1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY UNDERTAKING

IDENTIFICATION OF THE MIXTURE

TRADE/MATERIAL NAME: Marine Firestop Foam Part A
CHEMICAL NAMES: Proprietary RTV Silicone Foam Part A
SYNONYMS: None
RELEVANT USE of the SUBSTANCE: Sealant
USES ADVISED AGAINST: Other than Relevant Use

SUPPLIER/MANUFACTURER'S NAME (USA/Canada):
Specified Technologies, Inc.
Address: 210 Evans Way,
Somerville, New Jersey 08876
Business Phone: (908) 526-8000 (8:00am to 5:00pm Eastern Standard Time)
Emergency Phone: U.S., Canada: 1-800-255-3924 (24 hrs)
International: +1-813-248-0585 (collect-24 hrs)

NOTE: ALL United States Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards, Canadian WHMIS [Controlled Products Regulations], Mexican NOM018-STPS 2000, SPRING Singapore, and Japanese JIS Z7250 required information is included in appropriate sections based on the U.S. ANSI Z400.1-2010 format. This product has been classified in accordance with the hazard criteria of the countries listed above.

2. HAZARD IDENTIFICATION

Precautionary Statement Codes: Not applicable. Hazard Symbols: Not applicable

3. COMPOSITION and INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS #</th>
<th>Chinese IECSC Inventory</th>
<th>Japanese ENCS #</th>
<th>Korean ECL Inventory #</th>
<th>Taiwan NESCI ECS Inventory</th>
<th>WT%</th>
<th>LABEL ELEMENTS</th>
<th>GHSGHS Hazard Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixture</td>
<td></td>
<td>Balance</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

See Section 16 for full text of Classification

4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES: Contaminated individuals must be taken for medical attention if any adverse effects occur. Remove contaminated clothing and shoes. Take a copy of this SDS to health professional with victim. Wash clothing and thoroughly clean shoes before reuse. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Take a copy of label and SDS to physician or health professional with the contaminated individual.

- **Skin Exposure:** If adverse skin effects occur, discontinue use and flush contaminated area. Seek medical attention if adverse effect occurs after flushing.
- **Inhalation:** If fumes or vapors are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek medical attention if adverse effect continues after removal to fresh air.
- **Eye Exposure:** If this product contaminates the eyes, rinse eyes under gently running water. Use sufficient force to open eyelids and then "roll" eyes while flushing. Minimum flushing is for 20 minutes. The contaminated individual must seek medical attention if any adverse effect continues after rinsing.
- **Ingestion:** If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, DO NOT INDUCE VOMITING. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow. If victim is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: It is currently not known if any pre-existing conditions may be aggravated by overexposures to this product.

INDICATION OF IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT IF NEEDED: Treat symptoms and eliminate exposure.
5. FIRE-FIGHTING MEASURES

FLASH POINT (closed cup): 177°C (350.6°F)

AUTOIGNITION TEMPERATURE: Not available.

FLAMMABLE LIMITS (in air by volume, %): Not available.

FIRE EXTINGUISHING MEDIA: Use extinguishing materials suitable for the surrounding area.

UNSUITABLE FIRE EXTINGUISHING MEDIA: None known.

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is combustible and may ignite if highly heated for a prolonged period or if subjected to direct flame. If involved in a fire, this product will release smoke, acrid vapors and toxic gases (e.g., carbon and metal oxides, per manufacturer). Measurements at temperatures above 150°C in presence of air (oxygen) have shown that small amounts of formaldehyde are formed due to oxidative degradation, per manufacturer.


Explosion Sensitivity to Static Discharge: May be sensitive for concentrated vapors.

SPECIAL PROTECTIVE ACTIONS FOR FIRE-FIGHTERS: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus (SCBA) and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. Water spray can be used to cool fire-exposed containers. Water fog or spray can also be used by trained firefighters to disperse this product’s vapors and to protect personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS AND EMERGENCY PROCEDURES: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666). The atmosphere must at least 19.5 percent Oxygen before non-emergency personnel can be allowed in the area without Self-Contained Breathing Apparatus and fire protection.

PERSONAL PROTECTIVE EQUIPMENT: Proper protective equipment should be used. Use only non-sparking tools and equipment.

Small Spills: Wear rubber gloves, splash goggles, and appropriate body protection.

