1. IDENTIFICATION

**Product identifier**
- **Product Code**: F431-5024A
- **Product Name**: PERMA-SHIELD PL SEWER PIPE GRN
- **Common Name**: SERIES 431 PART A
- **UN/ID no.**: 3066

**Recommended use of the chemical and restrictions on use**
- **Recommended Use**: industrial paint.
- **Uses advised against**: Consumer use, For professional use only. Not for residential use.

**Details of the supplier of the safety data sheet**
- **Manufacturer Address**: Tnemec Company, Inc. 6800 Corporate Drive, Kansas City, MO 64120-1372 816-474-3400
- **Distributor**: Tnemec Company, Inc. 86 Boul, des Entreprises, Ste. 203, Boisbriand, Quebec Canada J7G 2T3

**Emergency telephone number**
- **Company Phone Number**: Tnemec Regulatory Dept: 816-474-3400
- **24 Hour Emergency Phone Number**: 800-535-5053 (Infotrac)

2. HAZARDS IDENTIFICATION

**Classification**

**OSHA Regulatory Status**
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Acute toxicity - Oral</th>
<th>Skin corrosion/irritation</th>
<th>Serious eye damage/eye irritation</th>
<th>Respiratory sensitization</th>
<th>Skin sensitization</th>
<th>Germ cell mutagenicity</th>
<th>Carcinogenicity</th>
<th>Reproductive Toxicity</th>
<th>Specific target organ toxicity (single exposure)</th>
<th>Specific target organ toxicity (repeated exposure)</th>
<th>Flammable Liquids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>4</td>
<td>Category 1 Sub-category A</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1B</td>
<td>1A</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

**Label elements**

**EMERGENCY OVERVIEW**

**Danger**
Precautionary Statements

Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Do not breathe dust/fume/gas/mist/vapors/spray
In case of inadequate ventilation wear respiratory protection
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves
Keep away from heat/sparks/open flames/hot surfaces. — No smoking

Response
Immediately call a POISON CENTER or doctor/physician
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
Immediately call a POISON CENTER or doctor/physician
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
Wash contaminated clothing before reuse
If skin irritation or rash occurs: Get medical advice/attention
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
Immediately call a POISON CENTER or doctor/physician
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth
Do NOT induce vomiting
In case of fire: Use CO2, dry chemical, or foam for extinction

Storage
Store locked up
Store in a well-ventilated place. Keep cool
Keep away from children

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazard statements
Harmful if swallowed
Causes severe skin burns and eye damage
May cause allergy or asthma symptoms or breathing difficulties if inhaled
May cause an allergic skin reaction
May cause genetic defects
May cause cancer
Suspected of damaging fertility or the unborn child
Causes damage to organs
Causes damage to organs through prolonged or repeated exposure
Combustible liquid
May be corrosive to metals

Appearance opaque
Physical state liquid
Odor Slight

Combustible liquid
May be corrosive to metals

F431-5024A PERMA-SHIELD PL SEWER PIPE GRN
Revision Date 03-Aug-2016

Hazard not otherwise classified (HNOC)
Other information
Cancer hazard. Contains crystalline silica which can cause cancer. (Risk of cancer depends on duration and level of exposure). Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs.

Acute Toxicity 50.1619786 % of the mixture consists of ingredient(s) of unknown toxicity.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLYAMINE ADDUCT</td>
<td>-</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT</td>
<td>68131-74-8</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL</td>
<td>98-00-0</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>BENZYL ALCOHOL</td>
<td>100-51-6</td>
<td>10 - 30%</td>
</tr>
<tr>
<td>TITANIUM DIOXIDE (TOTAL DUST)</td>
<td>13463-67-7</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>1,2-CYCLOHEXANEDIAMINE</td>
<td>694-83-7</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>CRYSSTALLINE SILICA (QUARTZ)</td>
<td>14808-60-7</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>SYNTHETIC VITREOUS (SILICATE) FIBRES</td>
<td>65997-17-3</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>HEXAMETHYLENEDIAMINE</td>
<td>124-09-4</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>SYNTHETIC AMORPHUS PYROGENIC SILICA</td>
<td>112945-52-5</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>STODDARD SOLVENT (MINERAL SPIRITS)</td>
<td>8052-41-3</td>
<td>0.1 - 1%</td>
</tr>
<tr>
<td>CRYSSTALLINE SILICA (QUARTZ)</td>
<td>14808-60-7</td>
<td>0.1 - 1%</td>
</tr>
</tbody>
</table>

