**s&m Bronopol**

*Preservative for cosmetics & toiletries*

- Bactericidal effect
- Excellent efficacy against pseudomonas
- Effective in pH ranges up to 8
- Effective even in very low use-concentrations

<table>
<thead>
<tr>
<th>Use-concentration</th>
<th>acc. schülke-recommendation</th>
<th>acc. ASEAN / EU Cosmetics Regulation</th>
<th>acc. CIR (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave-on (i.e. creams, lotions etc.)</td>
<td>0.01 - 0.10 %</td>
<td>max. 0.10 %</td>
<td>max. 0.10 %</td>
</tr>
<tr>
<td>Rinse-off (i.e. shampoos, bath preparations etc.)</td>
<td>0.01 - 0.10 %</td>
<td>max. 0.10 %</td>
<td>max. 0.10 %</td>
</tr>
</tbody>
</table>

**EU-INCI-declaration**

2-Bromo-2-nitropropane-1,3-diol

**US-INCI-declaration**

2-Bromo-2-nitropropane-1,3-diol

**Active substance**

<table>
<thead>
<tr>
<th>INCI name</th>
<th>EINECS-Name:</th>
<th>CAS-No.</th>
<th>EC-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Bromo-2-nitropropane-1,3-diol</td>
<td>Bronopol</td>
<td>52-51-7</td>
<td>200-143-0</td>
</tr>
</tbody>
</table>

**Physico-chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>white - off white</td>
</tr>
<tr>
<td>Form</td>
<td>crystalline</td>
</tr>
<tr>
<td>Odour</td>
<td>nearly odourless</td>
</tr>
<tr>
<td>Water solubility (23 °C)</td>
<td>ca. 280 g/l</td>
</tr>
<tr>
<td>Foaming characteristics (DIN 53902)</td>
<td>Non foaming (0.1 % in water)</td>
</tr>
<tr>
<td>pH (10 g/l)</td>
<td>5 - 7</td>
</tr>
</tbody>
</table>

**Fields of application**

The recommended use levels relate to the total formulation in each case. The values given are recommended guidelines. The optimum use level should be evaluated by means of a repeated challenge test (e.g. at schülke Technical and Microbiological department).

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Recommended dosage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emulsions</td>
<td>0.01 - 0.10 %</td>
</tr>
<tr>
<td>Solutions (e.g. shampoos, bath preparations and hand cleansing preparations)</td>
<td>0.01 - 0.10 %</td>
</tr>
<tr>
<td>Other uses</td>
<td>Kindly contact us.</td>
</tr>
</tbody>
</table>

**Indications for use**

General Information

s&m Bronopol is fully effective both in anionic as well as cationic and non-ionic systems. High pH values (> pH 8.0) should be avoided. Acidic pH values have no negative influence on the effectiveness.

Solubility

s&m Bronopol is fully soluble in water and in most polar organic solvents.

Compatibility with surfactants

s&m Bronopol proved to have good compatibility with anionic surfactants such as sulphates, ether sulphates and sulphosuccinates, as well as with non-ionicogenic surfactants.

Compatibility with sulphite ions

s&m Bronopol is inactivated by sulphite ions. Excessive sulphite > 20 ppm must be avoided.

Recommended use pH range

3 - 8

Maximum use temperature

s&m Bronopol should in principle only be incorporated into the product to be preserved in the cooling phase at a temperature lower than 40 °C. It is advantageous to add s&m Bronopol in the cooling phase, e.g. with the fragrance (t < 40 °C).

Additional advice

s&m Bronopol is not suitable for products containing amines or diethanolamides due to the risk of nitrosamine formation with the active ingredient Bronopol. With pH values > 7, heating should if possible be avoided entirely.
s&m Bronopol

Microbiological efficacy

For s&m Bronopol to perform effectively in destroying organisms in products already contaminated, a minimum contact time of 48 hours is necessary. Since the effect of s&m Bronopol takes place through chemical reactions with the microorganisms, when it is used in heavily contaminated products loss of active ingredient must be taken into account.

