PRODUCT NAME: **HTH® FILTER CLEANER**

1. **PRODUCT AND COMPANY IDENTIFICATION**

<table>
<thead>
<tr>
<th>Arch Chemicals, Inc.</th>
<th>REVISION DATE: 07/21/2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>501 Merritt 7 PO Box 5204</td>
<td>SUPERCEDES: 09/11/2007</td>
</tr>
<tr>
<td>Norwalk, CT 06856-5204</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MSDS Number: 000000003648</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYNONYMS: None</td>
</tr>
<tr>
<td>CHEMICAL FAMILY: Organic aqueous solution</td>
</tr>
<tr>
<td>DESCRIPTION / USE: Filter cleaner</td>
</tr>
<tr>
<td>FORMULA: NOT APPLICABLE/MIXTURE</td>
</tr>
</tbody>
</table>

2. **HAZARDS IDENTIFICATION**

<table>
<thead>
<tr>
<th>OSHA Hazard Classification: Corrosive to eyes, Moderate skin irritant, Mucous membrane irritant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routes of Entry: Inhalation, skin, eyes, ingestion</td>
</tr>
<tr>
<td>Medical Conditions Aggravated: No known or reported interactions.</td>
</tr>
</tbody>
</table>

**Human Threshold Response Data**

- **Odor Threshold**
  - Not established for product.
  - Butoxyethanol: 0.1 ppm

- **Irritation Threshold**
  - Not established for product.

<table>
<thead>
<tr>
<th>Hazardous Materials Identification System / National Fire Protection Association Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard Ratings :</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>HMIS</td>
</tr>
<tr>
<td>NFPA</td>
</tr>
</tbody>
</table>

FOR ANY EMERGENCY, 24 HOURS / 7 DAYS, CALL: 1-800-654-6911 (OUTSIDE USA: 1-423-780-2970)

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®: 1-800-424-9300 (OUTSIDE USA: 1-703-527-3887)

FOR ALL MSDS QUESTIONS & REQUESTS, CALL: 1-800-511-MSDS (OUTSIDE USA: 1-423-780-2347)
Immediate (Acute) Health Effects

Inhalation Toxicity: Not expected to be toxic by inhalation. Inhalation of mist or vapor may cause irritation to the mucous membranes of the respiratory tract. Any irritation would be transient with no permanent damage expected.

Skin Toxicity: Slightly toxic by skin contact. Skin contact may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage.

Eye Toxicity: Corrosive. Burns can occur following exposure. Direct contact may cause impairment of vision, corneal damage and/or blindness. Rinsing of the eye should take place immediately.

Ingestion Toxicity: Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting or diarrhea. Slightly toxic if swallowed.

Acute Target Organ Toxicity: This product is corrosive to the eyes, moderately irritating to the skin and upon inhalation, may cause irritation to mucous membranes and respiratory tract.

Prolonged (Chronic) Health Effects

Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

Reproductive and Developmental Toxicity: No reproductive or developmental risk to humans is expected from exposure to this product.

Inhalation: There are no known or reported effects from chronic exposure except for effects similar to those experienced from acute exposure.

Skin Contact: Prolonged or repeated exposure may cause severe irritation.

Ingestion: There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.

Sensitization: This material is not known or reported to be a skin or respiratory sensitizer.

Chronic Target Organ Toxicity: This product has not been tested. However, chronic (repeated) exposures to this product would be expected to produce similar effects as seen from acute exposures.

Supplemental Health Hazard Information: No additional health information available.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS OR CHEMICAL NAME</th>
<th>CAS #</th>
<th>% RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citric Acid</td>
<td>77-92-9</td>
<td>1 - 6</td>
</tr>
<tr>
<td>Butoxyethanol</td>
<td>111-76-2</td>
<td>5 - 10</td>
</tr>
</tbody>
</table>
4. FIRST AID MEASURES

Inhalation: IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult or if respiratory irritation develops.

Skin Contact: IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Seek medical attention if irritation develops.

Eye Contact: IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention immediately.

Ingestion: IF SWALLOWED: Call a physician immediately. DO NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.

5. FIRE FIGHTING MEASURES

Flammability Summary (OSHA): Product is not known to be flammable, combustible, pyrophoric or explosive.

Flammable Properties
Flash Point: Not applicable
Autoignition Temperature: Not applicable
Fire / Explosion Hazards: This material is not expected to burn unless all the water is boiled away. The remaining compounds may be ignitable.

