td>
<td>~320 g/l</td>
</tr>
<tr>
<td>toluene</td>
<td>~300 g/l</td>
</tr>
<tr>
<td>water</td>
<td>~4 g/l</td>
</tr>
</tbody>
</table>

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

Storage
Product should be stored in the original sealed package. When exposed to air, light, moisture or heat, the product may turn slightly red. Change in the color of product does not affect the efficacy of the product.

Spectrum of Activity
Minimal Inhibitory Concentration (MIC) in ppm of Preventol® CMK Preservative in nutrient agar.
<table>
<thead>
<tr>
<th>Bacteria</th>
<th>MIC (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aeromonas punctata</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Bacillus mycoides</em></td>
<td>100-150</td>
</tr>
<tr>
<td><em>Bacillus subtilis</em></td>
<td>150</td>
</tr>
<tr>
<td><em>Desulfovibrio desulfuricans</em></td>
<td>35</td>
</tr>
<tr>
<td><em>Enterobacter aerogenes</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Escherichia coli</em></td>
<td>200-250</td>
</tr>
<tr>
<td><em>Escherichia coli EHEC DSM 8579</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Legionella pneumophila ATCC 33152</em></td>
<td>100-200</td>
</tr>
<tr>
<td><em>Leuconostoc mesenteroides</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Listeria monocytogenes DSM 20600</em></td>
<td>100-200</td>
</tr>
<tr>
<td><em>Mycobacterium terrae DSM 43227</em></td>
<td>100</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em></td>
<td>500</td>
</tr>
<tr>
<td><em>Pseudomonas aeruginosa</em></td>
<td>500-800</td>
</tr>
<tr>
<td><em>Pseudomonas fluorescens</em></td>
<td>500</td>
</tr>
<tr>
<td><em>Staphylococcus aureus MRSA</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Staphylococcus aureus MRSA DSM 2569</em></td>
<td>100-200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yeast</th>
<th>MIC (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Candida albicans</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Candida krusei</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Rhodotorula mucilaginosa</em></td>
<td>100</td>
</tr>
<tr>
<td><em>Saccharomyces cerevisiae</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Saccharomyces bailii</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Rhodotorula rubra</em></td>
<td>100</td>
</tr>
<tr>
<td><em>Torula utilis</em></td>
<td>200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fungi</th>
<th>MIC (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Alternaria tenuis</em></td>
<td>75-100</td>
</tr>
<tr>
<td><em>Aspergillus flavus</em></td>
<td>100</td>
</tr>
<tr>
<td><em>Aspergillus niger</em></td>
<td>100</td>
</tr>
<tr>
<td><em>Aspergillus terreus</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Aspergillus ustus</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Chaetomium globosum</em></td>
<td>75-100</td>
</tr>
<tr>
<td><em>Microsporum canis CBS 38564</em></td>
<td>10-100</td>
</tr>
<tr>
<td><em>Mucor racemosus</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Penicillium brevicaula</em></td>
<td>100-200</td>
</tr>
<tr>
<td><em>Rhizopus stolonifer</em></td>
<td>200</td>
</tr>
<tr>
<td><em>Trichophyton mentagrophytes</em></td>
<td>50-100</td>
</tr>
</tbody>
</table>

**Application**

Preventol® CMK Preservative is best used pre-dissolved (e.g. in alcohol, glycol or caustic soda solution) so that it can be more easily distributed in the product to be preserved. Preventol® CMK Preservative can also be added in the form of an alkaline stock solution. A stock solution containing 30% PREVENTOL® CMK Preservative can be formulated by stirring 1 kg Preventol® CMK Preservative into 1.85 liters of water and 0.5 kg 50% caustic soda solution until it dissolves. Dissolving can be accelerated by gently heating the liquid. The steam-volatility of PREVENTOL® CMK Preservative must be taken in account in the case of certain applications (e.g. when drying glue slurries which contain Preventol® CMK Preservative).
Material Compatibility
Preventol® CMK Preservative is compatible with high quality stainless steel. In the case of plastics, Polyethylene (PE), Polypropylene (PP), Teflon (PTFE) and FRC Atac 382 are compatible with Preventol Preservative. Viton and EPDM 75 have shown good compatibility with the Preventol® CMK Preservative.

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.

