

MSDS According to the REACH regulation 1907/2006/EC and CLP (GHS) regulation 1272/2008/EC.

**1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY**

**Trade Name / Substance Name:** ZINC CHROMATE CZ20/CZ40  
(IUPAC: Potassium dizinc dioxido-dioxo chromium hydroxide)

**REACH registration Number:** 01-2119605164-50-0000

**Relevant identified uses of the substance and uses advised against:** anticorrosive pigment for paints (solid corrosion inhibitor). Pigment reserved for industrial use only (OEM): Aerospace and car refinishing.

**Manufacturer :** SOCIETE NOUVELLE DES COULEURS ZINCIQUES

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800 424 9300 (CHEMTREC - USA).

**24-hour international emergency number :**

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**2. HAZARDS IDENTIFICATION****2.1 Classification according to Regulation 1272/2008/EC [CLP/GHS Annex VI]**

**Hazard pictogram :**

**Signal word :**

**DANGER**

**Hazard statements :** H350

May cause cancer by dust inhalation.

H302

Harmful if swallowed.

H317

May cause an allergic skin reaction.

H410

Very toxic to aquatic life with long lasting effects.

**Precautionary statements:**

**Prevention:** P202

Do not handle until all safety precautions have been read and understood.

P273

Avoid release to the environment.

**Response:** P264

Wash thoroughly after handling.

P308 P313

If exposed or concerned : get medical advice/attention.

P391

Collect spillage.

**Disposal:** P501

Dispose of contents/ containers to be collected by a licensed contractor in accordance with national and local regulations.

**2. HAZARDS IDENTIFICATION (Continued)**
**2.2 Classification according to Directive 67/548/EEC and 1999/45/EC**

(Applicable up to 12/2010 for substances and 06/2015 for preparations):

**Danger :**


Toxic,



Dangerous for the environment.

**T**
**N**
**Labelling according to 67/548/EEC:**

R45- R20/22 - R43

R50/53

**Inhalation risk :** A hazardous concentration of particles in the air can be quickly achieved by dispersion.

**Ingestion risk:** Also harmful in case of ingestion.

**Skin risk:** May cause sensitisation by skin contact.

**Environmental Risk :** This substance is very dangerous for the aquatic organisms. It is highly recommended not to let this product contaminate the Environment.

**3. COMPOSITION / DATA ON COMPONENTS**
**Chemical composition :** Substance, Zinc potassium chromate ( $3\text{ZnCrO}_4$ ,  $\text{K}_2\text{CrO}_4$ ,  $\text{Zn}(\text{OH})_2$ ,  $2\text{H}_2\text{O}$ )

**CAS N° :** 11103-86-9

**EINECS N°:** 234-329-8

**EC Index Number:** 024-007-00-3

**REACH registration Number:** 01-2119605164-50-0000

**Pigment :** Yellow 36 pigment

**Colour Index :** 77955

**Impurity, hazardous components:**(1) regulation 1272/2008/EC (2) directive 67/548/EEC

<u>CAS N°</u>	<u>Annex VI Index N°</u>	<u>Name</u>	<u>%</u>	<u>Phrase</u>	<u>Symbol</u>
<b>Substance:</b> 11103-86-9	024-007-00-3	Zinc and potassium chromate $3\text{ZnCrO}_4$ , $\text{K}_2\text{CrO}_4$ , $\text{Zn}(\text{OH})_2$ , $2\text{H}_2\text{O}$	97	H350 H302 (1) H317 H400 H410 R 45-22-43-50/53(2) S 53-45-60-61	GHS08 GHS07 GHS09 Danger T, N
<b>Impurities:</b> 7789-06-2	024-009-00-4	Strontium chromate $\text{SrCrO}_4$	0.1	H350 H302 (1) H400 H410 R45-22-50/53 (2) S 53-45-60-61	GHS08 GHS07 GHS09 Danger T, N
10294-40-3	056-002-00-7	Barium Chromate $\text{BaCrO}_4$	2.9	H332 H302 (1) R20/22 (2) S28	GHS07 Warning Xn

**4. FIRST AID MEASURES**
**Description of first aid measures:** Get immediately medical attention

**After inhaling :** Immediately remove from exposure area to fresh air. If respiration has stopped perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get immediately medical attention.

