

Section 1 - Product and Company Identification

Hazard Label WARNING label

Company Information

Johns Manville
Roofing Systems
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;	ENRGY™ 3 Foil Face;	Tapered ENRGY™ 3 Plus;
ENRGY 3® 25 psi 8924;	ENRGY™ 3 PLUS;	Tapered ENRGY™ 3;
ENRGY 3® 8924	ENRGY™ 3;	Tapered Fesco® Foam;
ENRGY™ 3 25 PSI;	Fesco® Foam;	Vented Nailboard;
ENRGY™ 3 AGF;	Nailboard;	

Use: These products provide high thermal insulation value over metal, nailable, and non-nailable roof decks in built-up, modified bitumen and single ply membrane roofing systems.

Section 2 - Hazards Identification

Emergency Overview

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

HMIS Ratings: Health = 1 Fire = 1 Reactivity = 0

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.

Primary Routes of Entry (Exposure)

Inhalation, skin, and eye contact.

Target Organs

Nose (nasal passages), throat, lungs, skin, eyes

Medical Conditions Aggravated by Exposure

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

Section 3 - Composition/Information on Ingredients

CAS #	Component	Percent
Not Available	Polyisocyanurate foam	5-90
Not Available	Wood Fiber board (Component of ENRGY™ 3 PLUS and Nailboard)	0-90**
Not Available	Fesco Perlite Board (Component of ISO, Fesco® Foam and Tapered products)	0-75
Not Available	Paper or Foil Scrim Kraft Facing	0-30
Not Available	Foil Facing	<10
Not Available	Continuous filament glass fibers (Present in scrim and mat-faced products)	0-15
13674-84-5	Chlorinated fire retardant	<5
109-66-0	Pentane	0-6*
Not Available	Acrylic Based Binder with Urea Formaldehyde Crosslinker, Cured (present in 8924 mat)	1-5
Not Available	Newly developed biosoluble fine reinforcement fiber - JM designation 481	1-5
78-78-4	Isopentane	0-5*
287-92-3	Cyclopentane	0-5*
1333-86-4	Carbon black bound in facer	<1

50-00-0	Formaldehyde (present in 8924 mat)	<1
Not Available	Glass Wool Fiber (Present in mat-faced products)	0-1.5
Not Available	Wood dust	0

Component Information

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

** When cut, these products release wood dust.

Formaldehyde may be released by partial hydrolysis of the urea formaldehyde polymer.

Occupational exposure to carbon black is not expected to occur due to product form and intended use. Exposure limit is given for reference only.

General Product Description

Yellow-to-tan foam board with various facings and backings (foil facing, fiber glass mat facing, or oriented-strand board (OSB) backing).

Section 4 - First Aid Measures

First Aid: Inhalation

If the affected person is having difficulty breathing, administer oxygen or apply artificial respiration and immediately contact a medical professional.

First Aid: Skin

Wash gently with soap and water to remove dust. Should irritation persist, seek medical attention.

First Aid: Ingestion

Rinse mouth with water to remove dust and drink plenty of water to help reduce irritation. If irritation persists, seek medical attention.

First Aid: Eyes

Do not rub or scratch eyes. Dust particles may cause the eye to be scratched. Flush eyes with large amounts of water until irritation subsides. If irritation persists, seek medical attention.

First Aid: Notes to Physician

Dust from the product may cause mechanical irritation of the eyes, skin, and upper respiratory tract. Treat symptomatically.

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.

Section 6 - Accidental Release Measures
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Clean-Up Procedures

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

Section 7 - Handling and Storage

Handling Procedures

Use protective equipment as described in Section 8 of this safety data sheet when handling uncontained material. Handle in accordance with good industrial hygiene and safety practices.

Storage Procedures

Warehouse storage should be in accordance with package directions, if any. Material should be kept clean, dry, and in original packaging.

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

The Occupational Safety and Health Administration (OSHA) has not adopted specific occupational exposure standards for fiber glass. Fiber glass is treated as a nuisance dust and is regulated by OSHA as a particulate not otherwise regulated (total dust) shown in CFR 1910.1000 Table Z-3.