Directions for Use
It is a violation of federal law to use this product in a manner inconsistent with its labeling. The following guidance is given as an approximation for each use pattern, but field-testing is recommended to achieve optimum effectiveness.

Recommended use: The following recommended doses of Preventol® CMK Preservative must be used to provide preservative efficacy:

Adhesives
The weight of Preventol® CMK Preservative to be used is based on the total weight of the adhesive formulation. The preservative should be incorporated into the adhesive formulation just after the initial addition of water. The adhesive formulation should be stirred to ensure homogeneous distribution. In many cases, Preventol® CMK Preservative is best pre-dissolved in suitable solvent systems such as ethanol or 1,2-propanediol, or by preparation of the preservative in an aqueous caustic soda stock solution to be added to the glues and adhesives to be preserved. In the production of dry glues, Preventol® CMK Preservative should be added toward the end of thickening in order to minimize any losses of active substance. Independent of the method chosen, the preservative must be evenly distributed throughout the adhesive or glue to be preserved in order to achieve satisfactory results.

Recommended Dosages:
- Bone Glues: 0.10-0.15%
- Skin Glues: 0.15-0.25%
- Fish Glues: 0.15-0.25%
- Leather Glues: 0.10-0.25%
- Gelatin based glues: 0.10-0.20%
- Casein containing adhesives: 0.20-0.30%
- Other animal glues: 0.10-0.25%
- Starch based glues (Liquid): 0.10-0.15%
- Starch based glues (Solid): 0.20-1.00%
- Dextrin adhesives: 0.05-0.10%
- Hydroxyethyl-cellulose adhesives: 0.05-0.10%
- Methyl cellulose adhesives: 0.05-0.10%
- Other plant based adhesives: 0.05-0.25%
- Polyvinylacetate adhesives: 0.05-0.25%
- Acrylic adhesives: 0.05-0.25%
- Styrene butadiene (SBR Latex) adhesives: 0.05-0.25%
- Other adhesive emulsions: 0.05-0.25%
- Gumarabic and similar gums: 0.10-0.15%
- Rosin paper sizes: 0.10-0.25%

Joint Cements
The weight of Preventol® CMK Preservative to be used is based on the total weight of the joint cement formulation. The preservative should be incorporated into the joint cement formulation just after the initial addition of water or other liquid components sufficient to disperse the preservative. To ensure homogeneous distribution, good stirring is recommended.
Recommended Dosages
Vinyl latex based 0.075-0.20%  
Protein based 0.075-0.20%  
Other joint cement materials 0.075-0.20%

Polymer Dispersions and Emulsions
Preventol® CMK Preservative should be added immediately after the preparation of the polymer dispersion or emulsion during the cooling process. Losses of active ingredient caused by elevated temperatures should be taken into account and avoided by suitable measures. For quick homogeneous distribution, Preventol® CMK Preservative should be dissolved in suitable solvents such as ethanol, or 1,2-propanediol, or, alternatively by preparation of water dilutable alkaline solutions. These pre-dissolved solutions are then added to the polymer dispersions or emulsions.

Recommended Dosages:
Acrylic 0.05-0.20%
Polyvinyl acetate (PVA) 0.05-0.20%
Styrene-Butadiene (SBR Latex) 0.05-0.20%
Other polymer emulsions 0.05-0.20%

Leather
Preventol® CMK Preservative may be dissolved in five times the amount of alcohol and then stirred into pickle solutions. In the case of chrome leather, an effective protection against mold attack may be obtained without additional labor by stirring Preventol® CMK Preservative together with soda into the basifying solution, since Preventol® CMK Preservative dissolves freely in the alkaline solution together with soda. The oil-soluble Preventol® CMK Preservative can also be dissolved in the fat liquor and applied in the drum simultaneously. Finished vegetable-tanned leathers and chrome leathers may also be protected against mold attack by a treatment on both sides of the material with a 0.2-0.4% solution of Preventol® CMK Preservative.

