

**Section 1. Identification**

**Product name** : ABX Fluocyte 0.5L  
**Product type** : Liquid.  
**Product code** : 0904011  
**SAP Code** : 1210904011  
**Other means of identification** : Not available.  
**Product description** : 0.5 L

**Relevant identified uses of the substance or mixture and uses advised against****Identified uses**

ABX Fluocyte is a staining solution intended for *in vitro* diagnostic use and designed for erythrocytes (RBC) counting and differentiation on HORIBA Medical blood cell counters.

**Uses advised against**

Not applicable.

**Supplier's details** : HORIBA ABX SAS  
Parc Euromédecine  
Rue du Caducée  
BP 7290  
34184 Montpellier Cedex 4  
FRANCE  
Tel: +33 (0) 4 67 14 15 16  
Fax: +33 (0) 4 67 14 15 17

HORIBA Medical  
9755 Research Drive  
Irvine, CA 92618  
Phone: + 1 888 903 5001  
Fax: +1 949 753 0533

**e-mail address of person responsible for this SDS** : documentation.med@horiba.com  
hotline-med.us@horiba.com

**National advisory body/Poison Center**

**Emergency telephone number** : +1 800 424 9300 (CHEMTREC®)

**Supplier**

**Telephone number** : + 800 67 14 15 16

**Section 2. Hazards identification**

**OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

**Classification of the substance or mixture** : Not classified.

**GHS label elements**

**Date of issue/Date of revision** : 11/01/2023

1/12

## Section 2. Hazards identification

- Signal word** : No signal word.
- Hazard statements** : No known significant effects or critical hazards.
- Precautionary statements**
- Prevention** : Not applicable.
- Response** : Not applicable.
- Storage** : Not applicable.
- Disposal** : Not applicable.
- Hazards not otherwise classified** : None known.

## Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture
- Other means of identification** : Not available.

| Ingredient name | %  | CAS number |
|-----------------|----|------------|
| Methanol        | ≤5 | 67-56-1    |

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur.
- Ingestion** : Wash out mouth with water. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

#### Over-exposure signs/symptoms

- Eye contact** : No specific data.
- Inhalation** : No specific data.
- Skin contact** : No specific data.
- Ingestion** : No specific data.

## Section 4. First aid measures

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

**Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.

**Unsuitable extinguishing media** : None known.

**Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst.

**Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide

**Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

**Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Remark** :  Non-flammable.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

**For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.

**For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

**Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

### Methods and materials for containment and cleaning up

**Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

## Section 6. Accidental release measures

- Large spill** : Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling


- Protective measures** : Put on appropriate personal protective equipment (see Section 8).
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store between the following temperatures: 18 to 25°C (64,4 to 77°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use. Store away from light.

## Section 8. Exposure controls/personal protection

### Control parameters

### Occupational exposure limits

| Ingredient name  | Exposure limits   |
|--|---|
| <p> Methanol</p> | <p><b>ACGIH TLV (United States, 1/2022).</b><br/> <b>Absorbed through skin.</b><br/>                     TWA: 200 ppm 8 hours.<br/>                     TWA: 262 mg/m<sup>3</sup> 8 hours.<br/>                     STEL: 250 ppm 15 minutes.<br/>                     STEL: 328 mg/m<sup>3</sup> 15 minutes.</p> <p><b>OSHA PEL 1989 (United States, 3/1989).</b><br/> <b>Absorbed through skin.</b><br/>                     TWA: 200 ppm 8 hours.<br/>                     TWA: 260 mg/m<sup>3</sup> 8 hours.<br/>                     STEL: 250 ppm 15 minutes.<br/>                     STEL: 325 mg/m<sup>3</sup> 15 minutes.</p> <p><b>NIOSH REL (United States, 10/2020).</b><br/> <b>Absorbed through skin.</b><br/>                     TWA: 200 ppm 10 hours.<br/>                     TWA: 260 mg/m<sup>3</sup> 10 hours.<br/>                     STEL: 250 ppm 15 minutes.<br/>                     STEL: 325 mg/m<sup>3</sup> 15 minutes.</p> <p><b>OSHA PEL (United States, 5/2018).</b><br/>                     TWA: 200 ppm 8 hours.<br/>                     TWA: 260 mg/m<sup>3</sup> 8 hours.</p> |

