

1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

Product Identification

Product Name: Black Foam Rubber
Common Name(s): EPDM Closed
Cell Elastomeric Thermal Insulation,
Elastomeric foam rubber thermal
insulation/EPDM closed-cell foam,
Ethylene-Propylene-Terpolymer Rubber

2. HAZARDS IDENTIFICATION

Inhalation: No significant signs of any adverse health hazards are expected to occur as a result of inhalation exposure.

Eye Contact: No significant signs of any adverse health hazards are expected to occur as a result of eye contact.

Skin Contact: No significant signs of any adverse health hazards are expected to occur as a result of skin contact.

Ingestion: Practically non-toxic.

3. COMPOSITION/INFORMATION ON INGREDIENTS

ETHYLENE-PROPYLENE-TERPOLYMER RUBBER

Formal Name: EPT/EPDM

Chemical Family: Synthetic Rubber

CAS No.: 25038-36-2

ALUMINA TRIHYDRATE

Chemical Name: Alumina Trihydrate/Aluminum Hydroxide

Formal Name: Aluminum Oxide Trihydrate

CAS No.: 21645-51-2

CARBON BLACK

Chemical Name: Carbon Black

Formal Name: Furnace Black

Chemical Family: High - Purity Colloidal Carbon

CAS No.: 1333-86-4

4. FIRST AID MEASURES

Inhalation: Not required under normal use. If irritation persists, remove from exposed area.

Eye Contact: Not required under normal use. Flush with water until all traces of this material are gone. Seek medical attention if irritation persists.

Skin Contact: Not required under normal use.

Ingestion: Not applicable.

5. FIRE FIGHTING MEASURES

Extinguishing Media: Carbon Dioxide, ABC dry chemical, water spray and foam.
Specific hazards with regard to fire fighting measures: Approach from upwind side. Avoid breathing smoke, fumes or vapors on downwind side. Firefighters wear protective clothing, especially eye protection and self contained breathing apparatus.

Hazardous Combustion Products: May generate Carbon Monoxide, Carbon Dioxide, low molecular weight alcohols, aldehydes and acids.

6. ACCIDENTAL RELEASE MEASURES

Steps if materials released/spilled:

Land spill: Collect spilled material and place in an appropriate container for reuse or disposal

Water spill: Product is insoluble. Collect spilled material and place in an appropriate container for reuse or disposal

Neutralizing Agent: N/A

7. HANDLING AND STORAGE

Handling condition: No special precaution required.

Storage condition: Keep in a dry normal storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: General ventilation

Personal Protection: N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Expanded Rubber Foam

Specific Gravity (H₂O=1): 0.04-0.09

Service Temperature (oC): -57°C to +125°C (-70°F to +257°F)

Thermal Conductivity (W/mK): 0.035 (0.245 Btu in/ft² hr °F) at 24°C (75°F)

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Water Vapor Permeability: 0.03 Perm-inch (4.38x10⁻¹⁴ Kg/Pa s m)

Water Absorption (%by weight): 5% by weight

Compression Set: Excellent

Flammability: Self-extinguishing

10. STABILITY AND REACTIVITY

Stability: Material is stable.

Conditions to Avoid: None known.

Materials to Avoid: Strong-oxidizing agents.

Hazardous Polymerization: Will Not Occur.

Hazardous Decomposition: May generate Carbon Monoxide, Carbon Dioxide, Low molecular weight alcohol/aldehydes and acid.

11. TOXICOLOGICAL INFORMATION

No Data.

12. ECOLOGICAL INFORMATION

No Data.

13. DISPOSAL CONSIDERATIONS

Incineration preferred in a federal, state, or local approved facility.

14. TRANSPORT INFORMATION

None special required.

15. REGULATORY INFORMATION

COMPONENT /	(CAS/PERC) /	CODES
None known		
None known		

16. OTHER INFORMATION

Disclaimer:

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: Black M/F Buckles
Common Name(s): Side Release Buckles

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

ADDITIONAL HEALTH EFFECTS

Read the specific datasheet for product to be used before using this resin, as well as the Delrin Molding Guide.

ACETAL POLYMER

There are no known effects from exposure to the Delrin polymer itself. If overheated, the polymer releases formaldehyde, which may cause skin, eye, and respiratory irritation and allergic reactions.

Significant skin permeation and systemic toxicity after contact appears unlikely. There are inconclusive or unverified reports of human sensitization.

CARBON BLACK

Immediate effects of overexposure to Carbon Black by inhalation may include irritation of the nose, throat, and lungs with cough, difficulty breathing or shortness of breath.

If particles from Carbon Black contact the eye, mechanical irritation with tearing, pain or blurred vision may result.

Significant skin permeation, and systemic toxicity, after contact with Carbon Black appears unlikely. There are no reports of human sensitization.

Epidemiologic studies demonstrate no significant risk of human cancer from exposure to Carbon Black. While some reports cite an increased incidence of pulmonary abnormalities, such as decreased pulmonary function and radiological changes among Carbon Black workers, other reports show no correlation between exposure and effects on pulmonary function or disease.

Increased susceptibility to the effects of Carbon Black may be observed in persons with pre-existing disease of the lungs.

Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material	IARC	NTP	OSHA	ACGIH
FORMALDEHYDE:	1	X	X	A2
CARBON BLACK:	2B			

3. COMPOSITION/INFORMATION ON INGREDIENTS

Material:	CAS Number	%
Acetal Polymer:		>98
Stabilizer:		<2
Formaldehyde:	50-00-0	<0.005
Carbon Black:	1333-86-4	0-0.5

Components (Remarks)

Material is not known to contain Toxic Chemicals under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372. Additives in this product do not present a respiration hazard unless the product is ground to a powder of respirable size and the dust is inhaled. All dusts are potentially injurious to the respiratory tract if respirable particles are generated and inhaled in sufficiently high concentrations. Good industrial hygiene practices, as with all dusts, should include precautions to prevent inhalation of respirable particles.

4. FIRST AID MEASURES

Inhalation: No specific intervention is indicated as the compound is not likely to be hazardous by inhalation. Consult a physician if necessary. If exposed to fumes from overheating or combustion, move to fresh air. Consult a physician if symptoms persist.

Skin Contact: The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. If molten polymer gets on skin, cool rapidly with cold water. Do not attempt to peel polymer from skin. Obtain medical treatment for thermal burn.

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

Ingestion: No specific intervention is indicated as compound is not likely to be hazardous by ingestion.

5. FIRE FIGHTING MEASURES

Flash Point: Not Applicable

"Delrin" dust cloud ignition temperature is 440 degrees C (824 degrees F).

Not a fire or explosion hazard. Burns with invisible flame. Hazardous gases/vapors produced in fire are carbon monoxide, formaldehyde.

Extinguishing Media

Water, Foam, Dry Chemical, CO2.

Fire Fighting Instructions

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus.

6. 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.

Spilled material is a slipping hazard.

Spill Clean Up

Recover undamaged and minimally contaminated material for reuse and reclamation. Shovel or sweep up.

7. HANDLING AND STORAGE

Handling (Personnel): See FIRST AID and PERSONAL PROTECTIVE EQUIPMENT SECTIONS.

Handling (Physical Aspects): Open container only in well-ventilated area.

Storage: Store in a well ventilated area away from heat and sunlight. Keep container closed to prevent contamination.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:

VENTILATION

When hot processing this material, use local and/or general exhaust ventilation to control the concentration of vapors and fumes below exposure limits. In cutting or grinding operations with this material, use local exhaust to control the concentration of dust below exposure limits.

Personal Protective Equipment:

EYE/FACE PROTECTION

Wear safety glasses. Wear coverall chemical splash goggles and face shield when

possibility exists for eye and face contact due to splashing or spraying of molten material.

RESPIRATORS

When temperatures exceed 230 degrees C and ventilation is inadequate to maintain concentrations below exposure limits, use a positive pressure air supplied respirator. Air purifying respirators may not provide adequate protection. During grinding, sanding, or sawing operations use a NIOSH/MSHA approved air purifying respirator with dust/mist cartridge or canister if airborne particulate concentrations are expected to exceed permissible exposure levels.

PROTECTIVE CLOTHING

If there is potential contact with hot/molten material, wear heat resistant clothing and footwear.

Exposure Guidelines:

Exposure Limits

PEL (OSHA) : Particulates (Not Otherwise Regulated)
 15 mg/m³, 8 Hr. TWA, total dust
 5 mg/m³, 8 Hr. TWA, respirable dust

Other Applicable Exposure Limits

FORMALDEHYDE

PEL (OSHA): 0.75 ppm, 0.92 mg/m³, 8 Hr. TWA
 STEL 2 ppm, 2.5 mg/m³
TLV (ACGIH): Ceiling 0.3 ppm, A2
 Sensitizer
AEL * (DuPont): 0.5 ppm, 8 & 12 Hr. TWA
 1 ppm, 15 minute TWA

CARBON BLACK

PEL (OSHA): 3.5 mg/m³, 8 Hr. TWA
TLV (ACGIH): 3.5 mg/m³, 8 Hr. TWA, A4
AEL * (DuPont): 0.5 mg/m³, 8 & 12 Hr.TWA, (Polynuclear
 Aromatic Hydrocarbon Content <0.1%)
 Includes Channel, Lamp, and Thermal Black

* 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point: 175-183 C (347-361 F)

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Solubility in Water: Insoluble

Odor: Slight formaldehyde

Color: Off-White, Black.

Form: Pellets

Specific Gravity: >1.00

10. STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Conditions to Avoid

Maintain polymer melt temperatures below 230 C (446 F). Avoid prolonged exposure at or above the recommended processing temperatures.

Incompatibility with Other Materials

Incompatible with strong acids and bases (decomposes forming formaldehyde) and strong oxidizing agents. At melt temperatures, acetal resins are incompatible with halogenated polymers such as PVC and PVDC and any elastomers containing halogenated polymers. Even small amounts of such contaminants can cause sudden and spontaneous formaldehyde gas formation. Workplace fume concentrations well above threshold levels are a likely result. Unsafe pressurization of equipment, e.g., extruders, molds, can also result. Do not contaminate either virgin resin or rework. Do not mix this resin with pigments or additives other than those designated by DuPont. Do not mix this grade with other grades of Delrin, nor with any other resins, without first consulting DuPont. Doing any of the above may change the thermal stability of this resin and potentially cause decomposition.

Decomposition

Decomposition of this material depends on the length of time it is exposed to elevated temperatures. At the recommended processing temperature of 210-220 C (410-428 F), decomposition should not be significant until after 30 minutes. Decomposition may be accelerated by contaminants, pigments, and/or other additives. Autoclaving with pressurized steam may lead to a rapid decomposition and should be done for only minimum amounts of time. COOL COMPLETELY BEFORE OPENING the autoclave. Hazardous gas/vapor produced is formaldehyde.

Polymerization

Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Animal Data:

Delrin

Inhalation 6 hour LC50: > 22,000 mg/m³ in rats
Oral LD50: > 11,000 mg/kg in rats

Delrin is not a skin irritant, and is not a skin sensitizer in animals.

Single or repeated inhalation exposures to high concentrations of Delrin dust resulted in collapse of some areas of the lungs, other areas were over-inflated. This effect was seen as late as 11-19 days post-exposure.

No toxic effects were observed in animals ingesting Delrin.

No animal test reports are available to define carcinogenic, mutagenic, developmental, or reproductive hazards.

CARBON BLACK

Oral ALD, rat: > 25,100 mg/kg

Repeated inhalation exposure of animals to Carbon Black caused inflammation of the respiratory tract, lungs and emphysema.

Repeated exposure to high doses of Carbon Black by ingestion or skin contact caused no significant toxicological effects.

No adequate studies have been conducted in animals to define the carcinogenicity of Carbon Black by ingestion. In several skin painting studies using various Carbon Blacks no carcinogenicity was observed. Tests by inhalation for carcinogenicity in rats show significant increases in lung tumors in female rats but not male rats. In another study using female mice exposed by inhalation to Carbon Black there was no increase in the incidence of respiratory tract tumors. Researchers conducting the rat inhalation studies believe that these effects probably result from the massive accumulation of small dust particles in the lung, which overwhelm the normal lung clearance mechanisms. This represents "lung overload" phenomenon, rather than a specific chemical effect of the dust particle in the lung.

Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures. Tests in animals for genetic toxicity have produced mostly negative results. No animal data are available to define developmental or reproductive toxicity.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity: No information is available. Toxicity is expected to be low based on insolubility in water. Do not discharge to streams, ponds, lakes or sewers.