#### **4. FIRST AID MEASURES (Continued)**

**After skin contact:** Immediately remove contaminated clothing and shoes. Wash contaminated area with soap or mild detergent and large amount of water until no evidence of chemicals remains. Lesions can be scrubbed with a 20 % solution of sodium hyposulfite or treated with a calcium-disodium EDTA ointments. Freshly prepared and promptly applied 10 % ascorbic acid solution may speed healing of ulcers (Gosselin Clinical toxicology of Commercial Products, 5<sup>th</sup> Ed). As will 1 % solution of aluminium acetate wet dressing (Arena, Poisoning 4<sup>th</sup> Ed.)

**After eye contact:** Wash eyes immediately with large amounts of water, occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Continue irrigating with normal saline until pH has returned to normal (30-60 minutes) cover with sterile bandages. Get immediately medical attention.

**After ingestion:** If the person is conscious and not convulsing, induce vomiting by giving syrup of ipecac (keeping the head below hips level to prevent aspiration), followed by water. Repeat in 20 minutes if not effective initially. For patients with depressed respiration or if vomiting has not worked out, perform gastric lavage cautiously (Dreisbach, Handbook of Poisoning, 12<sup>th</sup> Ed.). Treat symptomatically and supportively. Gastric lavage should be performed by qualified medical personnel. Get immediately medical attention.

**Most important symptoms and effects, both acute and delayed:** see chapter 11

**Indication of any immediate medical attention and special treatment needed:** NOTE TO PHYSICIAN

**ANTIDOTE:** The following antidote has been recommended. However, the decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel.

**CHROMIUM POISONING:** Use of dimercaprol has been suggested on the basis of findings in animals. Give 3 mg/kg (or 0.3 ml/10 kg) every 4 hours, intramuscularly for the first 2 days and then 2 mg/kg every 12 hours for a total of 10 days (Dreisbach Handbook of Poisoning, 12<sup>th</sup> Ed.). Antidote should be administered by qualified medical personnel.

**POISONING FROM ZINC SALTS:** Give calcium disodium edetate 15-25 mg/kg (0.08-0.125 ml of 20 % solution per kg of body weight) in 250-500 ml of 5 % dextrose intravenously over a 1 to 2 hour period twice daily. The maximum dose should not exceed 50 mg/kg/day. The drug should be given in 5-day courses with a rest period of at least 2 days between courses. After the first course, subsequent courses should not exceed 50 mg/kg/day. Daily urine analyses should be done during the treatment period. The dosage should be reduced if any unusual urinary findings appear. For intramuscular administration, give 12.5 mg/kg body weight every 4-6 hours. Dilute each dose with an equal volume of 1 % procaine. Dose limitation is the same as that given above. (Dreisbach, Handbook of Poisoning, 12<sup>th</sup> Ed.). Antidote should be administered by qualified medical personnel.

#### **5. FIRE FIGHTING MEASURES**

**Suitable extinguishing media:** CO<sub>2</sub>, dry chemical, regular foam. **Not recommended:** Water spray (chromate slightly soluble in water). Do not let this material and its solution contaminate the Environment.

**Special hazards arising from the substance:** Negligible hazard when exposed to flames. Keep away from dust. When heated this substance is decomposed and may release oxygen (temperature range 200-600°C depending of reducing condition). When excess of heating, after reduction of the Zinc Potassium chromate in trivalent chromium salts, these are converted in CrO<sub>3</sub> in oxidising conditions. In case of large fire, substance decomposition may release some oxides of chromium. Keep away from reducers (ex hydrazine, wood, sulphur, paper, aluminium).

## 5. FIRE FIGHTING MEASURES (Continued)

### Advice for fire-fighters:

**Special personal protection equipment:** Wear an air respirator beyond dust limits, gloves and appropriate clothing and equipment to prevent a prolonged skin contact with substance.

**Conduct of fire fighting:** Avoid dusting. Keep away unprotected people. Move container from fire area if possible do it without risk. Do not scatter spilled material with high-pressure water streams. Dike and contain fire-control water for later disposal. Contaminated wastes have to be collected by a licensed contractor. Do not let contaminated water contaminate the environment.

**Additional information:** The fire water, waste contaminated containers and fire residues containing zinc potassium chromate must be removed by a licensed contractor for garbage.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures:** Avoid dusting. Wear appropriate mask (type FFP3 [EN 149]) or better adequate respirator, safety glasses, gloves and appropriate clothing equipment to prevent from a prolonged skin contact with this substance. Keep unnecessary people away.