*The exact percentage (concentration) of composition has been withheld as a trade secret.

### 4. FIRST AID MEASURES

**Description of first aid measures**

**General advice**
If symptoms persist, call a physician.

**Eye contact**
Rinse thoroughly with plenty of water for at least 15 minutes. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician immediately.

**Skin contact**
Wash off immediately with soap and plenty of water. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Call a physician immediately.

**Inhalation**
Remove to fresh air. Oxygen or artificial respiration if needed.

**Ingestion**
If swallowed, do not induce vomiting. Get medical attention immediately.

**Self-protection of the first aider**
Use personal protective equipment. Avoid contact with eyes, skin and clothing.

**Most important symptoms and effects, both acute and delayed**

**Notes to physician**
Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**
Carbon dioxide. Foam. Dry chemical.

**Unsuitable extinguishing media**
Do not use a solid water stream as it may scatter and spread fire.

**Specific hazards arising from the chemical**
Thermal decomposition can lead to release of irritating gases and vapours In the event of fire and/or explosion do not breathe fumes.
Hazardous combustion products

Protective equipment and precautions for firefighters
Use water spray to cool unopened containers. In the event of fire, wear self-contained breathing apparatus. Keep away from heat/sparks/open flames/hot surfaces. MAY CAUSE HEAT AND PRESSURE BUILD-UP IN CLOSED CONTAINERS. Solvent vapors are heavier than air and may spread along floors. Flash back possible over considerable distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with eyes, skin and clothing. Use personal protective equipment. Remove all sources of ignition.

Environmental Precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Methods and material for containment and cleaning up

Methods for containment
Remove all sources of ignition. Spills may be collected with inert, absorbent material for proper disposal. Use non-sparking tools, protective gloves, goggles and clothing, adequate ventilation, avoid the breathing of vapors and use respiratory protective devices. Transfer absorbent material to suitable containers for proper disposal.

Methods for cleaning up
If spilled, contain spilled material and remove with inert absorbent. Dispose of contaminated absorbent, container and unused contents in accordance with local, state and federal regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling
Close container after each use. Avoid contact with eyes, skin and clothing. Do not eat, drink or smoke when using this product. If splashes are likely to occur, wear goggles. Wear protective gloves/clothing. Do not burn, or use a cutting torch on, the empty drum. When used in a mixture, read the labels and safety data sheets of all components. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.

Incompatible products

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT 68131-74-8</td>
<td>TWA: 1 mg/m³</td>
<td>-</td>
<td>100 mg/m³ 10 mg/m³</td>
</tr>
</tbody>
</table>
### FURFURYL ALCOHOL

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>olecular formula</td>
<td>C₄H₈O</td>
</tr>
<tr>
<td>Molecular mass</td>
<td>96.13 g/mol</td>
</tr>
<tr>
<td>CAS number</td>
<td>98-00-0</td>
</tr>
<tr>
<td>TWA:</td>
<td>10 ppm</td>
</tr>
<tr>
<td>Skin STEL:</td>
<td>15 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>10 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>40 mg/m³</td>
</tr>
<tr>
<td>STEL:</td>
<td>15 ppm</td>
</tr>
<tr>
<td>STEL:</td>
<td>60 mg/m³</td>
</tr>
<tr>
<td>Skin TWA:</td>
<td>50 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>200 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>75 ppm</td>
</tr>
</tbody>
</table>

