The MSDS format adheres to U.S. standards and regulatory requirements and may not meet regulatory requirements in other countries.

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience are gained.

RISTON(R) FX515 PHOTOPOLYMER FILM (VAPORS)

CWV00035 Revised 20-JUN-2001 Printed 1-AUG-2001

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

RISTON is a registered trademark of DuPont.

Trade names and Synonyms

Company Identification

MANUFACTURER/DISTRIBUTOR
DuPont
1007 Market Street
Wilmington, DE 19898

PHONE NUMBERS
Product Information : 1-800-441-7519 (outside the U.S.)
302-774-1000
Transport Emergency : CHEMTREC 1-800-424-9300 (outside U.S.)
703-527-3887
Medical Emergency : 1-800-441-3637 (outside the U.S.)
302-774-1000

COMPOSITION/INFORMATION ON INGREDIENTS

Components

<table>
<thead>
<tr>
<th>Material</th>
<th>CAS Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETONE</td>
<td>67-64-1</td>
<td>60-100</td>
</tr>
<tr>
<td>2,2'-AZOBIS 2-METHYL-PROPANONITRILE</td>
<td>78-67-1</td>
<td>1-5</td>
</tr>
<tr>
<td>METHANOL</td>
<td>67-56-1</td>
<td>1-5</td>
</tr>
<tr>
<td>ALIPHATIC ALCOHOL</td>
<td></td>
<td>5-10</td>
</tr>
</tbody>
</table>

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Components (Remarks)

The concentrations are based on GC/MS analyses of film

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HAZARDS IDENTIFICATION

Potential Health Effects

HEALTH HAZARD INFORMATION:
Control of resist vapors with a DuPont laminator that is installed, operated and maintained in accordance with published instructions assures that airborne concentrations will be maintained at extremely low levels and capable of providing a safe environment for workers. Other laminators and designs should be tested for the adequacy of ventilation.

HUMAN HEALTH EFFECTS OF OVEREXPOSURE:

Skin contact with the vapors or vapor condensate may result in skin irritation with discomfort or rash; or allergic skin rashes.

Eye contact with the vapors may result in eye irritation with discomfort, tearing, or blurring of vision.

Inhalation of the vapors may cause irritation of the upper respiratory passages, with coughing and discomfort.
Prolonged inhalation of the vapors may produce nonspecific discomfort, such as nausea, headache, or weakness; or temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion and incoordination.

HEALTH HAZARD DATA FOR COMPONENTS:

ACETONE

Inhalation 4 hour ALC: 64,000 ppm in rats
Skin Absorption LD50: 20,000 mg/kg in rabbits
Contact with the skin may cause drying due to repeated or prolonged contact. Contact with the eyes may cause irritation with discomfort, tearing or blurring of vision. Inhalation may cause irritation of the upper respiratory passages. Inhalation or ingestion may cause nonspecific discomfort including nausea, headache, weakness, dizziness, incoordination, confusion and or loss of consciousness. Ingestion is not an expected route of exposure for this product. Significant skin permeation and systemic toxicity, after contact appears unlikely. There are no reports of human sensitization.

Animal testing indicates that acetone does not have carcinogenic or mutagenic effects. No animal test reports are available to define developmental or reproductive toxicity.

2,2'-AZOBIS 2-METHYL PROPANENITRILE

Inhalation 4 hour ALC: 950 mg/m3 in rats
Skin Absorption: No information found.
Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision. Inhalation may cause nonspecific discomfort, such as nausea, headache, or weakness; abnormal liver or kidney function as detected by

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laboratory tests; liver enlargement; central nervous system
irritation with tremors, convulsions and irritability; or
fatality from gross overexposure. Individuals with
preexisting diseases of the liver, lungs, kidneys or central
nervous system may have increased susceptibility to the
toxicity of excessive exposures.

**METHANOL**

Inhalation 1 hour LC50: 14,500 ppm in rats
Skin absorption LD50: 15,800 mg/kg in rabbits

Human health effects of overexposure by inhalation,
ingestion, or skin or eye contact may initially include:
nonspecific discomfort, such as nausea, headache, or
weakness; temporary nervous system depression with
anesthetic effects such as dizziness, headache, confusion,
coordination, and loss of consciousness; or blindness.
Higher exposures may lead to these effects: abnormal liver
and kidney function as detected by laboratory tests; or
fatality from gross overexposure. Skin permeation can occur
in amounts capable of producing the effects of systemic
toxicity. There are no reports of human sensitization.
Individuals with preexisting diseases of the retina or liver
may have increased susceptibility to the toxicity of
excessive exposures.

As little as 100 ml ingested may cause blindness or
fatality.

**ALIPHATIC ALCOHOL**

No information available.

Carcinogenicity Information

None of the components present in this material at concentrations
equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH
as a carcinogen.

**FIRST AID MEASURES**

**First Aid**

**INHALATION**

If inhaled, remove to fresh air. If not breathing, give
artificial respiration. If breathing is difficult, give oxygen.
Call a physician.

