SAFETY DATA SHEET

1. Identification
Product identifier: ZRC-221 Cold Galvanizing Compound
Other means of identification:
   Product code: 50002 - 50003
Recommended use: Corrosion protection of iron and steel.
Recommended restrictions: None known.
Manufacturer/Importer/Supplier/Distributor information
Supplier/Manufacturer: ZRC Worldwide
Address: 145 Enterprise Drive, Marshfield, MA 02050
Telephone: 781-319-0400
Emergency telephone: 703-527-3887 CCN15781
Email: info@zrcworldwide.com

2. Hazard(s) identification
Physical hazards: Flammable liquids - Category 3
Health hazards: Specific target organ toxicity, repeated exposure - Category 1 (central nervous system)
Environmental hazards: Hazardous to the aquatic environment, acute hazard - Category 1
Hazardous to the aquatic environment, long-term hazard - Category 1
OSHA defined hazards: Not classified.
Label elements
Signal word: Danger
Hazard statement: Flammable liquid and vapor. Causes damage to organs (central nervous system) through prolonged or repeated exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
Precautionary statement
Prevention: Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe mist or vapor. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/eye protection/face protection.
Response: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical advice/attention if you feel unwell. Collect spillage. In case of fire: Use water fog, foam, dry chemical powder, dry sand, carbon dioxide to extinguish.
Storage: Store in a well-ventilated place. Keep cool.
Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC): None known.
Supplemental information: None.

3. Composition/information on ingredients
Mixtures
ZRC-221 Cold Galvanizing Compound
917618     Version #: 05     Revision date: 31-May-2017     Issue date: 14-December-2013
Chemical name | CAS number | %
--- | --- | ---
Zinc | 7440-66-6 | 75 - 85
Distillates (petroleum), hydrotreated light | 64742-47-8 | 2 - 3
Solvent naphtha (petroleum), medium aliph. | 64742-88-7 | 2 - 3
Zinc oxide | 1314-13-2 | 2 - 3
Solvent naphtha (petroleum), light aromatic | 64742-95-6 | 0.1 - 0.2

All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition comments: Components not listed are either non-health-hazardous or are below reportable limits. All concentrations are in percent by weight unless ingredient is a gas.

4. First-aid measures

Inhalation: Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower. Get medical attention if irritation develops and persists.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Get medical attention if irritation develops and persists.

Ingestion: Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed: Direct contact with eyes may cause temporary irritation. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed: Provide general supportive measures and treat symptomatically. Thermal burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital. Keep victim under observation. Symptoms may be delayed.

General information: Take off all contaminated clothing immediately. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Wash contaminated clothing before reuse.

5. Fire-fighting measures


Unsuitable extinguishing media: Water. Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical: Vapors may form explosive mixtures with air. Vapors may travel considerable distance to a source of ignition and flash back. During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters: Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions: In case of fire and/or explosion do not breathe fumes. Move containers from fire area if you can do so without risk.

General fire hazards: Flammable liquid and vapor.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ventilate closed spaces before entering them. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Take precautionary measures against static discharge. Use only non-sparking tools.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Following product recovery, flush area with water.

Small Spills: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal. Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental precautions

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

7. Handling and storage

Precautions for safe handling

Do not handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Explosion-proof general and local exhaust ventilation. Take precautionary measures against static discharges. All equipment used when handling the product must be grounded. Use non-sparking tools and explosion-proof equipment. Do not breathe mist or vapor. Avoid prolonged exposure. When using, do not eat, drink or smoke. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid discharge into drains, water courses or onto the ground.

Conditions for safe storage, including any incompatibilities

Keep away from heat, sparks and open flame. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Store in a cool, dry place out of direct sunlight. Store in original tightly closed container. Store in a well-ventilated place. Keep in an area equipped with sprinklers. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates (petroleum), hydrotreated light (CAS 64742-47-8)</td>
<td>PEL</td>
<td>400 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide (CAS 1314-13-2)</td>
<td>PEL</td>
<td>100 ppm</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td>Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)</td>
<td>TWA</td>
<td>200 mg/m3</td>
<td>Non-aerosol.</td>
</tr>
<tr>
<td>Zinc oxide (CAS 1314-13-2)</td>
<td>STEL</td>
<td>10 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>2 mg/m3</td>
<td>Respirable fraction.</td>
</tr>
</tbody>
</table>