Recommended Dosages:
Pickle solutions and pickled hides 0.15-0.25%
Chrome leather (calculated on pelt weight) 0.10-0.20%
Leather pasting adhesives 0.05-0.10%
Leather pigment finishes 0.20-0.40%

Lubricoolants and Mineral Oil Based Products
Preventol® CMK Preservative can be incorporated into the original concentrate of metalworking fluids by adding the solid preservative under stirring until the preservative is completely dissolved (the compatibility of the fluid to be preserved and the preservative should be evaluated before this method is attempted). Preventol® CMK Preservative is equally suitable for tank side addition (maintenance). In this case, the preservative has to be added in a pre-dissolved form. Suitable solvents for this purpose are, for example, ethanol, or 1,2-propanediol, or, alternatively by preparation of water dilutable alkaline solutions. To achieve maximum distribution within the ready-to-use dilution of the metalworking alkaline solutions, the preservative should be dosed [at a point] in the system under conditions which ensure good circulation.

Recommended Dosages:
Soluble Oils (Oil Emulsions, Aqueous) Concentrates 1.00-6.00%  
Ready for Use 0.05-0.30%  
Semi-Synthetic (Emulsions, Aqueous) Concentrates 1.00-6.00%  
Ready for Use 0.05-0.30%
Synthetic (Solutions)
Concentrate 1.00-6.00%
Ready for Use 0.05-0.30%

Printing Industry
Preventol® CMK Preservative is incorporated preferably after pre-dissolution in suitable systems such as ethanol or 1,2-propanediol, or alternatively by preparing water dilutable alkaline solutions, which are added to the products to be preserved. Stirring is recommended to achieve homogeneous distribution of the preservative.

Recommended Dosages:
Inks 0.05-0.20%
Fountain solutions 0.05-0.20%
Printing pastes 0.20-0.30%
Other printing materials and auxiliaries 0.05-0.30%

Building Industry
Preventol® CMK Preservative can be added directly to concrete additive solutions having an alkaline pH-value. The additive solution should be stirred well to dissolve the preservative material efficiently. In the case of neutral or acid concrete additives, it is preferable to incorporate Preventol® CMK Preservative by first dissolving it in a suitable solvent such as ethanol or 1,2-propanediol or by converting it to a water dilutable alkaline concentrate. In this pre-dissolved form Preventol® CMK Preservative can easily be incorporated into the concrete additives in such a way that preservative is homogeneously distributed throughout the product.

Recommended Dosages:
Bitumen emulsion 0.15-0.40%
Concrete additives 0.15-0.40%
Other building materials and auxiliaries 0.15-0.40%

Coating Industry
Preventol® CMK Preservative can be incorporated directly into pigments and fillers for coatings applications, or it can also be dissolved in a suitable solvent to be incorporated into the make-up water during the grind. For best results, the preservative should be dispersed homogeneously throughout the paint material. Depending on the ingredients, discoloration may occur and should be evaluated before conducting lab trials.

Recommended Dosages:
Dyestuff paste, knifing fillers and plastic putty 0.10-0.15%
Casein based coatings 0.30-0.40%
Paints 0.05-0.40%
Other auxiliaries and coating materials 0.05-0.40%
Synthetic resin dispersions 0.05-0.25%

Paper Industry
Preventol® CMK Preservative can be metered directly into the products to be preserved following the concentrations as indicated above. Good stirring is recommended to ensure fast and even distribution of the preservative throughout the products. In many cases it might be preferable to first pre-dissolve Preventol® CMK Preservative in suitable solvent systems such as ethanol or 1,2-propanediol, or alternatively by preparation of water dilutable alkaline solutions which then are added to the products to be preserved. Stir well to achieve homogeneous distribution of the preservative. Losses of active ingredient at elevated temperatures should be taken into account and avoided by suitable measures.
Incorporation of Preventol® CMK Preservative in dry components of suspensions is possible, if temperature during grinding does not exceed 60°C.

**Recommended Dosages:**
- Rosin Paper Sizes: 0.05-0.15%
- Filler Suspensions and coating compounds: 0.05-0.20%
- Starch slurries: 0.10-0.20%
- Pigment slurries: 0.05-0.30%
- Other materials and auxiliaries: 0.05-0.20%

**Textile Industry**
Preventol® CMK Preservative may be incorporated into the dry thickener by evenly mixing with the preservative to result in a pre-preserved, dry product. [Grinding required] Alternatively, incorporation of the preservative can be done at the stage of the ready-to-use thickener solution. In this case, Preventol® CMK Preservative is best pre-dissolved in suitable solvents such as ethanol or 1,2 propanediol, or an aqueous caustic soda stock solution is prepared and then added to thickener solutions to be preserved. For fast and homogeneous distribution of the preservative, stirring is recommended.