### TITANIUM DIOXIDE (TOTAL DUST)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>13463-67-7</td>
</tr>
<tr>
<td>TWA:</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>15 mg/m³</td>
</tr>
<tr>
<td>STEL:</td>
<td>60 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>5000 mg/m³</td>
</tr>
</tbody>
</table>

### CRYSTALLINE SILICA (QUARTZ)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>14808-60-7</td>
</tr>
<tr>
<td>TWA:</td>
<td>0.025 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>50 mg/m³</td>
</tr>
</tbody>
</table>

### SYNTHETIC VITREOUS (SILICATE) FIBRES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>65997-17-3</td>
</tr>
<tr>
<td>TWA:</td>
<td>1 fiber/cm³</td>
</tr>
<tr>
<td>TWA:</td>
<td>5 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>5000 mg/m³</td>
</tr>
</tbody>
</table>

### HEXAMETHYLENEDIAMINE

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>124-09-4</td>
</tr>
<tr>
<td>TWA:</td>
<td>0.5 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>20000 mg/m³</td>
</tr>
</tbody>
</table>

### STODDARD SOLVENT (MINERAL SPIRITS)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>8052-41-3</td>
</tr>
<tr>
<td>TWA:</td>
<td>100 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>100 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>525 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>500 ppm</td>
</tr>
<tr>
<td>TWA:</td>
<td>2900 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>5000 mg/m³</td>
</tr>
</tbody>
</table>

### CRYSTALLINE SILICA (QUARTZ)

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS number</td>
<td>14808-60-7</td>
</tr>
<tr>
<td>TWA:</td>
<td>0.025 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>0.1 mg/m³</td>
</tr>
<tr>
<td>TWA:</td>
<td>50 mg/m³</td>
</tr>
</tbody>
</table>

### Appropriate engineering controls

**Engineering measures**

Sufficient ventilation, in volume and pattern, should be provided through both local and general exhaust to keep the air contaminant concentration below current applicable OSHA Permissible Exposure Limits (PEL) and ACGIH’s Threshold Limit Values (TLV). Appropriate ventilation should be employed to remove hazardous decomposition products formed during welding or flame cutting operations of surfaces coated with this product.

**Individual protection measures, such as personal protective equipment**

**Eye/face protection**

Use chemical resistant splash type goggles. If splashes are likely to occur, wear face-shield.

**Skin and body protection**

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Respiratory protection**

Use only with adequate ventilation. Do not breathe vapors, spray mist, or dust. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates vapor/mist or dust levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application. Follow respirator manufacturer's directions for respirator use. Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs.

**General hygiene considerations**

Handle in accordance with good industrial hygiene and safety practice. Avoid breathing dust created by cutting, sanding, or grinding.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physical state</strong></td>
<td>liquid</td>
<td></td>
</tr>
<tr>
<td><strong>Appearance</strong></td>
<td>opaque</td>
<td></td>
</tr>
<tr>
<td><strong>Color</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>Odor</strong></td>
<td>Slight</td>
<td></td>
</tr>
<tr>
<td><strong>Odor threshold</strong></td>
<td>No information available</td>
<td></td>
</tr>
<tr>
<td><strong>pH</strong></td>
<td>Values</td>
<td>Remarks</td>
</tr>
<tr>
<td>Melting point / freezing point</td>
<td>72 °C / 162 °F</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>72 °C / 162 °F</td>
<td>No data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>77 °C / 170.0 °F</td>
<td>Pensky Martens - Closed Cup</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td></td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td></td>
<td>No information available</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Conditions to avoid
Heat, flames and sparks. Epoxy constituents.

Incompatible materials
Strong oxidizing agents, Acids, Bases

Hazardous decomposition products

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination. May cause sensitization by inhalation. Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs.

Eye contact
Causes serious eye damage.

Skin contact
Causes severe skin burns. May cause sensitization by skin contact.

