1 Identification of the substance/mixture and the company/undertaking

1.1 Product identifier
Trade name: Armor-Hard HDR
Article number: Armor-Hard HDR (Part A)

1.2 Application of the substance / the mixture: Epoxy binder

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier:
Metzger/McGuire Co.
P. O. Box 2217
Concord, NH  03302
Telephone: (800) 223-6680

1.4 Emergency telephone number:
(800) 255-3924  24 hrs. (Continental U.S.)
(813) 248-0585  24 hrs. (Outside Continental U.S.)

2 Hazards identification

2.1 GHS Classification of the substance or mixture
Skin Irritant 2; H315: Causes skin irritation.
Eye Irritant 2; H319: Causes serious eye irritation.
Skin Sensitizer 1; H317: May cause and allergic skin reaction.

2.2 GHS Label elements
Hazard pictograms/symbols

Signal word: Warning

Hazard statements:
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H317: May cause and allergic skin reaction.

Precautionary statements:
P280: wear protective gloves / eye protection.
P273: Avoid release to the environment.
P264: Wash thoroughly after handling.
P261: Avoid breathing mist/vapours/spray.
P305+P311+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313: If skin irritation or rash occurs: Get medical advice/attention.

3 Composition/information on ingredients

3.2 Mixture
Description: Mixture of substances listed below with nonhazardous additions.

Dangerous components:

<table>
<thead>
<tr>
<th>CAS</th>
<th>Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin (number average molecular weight &lt; 700)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS: 25068-38-6</td>
<td>70-90%</td>
</tr>
<tr>
<td>CAS: 2461-15-6</td>
<td>[(2-ethylhexyl)oxy(methyl)oxirane]</td>
</tr>
</tbody>
</table>

4 First aid measures

4.1 Description of first aid measures
General information:
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
Take affected persons out into the fresh air.
After inhalation: Supply fresh air; consult doctor in case of complaints.
After skin contact: Immediately rinse with water.
If skin irritation continues, consult a doctor.
After eye contact:
Remove contact lenses if worn, if possible.
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
After swallowing:
Rinse out mouth and then drink plenty of water.
Do not Induce vomiting; call for medical help immediately.

4.2 Most important symptoms and effects, both acute and delayed:
Allergic reactions.
Nausea.
Coughing.
Gastric or intestinal disorders.
Irritant to skin and mucous membranes.
Irritant to eyes.

4.3 Indication of any immediate medical attention and special treatment needed:
Contains reaction product: bisphenol - A-(epichlorhydrin) epoxy resin (number average molecular weight < 700), Reaction
May produce an allergic reaction.
If necessary oxygen respiration treatment.
Later observation for pneumonia and pulmonary edema.
Medical supervision for at least 48 hours.
5 Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents:
- Water haze or fog.
- Foam.
- Fire-extinguishing powder.
- Carbon dioxide.
For safety reasons unsuitable extinguishing agents:
- Water with full jet
- Water spray
5.2 Special hazards arising from the substance or mixture:
Formation of toxic gases is possible during heating or in case of fire.
5.3 Advice for the firefighters
Protective equipment:
- Wear self-contained respiratory protective device.
- Wear fully protective suit.
Additional information:
- Cool endangered receptacles with water fog or haze.
- Eliminate all ignition sources if safe to do so.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:
- Use respiratory protective device against the effects of fumes/dust/aerosol.
- Wear protective equipment. Keep unprotected persons away.
- Ensure adequate ventilation.
- Keep away from ignition sources.
6.2 Environmental precautions:
- Do not allow to enter sewers/ surface or ground water.
- Inform respective authorities in case of seepage into water course or sewage system.
- Prevent from spreading (e.g. by damming –in or oil barriers).
6.3 Methods and material for containment and cleaning up:
- Absorb liquid components with liquid-binding material.
- Send for recovery or disposal in suitable receptacles.
- Dispose contaminated material as waste according to item 13.
- Ensure adequate ventilation.

7 Handling and storage

7.1 Precautions for safe handling:
- Use only in well-ventilated areas.
- Store in cool, dry place in tightly closed receptacles (60-80°F recommended).
7.2 Conditions for safe storage, including any incompatibilities:
- Use only receptacles specifically permitted for this substance/product.
- Avoid storage near extreme heat, ignition sources or open flame.
- Further information about storage conditions:
- Keep container tightly sealed.