13. DISPOSAL CONSIDERATIONS

Preferred options for disposal are (1) recycling, (2) incineration with energy recovery, and (3) landfill. The high fuel value of this product makes option 2 very desirable for material that cannot be recycled, but incinerator must be capable of scrubbing out acidic combustion products. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations.

14. TRANSPORT INFORMATION

Not regulated in transportation by DOT/IMO/IATA.

15. REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: In compliance with TSCA Inventory requirements for commercial purposes.

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)- Carbon Black.

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM- Formaldehyde.

The State of California, under Proposition 65, regulates Carbon Black - airborne, unbound particles of respirable size as a carcinogen. In this product, carbon black is not supplied in the form regulated in California.

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)- Carbon Black.

16. OTHER INFORMATION

Disclaimer:

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of this information for the user's intended purposes or for the consequences of its use.
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particular purpose(s).

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UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

Product Identification

Product Name: Nickel-Plated Metal
Grommet

Common Name(s): Nickel Plating On
Metallic Strip Substrate, Metal With Metal
Additives

2. HAZARDS IDENTIFICATION

Generally not hazardous in normal handling; however, good laboratory practices should always be used. Avoid long-term exposure to skin or by inhalation of dusts formed during cutting/grinding/etc.

Health: 1

Flammability: 0

Reactivity: 0

Hazard Scale: Least Slight Moderate High Extreme
0 1 2 3 4

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS #</u>	<u>%</u>	<u>Exposure Limits</u>
Nickel Metal	744-02-0	99.99	OSHA PEL 1mg/mf
Plating Additive	N/A	N/A	N/A

4. FIRST AID MEASURES

Skin: Wash skin immediately with soap & water. Remove contaminated clothing. Avoid prolonged/repeated contact with skin. Not a route of entry to body. Contact physician if irritation persists.

Eyes: Mild Irritant; wash eyes exposed to dust with plenty of water for at least 15 minutes, lifting eyelids occasionally. Seek medical attention.

Inhalation: Irritant; remove to fresh air if exposed to excessive dust. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.

Ingestion Conscious & Alert: Induce vomiting.

Spontaneous Vomiting: Keep head below hips, rinse mouth, give ½-1 cup water or milk.

Unconscious: Do NOT induce vomiting. Never give anything by mouth to an unconscious

5. FIRE FIGHTING MEASURES

Fire Extinguisher Type: Consistent with other substances involved.

Fire/Explosion Hazards: Not combustible/fire hazard.

Fire Fighting Procedure: Consistent with other substances involved. Wear self-contained breathing device.

6. ACCIDENTAL RELEASE MEASURES

Sweep up and place in suitable containers for reclamation or later disposal per Federal, State, and Local regulations.

7. HANDLING AND STORAGE

Store in a cool, dry, well-ventilated area. Keep away from heat and flame. Do not get dusts in eyes, on skin, or on clothing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: NIOSH approved dust mask.

Hand Protection: Gloves to prevent skin exposure.

Eye Protection: Appropriate safety glasses/goggles.

Effects of overexposure, Acute and Chronic: Edges of base material may cause cuts to unprotected skin, no other effects expected to skin. Prolonged inhalation of dust or fume may result in a benign pneumoconiosis, producing distinctive changes in the lungs with no apparent disability or complications.

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point: 2647°F (1453°C)

Boiling Point: 4946°F (2730° C)

Vapor Pressure: N/A

Evaporation Rate: N/A

Vapor Density: N/A

Solubility in Water: Dusts are insoluble

Evaporation Standard: N/A

Auto Ignition Temperature: N/A

Flash Point: N/A

Lower Flammability Limit in Air: N/A

Upper Flammability Limit in Air: N/A

Appearance: Silvery matte or bright finish over rigid or semi-rigid substrate.

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions to Avoid: Acids.

Hazardous Decomposition Products: Hydrogen gas when contacted with acids.

Materials to Avoid: Nickel can react with acids can create hydrogen gas, which can form explosive mixtures in air.

11. TOXICOLOGICAL INFORMATION

Acute Oral Effects: No data available

Acute Skin Effects: No data available

Acute Inhalation Effects: No data available

Second Rank Acute Toxicity: No data available

Chronic Effect: No data available

Mutagenicity: No data available

Next Generation Effect (Teratogenicity): No data available

Carcinogenicity: Not prescribed by Industrial Safety Health Act

Other: No data available

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data available

Soil Mobility: No data available

Environmental Absorption and Degradation: No data available

D. Probable Accumulation in Animal Bodies: No data available

13. DISPOSAL CONSIDERATIONS

Regulations On Disposal Management: Not regulated

Disposal Method: Follow applicable regulations

Special Notice On Disposal: No particular notice

14. TRANSPORT INFORMATION

Not regulated

15. REGULATORY INFORMATION

Regulations prescribed by Industrial Safety and Health Act:

No data available

Regulations prescribed in other laws related to chemical matter management such as

Hazardous Chemical Matter Act:

No data available

Regulations by other countries:

No data available

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16. OTHER INFORMATION

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: Black Nomex Thread
Common Name(s): Nomex Aramid Fire
Retardant Thread, Nomex Sewing Thread

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

Emergency Overview

The hazards of this product are associated mainly with its processing. Dust may form explosive mixture in air. High concentrations of dust can irritate eyes, nose and respiratory system and cause coughing and sneezing. Processing meta-aramid products can release Dimethyl Acetamide (DMAC). Hazards related to DMAC include: May be harmful by inhalation (after often repeated exposure). May be harmful in contact with skin (after often repeated exposure). Liver and kidney injuries may occur. Processing para-aramid products can release respirable dust and respirable fibre particulate. Prolonged inhalation of respirable dust and respirable fibre particulate at high concentrations can cause lung damage. Continual rubbing of fibre particulates and dust on the skin can cause a transitory, mild irritation with redness or itching.

Potential Health Effects

Carcinogenicity

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

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Meta-aramid fiber or meta-aramid fiber blended with para-aramid, antistatic or other synthetic fibers		100 %

Exposure limits may be applicable for the following:

Meta-aramid	25765-47-3
Para-aramid	26125-61-1
Synthetic fibres	
N,N-Dimethylacetamide	127-19-5

4. FIRST AID MEASURES

General advice: No hazards, which require special first aid measures. If symptoms persist, call a physician. If irritation occurs, flush area thoroughly with water.

5. FIRE FIGHTING MEASURES

Flammable Properties

Flash point: not applicable

Thermal decomposition: > 300 °C (> 572 °F)

Fire and Explosion Hazard: Hazardous decomposition products formed under fire conditions.

Extinguishing Media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Firefighting Instructions: Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

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

Safeguards (Personnel): None.

Spill Cleanup: Avoid dust formation. Clean up dusts and fibres with high efficiency particulate air (HEPA) filtered vacuum equipment, or by wet cleaning.

Accidental Release Measures: Do not let product enter drains.

7. HANDLING AND STORAGE

Handling (Personnel): Avoid dust formation. Do not touch moving threadlines. Entanglement with this fibre can severely cut or even sever fingers. Avoid breathing dust or vapor.

Storage: Keep away from direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: Ensure adequate ventilation. Recirculated air should be filtered to remove respirable dust. Provide for appropriate exhaust ventilation and dust collection at machinery. Static charges can cause explosions in solvent and dust laden atmospheres.

Provide grounding of equipment to prevent static build-up.

Personal protective equipment

Eye protection: Safety glasses with side-shields

Respiratory protection: When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Exposure Guidelines

Exposure Limit Values

Meta-aramid

AEL *	(DUPONT)	10 mg/m ³	8 hr.	TWA	Total dust.
AEL *	(DUPONT)	5 mg/m ³	8 hr.	TWA	Respirable dust.

Para-aramid

AEL *	(DUPONT)	2 fibers/cm ³	8 & 12 hr.	TWA	Respirable fibers.
AEL *	(DUPONT)	5 mg/m ³	8 & 12 hr.	TWA	Non-fibrous particulate and/or nonrespirable fibres.

N,N-Dimethylacetamide

PEL	(OSHA)	10 ppm	35 mg/m ³	8 hr.	TWA	Skin designation applies.
						Skin designation applies.
TLV	(ACGIH)	10 ppm			TWA	
AEL *	(DUPONT)	10 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.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form: Nonwoven fabric, woven fabric, fibres, yarn

Color: Black, pigmented

Odor: None

Melting point/range: N/A

Specific Gravity: 1.38

Water solubility: Insoluble

10. STABILITY AND REACTIVITY

Conditions to avoid: Temperature > 200 °C (> 392 °F).
Heating can release hazardous gases.

Incompatibility: Strong acids and strong bases

Decomposition: **Decomposition temperature:** > 300 °C (> 572 °F).
Hazardous decomposition products Carbon monoxide, nitrogen oxides (NO_x), Hydrogen cyanide (hydrocyanic acid).

11. TOXICOLOGICAL INFORMATION

Skin sensitization: Did not cause sensitization on laboratory animals.
Negative in human patch test.

Meta-aramid

Oral ALD: > 11,000 mg/kg, rat

Inhalation ALC: > 238 mg/m³, rat
lung effects

Skin irritation: non-irritant

Carcinogenicity: Did not show carcinogenic effects in animal experiments.

Para-aramid

Oral ALD: > 7,500 mg/kg, rat

Skin irritation: Species: rabbit, No skin irritation
non-irritant

Eye irritation: non-irritant

Repeated dose toxicity: Inhalation, rat
lung effects

Carcinogenicity: Animal testing did not show any carcinogenic effects.

Mutagenicity: Tests on bacterial or mammalian cell cultures did not show
mutagenic effects.

N,N-Dimethylacetamide

Dermal LD50: 2,240 - 9,600 mg/kg, animals (unspecified species)

Oral LD50: 3,000 - 6,000 mg/kg, rat

Inhalation 1 h LC50: 8.81 mg/l female, rat
Value applicable only if respirable particles are formed.

Inhalation 4 h LC50: 2.2 mg/l female, rat

Skin irritation: Species: rabbit
Mild skin irritation

Eye irritation: Species: rabbit
irritant

Repeated dose toxicity: **Dermal**

Central nervous system depression, Liver effects, Skin effects

Oral

Pathologic changes, Stomach, Testes, Liver, Kidney, Abnormal decrease in number of red blood cells (anaemia)

Inhalation

Kidney effects, Liver effects, Retinal damage

Carcinogenicity:

Did not show carcinogenic effects in animal experiments.

Mutagenicity:

Did not cause genetic damage in cultured bacterial cells. Did not cause genetic damage in cultured mammalian cells. Evidence suggests this substance does not cause genetic damage in animals.

Toxicity to reproduction:

Animal testing showed no reproductive toxicity.

Teratogenicity:

Animal testing showed effects on embryo-foetal development at levels equal to or above those causing maternal toxicity.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Para-aramid: This product has no known eco-toxicological effects.

N,N-Dimethylacetamide 96 h LC50: Fathead minnow 1,500 mg/l

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Can be landfilled or incinerated, when in compliance with local regulations. Do not flush into surface water or sanitary sewer system.

14. TRANSPORT INFORMATION

None special required.

15. REGULATORY INFORMATION

TSCA Status: Product is an article as defined at 40CFR720.3(c) and is not subject to TSCA Inventory requirements.

SARA 313 Regulated Chemical(s): SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65: Chemicals known to State of California to cause cancer, birth defects or any other harm: none known

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Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

Product Identification

Product Name: Black Polypropylene
Webbing

Common Name(s): Polypropylene or
Polyethylene Webbing, Polypropylene
Web (Polyolefin)

2. HAZARDS IDENTIFICATION

Appearance: Black

Eye Contact: Product fines can cause mechanical irritation.

Skin Contact: Product is unlikely to cause irritation.

Inhalation: Product fines may cause mechanical irritation.

Ingestion: Product is practically non-toxic.

Signs and Symptoms: Irritation as noted above.

Carcinogenicity:

NTP: No

IARC Monographs: No

OSHA Regulated: No

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component</u>	<u>Polypropylene</u>	<u>Carbon Black</u>	<u>Additives</u>
CAS No	9003-07-0	1333-86-4-	-
Composition (%)	Min 98%	Max 1.5%	Max 0.5%

4. FIRST AID MEASURES

Eye Contact: Flush eyes with water if irritation occurs.

Skin Contact: Flush skin with plenty of soap and water for at least 15 minutes, while removing contaminated clothing and shoes.

Ingestion: Do not induce vomiting. Allow the victim to rinse his mouth then to drink 2-4 cupfuls of water and seek medical advice.

Inhalation: Remove from exposure to fresh air immediately.

