

Safety Data Sheet
Prepared in Accordance with HCS 29
C.F.R. 1910.1200



1. Identification of the Substance/Mixture and the Company/Undertaking

- | | | | |
|--|--|-------------------------|------------|
| 1.1 Product Identifier | RM-2500A | Revision Date: | 09/23/2022 |
| Product Name: | Prime Gel 2500 Quick Bond Component A | Supersedes Date: | 11/30/2018 |
| 1.2 Relevant identified uses of the substance or mixture and uses advised against | See Technical Datasheet. Base of 2 component adhesive. Widespread use leading to inclusion into/onto article (outdoor). For use by appropriately trained applicators. Roller application or brushing. Advised against: Home DIY applications. Construction chemical. | | |
| 1.3 Details of the supplier of the safety data sheet | | | |
| Supplier: | Prime Resins Inc. 2291 Plunkett Road Conyers, GA 30012 USA Phone: 800-321-7212 Fax: 770-338-0936 www.primeresins.com | | |
| Datasheet Produced by: | EHS@primeresins.com | | |
| 1.4 Emergency telephone number: | CHEMTREC +001 703 5273887 (Outside US) CHEMTREC 1-800-424-9300 (Inside US) Giftinformasjonen: +47 22 59 13 00 | | |

2. Hazard Identification

2.1 Classification of the substance or mixture

Hazardous to the aquatic environment, Chronic, category 2
 Carcinogenicity, category 2
 Eye Irritation, category 2A
 STOT, single exposure, category 3, RTI
 Skin Irritation, category 2
 Skin Sensitizer, category 1

2.2 Label elements

Symbol(s) of Product



Signal Word

Warning

Named Chemicals on Label

titanium dioxide, Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700)

HAZARD STATEMENTS

| | | |
|---|------|--|
| Skin Irritation, category 2 | H315 | Causes skin irritation. |
| Skin Sensitizer, category 1 | H317 | May cause an allergic skin reaction. |
| Eye Irritation, category 2A | H319 | Causes serious eye irritation. |
| STOT, single exposure, category 3, RTI | H335 | May cause respiratory irritation. |
| Carcinogenicity, category 2 | H351 | Suspected of causing cancer. |
| Hazardous to the aquatic environment, Chronic, category 2 | H411 | Toxic to aquatic life with long lasting effects. |

PRECAUTION PHRASES

| | |
|--------------|---|
| P261 | Avoid breathing dust/fume/gas/mist/vapours/spray. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P284 | Wear respiratory protection. |
| P302+352 | IF ON SKIN: Wash with plenty of soap and water. |
| P304+340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P305+351+338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. |
| P308+313 | IF exposed or concerned: Get medical advice/attention. |
| P333+313 | If skin irritation or rash occurs: Get medical advice/attention. |
| P391 | Collect spillage. |

2.3 Other hazards

Ingestion may cause irritation to mucous membranes.

Results of PBT and vPvB assessment:

The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.

3. Composition/Information On Ingredients

3.2 Mixtures

Hazardous ingredients

| <u>Name According to EEC</u> | <u>EINEC No.</u> | <u>CAS-No.</u> | <u>%</u> | <u>Classifications</u> |
|---|------------------|----------------|----------|---|
| Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700) | 500-033-5 | 25068-38-6 | 75-100 | H315-317-319-335-4 11 Aquatic Chronic 2, Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1, STOT SE 3 RTI |

| | | | | | |
|----------------------------|-----------|-------------|------------|------|---------|
| titanium dioxide | 236-675-5 | 13463-67-7 | 2.5 - <10 | H351 | Carc. 2 |
| hydrated, amorphous silica | | 112926-00-8 | 1.0 - <2.5 | | |

| <u>CAS-No.</u> | <u>M-Factors</u> |
|----------------|------------------|
| 25068-38-6 | 0 |
| 13463-67-7 | 0 |
| 112926-00-8 | 0 |

Additional Information: The text for GHS Hazard Statements shown above (if any) is given in Section 16.

4. First-aid Measures

4.1 Description of First Aid Measures

GENERAL NOTES: When symptoms persist or in all cases of doubt seek medical advice. Show this safety data sheet to the doctor in attendance.

AFTER INHALATION: Remove person to fresh air. If signs/symptoms continue, get medical attention.

AFTER SKIN CONTACT: Use a mild soap if available. Do not use solvent or thinners to clean skin. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician.

AFTER EYE CONTACT: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses. If eye irritation persists, consult a specialist.

AFTER INGESTION: Consult a physician. Gently wipe or rinse the inside of the mouth with water. Give small amounts of water to drink. Never give anything by mouth to an unconscious person. If swallowed, DO NOT induce vomiting unless directed to do so by medical personnel.

Self protection of the first aider:

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

May cause sensitization by skin contact. Irritating to eyes and skin.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. No information available on clinical testing and medical monitoring. Specific toxicological information on substances, if available, can be found in section 11.

5. Fire-fighting Measures

5.1 Extinguishing Media:

Carbon Dioxide, Dry Chemical, Foam

FOR SAFETY REASONS NOT TO BE USED: Do not use a solid water stream as it may scatter and spread fire. Alcohol, Alcohol based solutions, any other media not listed above.

5.2 Special hazards arising from the substance or mixture

In case of fire hazardous decomposition products may be produced such as: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke).

5.3 Advice for firefighters

Keep containers and surroundings cool with water spray. In the event of fire, wear self-contained breathing apparatus. Do not use a solid water stream as it may scatter and spread fire. Hazardous decomposition products formed under fire conditions. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes and clothing. For personal protection see section 8.2. Ensure adequate ventilation. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Discharge into the environment must be avoided. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. May cause long-term adverse effects in the aquatic environment.