8 Exposure controls/personal protection

8.1 Control parameters
Ingredients with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
DNELs: No further relevant information available.
PNECs: No further relevant information available.
Additional information: The lists valid during the making were used as basis.
8.2 Engineering controls
- Provide readily accessible eye wash stations and safety showers.
- Provide ventilation adequate to ensure concentrations are minimized.
8.3 Personal protective equipment
General protective and hygienic measures:
- Keep away from foodstuffs, beverages and feed.
- Immediately remove all soiled and contaminated clothing.
- Wash hands before breaks and at the end of work.
- Do not inhale gases / fumes / aerosols.
- Avoid contact with the eyes and skin.
Respiratory protection:
- Not required under normal conditions of use.
- Use suitable respiratory protective device in case of insufficient ventilation.
- For spills, respiratory protection may be advisable.
Hand protection:
- Protective, impervious gloves. (Neoprene, PVC, Nitrile rubber)
Skin and Body protection:
- Protective work clothing.

9 Physical and chemical properties

9.1 Information on basic physical and chemical properties
General Information
Form: Liquid
Colour: Colorless
10 Stability and reactivity

10.1 Reactivity
10.2 Chemical stability
Thermal decomposition / conditions to be avoided:
No decomposition if used and stored according to specifications.
10.3 Possibility of hazardous reactions:
Reacts with strong alkali.
Exothermic polymerization.
Reacts with strong acids and oxidizing agents.
Reacts with catalysts.
10.4 Conditions to avoid:
Avoid contact with strong oxidizing agents, excessive heat or flames.
10.5 Incompatible materials:
Strong acids, bases and oxidizing agents.
10.6 Hazardous decomposition products:
Carbon monoxide and carbon dioxide.

11 Toxicological information

11.1 Information on likely routes of exposure:
Inhalation: May cause respiratory irritation
Ingestion: No data
Skin contact: May cause skin irritation
Eye contact: May cause eye irritation
11.2 Symptoms related to physical, chemical and toxicological characteristics: No available data
11.3 Delayed and immediate effects as well as chronic effects from short and long-term exposure:
(Data for primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)
Acute toxic:
Oral LD50 > 2,000 mg/kg (rat)
Dermal LD50 > 2,000 mg/kg (rat)
Inhalation No data
Skin Corrosive/irritant:
Test material was slightly irritating to skin in key studies. For the skin, mean erythema and edema scores were
0.8 and 0.5 respectively.
Serious eye damage/eye irritation:
Test material was slightly irritating to the eye in key studies. The mean eye score was 0.4
Respiratory sensitization: No data available
Skin sensitization:
In a local lymph node assay, the concentration that would cause a 3-fold increase in proliferation (EC-3) was
calculated to be 5.7% which is consistent with moderate dermal sensitization potential.
11.4 Numerical measures of toxicity: No data available for mixture.
Additional toxicological information:
The product show the following dangers according to the calculation method of the General EU
Classification Guidelines for Preparations as issued in the latest version: Irritant
Danger through skin absorption.
Toxic and/or corrosive effects may be delayed up to 24 hours.
Inhalation of concentrated vapours as well as oral intake will lead to anesthesia-like conditions and headache,
dizziness, etc.

12 Ecological information

12.1 Toxicity
Aquatic toxicity:
(Data taken from SDS of primary component, Reaction product: bisphenol - A- (epichlorhydrin) epoxy resin)

<table>
<thead>
<tr>
<th>Species</th>
<th>EC50/LC50 (mg/L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish</td>
<td>96hr-LC50 = 3.6mg/L, test mat: Oncorhynchus mykiss (direct application, nominal) (OECD Guideline 203)</td>
</tr>
<tr>
<td></td>
<td>LC50 1.41 mg/L 96hr Oryzias latipes</td>
</tr>
<tr>
<td>Crustacea</td>
<td>48hr-EC50 = 2.6mg/L, test mat Daphnia magna (direct application, nominal, based on: mobility) (OECD Guideline 202)</td>
</tr>
<tr>
<td></td>
<td>EC50 1.7mg/L 48hr</td>
</tr>
<tr>
<td>Aquatic Plant</td>
<td>72hr-EC50 &gt; 11 mg/L Scenedesmus capricornutum water soluble fraction (meas. (arithmetic mean)) based on: growth rate (EPA-660/3-75-009)</td>
</tr>
</tbody>
</table>
12.2 Persistence and degradability: No data available.
12.3 Bioaccumulative potential: No further relevant information available.
12.4 Mobility in soil: No further relevant information available.
12.5 Results of PBT and vPvB assessment:
PBT: Not applicable.
vPvB: Not applicable.
12.6 Other adverse effects: No further relevant information available

13 Disposal considerations

13.1 Waste treatment methods
Waste from residue/unused product:
This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations

Contaminated packaging:
Disposal must be made in accordance with official federal, state and local regulations.