Ingestion
Harmful if swallowed.

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral (Rat)</th>
<th>LD50 Dermal (Rat)</th>
<th>LC50 Inhalation (Rat)</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT</td>
<td>&gt; 2000 mg/kg</td>
<td>= 3825 mg/kg (Rat)</td>
<td>= 233 ppm (Rat) 4 h</td>
</tr>
<tr>
<td>68131-74-8</td>
<td></td>
<td>400 mg/kg (Rabbit)</td>
<td></td>
</tr>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td>= 110 mg/kg (Rat)</td>
<td>= 657 mg/kg (Rabbit)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>= 177 mg/kg (Rat)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Information on toxicological effects

**Symptoms**
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Skin disorders. Respiratory disorders. Irritating to eyes and skin.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Corrosivity**
Causes severe damage to eyes and skin. May be corrosive to metals.

**Chronic Toxicity**
NOTICE: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. Cancer hazard. Contains crystalline silica which can cause cancer. (Risk of cancer depends on duration and level of exposure). May cause sensitization by inhalation and skin contact. Substances known to impair fertility. Substances known to be mutagenic to man. May cause sensitization of susceptible persons. May cause genetic defects.

**Carcinogenicity**
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT 68131-74-8</td>
<td>Group 1</td>
<td>Known</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TITANIUM DIOXIDE (TOTAL DUST) 13463-67-7</td>
<td>Group 2B</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>1,2-CYCLOHEXANEDIAMINE 694-83-7</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) 14808-60-7</td>
<td>A2</td>
<td>Group 1</td>
<td>Known</td>
<td>X</td>
</tr>
<tr>
<td>SYNTHETIC VITREOUS (SILICATE) FIBRES 65997-17-3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYNTHETIC AMORPHUS PYROGENIC SILICA 112945-62-5</td>
<td></td>
<td>Group 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) 14808-60-7</td>
<td>A2</td>
<td>Group 1</td>
<td>Known</td>
<td>X</td>
</tr>
</tbody>
</table>

**Reproductive effects**
Suspected of damaging fertility or the unborn child.

**STOT - single exposure**
Eyes, Skin, Respiratory system

**STOT - repeated exposure**
Causes damage to organs through prolonged or repeated exposure

**Target organ effects**
Eyes, Lungs, respiratory system, Skin, Central nervous system, kidney, liver, Nasal Cavities.

**Aspiration hazard**
No information available.

**Acute Toxicity**
50.1619786 % of the mixture consists of ingredient(s) of unknown toxicity.
12. ECOLOGICAL INFORMATION

Ecotoxicity

Harmful to aquatic life

52.1338% of the mixture consists of components(s) of unknown hazards to the aquatic environment

<table>
<thead>
<tr>
<th>Component</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to daphnia</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT 68131-74-8</td>
<td></td>
<td></td>
<td>140 - 2000: 24 h Daphnia magna mg/L EC50</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td></td>
<td>32: 96 h Pimephales promelas mg/L LC50 static</td>
<td>328: 24 h Daphnia magna mg/L EC50</td>
</tr>
<tr>
<td>BENZYL ALCOHOL 100-51-6</td>
<td>35: 3 h Anabaena variabilis mg/L EC50</td>
<td>10: 96 h Lepomis macrochirus mg/L LC50 static</td>
<td>23: 48 h water flea mg/L EC50</td>
</tr>
<tr>
<td>HEXAMETHYLENEDIAMINE 124-09-4</td>
<td>14.8: 96 h Pseudokirchneriella subcapitata mg/L EC50</td>
<td>1825: 96 h Pimephales promelas mg/L LC50 static</td>
<td>23.4: 48 h Daphnia magna mg/L EC50</td>
</tr>
</tbody>
</table>

Persistence and degradability

No information available.

Bioaccumulation

No information available.