**Environmental precautions:** Do not get rid of waste waters, neither in discharge, nor in sewers, but according to local regulations. To prevent dispersion on the floor and later in the environment, it is highly recommended to forbid walking on the product spillage. Avoid/minimise residues and waste production as possible.

### Methods and material for containment and cleaning up:

**Occupational spill:** Avoid dusting. Sweep up in suitable clean, dry container or absorb material avoiding dusting. Do not flush spilled materials into sewer. Keep unnecessary people away.

**Soil spill :** Dig a holding area such as pit, pond or lagoon to contain spilled material. Use protective cover such as plastic sheet to prevent dissolving in fire-fighting water or rain. Dusting is prohibited.

**Water spill:** For total elimination. Detoxication of  $Cr^{6+}$  is recommended ( $Cr^{6+}$  in waste water is prohibited according to local regulations). For this purpose add  $FeSO_4$  for the chromium reduction and then proceed to  $Cr^{3+}$  flocculation by neutralisation (pH 8-9) with sodium carbonate, lime. Use mechanical dredges or lifts to extract immobilised masses of pollution and precipitates.

**Air spill:** A hazardous concentration of particles in suspension in the air can quickly be reached by dispersion. Keep unnecessary and unprotected people away. Let the particles suspension fall down and go into the place with appropriate individual protection equipment: respirator (or dust mask) and protective (impervious) clothing. Prevent any contact with food and animal feeding stuff.

## 7. HANDLING AND STORAGE

### Precautions for safe handling:

**EC:** The directive 90/394/EC dealing with the prevention of exposition risks to carcinogenic agents in workhouses applies to this substance (see Chapter 15). The directive 98/24/EC deals with the workers health and security protection against chemical risks in workhouses.

**Handling:** Avoid dust breathing and use adequate ventilation. Protection is required to keep exposure below permissible limit (see Chapter 8 and 15). Refer to Chapter 8 to know the protection means you have to wear.

**7. HANDLING AND STORAGE (Continued)**

**Protection against fire and explosion:** The product is non-flammable. It may reduce the ignition temperature of flammable substances. Prevent static electric sparks.

**Conditions for safe storage, including any incompatibilities:**

**Storage:** Store in roofed place at room temperature. Keep containers tightly sealed. Do not store with or close to food and animals feeding stuff. SEVESO II Directive applies if a total sum of 200 tons environmentally dangerous substances and preparations in production and storage is exceeded.

**Material/chemical incompatibility:** Do not store close to reducers (ex-hydrazine, aluminium powder...) and acids ( product soluble in acids).

**Technical incompatibility:** Chromate can be reduced (slight change of the zinc potassium chromate colour which becomes greenish – reduction of Cr<sup>6+</sup> in Cr<sup>3+</sup> –). This colour change is more sensitive with alcohols from 50°C and up. This reaction does not occur at room temperature.

**Specific end use(s):** Pigment reserved for industrial use only (OEM): aerospace and car refinishing. See e-sds

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**
**CONTROL PARAMETERS**
**EXPOSITION LIMIT VALUE** (Occupational Exposure Limits) :

Zinc potassium chromate    3ZnCrO<sub>4</sub>, K<sub>2</sub>CrO<sub>4</sub>, Zn(OH)<sub>2</sub> 2H<sub>2</sub>O    97%  
**CAS N°** : 11103-86-9    **EC N°** : 024-007-00-3.

European Union	: Chromium VI compounds	0.05 mg Cr/m <sup>3</sup>
France	: Chromium VI compounds	0.05 mg Cr/m <sup>3</sup>
		ANSES Avis 7/10/2010: 8 hour time weighted average TWA 0.001 mg Cr <sup>6+</sup> /m <sup>3</sup>
Denmark	: Chromates	0.005 mg Cr/m <sup>3</sup>
Germany	: Chromium VI compounds except insolubles. Carc. Cat. 1A	0.05 mg Cr/m <sup>3</sup>
	(EC Carc Cat.1A : Proved human carcinogen).	
Japan	: Chromium VI compounds	0.05 mg Cr/m <sup>3</sup>
South Africa	: Chromium VI compounds	0.05 mg Cr/m <sup>3</sup>
Sweden	: Chromates VI	0.02 mg Cr/m <sup>3</sup>
UK	: Chromium VI compounds (MEL)	0.05 mg Cr/m <sup>3</sup> (Maximum Exposure Limit)
USA :		

**Threshold Limit Value** (TLV - ACGIH)    0.01 mg Cr /m<sup>3</sup> (TWA : 8 hour Time Weighted Average).

**Cancer Class:**    GHS Carcinogen 1A. A1 (confirmed human carcinogen).

**Threshold Limit Value** (PEL - OSHA)    Chromates as CrO<sub>3</sub> 0.10 mg Cr / m<sup>3</sup>

(note : this value is considered as a ceiling value : peaks should not be exceeded for any period of time).

