METALWORKING FLUID ADDITIVES DIVISION

GROTAN® U15
Broad Spectrum Microbicide for Metalworking Fluid Applications
Registration No. 18245
Pest Control Products Act

Description
A major source of product failure in soluble oil, semi-synthetic and synthetic metalworking fluids is contamination from fungi (moulds and yeasts) and other organisms. These microorganisms may cause fluid degradation and the growth of biomass, which can adhere to interior surfaces, fluid delivery systems and reservoirs. This in turn can create malodors, diminish fluid performance and system efficiency, which can increase costs, decrease tool life, reduce productivity and cause machine shut-down. The use of Grotan® U15, a proven high quality preservative to control biodeterioration, will help maintain product functionality and increase the life of the metalworking fluid.

Application/Use
The level of Grotan U15 required for optimum effectiveness is dependant upon the composition and dilution of the metalworking fluid, the severity of operation, and the type and degree of existing contamination. Grotan U15 is highly water soluble and requires no pre-mixing. Normal, good system circulation is sufficient. A metering pump is suggested when adding Grotan U15.

Avoid charging Grotan U15 in high temperature zones (ideally, add to fluid below 60°C) and avoid dosing at the same time and location as corrosion inhibitors and alkaline pH adjusters.

Highlights
- Broad spectrum of activity against Gram-positive and Gram-negative bacteria
- Ease of incorporation
- Easily disperses in metalworking fluids

Physical Properties
The following are typical properties of Grotan U15; they are not to be considered product specifications.

Active Ingredient 5-Chloro-2-methyl-4-isothiazolin-3-one: ....................................................... 1.13%
Active Ingredient 2-Methyl-4-isothiazolin-3-one: ...................................................................... 0.37%
Color:.................................................................................................. Clear colorless to yellow liquid
Odor: ....................................................................................................................... Slightly aromatic
Refractive Index, 20°C: ................................................................................................. 1.341
Solubility: .............................................................................................................. Soluble in water in all proportions

Antimicrobial Activity
The following are examples of the broad range of organisms against which Grotan U15 has demonstrated efficacy:

<table>
<thead>
<tr>
<th>Gram Negative Bacteria</th>
<th>Gram Positive Bacteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pseudomonas spp.</td>
<td>Bacillus subtilis</td>
</tr>
<tr>
<td>Enterobacter aerogenes</td>
<td>Staphylococcus aureus</td>
</tr>
<tr>
<td>Desulfovibrio desulfuricans</td>
<td>Streptococcus faecalis</td>
</tr>
<tr>
<td>Proteus vulgaris</td>
<td></td>
</tr>
<tr>
<td>Escherichia coli</td>
<td></td>
</tr>
</tbody>
</table>
Grotan® U15 is a liquid preservative designed for tankside application to working dilutions of soluble oil, semi-synthetic and synthetic metalworking fluid systems, all of which can be subject to microbial attack and biodeterioration. Grotan U15 has a broad spectrum of antimicrobial activity, and easily disperses in metalworking fluids. Grotan U15 is not recommended for metalworking fluid concentrates.

To control microbial contamination in freshly prepared fluids and in daily water or fluid make-up additions, add Grotan U15 at a dose in the range of 250 to 1500 ppm (250 - 1500 mL per 1000 L of fluid or make-up).

For 'shock treatment' of heavily contaminated systems, add 1.5L of Grotan U15 per 1000 L of fluid (0.15% or 1500 ppm).

**Tankside advisory:** Grotan U15 may be used in systems with most popular fungicides. However, fungicides based on sodium pyrithione are not chemically compatible with Grotan U15. If used together, the efficacy of both will be compromised.

The actual use level of Grotan U15 required for optimum effectiveness in your product may vary according to the composition and end use of the individual formulation. Troy suggests that all formulation ingredients be evaluated for efficacy and stability in each product prior to commercial application.

**Toxicity**
LD50 (oral, rat) – 3522 mg/kg.; LD50 (dermal, rabbit) >2000 mg/kg.; severe skin irritant, corrosive (rabbit); skin sensitizer; corrosive to eyes (rabbit); LC50 (rat, 4 hr) – 490 mg/m³.

**Ecotoxicity**
This product is toxic to fish and may cause adverse environmental impact.

This product, or its components, are listed on, or are exempt from:

<table>
<thead>
<tr>
<th>Country</th>
<th>Agency</th>
<th>Registration Number and Sections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>PMRA</td>
<td>18245, Pest Control Products Act</td>
</tr>
</tbody>
</table>

**Handling, Storage, Health And Safety**

DANGER: Corrosive to eyes and causes skin burns. May cause allergic skin reaction. May be harmful if inhaled. May be fatal if swallowed or absorbed through the skin. Avoid contact with skin, eyes, or clothing. Avoid breathing vapor or mist. Wash thoroughly after handling. Keep container tightly closed. Use only with adequate ventilation. Store away from incompatible substances in a cool, dry, ventilated area. Do not contaminate water, food, or feed by storage or disposal.

Wear goggles or face shield and rubber gloves when handling. Do not take internally. Wash thoroughly after handling. This product is toxic to fish and wildlife. Treated effluent should not be discharged where it will drain into lakes, streams, ponds or public water. Do not contaminate water by cleaning of equipment or disposal of waters.
Observe all Federal, Provincial, and Local Regulations when storing or disposing of this substance.

**Shipping And Packaging**

**Grotan® U15** is packaged in:

<table>
<thead>
<tr>
<th>Shipping Container</th>
<th>Net Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-returnable HDPE Drum</td>
<td>209 kg net</td>
</tr>
<tr>
<td>HDPE Pail</td>
<td>20 kg net</td>
</tr>
</tbody>
</table>

**TDG**

- **Shipping Name**: UN3265, Corrosive liquid, acidic, organic, n.o.s. (contains: isothiazolinones) 8, PG III, ERG# 153
- **Labels Required**: Corrosive

**IATA**

- **Shipping Name**: UN3265, Corrosive liquid, acidic, organic, n.o.s. (contains: isothiazolinones) 8, PG III, ERG# 8L
- **Labels Required**: Corrosive

**IMDG**

- **Shipping Name**: UN3265, Corrosive liquid, acidic, organic, n.o.s. (contains: isothiazolinones) 8, PG III, EMS# F-A, S-B
- **Labels Required**: Corrosive

No warranty is made, whether expressed or implied, including warranties of merchantability or of fitness for a particular purpose for these products. No statements or recommendations contained herein are to be construed as inducements to infringe any relevant patent, now or hereafter in existence. Under no circumstances shall TROY Corporation or its affiliates be liable for incidental, consequential or other damages from alleged negligence, breach of warranty, strict liability or any other theory arising out of the use or handling of these products. The sole liability of TROY Corporation and its affiliates for any claims arising out of the manufacture, use or sale of its product shall be for the buyer's purchase price. Neither Troy Corporation nor any affiliates assumes any obligation or liability for the information in this document or the results obtained. The information in this document is provided without warranty and is to be utilized by customers of the products at the customer's sole risk. Customers should conduct their own tests in actual use conditions before commercial use of the products.

Polyphase®, MERGAL®, TroySan®, Troykyd®, Troythix®, TroySol™, Troymax™, Troyperse™, Powdernate®, Troyshield® and TroyGuard™ are Trademarks of Troy © 2005 Troy Corporation