SECTION I - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Anox™ 20 Powder, Anox™ 20 Granular and Anox™ 20 NDB™
Manufacturer: Great Lakes Chemical Corporation
Address: P.O. Box 2200
City: West Lafayette
State: Indiana
Zip: 47996-2200
Emergency Telephone Number: 1-800-949-5167
Information Telephone Number: 1-765-497-6100
Fax: 1-765-497-6123

Chemtrec Phone: 1-800-424-9300; Internationally call 703-527-3887
Effective Date: 02/10/2003
Supercede Date: 05/18/2000
MSDS Prepared By: Regulatory Affairs Department/Great Lakes Chemical Corporation

Synonyms:
- Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane
- Hydrocinnamic acid, 3,5-di-tert-butyl-4-hydroxy-, tetraester with pentaerythritol;
- Lowinox PP 35

Product Use: Antioxidant
Chemical Name: Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, 2,2-bis[3-[3,5-
bis(1,1-dimethylethyl)-4-hydroxyphenyl]-1-oxopropoxy]methyl]-1,3-propanediyl ester
Chemical Family: Sterically hindered phenol

No information available

SECTION II - COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>INGREDIENT NAME</th>
<th>CAS NO.</th>
<th>%</th>
<th>EXPOSURE LIMITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane</td>
<td>6683198</td>
<td>&gt;96</td>
<td>N (Hazardous)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15 mg/m3 (PNOR) (OSHA PEL TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (OSHA PEL CEIL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 mg/m3 (PNOC) (ACGIH TLV TWA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV STEL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not established (ACGIH TLV CEIL)</td>
</tr>
</tbody>
</table>

*Indented chemicals are components of previous ingredient.

Additional Information

5 mg/m3 Respirable Dust Level (OSHA)
3 mg/m3 Respirable Dust Level (ACGIH)
PNOR = Particulates Not Otherwise Regulated
PNOC = Particulates Not Otherwise Classified

SECTION III - HAZARDS IDENTIFICATION

Emergency Overview: White to off-white powder, granules or pellets
No odor
Not expected to be a hazard in normal industrial use.
Dusts can form an explosive mixture with air.

Relevant Routes of Exposure: Inhalation and ingestion.

Signs and Symptoms of Overexposure: No known signs and symptoms of exposure.
**SECTION III - HAZARDS IDENTIFICATION**

Medical Conditions Generally

Aggravated By Exposure: None reported

Potential Health Effects: See Section XI for additional information.

- **Eyes:** Not expected to be a hazard in normal industrial use. As with any dust, mechanical irritation is possible to the eye.
- **Skin:** Not expected to be a hazard in normal industrial use. As with any dust, mechanical irritation is possible to the skin.
- **Ingestion:** Not expected to be a hazard in normal industrial use.
- **Inhalation:** As with any dust, mechanical irritation is possible to mucous membranes and the respiratory tract.

Chronic Health Effects: None known

Carcinogenicity:

- NTP: No
- ACGIH: No
- IARC: No
- OTHER: No
- OSHA: No

Additional Information

No information available

**SECTION IV - FIRST AID MEASURES**

Eyes: Flush with large volumes of water for at least 15 minutes. Get medical attention.

Skin: Wash with large volumes of soap and water for at least 15 minutes. If irritation develops, get medical attention.

Ingestion: If conscious, give person 1 to 2 glasses of water. Get medical attention immediately.

Inhalation: Remove person to fresh air. Get medical attention immediately.

Antidotes: No information available

Notes to Physicians and/or Protection for First-Aiders: No information available

Additional Information

No information available

**SECTION V - FIRE FIGHTING MEASURES**

Flammable Limits in Air (% by Volume): Not available

Flash Point: 298 degrees C (Closed Cup)

Autoignition Temperature: Not available

Extinguishing Media: All conventional media are suitable. A strong jet stream of water is not suitable.

Fire Fighting Instructions: Wear a self-contained breathing apparatus and protective clothing to prevent skin and eye contact in fire situations.

Unusual Fire and Explosion Hazards: Under fire conditions, toxic and irritating fumes may be emitted. Dusts can form an explosive mixture with air.

Flammability Classification: Combustible dust

Known or Anticipated Hazardous Products of Combustion: Carbon monoxide and carbon dioxide
SECTION V - FIRE FIGHTING MEASURES

Additional Information

No information available

SECTION VI - ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Shut off all sources of ignition.
Wearing appropriate personal protective equipment, carefully sweep up material and place in suitable labeled containers for disposal.
Avoid creating a dusting condition.
Use only non-sparking tools.
Wash spill area after pick-up is complete, collecting all clean up water for appropriate disposal.

Personal Precautions: See Section VIII.
Environmental Precautions: Avoid releasing to the environment.

