

### Section 1 - Chemical Product and Company Identification

**Product Name** Polyisocyanurate Foam Insulations

**CAS#** None Assigned

**Generic Name** Insulation (Polyisocyanurate Foam)

**Formula** Polymer

**Chemical Name:** Proprietary

**Hazard Label** L3012-DF, L3012-E3AGF

**Manufacturer Information**

Johns Manville  
Roofing Systems Group  
P.O. Box 5108  
Denver, CO 80127 USA

Telephone: 303-978-2000 8:00AM-5:00PM M-F  
Internet Address: <http://www.jm.com>  
Emergency: 800-424-9300 (Chemtrec, In English)

**Trade Names:**

DuraFoam;	ISO 1™;	Tapered DuraFoam;
ENRGY™ 3 AGF;	ISO 3™ AGF;	Tapered ENRGY™ 3;
ENRGY™ 3 PLUS;	ISO 3™;	Tapered Fesco® Foam;
ENRGY™ 3;	ISOVENT;	Tapered ISO 1™;
Fesco® Foam;	Nailbase;	Tapered ISO 3™;
ISO 1™ AGF;	Nailboard;	Vented Nailboard

### Section 2 - Composition / Information on Ingredients

CAS #	Component	Percent
Not Available	Polyisocyanurate foam	5-90
Not Available	Wood Fiber board	0-90****
Not Available	Fesco Perlite Board	0-75*
Not Available	Paper Facing	0-30
	Continuous filament glass fibers (See Generic CAS # 65997-17-3)	0-15**
109-66-0	Pentane	0-6***
287-92-3	Cyclopentane	0-5***
78-78-4	Isopentane	0-5***
65997-17-3	Glass Wool Fiber	0-1.5**
Not Available	Wood dust	****

**Additional Component Information**

\* A component of ISO, Fesco® Foam and Tapered products.

\*\* In NAILBOARD, ISOVENT and other AGF mat-faced products. Reinforcement in paper facing.

\*\*\* Pentane concentration in product: all isomers < 6% mass.

\*\*\*\* ENRGY™ 3 PLUS contains wood fiberboard. Nailboard contains OSB (oriented strand board) with wood fiber. When cut, these products release wood dust.

### Section 3 - Hazards Identification

**Emergency Overview**

APPEARANCE AND ODOR: Yellow-to-tan foam board with no significant odor, and with various facings and backings. NAILBOARD has an oriented-strand board (OSB) backing; ISOVENT and AGF products have a white, fiber glass mat (AGF) facing.

Inhalation of excessive amounts of dust from the product may cause temporary upper respiratory irritation and/or congestion--remove individual to fresh air.

Product is combustible. Burning of this material will produce thick, black smoke.

**Potential Health Effects**

**Summary**

Breathing dust from this product may cause a scratchy throat, congestion, and slight coughing. Getting dust or fibers on the skin, or in the eyes may cause itching, rash, or redness. Additional health and safety information is provided in Section 11 of this material safety data sheet.

**Inhalation**

Irritation of the upper respiratory tract (scratchy throat), coughing, and congestion may occur in extreme exposures.

**Skin**

Temporary irritation (itching) or redness may occur.

**Ingestion**

This product is not intended to be ingested (eaten). If ingested, it may cause temporary irritation to the gastrointestinal (digestive) tract.

**Eyes**

Temporary irritation (itching) or redness may occur.

**Ears**

Temporary irritation (itching) or redness may occur.

**Primary Routes of Entry (Exposure)**

Inhalation (breathing dust), skin, and eye contact.

**Target Organs**

Upper respiratory passages, skin, and eyes.

**Medical Conditions Aggravated by Exposure**

Pre-existing chronic respiratory, skin, or eye diseases or conditions.

**Section 4 - First Aid Measures**

**First Aid: Inhalation**

Remove to fresh air. Drink water to clear throat, and blow nose to remove dust.

**First Aid: Skin**

Wash gently with soap and water to remove dust. Wash hands before eating or using the restroom.

**First Aid: Ingestion**

Product is not intended to be ingested or eaten. If this product is ingested, irritation of the gastrointestinal (GI) tract may occur, and should be treated symptomatically. Rinse mouth with water to remove fibers, and drink plenty of water to help reduce the irritation. No chronic effects are expected following ingestion.