Respirable fraction 5 mg/m³

Total dust 15 mg/m³

JM has adopted the fiber glass industry voluntary Product Stewardship Program (PSP), formerly the NAIMA-OSHA Health and Safety Partnership Program (HSPP). Under the PSP, JM recommends that exposures be limited to the voluntary concentration of 1 f/cc TWA for fibers longer than 5 microns with a diameter less than 3 microns. This will help minimize potential irritation effects. The PSP also includes the PPE recommendations described below.

B: Component Exposure Limits**Pentane (109-66-0)**

OSHA: 1000 ppm TWA; 2950 mg/m³ TWA

600 ppm TWA; 1800 mg/m³ TWA

ACGIH: 600 ppm TWA

Isopentane (78-78-4)

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

Cyclopentane (287-92-3)

OSHA: 600 ppm TWA; 1720 mg/m³ TWA

ACGIH: 600 ppm TWA

Carbon black bound in facer (1333-86-4)

OSHA: 3.5 mg/m³ TWA

3.5 mg/m³ TWA

ACGIH: 3.5 mg/m³ TWA

Formaldehyde (present in 8924 mat) (50-00-0)

OSHA: 0.75 ppm TWA

0.5 ppm Action Level; 0.75 ppm TWA; 2 ppm STEL (Irritant and potential cancer hazard - see 29

CFR 1910.1048)

3 ppm TWA (unless specified in 1910.1048)

ACGIH: 0.3 ppm Ceiling

Wood dust (Not Available)

OSHA: 5 mg/m³ TWA (related to Wood dust, all soft and hard woods)

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

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

Personal Protective Equipment: Skin

Leather or cotton gloves should be worn to protect against mechanical abrasion.

Personal Protective Equipment: Respiratory

A respirator should be used if ventilation is unavailable, or is inadequate for keeping dust levels below the applicable exposure limits referenced in Section 8 of this SDS. Wear a NIOSH-certified disposable or reusable particulate respirator with an efficiency rating of N95 or higher (per 42 CFR 84) when dust concentrations exceed the applicable exposure limits. Operations such as sawing, blowing, tear out, and spraying may generate airborne dust 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, milling or other processing to remove airborne dust.

Personal Protective Equipment: General

Protective equipment should be provided as necessary to prevent irritation of the throat, eyes, and skin, and to keep exposures below the applicable exposure limits identified in Section 8.

Section 9 - Physical & Chemical Properties

Appearance:	Yellow-to-tan foam board with various facings and backings.	Odor:	No significant odor
Physical State:	Solid	pH:	Not applicable
Vapor Pressure:	Not applicable	Vapor Density:	Not applicable
Boiling Point:	Not applicable	Melting Point:	Not applicable
Solubility (H₂O):	None	Specific Gravity:	0.03
Freezing Point:	Not applicable	Evaporation Rate:	Not applicable
Viscosity:	Not applicable	Percent Volatile:	Negligible
VOC:	Not determined		

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

These products are not reactive.

Hazardous Decomposition

May form carbon dioxide and carbon monoxide.

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**Chlorinated fire retardant (13674-84-5)**

Inhalation LC50 Rat: 5 mg/L/4H; Inhalation LC50 Rat:>17.8 mg/L/1H; Oral LD50 Rat:500 mg/kg; Dermal LD50 Rat:>5000 mg/kg; Dermal LD50 Rabbit:1230 mg/kg

Pentane (109-66-0)

Inhalation LC50 Rat: 364 g/m³/4H; Dermal LD50 Rabbit:3000 mg/kg; Oral LD50 Rat:>2000 mg/kg

Isopentane (78-78-4)

Inhalation LC50 Rat: 280000 mg/m³/4H

Cyclopentane (287-92-3)

Oral LD50 Mouse: 12800 mg/kg; Oral LD50 Rat:11400 mg/kg

Carbon black bound in facer (1333-86-4)

Oral LD50 Rat: >15400 mg/kg; Dermal LD50 Rabbit:>3 g/kg

Formaldehyde (present in 8924 mat) (50-00-0)

Inhalation LC50 Rat: 0.578 mg/L/4H; Oral LD50 Rat:500 mg/kg

Carcinogenicity**A: General Product Information**

Exposure to formaldehyde has been associated with the development of nasopharyngeal cancer in laboratory animals and humans. Formaldehyde has been classified as a known human carcinogen, Group 1, by the International Agency for Research on Cancer (IARC). The US Occupational Safety and Health Administration (OSHA) and the US National Toxicology Program (NTP) consider formaldehyde to have carcinogenic potential. OSHA specifically regulates formaldehyde under 29 CFR 1910.1048.