6.3 Methods and material for containment and cleaning up

Prevent further leakage or spillage if safe to do so. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

6.4 Reference to other sections

Please refer to disposal requirements or country specific disposal requirements for this material. See Section 13 for further information.

7. Handling and Storage**7.1 Precautions for safe handling**

INSTRUCTIONS FOR SAFE HANDLING: People handling epoxy products must have received special training according to guidelines from the National Occupational Health and Safety Board. Wear personal protective equipment. Avoid contact with skin and eyes. Apply technical measures to comply with the occupational exposure limits (see section 8).

PROTECTION AND HYGIENE MEASURES: Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons. In the case of sensitisation to any of the ingredients, it is inadvisable to work with the product. Handle in accordance with good industrial hygiene and safety practice. Keep working clothes separately. Keep away from food, drink and animal feedingstuffs. Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke.

7.2 Conditions for safe storage, including any incompatibilities

CONDITIONS TO AVOID: Avoid temperatures above 40 °C, direct sunlight and contact with sources of heat. Do not freeze.
STORAGE CONDITIONS: Keep out of the reach of children. Keep at temperatures between 10 and 25 °C. Store in original container. Keep container tightly closed in a dry and well-ventilated place. Keep away from food, drink and animal feeding stuffs.

7.3 Specific end use(s)

Component of multicomponent coatings. The mixing and application to be in accordance with the technical data sheets.

8. Exposure Controls/Personal Protection**8.1 Control parameters****Ingredients with Occupational Exposure Limits (US)**

| <u>Name</u> | <u>CAS-No.</u> | <u>ACGIH TWA</u> | <u>ACGIH STEL</u> | <u>ACGIH Ceiling</u> |
|---|----------------|------------------|-------------------|----------------------|
| Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700) | 25068-38-6 | | | |
| titanium dioxide | 13463-67-7 | 10 MGM3 | 10 MGM3 | |
| hydrated, amorphous silica | 112926-00-8 | 10.00 MG/M3 | | |

| <u>Name</u> | <u>CAS-No.</u> | <u>OSHA PEL</u> | <u>OSHA STEL</u> |
|---|----------------|-----------------|------------------|
| Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700) | 25068-38-6 | | |
| titanium dioxide | 13463-67-7 | 15 MGM3 | |
| hydrated, amorphous silica | 112926-00-8 | 6.00 MG/M3 | |

FURTHER INFORMATION: Refer to the regulatory exposure limits for the workforce enforced in each country.

8.2 Exposure controls

Personal Protection

RESPIRATORY PROTECTION: No personal respiratory protective equipment normally required. In case of insufficient ventilation wear suitable respiratory equipment, filter A.

EYE PROTECTION: Eye wash bottle with pure water. Safety glasses with side-shields conforming to EN 166.

HAND PROTECTION: Protective gloves complying with EN 374: Nitrile rubber. Butyl rubber. PVA. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Be aware that in daily use the durability of a chemical resistant protective glove can be notably shorter than the break through time measured according to EN 374, due to the numerous outside influences (e.g. temperature). Long sleeved clothing. Remove and wash contaminated clothing before re-use.

OTHER PROTECTIVE EQUIPMENT: Ensure that eyewash stations and safety showers are close to the workstation location.

ENGINEERING CONTROLS: Ensure adequate ventilation, especially in confined areas.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

| | |
|--|-----------------|
| Appearance: | White paste |
| Physical State | Paste |
| Odor | Slight aromatic |
| Odor threshold | Not determined |
| pH | Not determined |
| Melting point / freezing point (°C) | Not determined |
| Boiling point/range (°C) | N.D. - N.D. |
| Flash Point, (°F / °C) | Not determined |
| Evaporation rate | Not determined |
| Flammability (solid, gas) | Not determined |
| Upper/lower flammability or explosive limits - %(V) | Not determined |
| Vapour Pressure | Not determined |
| Vapour density | Not determined |
| Relative density | 10.11 |
| Solubility in / Miscibility with water | Not determined |
| Partition coefficient: n-octanol/water | Not determined |
| Auto-ignition temperature (°C) | Not determined |
| Decomposition temperature (°C) | Not determined |
| Viscosity | Not determined |
| Explosive properties | Not determined |
| Oxidising properties | Not determined |

9.2 Other information

| | |
|--|----------------|
| VOC Content g/l: | Not determined |
| Specific Gravity (g/cm³) | 0.000 |

10. Stability and Reactivity

10.1 Reactivity

No reactivity hazards known under recommended storage and use conditions.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Amines cause exothermic reactions.

10.4 Conditions to avoid

Avoid temperatures above 40 °C, direct sunlight and contact with sources of heat. Do not freeze.

10.5 Incompatible materials

Oxidizing agents. Acids and bases.

10.6 Hazardous decomposition products

In case of fire hazardous decomposition products may be produced such as: Carbon monoxide, carbon dioxide and unburned hydrocarbons (smoke). No decomposition if stored and applied as directed.

11. Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity:

Oral LD50: No information available.

Inhalation LC50: No information available.

Irritation: No information available.

Corrosivity: No information available.

Sensitization: No information available.

Repeated dose toxicity: No information available.

Carcinogenicity: No information available.

Mutagenicity: No information available.

Toxicity for reproduction: No information available.

STOT-single exposure: No information available.

STOT-repeated exposure: No information available.

