



MATERIAL SAFETY DATA SHEET

Ferro Corporation, Polymer Additives Division
 Walton Hills Operation
 7050 Krick Road
 Walton Hills, Ohio 44146-4494 USA

Emergency telephone number
 CHEMTREC: 1-800-424-9300
 Plant Number: 1-216-750-6708

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

Product Name: Therm-Chek® 5444A Date of Preparation: 08/26/2004
Chemical Family: Polymer Additive
Chemical Name: Barium, Cadmium, Zinc Complex Mixture
CAS-No.: Mixture
Product code: 1035479

2. COMPOSITION/INFORMATION ON INGREDIENTS

Exposure limits

| Components | CAS-No | Weight % | OSHA | ACGIH |
|-----------------------------|------------|------------|--|---|
| Aromatic solvent | 64742-95-6 | 10 - 20% | Not established | Not established |
| 1,2,4-trimethylbenzene | 95-63-6 | 5 - 10% | Not established | 25 ppm TWA |
| Triphenyl phosphite | 101-02-0 | 5 - 10% | Not established | Not established |
| Petroleum based hydrocarbon | | 1 - 5% | 5 mg/m ³ TWA (oil mist) | 10 mg/m ³ TWA (oil mist) |
| xylene | 1330-20-7 | 1 - 5% | 100 ppm TWA 435 mg/m ³ TWA | 100 ppm TWA 150 ppm STEL |
| Phenol | 108-95-2 | 1 - 5% | 19 mg/m ³ TWA 5 ppm TWA prevent or reduce skin absorption | 5 ppm TWA skin - potential for cutaneous absorption |
| cumene | 98-82-8 | 0.1 - 0.5% | 245 mg/m ³ TWA 50 ppm TWA prevent or reduce skin absorption | 50 ppm TWA |
| Cadmium compounds, as Cd | | 1 - 5% | 2.5 ug/m ³ action level (as Cd); 5 ug/m ³ TWA (as Cd) | 0.002 mg/m ³ TWA 0.01 mg/m ³ TWA |
| Barium compounds, as Ba | | 1 - 5% | 0.5 mg/m ³ TWA | 0.5 mg/m ³ TWA |

The specific chemical identities are being withheld as a trade secret (29CFR1910.1200).

3. HAZARDS IDENTIFICATION

Emergency Overview

Warning

NFPA 704

| | |
|-------------------------------|-----------------------|
| Color: Amber | Health: 2 |
| Physical state: Liquid | Fire: 2 |
| Odour: Solvent-like | Instability: 0 |

WARNING COMBUSTIBLE! Vapors may travel to a source and flash back. Avoid breathing vapors or mists. Irritating to eyes. Irritating to respiratory system and skin. May cause cancer. May be harmful if absorbed through skin.

Potential Health Effects

Principle routes of exposure: Eye contact. Skin contact. Inhalation.

Eye contact: Moderately irritating to the eyes.

Skin contact: Moderately irritating to the skin. May be harmful if absorbed through skin.

MARKETED BY

HARWICK STANDARD DISTRIBUTION CORPORATION

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Inhalation: Over-exposure by inhalation may cause respiratory irritation. Inhalation of high vapor concentrations can cause CNS-depression and narcosis. The effects of overexposure to cadmium may include decreased stamina, fatigue, sleep disturbance, headaches, aching bones and muscles, constipation, abdominal pains and decreased appetite. Existing lung or pulmonary conditions may be aggravated by exposure.

Ingestion: May irritate digestive tract. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

Chronic toxicity: Repeated and prolonged exposure to solvents may cause brain and nervous system damage. Cadmium is a cumulative poison and can build up in the body over time to toxic levels. Cadmium causes lung damage and kidney dysfunction and may cause lung or prostate cancer.

HMIS

Health: *2

Fire: 2

Physical hazard: 0

PPE: X

4. FIRST AID MEASURES

Eye contact: Rinse immediately with plenty of water, also under the eyelids. Get medical attention if irritation develops.

Skin contact: Wash off immediately with soap and plenty of water. Remove and wash contaminated clothing before re-use. If symptoms persist, call a physician.

Inhalation: Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. If symptoms persist, call a physician.

Ingestion: Clean mouth with water and drink afterwards plenty of water. Consult a physician.

Notes to physician: Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flash point: 61 °C (142°F) Method: PMCC

Suitable extinguishing media: Use dry chemical, CO₂, water spray or "alcohol" foam. Do not use a solid water stream as it may scatter and spread fire. Cool containers / tanks with spray water.

Hazardous decomposition products: Thermal decomposition can lead to release of irritating gases and vapors. Carbon oxides. Hydrocarbons. Heavy metal compounds. CdO. BaO. ZnO.

Special protective equipment for firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, NIOSH (approved or equivalent) and full protective gear.

