1 PRODUCT AND COMPANY IDENTIFICATION

Altuglas International
Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:
Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers
Altuglas International Customer Service
Phone Number (800) 523-1532
Available Hrs 8:00 am - 6:00pm EST

Product Name TUFFAK (R) A Polycarbonate Sheet
Product Synonym(s)
Chemical Family Polycarbonate
Chemical Formula N/A
Chemical Name See Ingredients
EPA Reg Num
Product Use

2 COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS RegistryNumber</th>
<th>Typical %</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene chloride</td>
<td>75-09-2</td>
<td>&lt; 3 ppm</td>
<td>Y</td>
</tr>
<tr>
<td>Carbonic dichloride, polymer with 4,4'-(1-methylethylidene)bis[phenol], 4-(1,1-dimethylphenyl)phenyl ester</td>
<td>103598-77-2</td>
<td>0-99</td>
<td>N</td>
</tr>
<tr>
<td>Carbonic dichloride, polymer with 4,4'-(1-methylethylidene)bis[phenol], 4-(1-methyl-1-phenylethyl)phenyl ester</td>
<td>111211-39-3</td>
<td>0-99</td>
<td>N</td>
</tr>
<tr>
<td>Carbonic dichloride, polymer with 4,4'-(1-methylethylidene)bis[phenol]</td>
<td>25971-63-5</td>
<td>0-99</td>
<td>N</td>
</tr>
</tbody>
</table>

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

While this material is not classified as hazardous under Federal OSHA regulations, this MSDS contains valuable information critical to the safe handling and proper use of this product. This MSDS should be retained and available for employees and other users of this product.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview
Polycarbonate sheet material
HANDLE IN ACCORDANCE WITH GOOD INDUSTRIAL HYGIENE AND SAFETY PRACTICES.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. As a finished product, it is a synthetic, high molecular weight polymer. Due to its chemical and physical properties, this material does not require special handling other than the good industrial hygiene and safety practices employed with any industrial material of this type. Under normal processing conditions, this material will release fume or vapor.
Components of these releases may vary with processing time and temperatures. These process releases may produce eye, skin and/or respiratory tract irritation and, with repeated or prolonged exposures, nausea, drowsiness, headache and weakness.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water.

IN CASE OF CONTACT, flush the area with plenty of water. Remove material from clothing. Wash clothing before reuse.

IF INHALED, remove to fresh air.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-Ignition Temperature</td>
<td>&gt;510 C/950 F</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>NA</td>
<td>Flash Point</td>
</tr>
<tr>
<td>Flammable Limits - Upper</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Flammable Limits - Lower</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

Heated material can form flammable vapors with air.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Contain spill. Sweep or scoop up and remove to suitable container. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE

Handling

Avoid temperature extremes during storage; ambient temperature preferred.

Storage

Use only with adequate ventilation.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local
8 EXPOSURE CONTROLS / PERSONAL PROTECTION

mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Use good industrial practice to avoid eye contact.

Skin Protection

Minimize skin contamination by following good industrial hygiene practice. Wearing protective gloves is recommended. Wash hands and contaminated skin thoroughly after handling.

Respiratory Protection

Avoid breathing dust. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

<table>
<thead>
<tr>
<th>Exposure Limit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH TWA</td>
<td>-</td>
</tr>
<tr>
<td>OSHA Skin designator</td>
<td>Y</td>
</tr>
<tr>
<td>OSHA STEL PEL</td>
<td>-</td>
</tr>
<tr>
<td>OSHA TWA PEL</td>
<td>-</td>
</tr>
</tbody>
</table>

-Only those components with exposure limits are printed in this section.
-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
-WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance/Odor</td>
<td>Polycarbonate sheet material</td>
</tr>
<tr>
<td>pH</td>
<td>NA</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.15 to 1.19</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>NA</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>NA</td>
</tr>
<tr>
<td>Melting Point</td>
<td>218 C/424 F</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>NA</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>NA</td>
</tr>
<tr>
<td>Solubility In Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Percent Volatile</td>
<td>0</td>
</tr>
</tbody>
</table>
10 STABILITY AND REACTIVITY

Stability
This material is chemically stable under normal and anticipated storage and handling conditions.

Hazardous Polymerization
Does not occur.

Incompatibility
None known.

Hazardous Decomposition Products
Thermal decomposition may yield toxic hydrocarbons which includes methane, phenolics, bisphenolA, diphenyl carbonate.

11 TOXICOLOGICAL INFORMATION

Toxicological Information
Bisphenol A- carbonic dichloride copolymer 4-(1-methyl-1-phenylethyl)phenyl ester
Single exposure (acute) studies indicate that a similar material is practically non-toxic if swallowed (rat LD50 >5,000 mg/kg), no more than slightly toxic if absorbed through skin (rabbit LD50 >2,000 mg/kg), non-irritating to rabbit skin and slightly irritating to rabbit eyes.

12 ECOLOGICAL INFORMATION

Ecotoxicological Information
No data are available.

Chemical Fate Information
No data are available.

13 DISPOSAL CONSIDERATIONS

Waste Disposal
Incineration is the recommended method for disposal observing all local, state and federal regulations.

14 TRANSPORT INFORMATION

DOT Name
NOT REGULATED

DOT Technical Name

DOT Hazard Class

UN Number

DOT Packing Group
PG

RQ

15 REGULATORY INFORMATION
Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

<table>
<thead>
<tr>
<th>Category</th>
<th>Immediate (Acute) Health</th>
<th>Delayed (Chronic) Health</th>
<th>Sudden Release of Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Reactive</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

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Ingredient Related Regulatory Information:

**SARA Reportable Quantities**

<table>
<thead>
<tr>
<th>Chemical Description</th>
<th>CERCLA RQ</th>
<th>SARA TPQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methylene chloride</td>
<td>1000 LBS</td>
<td>NE</td>
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<tr>
<td>Carbonic dichloride, polymer with 4,4’-(1-methylethylidene)bis[phenol], 4-(1,1-dimethylethyl)phenyl ester</td>
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**SARA Title III, Section 313**

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Methylene chloride

**California Prop 65 - Carcinogen**

This product does contain the following chemical(s), as indicated below, currently on the California list of Known Carcinogens.

Methylene chloride

**Massachusetts Right to Know**

This product does contain the following chemicals(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Methylene chloride

**New Jersey Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Methylene chloride

**Pennsylvania Environmental Hazard**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Methylene chloride

**Pennsylvania Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Methylene chloride

**Pennsylvania Special Hazard**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Special Hazard List.

Methylene chloride

16 OTHER INFORMATION
Arkema Inc. believes that the information and recommendations contained herein (including data and statements) are accurate as of the date hereof. NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY, OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use are beyond the control of Arkema Inc., Arkema Inc. expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information.