Mobility in Environmental Media

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENZYL ALCOHOL 100-51-6</td>
<td>1.1</td>
</tr>
<tr>
<td>HEXAMETHYLENEDIAMINE 124-09-4</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Other Adverse Effects

No information available

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Disposal Methods

Keep container tightly closed. If spilled, contain spilled material and remove with inert absorbent. Dispose of contaminated absorbent, container and unused contents in accordance with local, state and federal regulations.

Contaminated packaging

Empty containers should be taken to an approved waste handling site for recycling or disposal.

Component                                      | CAWAST |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT 68131-74-8</td>
<td>Toxic</td>
</tr>
<tr>
<td>HEXAMETHYLENEDIAMINE 124-09-4</td>
<td>Toxic</td>
</tr>
</tbody>
</table>

14. TRANSPORT INFORMATION

DOT

UN/ID no. 3066
Proper Shipping Name paint
Hazard Class 8
Packing Group III
Emergency Response Guide Number 153

IATA
- UN/ID no. 3066
- Proper Shipping Name paint
- Hazard Class 8
- Packing Group III
- ERG Code 856

Additional information
Call TNEMEC Traffic Department - 816-474-3400 for additional information or other modes of Transportation.

15. REGULATORY INFORMATION

International Inventories
- TSCA Complies
- DSL/NDSL Does not comply
- EINECS/ELINCS Does not comply
- ENCS Does not comply
- IECSC Complies
- KECL Does not comply
- PICCS Does not comply
- AICS Does not comply

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

The following chemical(s) are listed as HAP under the U.S. Clean Air Act, Section 12 (40 CFR 61):

Component COAL FIRED FLY ASH BI-PRODUCT
HAPS Data

United States of America

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372:

Component COAL FIRED FLY ASH BI-PRODUCT - 68131-74-8

SARA 313 - Threshold Values
0.1

SARA 311/312 Hazardous

Categorization
- Acute Health Hazard Yes
- Chronic Health Hazard Yes
- Fire Hazard Yes
- Sudden Release of Pressure Hazard No
- Reactive Hazard No

Component COAL FIRED FLY ASH BI-PRODUCT 68131-74-8
CWA - Reportable Quantities X
CWA - Toxic Pollutants
CWA - Priority Pollutants
CWA - Hazardous Substances

Page 9 / 10
CERCLA

United States of America

California Prop. 65
WARNING! This product contains a chemical known in the State of California to cause cancer

<table>
<thead>
<tr>
<th>Component</th>
<th>California Prop. 65</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT - 68131-74-8</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL - 98-00-0</td>
<td>*</td>
</tr>
<tr>
<td>TITANIUM DIOXIDE (TOTAL DUST) - 13463-67-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>1,2-CYCLOHEXANEDIAMINE - 694-83-7</td>
<td>*</td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) - 14808-60-7</td>
<td>Carcinogen</td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) - 14808-60-7</td>
<td>Carcinogen</td>
</tr>
</tbody>
</table>

California SCAQMD Rule 443
Contains Photochemically Reactive Solvent

State Right-to-Know

<table>
<thead>
<tr>
<th>Component</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>COAL FIRED FLY ASH BI-PRODUCT - 68131-74-8</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL - 98-00-0</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>BENZYL ALCOHOL - 100-51-6</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>TITANIUM DIOXIDE (TOTAL DUST) - 13463-67-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) - 14808-60-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HEXAMETHYLENEDIAMINE - 124-09-4</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>STODDARD SOLVENT (MINERAL SPIRITS) - 8052-41-3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>CRYSTALLINE SILICA (QUARTZ) - 14808-60-7</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

NFPA
Health 2  Flammability 1  Instability 1  Physical hazard *
HMIS (Hazardous Material Information System)
Health 2*  Flammability 1  Reactivity 1

Prepared By: Tnemec Regulatory Dept: 816-474-3400
Revision Date: 03-Aug-2016
Revision Summary: 9 4 5 7 10 8 11 14

Disclaimer
For specific information regarding occupational safety and health standards, please refer to the Code of Federal Regulations, Title 29, Part 1910. To the best of our knowledge, the information contained herein is accurate. However, neither the Tnemec Company or any of its subsidiaries assume any liability whatsoever for the accuracy of completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.
1. IDENTIFICATION

Product identifier
Product Code F431-0431B
Product Name PERMA-SHIELD PL EPOXY

Other means of identification
Common Name SERIES 431, PART B

Recommended use of the chemical and restrictions on use
Recommended Use industrial paint.
Uses advised against Consumer use, For professional use only. Not for residential use.