No information available

SECTION VII - HANDLING AND STORAGE

Handling: Use appropriate personal protection equipment.
Avoid eye, skin and clothing contact.
Avoid breathing dust.
Avoid repeated and prolonged contact.
Avoid creating a dusting situation.
Prevent buildup of static electricity.
All equipment should be properly grounded.

Storage: Store in a cool, dry, well-ventilated area away from incompatible materials.
Keep container tightly closed.
Store away from heat, sparks, and flame.
Protect containers against damage.
Keep material in supplier’s packaging.

Other Precautions: Avoid contact of material with open flames.

No information available

SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Adequate general ventilation is recommended when handling to control airborne levels.

Ventilation Requirements: Use local exhaust to minimize dusting.
Use mechanical ventilation for general area control.

Personal Protective Equipment:

Eye/Face Protection: Chemical safety glasses with side shields or chemical safety goggles
Gloves - PVC

Skin Protection: Do not wear textile or leather gloves.
Clothing designed to minimize skin contact

Respiratory Protection: Wear a NIOSH/MSHA approved dust respirator if dusting occurs, or there is potential for airborne exposures to exceed established threshold values.
SECTION VIII - EXPOSURE CONTROLS/PERSONAL PROTECTION


Other Protective Clothing or Equipment: No information available
Exposure Guidelines: See Section II.
Work Hygienic Practices: Wash thoroughly after handling.
Wash contaminated clothing before reuse.
Do not eat, drink, chew gum, use tobacco products, or apply cosmetics in work areas.

Additional Information

No information available

SECTION IX - PHYSICAL & CHEMICAL PROPERTIES

Appearance: White to off-white powder, granules or pellets
Percent Volatile: Not available

Boiling Point: 1130.3 degrees C (calculated)

Bulk Density: Not available
Color: White to off-white

Decomposition Temperature: Not available
Evaporation Rate: Not available

Freezing Point: Not available
Heat Value: Not available
Melting Point: 110-125 degrees C

Molecular/Chemical Formula: C73H108O12
Molecular Weight: 1176.5

Octanol/Water Partition Coefficient: Log Pow = 23
Odor: No odor

Odor Threshold: Not available

Particle Size: Not available

Additional Information

Minimum Ignition Energy: Between 1 mJ and 3 mJ
Minimum Ignition Temperature: 420 degrees C

SECTION X - STABILITY AND REACTIVITY

Stability: Stable under normal conditions of handling and use.

Conditions to Avoid: Ignition sources and dusting

Incompatibility With Other Materials: Strong oxidizers

Hazardous Decomposition Products: Thermal decomposition may produce the following:
Carbon monoxide and carbon dioxide

Hazardous Polymerization: Will not occur
SECTION X - STABILITY AND REACTIVITY

Conditions to Avoid: None

Additional Information

No information available

SECTION XI - TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>VALUE (LD50 OR LC50)</th>
<th>ANIMAL</th>
<th>ROUTES</th>
<th>COMPONENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;46 mg/L/1H</td>
<td>Rat</td>
<td>Acute Inhalation</td>
<td>Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane</td>
</tr>
<tr>
<td>&gt;3,160 mg/kg</td>
<td>Rabbit</td>
<td>Acute Dermal</td>
<td>Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane</td>
</tr>
<tr>
<td>&gt;5,000 mg/kg</td>
<td>Rat</td>
<td>Acute Oral</td>
<td>Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane</td>
</tr>
</tbody>
</table>

Toxicological Information:
Tetrakis(methylene(3,5-di-tert-butyl-4-hydroxy-hydrocinnamate))methane: This material has been determined not to be a primary eye or skin irritant in rabbits. Negative results were found in a sensitization study in guinea pigs. Negative mutagenicity results were obtained in an Ames test, a dominant lethal assay, a somatic mutation assay, and a reverse mutation assay.

In a 13 week repeated dose study in beagle dogs at doses of 1,000, 3,000, and 10,000 ppm, no adverse effects could be related to treatment.

In a two generation reproductive study at doses of 1,000, 3,000 and 10,000 ppm, no reproductive effects were seen.

Teratogenicity studies in rats and mice have shown negative results.

Additional Information

No information available

SECTION XII - ECOLOGICAL INFORMATION

Ecological Information:
EC50 in Daphnia magna (24 hour) >86 mg/L
LC50 in Zebra fish (96 hour) >100 mg/L
LC50 in Salmo gairdneri (96 hour) = 49 mg/L
EC50 in Algae (72H) >100 mg/L
EC50 in Escherichia coli (3H) >100 mg/L

A photodegradation half-life has been estimated at 1.2 hours.

Partially biodegradable

Avoid releasing to the environment.

