Ciba® TINOSAN® HP 100
new antimicrobial for home care
Bring freshness and hygiene into your customers' life

Deceptive cleanliness
The kitchen shines, the floor looks clean, everything seems to be spic and span. But appearances can be deceiving. Unwanted germs, invisible to the eye, can still thrive.

By cross-contamination, those potentially harmful bacteria can be transferred to humans. In other cases, micro-organisms can develop malodor in sponges and other kitchen utensils.

Hygiene is an important part of our well being
Consumers have become conscious of the potentially harmful threats germs can cause. This growing awareness about health and hygiene, resulting in increased cleanliness, has supported the increasing demand for antimicrobial household products. Such products include antimicrobial dishwashing liquids and hardsurface cleaners which contribute to an improved home hygiene and freshness.

Meet the demand!
With TINOSAN HP 100 antimicrobial, manufacturers of household products are able to meet their customers' requirements for products with proven antimicrobial effectiveness and gain a unique opportunity for product differentiation.
Bring freshness and hygiene into your customers’ life

TINOSAN HP 100
A highly effective liquid antimicrobial

Special customer benefits
- Broad spectrum of antimicrobial activity
- Effective at low concentrations
- Remanent activity on skin
- Long-lasting activity on inanimate surfaces

Special product benefits
- Easy handling
- Liquid pumpable formulation suitable for automatic dosing systems
- Easy incorporation in dishwashing products and all purpose cleaners
- Stable in a broad range of household formulations
- No predisolving and in most cases no heating necessary
- Excellent compatibility with most other raw materials used in the household industry
Inhibit odor generation

Dishwashing utensils such as sponges, brushes and cloths come in contact with foodstuff residue which often cannot be completely removed. Later, during storage, growth of unwanted odor-generating micro-organisms can take place on the surface of humid and soiled dishwashing utensils.

A study according to US standard method AATCC 100–1993 showed a 99.99% bacteria reduction after 8 hours contact on sponges used for washing-up with a dishwashing liquid containing TINOSAN HP 100.

TINOSAN HP 100 has not only a strong affinity to human skin but also to the inanimate surfaces of dishwashing utensils and therefore inhibits microbial growth on those materials.

Protect your skin with long-lasting antimicrobial activity

Although the primary use of dishwashing products is to clean dishes, these products also come into contact with the skin during dishwashing. This makes them a suitable tool to provide antimicrobial protection to the hands. Therefore, they are very often used as liquid handsoaps.

In the finger imprint test, the activity on the skin has been investigated by taking fingerprint imprints on inoculated agar plates, immediately after washing the hands with a dishwashing product containing TINOSAN HP 100 and after several time intervals.

The recommended concentration for TINOSAN HP 100 in antimicrobial dishwashing liquids is 0.6%.
Long-lasting freshness and hygiene in the kitchen

Bacteria reduced in the billions
Household cleaner formulations containing TINOSAN HP 100 exhibit both, an immediate bactericidal activity and a persistent, long-lasting bacteria growth inhibition on the surface which makes re-settlement of harmful microorganisms on surfaces less likely.

Surface cleaners containing TINOSAN HP 100 show 99.999% bacteria reduction in a time kill study after five minutes contact (suspension test).

Provide persistent activity on inanimated surfaces
After treatment with the antimicrobial formulation, there is a strong long-lasting growth inhibition of gram positive and gram negative harmful bacteria on the surface, even after rinsing the material several times.

Growth inhibition of harmful bacteria
For household cleaners, concentrations of at least 0.3% TINOSAN HP 100 are recommended. Should a more effective product be required, higher concentrations could be necessary.
Differentiate your products

"Clean long-lasting freshness into your home"

The proven effectiveness of TINOSAN HP 100 substantiates various antimicrobial claims, and thus offers excellent opportunities for the manufacturers of household and I & I products to differentiate their products.