Details of the supplier of the safety data sheet
Manufacturer Address Tnemec Company, Inc. 6800 Corporate Drive, Kansas City, MO 64120-1372 816-474-3400
Distributor Tnemec Company, Inc. 86 Boul, des Entreprises, Ste. 203, Boisbriand, Quebec Canada J7G 2T3

Emergency telephone number
Company Phone Number Tnemec Regulatory Dept: 816-474-3400
24 Hour Emergency Phone Number 800-535-5053 (Infotrac)

2. HAZARDS IDENTIFICATION

Classification

OSHA Regulatory Status
This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)

<table>
<thead>
<tr>
<th>Hazard Type</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity - Oral</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute toxicity - Dermal</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Category 2A</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Category 1</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ toxicity (repeated exposure)</td>
<td>Category 2</td>
</tr>
</tbody>
</table>

Label elements

EMERGENCY OVERVIEW

WARNING

Hazard statements
Harmful if swallowed
Harmful in contact with skin
Causes skin irritation
Causes serious eye irritation
May cause an allergic skin reaction
Suspected of causing cancer
May cause damage to organs through prolonged or repeated exposure
Precautionary Statements

Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Contaminated work clothing should not be allowed out of the workplace
Wear protective gloves
Do not breathe dust/fume/gas/mist/vapors/spray

Response
IF exposed or concerned: Get medical advice/attention
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention
IF ON SKIN: Wash with plenty of soap and water
Call a POISON CENTER or doctor/physician if you feel unwell
Take off contaminated clothing and wash before reuse
If skin irritation or rash occurs: Get medical advice/attention
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
Rinse mouth

Storage
Store locked up
Keep away from children

Disposal
Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Other information
Toxic to aquatic life with long lasting effects
SEE SAFETY DATA SHEET

Acute Toxicity
91.6287 % of the mixture consists of ingredient(s) of unknown toxicity.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPOXY RESIN (LER)</td>
<td>25085-99-8</td>
<td>60 - 100%</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL</td>
<td>98-00-0</td>
<td>1 - 10%</td>
</tr>
<tr>
<td>SYNTHETIC AMORPHUS PYROGENIC SILICA</td>
<td>112945-52-5</td>
<td>1 - 10%</td>
</tr>
</tbody>
</table>

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures
General advice
If symptoms persist, call a physician.

Eye contact
Rinse thoroughly with plenty of water for at least 15 minutes. If eye irritation persists, consult a specialist.

Skin contact
Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

Inhalation
Remove to fresh air. Oxygen or artificial respiration if needed.

Ingestion
If swallowed, do not induce vomiting. Get medical attention immediately.

Self-protection of the first aider
Use personal protective equipment. Avoid contact with eyes, skin and clothing.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Carbon dioxide. Foam. Dry chemical.

Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
Thermal decomposition can lead to release of irritating gases and vapours. In the event of fire and/or explosion do not breathe fumes.

Hazardous combustion products

Protective equipment and precautions for firefighters
Use water spray to cool unopened containers. In the event of fire, wear self-contained breathing apparatus. Keep away from heat/sparks/open flames/hot surfaces. MAY CAUSE HEAT AND PRESSURE BUILD-UP IN CLOSED CONTAINERS. Solvent vapors are heavier than air and may spread along floors. Flash back possible over considerable distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions
Avoid contact with eyes, skin and clothing. Use personal protective equipment. Remove all sources of ignition.