Notes to physician: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

Flash Point And Method: Not Applicable

Extinguishing Media: Use water fog, foam, dry chemical or CO2

Auto Ignition Temperature: Not Applicable

Special Firefighting Procedures And Precautions: Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots). Cool fire exposed containers with water.

Unusual Fire And Explosion Hazards: Treat as a solid that can burn. Molded parts generally burn slowly with a low smoke density and flaming drips. Under certain conditions can burn with a high smoke density.

6. ACCIDENTAL RELEASE MEASURES

General Information: Use proper personal protective equipment

Spill/Leaks: Clean up spills immediately. Sweep up, and then place into a suitable container for disposal.

7. HANDLING AND STORAGE

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Avoid contact with eyes, skin, and clothing. Avoid ingestion and inhalation.

Storage: Store in a cool, dry place. Keep container closed when not in use.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels.

Personal Protective Equipment:

Eye: Wear safety glasses and chemical goggles if splashing is possible.

Skin: Wear appropriate protective gloves and clothing to prevent skin exposure.

Clothing: Wear appropriate protective clothing to minimize contact with skin.

Respirators: Use approved supplier air respiratory protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Black

Odor: Essentially Odorless

pH: Not Applicable

Solubility: (In Water) Insoluble;

(Other Solvent) Soluble In Tetrahydronaphthalene, Tetrachloroethane Etc.

Viscosity: Not Applicable

Melt Point: 130 ~ 170°C

Boiling Point: Not Applicable

Decomposition Temperature: Not Applicable

Vapor Pressure: Not Applicable

Vapor Density (Air=1): Not Applicable

Evaporation Rate: Not Applicable

Specific Gravity (H2o=1): 0.89 ~ 0.91

Molecular Weight: >10,000

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal temperature and pressure

Conditions To Avoid: Incompatible materials, strong oxidants

Incompatibilities With Other Materials: Strong-oxidizing agents

Hazardous Decomposition Product: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.

11. TOXICOLOGICAL INFORMATION

LD50: 3200 mg/kg Mouse-in throat

Inhalation: Product fines may cause mechanical irritation.

Skin Contact: Product is unlikely to cause irritation.

Eye Contact: Product fines can cause mechanical irritation.

Ingestion: Product is practically non-toxic.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not applicable

Spill Or Leak Procedures: Shovel and sweep up or use industrial vacuum cleaner. Avoid generation dust clouds. Put into containers for reclaiming or disposal.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Place contaminated material in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

Environmental Hazards: Not applicable

14. TRANSPORT INFORMATION

Not applicable

15. REGULATORY INFORMATION

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Label Warning: Caution: May cause respiratory irritation during thermal processing operations.

DOT Hazard Classification: Not regulated **DOT Proper Shipping Description:** None

EPA Hazardous Substance and Reportable Quantity: Not listed

RCRA Hazardous Waste: Not listed

SARA Title III Section 302 Extremely Hazardous Substances: None present

SARA Title III Section 313 Toxic Chemicals: None present

16. OTHER INFORMATION

Disclaimer:

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: PTFE Heating Cable
Common Name(s):

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire, exposure, or accident call CHEMTREC
(800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

Invasion Method: /

Health Hazard: 1) This product is nontoxic. But it produce pyrolysis gas at high temperature which can cause poisoning. The poisoning symptoms are like: short of breath, fever, cough, cyanosis and tremble, they are temporary and similar to getting a cold. 2) If the cables overload long time when working, it may appear leakage and short circuit problems, etc.

The simple of high-temperature pyrolysis gas will appear in two hours and will last 36-48 hours. There is no related articles report how continuous or cumulative inhalation will effect.

Environmental Hazard: /

Combustion Hazard: noncombustible

3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure[☐] **Mixed**[☒]

Chemicals Name: Teflon Twin Conductor Heating Cable

Injurious Ingredient

/

Content

100% (qualified product)

CAS No

25067-11-2

4. FIRST AID MEASURES

Skin Contact: if the skin touches the hot resin melt of cable surface, immediately use cold water to wash the skin and go hospital. If there is electric leakage when cable works, Turn off the power immediately and take emergency treatments according to the situation. Severe people should be sent to hospital.

Eye Contact: immediately filed eyelid accidentally gets in the eyes with plenty of water rinse, then go hospital for treatment.

Inhalation: quickly get out there to air freshening place, keeps breathing smoothly. Perform oxygen therapy once hard to breach. Perform artificial respiration once breathing stop and then go to hospital.

Ingestion: /

5. FIRE FIGHTING MEASURES

Hazardous Characteristics:

- 1) The cable heat stability is excellent, no decomposition below 380 °F but less pyrolysis gas over 380 °F after long time heating and more pyrolysis gas over 420 °F. The pyrolysis gas will cause poisoning.
- 2) The cable has ground wire itself. No current leakage and short circuit under normal use. If overload in a long time, may cause current leakage and short circuit even fire accident.

Hazardous Combustion Products: carbon monoxide, carbon dioxide, hydrogen fluoride, erfluoroisobutylene (PFIB), fluorophosgene.

Method of Extinguishing: The cable is noncombustible. But in order to prevent from being heated and decomposition and produce poisonous gas, spray water to cool them and possible take them outside from fire ground.

Fire Extinguishing Agent: spray water, dry powder, sand, foam, carbon dioxide. Matters need attention: firefighters have to wear protective whole body suit, self-contained or positive pressure respirator.

6. ACCIDENTAL RELEASE MEASURES

Emergency processing: Turn off the power and evacuate people immediately. Arrange or contact people in charge to control the situation. If there is anyone gets a electric shock or poisonous, take emergency treatments according to the situation. Severe people should be sent to hospital.

7. HANDLING AND STORAGE

Operation Cautions: When use the cable to processing and manufacturing, Processing and manufacturing area should be airtight and total exhaust. Operator is well trained and hew to operating instruction. Do not damage the cable during the process.

Storage Cautions: Store at cool and ventilate and be far away from sunshine in summer. Keep cable separate from oxidant and edible chemicals. Handle with care when

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carrying.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Maximum Allowable Concentration: Pointless

Detection Method: /

Engineering Control: enclosed operation, total exhaust. As mechanized and automated as possible.

Respiratory Protection: Avoid breathing in the high-temperature pyrolysis gas during the processing and manufacturing. If the cable cause any pyrolysis gas, use full-face positive pressure air breathing apparatus.

Eye Protection: avoid eye exposure, wear a protection glass with sheath.

Body Protection: wear normal work clothes.

Hand Protection: wear suitable gloves.

Others: No smoking and pay attention to personal hygiene.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Shape: round blue wire, scentless

Melting Point: getting soft above 300°F

Boiling Point: pointless

Density: /

Proportion: no data

Vapor Pressure: pointless

Octanol / Water distribution coefficient of value: pointless

Heat of Combustion (KJ/mol): pointless

Stagnation Temperature: pointless

Critical Pressure(MPa): pointless

Flash Point: pointless

Upper Explosive Limit% (V/V): pointless

Lower Explosive Limit% (V/V): pointless

Solubleness: poorly soluble in water, acetone, ethanol

Main Application: underfloor heating, snow melting, heat tracking in industries, etc.

10. STABILITY AND REACTIVITY

Stability: stable

Prohibited material: Flammable or combustible material

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Harm of polymerization: not polymerized

Conditions of avoiding exposure: alkalis and alkaline rare earth metals, react with its metal powder below 370 °F.

Decomposition product: carbon monoxide, carbon dioxide, hydrogen fluoride, erfluoroisobutylene (PFIB), fluorophosgene.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity Test: **LD50:** No data; **LC50:** No data
Irritant: No data

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data
Biodegradability: No data
Abiotic degradability: No data
Other harmful factors: No data

13. DISPOSAL CONSIDERATIONS

Nature of the waste: no hazardous waste number in China, USA, EPA

Disposal Information: waste recycle, unrenewable wast landfill according to country and local laws and rules.

Waste Cautions: in the case of existing inflammables or Combustibles, high-temperature incineration will cause HF.

14. TRANSPORT INFORMATION

Dangerous Goods Code: /
UN Code: /
Packing mark: /
Categories of packing: Class
Packing method: inner package: plastic bag, outer package, carton box
Transport cautions: far away from sunshine. Handle with care when carrying.

15. REGULATORY INFORMATION

Law Information: (Hazardous Chemical Materials Safety Management Regulations) (People's Republic of China State Council Decree 344, from March 15, 2002 implementation). (Workplace Safe Use of Chemicals) ([1996] labor department No. 423) and other regulations, make corresponding provisions for safe use, production, storage, handling and other aspects of hazardous chemicals.

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(Commonly Used Classification of Dangerous Chemicals and Signs) (GB13690—1992)

16. OTHER INFORMATION

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire, exposure, or accident call CHEMTREC (800) 424-9300, day or night

Product Identification

Product Name: Black Polyvinyl Chloride (PVC) Fabric

Common Name(s): Reinforced Flexible PVC Sheeting, Coated Flexible PVC, Polyvinyl Chloride (PVC), and Polyester Fibers

2. HAZARDS IDENTIFICATION

Emergency Overview

Plastic films with polyester reinforced. Not considered Hazardous

Potential Health Effects

Eyes: May cause irritation if exposed to fumes from burning material

Skin: No adverse affects to skin under normal ambient conditions. If heated to elevated temperatures, contact may cause thermal burns.

Ingestion: Not likely to be ingested in present form. Very low toxicity if particles are swallowed, may cause choking.

Inhalation: Vapors/fumes released during high heat or burning of product may cause respiratory irritation. Should not breathe fumes if this occurs. Product is not intended for high heat applications, product cannot be inhaled in solid state at ambient temperature.

Acute Health Hazards: None. Does not apply

3. COMPOSITION/INFORMATION ON INGREDIENTS

Safety Data Sheet according to OSHA's Hazcom Standard (29 CFR 1910.1200)

PVC coated or laminated polyester woven fabric

Component Name	%Composition	CAS#/Codes
Polyvinyl Chloride, PVC	60-86%	9002-86-2
Polyester fibers	14-40%	80595-68-2

4. FIRST AID MEASURES

Eyes

Immediately flood the eye with plenty of water for at least 15 minutes, holding the eye open. Obtain medical attention if soreness or redness persists.

Skin

If molten material comes in contact with skin, cool under ice water or running stream of water. Do not attempt to remove the material from the skin as this may result in severe tissue damage. Seek medical attention immediately.

Ingestion

If swallowed seek medical attention. May cause gastrointestinal blockage. Obtain medical attention immediately.

Inhalation

Remove person to fresh air if fumes are inhaled from burning product. Seek medical attention if symptoms persist.

Advice to Physicians

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammable limits in Air, (% By Volume)	UPPER: Not Applicable LOWER: Not applicable
---	--

Flash Point: Not Available

Autoignition Temperature: Not Available

Extinguishing Media: Water spray, carbon dioxide.

Special Fire Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact of vapors with skin or eyes.

Unusual Fire and Explosion Hazard: Fire will generate Hydrogen Chloride gas, benzene, water, carbon monoxide, carbon dioxide and smoke.

Hazardous Decomposition Products: Not Applicable.

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Not Applicable.

7. HANDLING AND STORAGE

Use safe handling practices to avoid physical injury.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Not applicable

Ventilation: Not Applicable

Respiratory Protection: Not applicable

Eye Protection: Not applicable

Skin Protection: Not applicable

Exposure Guidelines: Not applicable

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Flexible PVC material with scrim reinforcement.

Color: Blue, black, etc. depending on vinyl color.

Odor: typical PVC odor

pH: Not applicable

Specific Gravity: 1.2-1.8

Boiling Range/Point (°C/F): Not applicable

Melting Point (°C/F): Degrades at 250-300 degrees F

Flash Point (PMCC) (°C/F): Not known

Vapor Pressure: Not applicable

Vapor Density: (Air=1) Not applicable

Solubility in Water: Nil, Insoluble

10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: Heat, High temperatures

Materials to Avoid: None known

Hazardous Decomposition Products: Hydrogen Chloride gas, a respiratory irritant is emitted at elevated temperatures.

11. TOXICOLOGICAL INFORMATION

Toxicological Information: No information available.

12. ECOLOGICAL INFORMATION

Ecological Information: Not Applicable.

13. DISPOSAL CONSIDERATIONS

Dispose of in accordance with all applicable local and national regulations.