**First Aid: Eyes**

Do not rub or scratch your eyes. Dust particles may cause the eye to be scratched. Flush eyes with large amounts of water for 5-15 minutes. If irritation persists, contact a medical professional.

**First Aid: Ears**

Do not rub or scratch the ear if itching occurs. Wash gently with soap and water to remove dust or fibers.

**First Aid: Notes to Physician**

This product is a mechanical irritant, and is not expected to produce any chronic health effects from acute exposures. Treatment should be directed toward removing the source of irritation with symptomatic treatment as necessary.

**Section 5 - Fire Fighting Measures**

**Flash Point:** Not applicable

**Upper Flammable Limit (UFL):** Not applicable

**Auto Ignition:** Not determined

**Rate of Burning:** Not determined

**General Fire Hazards**

Wood dust is a strong-to-severe explosion hazard if a dust "cloud" contacts an ignition source. Wood dusts may ignite at temperatures in excess of 204°C/400°F.

**Hazardous Combustion Products**

Product is combustible. Burning of this material will produce thick, black smoke.

**Extinguishing Media**

Carbon dioxide (CO2), water, water fog, dry chemical.

**Fire Fighting Equipment/Instructions**

No special procedures are expected to be necessary for this product. Normal fire fighting procedures should be followed to avoid inhalation of smoke and gases.

**Method Used:** Not applicable

**Lower Flammable Limit (LFL):** Not applicable

**Flammability Classification:** Not determined

**Section 6 - Accidental Release Measures****Containment Procedures**

Pick up large pieces. Vacuum dusts. If sweeping is necessary, use a dust suppressant such as water. Do not dry sweep dust accumulation or use compressed air for clean-up. These procedures will help to minimize potential exposures.

**Clean-Up Procedures**

Avoid the generation of dusts during clean-up.

**Section 7 - Handling and Storage****Handling Procedures**

Use protective equipment as described in Section 8 of this material safety data sheet when handling uncontained material.

**Storage Procedures**

Warehouse storage should be in accordance with package directions, if any. Material should be kept dry, and protected from moisture.

**Section 8 - Exposure Controls / Personal Protection****Exposure Guidelines****A: General Product Information**

No information available for the product.

**B: Component Exposure Limits****Continuous filament glass fibers (See Generic CAS # 65997-17-3)**

ACGIH: 1 fiber/cm<sup>3</sup> TWA (respirable fibers, length >5 µm, aspect ratio ≥3:1, as determined by the membrane filter method at 400-450X magnification [4-mm objective], using phase-contrast illumination); 5 mg/m<sup>3</sup> TWA (inhalable fraction)

**Pentane (109-66-0)**

ACGIH: 600 ppm TWA  
OSHA: 600 ppm TWA; 1800 mg/m<sup>3</sup> TWA  
750 ppm STEL; 2250 mg/m<sup>3</sup> STEL

**Isopentane (78-78-4)**

ACGIH: 600 ppm TWA (listed under Pentane, all isomers)

**Cyclopentane (287-92-3)**

ACGIH: 600 ppm TWA  
OSHA: 600 ppm TWA; 1720 mg/m<sup>3</sup> TWA

**Glass Wool Fiber (65997-17-3)**

ACGIH: 1 fiber/cm<sup>3</sup> TWA (respirable fibers, length >5 µm, aspect ratio ≥3:1, as determined by the membrane filter method at 400-450X magnification [4-mm objective], using phase-contrast illumination)

**Wood dust (Not Available)**

OSHA: 5 mg/m<sup>3</sup> TWA (related to Wood dust, all soft and hard woods, except western red cedar)  
10 mg/m<sup>3</sup> STEL

**PERSONAL PROTECTIVE EQUIPMENT****Personal Protective Equipment: Eyes/Face**

Safety glasses with sideshields are recommended to keep dust out of the eyes.

**Personal Protective Equipment: Ears**

Use ear protection (earplugs, hood, or earmuffs) to prevent airborne dust or fibers from entering the ear, if necessary.

**Personal Protective Equipment: Skin**

Leather or cotton gloves should be worn to prevent skin contact and irritation. Barrier creams may also be used to reduce skin contact and irritation caused by fiber glass.