14 Transport information

DOT
UN number: Not Regulated

IATA
UN number: UN3082
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Epoxy resin)
Hazard Class: 9
Packing Group: III
Labels(s): 9
Marine Pollutant: Yes

IMDG
UN number: UN3082
Proper Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Epoxy resin)
Hazard Class: 9
Packing Group: III
Labels(s): 9
Marine Pollutant: Yes

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

United States (USA)

SARA
Section 313 (specific toxic chemical listings):
Component(s) above 'de minimus' level: None
TSCA (Toxic Substances Control Act):
All the ingredients are listed.

Proposition 65 (California):
Chemicals known to cause cancer: None

Canada
Canadian Domestic Substances List (DSL):
All ingredients are listed
Canadian Ingredient Disclosure list (limit 0.1%)
None of the ingredients is listed
Canadian Ingredient Disclosure list (limit 1%)
None of the ingredients is listed.

15.2 Chemical Safety Assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Abbreviation and acronyms:
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienist
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substance
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
1 Identification of the substance/mixture and the company/undertaking

1.1 Product identifier
Trade name: Armor-Hard HDR
Article number: Armor-Hard HDR (Part B)

1.2 Application of the substance / the mixture: Epoxy binder

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier:
Metzger/McGuire Co.
P. O. Box 2217
Concord, NH 03302
Telephone: (800) 223-6680

1.4 Emergency telephone number:
(800) 255-3924 24 hrs. (Continental U.S.)
(813) 248-0585 24 hrs. (Outside Continental U.S.)

2 Hazards identification

2.1 GHS Classification of the substance or mixture
Acute Toxicity – Oral; Category 4
Acute Toxicity – Dermal; Category 4
Skin Corrosion; Category 1B
Serious Eye Damage; Category 1
Skin Sensitization; Category 1
Reproductive Toxicity; Category 2
Specific Target Organ Toxicity – single exposure; Category 3

2.2 GHS Label elements
Hazard pictograms/symbols
Signal word: Danger

Hazard statements:
H302+H312: Harmful if swallowed or in contact with skin.
H314: Causes severe skin burns and eye damage.
H317: May cause an allergic skin reaction.
H318: Causes serious eye damage.
H335: May cause respiratory irritation.
H361: Suspected of damaging fertility or the unborn child.

3 Composition/information on ingredients

3.2 Mixture
Description: Mixture of substances listed below with potential nonhazardous additions.

<table>
<thead>
<tr>
<th>CAS</th>
<th>Ingredient</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>111-40-0</td>
<td>Diethylenetriamine</td>
<td>30-60%</td>
</tr>
<tr>
<td>80-05-7</td>
<td>Phenol, 4,4’-(1-methylene)bis-</td>
<td>20-40%</td>
</tr>
<tr>
<td>Not Available</td>
<td>Polyamide resin</td>
<td>7-15%</td>
</tr>
<tr>
<td>100-51-6</td>
<td>Benzyl Alcohol</td>
<td>3-10%</td>
</tr>
<tr>
<td>Not Available</td>
<td>Mixed Cycloaliphatic amines</td>
<td>2-8%</td>
</tr>
</tbody>
</table>

4 First aid measures

4.1 Description of first aid measures
General information:
Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

After inhalation: Supply fresh air; consult doctor in case of complaints.

After skin contact: Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Take off contaminated clothing and shoes immediately.

After eye contact:
Rinse immediately with plenty of water for at least 15 minutes. If symptoms persist, consult a doctor.

After ingestion:
Never give anything by mouth to an unconscious person. Prevent aspiration of vomit. Turn victim's head to the side. Do not induce vomiting; call for medical help immediately.

4.2 Most important symptoms and effects, both acute and delayed:
Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders, skin disorders and allergies.

4.3 Indication of any immediate medical attention and special treatment needed:
Contains Phenol, 4,4’-(1-methylethylidene)bis-. May cause an allergic reaction.

5.1 Extinguishing media
Suitable extinguishing agents:
Foam.
Fire-extinguishing powder.
Carbon dioxide.

5.2 Specific hazards arising from the substance or mixture:

5.3 Advice for the firefighters
Protective equipment:
Wear self-contained respiratory protective device.
Wear fully protective suit.

