

Zaclon Galvanizing Fluxes (K;F;C;CS)

Safety Data Sheet

SECTION 1: Identification

1.1. Product identifier

Product name : Zaclon Galvanizing Fluxes (K;F;C;CS)

1.2. Recommended use and restrictions on use

Manufacturing

1.3. Supplier

Zaclon LLC
2981 Independence Road
Cleveland, OH 44115
T 800-356-7327

1.4. Emergency telephone number

Emergency number : Chemtrec 1 800 424 9300

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS-CA)

| | |
|--|------|
| Acute toxicity (oral) Category 4 | H302 |
| Skin corrosion/irritation Category 1B | H314 |
| Specific target organ toxicity (single exposure) Category 3 | H335 |
| Hazardous to the aquatic environment - Acute Hazard Category 1 | H400 |
| Hazardous to the aquatic environment - Chronic Hazard Category 1 | H410 |

Full text of H statements : see section 16

2.2. GHS Label elements, including precautionary statements

GHS-US/CAN Classification

Hazard pictograms :



Signal word : Danger

Hazard statements : H302 - Harmful if swallowed
H314 - Causes severe skin burns and eye damage
H335 - May cause respiratory irritation
H400 - Very toxic to aquatic life
H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements : P260 - Do not breathe dust/fume/gas/mist/vapors/spray
P264 - Wash thoroughly after handling
P270 - Do not eat, drink or smoke when using this product
P271 - Use only outdoors or in a well-ventilated area
P273 - Avoid release to the environment
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P301+P312 - IF SWALLOWED: Call a POISON CENTER or doctor if you feel unwell
P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting
P303+P361+P353 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P310 - Immediately call a POISON CENTER/doctor
P312 - Call a POISON CENTER/doctor if you feel unwell
P321 - Specific treatment (see label)
P330 - Rinse mouth
P363 - Wash contaminated clothing before reuse
P391 - Collect spillage
P403+P233 - Store in a well-ventilated place. Keep container tightly closed
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations..

2.3. Other hazards

No additional information available

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2.4. Unknown acute toxicity (GHS-CA)

No data available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

| Name | Product identifier | % | GHS-CAN classification | GHS-US classification |
|-------------------|---------------------|---------|--|--|
| Ammonium chloride | (CAS No) 12125-02-9 | 40 - 75 | Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Comb. Dust | Acute Tox. 4 (Oral), H302 Eye Irrit. 2, H319 Comb. Dust |
| Zinc chloride | (CAS No) 7646-85-7 | 25 - 60 | Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 | Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 |

SECTION 4: First-aid measures

4.1. Description of first aid measures

| | |
|---------------------------------------|--|
| First-aid measures after inhalation | : If inhaled, remove to fresh air immediately. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician. |
| First-aid measures after skin contact | : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse and discard shoes. |
| First-aid measures after eye contact | : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. |
| First-aid measures after ingestion | : If swallowed, do not induce vomiting. Give large quantities of water. Call a physician immediately. Never give anything by mouth to an unconscious person. |

4.2. Most important symptoms and effects, both acute and delayed

| | |
|--------------------------------------|--|
| Symptoms/injuries after inhalation | : Causes irritation of lungs and upper respiratory passages. |
| Symptoms/injuries after skin contact | : Causes severe skin burns. |
| Symptoms/injuries after eye contact | : Causes eye damage. |
| Symptoms/injuries after ingestion | : Not a likely route of exposure during normal product use. May be fatal from significant ingestion. |

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

| | |
|--------------------------------|--|
| Suitable extinguishing media | : As appropriate for combustibles in area. |
| Unsuitable extinguishing media | : None. |

5.2. Special hazards arising from the substance or mixture

| | |
|------------------|--|
| Fire hazard | : May release ammonium chloride fumes, zinc oxide fumes, zinc chloride fumes, and ammonia and hydrogen chloride gases in a fire. |
| Explosion hazard | : None known. |

5.3. Advice for firefighters

| | |
|--------------------------------|--|
| Protection during firefighting | : Firefighters should wear full protective gear. |
|--------------------------------|--|

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

| | |
|-------------------------|---|
| For containment | : Stop the flow of material, if this is without risk. |
| Methods for cleaning up | : Confine spill and soak up with absorbent. Place in an approved container and dispose in accordance with local, state and federal regulations. |

6.4. Reference to other sections

No additional information available

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Do not get in eyes, on skin, on clothing. Avoid breathing dusts, mists, or fumes. Wash thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a tightly closed container in a dry place. Do not store with cyanides or sulfides.