Large Spills: Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. Minimum level of personal protective equipment for releases in which the level of oxygen is less than 19.5% or is unknown must be Level B: triple-gloves (rubber gloves and nitrile gloves over latex gloves), boots, Tyvek or similar protective clothing, hard hat, and Self-Contained Breathing Apparatus.

METHODS FOR CLEAN-UP AND CONTAINMENT: Spills of this product present minimal hazard.

Small Spills: Small releases can be carefully swept up or cleaned up using a damp sponge or polypads.

Large Spills: Access to the spill area should be restricted. For large spills, dike or otherwise contain spill and sweep-up or vacuum with non-sparking vacuum.

All Spills: Place all spill residue in a double plastic bag or other containment and seal. Close off sewers and take other measures to protect human health and the environment as necessary. Rinse area with soap and water solution and follow with a water rinse. Decontaminate the area thoroughly. Do not mix with wastes from other materials. Dispose of in accordance with applicable Federal, State, and local procedures (see Section 13, Disposal Considerations). For spills on water, contain, minimize dispersion and collect. Dispose of recovered material and report spill per regulatory requirements.

ENVIRONMENTAL PRECAUTIONS: Avoid release to the environment. Run-off water may be contaminated by other materials and should be contained to prevent possible environmental damage.

REFERENCE TO OTHER SECTIONS: See information in Section 8 (Exposure Controls – Personal Protection) and Section 13 (Disposal Considerations) for additional information.
7. HANDLING and USE
PRECAUTIONS FOR SAFE HANDLING: As with all chemicals, avoid getting this material ON YOU or IN YOU. Do not eat, drink, smoke, or apply cosmetics while handling this product. Wash hands thoroughly after handling this product or containers of this product. Avoid breathing fumes or vapors generated by this product. Use in a well-ventilated location.

CONDITIONS FOR SAFE STORAGE: Store containers in a cool, dry location, away from direct sunlight, sources of intense heat. Containers should be grounded and separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Post warning and “NO SMOKING” signs in storage and use areas as appropriate. Have appropriate extinguishing equipment in the storage area (e.g., sprinkler system, portable fire extinguishers). The recommended storage temperature is < 27°C (< 80°F).

SPECIFIC END USE(S): This product is for use as a sealant. Follow all industry standards for use of this product.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, if necessary. Collect all rinsates and dispose of according to applicable Federal, State, and local procedures.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE LIMITS/CONTROL PARAMETERS:

Ventilation and Engineering Controls: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided below (if applicable). Exhaust directly to the outside, taking necessary precautions for environmental protection.

Workplace Exposure Limits/Control Parameters:

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>CAS #</th>
<th>EXPOSURE LIMITS IN AIR</th>
<th>ACGIH-TLVs</th>
<th>OSHA-PELs</th>
<th>NIOSH-RELs</th>
<th>NIOSH</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TWA mg/m³</td>
<td>STEL mg/m³</td>
<td>TWA mg/m³</td>
<td>STEL mg/m³</td>
<td>TWA mg/m³</td>
<td>STEL mg/m³</td>
</tr>
<tr>
<td>Proprietary Ingredients</td>
<td></td>
<td>No Available Information</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NE = Not Established. See Section 16 for Definitions of Other Terms Used

International Occupational Exposure Limits: Currently, it cannot be determined if additional exposure limit values have been established by various countries for components.


Please reference applicable regulations and standards for relevant details.

Respiratory Protection: Maintain airborne contaminant concentrations below exposure limits listed above, if applicable. For materials without listed exposure limits, minimize respiratory exposure. If necessary, use only respiratory protection authorized under appropriate regulations. Oxygen levels below 19.5% are considered IDLH by U.S. OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under U.S. OSHA’s Respiratory Protection Standard (1910.134-1998).

Eye Protection: Wear splash goggles or safety glasses as appropriate for the task.

Hand Protection: Wash hands and wrists before putting on and after removing gloves. During manufacture or other similar operations, wear the appropriate hand protection for the process. Use double gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. Because all gloves are to some extent permeable and their permeability increases with time, they should be changed regularly (hourly is preferable) or immediately if torn or punctured. If necessary refer to appropriate regulations.

Skin Protection: Use appropriate protective clothing for the task (e.g., lab coat, etc.). If necessary, refer to the U.S. OSHA Technical Manual (Section VII: Personal Protective Equipment) or other appropriate regulations. Full-body chemical protective clothing is recommended for emergency response procedures. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee’s feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA and Canadian Standards.

