BIO/TEC 920 and BIO/TEC 922 are industrial biocide products containing the active ingredient BIT (1,2-benzisothiazolin-3-one).

BIO/TEC 920 is a 19% active ingredient aqueous dispersion of BIT producing an opaque white liquid product.

BIO/TEC 922 is a 19% active ingredient solution of BIT in dipropylene glycol and water producing a clear, amber colored liquid product.

Many aqueous dispersions and emulsions can spoil during storage and use due to the growth of bacteria, fungi, molds, or other microorganisms. BIO/TEC 920 and BIO/TEC 922 prevent microbial deterioration of products and resulting consequences such as:

- Phase separation
- Odor build-up
- Gas build-up
- Changes in viscosity
- Build-up of health threatening toxins

Both BIO/TEC 920 and BIO/TEC 922 are efficient microbial preservatives for many aqueous systems, and exhibit:

- Effective control of a wide range of organisms at cost-effective concentrations
- Often effective where other preservatives fail, especially at critical temperature and pH values
- Free from formaldehyde, formaldehyde releasers, phenolics, heavy metals, and halogens
- Excellent thermal and chemical stability
- Excellent long-term storage efficacy
- Compatible with non-ionic and anionic surfactants and many other commonly used raw materials
- Ease of use due to their liquid form
- Odorless at use concentrations
- Plus BIO/TEC 920 is VOC free
BIO/TEC 920 and BIO/TEC 922 protect against growth of microbial agents in aqueous systems such as the following:

- **Latices**, such as: polymer latices based on monomers such as acrylate, butadiene, PVA, or styrene; synthetic rubber/latex
- **Water-based adhesives**, including animal glues, carboxymethylcellulose (CMC) and derivatives, and adhesives based on gelatin and/or latex
- **Aqueous slurries of pigments**, such as titanium dioxide, or of **minerals**, such as kaolin, calcium carbonate, calcium sulfate, or magnesium sulfate
- **Oil in water emulsions**, such as textile spin-finish solutions, metal removal fluids, soluble oils (metal and engineering industries), and photographic emulsions
- **Paints and coatings**, such as aqueous coatings, water-based paints, and emulsion paints
- **Inks and fountain solutions**
- **Building and construction materials**, such as caulks, sealants, grouts, spackling, ready-mixed cements and wallboard compounds, and tape joint compounds
- **Pesticide formulations**, including in-can protection and protection of use dilutions
- **Cleaning products**, including floor waxes and polishes, surface cleaners, window cleaners, and dish detergents
- **Liquid laundry additives**, including laundry detergents, fabric softeners, and stain removers
- **Car care products**, including car washing products, car waxes, and silicone emulsions
- **Oil recovery materials**, such as drill muds, packer fluids, and completion fluids
- **Secondary oil recovery injection water** with additives
- **Leather processing solutions**, to protect the solution
- **Fresh animal hides and skins**, to preserve the integrity of the hides and skins before or during processing
- **Paper coatings** to be used in papermaking, including rosin dispersions and starch and casein based products
- **Pulp & paper mill system** slime control by shock dosing or continuous dosing

**U.S. REGULATORY CLEARANCES**

BIO/TEC 920 and BIO/TEC 922 are registered with the U.S. Environmental Protection Agency and have been granted EPA registration numbers:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>EPA Registration Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO/TEC 920</td>
<td>80285-3-55137</td>
</tr>
<tr>
<td>BIO/TEC 922</td>
<td>80285-2-55137</td>
</tr>
</tbody>
</table>
Under 40 CFR 180.1001(d), **BIO/TEC 920** and **BIO/TEC 922** components are exempt from the requirement for a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticides applied to growing agricultural crops. Not more than 0.1% of the active ingredient, BIT, is allowed in such pesticide formulations.