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14. TRANSPORT INFORMATION

DOT CFR 172.101 Data

Transportation (IATA)

Not Regulated

15. REGULATORY INFORMATION

NFPA Ratings

NFPA Code for Flammability -1

NFPA Code for Health -0

NFPA Code for Reactivity -0

NFPA Code for Special Hazards – 0

TSCA (40 CFR 710) Polyvinyl Chloride is listed in the TSCA Inventory

EPA SARA Title III: None

CERCLA: None

WHMIS Class: Not Regulated – Manufactured Article

16. OTHER INFORMATION

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

Product Identification

Product Name: Stainless Steel Hog Ring
Common Name(s): Stainless Steel Type
301, 302, 303, 304, 305, 308, 309, 310, 314,
321, 347, 415, F6NM, 1.4306, 153MA™,
253MA®, 353MA®, and 2304 - anchors,
hooks, rings & washers

2. HAZARDS IDENTIFICATION

Precautionary Statements:

P281: Wear personal protective equipment as required

P302: If on skin, wash with mild soap and running water

P304: If inhaled, move individual to fresh air. Seek medical attention if irritation persists

P305: If in eyes, flush eyes at least 15 minutes; seek medical attention if irritation persists

Hazard Statements: N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Abstracts Service Number: N/A

<u>Hazardous Ingredients</u>	<u>Weight %</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>	<u>OTHER</u>
Stainless steel alloy				
Chromium (Cr)	10 to 27			
Fume		0.5 mg/m3	0.05 mg/m3	
dust/mist		1.0 mg/m3	0.5 mg/m3	
Nickel (Ni)	0.0 to 35			
fume (soluble)		1.0 mg/m3	0.1 mg/m3	
dust		1.0 mg/m3	1.0 mg/m3	
Manganese (Mn)	0.0 to 15			
fume		5.0 mg/m3 C*	1.0 mg/m3	
dust		5.0 mg/m3 C*	5.0 mg/m3 C*	
Copper	0.0 to 4.0	0.1 mg/m3	0.2 mg/m3	
Tungsten	0.0 to 4.0	none	5.0 mg/m3	
Molybdenum	0.0 to 4.0	15 mg/m3	10 mg/m3	
Aluminum	0.0 to 2.0	none	10 mg/m3	

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Silicon	0.0 to 5.0	none	10 mg/m ³
Cobalt	0.0 to 5.0	0.1 mg/m ³	0.05 mg/m ³

Nonhazardous Ingredients

Sizing	< 1	-----none established-----
Iron (Fe) dust	48 to 89	-----none-----

fumes

(as Iron oxide)

10 mg/m³ 5.0 mg/m³

C* = Ceiling limit

4. FIRST AID MEASURES

Inhalation: Move individual to fresh air. Seek medical attention if irritation persists. Administer artificial respiration, if breathing has stopped.

Skin Contact: Wash with mild soap and running water. To avoid further irritation do not rub or scratch irritated areas. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with flowing water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: N. A. (Not Applicable)

5. FIRE FIGHTING MEASURES

Extinguishing Equipment: Water, foam, carbon dioxide, dry chemical

Special Fire-Fighting Instructions: In a sustained fire, self-contained breathing apparatus with full-face piece and protective clothing should be worn.

Unusual Fire and Explosion Hazards: None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS (Use Appropriate Safety Equipment/PPE):

For solid product, not applicable.

For dusts and fibers generated during fabrication, vacuum and containerize.

7. HANDLING AND STORAGE

Handling: See Section 8.

Storage: No special precautions necessary.

Disposal: Dispose of in accordance with federal, state and local regulations as a solid nonhazardous waste.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: General dilution ventilation and/or local exhaust ventilation should be provided, as necessary, to maintain exposures below PEL's or TLV's. Adequate ventilation must be provided at elevated temperatures.

Respiratory Protection: A properly fitted NIOSH/MHSA approved disposable dust respirator should be

Used when: high dust levels are encountered; the level of Chromium/Nickel/Manganese dust or glass fibers in the air exceeds the OSHA permissible exposure limits; or if irritation occurs. Use an air-supplied respirator in confined spaces. Use industrial hygiene air monitoring to insure that TLV or PEL values are not exceeded. Use respiratory protection in accordance with your company's respiratory protection program and OSHA regulations under 29 CFR 1910.134.

Eye Protection: Safety glasses, goggles or face shields should be worn.

Protective Clothing: Wear loose fitting, long sleeved shirt that covers to the base of the neck, and long pants. Wear gloves when handling product.

Work/Hygienic Practices: Handle in accordance with good industrial hygiene and safety practices:

- Avoid unnecessary exposure to dusts and fibers
- Remove fibers from skin after exposure
- Be careful not to rub or scratch irritated areas. Rubbing or scratching may force the fibers into the skin. The fibers should be washed off. Use of barrier creams can, in some instances, be helpful.
- Use vacuum equipment to remove fibers and dusts from clothing. **COMPRESSED AIR SHOULD NEVER BE USED.** Always wash work clothes separately and wipe out the washer/sink in order to prevent loose glass fibers from getting on other clothes.
- Keep the work area clean of any dusts and fibers generated during fabrication. Use vacuum equipment to clean up dusts and fibers. Avoid sweeping or using compressed air as these techniques resuspend dusts and fibers into the air.
- Have access to safety showers and eye wash fountains.
- For professional use only. Keep out of children's reach.

Exposure Limits (TLVS): N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point (Softening): NM (Not Measured)

Boiling Point (°C): N/A (Not Applicable)

Specific Gravity (Bare Glass): NM

Percent Volatile: N/A

Vapor Pressure: (mm Hg): N/A

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Vapor Density (Air = 1): N/A

Evaporative Rate (Ethyl Ether = 1): N/A

Solubility in Water: Not soluble

Appearance and Odor: Metallic appearing accessories with no odor.

pH: N/A

Relative Density: N/A

Upper/Lower Flammability or Exposure Limits: N/A

Freezing Point: N/A

Flash Point: N/A

Partition coefficient (n-octanol/water): N/A

Auto Ignition Temperature: N/A

Decomposition Temperature: N/A

Viscosity: N/A

10. STABILITY AND REACTIVITY

Stability (Conditions to Avoid): Product is stable.

Stabilizers: N/A

Incompatibility (Materials to Avoid): None known.

Hazardous Decomposition Products: See Section 11.

Hazardous Polymerization: Will not occur.

Flash Point (°F): N/A (Not Applicable)

Auto Ignition Temperature (°F): N/A

Flammability Limits (%): LEL: N/A UEL: N/A

11. TOXICOLOGICAL INFORMATION

Primary Routes of Exposure: Inhalation and skin contact.

Health Hazards (Including acute and chronic effects and symptoms of overexposure):

ACUTE: NOTE: Stainless steel products in their usual physical state do not pose any Health hazards. However, when subjected to welding, burning, grinding, cutting, abrasive blasting, heat treatment, pickling, or similar operations, potentially hazardous fumes or dusts may be emitted. Despite the fact that welding, burning, etc. of stainless steel products in this category may produce fumes containing manganese, chromium, nickel and copper, the air concentrations generated of these components are expected to be extremely low.

Iron (Fe): Subjecting iron and alloys containing iron to high temperatures (such as welding) will cause the formation of iron oxide. Long-term exposure to iron oxide fumes or dusts has been associated with a benign lung condition known as siderosis, which

is observable as an x-ray change. No physical impairment of lung function has been linked to siderosis.

Manganese (Mn): Mn intoxication is usually due to the oxide or salts of Mn; elemental Mn exhibits very low toxicity. The dusts and fumes can act as minor irritants to the eyes and respiratory tract. Both acute and chronic exposure may adversely affect the central nervous system (CNS), but symptoms are more likely occur after at least one or two years of prolonged or repeated exposures. Early symptoms may include weakness in the lower extremities, sleepiness, salivation, nervousness and apathy. In more advanced stages, severe muscular incoordination, impaired speech, spastic walking, mask-like facial expressions and uncontrollable laughing may occur. Manganese fumes have also been reported to result in metal fume fever, a flu-like syndrome with symptoms such as dizziness, chills, fever, headache and nausea. An increased incidence of pneumonia, bronchitis and pneumonitis has been reported in some worker populations exposed to manganese. Animal studies indicate exposure may increase susceptibility to bacterial and viral infection.

Chromium (Cr): The toxicity and health hazards of chromium are heavily dependent on its oxidation state. The elemental (as in the metals), divalent and trivalent forms are of very low toxicity. The hexavalent form (such as occurs in chromates and chromic acids) is very toxic and can produce both acute and chronic effects. Adverse effects on the skin may include ulcerations, irritative dermatitis and allergic skin reactions. Adverse effects on the respiratory system may include bronchospasms, edema, hypersecretion, bronchitis, irritation, allergic asthmatic reactions, and, ulceration and perforation of the nasal septum. Respiratory symptoms may include coughing and wheezing, shortness of breath and nasal itch. Eye irritation or inflammation can also be produced. Exposure to some hexavalent chromium compounds has also been shown to be associated with an increased risk of lung cancer.

Nickel (Ni): Ni fumes and dust are respiratory irritants and may cause severe pneumonitis. Skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch". Ni and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids (i.e. the conjunctiva). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.

Copper (Cu): Inhalation of copper fume may cause irritation of the eyes and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chills, dry throat, cough and weakness. Cu fume may also produce a metallic or sweet taste. Repeated or prolonged exposure to Cu fume may cause discoloration of the skin or hair.

Aluminum (Al): There are no reported known health effects. Aluminum is generally

considered to be in the nuisance dust category.

Silicon (Si): Silicon may produce x-ray changes in the lungs. There has been no known disability reported from the x-ray changes.

Tungsten (W): There has been some reported evidence of pulmonary involvement such as a cough.

Molybdenum (Mo): Molybdenum has caused, in animal studies, irritation of the nose and throat, weight loss and digestive disturbances. There have been no reports of industrial poisoning.

Cobalt (Co): Cobalt has been reported to cause asthma. It may also cause interstitial pneumonitis and sensitization of the respiratory system.

CHRONIC: See carcinogenicity section below. Chronic exposure to Chromium (Cr)/Nickel (Ni)/Manganese (Mn) fumes or dust may cause skin sensitization, asthma, bronchitis, lung fibrosis or pneumoniosis. It may also cause damage to the kidneys and liver as well as the nervous system.

CARCINOGENICITY:

Hazardous Ingredients:	Listed as carcinogen by:	<u>ACGIH</u>	<u>IARC</u>	<u>NTP</u>	<u>OSHA</u>
Chromium (Cr)/Nickel (Ni)**			----	none known----	

*****Dusts and fumes containing Chromium (Cr) or Nickel (Ni) should be considered carcinogens.**

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with a history of chronic respiratory or skin conditions that are aggravated by mechanical irritants may be at increased risk for worsening their condition from exposure during use of the product.

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

See Section 8 (if applicable).

14. TRANSPORT INFORMATION

N/A

15. REGULATORY INFORMATION

N/A

16. OTHER INFORMATION

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire, exposure, or accident call CHEMTREC (800) 424-9300, day or night

Product Identification

Product Name: Stainless Steel Quilting Pin

Common Name(s): Stainless Steel Type 301, 302, 303, 304, 305, 308, 309, 310, 314, 321, 347, 415, F6NM, 1.4306, 153MA™, 253MA®, 353MA®, and 2304 - anchors, hooks, rings & washers

2. HAZARDS IDENTIFICATION

Precautionary Statements:

P281: Wear personal protective equipment as required

P302: If on skin, wash with mild soap and running water

P304: If inhaled, move individual to fresh air. Seek medical attention if irritation persists

P305: If in eyes, flush eyes at least 15 minutes; seek medical attention if irritation persists

Hazard Statements: N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Abstracts Service Number: N/A

<u>Hazardous Ingredients</u>	<u>Weight %</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>	<u>OTHER</u>
Stainless steel alloy				
Chromium (Cr)	10 to 27			
Fume		0.5 mg/m3	0.05 mg/m3	
dust/mist		1.0 mg/m3	0.5 mg/m3	
Nickel (Ni)	0.0 to 35			
fume (soluble)		1.0 mg/m3	0.1 mg/m3	
dust		1.0 mg/m3	1.0 mg/m3	
Manganese (Mn)	0.0 to 15			
fume		5.0 mg/m3 C*	1.0 mg/m3	
dust		5.0 mg/m3 C*	5.0 mg/m3 C*	
Copper	0.0 to 4.0	0.1 mg/m3	0.2 mg/m3	
Tungsten	0.0 to 4.0	none	5.0 mg/m3	
Molybdenum	0.0 to 4.0	15 mg/m3	10 mg/m3	
Aluminum	0.0 to 2.0	none	10 mg/m3	

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Silicon	0.0 to 5.0	none	10 mg/m ³
Cobalt	0.0 to 5.0	0.1 mg/m ³	0.05 mg/m ³

Nonhazardous Ingredients

Sizing	< 1	-----none established-----
Iron (Fe) dust	48 to 89	-----none-----

fumes

(as Iron oxide)

10 mg/m³ 5.0 mg/m³

C* = Ceiling limit

4. FIRST AID MEASURES

Inhalation: Move individual to fresh air. Seek medical attention if irritation persists. Administer artificial respiration, if breathing has stopped.