Unusual hazards: Flash back possible over considerable distance. Vapors can form explosive mixtures at temperatures at or above the flash point. Risk of explosion if heated under confinement. Material may change or decompose on exposure to moisture.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions: Combustible material. Remove all sources of ignition. Do not breathe vapors/dust. Avoid contact with skin, eyes and clothing. Wear personal protective equipment. In case of insufficient ventilation, wear suitable respiratory equipment.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not allow material to contaminate ground water system.

Methods for cleaning up: Wear personal protective equipment. Absorb spill with inert material (e.g. dry sand or earth), then place in a chemical waste container. Dispose of promptly. Clean contaminated surface thoroughly.

7. HANDLING AND STORAGE

Handling: Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharges. Use only in area provided with appropriate exhaust ventilation. Wear personal protective equipment. In case of insufficient ventilation, wear suitable respiratory equipment.

Storage: Keep product and empty container away from heat and sources of ignition. Take precautionary measures against static discharges. Keep tightly closed in a dry, cool and well-ventilated place. Keep containers dry and tightly closed to avoid moisture absorption and contamination.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures: Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Respiratory protection: Use NIOSH approved respirator when ventilation is inadequate.

Hand protection: Impervious gloves.

Skin and body protection: Long sleeved clothing.

Eye protection: Safety glasses with side-shields. If splashes are likely to occur, wear: Face-shield.

Exposure limits: See Section 2.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---------------------------------|-------------------|-------------------------------------|-------------------|
| Color: | Amber | Appearance: | Clear |
| Physical state: | Liquid | Odour: | Solvent-like |
| Molecular weight: | No data available | Boiling point/range (°C): | No data available |
| pH: | No data available | Specific gravity (Water =1): | 1.028 |
| Vapor pressure (mmHg): | No data available | Evaporation rate (Water =1): | < 1.00 |
| Water solubility (mg/l): | Insoluble | VOC content (%) | No data available |

10. STABILITY AND REACTIVITY

Stability: Stable at normal conditions.

Polymerization: Will not occur.

Hazardous decomposition products: Carbon oxides, hydrocarbons. Thermal decomposition can lead to release of irritating gases and vapours. Vapors may be explosive. Possible decomposition products from hydrolysis: phenol, aliphatic alcohol, phosphoric acid.

Materials to avoid: Strong oxidizing agents. Strong acids and strong bases. Water.

Conditions to avoid: Heat, flames and sparks. Extremes of temperature and direct sunlight. Exposure to moisture.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

No data is available on the product itself.

Chronic toxicity: Repeated and prolonged exposure to solvents may cause brain and nervous system damage. Repeated absorption may cause disorder of central nervous system, liver, kidneys and blood. Chronic exposure may cause dermatitis.

Carcinogenic effects: Cadmium and cadmium compounds (as respirable dust/aerosols) have proven to be carcinogenic. Listed by IARC, NTP and OSHA as a carcinogen.

Target Organ Effects: Barium compound: Heart, gastrointestinal tract. Cadmium compound: Liver, Kidney.

Component information

Component information, if any, is listed below

Aromatic solvent

NIOSH - LD50s and LC50s: = 8400 mg/kg Oral LD50 Rat

1,2,4-trimethylbenzene

NIOSH - LD50s and LC50s: = 18 g/m³ Inhalation LC50 Rat 4 h

= 5 g/kg Oral LD50 Rat

= 8970 mg/kg Oral LD50 Rat

xylene

NIOSH - LD50s and LC50s: = 4300 mg/kg Oral LD50 Rat
= 5000 mg/kg Inhalation LC50 Rat 4 h
> 1700 mg/kg Dermal LD50 Rabbit

ACGIH - Carcinogens: A4 - Not Classifiable as a Human Carcinogen

Phenol

NIOSH - LD50s and LC50s: = 270 mg/kg Oral LD50 Mouse
= 317 mg/kg Oral LD50 Rat
= 630 mg/kg Dermal LD50 Rabbit

ACGIH - Carcinogens: A4 - Not Classifiable as a Human Carcinogen

Cadmium compound

ACGIH - Carcinogens: A2 - Suspected Human Carcinogen (as Cd)

OSHA - Specifically Regulated Chemicals: 2.5 ug/m³ action level (as Cd); 5 ug/m³ TWA (as Cd)

OSHA - Select Carcinogens: Present

IARC - Group 1: Monograph 58, 1993 (Evaluated as a group)

Triphenyl phosphite

NIOSH - LD50s and LC50s: = 1080 mg/kg Oral LD50 Mouse
= 444 mg/kg Oral LD50 Rat

Barium carbonate

NIOSH - LD50s and LC50s: = 200 mg/kg Oral LD50 Mouse
= 418 mg/kg Oral LD50 Rat

ACGIH - Carcinogens: A4 - Not Classifiable as a Human Carcinogen
A4 - Not Classifiable as a Human Carcinogen (as Ba)

12. ECOLOGICAL INFORMATION

Aquatic toxicity: No information available

Persistence and degradability: No information available

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products: Dispose of according to all federal, state and local applicable regulations. Where possible recycling is preferred to disposal or incineration.

