

1. Identification

Product Name: Nomex® Fibers
Synonyms: Aramid, Meta-Aramid, Aromatic Polyamide
Manufacturer: MiniFibers Inc.; 2923 Boones Creek Road; Johnson City, TN 37615 USA
Telephone: Information: (423) 282-4242 Emergency: (423) 282-4242
Date Prepared: September 2010

HMIS		
HEALTH	0	0
FLAMMABILITY	1	0
PHYSICAL HAZARD	0	0

2. Hazard Identification

This product is not hazardous under the criteria of U.S. Occupational Safety and Health Standard 29 CFR 1910 Subpart Z and United Nations GHS Parts 2, 3, and 4.

3. Composition / Information on Ingredients

Substance	CAS No.	EC No.	Concentration By Weight
Poly(isophthaloylchloride/m-phenylenediamine) (NOMEX® meta-aramid polymer)	25765-47-3	-	73 - 99.5%
N, N-dimethylacetamide (DMAc)	127-19-5	204-826-4	1 - 3%
Finish	none	-	0 - 2%
Colorants	none	-	0 - 4%
Dye assist agent	none	-	0 - 14%
Ultraviolet light stabilizer	none	-	0 - 4%
Water	7732-18-5	231-791-2	0 - 12%

4. Emergency & First Aid Measures

Routes of Exposure:

Inhalation: NOMEX® fibers are too big to inhale into the lungs, but fiber dust and fly from processing may be breathed into the nose and throat. Working unprotected in dusty conditions may cause upper respiratory irritation and cold-like symptoms. Move to fresh air if effects occur. Consult a physician if persistent coughing or other symptoms develop.

Skin: **If thermal burn, cool with water and seek immediate medical attention; do not attempt to peel fibers from skin.** Based on animal and human skin patch tests, NOMEX® does not cause sensitization (allergic reaction) and has little potential for skin irritation. Continual rubbing of fibers and fiber pieces on the skin (as when trapped under cuffs or collar, or when constantly handled as fabrics) may cause skin irritation. Wash off with soap and water, and consult a physician if symptoms develop.

Skin Absorption: A single prolonged skin exposure is not likely to result in the material being absorbed through the skin in harmful amounts.

Eyes: Fibers or fiber dust may cause irritation or scratch the surface of the eyes. NOMEX® is untested for eye irritancy. Flush with water to remove particles; remove contact lenses if present part eyelids with fingers to ensure complete flushing. Consult a physician if persistent irritation or other symptoms develop.

Ingestion: Based on animal studies, NOMEX® is nontoxic when eaten. Consult a physician if gastro-intestinal distress develops or if a large amount is swallowed.

Contaminated clothing does not need to be removed.

Personal protective equipment is not required for first-aid responders.

5. Fire Fighting Measures / Fire & Explosion Hazard Data

Flash Point: No data available

Flammable Limits: Not determined

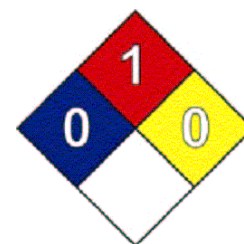
Extinguishing Media: Water, CO2, dry chemicals, foam, fog.

Hazardous Combustion Products: Burning NOMEX® produces hazardous gases similar to those from wool. These are mostly carbon monoxide, carbon dioxide, nitrogen oxides, and small amounts of hydrogen cyanide, ammonia, aldehydes, aliphatic hydrocarbons and other toxic gases depending on conditions of burning.

Unusual Fire & Explosion Hazards: None known.

Special Fire Fighting Procedures: Avoid excessive inhalation of smoke or potential thermal decomposition products. Keep product cool by spraying with water. If outdoors, fight fire from an upwind position.

Special Protective Equipment: Due to potential decomposition of the polymer, firefighters should be equipped with positive pressure self-contained breathing apparatus (SCBA) and standard protective fire fighting clothing (helmet, eye protection, overalls, boots, and gloves) when fighting all indoor fires and any significant outdoor fires.