BIT, the active ingredient of **BIO/TEC 920** and **BIO/TEC 922**, is cleared for use under the following FDA clearances:

<table>
<thead>
<tr>
<th>FDA Clearance Listing</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 CFR 175.105</td>
<td>adhesives</td>
</tr>
<tr>
<td>21 CFR 176.170</td>
<td>paper coating compositions, at level not to exceed 0.01 mg/in² of finished paper or paperboard in contact with fatty &amp; aqueous food</td>
</tr>
<tr>
<td>21 CFR 176.180</td>
<td>paper coating compositions, at level not to exceed 0.02 mg/in² of finished paper or paperboard in contact with dry food</td>
</tr>
<tr>
<td>21 CFR 176.300</td>
<td>slimicides (in manufacture of food-contact paper or paperboard) at level not to exceed 0.06 lb per ton of dry weight fiber</td>
</tr>
<tr>
<td>21 CFR 177.2600(c)(4)(ix)</td>
<td>uncured latex rubber (consult regulation for limitations)</td>
</tr>
</tbody>
</table>

**PHYSICAL PROPERTIES**

**BIO/TEC 920**

**Composition:** An aqueous dispersion of 1,2-benzisothiazolin-3-one at 19% average in very fine particle form

**Physical form and appearance:** Opaque white liquid.

**Viscosity:** 348 mPa.s at 20°C

**Specific gravity:** 1.02 at 20°C

**pH**

5.45 A (tested as 1% weight-weight aqueous dispersion) at 25°C using CIPAC Method MT75

**Boiling point:** ~100°C

**Solubility:** Soluble in water

**Stability:** Stable under all normal storage conditions
**BIO/TEC 922**

**Composition:** A solution of 1,2-benzisothiazolin-3-one at 19% average in dipropylene glycol and water

**Physical form and appearance:** Clear amber liquid.

**Viscosity:** 124 mm$^2$/s at 20°C

**Specific gravity:** 1.12 at 25°C

**pH:** 10.1 at 25°C

**Boiling point:** ~100°C

**Solubility:** Soluble in water

**Stability:** Stable under all normal storage conditions

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**MICROBIAL EFFICACY**

**BIO/TEC 920** and **BIO/TEC 922** penetrates the cells of microorganisms, reacts with vital parts of the cells and inactivates important substrates and enzymes necessary to normal cell function. These relatively unspecific reactions exhibit a bactericidal effect and minimize adaptation or the development of microbial resistance.

The efficacy of BIT against some typical organisms is listed in the following table showing the minimum inhibitory concentration (Mic) as expressed in ppm of active ingredient.

<table>
<thead>
<tr>
<th>Bacteria</th>
<th>Mic (ppm)</th>
<th>Fungi and yeasts</th>
<th>Mic (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>250</td>
<td>Aspergillus niger</td>
<td>350</td>
</tr>
<tr>
<td>Pseudomonas putida</td>
<td>250</td>
<td>Chaemotomium globosum</td>
<td>400</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>40</td>
<td>Pencillium notatum</td>
<td>125</td>
</tr>
<tr>
<td>Enterbacter cloacae</td>
<td>80</td>
<td>Saccharomyces cerevisiae</td>
<td>250</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>40</td>
<td>Rhodotoröla rubra</td>
<td>500</td>
</tr>
<tr>
<td>Streptococcus lactis</td>
<td>15</td>
<td>Candida albicans</td>
<td>100</td>
</tr>
<tr>
<td>Streptococcus faecalis</td>
<td>40</td>
<td>Endomycopsis albicans</td>
<td>250</td>
</tr>
</tbody>
</table>
DIRECTIONS FOR USE

It is a violation of Federal law to use these products in a manner inconsistent with its labeling. **BIO/TEC 920** and **BIO/TEC 922** are effective preservatives in most aqueous compositions. The concentration required to give protection depends on several factors. These include the susceptibility of the system to microbiological degradation, the extent to which micro-organisms can gain access, the species involved, pH, temperature, and length of time for which protection is required.

For protection against bacterial attack, a concentration within the range of 0.02 - 0.25% is almost invariably sufficient. In dilute fluid systems, spoilage is usually controlled with dosages not greater that 0.09%. Control of mold growth, particularly on paste products of high solids content, may occasionally require demand dosages above 0.25%. Do not use concentrations greater than 0.5%.

Trials at different concentrations are recommended. Typical applications, and the suggested range of concentrations on which trials can be based, are:

<table>
<thead>
<tr>
<th>Type of material to be protected</th>
<th>Lbs BIO/TEC 920 or BIO/TEC 922 to use per 1000 lb. of material to be protected</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Latices</strong>, such as polymer latices based on monomers such as acrylate, butadiene, PVA, or styrene; synthetic rubber/latex</td>
<td>0.5 to 1.5 lb. (0.05 - 0.15%)</td>
</tr>
<tr>
<td><strong>Oil-in-water emulsions</strong> such as textile spin-finish solutions, cutting/rolling oils, soluble oils (metal and engineering industries), and photographic emulsions. Note: limit amount of <strong>BIO/TEC 920</strong> or <strong>BIO/TEC 922</strong> in metalworking fluid concentrate (to be diluted before use) to 3.0 % to reduce the possibility of dermal sensitization.</td>
<td>0.5 to 1.8 lb. (0.05 – 0.18%)</td>
</tr>
<tr>
<td><strong>Paints and coatings</strong>, such as aqueous coatings, water-based paints, and emulsion paints</td>
<td>0.5 to 2.5 lb. (0.05 – 0.25%)</td>
</tr>
<tr>
<td><strong>Inks and fountain solutions</strong></td>
<td>0.5 to 2.5 lb. (0.05 – 0.25%)</td>
</tr>
<tr>
<td><strong>Water-based adhesives</strong>, including animal glues, adhesives based on carboxymethylcellulose (CMC) and derivatives, gelatin and/or latex</td>
<td>0.5 to 2.5 lb. (0.05 – 0.25%)</td>
</tr>
<tr>
<td>Type of material to be protected</td>
<td>Lbs BIO/TEC 920 or BIO/TEC 922 to use per 1000 lb. of material to be protected</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Aqueous slurries of pigments</strong> such as titanium dioxide or of minerals such as kaolin, calcium carbonate, calcium sulfates, or magnesium sulfate</td>
<td>0.4 to 1.25 lb. (0.04 - 0.125%)</td>
</tr>
<tr>
<td><strong>Building materials</strong>, such as caulks, sealants, grouts, spackling, ready-mixed cement and wallboard compounds, and tape joint compounds</td>
<td>0.8 to 2.5 lb. (0.08 – 0.25%)</td>
</tr>
<tr>
<td><strong>Pesticide formulations</strong>, including in-can protection and protection of use dilutions</td>
<td>0.5 to 2.5 lb. (0.05 – 0.25%)</td>
</tr>
<tr>
<td><strong>Home cleaning products</strong>, including floor waxes and polishes, surface cleaners, window cleaners, and dish detergents</td>
<td>0.5 to 1.5 lb. (0.05 – 0.15%)</td>
</tr>
<tr>
<td><strong>Liquid laundry additives</strong>, including laundry detergents, fabric softeners, and stain removers</td>
<td>0.5 to 1.5 lb. (0.05 – 0.15%)</td>
</tr>
<tr>
<td><strong>Car care products</strong>, including car washing products, car waxes, and silicone emulsions</td>
<td>0.75 to 1.5 lb. (0.075 – 0.15%)</td>
</tr>
<tr>
<td><strong>Oil recovery materials</strong>, such as drill muds, packer fluids, and completion fluids, containing polysaccharide fluid loss control agents and/or thickeners such as starch, guar or xanthan gum</td>
<td>0.5 to 1.5 lb. (0.05 – 0.15%) of total weight of the fluid, or 15 to 45 lb per 1000 lb of dry polysaccharide added</td>
</tr>
<tr>
<td><strong>Secondary oil recovery injection water</strong> containing additives, such as polymer or micellar/polymer waterfloods using thickeners such as xanthan gum and/or polyacrylamides</td>
<td>0.15 to 1.5 lb. (0.015 – 0.15%) of total weight of fluid</td>
</tr>
<tr>
<td>Leather processing solutions, to preserve the solutions</td>
<td>0.25 to 2 lb. (0.025 – 0.20%)</td>
</tr>
<tr>
<td><strong>Fresh animal skins and hides</strong>, to preserve the integrity of the hides and skins before or during processing. Add the appropriate quantity of BIO/TEC 920 or BIO/TEC 922 to the brine solution during the curing operation or treat hides or skins with an appropriately diluted aqueous solution during other portions of the processing operation. The specific use rate and contact time needed to control microbial attack will depend on the degree of decomposition of the hides or skins prior to treatment.</td>
<td>1 to 24 pounds (13 fluid ounces to 2.5 gallons) of BIO/TEC 920 or BIO/TEC 922 per 1000 pounds of hides or skins</td>
</tr>
</tbody>
</table>
# Technical Data

## Type of material to be protected

<table>
<thead>
<tr>
<th>Paper coatings to be used in papermaking, including rosin dispersions, starch and casein based products</th>
<th>0.5 to 1.5 lb. (0.05 – 0.15%)</th>
</tr>
</thead>
</table>

## Pulp & paper mill system slime control

The preferred method of addition is by **shock dosing** because this ensures that a high concentration of **BIO/TEC 920** or **BIO/TEC 922** is present in the system for several hours. If a slime control agent is added by continuous methods over periods of several hours, its concentration in the system at all times is low. This can lead to the development of resistant organisms, which is less likely to occur when the shock dosing method is used.