9. PHYSICAL and CHEMICAL PROPERTIES

FORM: Liquid.
MOLECULAR FORMULA: Mixture.
ODOR: Faint.
FLAMMABLE LIMITS (in air by volume, %): Not available.
DECOMPOSITION TEMPERATURE: Not available.
AUTOIGNITION TEMPERATURE: Not available.
FREEZING/MELTING POINT: Not available.
VAPOR PRESSURE: Not available.
VOLATILE ORGANIC COMPOUNDS (w/w): 3%
EVAPORATION RATE (n-BuAc = 1): > 1
SOLUBILITY IN WATER: Partially soluble.
COLOR: Black.
MOLECULAR WEIGHT: Mixture.
ODOR THRESHOLD: Not available.
OXIDIZING PROPERTIES: Not applicable.
PERCENT VOLATILE: Not available.
FLASH POINT (closed cup): 177°C (350.6°F)
BOILING POINT: 260°C (500°F)
SPECIFIC GRAVITY (water = 1): 1.42 g/cm³
VAPOR DENSITY (air = 1): Not available.
SCAQMD (U.S. EPA Method 24): Not available.
SOLUBILITY IN SOLVENTS: Partially soluble in toluene.

MARINE FIRESTOP FOAM PART A SDS
EFFECTIVE DATE: JUNE 17, 2015
PAGE 3 OF 8
9. PHYSICAL and CHEMICAL PROPERTIES (Continued)

COEFFICIENT WATER/OIL DISTRIBUTION: Not established. pH: Not available.

VISCOSITY: Dynamic: Not available. Kinematic @ 40°C: > 20.5 mm2s

HOW TO DETECT THIS SUBSTANCE (warning properties in event of accidental release): The appearance may be a characteristic to distinguish a release of this product.

10. STABILITY and REACTIVITY

CHEMICAL STABILITY: This product is stable when properly stored at normal temperature and pressures (see Section 7, Handling and Storage).

DECOMPOSITION PRODUCTS: Combustion: Carbon and metal oxides and formaldehyde, per manufacturer. Hydrolysis: None known.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: This product is incompatible with strong oxidizers.

POSSIBILITY OF HAZARDOUS POLYMERIZATION OR REACTION: Will not occur.

CONDITIONS TO AVOID: Avoid exposure to or contact with extreme temperatures and incompatible chemicals.

11. TOXICOLOGICAL INFORMATION

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE: The health hazard information provided below is pertinent to employees using this product in an occupational setting. The following paragraphs describe the symptoms of exposure by route of exposure.

Inhalation: Inhalation of fumes or vapors may cause irritation of the nose, throat, and lungs and cause coughing. Removal to fresh air should relieve symptoms.

Contact with Skin or Eyes: Direct eye contact may cause transient irritation, redness, and tearing from irritation. Prolonged or repeated skin exposures may cause dermatitis (dry red skin).

Skin Absorption: Components are not known to be absorbed through intact skin.

Ingestion: Ingestion is not a significant route of occupational exposure and is unlikely to occur. If this product is swallowed, irritation of the mouth, throat, esophagus and other tissues of the digestive system may occur. Symptoms of ingestion may include nausea, vomiting, and diarrhea.

Injection: Accidental injection of this product via laceration or puncture by a contaminated object can cause redness at the site of injection.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Exposure to this product may cause the following health effects:

Acute: Inhalation of fumes or vapors may cause irritation of respiratory system. Eye contact may cause mechanical irritation.

Chronic: Prolonged or repeated skin exposure may cause dermatitis (dry red skin). This product contains a trace compound that may have adverse effect on fertility, or the fetus, based on animal data.

TARGET ORGANS: Acute: Skin, eyes, respiratory system. Chronic: Skin.

TOXICITY DATA: Currently, no toxicological data are available.

IRRITANCY OF PRODUCT: Inhalation of fumes or vapors may cause respiratory irritation. Eye contact may cause irritation. Prolonged skin contact may cause irritation.

SENSITIZATION OF PRODUCT: No information available.

CARCINOGENIC POTENTIAL OF COMPONENTS: Not determined.

REPRODUCTIVE TOXICITY INFORMATION: Not determined.

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs): Not determined.

DEGREE OF EFFECT TO THE HEALTH OF THE POLLUTING AGENT OF ENVIRONMENT OF WORK (per Mexican NOM-010 STPS-1999): 0

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

MOBILITY: This product has not been tested for mobility in soil.