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION (Continued)**
**EXPOSITION CONTROL:**
**Professional exposure**

This substance can be associated to the alkaline chromate's family for which biological exposure indices exist. These indices are a mean to assess the workers' exposure to chemical substances and can be complementary to the measurements of exposition threshold values in the air (table below).

CrO <sub>3</sub> concentration in the air without protection (µg/m <sup>3</sup> )	Chromium content in erythrocytes (µl/l blood)	Chromium in urine (µg/l)
0.03	9	12
0.05	17	20
0.08	25	30
0.1	35	40

A direct relationship exists between the exposure on a workhouse of compounds belonging to the alkaline chromate's family and the chromium concentration in blood and urine. Results of such analyses allow assessing workers' health (table above).

**OCCUPATIONAL EXPOSURE MANAGEMENT:**

Cr<sup>VI+</sup> Risk management minimizing needs an 8 hours time weighted average exposure below the DMEL in occupational workplaces. In order to perform a real exposure on workplace, it is recommended to:

- Keep under control Cr<sup>VI+</sup> nuisance dust exposure,
- Determine the accurate working time per shift,
- Choose appropriate Personal protective equipment (Respiratory Protective device...) with accurate safety factor.

After calculation, Risk characterisation ratio must be below than 1 for safe operating conditions. For more information see extended safety data sheet.

**DMEL of 0.5 µg Cr(VI)/m<sup>3</sup> is suggested for zinc potassium chromate (8 hour time weighted average) :**

The DMEL (Derived Minimum Effect Level dose) calculated for carcinogenicity is clearly lower than the acute inhalation DNEL (Derived No Effect Level dose). The DNEL for acute inhalation would thus be 0.014 mg Cr(VI)/m<sup>3</sup> = 56 µg zinc potassium chromate/m<sup>3</sup>. Based on this, the acute inhalation effects are considered to be covered by the very low inhalation DMEL derived for carcinogenicity. No DNEL is therefore proposed for acute inhalation.

**Additional notes for design of plant equipment** : no further detail. See chapter 7.

**PERSONAL PROTECTION**

**Respiratory protection**: wear a specific respirator or dust mask (at least FFP3 type) adapted to contamination level found on site beyond dust exposure limits.

**Hand protection**: employee must wear appropriate protective gloves to prevent from contact with this substance.

**Eye protection**: employee must wear splash-proof or dust-resistant safety goggles and a face shield to prevent from contact with this substance ( for example EN166).

**Clothing**: Employee must wear appropriate protective (impervious) clothing and equipment to prevent from any possibility of skin contact with this substance.

**Skin protection**: Wear appropriate clothing to avoid any contact with skin.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION (Continued)**

**Other recommendations:** Showering is recommended after work according to local regulations. Do not drink and eat on site.

**ENVIRONMENT EXPOSITION CONTROL :**

Avoid any dust generation. No data are available as to the Environment exposure. However, emissions have to conform to the authorised limits.

Given the lack of data, this compound is considered as trivalent chromium in soils. Little quantities of hexavalent chromium are quickly converted into trivalent chromium in the soil.

**Atmospheric emissions:** Ventilation systems must be appropriated to get the performance level to control air emissions as required by national regulations. If necessary an appropriate treatment device must be installed according to regulations (Cr<sup>6+</sup> compound).

**Water emissions:** Must be keep under control so they do not contaminate water drainage systems, sewers, streams surface water and groundwater as required by national regulations.

**Soil emissions:** Do not let this material to contaminate soils or ground.

The **PNEC** (Predicted No Effect Concentration) values for Chromium:

- surface water compartment are 3.4 µg/l for chromium (VI) and 4.7 µg/l for chromium (III)
- The **PNEC sediment** can be estimated as follows: For chromium (III), PNEC sediment = 31 mg/kg wet weight for acid conditions and 307 mg/kg wet weight for other conditions.

