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: PI-01 or L2070  
Manufacturer Information:  
Johns Manville Insulation Group  
Building Insulation Division  
P.O. Box 5108  
Denver, CO 80127 USA  
Trade Names: AP Foil-Faced; extRa; IsoVent; R-Panel; VentBoard

Section 2 - Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Component</th>
<th>Percent</th>
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<tr>
<td>Not Available</td>
<td>Polyisocyanurate foam</td>
<td>25-45</td>
</tr>
<tr>
<td>Not Available</td>
<td>Foil Facing</td>
<td>0-30*</td>
</tr>
<tr>
<td>Not Available</td>
<td>Paper or Polymer Facing</td>
<td>0-30*</td>
</tr>
<tr>
<td>109-66-0</td>
<td>Pentane</td>
<td>0-5**</td>
</tr>
<tr>
<td>287-92-3</td>
<td>Cyclopentane</td>
<td>0-5**</td>
</tr>
<tr>
<td>78-78-4</td>
<td>Isopentane</td>
<td>0-5**</td>
</tr>
<tr>
<td>65997-17-3</td>
<td>Continuous filament glass fibers</td>
<td>***</td>
</tr>
</tbody>
</table>

Additional Component Information  
* Facing is one or the other of these materials.  
**Pentane (blowing agent) concentration in product: all isomers ≤ 6% mass.  
*** Reinforcement in paper or polymer facings.

Section 3 - Hazards Identification

Emergency Overview

APPEARANCE AND ODOR: Tan foam board. Facings include foil or reinforced paper or polymer sheets. No significant odor.

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 products may 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. Breathing large amounts of dust or fibers from this product may lead to chronic health effects as discussed 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.

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: 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
Method Used: Not applicable
Upper Flammable Limit (UFL): Not applicable
Lower Flammable Limit (LFL): Not applicable
Auto Ignition: Not determined
Flammability Classification: Not determined
Rate of Burning: Not determined

General Fire Hazards
Product is combustible. Avoid direct contact with flame.

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
Firefighters should wear full-face, self contained breathing apparatus and impervious protective clothing. Firefighters should avoid inhaling any combustion products.

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 clean, dry, and protected from moisture. Eliminate all sources of ignition.
Section 8 - Exposure Controls / Personal Protection

Exposure Guidelines
A: General Product Information
   No information available for the product.

B: Component Exposure Limits
   Pentane (109-66-0)
   ACGIH:  600 ppm TWA
   OSHA: 600 ppm TWA; 1800 mg/m3 TWA
   750 ppm STEL; 2250 mg/m3 STEL

   Cyclopentane (287-92-3)
   ACGIH:  600 ppm TWA
   OSHA: 600 ppm TWA; 1720 mg/m3 TWA

   Isopentane (78-78-4)
   ACGIH:  600 ppm TWA (listed under Pentane, all isomers)

   Continuous filament glass fibers (65997-17-3)
   ACGIH: 1 fiber/cm³ TWA (respirable fibers: length > 5 µm, aspect ratio equal to or greater than 3:1, as
determined by the membrane filter method at 400-450X magnification (4-mm objective), using
phase-contrast illumination.); 5 mg/m³ TWA (inhalable fraction)

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face
   Safety glasses with sideshields are recommended to keep dust out of the eyes.

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
   Loose-fitting, long-sleeved clothing should be worn to protect skin from irritation. Work 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 dust being transferred to other clothing.

Section 9 - Physical & Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Tan foam board with various facings.</td>
</tr>
<tr>
<td>Physical State</td>
<td>Solid</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Solubility (H₂O)</td>
<td>None</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not applicable</td>
</tr>
<tr>
<td>VOC</td>
<td>Not applicable</td>
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<tr>
<td>Odor</td>
<td>No significant odor</td>
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<tr>
<td>pH</td>
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<tr>
<td>Vapor Density</td>
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<td>Melting Point</td>
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<tr>
<td>Specific Gravity</td>
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<tr>
<td>Evaporation Rate</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Percent Volatile</td>
<td>Negligible</td>
</tr>
</tbody>
</table>
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/m3/4H; Dermal LD50 Rabbit: 3000 mg/kg

Cyclopentane (287-92-3)
Oral LD50 Mouse: 12800 mg/kg

Carcinogenicity
A: General Product Information
The Occupational Safety and Health Administration (OSHA), National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), and American Conference of Governmental Industrial Hygienists (ACGIH) have not classified this product as a carcinogen.