Aspiration hazard: No information available.

If no information is available above under Acute Toxicity then the acute effects of this product have not been tested.
Data on individual components are tabulated below:

| <u>CAS-No.</u> | <u>Chemical Name</u> | <u>Oral LD50</u> | <u>Dermal LD50</u> | <u>Vapor LC50</u> | <u>Gas LC50</u> | <u>Dust/Mist LC50</u> |
|----------------|---|------------------------|--------------------|-------------------|-----------------|-----------------------|
| 25068-38-6 | Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700) | >2000 mg/kg, rat, oral | >2000 mg/kg, rat | | 0.000 | 0.000 |

13463-67-7 titanium dioxide

10000 mg/kg,
oral (rat)

0.000

6,82 mg/l (rat)
4h**Additional Information:**

In the case of sensitisation to any of the ingredients, it is inadvisable to work with the product. Ingestion may cause irritation to mucous membranes. Irritating to eyes and skin. May cause allergic skin reaction. Constituents of this product may include crystalline silica which, if inhalable, may cause silicosis, a form of progressive pulmonary fibrosis. Inhalable crystalline silica is listed by IARC as a group I carcinogen (lung) based on sufficient evidence in occupationally exposed humans and sufficient evidence in animals. Crystalline silica is also listed by the NTP as a known human carcinogen. Constituents may also contain asbestiform or non-asbestiform tremolite or other silicates as impurities, and above de minimus exposure to these impurities in inhalable form may be carcinogenic or cause other serious lung problems. This product may contain Titanium Dioxide, which is listed by IARC as possibly carcinogenic to humans (Group 2B). This listing is based on inadequate evidence of carcinogenicity in humans and sufficient evidence in experimental animals. This classification is relevant when exposed to titanium dioxide in dust or powder form only, including cured product that is subject to sanding, grinding, cutting, or other surface preparation activities.

12. Ecological Information

12.1 Toxicity:

| | |
|----------------------|----------------|
| EC50 48hr (Daphnia): | No information |
| IC50 72hr (Algae): | No information |
| LC50 96hr (fish): | No information |

12.2 Persistence and degradability: No information**12.3 Bioaccumulative potential:** No information**12.4 Mobility in soil:** No information**12.5 Results of PBT and vPvB assessment:** The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.**12.6 Other adverse effects:** No information

| <u>CAS-No.</u> | <u>Chemical Name</u> | <u>EC50 48hr</u> | <u>IC50 72hr</u> | <u>LC50 96hr</u> |
|----------------|---|---|------------------|------------------|
| 25068-38-6 | Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700) | 1.8 mg/l | No information | 1.5-7.7 mg/L |
| 13463-67-7 | titanium dioxide | >100 mg/l (EC50, 48h, Daphnia magna OECD202)ation | No information | >1000 mg/l |
| 112926-00-8 | hydrated, amorphous silica | No information | No information | |

13. Disposal Considerations

13.1 WASTE TREATMENT METHODS: Dispose of waste material at an approved hazardous waste treatment/disposal facility in accordance with applicable local state, and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems. Contaminated packaging to be disposed of as product. Fully drained containers which are drop- and scrape-free can be treated as industrial waste, and can possibly be recycled. Empty containers should be taken to an approved waste handling site for recycling or disposal. The product should not be allowed to enter drains, water courses or the soil.

14. Transport Information

| | | |
|------|--|---|
| 14.1 | UN number | UN3082 |
| 14.2 | UN proper shipping name | Environmentally hazardous substance, liquid, n.o.s. |
| | Technical name | Epoxy resin |
| 14.3 | Transport hazard class(es) | 9 |
| | Subsidiary shipping hazard | Not applicable |
| 14.4 | Packing group | III |
| 14.5 | Environmental hazards | Yes (Epoxy resin) |
| 14.6 | Special precautions for user | Not applicable |
| | EmS-No.: | Not applicable |
| 14.7 | Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code | Not applicable |

15. Regulatory Information

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

U.S. Federal Regulations: As follows -

CERCLA - Sara Hazard Category

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Carcinogenicity, Skin Corrosion or Irritation, Respiratory or Skin Sensitization, Serious eye damage or eye irritation, Specific target organ toxicity (single or repeated exposure)

Sara Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the U.S. Superfund Amendment and Reauthorization Act (SARA) of 1986 and 40 CFR part 372:

No SARA 313 substances exist in this product above de minimis concentrations.

Toxic Substances Control Act:

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

No TSCA 12(b) components exist in this product.

U.S. Clean Air Act:

| | |
|------------------------------|----------------|
| EPA Coating Category: | Not applicable |
| EPA VOC Content Limit (g/l): | Not determined |
| Product VOC Content (g/l) | Not applicable |
| Thinning Recommendations: | Not applicable |
| Application Recommendations: | Not applicable |

* As per the federal EPA definition for coating categories in 40 CFR 59.401.

** Grams of VOC per liter of coating product as applied (mixture of Part A and Part B) per ASTM D2369 Method E.

U.S. State Regulations: As follows -**New Jersey Right-to-Know:**

The following materials are non-hazardous, but are among the top five components in this product.

| <u>Chemical Name</u> | <u>CAS-No.</u> |
|-----------------------------|----------------|
| hydrophobic silicon dioxide | 67762-90-7 |
| No Chemical Name Found | |

Pennsylvania Right-To-Know

The following non-hazardous ingredients are present in the product at greater than 3%.

| <u>Chemical Name</u> | <u>CAS-No.</u> |
|-----------------------------|----------------|
| hydrophobic silicon dioxide | 67762-90-7 |

California Proposition 65:

WARNING: Cancer - www.P65Warnings.ca.gov

WARNING: Reproductive Toxicant -- www.P65Warnings.ca.gov

International Regulations: As follows -*** Canadian DSL:**

All chemical ingredients included on inventory or exempt.