**Recommended Dosages:**
- Spinning Preparation: 0.05-0.15%
- Sizes and finishing agents: 0.10-0.15%
- Yarn humidifiers: 0.10-0.20%
- Printing thickeners (solid): 0.5-2.00%
- Printing thickeners (liquid): 0.10-0.15%
- Other materials and auxiliaries: 0.05-0.20%

**Photo Industry**
Incorporation of Preventol® CMK Preservative in concentrations as indicated above should be done after pre-dissolving the preservative in suitable solvent systems such as ethanol or 1,2-propanediol or others which are compatible with the individual production process.

**Recommended Dosages:**
- Gelatin: 0.05-0.20%
- Other materials and auxiliaries: 0.05-0.20%

**Oil Industry**
Preventol® CMK Preservative may be incorporated into the solid by evenly mixing with the preservative to result in a pre-preserved, dry product. Alternatively, incorporation of the preservative can be done at the stage of the ready to use drilling mud. In this case, Preventol® CMK Preservative is best pre-dissolved in suitable solvents such as ethanol or 1,2 propanediol, or an aqueous caustic soda stock solution is prepared and then added to the thickener solutions to be preserved. For fast and homogeneous distribution of the preservative, stirring is recommended.

**Recommended Dosages:**
- Biopolymers, solid (xanthan, starch, galactomannan,etc): 0.5-2.00%
- Biopolymers, liquid (Drilling muds): 0.05-0.20%
- Other materials and auxiliaries: 0.05-0.20%

**Additional Materials**
The concentration of Preventol® CMK Preservative as indicated is based on total weight of the products to be preserved. Depending on the type of product to be protected, Preventol® CMK Preservative can be
incorporated either directly or after pre dissolution in suitable solvent systems such as ethanol or 1,2-propanediol, or by preparation of water dilutable alkaline solutions (e.g. in caustic soda). Independent of the method chosen, for satisfactory results, the preservative must be achieved for example, by incorporation of the preservative into the make-up water at the beginning of the production and/or generally by stirring at every appropriate production stage.

*Note: The FDA has approved this material as a Food Contact Substance with intended use at levels up to 1% as an antimicrobial preservative in lubricants that may have incidental contact with food.

Recommended Dosages:
Polishing and wax material 0.10-0.40%
Protein solutions 0.20-0.20%
Cleaning solutions, detergents 0.05-0.20%
Ceramic glazes 0.10-0.20%
Fire Extinguishing materials 0.10-0.30%
Materials and auxiliaries in the leather industry 0.10-0.30%
Cosmetic and toiletry raw materials 0.10-0.30%
Industrial Lubricants 0.10-1.00%

Registration / Approval / Recommendation**
EPA Registration No. 39967-12

U.S.A.
The active ingredient in Preventol® CMK Preservative is listed in the following FDA approvals (concentration limits or other limitations may apply):

21 CFR 175.105 (Adhesives) For use as a preservative only.

21 CFR 176.200 (Defoaming agents used in coatings) For use as preservative of defoamer only

21 CFR 176.210 (Defoaming agents used in the manufacture of paper and paperboard)

21 CFR 178.3120 (Indirect Food Additives: Adjuvants, Production Aids, and Sanitizers—Animal Glue) For use as preservative only

FCN 560—filed by LANXESS. For use as an antimicrobial preservative in lubricants with incidental food contact. The FCS is for use at a level not to exceed 1% by weight of lubricants for incidental food contact

The use of Preventol® CMK Preservative 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

**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.
Precautions
Preventol® CMK Preservative is supplied in the form of pellets. Contact of the product with the skin and the inhalation of dust should be avoided. The precautions generally recommended for handling chemicals should be observed, e.g. wearing of protective clothing, safety goggles, protective gloves and dust mask.
If the product comes into contact with the skin, the affected area should be washed immediately with large amounts of a polyethylene glycol P 300 and ethanol mixture (2:1) and then 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.

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.

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.

Note: The information contained in this bulletin is current as of January 2016. Please contact LANXESS Corporation to determine if this publication has been revised.

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