7.3. Specific end use(s)

Manufacturing

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| Ammonium chloride (12125-02-9) | | |
|--------------------------------|-------------------------------------|-----------------------------|
| USA - ACGIH | ACGIH TWA (mg/m ³) | 10 mg/m ³ (fume) |
| USA - ACGIH | ACGIH STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Canada (Quebec) | VECD (mg/m ³) | 20 mg/m ³ (fume) |
| Canada (Quebec) | VEMP (mg/m ³) | 10 mg/m ³ (fume) |
| Alberta | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Alberta | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| British Columbia | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| British Columbia | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Manitoba | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Manitoba | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| New Brunswick | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| New Brunswick | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| New Foundland & Labrador | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| New Foundland & Labrador | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Nova Scotia | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Nova Scotia | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Nunavut | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Nunavut | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Northwest Territories | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Northwest Territories | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Ontario | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Ontario | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Prince Edward Island | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Prince Edward Island | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Saskatchewan | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Saskatchewan | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Yukon | OEL STEL (mg/m ³) | 20 mg/m ³ (fume) |
| Yukon | OEL TWA (mg/m ³) | 10 mg/m ³ (fume) |
| Zinc chloride (7646-85-7) | | |
| USA - ACGIH | ACGIH TWA (mg/m ³) | 1 mg/m ³ (fume) |
| USA - ACGIH | ACGIH STEL (mg/m ³) | 2 mg/m ³ (fume) |
| USA - OSHA | OSHA PEL (TWA) (mg/m ³) | 1 mg/m ³ (fume) |
| Canada (Quebec) | VEMP (mg/m ³) | 1 mg/m ³ (fume) |
| Alberta | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Alberta | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| British Columbia | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| British Columbia | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Manitoba | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Manitoba | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| New Brunswick | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |

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| Zinc chloride (7646-85-7) | | |
|---------------------------|-------------------------------|----------------------------|
| New Brunswick | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| New Foundland & Labrador | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| New Foundland & Labrador | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Nova Scotia | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Nova Scotia | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Nunavut | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Nunavut | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Northwest Territories | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Northwest Territories | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Ontario | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Ontario | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Prince Edward Island | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Prince Edward Island | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Saskatchewan | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Saskatchewan | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |
| Yukon | OEL STEL (mg/m ³) | 2 mg/m ³ (fume) |
| Yukon | OEL TWA (mg/m ³) | 1 mg/m ³ (fume) |

8.2. Exposure controls

| | |
|----------------------------------|--|
| Appropriate engineering controls | : Provide adequate local exhaust ventilation to maintain worker exposure below exposure limits. |
| Hand protection | : Use neoprene or PVC rubber gloves, apron, boots; long sleeve shirt and pants. If considerable contact is likely, wear impervious (rubber) clothing or acid suit. |
| Eye protection | : Use chemical splash goggles. |
| Skin and body protection | : Wear suitable working clothes. |
| Respiratory protection | : If airborne concentrations are above the applicable exposure limits, use NIOSH approved respiratory protection. |

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|--|-----------------------------|
| Physical state | : Solid |
| Appearance | : Granular or fine particle |
| Color | : White to off-white |
| Odor | : Odorless. |
| Odor threshold | : No data available |
| pH | : No data available |
| Relative evaporation rate (butylacetate=1) | : No data available |
| Melting point | : ~343 °C (~650°F) |
| Freezing point | : No data available |
| Boiling point | : Decomposes |
| Flash point | : No data available |
| Self ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability (solid, gas) | : No data available |
| Vapor pressure | : No data available |
| Relative vapor density at 20 °C | : No data available |
| Specific gravity | : 67 lb/cu ft3 |
| Solubility | : No data available |
| Log Pow | : No data available |
| Log Kow | : No data available |
| Viscosity, kinematic | : No data available |
| Viscosity, dynamic | : No data available |
| Explosive properties | : No data available |
| Oxidizing properties | : No data available |
| Explosive limits | : No data available |

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9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

The product is stable at normal handling and storage conditions.