PERSISTENCE AND BIODEGRADABILITY: This product has not been tested for persistence or biodegradability.

BIO-ACCUMULATION POTENTIAL: This product has not been tested for bio-accumulation potential.

ECOTOXICITY: This product has not been tested for aquatic or animal toxicity. All releases to terrestrial, atmospheric and aquatic environments should be avoided. No aquatic toxicity data is available for the product or components.

OTHER ADVERSE EFFECTS: This material is not listed as having ozone depletion potential.

ENVIRONMENTAL EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.
13. DISPOSAL CONSIDERATIONS

DISPOSAL METHODS: It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Shipment of wastes must be done with appropriately permitted and registered transporters.

DISPOSAL CONTAINERS: Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials.

U.S. EPA WASTE NUMBER: Not applicable.

14. TRANSPORTATION INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS: This product is not classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is not classified as Dangerous Goods, per regulations of Transport Canada.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA): This product is not classified as dangerous goods under rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO) DESIGNATION: This product is not classified as Dangerous Goods by the International Maritime Organization.

OFFICIAL MEXICAN STANDARD; REGULATION FOR THE TRANSPORT OF DANGEROUS GOODS AND RESIDUES: This product is not classified as Dangerous Goods, per transport regulations of Mexico.

SINGAPORE STANDARD 286: PART A: This product has no requirements under the Specification for Caution Labeling for Hazardous Substances, Part 4: Marking of Packages, Containers and Vehicles, as it does not meet the criteria for any hazard class under this regulation.

TRANSPORT IN BULK ACCORDING TO THE IBC CODE: See the information under the individual jurisdiction listings for IBC information.

ENVIRONMENTAL HAZARDS: This material does not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN) and is not listed in Annex III under MARPOL 73/78.

15. REGULATORY INFORMATION

UNITED STATES REGULATIONS:
U.S. SARA Reporting Requirements: No requirements for components, but this cannot be verified.
U.S. SARA Hazard Categories (Section 311/312, 40 CFR 370-21): Not applicable.
U.S. CERCLA Reportable Quantity (RQ): Not determined.
U.S. TSCA Inventory Status: All components are listed or exempted. California Safe Drinking Water and Toxic Enforcement Act (Proposition 65): WARNING: This product contains a chemical known to the state of California to cause cancer.

CANADIAN REGULATIONS:
Canadian DSL/NDSL Inventory Status: All components are listed or exempted.
Canadian WHMIS Classification and Symbols: Class D2A: Material causing other toxic effects (Very Toxic).

CHINESE REGULATIONS:
Chinese Inventory of Existing Chemical Substances Status: All components are listed or exempted.

JAPANESE REGULATIONS:
Japanese ENCS: All components are listed or exempted.

Japanese Ministry of Economy, Trade, and Industry (METI) Status: All components are listed or exempted.

KOREAN REGULATIONS:
Korean Existing Chemicals List (ECL) Status: All components are listed or exempted.

TAIWANESE REGULATIONS:
Taiwan Existing Chemical Substances Inventory Status: Not determined
16. OTHER INFORMATION

LABELING (Precautionary Statements) U.S. ANSI LABELING (Z129.1): CAUTION! COMPONENTS ARE UNKNOWN/MAY CAUSE MILD IRRITATION BY INHALATION AND EYE CONTACT. PROLONGED SKIN CONTACT MAY CAUSE IRRITATION. Avoid breathing fumes or vapors. Do not taste or swallow. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear appropriate eye, hand, and body protection. Avoid exposure to elevated temperatures. FIRST-AID: In case of contact, immediately flush skin or eyes with plenty of water for at least 20 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. If swallowed, do not induce vomiting. Get medical attention. IN CASE OF FIRE: Use water fog, foam, dry chemical, or CO2. IN CASE OF SPILL: Absorb spill on appropriate material and place in suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations. Consult Safety Data Sheet for additional information.

REVISION DETAILS: New.

REFERENCES AND DATA SOURCES: Contact the supplier for information.

METHODS OF EVALUATING INFORMATION FOR THE PURPOSE OF CLASSIFICATION: Criteria of the GHS were used for classification.

PREPARED BY: CHEMICAL SAFETY ASSOCIATES, Inc. • PO Box 1961, Hilo, HI 96721-1961 • (800) 441-3365

DATE OF PRINTING: December 2, 2016
EXPOSURE LIMITS IN AIR:

CEILING LEVEL: The concentration that shall not be exceeded during any part of the working exposure.