PNECs for zinc

Environmental compartment	PNEC value for Zn
Freshwater	20.6* µg/L
Saltwater	6.1* µg/L
Freshwater sediment	235.6 mg/kg sediment dry weight**.
Saltwater sediment	113 mg/kg sediment dry weight**
Soil	106.8 mg/kg soil dry weight***.
STP	52 µg/L

\*added value, « PNEC<sub>add</sub> »

\*\*A generic bioavailability factor of 0.5 is applied by default, according to the EU risk assessment (ECB 2008)

\*\*\* A generic bioavailability/ageing factor of 3 is applied by default (ECB 2008).

**9. PHYSICAL AND CHEMICAL PROPERTIES**
**Information on basic physical and chemical properties:**

**Physical state** : solid  
**Odour and appearance** : odourless yellow powder

**Change in physical state :**

**Deshydration** 260°C  
**Decomposition** around 500°C (air) \*  
**Melting** >1 970°C

\* Temperature may be reduced of 200°C by reducers

**9. PHYSICAL AND CHEMICAL PROPERTIES (Continued)**

<b>Flash-point</b>	: NA
<b>Flammable properties</b>	: not flammable, may enhance flammability of other materials.
<b>Explosion risks</b>	: NA
<b>Vapour pressure</b>	: NA
<b>Specific gravity</b>	: 3.5 ISO 787/10
<b>Solubility (water 20°C)</b>	: 0.5 - 1.0 g/l ISO 1249
<b>pH</b>	: 6 - 9 ISO 787/9
<b>Other information</b>	: very soluble in acids and ammonia salts. slightly soluble in alkali.
<b>Coef. water/n octanol</b>	: not available.

**10. STABILITY AND REACTIVITY****Reactivity:**

Zinc Potassium Chromates is slightly soluble in water (1g/l). When heated this substance is decomposed and may release oxygen (temperature range 200-600°C depending of reducing condition). Based on similar substance approach and upon test results (strontium chromate) according GHS/CLP 1272/2008/EC regulation, this substance should not be considered to be an oxidizing solid (oxidizer not strong enough to be classified).

**Chemical stability:**

Stable under normal temperatures and pressures. When mixed with acids this substance may generate dichromate (pH: 5.5-3.5)/ chromic acid (pH <3.5) in mixture.

**Possibility of hazardous reactions:** Stable under normal condition of uses. When excess of heating, after reduction of the Zinc Potassium chromate in trivalent chromium salts, these are converted in CrO<sub>3</sub> in oxidising conditions. In case of large fire, substance decomposition may release some oxides of chromium.

**Conditions to avoid:** Flammability. This product may burn, but does not ignite readily. Prevent static electric sparks.

**Incompatible materials:** Avoid contact with strong reducers (Al, hydrazine, combustible materials...), excessive heat, sparks or open flame.

**Hazardous decomposition products:** stable under normal temperatures and pressures. At high temperature, may release Cr<sup>6+</sup>. After reduction of the zinc potassium chromate in trivalent chromium salts, these are converted in CrO<sub>3</sub> in oxidising conditions.

**11. TOXICOLOGICAL INFORMATION****Toxicity Data :**

Zinc potassium chromate (97 %)	<b>CAS n°</b> 11103-86-9
Mouse: intravenous	<b>LDLo</b> = 30 mg/kg

Due to lack of data concerning zinc potassium chromate, a similar substance approach (strontium chromate) may be suggested as a reference for this substance which belongs to slightly water soluble chromate family.

SrCrO <sub>4</sub> LD50 (oral):	327 mg/kg bw
SrCrO <sub>4</sub> LC50 (inhalation):	270 mg/m <sup>3</sup> air



**11. TOXICOLOGICAL INFORMATION (Continued)**

**Carcinogen status**

- EC (CLP-GHS) classified as Carcinogen Class C1 and Category 1A (CLP-GHS) for human beings. Risk of Cancer for human being depends on duration and level of exposure by dust inhalation.
- Animal Sufficient Evidence (IARC Group 1 for hexavalent chromium compounds). An excess risk for lung and sino nasal cancer has been reported on workers in the chromate and chromate pigment production and chromium plating industries.

Zinc Chromate has been tested on rats by intrabronchial implantation, producing local tumours, and by subcutaneous and intramuscular injection, generating local sarcomas.

**INHALATION**

**Acute Toxicity:** 30 mg (Cr<sup>6+</sup>)/m<sup>3</sup> immediately dangerous to Life or Health. May cause sore throat, coughing, dispnea, laboured breathing. At high levels: depression, damage to deep lung tissue and delayed pulmonary edema may occur.

