

**Section 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION**

*Prepared to U.S. OSHA, CMA, ANSI, Canadian WHMIS Standards, EC Directives, and the Japanese Industrial Standard JIS Z 9250: 2000*

**NAME USED ON LABEL:** **APICAL FILM: NP**  
**PRODUCT USE:** **INDUSTRIAL**  
**SUPPLIER/MANUFACTURER'S NAME:** KANEKA NORTH AMERICA LLC. – APICAL® DIVISION  
**ADDRESS:** 6161 Underwood Road  
 Pasadena, Texas 77507  
**EMERGENCY PHONE:** (800) 424-9300 or (703) 527-3887 (CHEMTREC)  
**PRODUCT INFORMATION PHONE:** (800) 222-8128  
**CHEMICAL NAME:** Polyimide Film  
**CHEMICAL FAMILY NAME:** Polyimide Film

**NOTE:** These products are defined as an “Article” under the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Workplace Hazardous Materials Standard. These products are also not considered dangerous substances or dangerous preparations under the standards of the European Community. Refer to Section 15 (Regulatory Information) for specific regulatory citations. As an article, these products present negligible health and physical hazards under reasonably anticipated circumstances of use. Subsequently, a Material Safety Data Sheet is not required for these products under Standards cited above. This document is prepared to provide persons using these products with additional safety information.

**Section 2. HAZARD IDENTIFICATION**

**EMERGENCY OVERVIEW:** These products are amber, transparent films. **Health Hazards:** These products present no significant health hazard under normal circumstances of handling. If subjected to very high temperatures, thermal degradation may release toxic compounds, including carbon oxides and nitrogen oxides. **Flammability Hazard:** These products can char, but should not burn if involved in a fire, or subjected to temperature above 400°C (752°F) and in normal oxygen content atmospheres. **Reactivity Hazard:** This product is not reactive. **Environmental Hazard:** There are no significant environmental hazards posed by these products; however waste products should be disposed of properly in permitted landfill. **Emergency Considerations:** Emergency responders must wear proper personal protective equipment for the incident to which they are responding.

**SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE:**  
 These products pose no significant hazards by all routes of exposure:

**INHALATION:** Due to the form of these products, inhalation is not a route of exposure. If products are heated to decomposition, inhalation of decomposition products (carbon and nitrogen oxides), can be irritating to the nose, throat and respiratory system.

**CONTACT WITH SKIN or EYES:** Skin and eye contact with these products should pose no significant hazard, beyond the possibility of cuts from handling the films similar to “paper cuts”. If heated to decomposition, irritation of skin and eyes may occur from decomposition fumes.

**SKIN ABSORPTION:** Although the Dimethyl Formamide component of these products are known to be absorbed via intact skin, the form of these products make this route of exposure to these compounds unlikely.

**INGESTION:** Ingestion is not anticipated to be a likely route of exposure to this product.

**INJECTION:** Accidental injection of this product, via laceration or puncture by a contaminated object, may cause pain and irritation in addition to the wound.

**ADDITIONAL INFORMATION:** Caution: Do not use in medical applications involving implantation in the human body or in contact with fluids or tissues.

**HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.** Overexposure to these products may cause the following health effects:

**ACUTE:** These products pose no significant hazards by all routes of exposure under normal circumstances of use and handling. If heated to decomposition, irritation of respiratory system, skin and eyes may occur from decomposition fumes.

**CHRONIC:** There are no known chronic effects from these products.

**TARGET ORGANS:** ACUTE: Decomposition Fumes Only: Respiratory system, skin, eyes. CHRONIC: None known.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM		
<b>HEALTH HAZARD</b>	(BLUE)	0
<b>FLAMMABILITY HAZARD</b>	(RED)	1
<b>PHYSICAL HAZARD</b>	(YELLOW)	0
<b>PROTECTIVE EQUIPMENT</b>		
SEE SECTION 8		
For Routine Industrial Use and Handling Applications		