DGF MAKs: Federal Republic of Germany Maximum Concentration Values in the workplace. Exposure to MAK values is not generally permitted, except in the case of emergency.

DGF MAK Germ Cell Mutagen Categories: 1: Germ cell mutagens that have been shown to increase the mutation frequency in the progeny of exposed humans. 2: Germ cell mutagens that have been shown to increase the mutation frequency in the progeny of exposed animals. 3: Substances that have been shown to induce genetic damage in germ cells of human or animals, which produce mutagenic effects in somatic cells of mammals in vivo and have been shown to reach the germ cells. 4: Germ cell mutagens that have been shown to cause genetic effects in mammalian somatic cells in vivo; in exceptional cases, for substances for which there are no in vivo data, but that are clearly mutagenic in vitro and structurally related to known germ cell mutagens. 5: Germ cell mutagens for which there is evidence that the substances are those with non-genotoxic mechanisms of action. By definition, germ cell mutagens are genotoxic. Therefore, a Category 4 germ cell mutagen cannot apply. At some time in the future, when it will be possible that a Category 4 germ cell mutagen cannot apply, the MAK value should be revised, provided that the contribution to genetic risk for humans is not known.

DGF Pregnancy Risk Group Classification: Group A: A risk of damage to the developing embryo or fetus has been unequivocally demonstrated. Exposure of pregnant women can lead to damage to the developing organism, even when MAK and BAT (Biological Tolerance Value for Working Materials) values are observed. Group B: Currently available information indicates a risk of damage to the developing embryo or fetus must be considered to be probable. Damage to the developing organism cannot be excluded when pregnant women are exposed, even when MAK and BAT values are observed. Group C: There is no reason to fear a risk of damage to the developing embryo or fetus when MAK and BAT values are observed. Group D: Classification in one of the groups A-C is not yet possible because, although the data available may indicate a trend, there is not sufficient evidence for evaluation.

IDLH: Immediately Dangerous to Life and Health. This level represents a concentration from which one can escape within 30 minutes without suffering escape-preventing or permanent injury.

LOEL: No established. When no exposure guidelines are established, an entry of NE is made for reference.

NIC: Notice of Intended Change.

NIOSH RELs: NIOSH’s Recommended Exposure Limits.

PCL: Permissible Concentration Limits. This value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 38432-38454). The phrase, "Vacated 1989 PEL" is placed next to the PEL that was vacated by Court Order.

TLV: Workplace Environmental Exposure Limits from the AIHA.

TWA: Time Weighted Average exposure concentration for a conventional 8-hr (TLV) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEL: White Establishing Limit. Threshold Limit Values from the ACGIH.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:

This rating system was developed by the National Paint and Coating Association and has been adopted by industry to identify the degree of chemical hazards.

HAZARD HEALTH:

0: Minimal Hazard: No significant health risk; irritation of skin or eyes not anticipated. Skin Irritation: Essentially non-irritating. Mechanical irritation may occur. PII or Draize ≤ 0. 2: Mild Hazard: Very slight to slight irritation. Irritants, sensitizers. PII or Draize > 0 ≤ 2. 4: Moderate Hazard: Temporary or transitory injury may occur. PII or Draize > 2 ≤ 5. 6: Severe Hazard: Permanent or substantial injury may occur. PII or Draize > 5 ≤ 20. 8: Extremely Severe Hazard: Loss of life may occur. PII or Draize > 20.

HAZARD FLAMMABILITY:


HAZARD EXPLOSIVITY:

0: Not Explosive. 2: Non-Explosive. 4: Explosive. 5: Unstable Explosive. 6: Explosive that may detonate. 7: Detonating Explosive. 8: Explosive with high detonation sensitivity. 9: Detonating Explosive on impact. 10: Detonating Explosive on impact and shock. 11: Detonating Explosive on impact, shock, or friction. 12: Detonating Explosive on impact, shock, or friction. 13: Detonating Explosive on impact, shock, friction, or impact. 14: Detonating Explosive on impact, shock, friction, or impact. 15: Detonating Explosive on impact, shock, friction, or impact. 16: Detonating Explosive on impact, shock, friction, or impact. 17: Detonating Explosive on impact, shock, friction, impact, or shock. 18: Detonating Explosive on impact, shock, friction, impact, or shock. 19: Detonating Explosive on impact, shock, friction, impact, or shock.