15.2 Chemical Safety Assessment:

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

16. Other Information**Text for GHS Hazard Statements shown in Section 3 describing each ingredient:**

| | |
|------|--------------------------------------|
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H319 | Causes serious eye irritation. |
| H335 | May cause respiratory irritation. |

H351 Suspected of causing cancer.
 H411 Toxic to aquatic life with long lasting effects.

Reasons for revision

Revision Description Changed
 Substance and/or Product Properties Changed in Section(s):
 01 - Identification
 08 - Exposure Controls/Personal Protection
 11 - Toxicological Information
 14 - Transportation Information
 15 - Regulatory Information
 Revision Statement(s) Changed

List of References:

This Safety Data Sheet was compiled with data and information from the following sources:

The Ariel Regulatory Database provided by the 3E Corporation in Copenhagen, Denmark;
 European Union Commission Regulation No. 1907/2006 on REACH as amended within Commission Regulation (EU) 2015/830;
 European Union (EC) Regulation No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) and subsequent technical progress adaptations (ATP);
 EU Council Decision 2000/532/EC and its Annex entitled "List of Wastes".

Acronym & Abbreviation Key:

| | |
|--------|--|
| CLP | Classification, Labeling & Packaging Regulation |
| EC | European Commission |
| EU | European Union |
| US | United States |
| CAS | Chemical Abstract Service |
| EINECS | European Inventory of Existing Chemical Substances |
| REACH | Registration, Evaluation, Authorization of Chemicals Regulation |
| GHS | Globally Harmonized System of Classification and Labeling of Chemicals |
| LTEL | Long term exposure limit |
| STEL | Short term exposure limit |
| OEL | Occupational exposure limit |
| ppm | Parts per million |
| mg/m3 | Milligrams per cubic meter |
| TLV | Threshold Limit Value |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| OSHA | Occupational Safety & Health Administration |
| PEL | Permissible Exposure Limits |
| VOC | Volatile organic compounds |
| g/l | Grams per liter |
| mg/kg | Milligrams per kilogram |
| N/A | Not applicable |
| LD50 | Lethal dose at 50% |
| LC50 | Lethal concentration at 50% |
| EC50 | Half maximal effective concentration |
| IC50 | Half maximal inhibitory concentration |
| PBT | Persistent bioaccumulative toxic chemical |
| vPvB | Very persistent and very bioaccumulative |
| EEC | European Economic Community |
| ADR | International Transport of Dangerous Goods by Road |
| RID | International Transport of Dangerous Goods by Rail |
| UN | United Nations |
| IMDG | International Maritime Dangerous Goods Code |

| | |
|--------|---|
| IATA | International Air Transport Association |
| MARPOL | International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 |
| IBC | International Bulk Container |
| RTI | Respiratory Tract Irritation |
| NE | Narcotic Effects |

For further information, please contact: Technical Services Department

The information on this sheet corresponds to our present knowledge. It is not a specification and it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage, and use of the product. It is not applicable to unusual or non-standard uses of the product or where instructions and recommendations are not followed.

Safety Data Sheet
Prepared in Accordance with HCS 29
C.F.R. 1910.1200



1. Identification of the Substance/Mixture and the Company/Undertaking

- | | | | |
|--|---|-------------------------|------------|
| 1.1 Product Identifier | RM-2500C,B | Revision Date: | 09/23/2022 |
| Product Name: | Prime Gel 2500 Quick Bond Component B | Supersedes Date: | 07/18/2022 |
| 1.2 Relevant identified uses of the substance or mixture and uses advised against | Epoxy Hardener. Hardener of 2 component adhesive. Advised against: Home DIY applications. Construction chemical. Please see Technical Data Sheet. | | |
| 1.3 Details of the supplier of the safety data sheet | | | |
| Supplier: | Prime Resins Inc. 2291 Plunkett Road Conyers, GA 30012 USA Phone: 800-321-7212 Fax: 770-338-0936 www.primeresins.com | | |
| Datasheet Produced by: | EHS@primeresins.com | | |
| 1.4 Emergency telephone number: | CHEMTREC +001 703 5273887 (Outside US) CHEMTREC 1-800-424-9300 (Inside US) Giftnformasjonen: +47 22 59 13 00 | | |

2. Hazard Identification

2.1 Classification of the substance or mixture

Hazardous to the aquatic environment, Chronic, category 2
 Reproductive Toxicity, category 2
 Skin Corrosion, category 1
 Skin Sensitizer, category 1

2.2 Label elements**Symbol(s) of Product****Signal Word**

Danger

Named Chemicals on Label

2-piperazin-1-ylethylamine, Fatty acids, tall-oil, reaction products with tetraethylenepentamine, 4-nonylphenol, branched

HAZARD STATEMENTS

| | | |
|---|--------|--|
| Skin Corrosion, category 1 | H314-1 | Causes severe skin burns and eye damage. |
| Skin Sensitizer, category 1 | H317 | May cause an allergic skin reaction. |
| Reproductive Toxicity, category 2 | H361 | Suspected of damaging fertility or the unborn child. |
| Hazardous to the aquatic environment, Chronic, category 2 | H411 | Toxic to aquatic life with long lasting effects. |

PRECAUTION PHRASES

| | |
|--------------|---|
| P260 | Do not breathe dust/fume/gas/mist/vapours/spray. |
| P264 | Wash hands thoroughly after handling. |
| P273 | Avoid release to the environment. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection. |
| P284 | Wear respiratory protection. |
| P301+310 | IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. |
| P301+330+331 | IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. |
| P302+352 | IF ON SKIN: Wash with plenty of soap and water. |
| P303+361+353 | IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. |
| P304+340 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. |
| P305+351+338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do so. Continue rinsing. |
| P308+313 | IF exposed or concerned: Get medical advice/attention. |
| P333+313 | If skin irritation or rash occurs: Get medical advice/attention. |
| P363 | Wash contaminated clothing before reuse. |
| P391 | Collect spillage. |

2.3 Other hazards

No Information

Results of PBT and vPvB assessment:

The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.