10.3. Possibility of hazardous reactions

Will not occur.

10.4. Conditions to avoid

None.

10.5. Incompatible materials

Incompatible with cyanides and sulfides (may release toxic gases).

10.6. Hazardous decomposition products

At high temperatures, (~343°C; ~650°F) as in intended use, ammonium chloride fumes, zinc oxide fumes, zinc chloride fumes, and ammonia and hydrogen chloride gases may be released.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Oral: Harmful if swallowed.
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

| | |
|---------------|-----------------------|
| ATE CA (oral) | 500 mg/kg body weight |
|---------------|-----------------------|

| | |
|---------------------------------------|------------|
| Ammonium chloride (12125-02-9) | |
| LD50 oral rat | 1650 mg/kg |

| | |
|----------------------------------|------------|
| Zinc chloride (7646-85-7) | |
| LD50 oral rat | 1100 mg/kg |

Skin corrosion/irritation : Causes severe skin burns and eye damage.
pH: 2.5 - 3.56 (2 lb/gal solution)

Serious eye damage/irritation : Eye damage, category 1, implicit
pH: 2.5 - 3.56 (2 lb/gal solution)

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity – single exposure : May cause respiratory irritation.

Toxic effects described in animals from short exposures include corrosion of mucosal surfaces, liver effects, and kidney effects. Toxic effects in animals occurring only with inhalation exposures are lower respiratory infection with pulmonary edema

Specific target organ toxicity – repeated exposure : Not classified

Human health effects of overexposure by inhalation, ingestion, or skin or eye contact may initially include: eye irritation with discomfort, tearing, or blurring of vision, skin irritation with discomfort or rash; or irritation of the upper respiratory passages. Higher exposures may lead to these effects; skin and eye burns or ulceration; temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath; possibly modest initial symptoms, followed in hours by severe shortness of breath, requiring prompt medical attention; fatality from gross overexposure by fume inhalation or by significant ingestion. There are inconclusive or unverified reports of human sensitization. Individuals with pre-existing diseases of the lungs may have increased susceptibility to the toxicity of excessive exposures.

When the Zaclon® products are heated to high temperatures as those encountered in the galvanizing process, irritating zinc chloride fumes and gaseous hydrogen chloride may be released. Severe exposures may cause pulmonary edema. Heating may also release zinc oxide fumes which may cause metal fume fever.

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Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : Very toxic to aquatic life with long lasting effects.
Aquatic acute : Very toxic to aquatic life.
Aquatic chronic : Very toxic to aquatic life with long lasting effects.

Ammonium chloride (12125-02-9)

| | |
|-------------|--|
| LC50 fish 1 | 209 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static]) |
|-------------|--|

Zinc chloride (7646-85-7)

| | |
|------------|-------|
| BCF fish 1 | 16000 |
|------------|-------|

12.2. Persistence and degradability

No additional information available

12.3. Bioaccumulative potential

Zinc chloride (7646-85-7)

| | |
|------------|-------|
| BCF fish 1 | 16000 |
|------------|-------|

12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Ozone : Not classified

SECTION 13: Disposal considerations

13.1. Disposal methods

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

TDG

UN-No. (TDG) : UN2331
Packing group : III - Minor Danger
TDG Primary Hazard Classes : 8 - Class 8 - Corrosives
Transport document description : UN2331 ZINC CHLORIDE, ANHYDROUS, 8, III
Proper Shipping Name (TDG) : ZINC CHLORIDE, ANHYDROUS

Hazard labels (TDG) : 8 - Corrosive substances



Explosive Limit and Limited Quantity Index : 5 kg
Excepted quantities (TDG) : E1
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 25 kg
Marine pollutant : Yes (IMDG only)



