Product Information

Preventol® O extra / ON extra
**Preventol® O extra / ON extra**

**Use**
For the preservation of aqueous products such as glues and adhesives, thickener solutions, concrete additives, filler suspensions, pigment slurries.
As a preservative for the leather industry.
For the preservation of textile auxiliaries.
For the preservation of whole citrus fruit.
As an active ingredient for disinfectants.
For the manufacture of plastics additives such as heat stabilisers.

**Chemical and physical data**

**Preventol® O extra**

<table>
<thead>
<tr>
<th>Active ingredient:</th>
<th>approx. 99 % ortho-phenylphenol, 2-phenylphenol, (OPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product description:</td>
<td>flakes or fused</td>
</tr>
</tbody>
</table>

**Specification**

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

The product (E 231) fulfills the special purity requirements of the appendix of EU guideline 96/77/EG from 2 December 1996 (definition of specific purity criteria for food additives other than dyes and sweeteners).

**Characteristic data**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density (20 °C):</td>
<td>approx. 1.24 g/cm³</td>
</tr>
<tr>
<td>Bulk density (flakes):</td>
<td>approx. 650 kg/m³</td>
</tr>
<tr>
<td>Vapour pressure (20 °C):</td>
<td>0.00475 hPa</td>
</tr>
<tr>
<td>(25 °C):</td>
<td>0.00906 hPa</td>
</tr>
<tr>
<td>(50 °C):</td>
<td>0.162 hPa</td>
</tr>
<tr>
<td>Boiling point (1013 mbar):</td>
<td>approx. 287 °C</td>
</tr>
<tr>
<td>Flash point:</td>
<td>approx. 138 °C (DIN 51758)</td>
</tr>
<tr>
<td>pH (0.01 % in water):</td>
<td>approx. 7</td>
</tr>
<tr>
<td>Stability range:</td>
<td>pH 1–14</td>
</tr>
</tbody>
</table>

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.*
Preventol® O extra / ON extra

**Solubility (20 °C) in:**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>water</td>
<td>0.5 - 0.6 g/l</td>
</tr>
<tr>
<td>ethanol</td>
<td>5900 g/l</td>
</tr>
<tr>
<td>isopropanol</td>
<td>3300 g/l</td>
</tr>
<tr>
<td>10 % NaOH</td>
<td>500 g/l</td>
</tr>
</tbody>
</table>

**Storage**

Provided the product is correctly stored and kept in the original sealed package, the shelf life is 2 years. The product may change its colour slightly when exposed to air, but this does not affect its effectiveness.

**Preventol® ON extra**

<table>
<thead>
<tr>
<th>Active ingredient:</th>
<th>approx. 70 % sodium-2-phenylphenolate (Na-OPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product description:</td>
<td>flakes; the product contains water of crystallisation</td>
</tr>
</tbody>
</table>

**Specification**

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

The product (E 232) fulfills the special purity requirements of the appendix of EU guideline 96/77/EG from 2 December 1996 (definition of specific purity criteria for food additives other than dyes and sweeteners).

**Characteristic data***

|Bulk density (flakes):        | approx. 400 - 450 kg/m³ |
|pH (2 % in water):            | 11.1 - 11.8              |
|Stability range:              | up to pH 14              |

*Characteristic data provide further information about the product and are not subject to constant monitoring. They are therefore not binding.
Preventol® O extra / ON extra

Solubility (20 °C) in:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ethanol</td>
<td>2000 g/l</td>
</tr>
<tr>
<td>isopropanol</td>
<td>1500 g/l</td>
</tr>
<tr>
<td>water</td>
<td>1200 g/l (at 25 °C)</td>
</tr>
</tbody>
</table>

Storage

Provided the product is correctly stored and kept in the original sealed package, its shelf life is 2 years. The product may discolour (turn slightly red) when exposed to air, light, moisture or heat. This does not impair its effectiveness.