3. Composition/Information On Ingredients**3.2 Mixtures****Hazardous ingredients**

| <u>Name According to EEC</u> | <u>EINEC No.</u> | <u>CAS-No.</u> | <u>%</u> | <u>Classifications</u> |
|------------------------------|------------------|----------------|----------|------------------------|
|------------------------------|------------------|----------------|----------|------------------------|

| | | | | | |
|--|-----------|-------------|------------|--------------------------|--|
| 4-nonylphenol, branched | 284-325-5 | 84852-15-3 | 10 - <25 | H302-314-361-400-4 10 | Acute Tox. 4 Oral, Aquatic Acute 1, Aquatic Chronic 1, Repr. 2, Skin Corr. 1 |
| 2,4,6-tris (dimethylaminomethyl) phenol | 202-013-9 | 90-72-2 | 2.5 - <10 | H302-312-314 | Acute Tox. 4 Dermal, Acute Tox. 4 Oral, Skin Corr. 1 |
| 2-piperazin-1-ylethylamine | 205-411-0 | 140-31-8 | 2.5 - <10 | H290-311-314-317-4 12 | Acute Tox. 3 Dermal, Aquatic Chronic 3, Met. Corr. 1, Skin Corr. 1, Skin Sens. 1 |
| Fatty acids, tall-oil, reaction products with tetraethylenepentamine | 273-201-6 | 68953-36-6 | 2.5 - <10 | H314-317-400-410 | Aquatic Acute 1, Aquatic Chronic 1, Skin Corr. 1, Skin Sens. 1 |
| hydrated, amorphous silica | | 112926-00-8 | 1.0 - <2.5 | | |
| carbon black | | 1333-86-4 | 0.1 - <1.0 | H332-351 | Acute Tox. 4 Inhalation, Carc. 2 |

| <u>CAS-No.</u> | <u>M-Factors</u> |
|----------------|------------------|
| 84852-15-3 | 0 |
| 90-72-2 | 0 |
| 140-31-8 | 0 |
| 68953-36-6 | 0 |
| 112926-00-8 | 0 |
| 1333-86-4 | 0 |

Additional Information: The text for GHS Hazard Statements shown above (if any) is given in Section 16.

4. First-aid Measures

4.1 Description of First Aid Measures

GENERAL NOTES: Show this safety data sheet to the doctor in attendance.

AFTER INHALATION: Move to fresh air. Provide fresh air, rest and warmth. Call a physician immediately. Give oxygen or artificial respiration if needed. When risk of unconsciousness, place and transport the victim in secured recovery position.

AFTER SKIN CONTACT: Use a mild soap if available. Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty. Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. If skin irritation persists, call a physician. Do not use solvent or thinners to clean skin.

AFTER EYE CONTACT: Immediate medical attention is required. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses.

AFTER INGESTION: If vomiting occurs spontaneously: Keep head below hips to prevent aspiration of stomach vomit into lungs. Provide fresh air, rest and warmth. Do not induce vomiting. Get immediate medical attention. Never give anything by mouth to an unconscious person.

Self protection of the first aider:

No action shall be taken involving any personal risk or without suitable training. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Causes burns. Irritating to skin. May cause sensitization by skin contact. Harmful by inhalation and if swallowed. Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically. Immediate medical attention is required. No information available on clinical testing and medical monitoring. Specific toxicological information on substances, if available, can be found in section 11. When symptoms persist or in all cases of doubt seek medical advice.

5. Fire-fighting Measures

5.1 Extinguishing Media:

Carbon Dioxide, Dry Chemical, Foam

FOR SAFETY REASONS NOT TO BE USED: Alcohol, Alcohol based solutions, any other media not listed above. Do not use a solid water stream as it may scatter and spread fire.

5.2 Special hazards arising from the substance or mixture

Heating or fire conditions liberates toxic gas. As the product contains combustible organic components, fire will produce dense black smoke containing hazardous products of combustion (see section 10). Vapours may form explosive mixtures with air. Solvent vapours are heavier than air and may spread along floors and ignite.

5.3 Advice for firefighters

In the event of fire, wear self-contained breathing apparatus. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Keep containers and surroundings cool with water spray.

6. Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Use personal protective equipment. Remove all sources of ignition.

6.2 Environmental precautions

Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Do not let product enter drains. Prevent further leakage or spillage if safe to do so. Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13). Clean with detergents. Avoid solvents.

6.4 Reference to other sections

Please refer to disposal requirements or country specific disposal requirements for this material. See Section 13 for further information.