HAZARD TOXICITY:

0: Non-Irritant. 2: Slightly to mildly irritating, but reversible within 7 days. Draize > 0 ≤ 25. 4: Slightly or mildly irritating. PII or Draize > 0 ≤ 25. 6: Moderately irritating; temporary or transient injury may occur. PII or Draize > 25 ≤ 100. 8: Irritating; minor injury, temporary or transitory injury may occur. PII or Draize > 100 ≤ 500. 10: Moderately Severe: Severe irritation; irreversible injury may result from brief contact. Skin irritation: Not appropriate. Do not rate as 4, based on skin irritation alone. Eye irritation: Not appropriate. Do not rate as 4, based on eye irritation alone. 12: severe irritation; irreversible injury may result from brief contact and/or exposure. 14: Corrosive; irreversible injury may result from brief contact and/or exposure. 16: corrisive; irreversible injury may result from brief contact and/or exposure. 18: Corrosive; irreversible injury may result from brief contact and/or exposure.

CLASIFICATION OF MATERIALS:

1: Acute Oral Toxicity LD50 Rat ≤ 0.05 mg/kg. 2: Acute Oral Toxicity LD50 Rat > 0.05 – 2 mg/kg. 3: Acute Oral Toxicity LD50 Rat > 2 mg/kg.

INHALATION:

1: Acute Inhalation LC50 Rat ≤ 0.5 – 2 mg/L. 2: Acute Inhalation LC50 Rat > 0.5 – 2 mg/L.

Water Reactivity:

0: Not Reactivity. 1: Hydraulic of water-reactive. 2: Reactivity with water. 3: Reactivity that may cause significant heat generation or explosion.

PHYSICAL:

0: No Reactivity. 1: Reactivity that may cause significant heat generation or explosion.

MARINE FIRE PROTECTION ASSOCIATION HAZARD RATINGS:

0: Minimal Hazard: No significant health risk; irritation of skin or eyes not anticipated. Skin Irritation: Essentially non-irritating. Mechanical irritation may occur. PII or Draize ≤ 0. 2: Mild Hazard: Very slight to slight irritation. Irritants, sensitizers. PII or Draize > 0 ≤ 2. 4: Moderate Hazard: Temporary or transitory injury may occur. PII or Draize > 2 ≤ 5. 6: Severe Hazard: Permanent or substantial injury may occur. PII or Draize > 5 ≤ 20. 8: Extremely Severe Hazard: Loss of life may occur. PII or Draize > 20.

DEFINITION OF TERMS

A large number of abbreviations and acronyms appear on a SDS. Some of these, which are commonly used, include the following:

DFG: German Federal Institute for Occupational Safety and Health. MAK: Maximum Admissible Concentration. PEL: Permissible Exposure Limit. TLV: Threshold Limit Value. This value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 38432-38454). The phrase, "Vacated 1989 PEL" is placed next to the PEL that was vacated by Court Order.

TLV: Workplace Environmental Exposure Limits from the AIHA.

TWA: Time Weighted Average exposure concentration for a conventional 8-hr (TLV) or up to a 10-hr (REL) workday and a 40-hr workweek.

WEL: White Establishing Limit. Threshold Limit Values from the ACGIH.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM HAZARD RATINGS:


HAZARD TOXICITY:

0: Non-Irritant. 2: Slightly to mildly irritating, but reversible within 7 days. Draize > 0 ≤ 25. 4: Slightly or mildly irritating. PII or Draize > 0 ≤ 25. 6: Moderately irritating; temporary or transitory injury may occur. PII or Draize > 25 ≤ 100. 8: Moderately Severe: Severe irritation; irreversible injury may result from brief contact. Skin irritation: Not appropriate. Do not rate as 4, based on skin irritation alone. Eye irritation: Not appropriate. Do not rate as 4, based on eye irritation alone. 12: severe irritation; irreversible injury may result from brief contact and/or exposure. 14: Corrosive; irreversible injury may result from brief contact and/or exposure. 16: corrisive; irreversible injury may result from brief contact and/or exposure.

CLASIFICATION OF MATERIALS:

1: Acute Oral Toxicity LD50 Rat ≤ 0.05 mg/kg. 2: Acute Oral Toxicity LD50 Rat > 0.05 – 2 mg/kg. 3: Acute Oral Toxicity LD50 Rat > 2 mg/kg.