Skin Contact: Wash with mild soap and running water. To avoid further irritation do not rub or scratch irritated areas. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with flowing water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: N. A. (Not Applicable)

5. FIRE FIGHTING MEASURES

Extinguishing Equipment: Water, foam, carbon dioxide, dry chemical

Special Fire-Fighting Instructions: In a sustained fire, self-contained breathing apparatus with full-face piece and protective clothing should be worn.

Unusual Fire and Explosion Hazards: None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS (Use Appropriate Safety Equipment/PPE):

For solid product, not applicable.

For dusts and fibers generated during fabrication, vacuum and containerize.

7. HANDLING AND STORAGE

Handling: See Section 8.

Storage: No special precautions necessary.

Disposal: Dispose of in accordance with federal, state and local regulations as a solid nonhazardous waste.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: General dilution ventilation and/or local exhaust ventilation should be provided, as necessary, to maintain exposures below PEL's or TLV's. Adequate ventilation must be provided at elevated temperatures.

Respiratory Protection: A properly fitted NIOSH/MHSA approved disposable dust respirator should be

Used when: high dust levels are encountered; the level of Chromium/Nickel/Manganese dust or glass fibers in the air exceeds the OSHA permissible exposure limits; or if irritation occurs. Use an air-supplied respirator in confined spaces. Use industrial hygiene air monitoring to insure that TLV or PEL values are not exceeded. Use respiratory protection in accordance with your company's respiratory protection program and OSHA regulations under 29 CFR 1910.134.

Eye Protection: Safety glasses, goggles or face shields should be worn.

Protective Clothing: Wear loose fitting, long sleeved shirt that covers to the base of the neck, and long pants. Wear gloves when handling product.

Work/Hygienic Practices: Handle in accordance with good industrial hygiene and safety practices:

- Avoid unnecessary exposure to dusts and fibers
- Remove fibers from skin after exposure
- Be careful not to rub or scratch irritated areas. Rubbing or scratching may force the fibers into the skin. The fibers should be washed off. Use of barrier creams can, in some instances, be helpful.
- Use vacuum equipment to remove fibers and dusts from clothing. **COMPRESSED AIR SHOULD NEVER BE USED.** Always wash work clothes separately and wipe out the washer/sink in order to prevent loose glass fibers from getting on other clothes.
- Keep the work area clean of any dusts and fibers generated during fabrication. Use vacuum equipment to clean up dusts and fibers. Avoid sweeping or using compressed air as these techniques resuspend dusts and fibers into the air.
- Have access to safety showers and eye wash fountains.
- For professional use only. Keep out of children's reach.

Exposure Limits (TLVS): N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point (Softening): NM (Not Measured)

Boiling Point (°C): N/A (Not Applicable)

Specific Gravity (Bare Glass): NM

Percent Volatile: N/A

Vapor Pressure: (mm Hg): N/A

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Vapor Density (Air = 1): N/A

Evaporative Rate (Ethyl Ether = 1): N/A

Solubility in Water: Not soluble

Appearance and Odor: Metallic appearing accessories with no odor.

pH: N/A

Relative Density: N/A

Upper/Lower Flammability or Exposure Limits: N/A

Freezing Point: N/A

Flash Point: N/A

Partition coefficient (n-octanol/water): N/A

Auto Ignition Temperature: N/A

Decomposition Temperature: N/A

Viscosity: N/A

10. STABILITY AND REACTIVITY

Stability (Conditions to Avoid): Product is stable.

Stabilizers: N/A

Incompatibility (Materials to Avoid): None known.

Hazardous Decomposition Products: See Section 11.

Hazardous Polymerization: Will not occur.

Flash Point (°F): N/A (Not Applicable)

Auto Ignition Temperature (°F): N/A

Flammability Limits (%): LEL: N/A UEL: N/A

11. TOXICOLOGICAL INFORMATION

Primary Routes of Exposure: Inhalation and skin contact.

Health Hazards (Including acute and chronic effects and symptoms of overexposure):

ACUTE: NOTE: Stainless steel products in their usual physical state do not pose any Health hazards. However, when subjected to welding, burning, grinding, cutting, abrasive blasting, heat treatment, pickling, or similar operations, potentially hazardous fumes or dusts may be emitted. Despite the fact that welding, burning, etc. of stainless steel products in this category may produce fumes containing manganese, chromium, nickel and copper, the air concentrations generated of these components are expected to be extremely low.

Iron (Fe): Subjecting iron and alloys containing iron to high temperatures (such as welding) will cause the formation of iron oxide. Long-term exposure to iron oxide fumes or dusts has been associated with a benign lung condition known as siderosis, which

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is observable as an x-ray change. No physical impairment of lung function has been linked to siderosis.

Manganese (Mn): Mn intoxication is usually due to the oxide or salts of Mn; elemental Mn exhibits very low toxicity. The dusts and fumes can act as minor irritants to the eyes and respiratory tract. Both acute and chronic exposure may adversely affect the central nervous system (CNS), but symptoms are more likely occur after at least one or two years of prolonged or repeated exposures. Early symptoms may include weakness in the lower extremities, sleepiness, salivation, nervousness and apathy. In more advanced stages, severe muscular incoordination, impaired speech, spastic walking, mask-like facial expressions and uncontrollable laughing may occur. Manganese fumes have also been reported to result in metal fume fever, a flu-like syndrome with symptoms such as dizziness, chills, fever, headache and nausea. An increased incidence of pneumonia, bronchitis and pneumonitis has been reported in some worker populations exposed to manganese. Animal studies indicate exposure may increase susceptibility to bacterial and viral infection.

Chromium (Cr): The toxicity and health hazards of chromium are heavily dependent on its oxidation state. The elemental (as in the metals), divalent and trivalent forms are of very low toxicity. The hexavalent form (such as occurs in chromates and chromic acids) is very toxic and can produce both acute and chronic effects. Adverse effects on the skin may include ulcerations, irritative dermatitis and allergic skin reactions. Adverse effects on the respiratory system may include bronchospasms, edema, hypersecretion, bronchitis, irritation, allergic asthmatic reactions, and, ulceration and perforation of the nasal septum. Respiratory symptoms may include coughing and wheezing, shortness of breath and nasal itch. Eye irritation or inflammation can also be produced. Exposure to some hexavalent chromium compounds has also been shown to be associated with an increased risk of lung cancer.

Nickel (Ni): Ni fumes and dust are respiratory irritants and may cause severe pneumonitis. Skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch". Ni and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids (i.e. the conjunctiva). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.

Copper (Cu): Inhalation of copper fume may cause irritation of the eyes and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chills, dry throat, cough and weakness. Cu fume may also produce a metallic or sweet taste. Repeated or prolonged exposure to Cu fume may cause discoloration of the skin or hair.

Aluminum (Al): There are no reported known health effects. Aluminum is generally

considered to be in the nuisance dust category.

Silicon (Si): Silicon may produce x-ray changes in the lungs. There has been no known disability reported from the x-ray changes.

Tungsten (W): There has been some reported evidence of pulmonary involvement such as a cough.

Molybdenum (Mo): Molybdenum has caused, in animal studies, irritation of the nose and throat, weight loss and digestive disturbances. There have been no reports of industrial poisoning.

Cobalt (Co): Cobalt has been reported to cause asthma. It may also cause interstitial pneumonitis and sensitization of the respiratory system.

CHRONIC: See carcinogenicity section below. Chronic exposure to Chromium (Cr)/Nickel (Ni)/Manganese (Mn) fumes or dust may cause skin sensitization, asthma, bronchitis, lung fibrosis or pneumoniosis. It may also cause damage to the kidneys and liver as well as the nervous system.

CARCINOGENICITY:

Hazardous Ingredients:	Listed as carcinogen by:	<u>ACGIH</u>	<u>IARC</u>	<u>NTP</u>	<u>OSHA</u>
Chromium (Cr)/Nickel (Ni)**			----	none known----	

*****Dusts and fumes containing Chromium (Cr) or Nickel (Ni) should be considered carcinogens.**

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with a history of chronic respiratory or skin conditions that are aggravated by mechanical irritants may be at increased risk for worsening their condition from exposure during use of the product.

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

See Section 8 (if applicable).

14. TRANSPORT INFORMATION

N/A

15. REGULATORY INFORMATION

N/A

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16. OTHER INFORMATION

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Individuals should make a determination as to the suitability of the information for their particular purpose(s).

1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: Stainless Steel Tag
Common Name(s): Stainless Steel
Products (Types 304 and 316)

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

Description Of Hazards:

Dust and fumes may be generated during working, e.g. during welding, cutting or grinding. Long term over-exposure to air pollutants in the form of dust or fumes may affect health and cause, for instance, chronic bronchitis. A thin coat of anti-corrosion oil is applied to certain materials. This should be taken into account during handling and working. Heating and working of materials that have been coated with anti-corrosion oil may cause irritating and hygienically harmful fumes. Skin irritation may be caused by repeated or extended contact with anti-corrosion oil.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Material/Component	CAS Number	% Weight	
		TYPE 304	TYPE 316
<u>Alloying Elements</u>			
Carbon (C)	7440-44-0	0.08 max	0.08 max
Manganese (Mn)	7439-96-5	2.0 max	2.0 max
Phosphorous (P)	7723-14-0	0.045 max	0.045 max
Sulfur (S)	7704-34-9	0.030 max	0.030 max
Silicon (Si)	7440-21-3	2.0 max	0.75 max
Chromium (Cr)	7440-47-3	18.0-20.0	18.0-20.0
Nickel (Ni)	7440-02-0	8.0-12.0	8.0-12.0
Molybdenum (Mo)	7439-98-7	0.0	2.0-3.0
Nitrogen (N)	7727-37-9	0.10 max	0.10 max
<u>Base Metal</u>			
Iron (Fe)	7439-89-6	Balance	Balance

NOTE: The above listing is a summary of elements used to alloy stainless steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

4. FIRST AID MEASURES

Eye Contact: flush eyes with plenty of water for at least 15 minutes. Seek medical attention if eye irritation persists.

Skin Contact: maintain good personal hygiene. Wash affected area with mild soap and water. Seek medical attention if skin irritation persists.

Inhalation: remove to fresh air. Check for clear airway, breathing and presence of pulse. If necessary, administer CPR. Consult a physician immediately.

Ingestion: Rare in industry. Dust may irritate mouth and gastrointestinal tract. If ingested, seek medical attention promptly.

Most important symptoms/effects, acute and delayed: Stainless steel as sold and shipped is not likely to present an acute or chronic health effects. However, during processing (cutting, milling, grinding, melting or welding) emitted byproducts may cause irritations, difficulty in breathing, coughing or wheezing. May cause allergic skin reactions. Indication of immediate medical attention and special treatment needed, if necessary:

Notes To Physician: May cause sensitization by skin contact or inhalation. Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable Extinguishing Media: Non-flammable. Will not support combustion. Not applicable for solid product. Use extinguishers appropriate for surrounding materials. Do not use water on molten metal.

Specific Hazards Arising From Material: Not applicable for solid product.

Hazardous Combustion Products: At temperatures above the melting point, fumes containing metal oxides and other alloying elements may be liberated.

Special Protective Equipment And Precautions For Fire Fighters: Firefighters should wear self-contained NIOSH-approved breathing apparatus and full protective clothing.

Explosion Data:

Sensitivity To Mechanical Impact: None.

Sensitivity To Static Discharge: N/A

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment And Emergency Procedures: Not applicable to stainless steel in solid state. Avoid dust formation. Ensure adequate ventilation. Clean-

up personnel should be protected against contact with eyes and skin protection.

Environmental Precautions: Not applicable to stainless steel in solid state.

Methods And Materials For Containment And Cleaning Up: Not applicable to stainless steel in solid state. For spills involving fine dusts, remove by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid inhalation of dusts.

7. HANDLING AND STORAGE

Precautions For Safe Handling: Not applicable to stainless steel in solid state. Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Practice good housekeeping. Avoid breathing metal fumes and/or dust.

Conditions For Safe Storage: No special storage conditions for stainless steel in solid state.