Additional information:
Cool endangered receptacles with water fog or haze.
Eliminate all ignition sources if safe to do so.

6 Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:
Use respiratory protective device against the effects of fumes/dust/aerosol. Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.

6.2 Environmental precautions:
Do not allow to enter sewers/surface or ground water. Inform respective authorities in case of seepage into water course or sewage system. Prevent from spreading (e.g. by damming-in or oil barriers).

6.3 Methods and material for containment and cleaning up:
Send for recovery or disposal in suitable receptacles. Dispose contaminated material as waste according to item 13. Ensure adequate ventilation.

7 Handling and storage

7.1 Precautions for safe handling:
Use only in well-ventilated areas.
Store in cool, dry place in tightly closed receptacles (60-80°F recommended).

7.2 Conditions for safe storage, including any incompatibilities:

8 Exposure controls/personal protection

8.1 Control parameters
Exposure Limits:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Time Weighted Average (TWA)</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylenetriamine</td>
<td>Recommended Exposure Limit (REL): NIOSH</td>
<td>1 ppm</td>
</tr>
<tr>
<td>Diethylenetriamine</td>
<td>Time Weighted Average (TWA): OSHA Z1A</td>
<td>1 ppm</td>
</tr>
<tr>
<td>Diethylenetriamine</td>
<td>Time Weighted Average (TWA): Permissible Exposure Limit (PEL): US CA OEL</td>
<td>1 ppm</td>
</tr>
<tr>
<td>Diethylenetriamine</td>
<td>Time Weighted Average (TWA): TN OEL</td>
<td>1 ppm</td>
</tr>
<tr>
<td>Benzyl alcohol</td>
<td>Time Weighted Average (TWA): WEEL</td>
<td>10 ppm</td>
</tr>
</tbody>
</table>

8.2 Engineering controls
Provide readily accessible eye wash stations and safety showers. Provide ventilation adequate to ensure concentrations are minimized.

8.3 Personal protective equipment
General protective and hygienic measures:
Keep away from foodstuffs, beverages and feed. Wash hands before breaks and at the end of work. Do not inhale gases / fumes / aerosols. Avoid contact with the eyes and skin.

Respiratory protection:
Not required under normal conditions of use. Use suitable respiratory protective device in case of insufficient ventilation. For spills, respiratory protection may be advisable. Use respiratory protection when grinding or cutting material.

Hand protection:
Protective, impervious gloves. (Neoprene, Butyl-rubber, Nitrile rubber)

Eye protection:
Face shield with safety glasses or goggles underneath.

Skin and Body protection:
Protective work clothing.
Where potential exposure warrants, rubber or plastic boots and chemically resistant protective suit.
9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information

Appearance
Form: Liquid
Colour: Amber
Odour: Amine
Odour threshold: No data available
pH: Alkaline
Melting point/range: No data available
Boiling point/range: >350 °F / >176 °C
Flash point: >212 °F / >100 °C
Evaporation rate: No data available
Flammability (solid, gaseous): Not applicable
Upper/lower flammability or explosive limit: Not applicable

9.2 Chemical stability

Partition coefficient (n-octanol/water): No data available
Auto/Self-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: 150 – 350 cps

10 Stability and reactivity

10.1 Reactivity

Exothermic polymerization.
Reacts with strong acids and oxidizing agents.
Reacts with catalysts.

10.2 Chemical stability

No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions:
Reacts with strong alkali.

11 Toxicological information

11.1 Information on likely routes of exposure:

Skin contact: Harmful in contact with skin. Causes skin burns.
Eye contact: Causes eye burns.
Ingestion: Harmful if swallowed. If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Inhalation: This product contains a component that is toxic by inhalation when aerosolized or sprayed. If product is not being aerosolized or sprayed, the inhalation toxicity may not be applicable. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system. Inhalation of aerosol may cause irritation to the upper respiratory tract. May cause nose, throat, and lung irritation. Can cause severe eye, skin and respiratory tract burns.

11.2 Symptoms related to physical, chemical and toxicological characteristics:

Repeated and/or prolonged exposures to low concentrations of vapors or aerosols may cause: sore throat, asthma, eye disease, kidney disorders, liver disorders and skin disorders and allergies.