Application

The halogen-free grades Preventol® O extra and ON extra have a particularly broad spectrum of activity covering bacteria, yeasts and mould fungi (see Table I). Before use, Preventol® O extra must be dissolved in either caustic soda solution, a low alcohol (e.g. glycol) or a water/alcohol mixture. To produce a 30 % stock solution of Preventol® O extra in a caustic soda solution, 1 kg Preventol® O extra is dissolved in a solution based on 1.85 l water and 0.5 kg 50 % caustic soda solution. It is not necessary to predissolve Preventol® O extra because this, being a sodium salt, naturally dissolves easily in water. In aqueous media with a pH below 9, the solubility of Preventol® O extra may be too low to create the concentrations necessary for reliable preservation. The same is true for Preventol® ON extra which, in solutions with a pH below 9, releases Preventol® O extra. In such cases, it is recommended that Preventol® CMK or Preventol® CMKNa is used, either alone or in combination with Preventol® O extra or ON extra. Alternatively, Preventol® WB, a combination of active ingredients, can be used. Preventol® O extra and Preventol® ON extra have outstanding thermal stability. Nonetheless, the release of active ingredient during the manufacture, for example, of dry glues is unavoidable, since phenolic active ingredients are fairly steam-volatile. The higher the pH of the solution, the lower the release of active ingredient.

Preventol® O extra and Preventol® ON extra can also be incorporated into solid products such as print thickeners and powdered glues. An even distribution of the active ingredient in the finished product, which is necessary to guarantee a reliable effect, can be achieved by mixing and grinding the product. It is more beneficial, however, to use Preventol® ON-S, a finely ground grade of Preventol® ON extra, which can be easily mixed with powders.

Applications and guide additions for Preventol® O extra and Preventol® ON extra are listed in Table II.
### Spectrum of activity

Minimum inhibitory concentrations (mg/l) of Preventol® O extra in nutrient agar

#### Table I

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Minimum Inhibitory Concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aeromonas punctata</td>
<td>200</td>
</tr>
<tr>
<td>Bacillus mycoides</td>
<td>100 - 300</td>
</tr>
<tr>
<td>Bacillus subtilis</td>
<td>100 - 200</td>
</tr>
<tr>
<td>Desulfovibrio desulfuricans</td>
<td>50</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>200</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>200</td>
</tr>
<tr>
<td>Leuconostoc mesenteroides</td>
<td>100 - 200</td>
</tr>
<tr>
<td>Proteus mirabilis</td>
<td>200</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>1500</td>
</tr>
<tr>
<td>Pseudomonas fluorescens</td>
<td>1000</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>200 - 300</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yeasts</th>
<th>Minimum Inhibitory Concentration (mg/l)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candida albicans</td>
<td>200</td>
</tr>
<tr>
<td>Candida krusei</td>
<td>200</td>
</tr>
<tr>
<td>Rhodotorula mucilaginosa</td>
<td>100</td>
</tr>
<tr>
<td>Saccharomyces cerevisiae</td>
<td>200</td>
</tr>
<tr>
<td>Saccharomyces bailii</td>
<td>100</td>
</tr>
<tr>
<td>Torula rubra</td>
<td>100</td>
</tr>
<tr>
<td>Torula utilis</td>
<td>100 - 200</td>
</tr>
<tr>
<td>Mould fungi</td>
<td>Percentage</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Alternaria tenuis</td>
<td>100 - 200</td>
</tr>
<tr>
<td>Aspergillus flavus</td>
<td>100</td>
</tr>
<tr>
<td>Aspergillus niger</td>
<td>50 - 100</td>
</tr>
<tr>
<td>Aspergillus terreus</td>
<td>200</td>
</tr>
<tr>
<td>Aspergillus ustus</td>
<td>150</td>
</tr>
<tr>
<td>Aureobasidium pullulans</td>
<td>35</td>
</tr>
<tr>
<td>Cephaloascus fragrans</td>
<td>200</td>
</tr>
<tr>
<td>Ceratocystis pilifera</td>
<td>100</td>
</tr>
<tr>
<td>Chaetomium globosum</td>
<td>50 - 100</td>
</tr>
<tr>
<td>Cladosporium herbarum</td>
<td>60</td>
</tr>
<tr>
<td>Cladosporium sphaerospermum</td>
<td>40</td>
</tr>
<tr>
<td>Gliocladium virens</td>
<td>200</td>
</tr>
<tr>
<td>Lentinus tigrinus</td>
<td>100</td>
</tr>
<tr>
<td>Mucor racemosus</td>
<td>200</td>
</tr>
</tbody>
</table>
Fields of application for Preventol® O extra