Incompatible Products: Store away from acids and incompatible materials.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters: There are no exposure limits for stainless steel. The exposure limit for iron-containing fumes has been established at 5 mg/m³ with ACGIH's TWA. The individual complex compounds within the fume may have lower exposure limits than the general fume.

Material/Component	CAS #	Exposure Limits OSHA PEL (mg/m3)	ACGIH TLV (mg/m3)
<u>Alloying Elements</u>			
Carbon (C)	7440-44-0	None Listed	None Listed
Manganese (Mn)	7439-96-5	5.0 as Mn	1.0 as Mn
Phosphorous (P)	7723-14-0	0.1 as P	0.1 as P
Sulfur (S)	7704-34-9	13 (Sulfur Dioxide)	5 (Sulfur Dioxide)
Silicon (Si)	7440-21-3	None Listed	None Listed
Chromium (Cr)	7440-47-3	1.0 as Cr	0.5 as Cr
Nickel (Ni)	7440-02-0	1.0 as Ni	1.0 as Ni
Molybdenum (Mo)	7439-98-7	5.0 Sol. Cmpds	5.0 Sol. Cmpds
Nitrogen (N)	7727-37-9	None Listed	Simple Asphyxiant
<u>Base Metal</u>			
Iron (Fe)	7439-89-6	(Fe ₂ O ₃ Fume)	5 (Fe ₂ O ₃ Fume)

Notes: Threshold Limit Values (TLV) established by the American Conference of

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Governmental Industrial Hygienists (ACGIH 2011) are 8-hour Time Weighted Average concentrations unless otherwise noted.

Appropriate Engineering Controls: Provide general or local exhaust to minimize airborne concentrations during milling, grinding, melting and welding operations.

Individual Protective Measures: Dependent upon process being performed on material each operation must be addressed for suitable equipment.

Gloves (Specify): Wear gloves as required

Eyes (Specify): Safety glasses or goggles as required.

Clothing (Specify): N/A

Footwear (Specify): N/A

Respirator (Specify): If concentrations exceed established limits use NIOSH/MSHA approved particulate respirators (dust & fume or high efficiency dust fume) when grinding or welding.

Other (Specify): N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Solid

Appearance: Silver Grey Metallic (Steel)

Odor: Not Applicable

Odor Threshold: Not Applicable

pH: Not Applicable

Melting Point: 1530°C (2786°F)

Boiling Point: Not Applicable

Flash Point (°C): N/A

Evaporation Rate: Not Applicable

Flammability (Solid, Gas): Not Flammable

Upper Flammable Limit %: Not Applicable

Lower Flammable Limit %: Not Applicable

Vapor Pressure: Not Applicable

Vapor Density: Not Applicable

Relative Density: 7.86

Specific Gravity: No Data

Solubility: Not Soluble

Partition Coefficient: No Data

Auto-Ignition Temp (°C): Not Applicable

Decomposition Temperature: No Data

Viscosity: Not Applicable

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Other Information: Not Applicable

10. STABILITY AND REACTIVITY

Reactivity: Not determined for product in solid form.

Chemical Stability: Yes. Steel products are stable under normal storage and handling conditions.

Possibility Of Hazardous Reactions: Hazardous polymerization cannot occur.

Conditions To Avoid: Contact with mineral acids will release flammable hydrogen gas. Dust formation.

Incompatible Materials: Yes, strong acids.

Hazardous Decomposition Products: Not Applicable.

11. TOXICOLOGICAL INFORMATION

Likely Routes Of Entry: None for stainless steel in its natural solid state.

Eyes: High concentrations of dust may cause irritation to the eyes.

Skin: Prolonged skin contact with coated steel may cause skin irritation in sensitive individuals.

Inhalation: Inhalation of metal particulate or elemental oxide fumes generated during welding, burning, grinding or machining may pose acute or chronic health effects.

Symptoms Related To The Physical, Chemical And Toxicological Characteristics: None for stainless steel in its natural solid state.

Effects Of Acute Exposure To Material: Manganese & Copper: Inhalation overexposure to manganese or copper (or zinc coated products) may cause metal fume fever characterized by fever and chills (i.e. flu-like symptoms) which appear 4-6 hours after exposure with no long-term effects.

Effects Of Chronic Exposure To Material:

Chromium: IARC lists certain hexavalent chromium compounds under its Group 1 category - "confirmed human carcinogens" and metallic chromium under its Group 3 category - "not classifiable as to their carcinogenicity to humans". Chromium metal is classified as carcinogenic by NTP.

Nickel: IARC lists metallic nickel under its Group 2B category - "possibly carcinogenic to humans". Nickel may cause skin sensitivity.

Cobalt: Cobalt dust may result in an asthma-like condition (cough, shortness of breath). IARC lists metallic cobalt under its Group 2B category - "possibly carcinogenic to humans".

Iron: Inhalation overexposures may cause a benign pneumoconiosis (siderosis) with few or no symptoms.

Manganese: Existing studies are inadequate to assess its carcinogenicity. Susceptible to Parkinson's disease, metal fume fever and kidney damage.

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STOT (Single Exposure): No data.

STOT (Repeated Exposures): Respiratory system. Allergic skin reactions.

Mutagenicity Of Material: N/A

Reproductive Effects: N/A

Teratogenicity Of Material: N/A

Carcinogenicity Of Material:

Chromium: IARC lists certain hexavalent chromium compounds under its Group 1 category - "confirmed human carcinogens" and metallic chromium under its Group 3 category - "not classifiable as to their carcinogenicity to humans".

Nickel: IARC lists metallic nickel under its Group 2B category - "possibly carcinogenic to humans".

Cobalt: IARC lists metallic cobalt under its Group 2B category - "possibly carcinogenic to humans".

Synergistic Materials: N/A

Aspiration Hazard: No data.

Sensitization Of Material: N/A

LD50 (of Material): Not established

LC50 (of Material): Not established

Notes:

- STOT – Specific Target Organ Toxicity
- International Agency for Research on Cancer (IARC) - Summaries & Evaluations (2008).
- 3rd Annual Report on Carcinogens as prepared by the National Toxicology Program (NTP).
- Iron containing welding fume has an exposure limit of 5 mg/m³ (ACGIH-TLV's 2011). Welding fume may also contain contaminants from fluxes or welding consumables. Prolonged skin contact may cause reddening and drying of skin or dermatitis in sensitive individuals due to nickel and/or chromium content in steel.

12. ECOLOGICAL INFORMATION

Ecotoxicity: No data available for the stainless steel in its natural solid state. However, individual components of the material have been found to be toxic to the environment.

Component	Toxicity To Fish	Toxicity To Algae	Toxicity To Microorganisms
Iron	LC50 Common Carp 96 hr. 0.56 mg/l	-	-
Chromium	LC50 Fathead minnow 96 hr. 10-100 mg/l	-	-
Nickel	LC50 Common Carp 96 hr. 1.3 mg/l	EC50 Freshwater Algae	EC50 Water Flea 48 hr. 1.0 mg/l

72 hr. 0.18 mg/l

Persistence And Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility In Soil: No data available for stainless steel in its natural solid state. Individual metal dusts may migrate into soil and groundwater and be absorbed by plants.

Other Adverse Effects: None known.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Methods: Steel scrap should be recycled whenever possible.

Container Cleaning & Disposal: Dispose of in accordance with applicable federal, provincial/state or local regulations.

14. TRANSPORT INFORMATION

General Shipping Information: Stainless steel not regulated for shipping.

Shipping Name And Description: N/A

Un Number: N/A

Hazard Class: N/A

Packing Group/Risk Group: N/A

Transport Regulations:

Canadian Transportation of Dangerous Goods Regulations (TDG) March 2011.

US Department of Transport (DOT) Hazardous Materials shipping information (Title 49 - Transportation March 2011).

15. REGULATORY INFORMATION

Regulatory Information: The following listing of regulations relating to the product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.

Additional Canadian Regulations:

WHMIS Classification: Class **D2A/D2B:** Materials Causing Other Toxic Effects.

Domestic Substances List: The components of this material are on the federal DSL Inventory.

Other Canadian Regulations: N/A

Additional U.S. Regulations:

SARA: The components of this material are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA – Oct. 2006).

SARA Threshold Planning Quantity: There are no specific Threshold Planning Quantities

for the components of this material. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

TSCA Inventory Status: The components of this material are listed on the Toxic Substances Control Act Inventory.

CERCLA Reportable Quantity (RQ): RQ's for Hazardous Substances in the Comprehensive Environmental Response, Compensation, and Liability Act are: Chromium = 5000 lb. (2270 kg); Copper = 5000 lb. (2270 kg); Nickel = 100 lb. (45 kg).

California (Proposition 65): The Chromium (VI) component of this material is known in the State of California to cause cancer. The Nickel component of this material is known in the State of California to cause cancer. The Cobalt component of this material is known in the State of California to cause cancer.

Other U.S. Federal Regulations: N/A.

Additional European Union Regulations:

RoHS & WEEE: This MSDS follows the European Union Directive "Restriction on the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment" (2002/95/EC) and the "Waste Electrical and Electronic Equipment (WEEE)" Directive (2002/96/EC).

Lead (Pb): Lead is not intentionally added to stainless steel however; it may exist in trace levels. Although not analyzed, lead levels in steel are typically well below the EU Directive limit of 0.1%. Note, the EU Directive has a lead exemption limit of up to 0.35% as an alloying element in steel.

Chromium VI (Cr +6): The hexavalent oxidation state of chromium does not normally exist as part of a metal or alloy

16. OTHER INFORMATION

Disclaimer:

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire, exposure, or accident call CHEMTREC (800) 424-9300, day or night

Product Identification

Product Name: Stainless Steel Washer

Common Name(s): Stainless Steel Type 301, 302, 303, 304, 305, 308, 309, 310, 314, 321, 347, 415, F6NM, 1.4306, 153MA™, 253MA®, 353MA®, and 2304 - anchors, hooks, rings & washers

2. HAZARDS IDENTIFICATION

Precautionary Statements:

P281: Wear personal protective equipment as required

P302: If on skin, wash with mild soap and running water

P304: If inhaled, move individual to fresh air. Seek medical attention if irritation persists

P305: If in eyes, flush eyes at least 15 minutes; seek medical attention if irritation persists

Hazard Statements: N/A

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Abstracts Service Number: N/A

<u>Hazardous Ingredients</u>	<u>Weight %</u>	<u>OSHA-PEL</u>	<u>ACGIH-TLV</u>	<u>OTHER</u>
Stainless steel alloy				
Chromium (Cr)	10 to 27			
Fume		0.5 mg/m3	0.05 mg/m3	
dust/mist		1.0 mg/m3	0.5 mg/m3	
Nickel (Ni)	0.0 to 35			
fume (soluble)		1.0 mg/m3	0.1 mg/m3	
dust		1.0 mg/m3	1.0 mg/m3	
Manganese (Mn)	0.0 to 15			
fume		5.0 mg/m3 C*	1.0 mg/m3	
dust		5.0 mg/m3 C*	5.0 mg/m3 C*	
Copper	0.0 to 4.0	0.1 mg/m3	0.2 mg/m3	
Tungsten	0.0 to 4.0	none	5.0 mg/m3	
Molybdenum	0.0 to 4.0	15 mg/m3	10 mg/m3	
Aluminum	0.0 to 2.0	none	10 mg/m3	

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Silicon	0.0 to 5.0	none	10 mg/m ³
Cobalt	0.0 to 5.0	0.1 mg/m ³	0.05 mg/m ³

Nonhazardous Ingredients

Sizing	< 1	-----none established-----
Iron (Fe) dust	48 to 89	-----none-----
fumes		
(as Iron oxide)		10 mg/m ³ 5.0 mg/m ³

C* = Ceiling limit

4. FIRST AID MEASURES

Inhalation: Move individual to fresh air. Seek medical attention if irritation persists. Administer artificial respiration, if breathing has stopped.

Skin Contact: Wash with mild soap and running water. To avoid further irritation do not rub or scratch irritated areas. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with flowing water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: N. A. (Not Applicable)

5. FIRE FIGHTING MEASURES

Extinguishing Equipment: Water, foam, carbon dioxide, dry chemical

Special Fire-Fighting Instructions: In a sustained fire, self-contained breathing apparatus with full-face piece and protective clothing should be worn.

Unusual Fire and Explosion Hazards: None known.

6. ACCIDENTAL RELEASE MEASURES

ACTION TO TAKE FOR SPILLS (Use Appropriate Safety Equipment/PPE):

For solid product, not applicable.

For dusts and fibers generated during fabrication, vacuum and containerize.

7. HANDLING AND STORAGE

Handling: See Section 8.

Storage: No special precautions necessary.