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

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. May cause allergic skin reaction. This product may cause adverse reproductive effects. Asthma, Eye disease, Kidney disorders, Liver disorders, Skin disorders and Allergies.

11.4 Numerical measures of toxicity:

No data is available for full mixture.

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS or other</th>
<th>Oral LD50</th>
<th>Dermal LD50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylenetriamine</td>
<td>CAS 111-40-0</td>
<td>1080 mg/kg (rat)</td>
<td>1090 mg/kg (rabbit)</td>
</tr>
<tr>
<td>Phenol, 4,4’-(1- methylethylidene)bis-</td>
<td>CAS 80-06-7</td>
<td>3250 mg/kg (rat)</td>
<td>3000 mg/kg (rabbit)</td>
</tr>
</tbody>
</table>

12 Ecological information

12.1 Aquatic toxicity:

No data available on the product itself.

Toxicity to fish – Components

- Benzyl alcohol: LC50 (96 h) : 10 mg/l Species: Bluegill sunfish (Lepomis macrochirus).
- Benzyl alcohol: LC50 (96 h) : 460 mg/l Species: Fathead minnow (Pimephales promelas).
13 Disposal considerations

13.1 Waste treatment methods
Waste from residue/unused product:
This product should not be allowed to enter drains, water courses or the soil. Dispose of this material in a safe manner and in accordance with federal, state and local regulations

Contaminated packaging:
Disposal must be made in accordance with official federal, state and local regulations.

14 Transport information

DOT
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

IATA
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

IMDG
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

TDG
UN number: UN2735
Proper Shipping Name: AMINES, LIQUID, CORROSIVE, N.O.S. (Diethylenetriamine, Polyamide)
Hazard Class: 8
Packing Group: II
Labels(s): 8
Marine Pollutant: No

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Toxic Substance Control Act (TSCA) 12(b) Component(s): None.

Country Regulatory list Notification
USA TSCA Included on Inventory.
EU EINECS Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada DSL Included on Inventory.
Australia AICS Included on Inventory.
Japan ENCS Included on Inventory.
South Korea ECL Included on Inventory.
China SEPA Included on Inventory.
Philippines PICCS Included on Inventory.

SARA
Section 355 (extremely hazardous substances):
None of the ingredients is listed.
Section 313 (Specific toxic chemical listings):
Component(s) above ‘de minimus’ level: Phenol, 4,4’-(1-methyllethylidene)bis-
TSCA (Toxic Substances Control Act): All the ingredients are listed.

Proposition 65 (California):
Chemicals known to cause cancer: None

15.2 Chemical Safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Abbreviation and acronyms:
ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labeling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienist
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substance
1.1 Product identifier
Trade name: Armor-Hard HDR
Article number: Armor-Hard HDR (Part C)

1.2 Application of the substance / the mixture: Epoxy aggregate filler

1.3 Details of the supplier of the Safety Data Sheet
Manufacturer/Supplier:
Metzger/McGuire Co.
P. O. Box 2217
Concord, NH 03302
Telephone: (800) 223-6680

1.4 Emergency telephone number:
(800) 255-3924 24 hrs. (Continental U.S.)
(813) 248-0585 24 hrs. (Outside Continental U.S.)

2.1 GHS Classification of the substance or mixture
Category 1A Carcinogen
Category 1 Specific Target Organ Toxicity (STOT) following repeated exposures
Category 2B Eye Irritation

2.2 GHS Label elements
Hazard pictograms/symbols

Signal word: Danger

Hazard statements:
H320: Causes eye irritation
H372: Causes damage to lungs, kidneys and autoimmune system through prolonged or repeated exposure by inhalation.
H350: May cause cancer by inhalation

Precautionary Statements:
P202: Do not handle until all safety precautions have been read and understood.
P260: Do not breathe dust.
P264: Wash hands thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.
P281: Use personal protective equipment as required.
P305+P351+P338 :IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
3 Composition/information on ingredients

3.2 Mixture
Description: Substance listed below with potential nonhazardous additions.

<table>
<thead>
<tr>
<th>Substance</th>
<th>CAS:</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica, Quartz, SiO2</td>
<td>14808-60-7</td>
<td>50-100%</td>
</tr>
</tbody>
</table>

4 First aid measures

4.1 Description of first aid measures
After inhalation: If gross inhalation of silica occurs, remove the person to fresh air, perform artificial respiration as needed and obtain medical attention as needed.

After skin contact:
If abrasion occurs wash with soap and water and seek medical attention if irritation persists or develops later.