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)</td>
<td>TWA</td>
<td>100 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide (CAS 1314-13-2)</td>
<td>STEL</td>
<td>15 mg/m3</td>
<td>Dust.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>10 mg/m3</td>
<td>Fume.</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distillates (petroleum), hydrotreated light (CAS 64742-47-8)</td>
<td>TWA</td>
<td>100 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)</td>
<td>TWA</td>
<td>100 mg/m3</td>
<td></td>
</tr>
<tr>
<td>Zinc oxide (CAS 1314-13-2)</td>
<td>Ceiling</td>
<td>15 mg/m3</td>
<td>Dust.</td>
</tr>
<tr>
<td></td>
<td>STEL</td>
<td>10 mg/m3</td>
<td>Fume.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>5 mg/m3</td>
<td>Dust.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5 mg/m3</td>
<td>Fume.</td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).
Exposure guidelines

US ACGIH Threshold Limit Values: Skin designation
Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)
Can be absorbed through the skin.

Appropriate engineering controls
Explosion-proof general and local exhaust ventilation. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection
If contact is likely, safety glasses with side shields are recommended.

Skin protection
Hand protection
No protection is ordinarily required under normal conditions of use. Use protective gloves made of: Rubber (natural, latex).

Skin protection
Other
Wear suitable protective clothing. Use of an impervious apron is recommended.

Respiratory protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Thermal hazards
Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations
When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
Gray liquid.

Physical state
Liquid.

Form
Liquid.

Color
Gray.

Odor
Aliphatic. Hydrocarbon.

Odor threshold
Not available.

pH
Not available.

Melting point/freezing point
Not available.

Initial boiling point and boiling range
291.2 - 404.6 °F (144 - 207 °C)

Flash point
109.4 °F (43.0 °C) Setaflash

Evaporation rate
< 1 (n-Butyl acetate=1)

Flammability (solid, gas)
Not applicable.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)
0.9 %

Flammability limit - upper (%)
7 %

Explosive limit - lower (%)
Not available.

Explosive limit - upper (%)
Not available.

Vapor pressure
Not available.

Vapor density
> 1 (25°C / 77°F)

Relative density
3.15

Solubility(ies)

Solubility (water)
Slightly soluble in water.

Partition coefficient (n-octanol/water)
Not available.

Auto-ignition temperature
Not available.

Decomposition temperature
Not available.
10. Stability and reactivity

Reactivity
The product is stable and non-reactive under normal conditions of use, storage and transport.

Chemical stability
Material is stable under normal conditions.

Possibility of hazardous reactions
No dangerous reaction known under conditions of normal use.

Conditions to avoid
Heat, flames and sparks. Avoid temperatures exceeding the flash point. Contact with incompatible materials.

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
Carbon oxides. Zinc oxides.

11. Toxicological information

Information on likely routes of exposure

Inhalation
May cause damage to organs through prolonged or repeated exposure by inhalation.

Skin contact
No adverse effects due to skin contact are expected. Prolonged skin contact may cause temporary irritation.

Eye contact
Direct contact with eyes may cause temporary irritation.

Ingestion
May cause discomfort if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity
Not expected to be acutely toxic.

Components

<table>
<thead>
<tr>
<th>Test Results</th>
<th>Species</th>
<th>Acute</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)</td>
<td></td>
<td>Dermal</td>
<td>Rabbit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oral</td>
<td>LD50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rat</td>
<td>&gt; 3000 mg/kg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oral</td>
<td>LD50</td>
</tr>
<tr>
<td>Zinc (CAS 7440-66-6)</td>
<td></td>
<td>Acute</td>
<td>Oral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rat</td>
<td>LD50</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation
Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation
Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization

Respiratory sensitization
Not a respiratory sensitizer.

Skin sensitization
This product is not expected to cause skin sensitization.

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity
Not listed.
NTP Report on Carcinogens
Not listed.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

Reproductive toxicity
This product is not expected to cause reproductive or developmental effects.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard
Not an aspiration hazard.

Chronic effects
Causes damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful.

Further information
No other specific acute or chronic health impact noted.