### Biological exposure indices

## Section 8. Exposure controls/personal protection

| Ingredient name | Exposure indices  |
|-----------------|---|
| Methanol        | <b>ACGIH BEI (United States, 1/2022)</b><br>BEI: 15 mg/l, methanol [in urine]. Sampling time: end of shift. |

- Appropriate engineering controls** : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

### Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** :  Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Recommended: Tightly sealed goggles according to EN 166
- Skin protection**
- Hand protection** :  Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. > 8 hours (breakthrough time): Protective gloves according to EN 374
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** :  Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: Combination filtering device according to EN 14387

## Section 9. Physical and chemical properties and safety characteristics

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

### Appearance

- Physical state** : Liquid.
- Color** : Yellowish.
- Odor** : Odorless.
- Odor threshold** : Not available.
- pH** : 6 to 8
- Melting point/freezing point** : Not available.
- Boiling point, initial boiling point, and boiling range** :

## Section 9. Physical and chemical properties and safety characteristics

| Ingredient name                              | °C   | °F    | Method |
|--|------|-------|--------|
| <input checked="" type="checkbox"/> Methanol | 64,7 | 148,5 |        |

**Flash point** : Not applicable.

**Flammability** :  Non-flammable.

**Lower and upper explosion limit/flammability limit** : Not available.

**Vapor pressure** :

| Ingredient name                              | Vapor Pressure at 20 °C |      |        | Vapor pressure at 50 °C |     |        |
|--|-------------------------|------|--------|-------------------------|-----|--------|
|  | mm Hg                   | kPa  | Method | mm Hg                   | kPa | Method |
| <input checked="" type="checkbox"/> Methanol | 126,96                  | 16,9 |        |                         |     |        |

**Relative vapor density** : Not available.

**Relative density** : Not available.

**Solubility(ies)** :

| Media  | Result         |
|--|----------------|
| <input checked="" type="checkbox"/> Cold water | Easily soluble |
| hot water                                      | Easily soluble |

**Solubility in water** : Not available.

**Miscible with water** :  Yes.

**Partition coefficient: n-octanol/water** :  Not applicable.

**Auto-ignition temperature** : Not applicable.

**Decomposition temperature** : Not available.

**Viscosity** : Not available.

### Particle characteristics

**Median particle size** :  Not applicable.

## Section 10. Stability and reactivity

**Reactivity** : No specific test data related to reactivity available for this product or its ingredients.

**Chemical stability** : The product is stable.

**Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.

**Conditions to avoid** : No specific data.

**Incompatible materials** : No specific data.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

| Product/ingredient name | Result               | Species | Dose        | Exposure |
|-------------------------|----------------------|---------|-------------|----------|
| Methanol                | LC50 Inhalation Gas. | Rat     | 145000 ppm  | 1 hours  |
|                         | LC50 Inhalation Gas. | Rat     | 64000 ppm   | 4 hours  |
|                         | LD50 Dermal          | Rabbit  | 15800 mg/kg | -        |
|                         | LD50 Oral            | Rat     | 5600 mg/kg  | -        |

#### Irritation/Corrosion

| Product/ingredient name | Result                   | Species | Score | Exposure        | Observation |
|-------------------------|--------------------------|---------|-------|-----------------|-------------|
| Methanol                | Eyes - Moderate irritant | Rabbit  | -     | 24 hours 100 mg | -           |
|                         | Eyes - Moderate irritant | Rabbit  | -     | 40 mg           | -           |
|                         | Skin - Moderate irritant | Rabbit  | -     | 24 hours 20 mg  | -           |

#### Sensitization

Not available.

#### Mutagenicity

Not available.

