
HAZARDS IDENTIFICATION

Potential Health Effects

POTENTIAL HEALTH EFFECTS

INHALATION: Not a probable route of exposure for film.
Exposure to alumina (aluminum oxide) encapsulated in the
polymer is not likely.

SKIN CONTACT: No irritation is expected from handling film.

EYE CONTACT: Not a probable route of exposure for film.

INGESTION: Not a probable route of exposure for film.

Data from gas chromatography and aqueous extraction studies
of similar films indicate that residual dimethylacetamide
(DMAC) is less than 0.0005% by weight.

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

Not a probable route of exposure for films.

SKIN CONTACT

Wash with soap and water after handling. If skin irritation
develops, consult a physician.

EYE CONTACT

Flush eyes with water. Consult a physician if irritation persists.

INGESTION

Not a probable route of exposure for films.

FIRE FIGHTING MEASURES

Flammable Properties

Not a fire or explosion hazard.

The flammability characteristic of polyimide film is reported as "self-extinguishing".

Polyimide film chars but does not burn. However, polyimide film will burn in an atmosphere of 100% oxygen. The major off-gases are carbon dioxide and carbon monoxide.

The processing of polyimide films can cause the generation of static charge. Precautions for static charges should also be taken when removing plastic films used as protective packaging for polyimide films.

Extinguishing Media

Use any available extinguishing media.

Fire Fighting Instructions

None required.

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.

Accidental Release Measures

Practice good housekeeping to prevent and eliminate slipping hazards.

HANDLING AND STORAGE

Handling (Personnel)

Wash thoroughly after handling.

Storage

Store away from flammable materials.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Safe handling of polyimide films at high temperatures (above 200 C/ 392 F) requires adequate ventilation. If small quantities of polyimide film are involved, normal air circulation may be all that is needed in case of overheating. Whether or not existing ventilation is adequate at higher temperatures will depend on the combined factors of film quantity, temperature and exposure time.

Personal Protective Equipment

Safety glasses are recommended as good industrial practice.

Respirators are not needed for normal use.

Special protective clothing is not needed for normal use. Gloves are recommended as good industrial practice.

Exposure Guidelines

Applicable Exposure Limits

Alumina Filler

PEL (OSHA) : 15 mg/m³, total dust, 8 Hr. TWA
5 mg/m³, respirable dust, 8 Hr. TWA
TLV (ACGIH) : Notice of Intended Changes (2007)
Withdraw Adopted Documentation and TLV;
See NIC Entry for Aluminum Metal and
Insoluble Compounds
AEL * (DuPont) : None Established

Copper

PEL (OSHA) : 0.1 mg/m³, fume, as Cu, 8 Hr. TWA
1 mg/m³, mist, as Cu, 8 Hr. TWA
TLV (ACGIH) : 0.2 mg/m³, fume, 8 Hr. TWA
1 mg/m³, dusts and mists, as Cu, 8 Hr.
TWA
Notice of Intended Changes (2007)
Withdrawn from the Notice of Intended
Changes
AEL * (DuPont) : None Established

Aluminum

PEL (OSHA) : 15 mg/m³, total dust as 8 Hr. TWA, 5 mg/
m³, respirable dust as 8 Hr. TWA, 5 mg/
m³, pyro powders, welding, fumes, 2 mg/
m³, soluble salts, alkyls as 8 Hr. TWA
TLV (ACGIH) : Notice of Intended Changes (2007)
1 mg/m³, 8 hour TWA, A4, Aluminum Metal
and Insoluble compounds, varies
AEL * (DuPont) : None Established

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally

(Applicable Exposure Limits - Continued)

imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Solubility in Water : Insoluble
Form : Opaque film

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

None reasonably foreseeable.

Decomposition

At 300 C, traces of organic vapors including furfuryl alcohol, methanol, dimethyl acetamide and dimethylformamide may evolve as film starts to decompose. The exact identity of the decomposition products is dependent on several variables including temperature, time, etc. At temperatures above 400 C, the major off-gases are expected to be carbon monoxide and carbon dioxide.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Aquatic Toxicity:

Film is insoluble.

DISPOSAL CONSIDERATIONS

Waste Disposal

Incinerate or landfill in accordance with Federal, State or local laws and ordinances.

TRANSPORTATION INFORMATION

Shipping Information

DOT
Proper Shipping Name : NOT APPLICABLE
Hazard Class : NOT REGULATED

REGULATORY INFORMATION

U.S. Federal Regulations

RCRA
Under RCRA, it is the responsibility of the product user to determine at the time of disposal whether a material containing the product or derived from the product should be classified as a hazardous waste (40 CFR 261.11).

If discarded in its purchased form, this product does not meet the RCRA characteristic definition for ignitability, corrosivity or reactivity and is not a RCRA listed waste, however, it has not been tested by the Toxicity Characteristic Leaching Procedure (TCLP).

State Regulations (U.S.)

STATE RIGHT-TO-KNOW

No substances on the state hazardous substances list, for the states indicated below, are used in the manufacture of products on this Material Safety Data Sheet, with the exceptions indicated.

SUBSTANCES ON THE PENNSYLVANIA HAZARDOUS SUBSTANCES LIST PRESENT AT A CONCENTRATION OF 1 % OR MORE (0.01% FOR SPECIAL HAZARDOUS SUBSTANCES)- Copper, aluminum oxide, aluminum dust

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM- None known

SUBSTANCES ON THE NEW JERSEY WORKPLACE HAZARDOUS SUBSTANCE LIST PRESENT AT A CONCENTRATION OF 1% OR MORE (0.1% FOR SUBSTANCES IDENTIFIED AS CARCINOGENS, MUTAGENS OR TERATOGENS)- Copper, aluminum oxide, aluminum dust

OTHER INFORMATION

Additional Information

MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body. For other medical applications see DuPont CAUTION Bulletin No. H-50102.

(Continued)

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.

Responsibility for MSDS : DuPont Flexible Circuit Materials
MSDS Coordinator
Telephone : (757) 686-8663 or (919) 248-5027

Indicates updated section.

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

End of MSDS