Extinguishing Media: Choose extinguishing media suitable for surrounding materials.
Fire Fighting Instructions: In case of fire, use normal fire-fighting equipment and the personal protective equipment recommended in Section 8 to include a NIOSH approved self-contained breathing apparatus.

Hazardous Combustion Products: Carbon monoxide, Carbon dioxide
Upper Flammable / Explosive Limit, % in air: No data
Lower Flammable / Explosive Limit, % in air: No data
6. ACCIDENTAL RELEASE MEASURES

Personal Protection for Emergency Situations: Use the personal protective equipment recommended in Section 8 and a NIOSH approved self-contained breathing apparatus.

Spill Mitigation Procedures

Air Release: Hazardous concentrations in air may be found in local spill area and immediately downwind. Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Water Release: This material is soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Land Release: Create a dike or trench to contain materials. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Do not place spill materials back in their original containers. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Additional Spill Information: Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section 13, Disposal Consideration.

7. HANDLING AND STORAGE

Handling: Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor.

Storage: Store in a cool, dry and well ventilated place. Isolate from incompatible materials. Avoid freezing.

Incompatible Materials for Storage: Refer to Section 10, "Incompatible Materials."

Empty Container Warning: Empty containers retain hazardous residue, dispose of accordingly.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to keep airborne exposures below the TLV, PEL or other recommended exposure limit.

Protective Equipment for Routine Use of Product
Respiratory Protection: Wear a NIOSH approved respirator if levels above the exposure limits are possible.

Respirator Type: A NIOSH approved air purifying respirator with organic vapor cartridge and N95 particulate filter. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.

Skin Protection: Wear impervious gloves to avoid skin contact.

Eye Protection: Use chemical goggles and a faceshield.

Protective Clothing Type: Impervious

General Protective Measures: An eye wash and safety shower should be provided in the immediate work area.

Exposure Limit Data

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>Name of Limit</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Butoxyethanol</td>
<td>111-76-2</td>
<td>ZUS_ACGIH</td>
<td>20 ppm TWA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>120 mg/m3 TWA</td>
</tr>
<tr>
<td>Butoxyethanol</td>
<td>111-76-2</td>
<td>ZUS_OSHAPO</td>
<td>25 ppm TWA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 mg/m3 TWA</td>
</tr>
<tr>
<td>Butoxyethanol</td>
<td>111-76-2</td>
<td>ZUS_OSHAP1</td>
<td>50 ppm TWA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>240 mg/m3 TWA</td>
</tr>
<tr>
<td>Butoxyethanol</td>
<td>111-76-2</td>
<td>NIOSH-IDLH</td>
<td>700 ppm</td>
</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical State: liquid
- Form: liquid
- Color: clear
- Odor: Heavy detergent odor
- Molecular Weight: Not applicable/Mixture
- Specific Gravity: 1.1380
- pH: 1.0 - 3.0 (@ 25 Deg. C)
- Boiling Point: 101 DEG°C / 215 DEG°F
- Freezing Point: 0 DEG°C / 32 DEG°F
- Melting Point: No data
- Density: 1.1380g/cc
- Vapor Pressure: 17.00000000 (@ 25 Deg. C)
- Vapor Density: No data
- Viscosity: Not applicable
- Fat Solubility: No data
- Solubility in Water: soluble
- Partition coefficient n-octanol/water: No data
- Evaporation Rate: Approximately 1.00
- Oxidizing: No data
- Volatiles, % by vol.: No data
- VOC Content: No data
HAP Content: No data

10. STABILITY AND REACTIVITY

Stability and Reactivity Summary: Stable under normal conditions. Not sensitive to mechanical shock. Not sensitive to static discharge. Product will not undergo hazardous polymerization.

Conditions to Avoid: High temperatures, Avoid freezing.