#### Carcinogenicity

Not available.

#### Reproductive toxicity

Not available.

#### Teratogenicity

Not available.

#### Specific target organ toxicity (single exposure)

| Product/ingredient name | Category   | Route of exposure | Target organs |
|-------------------------|------------|-------------------|---------------|
| Methanol                | Category 1 | -                 | -             |

#### Specific target organ toxicity (repeated exposure)

Not available.

#### Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

#### Potential acute health effects

**Eye contact** : No known significant effects or critical hazards.  
**Inhalation** : No known significant effects or critical hazards.  
**Skin contact** : No known significant effects or critical hazards.  
**Ingestion** : No known significant effects or critical hazards.

#### Symptoms related to the physical, chemical and toxicological characteristics

**Eye contact** : No specific data.  
**Inhalation** : No specific data.

## Section 11. Toxicological information

- Skin contact** : No specific data.  
**Ingestion** : No specific data.

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

#### Long term exposure

- Potential immediate effects** : Not available.  
**Potential delayed effects** : Not available.

#### Potential chronic health effects

Not available.

- General** : No known significant effects or critical hazards.  
**Carcinogenicity** : No known significant effects or critical hazards.  
**Mutagenicity** : No known significant effects or critical hazards.  
**Reproductive toxicity** :  No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

| Product/ingredient name   | Oral (mg/kg) | Dermal (mg/kg) | Inhalation (gases) (ppm) | Inhalation (vapors) (mg/l) | Inhalation (dusts and mists) (mg/l) |
|---|--------------|----------------|--------------------------|----------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> ABX Fluocyte 0.5L<br>methanol | 10000<br>100 | 30000,0<br>300 | N/A<br>64000             | 300,0<br>3                 | N/A<br>N/A                          |

## Section 12. Ecological information

### Toxicity

| Product/ingredient name                      | Result                               | Species                               | Exposure |
|--|--------------------------------------|---------------------------------------|----------|
| <input checked="" type="checkbox"/> methanol | Acute EC50 16,912 mg/l Marine water  | Algae - Ulva pertusa                  | 96 hours |
|  | Acute LC50 2500000 µg/l Marine water | Crustaceans - Crangon crangon - Adult | 48 hours |
|  | Acute LC50 3289 mg/l Fresh water     | Daphnia - Daphnia magna - Neonate     | 48 hours |
|  | Acute LC50 290 mg/l Fresh water      | Fish - Danio rerio - Egg              | 96 hours |
|  | Chronic NOEC 9,96 mg/l Marine water  | Algae - Ulva pertusa                  | 96 hours |

### Persistence and degradability

Not available.

### Bioaccumulative potential

| Product/ingredient name                      | LogP <sub>ow</sub> | BCF | Potential |
|--|--------------------|-----|-----------|
| <input checked="" type="checkbox"/> methanol | -0,77              | <10 | low       |

## Section 12. Ecological information

### Mobility in soil

Soil/water partition coefficient ( $K_{oc}$ ) : Not available.

Other adverse effects : No known significant effects or critical hazards.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

### United States - RCRA Toxic hazardous waste "U" List

| Ingredient   | CAS #   | Status | Reference number |
|--------------|---------|--------|------------------|
| Methanol (I) | 67-56-1 | Listed | U154             |

## Section 14. Transport information

|                            | DOT Classification | TDG Classification | Mexico Classification | IMDG           | IATA           |
|----------------------------|--------------------|--------------------|-----------------------|----------------|----------------|
| UN number                  | Not regulated.     | Not regulated.     | Not regulated.        | Not regulated. | Not regulated. |
| UN proper shipping name    | -                  | -                  | -                     | -              | -              |
| Transport hazard class(es) | -                  | -                  | -                     | -              | -              |
| Packing group              | -                  | -                  | -                     | -              | -              |
| Environmental hazards      | No.                | No.                | No.                   | No.            | No.            |

**Special precautions for user** : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to IMO instruments** : Not available.

