AIRTECH
ADVANCED MATERIALS GROUP

MATERIAL SAFETY DATA SHEET
Thermalimide – Issue Date: July 30, 2013

SECTION I - PRODUCT IDENTIFICATION

Trade Name: **Thermalimide**
Product Class:
Supplier:

Airtech International, Inc.
5700 Skylab Road
Huntington Beach, CA 92647
Telephone: 714-899-8100
Fax: 714-899-8179

Emergency Telephone: **800-424-9300**
Components Material: 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. As an article these products present negligible health and physical hazards under reasonable 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 II - HAZARDOUS INGREDIENTS

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:
Health Hazard: (Blue) 0
Flammability Hazard (Red) 1
Physical Hazard (Yellow) 0

SECTION III – COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Name	CAS#	EINECS#	ENCS#	w/w%
Polymide Polymer	Trade Secret	Unlisted	Unlisted	100
N.N – Dimethyl Formamide	68-12-2	200-679-5	2-680	<2.31 ppm residual

Chemical Name	Exposure Limits in Air					
	ACGIH-TLV		OSHA-PEL		NIOSH IDLH ppm	Other
	TWA ppm	STEL ppm	TWA ppm	STEL ppm		
Polymide Polymer	NE	NE	NE	NE	NE	NE
N.N-Dimethyl Formamide	10 (skin)	NE	10 (skin)	NE	500	NE

NE: Not Established. 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 Directive and the Japanese Industrial Standard JIS Z 9250:2000.

SECTION IV – 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 the 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 effects occur.

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 bye Exposure: None known.

Recommendations to Physicians: Treat symptoms and eliminate overexposure.

SECTION V – 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	Carbon Dioxide: Yes
Foam: Yes	Dry Chemical: 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 make irritating vapors, acrid smoke, and toxic gases (e.g, carbon monoxide, carbon dioxide, nitrogen oxides, dimeheylamine). 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.

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 VI – 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 normal necessary for clean-up.

SECTION VII – 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. 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 Accidental Release Measures. Make certain that application is locked and tagged out safely.

SECTION VIII – EXPOSURE CONTROLS – PERSONAL PROTECTION

Exposure Limits For Components: Please refer to exposure limits given in section 2.

Ventilation and Engineering Controls: No special measure 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 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 Standards 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-face piece pressure/demand SCBA or a full face piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Standard (1910.134-1998).

SECTION VIII – EXPOSURE CONTRL/PERSONAL PROTECTION

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 IX – PHYSICAL AND CHEMICAL PROPERTIES

Vapor Density (water=1): Not applicable
Boiling Point: Not applicable
Specific Gravity (water=1): Not determined
pH: not applicable
Molecular Weight: Not available
Evaporation Rate (n-BuAc =1): Not applicable
Expansion Ratio: Not applicable.
Odor Threshold: Not applicable
Specific Volume: Not applicable
Melting Point: May thermally degrade above 400°C (752°F)
Solubility in water: Insoluble
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 accidental release.

SECTION X – 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 XI – TOXICOLOGICAL INFORMATION

Toxicity Data: The toxicity data available for components of greater than 1% are not applicable to these products due to the solid form.
General Toxicity Information: Due to the form of these products, no significant hazards is expected by any routed 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 list: 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 if these products on the human reproductive system.
Mutagenicity: The components of these products are not reported to cause mutagenic effects in humans.
Embryotoxcity: 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 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 XII – 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 XIII – 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 VX – 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: Thee 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 XV – REGULATORY INFORMATION

Additional United Sates Requirements:
U.S. SARA Reporting Requirements: The components of these products are subject to the reporting requirement of Section 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

Chemical Name: N,N-Dimethyl Formamide:

SARA 302	SARA 304	SARA 313
(40 CFR 355, Appendix A)	(40 CFR Table 302.4)	(40 CFR 372.65)
NO	NO	NO

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 apples 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 190.1200). 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) dependant 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:

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

Japanese ENCS Inventory: The 4,4'-Diaminodiphenyl Ehter-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.

USER'S RESPONSIBILITY

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to use this information to develop appropriate work practice guidelines and employee instructional programs for your operation.

DISCLAIMER OF LIABILITY

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this material. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, express or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the se thereof. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user.

AIRTECH INTERNATIONAL INC.

5700 Skylab Road
Huntington Beach
CA 92647 USA

Phone : +1 714-899-8100
Fax : +1 714-899-8179

E-mail : airtech@airtechintl.com
Website : www.airtechonline.com

Data Sheet

THERMALIMIDE

Ultra high temperature bagging film

DESCRIPTION

Thermalimide is a high performance bagging film for cure temperatures up to 799 °F (426 °C).

TECHNICAL DATA

		Test method
Material type	Polyimide	
Elongation at break	95 %	ASTM D 882
Tensile strength	35000 psi (240 MPa)	ASTM D 882
Maximum use temperature	799 °F (426 °C)	
Flammability (self extinguishing)	Yes	ATP-5034
Materials to avoid	None	
Yield	27.7 m^2/Kg/25.4 µm	
Color	Amber	
Shelf life	Indefinite	

SIZES

Thickness	Width	Length	Weight / roll	Forms available*
0.002 inch (50 µm)	60 inches (1.52 m)	255 feet (78 m)	21 lbs (9.5 Kg)	SHT
0.002 inch (50 µm)	60 inches (1.52 m)	510 feet (155 m)	42 lbs (19 Kg)	SHT

NOTES

> Maximum use temperature is dependent upon the duration at maximum temperature and is process specific. Airtech recommends testing prior to use.
> Other sizes available upon request. Minimum order may be required.
> Custom designed shapes and sizes are available to fit your individual requirements.
Please consult Airtech for further information.

* SHT = sheeting, CF = centerfold, LFT = lay-flat tubing, LFT-G = lay-flat tubing gusseted.

Last updated : 2014-02-19

Catalog position : Bagging films