Environmental Precautions

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

Methods and material for containment and cleaning up

Methods for containment
Remove all sources of ignition. Spills may be collected with inert, absorbent material for proper disposal. Use non-sparking tools, protective gloves, goggles and clothing, adequate ventilation, avoid the breathing of vapors and use respiratory protective devices. Transfer absorbent material to suitable containers for proper disposal.

Methods for cleaning up
If spilled, contain spilled material and remove with inert absorbent. Dispose of contaminated absorbent, container and unused contents in accordance with local, state and federal regulations.
7. HANDLING AND STORAGE

Precautions for safe handling

Handling
Close container after each use. Avoid contact with eyes, skin and clothing. Do not eat, drink or smoke when using this product. If splashes are likely to occur, wear goggles. Wear protective gloves/clothing. Do not burn, or use a cutting torch on, the empty drum. When used in a mixture, read the labels and safety data sheets of all components. Wash thoroughly after handling.

Conditions for safe storage, including any incompatibilities

Storage
Keep container tightly closed in a dry and well-ventilated place. Keep out of the reach of children.

Incompatible products

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure guidelines

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td>TWA: 10 ppm</td>
<td>TWA: 10 ppm</td>
<td>75 ppm</td>
</tr>
<tr>
<td></td>
<td>Skin</td>
<td>TWA: 40 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td>STEL: 15 ppm</td>
<td>STEL: 15 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL: 60 mg/m³</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 50 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 200 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Appropriate engineering controls

Engineering measures
Sufficient ventilation, in volume and pattern, should be provided through both local and general exhaust to keep the air contaminant concentration below current applicable OSHA Permissible Exposure Limits (PEL) and ACGIH’s Threshold Limit Values (TLV). Appropriate ventilation should be employed to remove hazardous decomposition products formed during welding or flame cutting operations of surfaces coated with this product.

Individual protection measures, such as personal protective equipment

Eye/face protection
Use chemical resistant splash type goggles. If splashes are likely to occur, wear face-shield.

Skin and body protection
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection
Use only with adequate ventilation. Do not breathe vapors, spray mist, or dust. Ensure fresh air entry during application and drying. If you experience eye watering, headache or dizziness or if air monitoring demonstrates vapor/mist or dust levels are above applicable limits, wear an appropriate, properly fitted respirator (NIOSH/MSHA approved) during and after application. Follow respirator manufacturer’s directions for respirator use.

General hygiene considerations
Handle in accordance with good industrial hygiene and safety practice. Avoid breathing dust created by cutting, sanding, or grinding.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>liquid</th>
<th>Odor</th>
<th>Slight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>opaque</td>
<td>Odor threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>Color</td>
<td>No information available</td>
<td>No information available</td>
<td></td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Reactivity
No data available

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
None under normal processing.

Conditions to avoid
Heat, flames and sparks. Amines.

Incompatible materials
Strong oxidizing agents, Acids, Bases, Amines

Hazardous decomposition products

11. TOXICOLOGICAL INFORMATION

Information on Likely Routes of Exposure

Inhalation
May cause central nervous system depression with nausea, headache, dizziness, vomiting, and incoordination.

Eye contact
Causes serious eye irritation.

Skin contact
Irritating to skin. May cause sensitization by skin contact.
Ingestion
Harmful if swallowed.

Component | LD50 Oral | LD50 Dermal | LC50 Inhalation
---------- |----------- |------------- |------------------
FURFURYL ALCOHOL 98-00-0 | = 110 mg/kg (Rat) = 177 mg/kg (Rat) | = 400 mg/kg (Rabbit) = 3825 mg/kg (Rabbit) | = 233 ppm (Rat) 4 h
SYNTHETIC AMORPHOUS PYROGENIC SILICA 112945-52-5 | = 3160 mg/kg (Rat) |

Information on toxicological effects

Symptoms
Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Skin disorders. Irritating to eyes and skin.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Chronic Toxicity
Substances known to be carcinogenic to man. Skin sensitizer.