"new antimicrobial"
"long-lasting freshness and protection"
"substantial bacteria reduction"
"hygiene for your hands"
"sanitary freshness"
"antimicrobial protection"
"fights germs"
Ciba Specialty Chemicals

Ciba® TINOSAN HP 100 antimicrobial
Antimicrobial active ingredient for home and fabric care products

Characterization
TINOSAN® HP 100 is a highly active antimicrobial, effective against a wide range of gram-negative and gram-positive bacteria.

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>4,4’Dichloro 2-hydroxydiphenyl ether</th>
</tr>
</thead>
<tbody>
<tr>
<td>IUPAC name</td>
<td>5-Chloro-2-(4-chlorophenoxy) phenol</td>
</tr>
<tr>
<td>CAS name</td>
<td>Phenol, 5-chloro-2-(4-chlorophenoxy)</td>
</tr>
<tr>
<td>CAS number</td>
<td>3380-30-1</td>
</tr>
<tr>
<td>INCI name</td>
<td>Hydroxydichlorodiphenyl Ether</td>
</tr>
</tbody>
</table>

Molecular weight 255.1

Registration status

Features / Benefits
TINOSAN® HP 100 is highly effective against a broad spectrum of pathogenic bacteria. Depending on the concentration of the antimicrobial and the formulation composition, TINOSAN® HP 100 prevents growth and/or kills bacteria. Thus, the product reduces the risk of contamination with pathogenic bacteria and prevents formation of malodour.

Applications
TINOSAN® HP 100 is recommended for bleach-free household products providing antimicrobial activity to household products like laundry care and home care products.

Guidelines for use
- Dishwashing liquids 0.6%
- Laundry detergents 0.6%
- Fabric softeners 0.3 – 0.6%
- Surface cleaners 0.3 – 0.6%

Instructions for incorporation:
TINOSAN® HP 100 should be solubilized in concentrated surfactants, direct addition to the final formulation might cause precipitation of the active material. Preparation temperatures >150°C should be avoided. Therefore, incorporation in laundry detergent powders after drying in the spray tower is recommended.

Direct dilution of TINOSAN® HP 100 with water results in an insoluble precipitation. For removal of TINOSAN® HP 100, contain with suitable absorbent material and scope into containers for chemical disposal.

Physical properties
- Appearance: highly fluid liquid
- Density at 25°C: 1.07 – 1.17 g/cm³
- Viscosity at 25°C: < 250 mPas
- Physical form: solution
### Solubility

*of TINOSAN® HP 100 in % (w/w) in solvents*

<table>
<thead>
<tr>
<th>Solvent</th>
<th>% Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Ethanol</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Dimethyl phthalate</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Glycerin</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Dipropylene glycol</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Hexylene glycol</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Ethylene glycol n-Butyl Ether</td>
<td>&gt; 50%</td>
</tr>
<tr>
<td>Mineral Oil</td>
<td>24.0%</td>
</tr>
<tr>
<td>Petroleum</td>
<td>5.0%</td>
</tr>
</tbody>
</table>

### Microbiological Efficacy

Minimum inhibitory concentrations of TINOSAN® HP 100 in ppm (agar incorporation method)