It is not possible to give precise recommendations as to the quantity of **BIO/TEC 920** or **BIO/TEC 922** to add to control slime formation, because the magnitude of the problem varies greatly from mill to mill, depending on the furnish employed, the cleanliness of the mill system, and the additional nutrients (for example, starch) that may be added to the stock.

The following quantities of **BIO/TEC 920** or **BIO/TEC 922** are suggested for trial:

**Shock dosing**: If this preferred method is adopted, add 2.5 to 9 ounces for each ton of paper produced per day as a single shock dose, the actual quantity to be used depending on the severity of the slime problem. This addition may be made to any part of the stock preparation or backwater system. Alternatively, the addition may be made to those parts of the system where it is known that slime deposits accumulate.

**Continuous addition**: If this method is adopted, add continuously for either the single period of 8 hours during every 24 hours or for two separate periods of 4 hours during every 24 hours. Meter into the recirculated backwater at a rate of 7 to 8.5 ounces for each ton of paper produced during the dosing period.

## ECOLOGICAL EFFECTS (BIT)

BIT is biodegradable and has a low bioaccumulation potential. Permanent dosing with 10 ppm a.i. shows no negative effect on aerobic oxidation with activated sludge. For anaerobic degradation this level is 2 ppm a.i.
PRECAUTIONARY STATEMENTS
Keep Out of Reach of Children
DANGER
Hazards to Humans and Domestic Animals

Corrosive. Causes skin burns and irreversible eye damage. May be fatal if inhaled. Harmful if swallowed or absorbed through skin. Do not get in eyes, on skin, or on clothing. Do not breathe vapor or spray mist. Wear goggles or face shield, chemical resistant gloves, long pants and long sleeved shirt. Wear a mask or pesticide respirator approved by the National Institute for Occupational Safety and Health. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

FIRST AID:
If in Eyes: Hold eye open and rinse slowly and gently with water for 15 – 20 minutes. Remove contact lenses, if present, after the first 5 minutes then continue rinsing. Call a poison control center or doctor for treatment advice.
If Swallowed: Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to by a poison control centre doctor.
If Inhaled: Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible. Call a poison control center or doctor for further treatment advice.
If on Skin: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15 – 20 minutes. Call a poison control center or doctor for treatment. Wash contaminated clothing and footwear before reuse.

Poison Control Center:
Call 1-800-222-1222
Have the product container or label or this Bulletin with you when calling a poison control center, doctor, or going for treatment.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.
ENVIRONMENTAL HAZARDS

BIT based products are toxic to fish. Do not discharge into lakes, streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing BIT to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not apply in marine and estuarine oil fields.

STORAGE AND DISPOSAL

Prohibitions
Do not contaminate water, food, or feed by storage or disposal. Open dumping is prohibited.

Storage
Protect from frost. If frozen, allow to thaw and stir well before use.

Pesticide Disposal
Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

Container Disposal
Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

For information on spills, call 1-800-424-9300

Safe Handling Information
Refer to the Material Safety Data Sheet (MSDS) available from Southwest Engineers for information on the safe use, handling and disposal.
Warranties and Warranty Disclaimers

Southwest Engineers warrants that these products conform to the chemical description on the label and that it is reasonably fit for the purposes stated on the label when used in accordance with Southwest Engineers’ directions under normal conditions of use. This warranty does not extend to the use of this product contrary to label instructions, or under abnormal use conditions, or under conditions not reasonably foreseeable to Southwest Engineers, and the buyer assumes the risk of any such use. SOUTHWEST ENGINEERS DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY.

IN NO EVENT SHALL SOUTHWEST ENGINEERS BE LIABLE FOR ANY SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, ON ANY THEORY WHATSOEVER, INCLUDING NEGLIGENCE, and Southwest Engineers’ sole liability and Buyer’s and User’s exclusive remedy shall be limited to the refund of the purchase price. Statements concerning the use of products or the formulations described therein are not to be construed as recommending the infringement of any patent and no liability for infringement arising out of any such use is assumed by Southwest Engineers.

For technical information, literature, sample and order information, please contact Southwest Engineers at:

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