14.2. Transport information/DOT

DOT

DOT NA no. : UN2331

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UN-No.(DOT) : 2331
Packing group (DOT) : III - Minor Danger
Transport document description : UN2331 Zinc chloride, anhydrous, mixture, 8, III
Proper Shipping Name (DOT) : Zinc chloride, anhydrous, mixture
Contains Statement Field Selection (DOT) :
Class (DOT) : 8 - Class 8 - Corrosive material 49 CFR 173.136
Division (DOT) : 8
Hazard labels (DOT) : 8 - Corrosive



Dangerous for the environment : Yes
Marine pollutant : Yes



DOT Special Provisions (49 CFR 172.102) : IB8 - Authorized IBCs: Metal (11A, 11B, 11N, 21A, 21B, 21N, 31A, 31B and 31N); Rigid plastics (11H1, 11H2, 21H1, 21H2, 31H1 and 31H2); Composite (11HZ1, 11HZ2, 21HZ1, 21HZ2, 31HZ1 and 31HZ2); Fiberboard (11G); Wooden (11C, 11D and 11F); Flexible (13H1, 13H2, 13H3, 13H4, 13H5, 13L1, 13L2, 13L3, 13L4, 13M1 or 13M2).
IP3 - Flexible IBCs must be sift-proof and water-resistant or must be fitted with a sift-proof and water-resistant liner.

T1 - 1.5 178.274(d)(2) Normal..... 178.275(d)(2)
TP33 - The portable tank instruction assigned for this substance applies for granular and powdered solids and for solids which are filled and discharged at temperatures above their melting point which are cooled and transported as a solid mass. Solid substances transported or offered for transport above their melting point are authorized for transportation in portable tanks conforming to the provisions of portable tank instruction T4 for solid substances of packing group III or T7 for solid substances of packing group II, unless a tank with more stringent requirements for minimum shell thickness, maximum allowable working pressure, pressure-relief devices or bottom outlets are assigned in which case the more stringent tank instruction and special provisions shall apply. Filling limits must be in accordance with portable tank special provision TP3. Solids meeting the definition of an elevated temperature material must be transported in accordance with the applicable requirements of this subchapter.

DOT Packaging Exceptions (49 CFR 173.xxx) : None
DOT Packaging Non Bulk (49 CFR 173.xxx) : 213
DOT Packaging Bulk (49 CFR 173.xxx) : 240
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 25 kg
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 100 kg
DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.
Other information : No supplementary information available.

14.3. Air and sea transport

IMDG

UN-No. (IMDG) : 2331
Proper Shipping Name (IMDG) : ZINC CHLORIDE, ANHYDROUS
Transport document description (IMDG) : UN 2331 ZINC CHLORIDE, ANHYDROUS, 8, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
Class (IMDG) : 8 - Corrosive substances
Packing group (IMDG) : III - substances presenting low danger

IATA

UN-No. (IATA) : 2331
Proper Shipping Name (IATA) : Zinc chloride, anhydrous
Transport document description (IATA) : UN 2331 Zinc chloride, anhydrous, 8, III, ENVIRONMENTALLY HAZARDOUS
Class (IATA) : 8 - Corrosives
Packing group (IATA) : III - Minor Danger

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SECTION 15: Regulatory information

15.1. Canada National regulations

Ammonium chloride (12125-02-9)

Listed on the Canadian DSL (Domestic Substances List)

Zinc chloride (7646-85-7)

Listed on the Canadian DSL (Domestic Substances List)

15.2. US Federal regulations

Ammonium chloride (12125-02-9)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

Zinc chloride (7646-85-7)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.3. US State regulations

Ammonium chloride (12125-02-9)

U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

Zinc chloride (7646-85-7)

U.S. - Massachusetts - Right To Know List
U.S. - Minnesota - Hazardous Substance List
U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Full text of H-phrases:

| | |
|------|--|
| H302 | Harmful if swallowed |
| H314 | Causes severe skin burns and eye damage |
| H319 | Causes serious eye irritation |
| H335 | May cause respiratory irritation |
| H400 | Very toxic to aquatic life |
| H410 | Very toxic to aquatic life with long lasting effects |

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product