Sensitization
May cause sensitization of susceptible persons.

Mutagenicity
No information available.

Carcinogenicity
The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>ACGIH</th>
<th>IARC</th>
<th>NTP</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td>*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYNTHETIC AMORPHOUS PYROGENIC SILICA 112945-52-5</td>
<td></td>
<td>Group 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reproductive effects
No information available.

STOT - single exposure
No information available

STOT - repeated exposure
Causes damage to organs through prolonged or repeated exposure

Target organ effects
Central nervous system, Eyes, respiratory system, Skin.

Aspiration hazard
Based on product level data, this product does not meet the requirement to be classified as an aspiration hazard. However, this product contains an ingredient that may cause aspiration if swallowed.

Acute Toxicity
91.6287 % of the mixture consists of ingredient(s) of unknown toxicity.

12. ECOLOGICAL INFORMATION

Ecotoxicity
Toxic to aquatic life with long lasting effects

2.4112 % of the mixture consists of components(s) of unknown hazards to the aquatic environment

<table>
<thead>
<tr>
<th>Component</th>
<th>Toxicity to algae</th>
<th>Toxicity to fish</th>
<th>Toxicity to daphnia</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPOXY RESIN (LER) 25085-99-8</td>
<td>11 mg/L 72 hr</td>
<td>2 mg/L 96 hr Oncorhynchus mykiss</td>
<td>1.8 mg/L 48h</td>
</tr>
<tr>
<td>FURFURYL ALCOHOL 98-00-0</td>
<td>32: 96 h Pimephales promelas mg/L LC50 static</td>
<td>328: 24 h Daphnia magna mg/L EC50</td>
<td></td>
</tr>
</tbody>
</table>

Persistence and degradability
No information available.

Bioaccumulation
No information available.

Mobility in Environmental Media

Other Adverse Effects
No information available

13. DISPOSAL CONSIDERATIONS
Waste treatment methods

Disposal Methods
Keep container tightly closed. If spilled, contain spilled material and remove with inert absorbent. Dispose of contaminated absorbent, container and unused contents in accordance with local, state and federal regulations.

Contaminated packaging
Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. TRANSPORT INFORMATION

DOT
Proper Shipping Name
PAINT & RELATED MATERIAL

IATA

Additional information
Call TNEMEC Traffic Department - 816-474-3400 for additional information or other modes of Transportation.

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Complies/Does Not Comply</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
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<tr>
<td>DSL/NDSL</td>
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<td>EINECS/ELINCS</td>
<td>Does not comply</td>
</tr>
<tr>
<td>ENCS</td>
<td>Complies</td>
</tr>
<tr>
<td>IECSC</td>
<td>Complies</td>
</tr>
<tr>
<td>KECL</td>
<td>Complies</td>
</tr>
<tr>
<td>PICCS</td>
<td>Complies</td>
</tr>
<tr>
<td>AICS</td>
<td>Complies</td>
</tr>
</tbody>
</table>

United States of America

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and and Title 40n of the Code of Federal Regulations, Part 372:

SARA 311/312 Hazardous
Categorization

<table>
<thead>
<tr>
<th>Category</th>
<th>Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>No</td>
</tr>
</tbody>
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CERCLA
United States of America

California Prop. 65
WARNING! This product contains a chemical known in the State of California to cause cancer

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California SCAQMD Rule 443
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<td>X</td>
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<td>X</td>
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</table>

16. OTHER INFORMATION

NFPA
- Health 2
- Flammability 1
- Instability 1
- Physical hazard *

HMIS (Hazardous Material Information System)
- Health 2*
- Flammability 1
- Reactivity 1

Prepared By: Tnemec Regulatory Dept: 816-474-3400
Revision Date: 11-Jul-2016
Revision Summary: 9 1 4 5 7 10 8 11 14 15
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End of SDS