## Section 15. Regulatory information

**U.S. Federal regulations** : TSCA 8(a) CDR Exempt/Partial exemption: Not determined

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

### SARA 302/304

#### Composition/information on ingredients

| Name           | %     | EHS  | SARA 302 TPQ |           | SARA 304 RQ |           |
|----------------|-------|------|--------------|-----------|-------------|-----------|
|                |       |      | (lbs)        | (gallons) | (lbs)       | (gallons) |
| ☑ Sodium azide | ≤0,25 | Yes. | 500          | -         | 1000        | -         |

**SARA 304 RQ** : 4000000 lbs / 1816000 kg

### SARA 311/312

**Classification** : Not applicable.

#### Composition/information on ingredients

| Name       | %  | Classification  |
|------------|----|---|
| ☑ Methanol | ≤5 | FLAMMABLE LIQUIDS - Category 2<br>ACUTE TOXICITY (oral) - Category 3<br>ACUTE TOXICITY (dermal) - Category 3<br>ACUTE TOXICITY (inhalation) - Category 3<br>SKIN IRRITATION - Category 2<br>EYE IRRITATION - Category 2A<br>SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) - Category 1 |

### SARA 313

|  | Product name | CAS number | %  |
|--|--------------|------------|----|
| <b>Form R - Reporting requirements</b> | ☑ Methanol   | 67-56-1    | ≤5 |
| <b>Supplier notification</b>           | ☑ Methanol   | 67-56-1    | ≤5 |

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

**Massachusetts** : ☑ The following components are listed: METHANOL

**New York** : The following components are listed: Methanol

**New Jersey** : ☑ The following components are listed: METHYL ALCOHOL

**Pennsylvania** : The following components are listed: METHANOL

### California Prop. 65

**⚠ WARNING:** This product can expose you to Methanol, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

## Section 15. Regulatory information

| Ingredient name | No significant risk level | Maximum acceptable dosage level |
|-----------------|---------------------------|---------------------------------|
| Methanol        | -                         | Yes.                            |

### International regulations

#### Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

#### Montreal Protocol

Not listed.

#### Stockholm Convention on Persistent Organic Pollutants

Not listed.

#### Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

#### UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

### Inventory list

- Australia** : Not determined.
- Canada** : Not determined.
- China** : Not determined.
- Eurasian Economic Union** : **Russian Federation inventory**: All components are listed or exempted.
- Japan** : **Japan inventory (CSCL)**: Not determined.  
**Japan inventory (ISHL)**: Not determined.
- New Zealand** : Not determined.
- Philippines** : Not determined.
- Republic of Korea** : Not determined.
- Taiwan** : All components are listed or exempted.
- Thailand** : Not determined.
- Turkey** : Not determined.
- United States** : Not determined.
- Viet Nam** : Not determined.

## Section 16. Other information

### Hazardous Material Information System (U.S.A.)

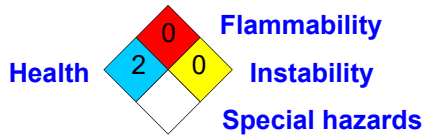
|                  |     |
|------------------|-----|
| Health           | / 0 |
| Flammability     | 0   |
| Physical hazards | 0   |
|                  |     |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

## Section 16. Other information

### National Fire Protection Association (U.S.A.)



### Procedure used to derive the classification

Not classified.

### History

**Date of printing** : 11/01/2023

**Date of issue/Date of revision** : 11/01/2023

**Date of previous issue** : 10/06/2019

**Version** : 3

### Key to abbreviations

: ATE = Acute Toxicity Estimate  
 BCF = Bioconcentration Factor  
 GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
 IATA = International Air Transport Association  
 IBC = Intermediate Bulk Container  
 IMDG = International Maritime Dangerous Goods  
 LogPow = logarithm of the octanol/water partition coefficient  
 MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
 N/A = Not available  
 SGG = Segregation Group  
 UN = United Nations

**References** : Not available.

**Revision comments** : New MSDS form.

☑ Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.