6. Accidental Release Measures / Steps to be Taken if Material is Released or Spilled

Personal Precautions: None needed.

Environmental Precautions: Fiber is not biodegradable; do not flush into drains.

Methods for Cleanup: Vacuum or sweep up and place in a standard disposal container. Avoid the use of air jets.

Material Safety Data Sheet

7. Precautions for Safe Handling & Storage

Precautions for Safe Handling: No special handling has been shown to be necessary.
Conditions for Safe Storage: Avoid overstacking to prevent collapse or breakage of the package. Do not store near flame or incompatible substances.
Other Precautions: NOMEX[®] is degraded by ultraviolet light. Do not store in direct sunlight. Fluorescent lighting will cause discoloration, but will not affect fiber mechanical properties.

8. Exposure Control Measures / Personal Protection

Exposure Guidelines:	Component	Exposure Guidelines			
		OSHA	ACGIH	DuPont	AIHA
		PEL	TLV	AEL*	WEEL
	Poly(isophthaloylchloride/ m-phenylenediamine) (NOMEX [®] meta-aramid polymer)	None established	None established	10mg/m ³ , 8 hr TWA, total dust 5mg/m ³ 8 hr TWA, respir. dust	5mg/m ³ 8 hr TWA total dust for non- respirable fibers and non-fibrous particles
	N,N-dimethylacetamide (DMAc)	10ppm, 36 mg/m ³ —8hr TWA	10ppm, 36 mg/m ³ —8hr TWA, skin, A4	10ppm, 8hr. TWA, skin	None established
Dust should be considered a nuisance dust: ACGIH TLV 10 mg/m ³ total dust OSHA PEL: 15 mg/m ³ total dust; 5-mg/m ³ respirable dust					
* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits that are lower than the AEL are in effect, such limits shall take precedence.					

Engineering Controls: Use only with adequate ventilation. Avoid dust generation. Local exhaust recommended to reduce exposure to fiber dust.

Specific Personal Protective Equipment:

Respiratory: Where airborne dust and fibril concentrations are expected to exceed applicable exposure limits, or where there is potential for irritation of the nasal passages by the mechanical action of the fibers, NIOSH-approved respirators should be used.
 An air-purifying respirator with a dust/mist/fume cartridge or canister may be permissible under certain circumstances. Disposable dust masks (3M model N95 8210, or equivalent) may also be used.
 When NOMEX[®] is used at elevated temperatures, or in a way that might create airborne DMAc or decomposition products in excess of applicable exposure limits, wear NIOSH-approved organic vapor cartridge respirators.

Eye: For operations where eye contact can occur, eye protection such as goggles or safety glasses is recommended.

Hand: Protective gloves not required.

Skin/Other: Not required.

Work/Hygienic Practices: Maintain good housekeeping to control dust accumulations. Avoid the use of air jets to blow off equipment; use vacuums instead. Do not consume food, drink or tobacco in areas where they may become contaminated with this material.

9. Physical & Chemical Properties / Characteristics

Chemical Formula: Proprietary	Flash Point: No data available	Solubility: Not soluble
Appearance: Off-white solid	Evaporation Rate: Does not apply	Partition Coefficient: No data available
Odor: No odor	Flammability: Non-flammable	Auto-Ignition Temp: No data available
pH: No data available	Vapor Pressure: Does not apply	Decomposition Temp: 200°C
Melting Point: Does not melt	Vapor Density: Does not apply	Viscosity: Does not apply
Boiling Point: Does not apply	Specific Gravity: 1.38 g/cm ³	

10. Stability & Reactivity Data

Reactivity: Data not available.
Stability: Stable under normal conditions.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Heating NOMEX[®] fiber above about 200°C (392°F) will drive out the DMAc (0-3% by weight in un-dyed fibers.) This will not harm the fiber, but the DMAc vapors may present an inhalation hazard in confined spaces.
 NOMEX[®] polymer begins to thermally degrade rapidly above 300°C (572°F). Fiber finishes can thermally decompose above 200°C (392°F). The thermal degradation rate increases with temperature.
Incompatible Materials: None known.
Hazardous Decomposition Products: Decomposition can produce irritating and toxic gases.