INHALATION:

1: Acute Inhalation LC50 Rat ≤ 0.5 – 2 mg/L. 2: Acute Inhalation LC50 Rat > 0.5 – 2 mg/L.

Water Reactivity:

0: Not Reactivity. 1: Hydraulic of water-reactive. 2: Reactivity with water. 3: Reactivity that may cause significant heat generation or explosion.

PHYSICAL:

0: No Reactivity. 1: Reactivity that may cause significant heat generation or explosion.
DEFINITION OF TERMS (Continued):

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

HEALTH HAZARD (continued): 3 Materials that, under emergency conditions, can cause serious or permanent injury. Gases with an LC50 for acute inhalation toxicity greater than 1,000 ppm but less than or equal to 3,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than its LEL for acute inhalation toxicity, if its LEL is less than or equal to 300 ppm and that does not meet the criteria for degree of hazard 4. Dusts and mists with an LEL for acute inhalation toxicity greater than 0.5% by weight, but less than or equal to 2 mg/L. Materials with an LEL for acute dermal toxicity greater than 40 mg/kg but less than or equal to 200 mg/kg. Materials that are corrosive to the respiratory tract. Materials that are corrosive to the eyes or cause irreversible corneal opacity. Materials corrosive to the skin. Carcinogenic gases that cause irreversible, and often invisible, tissue damage. Compressed liquefied gases with boiling points below -55°C (-67°F) that cause frostbite and irreversible tissue damage. Materials with an LDI for acute oral toxicity greater than 5 mg/kg but less than or equal to 50 mg/kg. Materials that, under emergency conditions, can be lethal. Gases with an LDI for acute inhalation toxicity greater than or equal to 1,000 ppm. Any liquid whose saturated vapor concentration at 20°C (68°F) is equal to or greater than ten times its LEL for acute inhalation toxicity, if its LEL is less than or equal to 1000 ppm. Dusts and mists whose LEL for acute inhalation toxicity is less than or equal to 0.5 mg/L. Materials whose LDI for acute dermal toxicity is less than or equal to 40 mg/kg. Materials whose LDI for acute oral toxicity is less than or equal to 5 mg/kg.

FLAMMABILITY HAZARD:

8 Materials that will not burn under typical fire conditions, including intrinsically incombusible materials such as concrete, stone, and sand. Materials that will not burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. 4 Materials that must be preheated before ignition can occur. Materials in this degree require considerable preheating, under all ambient temperature conditions, before ignition and combustion can occur. Materials that will burn in air when exposed to a temperature of 816°C (1500°F) for a period of 5 minutes in accordance with Annex D of NFPA 704. Liquids, solids, and semisolids having a flash point at or above 63.4°C (150°F) (i.e., Class III liquids). Liquids with a flash point greater than 35°C (95°F) that do not sustain combustion when tested using the Method of Testing for Sustained Combustibility, per 49 CFR 173, Appendix H or the UN Recommendations on the Transport of Dangerous Goods, Model Regulations (current edition) and the related Manual of Tests and Criteria (current edition). Liquids with a flash point greater than 35°C (95°F) in a water-miscible solution or dispersion with a water non-combustible liquid/solid content of more than 85% by weight. Liquids that have no fire point when tested by ASTM D 92, Standard Test Method for Flash and Fire Points by Cleveland Open Cup, up to the boiling point of the liquid or up to a temperature at which the sample being tested shows an obvious physical change. Combustible pellets with a representative diameter of greater than 2 mm (10 mesh). Most ordinary combustible materials. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. 2 Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur. Gases, vapors, and mists under normal conditions form hazardous atmospheres with air, but under high ambient temperatures or under moderate heating could release vapor in sufficient quantities to produce hazardous atmospheres with air. Liquids having a flash point at or above 37.8°C (100°F) and below 93.3°C (200°F) (i.e., Class II and Class IIIA liquids.) Solid materials in the form of powders or coarse dusts of representative diameter between 420 microns (40 mesh) and 2 mm (10 mesh) that burn rapidly but that generally do not form explosive mixtures with air. Solid materials in fibrous or shredded form that burn rapidly and create flash fire hazards, such as cotton, sisal, and hemp. Solids and semisolids that readily give off flammable vapors. Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. 3 Liquids and solids that can be ignited under almost all ambient temperature conditions. Materials in this degree produce hazardous atmospheres with air under almost all ambient temperatures or, though unaffected by ambient temperatures, are readily ignited under almost all conditions. Liquids having a flash point below 22.8°C (73°F) and having a boiling point at or above 37.8°C (100°F) and those liquids having a flash point at or above 22.8°C (73°F) and below 37.8°C (100°F) (i.e., Class II B and IIC liquids). Materials that on account of their physical form or environmental conditions can form explosive mixtures with air and are readily dispersed in air. Flammable liquids or semisolids with representative diameter less than 420 microns (40 mesh). Materials that burn with extreme rapidity, usually by reason of self-contained oxygen (e.g., dry nitrocellulose and many organic peroxides). Solids containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent. Materials that will rapidly or completely vaporize at atmospheric pressure and normal ambient temperature or that are readily dispersed in air and will burn readily. Flammable gases. Flammable cryogenic liquids. Liquids having a flash point below 22.8°C (73°F) and a boiling point below 22.8°C (73°F) and a boiling point below 37.8°C (100°F) (i.e., Class IA liquids). Materials that ignite when exposed to air. Solid materials containing greater than 0.5% by weight of a flammable or combustible solvent are rated by the closed cup flash point of the solvent.