After eye contact:
Immediately wash the eye with plenty of water for at least 15 minutes, while holding eyelid(s) open. If irritation persists, seek medical attention.

After ingestion:
If gastrointestinal discomfort occurs, give a large quantity of water. Never attempt to make an unconscious person drink or vomit. Seek medical attention.

4.2 Most important symptoms and effects, both acute and delayed:
There are generally no signs or symptoms of exposure to crystalline silica (quartz). Often, chronic silicosis has no symptoms. The symptoms of chronic silicosis, if present, are shortness of breath, wheezing, cough and sputum production. The symptoms of acute silicosis which can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months, are the same as those associated with chronic silicosis; additionally, weight loss and fever may also occur. The symptoms of scleroderma, an autoimmune disease, include thickening and stiffness of the skin, particularly in the fingers, shortness of breath, difficulty swallowing and joint problems.

4.3 Indication of any immediate medical attention and special treatment needed:
No information.

5 Firefighting measures

5.1 Extinguishing Media: Compatible with all media; use the medium appropriate to the surrounding fire.

Unusual Fire and Explosion Habits: None known.

Special Fire Fighting Procedures: None known.
Respiratory protection:

8.2 Engineering controls
Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below appropriate exposure limits.

Other control measures: Respirable dust and quartz levels should be monitored regularly. Dust and quartz levels in excess of appropriate exposure limits should be reduced by all feasible engineering controls, including (but not limited to) dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

8.3 Personal protective equipment

Respiratory protection:
Consult with OSHA regulations, Canadian CCOHS, NIOSH recommendations and other applicable regulatory agencies to determine the appropriate respiratory protection to be worn during use of this product, and use only such recommended respiratory protection equipment. Avoid breathing dust produced during the use and handling of this product. If the workplace airborne crystalline silica concentration is unknown for a given task, conduct air monitoring to determine the appropriate level of respiratory protection to be worn. Consult with a certified industrial hygienist, your insurance risk manager or the OSHA Consultative Services group for detailed information. Ensure appropriate respirators are worn during and following the task, including clean up or whenever airborne dust is present, to ensure worker exposures remain below occupational exposure limits. Provisions should be made for a respiratory protection training program (see 29 CFR 1910.134 – Respiratory Protection for minimum program requirements). See also ANSI standard Z88.2 (latest revision) “American National Standard for Respiratory Protection,” 29 CFR 1910.134 and 1926.103, and 42 CFR 84.

Hand/Skin protection:
Recommended in situations where abrasion from sand may occur.

Eye protection:
Safety glasses with side shields should be worn as minimum protection. Dust goggles should be worn when excessively (visible) dusty conditions are present or are anticipated. There is a potential for severe eye irritation for those wearing contact lenses.

A chronic REL is an airborne level of a chemical to dust suppression (wetting), ventilation, process enclosure, and enclosed employee work stations.

* The OSHA/MSHA PEL for dust containing crystalline silica (quartz) is based on the silica content of the respirable dust sample. The OSHA/MSHA PEL for crystalline silica as tridymite and cristobalite is one-half the PEL for crystalline silica (quartz).

* The ACGIH and NIOSH limits are for crystalline silica (quartz), independent of the dust concentration.

The ACGIH TLV for crystalline silica as cristobalite is equal to the TLV for crystalline silica as quartz. In 2005, ACGIH withdrew the TLV for crystalline silica as tridymite. Refer to Section 10 for thermal stability information for crystalline silica (quartz).

Ventilation: Use local exhaust, general ventilation or natural ventilation adequate to maintain exposures below system injury or illness.

* The TLV provided is for inhalable particles not otherwise specified.

California Inhalation Reference Exposure Limit (REL): The California chronic REL for respirable crystalline silica (quartz, cristobalite, tridymite) is 3 ug/m3. [Dated December 18, 2008] A chronic REL is an airborne level of a chemical at or below which no adverse health effects are anticipated in individuals indefinitely exposed to that level. [Dated 2/10/05]
Safety Data Sheet

Reactivity: Reactive with strong oxidizing agents

Chemical Stability: Stable

Thermal Stability: If crystalline silica (quartz) is heated to more than 870°C (1598°F), it can change to a form of crystalline silica known as tridymite, and if crystalline silica (quartz) is heated to more than 1470°C (2678°F), it can change to a form of crystalline silica known as cristobalite.