Disposal: Dispose of in accordance with federal, state and local regulations as a solid nonhazardous waste.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation: General dilution ventilation and/or local exhaust ventilation should be provided, as necessary, to maintain exposures below PEL's or TLV's. Adequate ventilation must be provided at elevated temperatures.

Respiratory Protection: A properly fitted NIOSH/MHSA approved disposable dust respirator should be

Used when: high dust levels are encountered; the level of Chromium/Nickel/Manganese dust or glass fibers in the air exceeds the OSHA permissible exposure limits; or if irritation occurs. Use an air-supplied respirator in confined spaces. Use industrial hygiene air monitoring to insure that TLV or PEL values are not exceeded. Use respiratory protection in accordance with your company's respiratory protection program and OSHA regulations under 29 CFR 1910.134.

Eye Protection: Safety glasses, goggles or face shields should be worn.

Protective Clothing: Wear loose fitting, long sleeved shirt that covers to the base of the neck, and long pants. Wear gloves when handling product.

Work/Hygienic Practices: Handle in accordance with good industrial hygiene and safety practices:

- Avoid unnecessary exposure to dusts and fibers
- Remove fibers from skin after exposure
- Be careful not to rub or scratch irritated areas. Rubbing or scratching may force the fibers into the skin. The fibers should be washed off. Use of barrier creams can, in some instances, be helpful.
- Use vacuum equipment to remove fibers and dusts from clothing. **COMPRESSED AIR SHOULD NEVER BE USED.** Always wash work clothes separately and wipe out the washer/sink in order to prevent loose glass fibers from getting on other clothes.
- Keep the work area clean of any dusts and fibers generated during fabrication. Use vacuum equipment to clean up dusts and fibers. Avoid sweeping or using compressed air as these techniques resuspend dusts and fibers into the air.
- Have access to safety showers and eye wash fountains.
- For professional use only. Keep out of children's reach.

Exposure Limits (TLVS): N/A

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point (Softening): NM (Not Measured)

Boiling Point (°C): N/A (Not Applicable)

Specific Gravity (Bare Glass): NM

Percent Volatile: N/A

Vapor Pressure: (mm Hg): N/A

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Vapor Density (Air = 1): N/A

Evaporative Rate (Ethyl Ether = 1): N/A

Solubility in Water: Not soluble

Appearance and Odor: Metallic appearing accessories with no odor.

pH: N/A

Relative Density: N/A

Upper/Lower Flammability or Exposure Limits: N/A

Freezing Point: N/A

Flash Point: N/A

Partition coefficient (n-octanol/water): N/A

Auto Ignition Temperature: N/A

Decomposition Temperature: N/A

Viscosity: N/A

10. STABILITY AND REACTIVITY

Stability (Conditions to Avoid): Product is stable.

Stabilizers: N/A

Incompatibility (Materials to Avoid): None known.

Hazardous Decomposition Products: See Section 11.

Hazardous Polymerization: Will not occur.

Flash Point (°F): N/A (Not Applicable)

Auto Ignition Temperature (°F): N/A

Flammability Limits (%): LEL: N/A UEL: N/A

11. TOXICOLOGICAL INFORMATION

Primary Routes of Exposure: Inhalation and skin contact.

Health Hazards (Including acute and chronic effects and symptoms of overexposure):

ACUTE: NOTE: Stainless steel products in their usual physical state do not pose any Health hazards. However, when subjected to welding, burning, grinding, cutting, abrasive blasting, heat treatment, pickling, or similar operations, potentially hazardous fumes or dusts may be emitted. Despite the fact that welding, burning, etc. of stainless steel products in this category may produce fumes containing manganese, chromium, nickel and copper, the air concentrations generated of these components are expected to be extremely low.

Iron (Fe): Subjecting iron and alloys containing iron to high temperatures (such as welding) will cause the formation of iron oxide. Long-term exposure to iron oxide fumes or dusts has been associated with a benign lung condition known as siderosis, which

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is observable as an x-ray change. No physical impairment of lung function has been linked to siderosis.

Manganese (Mn): Mn intoxication is usually due to the oxide or salts of Mn; elemental Mn exhibits very low toxicity. The dusts and fumes can act as minor irritants to the eyes and respiratory tract. Both acute and chronic exposure may adversely affect the central nervous system (CNS), but symptoms are more likely occur after at least one or two years of prolonged or repeated exposures. Early symptoms may include weakness in the lower extremities, sleepiness, salivation, nervousness and apathy. In more advanced stages, severe muscular incoordination, impaired speech, spastic walking, mask-like facial expressions and uncontrollable laughing may occur. Manganese fumes have also been reported to result in metal fume fever, a flu-like syndrome with symptoms such as dizziness, chills, fever, headache and nausea. An increased incidence of pneumonia, bronchitis and pneumonitis has been reported in some worker populations exposed to manganese. Animal studies indicate exposure may increase susceptibility to bacterial and viral infection.

Chromium (Cr): The toxicity and health hazards of chromium are heavily dependent on its oxidation state. The elemental (as in the metals), divalent and trivalent forms are of very low toxicity. The hexavalent form (such as occurs in chromates and chromic acids) is very toxic and can produce both acute and chronic effects. Adverse effects on the skin may include ulcerations, irritative dermatitis and allergic skin reactions. Adverse effects on the respiratory system may include bronchospasms, edema, hypersecretion, bronchitis, irritation, allergic asthmatic reactions, and, ulceration and perforation of the nasal septum. Respiratory symptoms may include coughing and wheezing, shortness of breath and nasal itch. Eye irritation or inflammation can also be produced. Exposure to some hexavalent chromium compounds has also been shown to be associated with an increased risk of lung cancer.

Nickel (Ni): Ni fumes and dust are respiratory irritants and may cause severe pneumonitis. Skin contact with nickel and its compounds may cause an allergic dermatitis. The resulting skin rash is often referred to as "nickel itch". Ni and its compounds may also produce eye irritation, particularly on the inner surfaces of the eyelids (i.e. the conjunctiva). Animal and/or epidemiology studies have linked nickel and certain nickel compounds to an increased incidence of cancer of the lungs and nasal passages.

Copper (Cu): Inhalation of copper fume may cause irritation of the eyes and throat and a flu-like illness called metal fume fever. Signs and symptoms of metal fume fever include fever, muscle aches, nausea, chills, dry throat, cough and weakness. Cu fume may also produce a metallic or sweet taste. Repeated or prolonged exposure to Cu fume may cause discoloration of the skin or hair.

Aluminum (Al): There are no reported known health effects. Aluminum is generally

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considered to be in the nuisance dust category.

Silicon (Si): Silicon may produce x-ray changes in the lungs. There has been no known disability reported from the x-ray changes.

Tungsten (W): There has been some reported evidence of pulmonary involvement such as a cough.

Molybdenum (Mo): Molybdenum has caused, in animal studies, irritation of the nose and throat, weight loss and digestive disturbances. There have been no reports of industrial poisoning.

Cobalt (Co): Cobalt has been reported to cause asthma. It may also cause interstitial pneumonitis and sensitization of the respiratory system.

CHRONIC: See carcinogenicity section below. Chronic exposure to Chromium (Cr)/Nickel (Ni)/Manganese (Mn) fumes or dust may cause skin sensitization, asthma, bronchitis, lung fibrosis or pneumoniosis. It may also cause damage to the kidneys and liver as well as the nervous system.

CARCINOGENICITY:

Hazardous Ingredients:	Listed as carcinogen by:	<u>ACGIH</u>	<u>IARC</u>	<u>NTP</u>	<u>OSHA</u>
Chromium (Cr)/Nickel (Ni)**			----	none known	----

*****Dusts and fumes containing Chromium (Cr) or Nickel (Ni) should be considered carcinogens.**

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Persons with a history of chronic respiratory or skin conditions that are aggravated by mechanical irritants may be at increased risk for worsening their condition from exposure during use of the product.

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

See Section 8 (if applicable).

14. TRANSPORT INFORMATION

N/A

15. REGULATORY INFORMATION

N/A

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16. OTHER INFORMATION

Disclaimer:

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Individuals should make a determination as to the suitability of the information for their particular purpose(s).

1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: Strain Relief
Common Name(s): Nylon 6,6, Liquid Tight
Cord Grip, Metric Thread Straight-Thru
Cable Strain Relief

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire,
exposure, or accident call CHEMTREC
(800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

No need for classification according to GHS criteria for this product.

Label elements

The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

CAUTION:

MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION. INGESTION MAY CAUSE GASTRIC DISTURBANCES.

- Use with local exhaust ventilation.
- Respiratory protection may not be required under normal operating conditions if adequate ventilation is provided.
- Wear NIOSH-certified chemical goggles.
- Wear protective clothing.
- Eye wash fountains and safety showers must be easily accessible.

3. COMPOSITION/INFORMATION ON INGREDIENTS

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

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This product does not contain any components classified as hazardous under the referenced regulation.

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

CAS Number

32131-17-2

Content (W/W)

> 50.0 - < 100.0 %

Chemical name

polyamide (PA 66)

4. FIRST AID MEASURES

Description of first aid measures

General advice:

Avoid contact with the skin, eyes and clothing. Remove contaminated clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Consult a physician.

If on skin:

Wash thoroughly with soap and water. Burns caused by molten material require hospital treatment.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. If irritation develops, seek medical attention.

If swallowed:

Rinse mouth and then drink plenty of water. Ingestion is not likely in the available physical form. If ingested, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: No significant reaction of the human body to the product known.

Hazards: No hazard is expected under intended use and appropriate handling.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media:

water spray, foam, dry powder

Special hazards arising from the substance or mixture

Hazards during fire-fighting:

Ammonium hydroxide, carbon monoxide, carbon dioxide, cyclopentanone, hydrogen cyanide, amine derivatives, nitriles can be emitted at > 320 °C

Under special fire conditions traces of other toxic substances are possible. Formation of further decomposition and oxidation products depends upon the fire conditions.

Advice for fire-fighters

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear. Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. ACCIDENTAL RELEASE MEASURES

Further accidental release measures:

High risk of slipping due to leakage/spillage of product.

Personal precautions, protective equipment and emergency procedures

No special precautions necessary.

Environmental precautions

This product is not regulated by RCRA. This product is not regulated by CERCLA ('Superfund').

Methods and material for containment and cleaning up

For small amounts: Pick up with suitable appliance and dispose of.

For large amounts: Pick up with suitable appliance and dispose of.

7. HANDLING AND STORAGE

Precautions for safe handling

Protection against fire and explosion: Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

The product in undamaged packing need not be stored separately.

Suitable materials for containers: Low density polyethylene (LDPE)

Further information on storage conditions: Keep container tightly closed. Avoid

deposition of dust. Protect against moisture.

Storage stability: Protect against moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Advice on system design:

Provide local exhaust ventilation to control dusts/vapours.

Personal protective equipment

Respiratory protection: Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) particulate respirator.

Hand protection: Wear gloves to prevent contact during mechanical processing and/or hot melt conditions.

Eye protection: Tightly fitting safety goggles (chemical goggles).

Body protection: Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures: Wash soiled clothing immediately.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form:	pellets	
Odour:	odourless	
Odour threshold:		not applicable
Colour:	various, depending on the colourant	
pH value:		not applicable
Melting temperature:	approx. 260 °C	(DIN 53765)
Boiling range:		The substance / product decomposes therefore not determined.
Sublimation point:		No applicable information available.
Flash point:	> 400 °C	(Unspecified)
Flammability:		not self-igniting
Flammability of Aerosol Products:		not applicable, the product does not form flammable aerosoles)
Lower explosion limit:		The substance / product decomposes therefore not

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Upper explosion limit:

Autoignition: > 400 °C
Vapour pressure:
Density: 1.10 - 1.20 g/cm³
Relative density:
Bulk density: 500 - 800 kg/m³
Vapour density:
Partitioning coefficient n-octanol/water (log Pow):
Self-ignition temperature:
Thermal decomposition: > 320 °C (TGA)
Viscosity, dynamic:

Viscosity, kinematic:

Solubility in water:
Solubility (quantitative):

Solubility (qualitative):

Evaporation rate:

determined.
The substance / product
decomposes therefore not
determined.
(ASTM D1929)
not applicable
(20 °C) (EN ISO 1183-1)
No data available.

not applicable
not applicable
not self-igniting

not applicable, the product is
a solid
not applicable, the product is
a solid
insoluble
No applicable information
available.
No applicable information
available.
The product is a non-volatile
solid.

10. STABILITY AND REACTIVITY

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

The product is chemically stable.
No hazardous reactions known.