11. Toxicological Information / Health Hazard Data**Health Hazards (Acute and Chronic):**

EYE EFFECTS: NOMEX[®] is untested for eye irritancy. As with other particles, mechanical action of fibers in the eye may cause slight irritation.

DMAc is an eye irritant in animals and man. Eye contact may include eye irritation with discomfort, tearing, or blurring of vision.

SKIN EFFECTS: NOMEX[®] fibers are not skin irritants, or skin sensitizers in animals. Skin sensitization has not been observed in human patch tests or in industrial experience. NOMEX[®] fiber has been used in direct contact with the skin in industrial gloves and protective apparel for many years. The mechanical action of the fibers may cause slight skin irritation at clothing binding points. Repeated harsh rubbing of the skin with fibrous dust or supported fiber structures (e.g., sized, coated or impregnated fabrics, paper edges, etc.) may cause abrasion, with resulting irritation and rash. Symptoms disappear following cessation of skin contact.

DMAc skin absorption toxicity: LD50 for rabbits is 2240mg/kg (moderately toxic by skin absorption). Liquid DMAc is a skin irritant, but not a skin sensitizer in animals. In humans, skin contact can cause irritation with discomfort or rash.

ACUTE ORAL EFFECTS:

NOMEX[®] has very low toxicity by ingestion. Oral ALD >7500mg/kg in rats.

DMAc is slightly toxic by ingestion. LD50 is 4930mg/kg in female rats.

ACUTE INHALATION EFFECTS:

Industrial experience shows that inhalation of fibrous dust and fly may cause mechanical irritation of the mucous membranes of the nose and throat with resulting dry cough, scratchy throat and runny nose. Symptoms cease upon cessation of exposure.

DMAc skin absorption toxicity: ALD for rabbits, when applied in single doses, is 5000mg/kg body weight. Human health effects of overexposure to DMAc by inhalation or skin absorption may initially include nonspecific discomfort such as nausea, headache, or weakness; temporary nervous headache, confusion, loss of coordination and loss of consciousness; abnormal liver and kidney functions as detected by laboratory tests or jaundice (liver). Skin permeation occurs rapidly and can occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization. Individuals with pre-existing diseases of the liver may have increased susceptibility to the toxicity of excessive exposure.

SUBCHRONIC INHALATION EFFECTS:

A two-week subchronic test in which mice were exposed to DMAc via inhalation showed liver and testicular effects at high exposure concentrations (300, 500 and 700ppm.) No adverse effects were observed at 100ppm.

CHRONIC INHALATION EFFECTS**FIBERS:**

NOMEX[®] fiber does not break down into fibrils when abraded; instead it produces non-fibrous particles. A 2.5mg dust sample of NOMEX[®], prepared by grinding NOMEX[®] paper, was instilled once into rat lungs. Tissue response was measured histopathologically in groups of rats at periodic sacrifices from 2 days to 2 years. No sign of adverse response to the NOMEX[®] dust was seen.

DMAc:

Toxic effects described in animals from exposure by inhalation, ingestion or skin contact include retinal, liver, lung and kidney effects, reduced spermatogenesis, bone marrow effects and ataxia. Tests in animals demonstrate no carcinogenic activity.

If there is significant potential for skin contact with DMAc, biological monitoring should be done to measure the level of DMAc metabolites in urine specimens collected at the end of the shift. It is DuPont practice to limit individual end-of-shift DMAc metabolites in urine levels to 40ppm or below, expressed as N-methylacetamide (MMAc) and to control average DMAc metabolite in urine levels for the job to 20ppm or below, expressed as MMAc.