7. Handling and Storage

7.1 Precautions for safe handling

INSTRUCTIONS FOR SAFE HANDLING: Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. Electrical equipment should be protected to the appropriate standard. Use only in area provided with appropriate exhaust ventilation. Provide sufficient air exchange and/or exhaust in work rooms. Wear personal protective equipment. Open drum carefully as content may be under pressure. Do not breathe vapours or spray mist. Use only explosion-proof equipment. Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this preparation is being used. Apply technical measures to comply with the occupational exposure limits (see section 8).

PROTECTION AND HYGIENE MEASURES: Wash hands before breaks and at the end of workday. When using, do not eat, drink or smoke.

7.2 Conditions for safe storage, including any incompatibilities

CONDITIONS TO AVOID: Avoid heat, sparks, flames and other ignition sources.

STORAGE CONDITIONS: Store in original container. Keep locked up or in an area accessible only to qualified or authorised persons. Keep container closed. Store in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. Store away from: oxidising materials, acids, and alkalis. Store in upright position only. Storage of corrosive material.

7.3 Specific end use(s)

No specific advice for end use available.

8. Exposure Controls/Personal Protection

8.1 Control parameters

Ingredients with Occupational Exposure Limits (US)

| <u>Name</u> | <u>CAS-No.</u> | <u>ACGIH TWA</u> | <u>ACGIH STEL</u> | <u>ACGIH Ceiling</u> |
|--|----------------|------------------|-------------------|----------------------|
| 4-nonylphenol, branched | 84852-15-3 | | | |
| 2,4,6-tris(dimethylaminomethyl)phenol | 90-72-2 | | | |
| 2-piperazin-1-ylethylamine | 140-31-8 | | | |
| Fatty acids, tall-oil, reaction products with tetraethylenepentamine | 68953-36-6 | | | |
| hydrated, amorphous silica | 112926-00-8 | 10.00 MG/M3 | | |
| carbon black | 1333-86-4 | 3 MGM3 | | |

| <u>Name</u> | <u>CAS-No.</u> | <u>OSHA PEL</u> | <u>OSHA STEL</u> |
|--|----------------|-----------------|------------------|
| 4-nonylphenol, branched | 84852-15-3 | | |
| 2,4,6-tris(dimethylaminomethyl)phenol | 90-72-2 | | |
| 2-piperazin-1-ylethylamine | 140-31-8 | | |
| Fatty acids, tall-oil, reaction products with tetraethylenepentamine | 68953-36-6 | | |
| hydrated, amorphous silica | 112926-00-8 | 6.00 MG/M3 | |
| carbon black | 1333-86-4 | 3.5 MGM3 | |

FURTHER INFORMATION: Refer to the regulatory exposure limits for the workforce enforced in each country.

8.2 Exposure controls

Personal Protection

RESPIRATORY PROTECTION: Use compressed air or fresh air breathing apparatus in closed compartments. Wear respiratory protection with combination filter (dust and gas filter, EN 14387:2004+A1:2008) during spraying operations: Gas filter type A2 (organic substances). Dust filter P3 (for fine dust).

EYE PROTECTION: Face-shield. Safety glasses with side-shields conforming to EN 166.

HAND PROTECTION: Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). Be aware that in daily use the durability of a chemical resistant protective glove can be notably shorter than the break through time measured according to EN 374, due to the numerous outside influences (e.g. temperature). Long sleeved clothing. Remove and wash contaminated clothing before re-use. Use chemical resistant gloves and lotions and barrier creams to prevent drying of the skin. Protective gloves complying with EN 374: Butyl rubber. Nitril rubber. Use chemical resistant gloves (EN 374): Butyl rubber. Protective gloves complying with EN 374: Neoprene. Nitrile rubber. Recommended glove material for mixed product: Protective gloves complying with EN 374: Butyl rubber. Nitril rubber.

OTHER PROTECTIVE EQUIPMENT: Ensure that eyewash stations and safety showers are close to the workstation location.

ENGINEERING CONTROLS: Ensure adequate ventilation, especially in confined areas.

9. Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

| | |
|-----------------------|-------------|
| Appearance: | Black paste |
| Physical State | Paste |

| | |
|--|----------------|
| Odor | Sulfur |
| Odor threshold | Not determined |
| pH | Not determined |
| Melting point / freezing point (°C) | Not determined |
| Boiling point/range (°C) | 220 - N.D. |
| Flash Point, (°F / °C) | Not determined |
| Evaporation rate | Not determined |
| Flammability (solid, gas) | Not determined |
| Upper/lower flammability or explosive limits - %(V) | Not determined |
| Vapour Pressure | Not determined |
| Vapour density | Not determined |
| Relative density | 1.13 |
| Solubility in / Miscibility with water | Not determined |
| Partition coefficient: n-octanol/water | Not determined |
| Auto-ignition temperature (°C) | Not determined |
| Decomposition temperature (°C) | Not determined |
| Viscosity | Not determined |
| Explosive properties | Not determined |
| Oxidising properties | Not determined |
| 9.2 Other information | |
| VOC Content g/l: | Not determined |
| Specific Gravity (g/cm³) | 1.130 |

10. Stability and Reactivity

10.1 Reactivity

No reactivity hazards known under normal storage and use conditions. No reactivity hazards known under recommended storage and use conditions.

10.2 Chemical stability

Stable under recommended storage conditions. Stable under normal conditions.

10.3 Possibility of hazardous reactions

No reactivity hazards known under recommended storage and use conditions. No reactivity hazards known under normal storage and use conditions.

10.4 Conditions to avoid

Avoid heat, sparks, flames and other ignition sources.

10.5 Incompatible materials

Strong oxidizing agents. Keep away from strong oxidising agents and strongly acid or alkaline materials.