Conditions to avoid

Temperature: > 320 degrees Celsius

Incompatible materials

No substances known that should be avoided.

Hazardous decomposition products

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Decomposition products:

Hazardous decomposition products: Ammonium hydroxide, carbon monoxide, carbon dioxide, cyclopentanone, hydrogen cyanide, amines, nitriles

Thermal decomposition:

> 320 °C (TGA)

11. TOXICOLOGICAL INFORMATION

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Contact with molten product may cause thermal burns. The resin in pelleted form poses a low hazard.

Oral

Type of value: ATE

Value: > 5,000 mg/kg

Inhalation

Not inhalable due to the physico-chemical properties of the product.

Assessment other acute effects

No applicable information available.

Irritation / corrosion

Assessment of irritating effects: Irritation is possible when the product comes in contact with the skin, respiratory tract or the eyes.

Sensitization

Assessment of sensitization: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: Based on our experience and the information

available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Genetic toxicity

Assessment of mutagenicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Carcinogenicity

Assessment of carcinogenicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Reproductive toxicity

Assessment of reproduction toxicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Other Information

Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Symptoms of Exposure

No significant reaction of the human body to the product known.

12. ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

The product has not been tested. The statement has been derived from the structure of the product. There is a high probability that the product is not acutely harmful to aquatic organisms.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Experience shows this product to be inert and non-degradable.

The product is virtually insoluble in water and can thus be separated from water mechanically in suitable effluent treatment plants.

Bioaccumulative potential

Bioaccumulation potential

The product will not be readily bioavailable due to its consistency and insolubility in water.

13. DISPOSAL CONSIDERATIONS

Waste disposal of substance: Check for possible recycling. Incinerate in suitable incineration plant, observing local authority regulations.

Container disposal: Packs must be completely emptied. Completely emptied packagings can be given for recycling.

14. TRANSPORT INFORMATION

Land transport

USDOT: Not classified as a dangerous good under transport regulations

Sea transport

IMDG: Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO: Not classified as a dangerous good under transport regulations

15. REGULATORY INFORMATION

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Not hazardous;

NFPA Hazard codes:

Health: 1 Fire: 1 Reactivity: 0 Special:

HMIS III rating

Health: 1 Flammability: 1 Physical hazard: 0

16. OTHER INFORMATION

Disclaimer:

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1. PRODUCT AND COMPANY IDENTIFICATION

Company Identification

UniTherm International Inc.
711 Jones Street
Lewisville, Texas 75057

Product Identification

Product Name: Yellow Natural Kevlar Thread

Common Name(s): Woven Textile Product, Aramid Fabric

EMERGENCY TELEPHONE NUMBER:

For emergency involving spill, leak, fire, exposure, or accident call CHEMTREC (800) 424-9300, day or night

2. HAZARDS IDENTIFICATION

Potential Routes Of Entry: Inhalation, skin contact

Effects Of Overexposure: Direct skin contact with aramid as dust may cause mechanical irritation and transitory dermatitis. Breathing of fibers or dust may cause mechanical irritation of the mouth, nose, and throat. For additional information see Section 8.

Emergency And First Aid Procedure:

Inhalation: Move to fresh air area.

Ingestion: Not likely to occur through normal use, should ingestion occur seek medical attention.

Eyes: Flush with flowing water for 15 minutes - seek medical attention

Skin: Flush with ample cool water followed by washing with mild soap to remove accumulated fibers.

Carcinogen: See sections 8 and 11.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Items listed in this section are either chemically or physically bonded to the fibrous glass textile and are deemed non-hazardous in the state supplied.

Material:	CAS Number	%
Poly (terephthaloylchloride-p-phenylene diamine):	26125-61-1	> 89
Water, absorbed (pulp shipped as wet lap: Contains up to 35% - 50%)	7732-18-5	< 7
Sodium sulfate: in KEVLAR pulp:	7757-82-6	< .01
in other forms :		< 2
Finish:	None	< 2
Wax overlay, in addition to above, on yarn: Types 960, 976 only	6474-43-4	< 10

4. FIRST AID MEASURES

Inhalation: Move individuals to fresh air. Seek medical attention if irritation persists

Skin Contact: Wash with mild soap and running water. Use a washcloth to help remove fibers. To avoid further irritation do not rub or scratch irritated areas. Rubbing or scratching may force fibers into the skin. Seek medical attention if irritation persists.

Eye Contact: Flush eyes with flowing water for at least 15 minutes. Seek medical attention if irritation persists.

Ingestion: Not applicable.

5. FIRE FIGHTING MEASURES

Flash Point: Not applicable

Flammable Limits: Not applicable

Extinguishing Media: Water, dry powder, or foam (needed for packaging only).

Special Fire Fighting Procedure: In any sustained fire, wear self-contained breathing apparatus.

Unusual Fire Hazards: In a sustained fire, combustible decomposition products may be released. Decomposition products are those related to carbon, hydrogen, oxygen, and nitrogen. The products formed will be dependent on the available oxygen and other factors. The principal products are carbon dioxide and water. Lesser amounts of carbon monoxide and compounds of nitrogen will also be generated.

6. ACCIDENTAL RELEASE MEASURES

Spill, Leak or Release: Use appropriate Personal Protective Equipment during clean up. Wash, shovel or sweep up and place in solid waste containers. Clean up dusts and fibers with HEPA filtered vacuum equipment.

7. HANDLING AND STORAGE

Shipping: Not regulated by DOT; not classified by TDG

Storage: Store in dry area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Safety Precautions

Avoid breathing fibers or dust. Follow good industrial hygiene practices for ventilation and clean-up; in particular avoid the use of air jets to blow off equipment; use vacuum cleaners with high efficiency particulate air (HEPA) filters instead. Do not handle moving thread lines of KEVLAR, as entanglement with a high strength fiber can severely cut or even sever fingers.

Workplace Exposure Measurements: measured levels of airborne respirable fibrils from

handling and processing KEVLAR pulp and filament yarn are typically 0.3 fibrils/CC or less, 8-Hour Time Weighted Average (TWA). The normally low airborne dust levels result from the inherent tendency of KEVLAR fibrils to clump together – they have high surface static charges and their branched shapes readily interlock. Staple spinning operations, with their high potential for fiber abrasion can produce levels of 1 – 3 fibrils/CC unless air handling is well designed and maintained. In all processing of KEVLAR, the use of compressed air to clean equipment can temporarily increase the airborne fibril concentrations markedly. Equipment should be vacuumed or wiped instead.

Generally Applicable Control Measures and Procedures

If the fibers or parts made from the fibers are cut or otherwise mechanically worked, dusts and fibers may be generated. Use engineering controls where technically feasible such as isolation, enclosures, exhaust ventilation, wetting, and dust collection systems wherever necessary to control airborne respirable fiber exposure below applicable limits.

- Loose fitting clothing that is routinely washed is recommended to reduce build up of fibers at chafing points.
- Laser cutting of fabric of KEVLAR or of laminates containing KEVLAR or machining that produces smoke should be well exhausted or ventilated to remove fumes from the workplace.
- Water jet cutting of fabric or composites of KEVLAR produces fibrils in the cutting waste. If dried, this waste can become a source of airborne respirable fibers. Rinse or wipe waste from work surfaces and parts.

Personal Protective Equipment

- **EYE/FACE PROTECTION:** When cutting or mechanically working this product, wear safety glasses or coverall goggles.
- **RESPIRATORS:** When cutting or mechanically working this product, wear NIOSH approved respiratory protection if there is potential for airborne exposures in excess of applicable limits, or if there is potential for irritation of the nasal passages to occur due to the mechanical action of the fibers".

9. PHYSICAL AND CHEMICAL PROPERTIES

Melting Point: Does not melt

Solubility in Water: Insoluble

Color: Yellow, Natural

Odor: Odorless

Specific Gravity: 1.44

Form: Solid – continuous multi-filament yarns, staple, cut floc, pulp fabric

Percent Volatiles: < 9%, water and finish (< 50% water, <.5 % finish in wet lap)

10. STABILITY AND REACTIVITY

Instability: Stable at normal temperatures and storage conditions

Incompatibility: None reasonable foreseeable

Polymerizations: Polymerization will not occur

Decompositions: Heat generated by laser cutting of fabric of KEVLAR or of laminates containing KEVLAR generates a variety of toxic off gases, some of which may cause irritation of the respiratory tract.

11. TOXICOLOGICAL INFORMATION

As shipped, KEVLAR aramid fiber products do not pose a hazard. KEVLAR staple and pulp contain a small amount of respirable fibers which may become airborne during opening, mixing, carding, or regrinding waste products containing KEVLAR. When mechanically working KEVLAR fiber or materials containing KEVLAR in operations such as cutting, machining, grinding, crushing or sanding, airborne respirable fibers may be formed. Repeated or prolonged inhalation of excessive concentration of respirable fibers may cause permanent lung injury.

Animal Data:

Oral ALD: 7500 mg/kg in rats

KEVLAR fiber is not a skin irritant, is untested for eye irritancy and is not a skin sensitizer in animals. By ingestion, the fiber has very low acute oral toxicity with no deaths observed in animal feeding studies at dose levels up to maximum, 7500 mg/kg. In a two week inhalation study, (1983) respirable KEVLAR fibers at concentrations of 1000-2000 fibers per cubic centimeter caused mild non-progressive fibrosis (lung scarring that shrinks with cessation of exposure), and nonspecific effects such as weight loss and irritation, but no effects at concentrations of 280 fibers per cubic centimeter. A two-year inhalation study (1985) with KEVLAR pulp (refined to increase its respirable content) showed fibrosis at concentrations of 25, 100, 400 fibers per cubic centimeter and lung lesions (previously identified as cystic keratinizing squamous cell carcinomas) in some rats in the group exposed to respirable fibers at concentrations of 100 fibers per cubic centimeters. This is a unique type of lesion not found in humans and may be indicative of a nonspecific biological response to the respirable material rather than an indication of KEVLAR toxicity. No fibroids were seen in animals exposed to 2.5 respirable fibers per cubic centimeter for two years. At no concentrations were fibers found to have migrated beyond the lungs and associated lymph system. Abdominal cavity tumors have been observed in two studies where rats were administered KEVLAR by intra-cavity injection. For additional details, see References.

Human Data:

Skin sensitization has not been observed in human skin tests or animal skin tests. The mechanical action of the fibers may cause slight skin irritation at clothing binding points and mild irritation of the eyes and nasal passages. Overexposure to the respirable fibers by inhalation may cause mild and temporary upper respiratory irritation with discomfort or cough. Based on animal testing, prolonged and repeated exposure to excessive concentrations may cause permanent lung injury. In all processing of KEVLAR, the use of compressed air to clean equipment can temporarily increase the airborne fibril

concentrations markedly. Equipment should be vacuumed or wiped instead.

Carcinogenicity:

None of the components in this material is listed by IARC, NTP, OSHA or ACGIH as a carcinogen. See Animal Data discussed above.

Exposure Limits for KEVLAR ARAMIS FIBER – DUPONT

AEL* (DuPont): 2 respirable fibers/cc (8-Hr. TWA)

TLV (ACGIH):** None established

PEL (OSHA): None established

* AEL is DuPont's Acceptable Exposure Limit.

** TLV is a registered trademark of the American Congress of Governmental Industrial Hygienists

Other Applicable Exposure Limits:

Exposure Limits for KEVLAR Dust

AEL * (DuPont): 5 mg/m³, total dust, and <3-micron diameter

TLV ** (ACGIH): None established

PEL (OSHA): None established

Particulates Not Otherwise Related:

WEEL (AIHA): 5 mg/m³, 8 hr. TWA total dust (non-respirable fibers and non-fibrous particles)

12. ECOLOGICAL INFORMATION

N/A

13. DISPOSAL CONSIDERATIONS

Waste Disposal: KEVLAR is not a hazardous waste as defined by regulations implementing the Resource Conservation and Recovery Act (RCRA). In general, KEVLAR waste materials may be discarded in accordance with the state and local regulations governing the disposal of other common or non RCRA regulated waste materials.

14. TRANSPORT INFORMATION

Shipping: Not regulated by DOT; not classified by TDG

15. REGULATORY INFORMATION

EPA, RCRA 40 CFR, Part 261, 1990: Non-hazardous

CA PROPOSITION 65: Not listed

CERCLA: Not listed

NJ RIGHT-TO-KNOW: Not subject to reporting

MSDS Number:

Revision Date:

SARA TITLE III: Exempt by definition

PA RIGHT-TO-KNOW: Not subject to reporting

TSCA INVENTORY: Reported/Included

16. OTHER INFORMATION

Disclaimer:

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