**Section 3. COMPOSITION and INFORMATION ON INGREDIENTS**

CHEMICAL NAME	CAS #	EINECS #	ENCS #	w/w %	EXPOSURE LIMITS IN AIR					
					ACGIH-TLV		OSHA-PEL		NIOSH IDLH	OTHER
					TWA	STEL	TWA	STEL		
Polyimide polymer	Trade Secret	Unlisted	Unlisted	100	NE	NE	NE	NE	NE	NE
N,N-Dimethyl Formamide	68-12-2	200-679-5	2-680	<2.31ppm residual	10 (skin)	NE	10 (skin)	NE	500	NE

NE = Not Established. NIC = Noticed of Intended Change. See Section 16 for Definitions of Terms Used.  
 NOTE: ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR, EC Directives and the Japanese Industrial Standard JIS Z 9250: 2000.

**Section 4. FIRST-AID MEASURES**

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to health professional with victim.

**SKIN EXPOSURE:** Under normal circumstances, this product is not expected to cause adverse effect by skin contact. While not expected, if adverse effect occurs after skin contact, begin decontamination with running water. Minimum flushing is for 15 minutes. Do not interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek medical attention if adverse effect occurs.

**INHALATION:** Due to the form of the products, inhalation is not a potential route of exposure to these products. If decomposition fumes from heated product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

**EYE or SKIN EXPOSURE:** If tissue damage occurs after eye or skin contact, place a sterile bandage over the affected area and contact physician or other medical health professional.

**INGESTION:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directly by medical personnel. Have victim rinse mouth with water or give several cupfuls of water, if conscious. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If vomiting occurs, lean patient forward or place on side (head-down position, if possible) to maintain an open airway and prevent aspiration.

**MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:** Non known.

**RECOMMENDATIONS TO PHYSICIANS:** Treat symptoms and eliminate overexposure.

**Section 5. FIRE-FIGHTING MEASURES**

**FLASH POINT:** Not determined.

**AUTOIGNITION TEMPERATURE:** Not determined.

**FLAMMABLE LIMITS (in air by volume, %):**

Lower (LEL): Not determined.

Upper (UEL): Not determined.

**FIRE EXTINGUISHING MATERIALS:**

Water Spray: YES

YES

Foam: YES

YES

Halon: YES

Other: Any "ABC" Class.

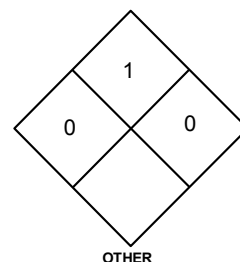
**UNUSUAL FIRE AND EXPLOSION HAZARDS:** These products pose a slight fire hazard at elevated temperatures. When involved in a fire, these films may decompose and produce irritating vapors, acrid smoke, and toxic gases (e.g., carbon monoxide, carbon dioxide, nitrogen oxides, dimethylamine). As with many plastic films, these product have the potential to form a static charge.

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Not sensitive.

**NFPA RATING**

FLAMMABILITY



See Section 16 for Definition of Ratings

**SPECIAL FIRE-FIGHTING PROCEDURES:** Avoid scattering burning material. Fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move fire-exposed containers if it can be done without risk to firefighters. If possible, firefighters should control run-off water to prevent environmental contamination. Rinse contaminated equipment with soapy water before returning such equipment to service.

### **Section 6. ACCIDENTAL RELEASE MEASURES**

**SPILL RESPONSE PROCEDURES:** If these products are dropped, film can be picked-up or swept-up. Persons cleaning-up the film should wear appropriate goggles, and suitable body protection. Dispose of waste product appropriately. No other response is normally necessary for clean-up

### **Section 7. HANDLING and USE**

**WORK AND HYGIENE PRACTICES:** Wash thoroughly after handling these products. Do not eat, drink, smoke, or apply cosmetics while handling these products. Use in a well-ventilated location. These products may cause a slip hazard if good housekeeping practices are not followed.