Incompatibility: Strong oxidizing agents, such as fluorine, chlorine trifluoride, hydrogen fluoride, oxygen difluoride, hydrogen peroxide, etc.; acetylene and ammonia.

Hazardous Decomposition Products: Silica will dissolve in hydrofluoric acid and produce a corrosive gas – silicon tetrafluoride.

Hazardous Polymerization: Not known to polymerize.

11 Toxicological information

CAUTION: Crystalline silica exists in several forms, the most common of which is quartz. Crystalline silica as tridymite and cristobalite are more fibrogenic than crystalline silica as quartz.

Potential Health Effects:

Primary routes(s) of exposure: Inhalation, Skin, Ingestion

Inhalation:

Acute Effects: One form of silicosis, acute silicosis, can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as 6 months. The symptoms of acute silicosis include (but are not limited to) progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

Chronic Effects: The adverse health effects – lung disease, silicosis, cancer, autoimmune disease, tuberculosis, and nephrotoxicity – are chronic effects.

Eye Contact: Crystalline silica (quartz) may cause abrasion of the cornea.

Skin Contact: May cause abrasion to skin.

Ingestion: No adverse effects expected for incidental ingestion. Ingestion of large amounts may cause gastrointestinal tract irritation.

Medical Conditions Generally Aggravated by Exposure: The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

A. SILICOSIS

The major concern is silicosis (lung disease), caused by the inhalation and retention of respirable crystalline silica dust. Silicosis can exist in several forms, chronic (or ordinary), accelerated or acute.

Chronic or Ordinary Silicosis is the most common form of silicosis and can occur after many years of exposure to levels above the occupational exposure limits for airborne respirable crystalline silica dust. It is further defined as either simple or complicated silicosis.

Simple Silicosis is characterized by lung lesions (shown as radiographic opacities) less than 1 centimeter in diameter, primarily in the upper lung zones. Often, simple silicosis is not associated with symptoms, detectable changes in lung function or disability. Simple silicosis may be progressive and may develop into complicated silicosis or progressive massive fibrosis (PMF).

Complicated Silicosis or PMF is characterized by lung lesions (shown as radiographic opacities) greater than 1 centimeter in diameter. Although there may be no symptoms associated with complicated silicosis or PMF, the symptoms, if present, are shortness of breath, wheezing, cough and sputum production. Complicated silicosis or PMF may be associated with decreased lung function and may be disabling. Advanced complicated silicosis or PMF may lead to death. Advanced complicated silicosis or PMF can result in heart disease (cor pulmonale) secondary to the lung disease.

Accelerated Silicosis can occur with exposure to high concentrations of respirable crystalline silica over a relatively short period; the lung lesions can appear within 5 (5) years of the initial exposure. The progression can be rapid. Accelerated silicosis is similar to chronic or ordinary silicosis, except that the lung lesions appear earlier and the progression is more rapid.

Acute Silicosis can occur with exposures to very high concentrations of respirable crystalline silica over a very short time period, sometimes as short as a few months. The symptoms of acute silicosis include progressive shortness of breath, fever, cough and weight loss. Acute silicosis is fatal.

10. POTENTIAL HEALTH EFFECTS

A. SILICOSIS

The condition of individuals with lung disease (e.g., bronchitis, emphysema, chronic obstructive pulmonary disease) can be aggravated by exposure.

B. CANCER

The International Agency for Research on Cancer ("IARC") concluded that there is "sufficient evidence in humans for the carcinogenicity of crystalline silica in the form of quartz or cristobalite", there is "sufficient evidence in experimental animals for the carcinogenicity of quartz dust" and that there is "limited evidence in experimental animals for the carcinogenicity of tridymite dust and cristobalite dust." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite dust is carcinogenic to humans (Group 1)." The IARC evaluation noted that not all industrial circumstances studied evidenced carcinogenicity. The monograph also stated that "Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its perfectly.

For further information on the IARC evaluation, see IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Volume 100C, "Silica Dust, Crystalline, in the Form of Quartz or Cristobalite" (2012).

NTP - In its Eleventh Annual Report on Carcinogens, concluded that respirable crystalline silica is known to be a human carcinogen, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to respirable crystalline silica and increased lung cancer rates in workers exposed to crystalline silica dust.

OSHA - Crystalline silica is not on the OSHA carcinogen list.