**Chronic Toxicity:** Repeated or prolonged exposure may cause nasal irritation from rhinitis to painless ulceration of the mouth and nose mucous membranes with bleeding and perforation of the nasal septum and a foul smelling nasal discharge. Hepatitis, with our without jaundice, gastritis, ulcers of the stomach and intestine, nausea, vomiting, anorexia fatigue, lassitude rheumatic pain, and liver and kidney damage are possible. Extended exposure to chromates has caused leucocytosis, leukopenia, monocytosis, eosinophilia, and other blood changes. An excess risk for lung and sinonasal cancer has been reported on workers in the chromate and chromate pigment production and chromium plating industries.

**Long term:** Known to be carcinogen for human beings (EC-GHS : Category 1A).

**Local effect:** Corrosive by inhalation.

**SKIN CONTACT**

**Acute toxicity:** Cr<sup>6+</sup> Application to ulcerated skin has created local necrosis, vomiting, shock, coma, disorder. Direct contact with skin may cause irritation and corrosion, forming ulcers with hard edges which heal slowly.

**Chronic Toxicity:** Cr<sup>6+</sup> Repeated or prolonged exposure may cause sensitisation dermatitis or severe eczematous dermatitis with oedema and slow healing ulcers.

**Local effects:** Dermatitis.

**EYE CONTACT**

**Acute toxicity:** Cr<sup>6+</sup> Direct contact may cause irritation, pain, blurred vision, severe burns, severe corneal injury with corneal opacity, and possible loss of vision.

**Chronic toxicity:** Cr<sup>6+</sup> Repeated or prolonged exposure may cause chronic conjunctivitis, lacrimation and rarely, brown staining of the cornea.

**11. TOXICOLOGICAL INFORMATION (Continued)**
**INGESTION**

**Acute toxicity:** May cause acute fulminating gastroenteritis with nausea, vomiting, thirst, vertigo, oliguria, anuria cholera-like stools, muscle cramps, convulsions and coma. Early deaths may result from blood loss into the gastrointestinal tract or else, causing cardiovascular shock. Survival of the initial phase may be followed by renal and hepatic necrosis and failure which may be fatal. Fatal cases have been reported in which the person showed hepatic coma symptoms; convulsions occurred during the final stages. The approximate lethal dose is 1-16 g. Chromate dermatitis may be aggravated by ingestion of chromates.

**Chronic toxicity:** Five cases of stomach cancer have been reported, apparently from swallowing chromate dust or excessive mouth breathing. Administration of drinking water around 0.45-25 ppm/1 year was non toxic to rats. Prolonged administration to rats created hypoactivity, which indicates chromium affection on the central nervous system.

**12. ECOLOGICAL INFORMATION**

**Toxicity:** Zinc Potassium Chromate is dangerous for the environment. Due to lack of data concerning Zinc Potassium Chromate, we refer to Potassium Dichromate (European Union Risk Assessment Report) for Cr<sup>6+</sup> compounds and Zinc for zinc compounds.

Hexavalent Chromium:
Toxicity to algae

Endpoint	mean value	range
EC50 (growth rate)	0.84 mg/l K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ≡ 0.30 mg/l Cr	0.6-1.03 mg/l K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ≡ 0.21-0.36 mg/l Cr
EC50 (biomass)	0.53 mg/l K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ≡ 0.19 mg/l Cr	0.20-0.75 mg K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> ≡ 0.071-0.26 mg/l Cr.

Toxicity to invertebrates

Potassium dichromate is recommended as a reference substance in the acute toxicity to Daphnia test (Method C.2; EEC, 1992). A ring test involving 129 EC50 determinations from 46 laboratories determined the mean 24h-EC50 value as 1.5 mg K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub>/l (EEC, 1992). This is equivalent to an EC50 of 0.53 mg Cr/l, expressed on a concentration of chromium basis.

Toxicity to fish

The acute toxicity of chromium (VI) to fish appears to be dependent on the water hardness and also pH.