Chemical Incompatibility: Strong oxidizing agents, strong acids, strong alkalies

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, phosphorus oxides

Decomposition Temperature: No data

11. TOXICOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Component</th>
<th>Animal Toxicology</th>
<th>Oral LD50 value</th>
<th>Dermal LD50 value</th>
<th>Inhalation LC50 value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>LD50</td>
<td>LD50</td>
<td>Inhalation LC50</td>
</tr>
<tr>
<td>Citric Acid</td>
<td></td>
<td>3,000 mg/kg rat</td>
<td>Believed to be &gt; 2,000 mg/kg rabbit</td>
<td>No data available</td>
</tr>
<tr>
<td>Butoxyethanol</td>
<td></td>
<td>1,590 mg/kg Rat</td>
<td>580 mg/kg Rabbit</td>
<td>Inhalation LC50 4 h 486 ppm Rat</td>
</tr>
<tr>
<td>ETIDRONIC ACID</td>
<td></td>
<td>1,440 mg/kg Rat</td>
<td>&gt; 4,764 mg/kg Rabbit</td>
<td>No data</td>
</tr>
<tr>
<td>POLY(OXY-1,2-ETHANEDIYL), ALPHA-(NONYLPHENYL)-</td>
<td></td>
<td>4,000 mg/kg Rat</td>
<td>&gt; 2,000 mg/kg Rabbit</td>
<td>Inhalation LC50 No data</td>
</tr>
</tbody>
</table>

Product Animal Toxicity:

<table>
<thead>
<tr>
<th>Oral LD50 value</th>
<th>Dermal LD50 value</th>
<th>Inhalation LC50 value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD50 Believed to be approximately 3,700 mg/kg rat</td>
<td>LD50 Believed to be approximately 1,700 mg/kg rabbit</td>
<td>no data available</td>
</tr>
</tbody>
</table>

Skin Irritation: This material is expected to be moderately irritating.
Eye Irritation: This material is expected to be corrosive.
Skin Sensitization: This material is not known or reported to be a skin or respiratory sensitizer.
Acute Toxicity: This product is corrosive to the eyes, moderately irritating to the skin and upon inhalation, may cause irritation to mucous membranes and respiratory tract.

Subchronic / Chronic Toxicity: Not known or reported to cause subchronic or chronic toxicity.

Reproductive and Developmental Toxicity: Not known or reported to cause reproductive or developmental toxicity.

- **Citric Acid**
  - This chemical has been tested in laboratory animals and there was no evidence of reproductive toxicity or teratogenicity.

- **Butoxyethanol**
  - Reproductive toxicity occurred in laboratory animals only at doses that were maternally toxic.

- **ETIDRONIC ACID**
  - This product has been tested and was shown not to produce any adverse effects on reproductive function or fetal development when administered to laboratory animals.

Mutagenicity:

- **Citric Acid**
  - This product was determined to be non-mutagenic in the Ames assay. It was also shown to be negative in the Dominant lethal assay.

- **Butoxyethanol**
  - This material has been shown to be non-mutagenic in the majority of a battery of assays. Not expected to be a mutagenic hazard.

- **ETIDRONIC ACID**
  - This chemical has been tested and was shown to be non-mutagenic.

Carcinogenicity:

- **Citric Acid**
  - The carcinogenicity has been evaluated through animal study and it was found not to be carcinogenic.

- **Butoxyethanol**
  - This material has been classified by the U.S. EPA as a "Group C" carcinogen (Suggestive Human Carcinogen), based on equivocal and limited evidence in laboratory animals. The International Agency for Research on Cancer (IARC) has classified this product or a component of this product as a Group 3 substance, Unclassifiable as to Its Carcinogenicity to Humans.

- **ETIDRONIC ACID**
  - This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA. Chemicals of similar structure have been shown not to cause cancer in laboratory animals.

12. ECOLOGICAL INFORMATION

Overview: No data for product. Individual constituents are as follows:
Ecological Toxicity Values for: **Citric Acid**
- Lepomis macrochirus (Bluegill sunfish) - (static). 96 h LC50 = 1,516 mg/l
- Daphnia magna (Water flea) - 72 h EC50 Approximately 120 mg/l

Ecological Toxicity Values for: **ETIDRONIC ACID**
- Bluegill - 96 h LC50 = 868 mg/l
- Rainbow trout (Salmo gairdneri) - 96 h LC50 = 368 mg/l
- Channel Catfish (Ictalurus punctatus Rafinesque) - 96 h LC50 = 695 mg/l
- Sheepshead minnow - 96 h LC50 = 2,180 mg/l
- Daphnia magna - 48 h EC50 = 527 mg/l
- Grass shrimp - 96 h LC50 = 1,770 mg/l
- Oyster Shell Deposition - 96 h EC50 = 89 mg/l
- Mallard duck - Oral LD50 > 2,510 mg/kg
- Bobwhite quail - Oral LD50 > 2,510 mg/kg

### 13. DISPOSAL CONSIDERATIONS

**CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THE MATERIAL. THE USER OF THE MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.**

**Waste Disposal Summary:** If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following EPA hazardous waste number: D002.