B: Component Carcinogenicity**Continuous filament glass fibers (Present in scrim and mat-faced products)**

ACGIH: A4 - Not Classifiable as a Human Carcinogen (listed under Synthetic Vitreous Fibers)
IARC: Group 3 - Not Classifiable (IARC Monograph 81 [2002] (listed under Man-made mineral fibres), Monograph 43 [1988])

Newly developed biosoluble fine reinforcement fiber - JM designation 481

ACGIH: This fiber has not been specifically evaluated by any regulatory authority or other classification entity, such as the American Conference of Governmental Industrial Hygienists (ACGIH), the International Agency for Research on Cancer (IARC) or the National Toxicology Program (NTP).

Carbon black bound in facer (1333-86-4)

ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Group 2B - Possibly Carcinogenic to Humans (IARC Monograph 93 [in preparation], Monograph 65 [1996])

Formaldehyde (present in 8924 mat) (50-00-0)

ACGIH: A2 - Suspected Human Carcinogen
OSHA: 0.5 ppm Action Level; 0.75 ppm TWA; 2 ppm STEL (Irritant and potential cancer hazard - see 29 CFR 1910.1048)
NTP: Reasonably Anticipated To Be A Human Carcinogen (Possible Select Carcinogen)
IARC: Group 1 - Known Human Carcinogen

Glass Wool Fiber (Present in mat-faced products)

ACGIH: A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans (listed under Synthetic Vitreous Fibers)
NTP: Reasonably Anticipated To Be A Human Carcinogen (respirable size)
IARC: Group 3 - Not Classifiable (IARC Monograph 81 [2002] (listed under Man-made mineral fibres), Monograph 43 [1988])

Wood dust

NTP: Known Human Carcinogen (related to Wood dust, all soft and hard woods)
IARC: Group 1 - Known Human Carcinogen (IARC Monograph 62 [1995] (related to Wood dust, all soft and hard woods))

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/m³ 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.

Continuous Filament Glass Fiber: No chronic health effects are known to be associated with exposure to continuous filament fiber glass. Results from epidemiologic studies have not shown any increases in respiratory disease or cancer. The International Agency for Research on Cancer (IARC) has classified continuous filament fiber glass as a Group 3 substance, not classifiable as to its carcinogenicity to humans. Because of the large diameter of continuous filament fibers, these products are not considered respirable.

Newly developed biosoluble fine reinforcement fiber: Intratracheal instillation tests conducted in July 2006 per European Commission protocol ECB/TM 27 Rev. 7, 1998 has shown that both the fibres longer than 20 um and World Health Organization (WHO) fibres have a weighted half-life of less than 40 days.

The U.S. Department of Health and Human Services, National Toxicology Program (NTP 1998, 2000, 2002) classified glass wool (respirable size) as reasonably anticipated to be a human carcinogen, based on sufficient evidence of carcinogenicity in animals. This assessment was originally prepared in 1993-1994 for the 7th Report on Carcinogens (NTP 1994), but has not been updated since then in the 8th, 9th, or 10th Reports on Carcinogens (NTP 1998, 2000, 2002).

Exposure to formaldehyde gas (released under conditions of high heat or humidity) may cause eye and upper respiratory irritation, and possible respiratory or skin sensitization (allergy). If sensitization occurs, subsequent exposures to formaldehyde may worsen asthma or other respiratory problems, and cause allergic-type reactions.

Exposure to formaldehyde gas has been associated with the development of nasopharyngeal cancer in laboratory animals and humans. Formaldehyde has been classified as a known human carcinogen, Group 1, by the International Agency for Research on Cancer (IARC). The US Occupational Safety and Health Administration (OSHA) and the US National Toxicology Program (NTP) consider formaldehyde to have carcinogenic potential. OSHA specifically regulates formaldehyde under 29 CFR 1910.1048.

