MATERIAL SAFETY DATA SHEET

Hazardous Materials Information System (HMIS) Ratings
HEALTH = 2  FIRE = 1  REACTIVITY = 1  PROTECTIVE EQUIPMENT = C

Revision Date: 06-21-2001  Supercedes Date: None

I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Number: VARIABLE MATERIAL NUMBERS
Material Description: Generic MSDS for UV-Curable Inks (INXCure®, UNICure®, INXFlex® UV)
Manufacturers Name: INX International Ink Co.
Manufacturers Address: 651 Bonnie Lane, Elk Grove Village, IL 60007
24 Hour Emergency Phone: 800.535.5053 INFOTRAC 24 Hour Spill and Emergency
Product Safety (EHS) Phone: 847.981.9399
MSDS Email Information: msds@corp.inxintl.com

II. COMPOSITION/INFORMATION ON HAZARDOUS INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>Weight %</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triacrylate Monomer</td>
<td>Trade Secret</td>
<td>10 - 30</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>Acrylate Oligomer</td>
<td>Trade Secret</td>
<td>10 - 30</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>Acrylate Oligomer</td>
<td>Trade Secret</td>
<td>3 - 7</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>Hydroxy-cyclohexyl, 1-, Phenyl Ketone</td>
<td>947-19-3</td>
<td>1 - 5</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>1-Propanone, 2-methyl-1-[4-(methylthio)phenyl]-2-(4-morpholinyl)-</td>
<td>71868-10-5</td>
<td>1 - 5</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>Photoinitiator</td>
<td>Trade Secret</td>
<td>1 - 5</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
<tr>
<td>Pentaerythritol Tetraacrylate</td>
<td>Trade Secret</td>
<td>1 - 5</td>
<td>No PEL established</td>
<td>ND</td>
</tr>
</tbody>
</table>

Non-Dye Black inks contain carbon black, which has been reclassified by IARC as a Class 2B carcinogen. Refer to Section III.

III. HAZARDS IDENTIFICATION

Routes of Entry: Inhalation. Ingestion. Skin contact, eye contact.
Aggravated Medical Conditions: Skin disease including eczema and sensitization. Skin allergies.

Immediate (Acute) Health Effects:
Eye Contact: Can cause severe irritation. Eye contact may result in corneal injury. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Temporary vision impairment (cloudy or blurred vision) is possible.

Skin Contact: May cause skin sensitization, an allergic reaction, which becomes evident on re-exposure to this material.

Inhalation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.

Ingestion: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Upon ingestion of a large quantity of this material, visual disturbances may occur. Onset of the response may be delayed.

Long-Term (Chronic) Health Effects:

Eye Contact: Upon prolonged or repeated contact, can cause severe irritation. Eye contact may result in corneal injury. Symptoms may include discomfort or pain, excess blinking and tear production, with marked redness and swelling of the conjunctiva. Temporary vision impairment (cloudy or blurred vision) is possible.

Skin Contact: Upon prolonged or repeated contact this product may cause sensitization. Avoid prolonged or repeated exposure. If sensitized, continued exposures will potentially result in irritation, reddening, and rashes at very low exposures.

Inhalation: Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache. Prolonged inhalation may be harmful.

Skin Absorption: Moderate absorption skin hazard. May cause minor systemic damage.

Carcinogenicity/Mutagenicity: None of the substances have been shown to cause cancer in long term animal studies. Not a carcinogen according to NTP, IARC, or OSHA. No data available to indicate product or any components present at greater than 0.1% is mutagenic or genotoxic.

Reproductive Toxicity: No data available to indicate product or any components present at greater than 0.1% may cause birth defects.

NIOSH Listed Target Organs for Hazardous Components:
Carbon black 1333-86-4 respiratory system, eyes, lymphatic cancer (in dust form only)

IV. FIRST AID

Eyes: Immediately flush eyes with plenty of water for at least 20 minutes. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed.

Inhalation: Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen.

Skin Contact: Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists. Do NOT take contaminated clothing home.

Ingestion: Do not induce vomiting and seek medical attention if any symptoms occur. If necessary, drink two glasses of water or milk to dilute. Provide medical care provider with this MSDS.

V. FIRE FIGHTING MEASURES

Flammability Summary: Combustible at elevated temperatures. NFPA Class IIIB Liquid.
Flash Point: Flash point is > 100 C (212 F).
Fire Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire. If polymerization occurs, the possibility of explosive rupturing exists. Can burn in fire, releasing toxic vapors.

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical when fighting fires. Water or foam may cause fothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the surface of the fire. Do not direct a stream of water into the...
VI. ACCIDENTAL RELEASE MEASURES

**Fire Fighting Instructions:**
Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

**Hazardous Combustion Products:**

**Spill Health Precautions:**
Exposure to the spilled material may be irritating. Follow personal protective equipment recommendations found in Section VIII of this MSDS. Remove soiled clothing and launder before reuse.

**Spill Mitigation Procedures**

**General Methods:**
Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Dike liquid materials with a suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation. Remove and dispose of soiled clothing.

**Water Spills:**
Avoid runoff into storm sewers and ditches that lead to waterways.

VII. HANDLING AND STORAGE

**Handling:**
Harmful or irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Do not get in eyes, on skin and clothing. Remove contaminated clothing and wash before reuse. Contents may develop pressure upon prolonged storage.