LC50 (96h), Fish in freshwater: 58.5 mg/l

LC50 (96h), Fish in saltwater: 84.8 mg/l

Toxicity to Micro-organisms

EC50 (24h), Bacteria: 3.5 mg/l

Zinc:

The reference values for acute aquatic toxicity, based on the lowest observed EC50 values of the corresponding databases at different pH and expressed as Zn<sup>++</sup> ion concentration are:

Acute toxicity for fish ( <i>Oncorhynchus mykiss</i> ) as zinc	<b>LC50</b> (96 h)	0.14 – 2.6 mg Zn <sup>2+</sup> /l.
Acute toxicity for crustacea ( <i>Ceriodaphnia dubia</i> ) as zinc	<b>EC50</b> (48 h)	0.413 mg Zn <sup>2+</sup> /l. for pH <7
(48 hr - <i>Ceriodaphnia dubia</i> test according to US EPA 821-R-02-012 standard test protocol; reference: Hyne et al 2005)		
Acute toxicity for algae ( <i>Selenastrum capricornutum</i> ) as zinc	<b>EC50</b> (72 h)	0.136– 0.150 mg Zn <sup>2+</sup> /l.
(= <i>Pseudokirchneriella subcapitata</i> ) test according to OECD 201 standard protocol; reference: Van Ginneken, 1994)		
As this substance, classified as aquatic acute/chronic toxic category 1 the multiplying factor M for this substance is 1 for an equivalent LC50 [0.1-1.0]mg/l (GHS or 1272/2008/EC regulation).		

**12. ECOLOGICAL INFORMATION (Continued)**

**Persistence and Degradability:** Substance slightly soluble in water ( $\text{Cr}^{6+}$ ) See chapter 6. No specific data available for Zinc Potassium Chromate. This compound is considered as alkaline dichromate ( $\text{Cr}^{6+}$ ) and zinc compounds.

**Chromium (VI)** may react with particulate matter or pollutants to form Cr (III). In general, chromium is removed from atmosphere by wet and dry depositions. The main form of chromium in seawater is Cr (VI). Hexavalent chromium may remain unchanged or change slowly in many natural waters at low concentrations of organic / reductive. The oxidizing capacity of hexavalent chromium in water increases at a lower pH. Most of chromium released into water is eventually deposited in sediments in hydrated form after being reduced to Cr (III).  $\text{Cr}^{6+}$  needs to be reduced for elimination. See chapter 6 & 9. Avoid infiltration into waste water draining or soils.

**Zinc** is an element, and as such the criterion "persistence" is not relevant for the metal and its inorganic compounds in a way as it is applied to organic substances. An analysis on the removal of zinc from the water column has been presented as a surrogate for persistence. The rapid removal of zinc from the water column is documented in the CSR. So, zinc and zinc compounds do not meet this criterion, neither.

**Bioaccumulative potential:** The passage and bioaccumulation of **chromium** from the earth to the upper parts of plants above the ground is unlikely. Chromium is commonly found in freshwater organisms and accumulates in moderation. **Zinc** is a natural, essential element, which is needed for the optimal growth and development of all living organisms, including man. All living organisms have homeostasis mechanisms that actively regulate zinc uptake and absorption/excretion from the body; due to this regulation, zinc and zinc compounds do not bioaccumulate or bio magnify.

**Mobility in soil:** **Chromium VI** is extensively converted to trivalent chromium in soils and sediments (favoured by anaerobic conditions and low pH). In sediment and soil, chromium III is adsorbed more than the chromium VI. **For zinc** (like for other metals) the transport and distribution over the different environmental compartments e.g. the water (dissolved fraction, fraction bound to suspended matter), soil (fraction bound or complexed to the soil particles, fraction in the soil pore water,...) is described and quantified by the metal partition coefficients between these different fractions. In the CSR, a solids-water partitioning coefficient of 158.5 l/kg (log value 2.2) was applied for zinc in soils (CSR zinc 2010).

**Results of PBT and vPvB assessment:** The Annex XIII of the REACH Regulation No. 1907/2006 is not applicable to inorganic substances.

Avoid infiltration into waste water draining or soils.

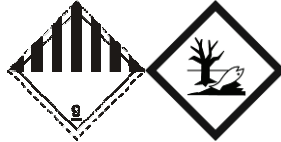
**13. DISPOSAL CONSIDERATIONS****Waste treatment methods**

**Product:** Do not let contaminate the environment with this substance. Waste and spillage must be collected by a licensed contractor for treatment. Dispose in accordance with state or local regulations.