**STORAGE AND HANDLING PRACTICES:** All employees who handle these films should be trained to handle them appropriately. Containers of these products must be properly labeled. Store product in a cool, dry location, away from direct sunlight, or sources of intense heat. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep containers tightly closed when not in use. Inspect all incoming product containers before storage to ensure containers are properly labeled and not damaged.

**PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:** Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely.

### **Section 8. EXPOSURE CONTROLS - PERSONAL PROTECTION**

**EXPOSURE LIMITS FOR COMPONENTS:** Please refer to exposure limits given in Section 2 (Composition and Information On Ingredients).

**VENTILATION AND ENGINEERING CONTROLS:** No special measures are normally needed when handling these films, beyond normal building ventilation.

**RESPIRATORY PROTECTION:** None needed under normal circumstances of use. Maintain airborne contaminant concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients) if applicable. If respiratory protection is needed, use only respiratory protection authorized in the U.S. Federal OSHA Respiratory Protection Standard (29 CFR 1910.134), or equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, and the European Standard EN149, and EC member states, as well as requirements of Japan. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

### **Section 8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)**

**EYE PROTECTION:** None needed under normal circumstances of use. Wear safety glasses or goggles if during the use of this product operations may produce flying debris or particulates. If necessary, refer to U.S. OSHA 29 CFR 1910.133, Canadian Standards, the European Standard EN166 or applicable Standards of Japan for further information.

**HAND PROTECTION:** Due to possibility of cuts from film, light-weight gloves (fabric or latex) may be appropriate to wear when handling film. If necessary, refer to U.S. OSHA 29 CFR 1910.138 appropriate Standards of Canada, the European Economic Community and applicable Standards of Japan.

**BODY PROTECTION:** If necessary, use body protection appropriate for task. If necessary, refer to appropriate Standards of Canada, the European Economic Community or Japan.

### **Section 9. PHYSICAL and CHEMICAL PROPERTIES**

**VAPOR DENSITY (water = 1):** Not applicable.

**SPECIFIC VOLUME:** Not applicable.

**BOILING POINT:** Not applicable.

**MELTING POINT:** May thermally degrade above 400°C (752°F)

**SPECIFIC GRAVITY (water = 1):** Not determined

**pH:** Not applicable.

**SOLUBILITY IN WATER:** Insoluble.

**MOLECULAR WEIGHT:** Not available.

**EVAPORATION RATE (n-BuAc = 1):** Not applicable.

**EXPANSION RATIO** Not applicable.

**ODOR THRESHOLD:** Not applicable.

**VAPOR PRESSURE:** Not applicable.

**PERCENT VOLATILES:** 1% max.

**LOG COEFFICIENT WATER/OIL DISTRIBUTION:** Not determined.

**APPEARANCE, ODOR AND COLOR:** These products are amber-colored, odorless films.

**HOW TO DETECT THIS SUBSTANCE (warning properties):** The appearance is a good warning properties for this material in event of an accidental release.

## Section 10. STABILITY and REACTIVITY

**STABILITY:** Stable under conditions of normal temperature and pressure.

**DECOMPOSITION PRODUCTS:** Thermal decomposition products include dimethylamine, carbon monoxide, carbon dioxide, and oxides of nitrogen.

**MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE:** None known.

**HAZARDOUS POLYMERIZATION:** Will not occur.

**CONDITIONS TO AVOID:** Exposure to extreme temperatures.

## Section 11. TOXICOLOGICAL INFORMATION

**TOXICITY DATA:** The toxicity data available for components of greater than 1% are not applicable to these products due to the solid film form.

**GENERAL TOXICITY INFORMATION:** Due to the form of these products, no significant hazard is expected by any route of exposure. Heating to decomposition may form toxic and irritating fumes, including oxides of carbon and nitrogen.

**SUSPECTED CANCER AGENT:** The components of these products are listed by agencies tracking the carcinogenic potential of chemical compounds, as follows:

**N,N-DIMETHYL FORMAMIDE:** ACGIH TLV-A4 (Not Classifiable as a Human Carcinogen); IARC-3 (Unclassifiable as to Carcinogenicity in Humans)  
The remaining components of these products are not found on the following lists: U.S. FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA and therefore are neither considered to be nor suspected to be cancer causing agents by these agencies.