B: Component Carcinogenicity
Continuous filament glass fibers (65997-17-3)
ACGIH: A4 - Not Classifiable as a Human Carcinogen
IARC: Group 3 - Not Classifiable (IARC Monograph 43, 1988; Monograph 81, 2002)

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).

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.
**Material Name:** Polyisocyanurate Foam Insulation

**Section 12 - Ecological Information**

**Ecotoxicity**

A: General Product Information

No additional information available.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Pentane (109-66-0)

96 Hr LC50 rainbow trout: 9.87 mg/L; 96 Hr LC50 fathead minnow: 11.59 mg/L; 96 Hr LC50 bluegill: 9.99 mg/L

48 Hr LC50 water flea: 9.7 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 product's 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:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>CA</th>
<th>FL</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentane</td>
<td>109-66-0</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cyclopentane</td>
<td>287-92-3</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Isopentane</td>
<td>78-78-4</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuous filament glass fibers</td>
<td>65997-17-3</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

**Other Regulatory Information**

A: General Product Information

No information available for the product.

B: 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.

<table>
<thead>
<tr>
<th>TSCA 12(b)</th>
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</thead>
<tbody>
<tr>
<td>Component</td>
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<tr>
<td>Pentane</td>
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</table>
C: Component Analysis - Inventory

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>TSCA</th>
<th>DSL</th>
<th>EINECS</th>
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<tbody>
<tr>
<td>Pentane</td>
<td>109-66-0</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cyclopentane</td>
<td>287-92-3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Isopentane</td>
<td>78-78-4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Continuous filament glass fibers</td>
<td>65997-17-3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Component Analysis - WHMIS IDL

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Minimum Concentration</th>
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<tbody>
<tr>
<td>Pentane</td>
<td>109-66-0</td>
<td>1 %</td>
</tr>
<tr>
<td>Cyclopentane</td>
<td>287-92-3</td>
<td>1 %</td>
</tr>
</tbody>
</table>

Section 16 - Other Information

Prepared for:
Johns Manville
Building Insulation Division
P.O. Box 5108
Denver, CO 80217-5108

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

As of the date of preparation of this document, the foregoing information is believed to be accurate and is provided in good faith to comply with applicable federal and state law(s). However, no warranty or representation with respect to such information is intended or given.

<table>
<thead>
<tr>
<th>Date</th>
<th>MSDS #</th>
<th>Reason</th>
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<tbody>
<tr>
<td>08/01/00</td>
<td>2070-1.0000</td>
<td>New MSDS authoring system.</td>
</tr>
<tr>
<td>04/08/03</td>
<td>2070-1.0001</td>
<td>Section 1: Added blowing agents, HCFC or pentanes. All other sections updated for these components.</td>
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<tr>
<td>11/26/03</td>
<td>2070-1.0002</td>
<td>Section 16 division change RID to BID</td>
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<tr>
<td>02/10/04</td>
<td>2070-1.0003</td>
<td>Sect. 2, Dichlorofluoroethane no longer a component of these products.</td>
</tr>
<tr>
<td>07/15/05</td>
<td>2070-1.0004</td>
<td>Regulatory updates: Sections 8, 11, &amp; 15</td>
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<tr>
<td>12/07/05</td>
<td>2070-1.0005</td>
<td>Regulatory updates. Minor edits to Section 8 Exposure and Section 15 WHMIS.</td>
</tr>
</tbody>
</table>

This is the end of MSDS # 2070