MUTAGENIC, DEVELOPMENTAL AND REPRODUCTIVE EFFECTS**FIBERS:**

No animal tests have been run to define mutagenic, developmental or reproductive hazards of NOMEX[®] fibers.

DMAc:

Tests in mammalian cell cultures demonstrate no mutagenic activity. In laboratory tests, application of DMAc to the skin of pregnant rats has caused fetal deaths when the doses were close to the lethal dose level for the mother. Embryonal malformations have been observed at dose levels 20% of the lethal dose and higher. However, when male and female rats were exposed to mean concentrations of DMAc at 31ppm, 101ppm, and 291 ppm for 6 hours per day over several weeks, no reproductive effects were observed.

Carcinogenicity:

NTP: Not listed.

IARC: 3 - Not classifiable as to its carcinogenicity to humans.

OSHA: Not regulated.

Signs and Symptoms of Exposure:

No data available.

Medical Conditions Aggravated by Exposure:

Some individuals, e.g. with asthma or bronchitis, are likely to be intolerant of high concentrations of airborne fibers or fiber dust when processing.

12. Ecological Information**Toxicity:**

NOMEX[®] fibers do not leach material toxic to flora or fauna.

Finishes and additives used with NOMEX[®] are routinely tested for their potential effects on manufacturing wastewater treatment systems. Biocompatibility and aquatic toxicity tests give the following results:

- None appear to be inhibitory or toxic to microbes commonly found in biological treatment systems.
- Biodegradation and normal anti-foam treatments control foaming.

- Discharge of scoured finishes should not result in increased effluent toxicities.
- Finishes are completely or substantially biodegradable.

Since concentrations and treatment conditions vary, the above should be considered indicative only.

Persistence and Degradability: NOMEX[®] fibers are essentially non-biodegradable in the environment. DMAc in wastewater streams contributes to the Biological Oxygen Demand (BOD), but is readily biodegradable in conventional biological sewage treatment systems.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

13. Disposal Considerations

Waste Disposal Method: NOMEX[®] fibers are not hazardous wastes as defined by regulations implementing the Resource Conservation and Recovery Act (RCRA). In general, waste materials of NOMEX[®] may be treated, stored, transported and disposed of in accordance with the state and local regulations governing the disposal of other common or non-RCRA regulated waste materials. Since the fiber is essentially non-biodegradable, do not flush to surface water or sanitary sewer system. Dispose of in accordance with all applicable governmental regulations for non-hazardous solid waste. Recycling of corrugated packaging is encouraged where possible. Other packaging may be disposed of with product. Standard disposal containers are acceptable.

14. Transport Information

Proper Shipping Name:	Aramid Staple Fibers	U.S. DOT:	Not regulated.
U.S. NMFC Item Number:	68310	ICAO/IATA:	Not regulated.
HTC Number:	5503.90	IMDG:	Not regulated.
U.N. Number:	None	Canada TDG:	Not regulated.

15. Regulatory Information

International:

Canada: DSL/NDSL: The main ingredient of this product is included on the Canadian Non-Domestic Substance List. All other ingredients are included on the Canadian Domestic Substance List.

Canada: WHMIS: Not a controlled product.

Europe: Not classified as dangerous according to Directive 1999/45/EC.

UN: Does not appear on the Dangerous Goods List.

Federal (U.S.):

EPA: Not regulated.

OSHA: Not hazardous under the criteria of Occupational Safety and Health Standard 29 CFR 1910 Subpart Z.

State:

CA: Proposition 65: Does not contain chemicals known to the State of California to cause cancer or reproductive toxicity.

16. Other Information

This MSDS has been prepared in compliance with United States OSHA Hazard Communication Standard 29 CFR 1910.1200 and the United Nations Globally Harmonized System for the Classification and Labeling of Chemicals.

Disclaimer: To the best of our knowledge, the information contained herein is accurate. However, we cannot assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of the suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.