**SKIN CONTACT**

In case of contact, immediately flush skin with plenty of water
for at least 15 minutes while removing contaminated clothing and
shoes. Call a physician. Wash contaminated clothing before reuse.

**EYE CONTACT**

In case of contact, immediately flush eyes with plenty of water
for at least 15 minutes. Call a physician.

**INGESTION**

Ingestion is not an expected route of exposure during normal use

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8/1/01
of the product. If ingested, consult a physician.

**FIRE FIGHTING MEASURES**

**Flammable Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flash Point</td>
<td>not determined</td>
</tr>
<tr>
<td>Flammable limits in Air, % by Volume</td>
<td>not determined</td>
</tr>
<tr>
<td>LEL</td>
<td>not determined</td>
</tr>
<tr>
<td>UEL</td>
<td>not determined</td>
</tr>
<tr>
<td>Autoignition</td>
<td>not determined</td>
</tr>
</tbody>
</table>

Thermal decomposition can lead to evolution of irritating vapors or gases.

**Extinguishing Media**

- Foam, Dry Chemical, CO2.

**Fire Fighting Instructions**

- Wear self-contained breathing apparatus (SCBA) and full protective equipment.

**ACCIDENTAL RELEASE MEASURES**

**Safeguards (Personnel)**

Note: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

**Initial Containment**

- For condensate, soak up with inert absorbent material and place in waste container for disposal.

**HANDLING AND STORAGE**

**Handling (Personnel)**

- Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing.

**EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Engineering Controls**

- Use sufficient exhaust on laminators to keep exposures below recommended limits. Laminator temperature should be maintained below 125 deg C to minimize vapor generation.

**Personal Protective Equipment**

- **Respiratory:**
  - Self-contained breathing apparatus for fire fighting and mist or spray exposures, if necessary.
GLOVES:
Use neoprene gloves when handling laminator interior exhaust system and interior surfaces of connected duct work. Before removing gloves, decontaminate by washing with soap and water.

Exposure Guidelines

Applicable Exposure Limits

ACETONE
PEL (OSHA): 1000 ppm, 2400 mg/m³, 8 Hr. TWA
TLV (ACGIH): 500 ppm, 1188 mg/m³, A4
STEL 750 ppm, 1782 mg/m³, A4
AEL * (DuPont): 500 ppm, 8 & 12 Hr. TWA

2,2'-AZOBIS 2-METHYL-
PEL (OSHA): None Established
TLV (ACGIH): None Established
AEL * (DuPont): 1 mg/m³, 8 Hr. TWA
0.7 mg/m³, 12 Hr. TWA

METHANOL
PEL (OSHA): 200 ppm, 260 mg/m³, 8 Hr. TWA
TLV (ACGIH): 200 ppm, 8 Hr. TWA, Skin
STEL 250 ppm
AEL * (DuPont): 200 ppm, 8 & 12 Hr. TWA, Skin

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data
Evaporation Rate: <1 (butyl acetate =1)
Solubility in Water: 0 insoluble
Odor: mild acrylate
Appearance: Vapors are normally colorless, but may appear as white smoke in the absence of exhaust ventilation. Vapors may condense as clear yellow liquid.

STABILITY AND REACTIVITY

Incompatibility with Other Materials

None reasonably foreseeable.

REGULATORY INFORMATION

State Regulations (U.S.)
WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM- toluene <0.1%, ethyl acrylate <0.1%
OTHER INFORMATION

Additional Information

PRECAUTIONARY STATEMENTS FOR VAPOR CONDENSATE

WARNING! CAUSES EYE, SKIN AND RESPIRATORY IRRITATION.

Condensate will contain higher percentages of less volatile components, including acrylate monomers, which may cause delayed skin burns and may cause skin sensitization. Avoid contact with eyes, skin and clothing. Avoid breathing mist or vapor. Wash thoroughly with soap and water after handling condensate or wipes. Laminators used to apply Riston(R) film should be designed with adequate ventilation to exhaust these vapors from the workplace. Vapors may condense on cold surfaces near the area where film is heated or in the laminator exhaust duct. Check these surfaces for condensate build-up. Clean often with a cloth barely moistened with isopropyl alcohol.

INFORMATION ON THE CLEAN AIR ACT OF 1990 TITLE VI SECTION 611: CONCERNING OZONE DEPLETING SUBSTANCES

DuPont Riston(R), Vacrel(R), and VALU(TM) photopolymer resists and solder masks do NOT contain and are NOT manufactured with either Class I or Class II Ozone Depleting Substances.

For further information regarding the safe use of this material, please refer to DuPont Technical Bulletin "Handling Procedure for DuPont Photopolymer Films" (T-B9944). (Replacement number for document # H-433328).

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

DUPONT TECHNOLOGIES
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RESEARCH TRIANGLE PARK, NC 27709
919-248-5345 OR 919-248-5027

End of MSDS

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8/1/01