<table>
<thead>
<tr>
<th>Gram-positive bacteria</th>
<th>Minimum Inhibitory Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corynebacterium xerosis ATCC 373</td>
<td>20.0</td>
</tr>
<tr>
<td>Enterococcus hirae ATCC 10541</td>
<td>25.0</td>
</tr>
<tr>
<td>Enterococcus faecalis ATCC 51299 (vancomycin-resistant)</td>
<td>50.0</td>
</tr>
<tr>
<td>Staphylococcus aureus ATCC 9144</td>
<td>0.2</td>
</tr>
<tr>
<td>Staphylococcus aureus ATCC 25923</td>
<td>0.1</td>
</tr>
<tr>
<td>Staphylococcus aureus NCTC 11940 (methicillin-resistant)</td>
<td>0.1</td>
</tr>
<tr>
<td>Staphylococcus aureus NCTC 12232 (methicillin-resistant)</td>
<td>0.1</td>
</tr>
<tr>
<td>Staphylococcus aureus NCTC 10703 (rifampicin-resistant)</td>
<td>0.1</td>
</tr>
<tr>
<td>Staphylococcus epidermidis ATCC 12228</td>
<td>0.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gram-negative bacteria</th>
<th>Minimum Inhibitory Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Escherichia coli NCTC 8196</td>
<td>0.07</td>
</tr>
<tr>
<td>Escherichia coli ATCC 8739</td>
<td>0.2</td>
</tr>
<tr>
<td>Escherichia coli O156 (EHEC)</td>
<td>1.5</td>
</tr>
<tr>
<td>Enterobacter cloacae ATCC 13047</td>
<td>1.0</td>
</tr>
<tr>
<td>Enterobacter gergoviae ATCC 33028</td>
<td>20.0</td>
</tr>
<tr>
<td>Klebsiella oxytoca DSM 30106</td>
<td>2.5</td>
</tr>
<tr>
<td>Klebsiella pneumoniae ATCC 4352</td>
<td>0.07</td>
</tr>
<tr>
<td>Listeria monocytogenes DSM 20600</td>
<td>12.5</td>
</tr>
<tr>
<td>Proteus mirabilis ATCC 14153</td>
<td>2.5</td>
</tr>
<tr>
<td>Proteus vulgaris ATCC 13315</td>
<td>0.2</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa ATCC 15442</td>
<td>&gt; 1000</td>
</tr>
<tr>
<td>Salmonella choleraesuis ATCC 9184</td>
<td>0.25</td>
</tr>
<tr>
<td>Yersinia enterocolitica DSM 4780</td>
<td>25.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fungi</th>
<th>Minimum Inhibitory Concentration (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspergillus niger ATCC 6275</td>
<td>150</td>
</tr>
<tr>
<td>Candida albicans ATCC 10259</td>
<td>30.0</td>
</tr>
</tbody>
</table>

### Ecology / Toxicology

The usual hygiene and safety rules for handling chemicals should be observed in storage, handling and use.

More detailed information on the safety data sheet.

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Ciba Specialty Chemicals

Ciba® TINOSAN® HP 100 antimicrobial
Antimicrobial active ingredient for home and fabric care products

Marketing support documents

Brochures

2525
TINOSAN® HP 100 new antimicrobial for fabric care

2526
TINOSAN® HP 100 new antimicrobial for home care

2525 / 2526 T11
TINOSAN® HP 100 new antimicrobial, technical data

Presentations

1042
TINOSAN® HP 100, a new antimicrobial for household applications

Publications

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European standard EN 1276: Quantitative suspension test for the evaluation of the bactericidal activity of chemical disinfectants and antiseptics used in food, industrial, domestic, and institutional areas.


TINOSAN® HP 100

With over 30 years experience in high performance antimicrobials for the personal care and household markets, Ciba Specialty Chemicals provides comprehensive support in

• Technical Information
• Technical Service
• Formulation development
• Microbiological efficacy testing
• Registration support
• Safety information
• Chemical analysis
• Claim support

Information on TINOSAN HP 100 for fabric care products can be found in our brochure no 2525 Ciba® TINOSAN® HP 100 new antimicrobial for fabric care.

Ciba® TINOSAN® HP 100

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The usual hygiene and safety rules for handling chemicals should be observed in storage, handling and use. The products must not be swallowed. For information on ecology/toxicology, please see the existing Safety Data Sheets for this product.

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Pub. No. 2526.
Edited in Switzerland.
Каталог был представлен на выставке «Бытхим Экспо – 2004»

Каталог включен в базу данных «Федерального информационного фонда отечественных и иностранных каталогов на промышленную продукцию»

Электронная копия издания изготовлена с целью её включения в базы данных Федерального информационного фонда отечественных и иностранных каталогов на промышленную продукцию, которые формируются в соответствии с Постановлением Правительства РФ от 24 июля 1997 г. № 950 и Постановлением Правительства РФ от 31 декабря 1999 г. № 2172-р и зарегистрированы Комитетом по политике информатизации при Президенте РФ под №№ 39-50.

2005 год