**Personal Protective Equipment: Respiratory**

A respirator should be used if ventilation is unavailable, or is inadequate for keeping dust and fiber levels below the applicable exposure limits. In those cases, use a NIOSH-certified disposable or reusable particulate respirator with an efficiency rating of N95 or higher (under 42 CFR 84) when working with this product. For exposures up to five times the established exposure limits use a quarter-mask respirator, rated N95 or higher; and for exposures up to ten times the established exposure limits use a half-mask respirator (e.g., MSA's DM-11, Racal's Delta N95, 3M's 8210), rated N95 or higher. Operations such as sawing, blowing, tear out, and spraying may generate airborne fiber concentrations requiring a higher level of respiratory protection. For exposures up to 50 times the established exposure limits use a full-face respirator, rated N99 or higher.

**Ventilation**

In fixed manufacturing settings, local exhaust ventilation should be provided at areas of cutting to remove airborne dust and fibers. General dilution ventilation should be provided as necessary to keep airborne dust and fibers below the applicable exposure limits and guidelines. The need for ventilation systems should be evaluated by a professional industrial hygienist, while the design of specific ventilation systems should be conducted by a professional engineer.

**Personal Protective Equipment: General**

Wear a cap, a loose-fitting, long-sleeved shirt and long pants to protect skin from irritation. Exposed skin areas should be washed with soap and warm water after handling or working with fiber glass. Clothing should be washed separately from other clothes, and the washer should be rinsed thoroughly (run empty for a complete wash cycle). This will reduce the chances of fiber glass being transferred to other clothing.

**Section 9 - Physical & Chemical Properties**

<b>Appearance:</b>	Yellow-to-tan foam board with various facings and backings.	<b>Odor:</b>	No significant odor
<b>Physical State:</b>	Solid	<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	Not applicable	<b>Vapor Density:</b>	Not applicable
<b>Boiling Point:</b>	Not applicable	<b>Melting Point:</b>	Not applicable
<b>Solubility (H<sub>2</sub>O):</b>	None	<b>Specific Gravity:</b>	0.03
<b>Freezing Point:</b>	Not applicable	<b>Evaporation Rate:</b>	Not applicable
<b>Viscosity:</b>	Not applicable	<b>Percent Volatile:</b>	Negligible
<b>VOC:</b>	Not applicable		

**Section 10 - Chemical Stability & Reactivity Information****Chemical Stability**

This is a stable material. This product is not reactive.

**Chemical Stability: Conditions to Avoid**

Keep away from heat, sparks, or open flame.

**Incompatibility**

Acetone, methyl ethyl ketone, tetrahydrofuran, chlorine, chloroform, hydrogen peroxide, ethylene dichloride, dimethyl sulfoxide, and dimethyl formamide.

**Hazardous Decomposition**

The decomposition products from this material are those that would be expected from any organic (carbon-containing) material, and are mainly derived from pyrolysis, or burning, of the resin. These decomposition products may include carbon monoxide, carbon dioxide, carbon particles, and traces of hydrogen cyanide.

**Hazardous Polymerization**

Will not occur.

**Section 11 - Toxicological Information****Acute Toxicity****A: General Product Information**

Dust from this product is a mechanical irritant, which means that it may cause temporary irritation or scratchiness of the throat, and/or itching of the eyes and skin.

Isopentane, cyclopentane, and n-pentane may be released at very low concentrations (well below their lower flammability limits) from these products when they are cut or crushed. These pentanes are nontoxic at levels below their lower flammability limits.

**B: Component Analysis - LD50/LC50**

**Pentane (109-66-0)**

Inhalation LC50 Rat: 364 g/m<sup>3</sup>/4H; Dermal LD50 Rabbit: 3000 mg/kg

**Cyclopentane (287-92-3)**

Oral LD50 Mouse: 12800 mg/kg

**Carcinogenicity**

**A: General Product Information**

No data for this product as a whole.