**MIC**

The efficacy of the product has been tested against the following microorganisms according to DGHM (German Society for Hygiene and Microbiology). Determination of the minimum inhibitory concentration in the serial dilution test produced the following values (MIC in % of the product):

<table>
<thead>
<tr>
<th>Bacteria (gram-negative)</th>
<th>MIC</th>
<th>Bacteria (gram-positive)</th>
<th>MIC</th>
<th>Yeasts</th>
<th>MIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli</td>
<td>0.0025</td>
<td>Staphylococcus aureus</td>
<td>0.0025</td>
<td>Candida albicans</td>
<td>0.16</td>
</tr>
<tr>
<td>Legionella pneumophila</td>
<td>0.0050</td>
<td>Staphylococcus epidermidis</td>
<td>0.0025</td>
<td>Saccharomyces cerevisiae</td>
<td>0.32</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td>0.0025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>0.0025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burkholderia cepacia</td>
<td>0.0025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudomonas fluorescens</td>
<td>0.0025</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Compatibility**

Compatible to be avoided

aqueous dilution (0.1 %) No significant difference to water aluminium

powder plastics metallic materials

*Compatibility has to be proved in each case

Environmental information

At a sufficient degree of dilution, all components of s&m Bronopol are completely biodegradable. Dilutions of s&m Bronopol do not normally interfere with the operation of waste water treatment plants.

**Labeling**

<table>
<thead>
<tr>
<th>Hazard statements</th>
<th>Precautionary statements</th>
<th>Labelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>H302, H312, H315, H318, H335, H400, H411</td>
<td>P351, P352, P370, P310</td>
<td>Danger GHS05 (Corrosion) GHS07 (Exclamation mark) GHS09 (Environment)</td>
</tr>
</tbody>
</table>

**Transport & Storage**

<table>
<thead>
<tr>
<th>Dangerous goods</th>
<th>UN number</th>
<th>Packaging group</th>
<th>Package sizes</th>
<th>Shelf life</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>3241</td>
<td>III</td>
<td>25 kg</td>
<td>30 months</td>
<td>Keep container tightly closed. Protect from heat and direct sunlight. Keep in a dry place.</td>
</tr>
</tbody>
</table>

For further hazard instructions and safety advice please refer to the actual material safety data sheet.

schülke subsidiaries:

Belgium
S.A. Schülke & Mayr Belgium N.V.
1130 Brussel
Tel. +32-2-479 73 35
Fax +32-2-479 99 66

Netherlands
Schülke & Mayr Benelux B.V.
2031 CC Haarlem
Tel. +31-23-535 26 34
Fax +31-23-536 79 70

China
Schülke & Mayr GmbH
Shanghai Representative Office
Shanghai 200041
Tel. +86-21-62 17 29 95
Fax +86-21-62 17 29 97

Switzerland
Schülke & Mayr AG
8003 Zürich
Tel. +41-44 466 55 44
Fax +41-44 466 55 33

France
Schülke France SARL
94250 Gentilly
Tel. +33-1-49 69 83 79
Fax +33-1-49 69 83 85

United Kingdom
Schülke & Mayr UK Ltd.
Sheffield S9 1 AT
Tel. +44-1142-54 35 00
Fax +44-1142-54 35 01

Italy
Schülke & Mayr Italia S.r.l.
20148 Milano
Tel. +39-02-40 26 590
Fax +39-02-40 26 609

Schülke & Mayr GmbH
22840 Norderstedt
Germany
Tel. +49 40 52100-0
Fax +49 40 52100-244
www.schuelke.com
sai@schuelke.com

Other Distributors:
Argentina · Austria · Australia · Belarus · Benin · Brazil · Bulgaria · Canada · Croatia · Czech Republic · Denmark · Egypt · Estonia · Finland · Ghana · Greece · Hong Kong · Hungary · India · Indonesia · Iran · Israel · Japan · Jordan · Korea · Kuwait · Latvia · Lebanon · Lithuania · Macedonia · Malaysia · New Zealand · Nigeria · Norway · Oman · Philippines · Poland · Portugal · Russia · Saudi Arabia · Singapore · Slovakia · Slovenia · South Africa · Spain · Sweden · Syria · Taiwan · Thailand · Turkey · Ukraine · United Arab Emirates · USA · Vietnam · Yemen

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