Section 12 - Ecological Information

Ecotoxicity

A: General Product Information

No data available for this product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Chlorinated fire retardant (13674-84-5)

96 Hr LC50 Brachydanio rerio: 56.2 mg/L [static]; 96 Hr LC50 Leuciscus idus: 180 mg/L [static]; 96 Hr LC50 Pimephales promelas: 98 mg/L [static]; 96 Hr LC50 Poecilia reticulata: 30 mg/L [static]
72 Hr EC50 Scenedesmus subspicatus: 45 mg/L; 96 Hr EC50 Selenastrum capricornutum: 4 mg/L
48 Hr EC50 Daphnia magna: 63 mg/L

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

Carbon black bound in facer (1333-86-4)

24 Hr EC50 Daphnia magna: >5600 mg/L

Formaldehyde (present in 8924 mat) (50-00-0)

96 Hr LC50 Pimephales promelas: 22.6-25.7 mg/L [flow-through]; 96 Hr LC50 Lepomis macrochirus: 1510 µg/L [static]; 96 Hr LC50 Brachydanio rerio: 41 mg/L [static]; 96 Hr LC50 Oncorhynchus mykiss: 0.032-0.226 ml/L [flow-through]; 96 Hr LC50 Oncorhynchus mykiss: 100-136 mg/L [static]; 96 Hr LC50 Pimephales promelas: 23.2-29.7 mg/L [static]
96 Hr EC50 water flea: 20 mg/L; 48 Hr EC50 Daphnia magna: 2 mg/L

Section 13 - Disposal Considerations**US EPA Waste Number & Descriptions****General Product Information**

This product is not expected to be a hazardous waste when it is disposed of according to the U.S. Environmental Protection Agency (EPA) under Resource Conservation and Recovery Act (RCRA) regulations. Product characterization after use is recommended to ensure proper disposal under federal and/or state requirements.

Disposal Instructions

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

Section 14 - Transport Information**International Transport Regulations**

These products are not classified as dangerous goods according to international transport regulations.

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

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Formaldehyde (present in 8924 mat) (50-00-0)

SARA 302: 500 lb TPQ

SARA 313: 0.1 % de minimis concentration

CERCLA: 100 lb final RQ; 45.4 kg final RQ

State Regulations**A: General Product Information**

The glass fibers in this product are not known to be regulated.

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
Carbon black bound in facer	1333-86-4	Yes	No	Yes	Yes	Yes	Yes
Formaldehyde (present in 8924 mat)	50-00-0	Yes	No	Yes	Yes	Yes	Yes
Wood dust (¹ related to Wood dust, all soft and hard woods)	Not Available	No	No	No	Yes ¹	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.

Component	CAS #
Glass Wool Fiber (Present in mat-faced products) (¹ related to Fibrous glass)	Not Available
Formaldehyde (present in 8924 mat)	50-00-0
Methyl Carbamate (trace)	598-55-0

TSCA Status

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

International Regulations**A: General Product Information**

These products are considered articles under both U.S. and international product regulations and as such, these products do not require registration or notification on the various country-specific inventories.

B: Component Analysis - WHMIS IDL

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

Component	CAS #	Minimum Concentration
Continuous filament glass fibers (Present in scrim and mat-faced products)	Not Available	1 % (related to Fibrous glass)
Pentane	109-66-0	1 %
Newly developed biosoluble fine reinforcement fiber - JM designation 481	Not Available	1 % (related to Fibrous glass)
Cyclopentane	287-92-3	1 %
Formaldehyde (present in 8924 mat)	50-00-0	0.1 %
Glass Wool Fiber (Present in mat-faced products)	Not Available	1 % (related to Fibrous glass)

WHMIS Classification

Controlled Product Classification: D2A

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations. This SDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information**Other Information**

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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.

01/15/07	3012-2.0109	Section 15 TSCA 12b info was edited and Pentane was removed. This product is an article under TSCA. Pentane does not need to be reported under TSCA 12b per 40CFR §707.60(b).
04/10/08	3012-2.0110	Updated SDS to GHS format. Removed from trade names: Tapered Durafoam, Nailbase, Isovent, ENRGY 3 AGF and Iso 3 AGF.
05/28/08	3012-2.0111	Added ENRGY 3 AGF back to trade names.
09/22/09	3012-2.0112	Removed ISO 3 trade name.
10/30/09	3012-2.0113	Addition of ENRGY 3® 25 psi 8924; ENRGY 3® 8924 and updates to the composition: addition of formaldehyde, methyl carbamate (sec 15) 481 fiber and mat binder. Removed ISO 3 and ISO Tapered.

End of Sheet 3012