10.6 Hazardous decomposition products

In case of fire or hot work operations, hazardous decomposition products may be formed such as: Carbon monoxide (CO), carbon dioxide (CO₂), oxides of nitrogen (NO_x). Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), aliphatic amines, aldehydes. Carbon dioxide (CO₂), carbon monoxide (CO), oxides of nitrogen (NO_x), aliphatic amines, aldehydes, cyanides.

11. Toxicological Information

11.1 Information on toxicological effects

Acute Toxicity:

Oral LD50: No information available.

Inhalation LC50: No information available.

Irritation: No information available.

Corrosivity: No information available.

Sensitization: No information available.

Repeated dose toxicity: No information available.

Carcinogenicity: No information available.

Mutagenicity: No information available.

Toxicity for reproduction: No information available.

STOT-single exposure: No information available.

STOT-repeated exposure: No information available.

Aspiration hazard: No information available.

If no information is available above under Acute Toxicity then the acute effects of this product have not been tested. Data on individual components are tabulated below:

| <u>CAS-No.</u> | <u>Chemical Name</u> | <u>Oral LD50</u> | <u>Dermal LD50</u> | <u>Vapor LC50</u> | <u>Gas LC50</u> | <u>Dust/Mist LC50</u> |
|----------------|--|---------------------------|--------------------|-------------------|-----------------|-----------------------|
| 84852-15-3 | 4-nonylphenol, branched | 580 mg/kg oral rat | | | 0.000 | 0.000 |
| 90-72-2 | 2,4,6-tris(dimethylaminomethyl) phenol | 1000 mg/kg oral | 1280 mg/kg | | 0.000 | 0.000 |
| 140-31-8 | 2-piperazin-1-ylethylamine | 2108 mg/kg, oral, rat | 866 mg/kg rabbit | | 0.000 | 0.000 |
| 68953-36-6 | Fatty acids, tall-oil, reaction products with tetraethylenepentamine | 4750 mg/kg oral, rat | 8550 | | 0.000 | 0.000 |
| 1333-86-4 | carbon black | >15400 mg/kg oral, rat | | | 0.000 | 3.6 |

Additional Information:

Corrosive - causes irreversible eye damage. Constituents of this product may include crystalline silica which, if inhalable, may cause silicosis, a form of progressive pulmonary fibrosis. Inhalable crystalline silica is listed by IARC as a group I carcinogen (lung) based on sufficient evidence in occupationally exposed humans and sufficient evidence in animals. Crystalline silica is also listed by the NTP as a known human carcinogen. Constituents may also contain asbestiform or non-asbestiform tremolite or other silicates as impurities, and above de minimus exposure to these impurities in inhalable form may be carcinogenic or cause other serious lung problems. Chronic exposure has been associated with various neurotoxic effects including permanent brain damage. Chronic exposure causes drying effect on the skin and eczema. Inhalation of vapour or mist can cause headache, nausea, irritation of nose, throat, and lungs. Repeated or prolonged skin contact may cause allergic reactions with susceptible persons. Corrosive to skin.

12. Ecological Information

- 12.1 **Toxicity:**
- | | |
|----------------------|----------------|
| EC50 48hr (Daphnia): | No information |
| IC50 72hr (Algae): | No information |
| LC50 96hr (fish): | No information |
- 12.2 **Persistence and degradability:** No information
- 12.3 **Bioaccumulative potential:** No information
- 12.4 **Mobility in soil:** No information
- 12.5 **Results of PBT and vPvB assessment:** The product does not meet the criteria for PBT/VPvB in accordance with Annex XIII.
- 12.6 **Other adverse effects:** No information

| <u>CAS-No.</u> | <u>Chemical Name</u> | <u>EC50 48hr</u> | <u>IC50 72hr</u> | <u>LC50 96hr</u> |
|----------------|--|------------------|------------------|------------------|
| 84852-15-3 | 4-nonylphenol, branched | .035 mg/L | .0563 mg/L | .1383 mg/l |
| 90-72-2 | 2,4,6-tris(dimethylaminomethyl)phenol | No information | No information | |
| 140-31-8 | 2-piperazin-1-ylethylamine | 58 mg/l | >1000 mg/L | 2190 mg/l |
| 68953-36-6 | Fatty acids, tall-oil, reaction products with tetraethylenepentamine | No information | No information | |
| 112926-00-8 | hydrated, amorphous silica | No information | No information | |
| 1333-86-4 | carbon black | No information | No information | |

13. Disposal Considerations

- 13.1 **WASTE TREATMENT METHODS:** Do not burn, or use a cutting torch on, the empty drum. According to the European Waste Catalogue, Waste Codes are not product specific, but application specific. Empty containers should be taken to an approved waste handling site for recycling or disposal. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local state, and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

14. Transport Information

- 14.1 **UN number** UN1760
- 14.2 **UN proper shipping name** Corrosive liquids, n.o.s.
- Technical name** Aliphatic amines, Alkylphenol
- 14.3 **Transport hazard class(es)** 8
- Subsidiary shipping hazard** Not applicable
- 14.4 **Packing group** PG II
- 14.5 **Environmental hazards** Yes (Nonylphenol)
- 14.6 **Special precautions for user** Not applicable
- EmS-No.:** Not applicable
- 14.7 **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code** Not applicable

15. Regulatory Information

15.1 Safety, health and environmental regulations/legislation for the substance or mixture:**U.S. Federal Regulations: As follows -****CERCLA - Sara Hazard Category**

This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

Reproductive toxicity, Skin Corrosion or Irritation, Respiratory or Skin Sensitization

Sara Section 313:

This product contains the following substances subject to the reporting requirements of Section 313 of Title III of the U.S. Superfund Amendment and Reauthorization Act (SARA) of 1986 and 40 CFR part 372:

| <u>Chemical Name</u> | <u>CAS-No.</u> | <u>%</u> |
|-------------------------|----------------|----------|
| 4-nonylphenol, branched | 84852-15-3 | 12.46 |

Toxic Substances Control Act:

This product contains the following chemical substances subject to the reporting requirements of TSCA 12(B) if exported from the United States:

No TSCA 12(b) components exist in this product.