**IRRITANCY OF PRODUCT:** Inhalation of dusts or fumes from heated product may cause respiratory irritation. Prolonged, skin contact may cause irritation. Eye contact can cause irritation, with the possibility of delayed symptoms.

**SENSITIZATION TO THE PRODUCT:** The components of these products are not known to be human skin or respiratory sensitizers.

**REPRODUCTIVE TOXICITY INFORMATION:** Listed below is information concerning the effects of these products on the human reproductive system.

**Mutagenicity:** The components of these products are not reported to cause mutagenic effects in humans.

**Embryotoxicity:** The components of these products are not reported to cause embryotoxic effects in humans.

**Teratogenicity:** The components of these products are not reported to cause teratogenic effects in humans.

**Reproductive Toxicity:** The components of these products are not reported to cause adverse reproductive effects in humans.

*A **mutagen** is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An **embryotoxin** is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A **teratogen** is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A **reproductive toxin** is any substance that interferes in any way with the reproductive process.*

**ACGIH BIOLOGICAL EXPOSURE INDICES:** There are ACGIH Biological Exposure Indices (BEIs) determined for the N,N-Dimethyl Formamide component of these products. These BEIs are not presented in this MSDS as exposure to these compounds is unlikely, due to the form of the products.

## Section 12. ECOLOGICAL INFORMATION

**ENVIRONMENTAL STABILITY:** No data currently, available. These products are not expected to bio-degrade significantly in the environment.

**EFFECT OF MATERIAL ON PLANTS or ANIMALS:** No data currently available.

**EFFECT OF CHEMICAL ON AQUATIC LIFE:** No data currently available.

**Section 13. DISPOSAL CONSIDERATIONS**

**PREPARING WASTES FOR DISPOSAL:** As supplied, these products do not meet the definition of a hazardous waste. Recover, reclaim or recycle the product, as appropriate. May be disposed of as a solid waste, sealed in an appropriate container. If mixed with other chemicals, the person using the product must determine if the waste mixture meets the definition of any hazard class and dispose of in accordance with appropriate U.S. Federal, State, and local regulations, or the applicable standards of Canada and its Provinces, those of EC Member States and of Japan.

**U.S. EPA WASTE NUMBER:** Not applicable.

**Section 14. TRANSPORTATION INFORMATION**

**THESE PRODUCTS ARE NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.**

**PROPER SHIPPING NAME:** Not Regulated  
**HAZARD CLASS NUMBER and DESCRIPTION:** Not Applicable  
**UN IDENTIFICATION NUMBER:** Not Applicable  
**PACKING GROUP:** Not Applicable  
**DOT LABEL(S) REQUIRED:** Not Applicable  
**NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000):** Not Applicable  
**MARINE POLLUTANT:** The components of these products are not classified by the DOT as a Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

**TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS:** These products are not considered as hazardous goods, per the regulations of Transport Canada.

**INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) DESIGNATION:** These products are not considered as dangerous goods, per rules of IATA.

**INTERNATIONAL MARITIME ORGANIZATION (IMO):** These products are not considered as dangerous goods, per rules of the IMO.

**JAPAN SHIP SAFETY LAW, PORT REGULATION LAW:** These products are not regulated according to Japan Ship Safety Law.

**EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR):** These products are not considered by the United Nations Economic Commission for Europe to be dangerous goods.

**Section 15. REGULATORY INFORMATION**

**ADDITIONAL UNITED STATES REGULATIONS:**

**U.S. SARA REPORTING REQUIREMENTS:** The components of these products are subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

CHEMICAL NAME	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
N,N-Dimethyl Formamide	No	No	Yes

**U.S. SARA THRESHOLD PLANNING QUANTITY:** There are no specific Threshold Planning Quantities for the components of these products. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20.