Additional Information

No information available
**SECTION XIII - DISPOSAL CONSIDERATIONS**

Disposal Considerations: Dispose of waste at an approved chemical disposal facility in compliance with all current Local, State/Province, Federal/Canadian laws and regulations.

Additional Information

No information available

**SECTION XIV - TRANSPORT INFORMATION**

**U.S. DOT**

<table>
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<tr>
<th>Proper Shipping Name:</th>
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<tbody>
<tr>
<td>Hazard Class:</td>
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<tr>
<td>Packing Group:</td>
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</tr>
<tr>
<td>Special Provisions:</td>
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<tr>
<td>Non-Bulk Packaging:</td>
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</tr>
<tr>
<td>Passenger Air/Rail Limit:</td>
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<tr>
<td>Vessel Stowage:</td>
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<tr>
<td>Reportable Quantity:</td>
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<table>
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<tbody>
<tr>
<td>Labels:</td>
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<tr>
<td>Packaging Exceptions:</td>
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<tr>
<td>Bulk Packaging:</td>
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<tr>
<td>Air Cargo Limit:</td>
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<tr>
<td>Other Stowage:</td>
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**AIR - ICAO OR IATA**

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<tbody>
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<tr>
<td>Subsidiary Risk:</td>
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<td>Hazard Labels:</td>
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<tr>
<td>Air Passenger Limit Per Package:</td>
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<tr>
<td>Air Cargo Limit Per Package:</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>Packing Instructions:</td>
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<tr>
<td>Cargo:</td>
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<tr>
<td>Special Provisions Code:</td>
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**WATER - IMDG**

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<tr>
<td>Packing Group:</td>
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</tr>
<tr>
<td>Medical First Aid Guide Code:</td>
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<table>
<thead>
<tr>
<th>ID Number:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Subsidiary Risk:</td>
<td>N/A</td>
</tr>
</tbody>
</table>

No information available

Additional Information

**SECTION XV - REGULATORY INFORMATION**

**U.S. Federal Regulations:**
The components of this product are either on the TSCA Inventory or exempt (i.e. impurities, a polymer complying with the exemption rule at 40 CFR 723.250) from the Inventory.

**State Regulations:**
No information available

**International Regulations:**
This material (or each component) is listed on the following inventories:
Canada - DSL
EU - EINECS
Australia - AICS
Japan - ENCS
Korea - ECL
Philippines - PICCS
China - List I
**SECTION XV - REGULATORY INFORMATION**

Canadian WHMIS Hazard Class and Division = Not controlled

<table>
<thead>
<tr>
<th>SARA Hazards:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Acute:</td>
<td>No</td>
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<tr>
<td>Reactive:</td>
<td>No</td>
</tr>
<tr>
<td>Pressure:</td>
<td>No</td>
</tr>
<tr>
<td>Chronic:</td>
<td>No</td>
</tr>
<tr>
<td>Fire:</td>
<td>No</td>
</tr>
</tbody>
</table>

Additional Information

The above regulatory information represents only selected regulations and is not meant to be a complete list.

**SECTION XVI - OTHER INFORMATION**

<table>
<thead>
<tr>
<th>NFPA Codes:</th>
<th></th>
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<tbody>
<tr>
<td>Health:</td>
<td>0</td>
</tr>
<tr>
<td>Reactivity:</td>
<td>0</td>
</tr>
</tbody>
</table>

| Flammability: | 1 |
| Other:        | 0 |

<table>
<thead>
<tr>
<th>HMIS Codes:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Health:</td>
<td>0</td>
</tr>
<tr>
<td>Reactivity:</td>
<td>0</td>
</tr>
</tbody>
</table>

| Flammability: | 1 |
| Protection:   | X |

Label Statements: Not available

Other Information:

Abbreviations:
- (L) = Loose bulk density in g/ml
- LOEC = Lowest observed effect concentration
- MATC = Maximum acceptable toxicant concentration
- NA = Not available
- N/A = Not applicable
- NL = Not limited
- NOAEL = No observable adverse effect level
- NOEC = No observed effect concentration
- NOEL = No observable effect level
- NR = Not rated
- (P) = Packed bulk density in g/ml
- PNOC = Particulates Not Otherwise Classified
- PNOR = Particulates Not Otherwise Regulated
- REL = Recommended exposure limit
- TS = Trade secret

Additional Information

Information on this form is furnished solely for the purpose of compliance with OSHA’s Hazard Communication Standard, 29CFR 1910.1200 and The Canadian Environmental Protection Act, Canada Gazette Part II, Vol. 122, No. 2 and shall not be used for any other purpose.

Revision Information:
- General review and update
- Section IX - Physical properties
- Section XI - Toxicological information
- Section XII - Ecological Information