**Storage:**
Store in a cool dry place. Isolate from incompatible materials. Avoid exposure to sunlight or ultraviolet (UV) light sources.

VIII. ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

**Engineering Controls:**
General room ventilation may be required to maintain operator comfort under normal conditions of use. Ventilation should effectively remove and prevent buildup of any vapor/mist/fume generated from the handling of this product.

**Protective Equipment**

**Respiratory:**
A respirator may be required to avoid overexposure when handling this product, however general or local exhaust ventilation will typically provide sufficient protection. Follow a respiratory protection program that meets 29 CFR 1910.134 and ANSI Z88.2 requirements whenever work place conditions warrant the use of a respirator.

**Eyes:**
Wear safety glasses when handling this product to avoid splashing or misting. Wear a full face mask if skin exposure to the face is possible. Wear chemical splash goggles if splashing or high-pressure system is used.

**Skin:**
Avoid skin contact by wearing chemically resistant gloves, and apron and other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work. Use of coveralls is recommended.

IX. PHYSICAL DATA

**Physical State & Color:**
Depends upon product selection. The color additives do not affect product hazards. Paste

**Odor:**
Moderate Acrylate

**Vapor Density:**
~ 3.10

**Evaporation Rate:**
~ 2.24

Specific Gravity, Density, Volatile Percent, VOC Percent, and Coating VOC values are given as ranges representative of the base colors for this product line. Physical data for a specific formulation may be derived from the CPDS (Certified Product Data Sheet) for the specific product.
Sheet). Customers may also request an itemized report of regulated constituents based on sales history for a given period.

**Boiling Point:**

<table>
<thead>
<tr>
<th>Range</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deg. C</td>
<td>88 - 305</td>
</tr>
<tr>
<td>Deg. F</td>
<td>190 - 581</td>
</tr>
</tbody>
</table>

| Specific Gravity / Density Range: |
|==================================|
| 1.14 - 1.25                      |
| 9.49 - 10.41 lb/gal              |

| Volatile Percent Range:          |
|==================================|
| 0.03 - 0.73 Weight %             |
| 0.04 - 0.92 Volume %             |

| VOC Percent Range:               |
|==================================|
| 0.02 - 0.65 Weight %             |
| 0.03 - 0.82 Volume %             |

| Coating VOC Range:               |
|==================================|
| 0.00 - 0.07 lb/gal               |
| 0 - 8 g/L                        |

**Stability and Reactivity**

**Stability Information:**

May become unstable at elevated temperatures and/or properties. Hazardous polymerization can occur if inhibitor content decreases.

**Conditions to Avoid:**

Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition. Loss of polymerization inhibitor. High temperatures and pressures. Ultraviolet light. Oxidizers.

**Chemical Incompatibility:**


**Chemical Name** | **CAS Number** | **LD50/LC50**
------ | -------------- | -------------
Carbon black | 1333-86-4 | Oral LD50 Rat: >15400 mg/kg; Dermal LD50 Rabbit: >3 gm/kg

**XII. Ecological Information**

Overview (for ingredients): Keep out of waterways.

**XIII. Disposal Considerations**

**Spent Material Characteristics:** Spent or discarded material is not expected to be a hazardous waste. The waste may be a "special" waste.

**Disposal Methods:** Clean up and dispose of according to federal, state, and local environmental regulations.

**Potential EPA Waste Codes:** None Known.

Components Subject to USEPA Land Disposal Restrictions:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS Number</th>
<th>Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>U220 Toluene</td>
<td>108-88-3</td>
<td>&lt;10ppm</td>
</tr>
</tbody>
</table>

**XIV. Transportation Information**

<table>
<thead>
<tr>
<th>Proper Shipping Name</th>
<th>Hazard Class</th>
<th>UN/NA Number</th>
<th>Packing Group</th>
<th>ERG Number</th>
<th>Subsidiary Risks</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT &amp; IATA: Not Restricted</td>
<td>N/AP</td>
<td>N/AP</td>
<td>N/AP</td>
<td>N/AP</td>
<td></td>
</tr>
</tbody>
</table>

**XV. Regulatory Information**

Toxic Substances Control Act (TSCA): All components in this product are on the TSCA Inventory.

**SARA Title III, Section 313: Toxic Chemicals:**

**CASRN:** Weight %:

- Warm Red and 2B Rubine Red colors MAY contain Barium Compounds from the pigment. Metallic gold colors MAY contain Copper and Zinc from the pigment. Metallic silver colors MAY contain Aluminum Compounds from the pigment.

**Clean Air Act; Hazardous Air Pollutants:**

CASRN: Weight %:

- Toluene 108-88-3: 0.108

**California; Proposition 65:**

None listed, however trace quantities may be present below detectable levels.

Toluene developmental toxicity - initial date 1/1/01

**MSDS ID:** Generic MSDS for UV-Curable Inks (INXCure®, UNICure®, INXFlex® UV)
XVI. ADDITIONAL INFORMATION

Disclaimer: The information provided herein is presented in good faith and complies with the OSHA Hazard Communication Standard, 29 CFR 1910.1200 (g). Nothing contained herein constitutes a specification nor does it guarantee warranty for said product. HMIS ratings are provided only as a suggestion, and should be used in conjunction with the complete MSDS information presented herein.