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATINGS (continued):

INSTABILITY HAZARD: 0 Materials that are normally stable, but that can become unstable at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 0.01 W/mL and below 10 W/mL. 2 Materials that readily undergo violent chemical changes at elevated temperatures and pressures. Materials that have an instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) at or above 10 W/mL and below 100 W/mL. 3 Materials that in themselves are capable of detonation or explosive decomposition or explosive reaction but that require a strong initiating source or that must be heated under confinement before initiation. Materials that have an estimated instantaneous power density (product of heat of reaction and reaction rate) at 250°C (482°F) of 100 W/mL or greater.

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point: Minimum temperature at which a liquid gives off sufficient vapor to form an ignitable mixture with air near the surface of the liquid or within the test vessel used. Autoignition Temperature: Minimum temperature of a solid, liquid, or gas required to initiate or cause self-sustained combustion in air with no other source of ignition.UEL: Lowest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame. UEL: Highest concentration of a flammable vapor or gas/air mixture that will ignite and burn with a flame.

TOXICOLOGICAL INFORMATION:

Human and Animal Toxicology: Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. LD50: Lethal Dose (oral, cutaneous, or inhalation) that kills 50% of the exposed animals. LC50: Lethal Concentration (gases) that kills 50% of the exposed animals. ppm: Concentration expressed in parts of material per million parts of air or water. mg/mL: Concentration expressed in weight of substance per volume of air or milliliters of water. mg/kg: Concentration expressed in weight of substance per kilogram of body weight. TLDL: TLD: Lethal Dose (oral, cutaneous, or inhalation) that kills 50% of the exposed animals. LC50: Lethal Concentration (gases) that kills 50% of the exposed animals. Time to kill 50% of the exposed animals. TCC: Temperature to cause a symptom. LD50: Lethal Dose (oral, cutaneous, or inhalation) that kills 50% of the exposed animals. LC50: Lethal Concentration (gases) that kills 50% of the exposed animals. LD50: Lethal Dose (oral, cutaneous, or inhalation) that kills 50% of the exposed animals.

ECOLOGICAL INFORMATION:

EC: Effect concentration in water. BCF: Bioconcentration Factor, which is used to determine if a substance will concentrate in life forms that consume contaminated plant or animal matter. TLM: Median threshold limit. log Kow or log Koc: Coefficient of Oil/Water Distribution is used to assess a substance's behavior in the environment.

REGULATORY INFORMATION:

U.S.: EPA: U.S. Environmental Protection Agency, ACGIH: American Conference of Governmental Industrial Hygienists, a professional association that establishes exposure limits. OSHA: U.S. Occupational Safety and Health Administration. MOSH: National Institute of Occupational Safety and Health, which is the research arm of OSHA. DOT: U.S. Department of Transportation. TC: Transport Canada. SARA: Superfund Amendments and Reauthorization Act. TSCA: U.S. Toxic Substance Control Act. CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act. Marine Pollution Treaty, according to the DOT; CERCLA or Superfund; and various state regulations. This section also includes information on the precautionary warnings that appear on the material's package label.

CANADA:


JAPAN:

METI: Ministry of Economy, Trade and Industry.