Table II

<table>
<thead>
<tr>
<th>Fields of application</th>
<th>Use</th>
<th>Suggested additions*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disinfectants and cleaning agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disinfectant concentrates</td>
<td>Disinfection</td>
<td>10 - 15 %</td>
</tr>
<tr>
<td>Ready-to-use disinfectant concentrates</td>
<td></td>
<td>0.075 - 0.15 %</td>
</tr>
<tr>
<td><strong>Timber</strong></td>
<td>Temporary protection</td>
<td>1 - 3 %</td>
</tr>
<tr>
<td>Sawn timber</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Leather</strong></td>
<td>Preservation</td>
<td>0.15 - 0.25 %</td>
</tr>
<tr>
<td>Chrome leather</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Glues and adhesives</strong></td>
<td>Preservation</td>
<td>0.10 - 0.20 %</td>
</tr>
<tr>
<td>Dextrine and cellulose glues</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starch glues (liquid)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starch glues (dry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper</strong></td>
<td>Preservation</td>
<td>0.07 - 0.15 %</td>
</tr>
<tr>
<td>Filler suspensions, coating compounds</td>
<td></td>
<td>0.025 - 0.050 %</td>
</tr>
<tr>
<td>Pigment slurries</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Textile Auxiliaries</strong></td>
<td>For the preservation in the ready-to-use dilution</td>
<td>1.0 - 2.0 %</td>
</tr>
<tr>
<td>Print thickeners (dry)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Citrus fruits</strong></td>
<td>Whole fruit preservation</td>
<td>0.15 - 1.3 %</td>
</tr>
<tr>
<td></td>
<td>in the dipping bath</td>
<td></td>
</tr>
<tr>
<td><strong>Various</strong></td>
<td>Preservation</td>
<td>0.20 - 0.30 %</td>
</tr>
<tr>
<td>Polishes, wax emulsions</td>
<td></td>
<td>0.1 - 0.3 %</td>
</tr>
<tr>
<td>Concrete additives</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Special reprints are available on request</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Where not indicated otherwise, the additions refer to the total weight. Recommended Preventol® ON extra concentrations are 1.6 times the Preventol® O extra concentration. Please note that the level of the addition depends on a large number of factors such as the germ content of the material, the formulation and production and storage conditions. The ideal concentration should be determined by on-site tests.
Registration / Approval / Recommendation

The products (E 231 and E 232) meet the purity requirements for food additives prescribed by EC Directives. They have been awarded the special purity mark named in the Federal German Regulation on Food Additives of July 10, 1984 (Appendix 2, List 2). Their content of arsenic, lead, copper and zinc do not exceed the maximum levels listed in Appendix 1 (general purity requirements).

11th Federal German Regulation on Cosmetics of 1988, Appendix VI, Part 1: Preventol® O extra and its salts are included in the list of approved preservatives. The maximum addition is 0.2 %, calculated as phenol-derivate.

BfR* Recommendation List XIV: o-phenylphenol and its sodium and potassium salts are listed as preservatives for plastics dispersions.

BfR* Recommendation List XXXVI: o-phenylphenol and its sodium and potassium salts are listed as preservatives for auxiliaries for the manufacture of paper and cardboard for foodstuff packaging.

*Federal Institute for Risk Assessment, previously BgVV

In the United States, 2-phenylphenol and/or its sodium salt is registered by the EPA and approved for use as a preservative or for other purposes by the Food and Drug Administration (FDA), including in the sections:

175.105 adhesives
175.300 coatings
176.170 paper and cardboard in contact with aqueous and fatty foods (only ON extra)
176.180 with dry food (only ON extra)
176.210 antifoaming agent for the manufacture of paper and cardboard
177.2600 products based on rubber
178.1010 disinfectant solutions
178.3120 glues based on animal products.

Preventol® O extra
EPA Registration 39967-3 (manufacturing-use)
EPA Registration 39967-11 (end-use)

Preventol® ON extra
EPA Registration 39967-24 (end-use)

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® O extra and ON extra are solid products which must be prevented from coming into contact with the skin. Care should be taken to prevent the dust being inhaled. The precautions generally recommended for handling chemicals should be observed, e.g. wearing of protective gloves, safety goggles and suitable 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 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 section 15 of the currently valid safety data sheet for the product which indicates labelling according to the German Hazardous Substances Regulation and the corresponding EU Directive.