U.S. Clean Air Act:

| | |
|------------------------------|----------------|
| EPA Coating Category: | Not applicable |
| EPA VOC Content Limit (g/l): | Not determined |
| Product VOC Content (g/l) | Not applicable |
| Thinning Recommendations: | Not applicable |
| Application Recommendations: | Not applicable |

* As per the federal EPA definition for coating categories in 40 CFR 59.401.

** Grams of VOC per liter of coating product as applied (mixture of Part A and Part B) per ASTM D2369 Method E.

U.S. State Regulations: As follows -**New Jersey Right-to-Know:**

The following materials are non-hazardous, but are among the top five components in this product.

| <u>Chemical Name</u> | <u>CAS-No.</u> |
|-----------------------------|----------------|
| Proprietary ingredient | |
| hydrophobic silicon dioxide | 67762-90-7 |

Pennsylvania Right-To-Know

The following non-hazardous ingredients are present in the product at greater than 3%.

| <u>Chemical Name</u> | <u>CAS-No.</u> |
|---|----------------|
| Proprietary ingredient hydrophobic silicon dioxide | 67762-90-7 |

California Proposition 65:

WARNING: Cancer - www.P65Warnings.ca.gov

No Proposition 65 Reproductive Toxins exist in this product.

International Regulations: As follows -*** Canadian DSL:**

All chemical ingredients included on inventory or exempt.

15.2 Chemical Safety Assessment:

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

16. Other Information**Text for GHS Hazard Statements shown in Section 3 describing each ingredient:**

| | |
|------|---|
| H290 | May be corrosive to metals. |
| H302 | Harmful if swallowed. |
| H311 | Toxic in contact with skin. |
| H312 | Harmful in contact with skin. |
| H314 | Causes severe skin burns and eye damage. |
| H317 | May cause an allergic skin reaction. |
| H332 | Harmful if inhaled. |
| H351 | Suspected of causing cancer. |
| H361 | Suspected of damaging fertility or the unborn child. |
| H400 | Very toxic to aquatic life. |
| H410 | Very toxic to aquatic life with long lasting effects. |
| H412 | Harmful to aquatic life with long lasting effects. |

Reasons for revision

Substance and/or Product Properties Changed in Section(s):

- 01 - Identification
- 08 - Exposure Controls/Personal Protection
- 14 - Transportation Information
- 15 - Regulatory Information

Revision Statement(s) Changed

This is a new Safety Data Sheet (SDS).

List of References:

This Safety Data Sheet was compiled with data and information from the following sources:

The Ariel Regulatory Database provided by the 3E Corporation in Copenhagen, Denmark;
 European Union Commission Regulation No. 1907/2006 on REACH as amended within Commission Regulation (EU) 2015/830;
 European Union (EC) Regulation No. 1272/2008 on the classification, labelling and packaging of substances and mixtures (CLP Regulation) and subsequent technical progress adaptations (ATP);
 EU Council Decision 2000/532/EC and its Annex entitled "List of Wastes".

Acronym & Abbreviation Key:

| | |
|-------------------|---|
| CLP | Classification, Labeling & Packaging Regulation |
| EC | European Commission |
| EU | European Union |
| US | United States |
| CAS | Chemical Abstract Service |
| EINECS | European Inventory of Existing Chemical Substances |
| REACH | Registration, Evaluation, Authorization of Chemicals Regulation |
| GHS | Globally Harmonized System of Classification and Labeling of Chemicals |
| LTEL | Long term exposure limit |
| STEL | Short term exposure limit |
| OEL | Occupational exposure limit |
| ppm | Parts per million |
| mg/m ³ | Milligrams per cubic meter |
| TLV | Threshold Limit Value |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| OSHA | Occupational Safety & Health Administration |
| PEL | Permissible Exposure Limits |
| VOC | Volatile organic compounds |
| g/l | Grams per liter |
| mg/kg | Milligrams per kilogram |
| N/A | Not applicable |
| LD50 | Lethal dose at 50% |
| LC50 | Lethal concentration at 50% |
| EC50 | Half maximal effective concentration |
| IC50 | Half maximal inhibitory concentration |
| PBT | Persistent bioaccumulative toxic chemical |
| vPvB | Very persistent and very bioaccumulative |
| EEC | European Economic Community |
| ADR | International Transport of Dangerous Goods by Road |
| RID | International Transport of Dangerous Goods by Rail |
| UN | United Nations |
| IMDG | International Maritime Dangerous Goods Code |
| IATA | International Air Transport Association |
| MARPOL | International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978 |
| IBC | International Bulk Container |
| RTI | Respiratory Tract Irritation |
| NE | Narcotic Effects |

For further information, please contact: Technical Services Department

The information on this sheet corresponds to our present knowledge. It is not a specification and it does not guarantee specific properties. The information is intended to provide general guidance as to health and safety based upon our knowledge of the handling, storage, and use of the product. It is not applicable to unusual or non-standard uses of the product or where instructions and recommendations are not followed.