**U.S. CERCLA REPORTABLE QUANTITY (RQ):** N,N-Dimethyl Formamide = 100 lb (45.4 kg)

**U.S. TSCA INVENTORY STATUS:** This is an article and is not subject to the requirements of TSCA. The components of these products are listed on the TSCA Inventory or are excepted as polymers of listed compounds applies per 40 CFR 723.259(e)(2).

**OTHER U.S. FEDERAL REGULATIONS:** This product meets the definition of an "Article" under the U.S. Federal OSHA Hazard Communication Standard (29 CFR 1910.1200). For further information, the definition of "Article" is provided below.

*Article* means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.

**U.S. STATE REGULATORY INFORMATION:** The components of these products are covered under specific State regulations, as denoted below:

<b>Alaska - Designated Toxic and Hazardous Substances:</b> Dimethyl Formamide.	<b>Massachusetts - Substance List:</b> Dimethyl Formamide.	<b>North Dakota - List of Hazardous Chemicals, Reportable Quantities:</b> No.
<b>California - Permissible Exposure Limits for Chemical Contaminants:</b> Dimethyl Formamide.	<b>Michigan - Critical Materials Register:</b> No.	<b>Pennsylvania - Hazardous Substance List:</b> Dimethyl Formamide
<b>Florida - Substance List:</b> Dimethyl Formamide.	<b>Minnesota - List of Hazardous Substances:</b> Dimethyl Formamide.	<b>Rhode Island - Hazardous Substance List:</b> Dimethyl Formamide.
<b>Illinois - Toxic Substance List:</b> Dimethyl Formamide.	<b>Missouri - Employer Information/Toxic Substance List:</b> Dimethyl Formamide.	<b>Texas - Hazardous Substance List:</b> Dimethyl Formamide.
<b>Kansas - Section 302/313 List:</b> No.	<b>New Jersey - Right to Know Hazardous Substance List:</b> Dimethyl Formamide	<b>West Virginia - Hazardous Substance List:</b> Dimethyl Formamide.
		<b>Wisconsin - Toxic and Hazardous Substances:</b> Dimethyl Formamide.

**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):** The components of these products are not on the California Proposition 65 Lists.

**ADDITIONAL CANADIAN REGULATIONS:**

**CANADIAN DSL/NDL INVENTORY STATUS:** The N,N-Dimethyl Formamide components are on the DSL Inventory. The 4,4'-Diaminodiphenyl ether-p-phenylenediamine-pyromellitic dianhydride block copolymer is not listed.

**OTHER CANADIAN REGULATIONS:** These products meet the definition of an article under WHMIS Regulations (Hazardous Products Act, 6&7, Part II (Sections 11 and 12).

**CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS:** The components of these products are not on the CEPA Priority Substances Lists.

**CANADIAN WHMIS CLASSIFICATION AND SYMBOL:** Not applicable.

**ADDITIONAL EUROPEAN COMMUNITY INFORMATION:**

**EC LABELING AND CLASSIFICATION:** These products do not meet the definition of any hazard class as defined by the European Community Council Directive 67/548/EEC. As an article, this product is not regulated as a dangerous substance (Council Directive 88/379/EEC; Articles 1, 2 and 3) because it does not meet the applicable definitions.

**EUROPEAN COMMUNITY ANNEX II HAZARD SYMBOLS:** Not applicable.

**ADDITIONAL JAPANESE REGULATIONS:**

**JAPANESE ENCS INVENTORY:** The 4,4'-Diaminodiphenyl Ether-P-Phenylenediamine-Pyromellitic Dianhydride Block Copolymer component of this product is not on the ENCS Inventory. The remaining components are on the ENCS Inventory.

**POISONOUS AND DELETERIOUS SUBSTANCES CONTROL LAW:** The components of these products are not listed under the Specified Poisonous Substance under the Poisonous and Deleterious Substances Control Law.

**Section 16. OTHER INFORMATION**

**PREPARED BY:** Kaneka Texas Corporation.  
6161 Underwood Rd., Pasadena TX 77507  
281-291-2140

This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Kaneka Texas Corporation's knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness is not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.