**B: Component Carcinogenicity**

**Continuous filament glass fibers (See Generic CAS # 65997-17-3)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen

IARC: Group 3 - Not Classifiable (IARC Monograph 81, 2002, listed under Man-made mineral fibres; Monograph 43, 1988)

**Glass Wool Fiber (65997-17-3)**

ACGIH: A3 - Confirmed animal carcinogen with unknown relevance to humans

NTP: Reasonably Anticipated To Be A Carcinogen (respirable size)

IARC: Group 3 - Not Classifiable (IARC Monograph 81, 2002, listed under Man-made mineral fibres; Monograph 43, 1988)

**Wood dust (Not Available)**

NTP: Known Carcinogen (related to Wood dust) (Select Carcinogen)

IARC: Group 1 - Known Human Carcinogen (IARC Monograph 62, 1995)

**Chronic Toxicity**

**Polyisocyanurate Foam:** There is no evidence that dust from this material causes disease in man. There are no known animal studies of the chronic health effects of breathing dust from polyisocyanurate foam. However, a subchronic inhalation study showed no adverse respiratory effects in rats as a result of breathing 9 mg/m<sup>3</sup> of dust from a similar foam (polyurethane foam) for 3 months (Thyssen et al., 1978). In 1987, IARC designated polyurethane as Group 3, not classifiable as to carcinogenicity to humans (Monograph 19).

**Wood Dust:** Risk of a rare form of nasal cancer has been associated with wood dust exposure. In the 1960's studies relating wood dust exposure in the furniture industry with nasal cancer were first reported in England. The link was confirmed in several other European countries and furniture industries. Studies of the furniture industry in the United States have shown notably lower-to-no increased risk of nasal cancer. Studies examining chronic exposure to wood dust have also been conducted outside of the furniture industry. Results from these studies have been inconsistent with the findings from studies of the furniture industry. Studies showing a link to nasal cancer have been primarily conducted in industries using hardwood. In 1980 the International Agency for Research on Cancer (IARC) reviewed the studies and concluded that there is a known risk of cancer in the furniture industry and a possible risk of cancer for carpenters and joiners.

Wood products can be contaminated with a saprophytic fungi (alternaria species) that when inhaled can cause hypersensitivity pneumonitis, an allergic condition that can lead to chronic disease and irreversible pulmonary damage. This fungi has been detected in wood pulp, and is believed to have caused lung disease in lumber mill workers. Also, reduced pulmonary function has been reported by some observers in workers who have been exposed to excessive levels of wood dust for prolonged periods of time, however these results have not been found consistently across all studies.

**Fiber Glass Wool:** In October 2001, IARC classified fiber glass wool as Group 3, "not classifiable as to its carcinogenicity to humans." The 2001 decision was based on current human and animal research that shows no association between inhalation exposure to dust from fiber glass wool and the development of respiratory disease. This is a reversal of the IARC finding in 1987 of a Group 2B designation (possibly carcinogenic to humans) based on earlier studies in which animals were injected with large quantities of fiber glass. NTP and ACGIH have not yet reviewed the IARC reclassification or the most current fiber glass health research; at this time, both agencies continue to classify glass wool based on the earlier animal injection studies.

Continuous Filament Glass Fiber: No chronic health effects are known to be associated with exposure to continuous filament fiber glass. Long-term epidemiologic studies do not show any increases in respiratory cancer or other disease among employees who manufacture this product. In 1987, the International Agency for Research on Cancer (IARC) classified continuous filament fiber glass as a Group 3 substance, "not classifiable as to its carcinogenicity to humans." In 2001, IARC re-affirmed this designation. Because of the large diameter of continuous filament fibers, these fibers are not considered respirable.

## Section 12 - Ecological Information

### Ecotoxicity

#### A: General Product Information

No data available for this product.

#### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

##### Pentane (109-66-0)

96 Hr LC50 Oncorhynchus mykiss: 9.87 mg/L; 96 Hr LC50 Pimephales promelas: 11.59 mg/L; 96 Hr LC50 Lepomis macrochirus: 9.99 mg/L  
48 Hr EC50 water flea: 9.7 mg/L

##### Isopentane (78-78-4)

48 Hr EC50 Daphnia magna: 2.3 mg/L

##### Cyclopentane (287-92-3)

48 Hr EC50 Daphnia magna: 10.5 mg/L

## Section 13 - Disposal Considerations

### US EPA Waste Number & Descriptions

#### A: General Product Information

This product, as supplied, is not regulated as a hazardous waste by the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Comply with state and local regulations for disposal. If you are unsure of the regulations, contact your local Public Health Department, or the local office of the EPA.

#### B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

#### Disposal Instructions

Dispose of waste material according to Local, State, Federal, and Provincial Environmental Regulations.

## Section 14 - Transportation Information

**Shipping Name:** This product is not classified as a hazardous material for transport.

## Section 15 - Regulatory Information

### US Federal Regulations

#### A: General Product Information

SARA 311/312: This product is not classified as hazardous under SARA 311/312.