14. TRANSPORT INFORMATION

DOT:

UN/ID No: NA1993

Proper shipping name: Combustible liquid, N.O.S.

U.S. DOT - Hazard Class: 3

Packing group: III

Other shipping information: Not regulated in containers <119 gallons. This material meets the definition of a marine pollutant.

Applies to containers for shipments in bulk or via water transportation.

Subsidiary risk: 9 Marine pollutant (cadmium compound)

cumene (0.1 - 0.5%)

DOT regulated marine pollutant

Cadmium compound (5 - 10%)

DOT regulated severe marine pollutant

cumene (0.1 - 0.5%)

CERCLA/DOT RQ: 5000 lb 2270 kg

Phenol (1 - 5%)

CERCLA/DOT RQ: 1000 lb 454 kg

xylylene (1 - 5%)

CERCLA/DOT RQ: 100 lb 45.4 kg

TDG (Canada):

Proper shipping name: Combustible liquid, N.O.S.

Hazard class: 3

Packing group: III

Subsidiary risk: 9 Marine pollutant (cadmium compound)

15. REGULATORY INFORMATION

U.S. Regulations:

Not subject to TSCA 12(b) Export Notification

1,2,4-trimethylbenzene (5 - 10%)

SARA 313: 1.0 percent de minimis concentration

Barium compounds, as Ba (1 - 5%)

SARA 313: form R reporting required for 1.0% de minimis concentration; Chemical Category N040

Barium Compound (5 - 10%)

SARA 313: form R reporting required for 1.0% de minimis concentration; Chemical Category N040

Cadmium compounds, as Cd (1 - 5%)

SARA 313: form R reporting required for 0.1% de minimis concentration; Chemical Category N078

Cadmium compound (5 - 10%)

SARA 313: 0.1 percent de minimis concentration (Chemical Category N078)

Zinc compounds, as Zn (1 - 5%)

SARA 313: form R reporting required for 1.0% de minimis concentration (only fume or dust); Chemical Category N982

Zinc Compound (10 - 20%)

SARA 313: 1.0 percent de minimis concentration (Chemical Category N982)

xylene (1 - 5%)

SARA 313: 1.0 percent de minimis concentration

Phenol (1 - 5%)

SARA 313: 1.0 percent de minimis concentration

cumene (0.1 - 0.5%)

SARA 313: 1.0 percent de minimis concentration

State Regulations

This product or its ingredients have been evaluated for New Jersey, Pennsylvania, and California Prop 65 supplier notification requirements. Substances that are subject to notification requirements, if any, are listed below.

Zinc Compound (10 - 20%)

NJRTK: 3012

PARTK: Listed

1,2,4-trimethylbenzene (5 - 10%)

NJRTK: sn 1929; sn 2716

PARTK: [present]; environmental hazard

xylene (1 - 5%)

NJRTK: sn 2014

PARTK: Listed

Phenol (1 - 5%)

NJRTK: sn 1487

PARTK: Listed

Barium Compound (5 - 10%)

NJRTK: 2146 (1.0%)

PARTK: Listed

Cadmium compound (5 - 10%)

NJRTK: 2199 (0.1%)

PARTK: Listed

Cal Prop65: carcinogen; developmental toxicity.

Barium carbonate (1 - 5%)

NJRTK: sn 0180

PARTK: Listed

Canadian WHMIS

WHMIS hazard class: B3 Combustible liquid. D2A Very toxic materials. D2B Toxic materials.

Components

1,2,4-trimethylbenzene (5 - 10%)

Phenol (1 - 5%)

Cadmium compound (5 - 10%)

Triphenyl phosphite (5 - 10%)

Barium carbonate (1 - 5%)

WHMIS Ingredient Disclosure:

0.1%

1%

1%

1%

0.1%

International Inventories

TSCA 8(b): All the ingredients are on the TSCA list.

Canadian DSL: All the ingredients are on the DSL.

EINECS: All the ingredients are on the EINECS list.

Phillipines (PICCS): Listed.

Japan (ENCS): Not listed.

Korea (KECL): Not listed.

China (IECS): Listed.

Australia (AICS): Listed.

16. OTHER INFORMATION

For Industrial Use Only

Prepared by: Ferro Technical Center

The information and recommendations contained in this Material Safety Data Sheet have been compiled from sources believed to be reliable and to represent the most reasonable current opinion on the subject when the MSDS was prepared. No warranty, guaranty or representation is made as to the correctness or sufficiency of the information. The user of this product must decide what safety measures are necessary to safely use this product, either abne or in combination with other products, and determine its environmental regulatory compliance obligations under any applicable federal or state laws.

End of Safety Data Sheet