**Disposal Methods:** As a hazardous liquid waste it must be disposed of in accordance with local, state and federal regulations.

**Potential US EPA Waste Codes:** D002

### 14. TRANSPORT INFORMATION

- **Land (US DOT):** Not Regulated
- **Water (IMDG):** UN3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (ETIDRONIC ACID) 8 III Marine Pollutant: No
- **Air (IATA):** UN3265 CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (ETIDRONIC ACID) 8 III
- **Emergency Response Guide Number:** Not applicable

**HTH® FILTER CLEANER**

**REVISION DATE:** 07/21/2009
Transportation Notes: Product not regulated for ground transport in the USA per exception permitted in 49 CFR 173.154(d).

EMS: F-A, S-B

15. REGULATORY INFORMATION

UNITED STATES:
Toxic Substances Control Act (TSCA): The components of this product are listed on the TSCA Inventory of Existing Chemical Substances.
EPA Pesticide Registration Number: None established
FIFRA Listing of Pesticide Chemicals (40 CFR 180): Not registered in the US under FIFRA.

Superfund Amendments and Reauthorization Act (SARA) Title III:
Hazard Categories Sections 311 / 312 (40 CFR 370.2): Health Immediate (Acute) Health Hazard Physical None

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:
ZUS_SAR302 TPQ (threshold planning quantity) None established

Reportable Quantity (49 CFR 172.101, Appendix):
ZUS_CERCLA Reportable quantity GLYCOL ETHERS Value:
ZUS_SAR302 Reportable quantity None established

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components
ZUS_SAR313 De minimis concentration Glycol ethers (Non-carcinogenic) Value: 1%

Clean Air Act Toxic ARP Section 112r:
CAA 112R None established

Clean Air Act Socmi:
HON SOC

US. EPA Hazardous Organic NESHAP (HON) Synthetic Organic Chemicals (40 CFR 63.100-.106, Table 1) 07 1999
Group I
ETHYLENE GLYCOL MONOBUTYL ETHER

Clean Air Act VOC Section 111:
CAA 111

US. EPA Clean Air Act (CAA) Section 111 SOCMI Intermediate or Final Volatile Organic Compounds (40 CFR 60.489)
01 1996
2-BUTOXYETHANOL

Clean Air Act Haz. Air Pollutants Section 112:
ZUS_CAAHAP None established
ZUS_CAAHRP None established

CAA AP

US. EPA Hazardous Organic NESHAP (HON) Hazardous Air Pollutants (40 CFR 63.100-.106, Table 2)
04 1999
GLYCOL ETHERS

State Right-to-Know Regulations Status of Ingredients

Pennsylvania:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>COMPONENT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-76-2</td>
<td>Butoxyethanol</td>
</tr>
</tbody>
</table>

ZUSPA_RTK

Pennsylvania: Hazardous substance list
1989-08-11
ETHANOL, 2-BUTOXY-

New Jersey:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>COMPONENT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-76-2</td>
<td>Butoxyethanol</td>
</tr>
</tbody>
</table>

ZUSNJ_RTK

New Jersey Right to Know Hazardous Substance List (RTK-HSL)
2007-03-01
2-BUTOXY ETHANOL ETHYLENE GLYCOL MONOBUTYL ETHER ETHANOL, 2-BUTOXY- BUTYL CELLOSOLVE Special Health Hazard - Carcinogen

Massachusetts:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>COMPONENT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-76-2</td>
<td>Butoxyethanol</td>
</tr>
</tbody>
</table>

ZUSMA_RTK
Massachusetts Right to Know List of Chemicals and Hazard Classifications
1993-04-24
2-BUTOXYETHANOL  BUTYL CELLOSOLVE  ETHYLENE GLYCOL MONOBUTYL ETHER

California Proposition 65:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>COMPONENT NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZUSCA_P65</td>
<td>None established</td>
</tr>
</tbody>
</table>

WHMIS Hazard Classification:

Ingredient Disclosure List (WHMIS)
1988-01-20
Threshold limits: 1 Weight %
409
CITRIC ACID

Ingredient Disclosure List (WHMIS)
2007-08-24
Threshold limits: 1 Weight %
824
Ethylene glycol monobutyl ether

16. OTHER INFORMATION

MSDS REVISION STATUS :  Revised to meet the ANSI standard of 16 sections
SECTIONS REVISED: 3, 8, 11
Major References :  Available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.