12. Ecological information

Ecotoxicity
Very toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Components</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc (CAS 7440-66-6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50</td>
<td>Daphnia magna</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.068 mg/l, 48 hours</td>
</tr>
<tr>
<td>Zinc oxide (CAS 1314-13-2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50</td>
<td>Water flea (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.098 mg/l, 48 Hours</td>
</tr>
</tbody>
</table>

Persistence and degradability
No data is available on the degradability of this product.

Bioaccumulative potential
No data available.

Mobility in soil
The product is slightly soluble in water.

Other adverse effects
The product contains volatile organic compounds which have a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.

Local disposal regulations
Dispose in accordance with all applicable regulations.

Hazardous waste code
D001: Waste Flammable material with a flash point <140 F
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
UN number
UN1263
UN proper shipping name
Paint
Transport hazard class(es)
Class 3
Subsidiary risk -
Label(s) 3
Packing group III
Environmental hazards
Marine pollutant Yes
Special precautions for user
Read safety instructions, SDS and emergency procedures before handling.
IATA
UN number: UN1263
UN proper shipping name: Paint
Transport hazard class(es):
  Class: 3
  Subsidiary risk: -
  Label(s): 3
Packing group: III
Environmental hazards: Yes
Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.

IMDG
UN number: UN1263
UN proper shipping name: Paint
Transport hazard class(es):
  Class: 3
  Subsidiary risk: -
Packing group: III
Environmental hazards: Yes
Marine pollutant: Yes
EmS: F-E, S-E
Special precautions for user: Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

15. Regulatory information

US federal regulations: This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
  Zinc (CAS 7440-66-6) 1.0 % One-Time Export Notification only.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
  Not regulated.
CERCLA Hazardous Substance List (40 CFR 302.4)
  Zinc (CAS 7440-66-6) LISTED
  Zinc oxide (CAS 1314-13-2) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories:
  Immediate Hazard - Yes
  Delayed Hazard - Yes
  Fire Hazard - Yes
  Pressure Hazard - No
  Reactivity Hazard - No

SARA 302 Extremely hazardous substance: Not listed.
SARA 311/312 Hazardous chemical: Yes
SARA 313 (TRI reporting):

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc</td>
<td>7440-66-6</td>
<td>75 - 85</td>
</tr>
<tr>
<td>Zinc oxide</td>
<td>1314-13-2</td>
<td>2 - 3</td>
</tr>
</tbody>
</table>

Other federal regulations:

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List
  Not regulated.
Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)
  Not regulated.
California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

**US state regulations**

**US. Massachusetts RTK - Substance List**
- Distillates (petroleum), hydrotreated light (CAS 64742-47-8)
- Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)
- Zinc (CAS 7440-66-6)
- Zinc oxide (CAS 1314-13-2)

**US. New Jersey Worker and Community Right-to-Know Act**
- Distillates (petroleum), hydrotreated light (CAS 64742-47-8)
- Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)
- Zinc (CAS 7440-66-6)
- Zinc oxide (CAS 1314-13-2)

**US. Pennsylvania Worker and Community Right-to-Know Law**
- Distillates (petroleum), hydrotreated light (CAS 64742-47-8)
- Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)
- Zinc (CAS 7440-66-6)
- Zinc oxide (CAS 1314-13-2)

**US. Rhode Island RTK**
- Distillates (petroleum), hydrotreated light (CAS 64742-47-8)
- Solvent naphtha (petroleum), medium aliph. (CAS 64742-88-7)
- Zinc (CAS 7440-66-6)
- Zinc oxide (CAS 1314-13-2)

**International Inventories**

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>No</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information, including date of preparation or last revision**

- **Issue date**: 14-December-2013
- **Revision date**: 31-May-2017
- **Version #**: 05
- **HMIS® ratings**
  - Health: 3*
  - Flammability: 3
  - Physical hazard: 0
- **NFPA ratings**
  ![NFPA ratings icon]
List of abbreviations

LC50: Lethal Concentration, 50%.
LD50: Lethal Dose, 50%.
EL50: Effective level, 50%.
LL50: Lethal level, 50%.
STEL: Short term exposure limit.
TWA: Time weighted average.
PEL: Permissible Exposure Limit.

Disclaimer

This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.