C. AUTOIMMUNE DISEASES

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis may be associated with the increased incidence of several autoimmune disorders, – scleroderma, systemic lupus erythematosus, rheumatoid arthritis and diseases affecting the kidneys. For a review of the subject, the following may be consulted: (1) "Antinuclear Antibody and Rheumatoid Factor in Silica-Exposed Workers", Arh Hig Rada Toksikol, (60) 185-90 (2009); (2) "Oxidative Sputum in Silica and Autoimmune Disease", Environmental Health Perspectives, (107) Supplement 5, 793-802 (1999); (3) Occupational Scleroderma", Current Opinion in Rheumatology, (11) 490-494 (1999); (4) "Connective Tissue Disease and Silicosis", Am J Ind Med, (35), 375-381 (1999).

D. TUBERCULOSIS


E. KIDNEY DISEASE

There is evidence that exposure to respirable crystalline silica (without silicosis) or that the disease silicosis is associated with the increased incidence of kidney diseases, including and stage renal disease. For additional information on the subject, the following may be consulted: (1) "Mortality from Lung and Kidney Disease in a Cohort of North American Industrial Sand Workers: An Update", Ann Occup Hyg, (49) 367-73 (2005); (2) "Kidney Disease and Silicosis", Nephron, (85) 14-19 (2000);
F. NON-MALIGNANT RESPIRATORY DISEASES

NIOSH has cited the results of studies that report an association between dusts found in various mining operations and non-malignant respiratory disease, particularly among smokers, including bronchitis, emphysema, and small airways disease.


12 Ecological information

Crystalline silica is not known to be ecotoxic.

13 Disposal considerations

13.1 Waste treatment methods

Waste from residue/unused product:
General: Crystalline silica may be landfilled. Material should be placed in covered containers to minimize generation of airborne dust.

Contaminated packaging:
Disposal must be made in accordance with official federal, state and local regulations.

14 Transport information

DOT
Not dangerous goods

IATA
Not dangerous goods

IMDG
Not dangerous goods

TDG
Not dangerous goods

15 Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

OTHER US REGULATORY INFORMATION:

OSHA: Crystalline Silica is not listed as a carcinogen.
SARA Title III: This product is not subject to the reporting requirements of Title III of SARA, 1986
TSCA.: Crystalline silica (quartz) appears on the EPA TSCA inventory under the CAS No. 14808-60-7.
RCRA: Crystalline silica (quartz) is not classified as a hazardous waste under the Resource Conservation and Recovery Act, or its regulations, 40 CFR §261 et seq.
CERCLA: Crystalline silica (quartz) is not classified as a hazardous substance under regulations of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 40 CFR §302.4
EPCRA (Emergency Planning and Community Right to Know Act): Crystalline silica (quartz) is not an extremely hazardous substance under regulations of the Emergency Planning and Community Right to Know Act, 40 CFR Part 355, Appendices A and B and is not a toxic chemical subject to the requirements of Section 313.
Clean Air Act: Crystalline silica (quartz) mined and processed by Badger Mining Corporation was not processed with or does not contain any Class I or Class II ozone depleting substances.
FDA: Silica is included in the list of substances that may be included in coatings used in food contact surfaces, 21 CFR §175.300(b)(3). (The FDA standard primarily applies to products containing silica used in the coatings of food contact surfaces).
California Proposition 65: Respirable crystalline silica (quartz) is classified as a substance known to the state of California to be a carcinogen.
Massachusetts Toxic Use Reduction Act: Respirable crystalline silica is considered toxic per the Massachusetts Toxic Use Reduction Act.
Pennsylvania Worker and Community Right to Know Act: Quartz is considered hazardous for purposes of the Act, but it is not a special hazardous substance or an environmental hazardous substance.

15.2 Chemical Safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Definitions of Acronyms
ACGIH: American Conference of Governmental Industrial Hygienists
ANSI: American National Standards Institute
APF: Assigned Protection Factor
California REL: California Inhalation Reference Exposure Limit
CAS: Chemical Abstracts Service
CCOHS: Canadian Centre for Occupational Health and Safety
CEPA: Canadian Environmental Protection Agency
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act
CPR: US Code of Federal Regulations
CPR: Controlled Products Regulation
DHHS: Department of Health and Human Services
DSL: Domestic Substances List
ECC: European Economic Community Guidelines
EINECS: European Inventory of Existing Commercial Chemical Substances
EPA: Environmental Protection Agency
EPCRA: Emergency Planning and Community Right to Know Act
FDA: Food and Drug Administration
GHS: Globally Harmonized System
HEPA: High-Efficiency Particulate Air
IARC: International Agency for Research on Cancer