#### B: Component Analysis

None of this products components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

### State Regulations

#### A: General Product Information

Other state regulations may apply. Check individual state requirements.

**B: Component Analysis - State**

The following components appear on one or more of the following state hazardous substances lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Pentane	109-66-0	Yes	No	Yes	Yes	Yes	Yes
Isopentane	78-78-4	No	No	Yes	No	Yes	Yes
Cyclopentane	287-92-3	Yes	No	Yes	Yes	Yes	Yes
Glass Wool Fiber ( <sup>1</sup> related to Mineral wool fiber)	65997-17-3	Yes <sup>1</sup>	No	Yes <sup>1</sup>	Yes	No	Yes <sup>1</sup>
Wood dust ( <sup>1</sup> related to Wood dust, all soft and hard woods)	Not Available	No	No	No	Yes <sup>1</sup>	No	No

The following statement(s) are provided under the California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65):  
WARNING! This product contains a chemical known to the state of California to cause cancer.

**Glass Wool Fiber (related to Mineral wool fiber) CAS# 65997-17-3**

**A: TSCA Status**

This product and its components are listed on the TSCA 8(b) inventory.

The following components listed in this product are listed on the TSCA Export Notification 12(b) list.

**TSCA 12(b)**

Component	CAS	TSCA 12 (b)
Pentane	109-66-0	Yes

**B: Component Analysis - Inventory**

Component	CAS #	TSCA	DSL	EINECS
Pentane	109-66-0	Yes	Yes	Yes
Isopentane	78-78-4	Yes	Yes	Yes
Cyclopentane	287-92-3	Yes	Yes	Yes
Glass Wool Fiber	65997-17-3	Yes	Yes	Yes

**Component Analysis - WHMIS IDL**

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Pentane	109-66-0	1 %
Cyclopentane	287-92-3	1 %

<b>Section 16 - Other Information</b>
---------------------------------------

**Other Information**

Prepared for:  
Johns Manville  
Roofing Systems Group  
P. O. Box 5108  
Denver, CO USA 80217-5108

Prepared by:  
Johns Manville Technical Center  
P.O. Box 625005  
Littleton, CO USA 80162-5005

The information herein is presented in good faith and believed to be accurate as of the effective date given. However, no warranty, expressed or implied, is given. It is the buyer's responsibility to ensure that its activities comply with Federal, State or provincial, and local laws.

Date	MSDS #	Reason
06/20/00	3012-1.0000	New MSDS authoring system.
01/10/01	3012-1.0100	Regulatory update for wood dust: Sect. 11 Carcinogenicity and Sect. 15 State regulations.

10/24/01	3012-2.0000	Sect. 1: Added Trade Names from MSDSs 3013-3014 (3013-3014 were deleted). Sect. 2: Composition: added pentanes (new non-ozone-depleting blowing agents) and misc components from MSDSs 3013-3014. Sections 8, 11, 12, and 15: updated for pentanes. Sect. 11, Chronic: Updated polyisocyanurate chronic toxicology based on study results with polyurethane foam dust.
12/19/01	3012-2.0100	Update Sections 3, 11 & 15 for IARC 2001 re-classification of fiber glass wool to Group 3, not classifiable as to carcinogenicity to humans.
04/16/02	3012-2.0101	Sect. 2, added dichlorofluorocarbon to components (not a new component).
07/22/02	3012-2.0102	Sect. 11: corrected IARC designation to Group 3.
04/14/03	3012-2.0103	Minor edits.
09/03/03	3012-2.0104	Sect. 2: Added E'NRG'Y 3 PLUS to Trade Names.
10/22/03	3012-2.0105	Section 15, TSCA 12b, Ethane is deleted
04/21/04	3012-2.0106	Section 1 removed E'NRG'Y 2 trade names and edited ENRGY and ISO trade names. Section 2 removed dichloro fluoro ethane ingredient. Regulatory update.
12/05/05	3012-2.0107	Regulatory update. Minor edits to Section 8 Exposure, Section 11 LD50, and Section 15 WHMIS. Addition of Pentane to TSCA 12b.
07/10/06	3012-2.0108	Addition of Vented NailBoard to trade names.

This is the end of MSDS # 3012