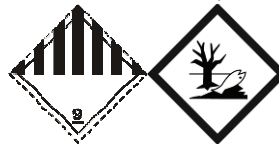
**Contaminated package and containers:** Empty bags can be either destroyed, or recycled according to the international norms that apply. Spoiled and unclean packagings are regulated by the ADR/IMDG/IATA. This substance meets the definition of the hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

**14. TRANSPORT INFORMATION**

**ADR:** UN 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC POTASSIUM CHROMATE), 9, III, (E)



**IMDG:** UN 3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (ZINC POTASSIUM CHROMATE), 9, III, MARINE POLLUTANT FS: F-A, S-F



**IATA:** UN 3077, Environmentally hazardous substance, solid, n.o.s. (zinc potassium chromate), 9, III



Packing instruction: Y956 if gross weight < 30 kg ( inner package <5kg), 956 if gross weight ≥ 30 kg.

**15. REGULATORY INFORMATION**

**15.1 Labelling according 1272/2008/EC (CLP – GHS)**

**Zinc potassium chromate Hazard pictogram :**



**DANGER**

**Signal word :**

Hazard statements :	<b>H350</b>	May cause cancer
	<b>H302</b>	Harmful if swallowed
	<b>H317</b>	May cause an allergic skin reaction
	<b>H410</b>	Very toxic to aquatic life with long lasting effects.

Precautionary statements:

<b>Prevention:</b>	<b>P202</b>	Do not handle until all safety precautions have been read and understood.
	<b>P273</b>	Avoid release to the environment.

<b>Response:</b>	<b>P264</b>	Wash thoroughly after handling.
	<b>P308 P313</b>	If exposed or concerned : get medical advice/attention.
	<b>P391</b>	Collect spillage.

<b>Disposal:</b>	<b>P501</b>	Dispose of contents/ containers to be collected by a licensed contractor in accordance with national and local regulations.
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**15. REGULATORY INFORMATION (Continued)****15.2 Labelling according 67/548/EEC:**

Labelling in accordance with 91/155/EEC and 67/548/EEC directives.

**Symbol of danger :**

Toxic



Dangerous for the environment.

**T****N**

Labelling according to 67/548/EEC:

**R45- R20/22 - R43****R50/53**

**EC** : Zinc Potassium Chromate storage is likely to be regulated by the SEVESO II directive ; it would be considered as a dangerous substance for the aquatic environment. Main SEVESO Category 9i

**R phrases:****R45** : May cause cancer.**R43** : May cause sensitisation by skin contact.**R20/22** : Also harmful by inhalation and if swallowed.**R50/53** : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.**S phrases:****S28** : After skin contact, immediately wash with plenty of water.**S45** : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).**S53** : Avoid exposure - obtain special instructions before use.**S60** : This material and its container must be disposed off as hazardous waste.**S61** : Avoid release to the environment. Refer to special instructions / safety data sheets.

**For industrial use only directive 97/56/EC and regulation 1907/2006/EC Annex XVII Appendix 2.**

**Chemical safety assessment:** Chemical safety report were performed for all ingredients included in Zinc Chromate 20 (see chapter 16)

**16. OTHER INFORMATION****PROPOSED EU CLASSIFICATION, ACCORDING CLP/GHS 1278/2008/EC METHOD****DANGER****Hazard pictogram :****Signal word :****Hazard statements :**

<b>H330</b>	Fatal if inhaled.
<b>H350</b>	May cause cancer by inhalation.
<b>H302</b>	Harmful if swallowed.
<b>H335</b>	May cause respiratory irritation.
<b>H317</b>	May cause an allergic skin reaction.
<b>H361</b>	Suspected of damaging fertility or the unborn child.
<b>H340</b>	May cause genetic defects.
<b>H400</b>	Very toxic to aquatic life.
<b>H410</b>	Very toxic to aquatic life with long lasting effects.

**16. OTHER INFORMATION (Continued)****Precautionary statements:**

<b><u>Prevention:</u></b>	<b>P201</b>	Obtain special instructions before use.
	<b>P260</b>	Do not breathe dust/fume/gas/mist/vapours/spray.
	<b>P262</b>	Do not get in eyes, on skin, or on clothing.
	<b>P263</b>	Avoid contact during pregnancy/while nursing.
	<b>P273</b>	Avoid release to the environment.
	<b>P281</b>	Use personal protective equipment as required.

**Detailed classification results (CLP/GHS)****for health hazards:**

Acute toxicity - oral:	Acute Tox. 4 (Hazard statement: H302: Harmful if swallowed.)
Acute toxicity - dermal:	Reason for no classification: data lacking
Acute toxicity - inhalation:	Acute Tox. 2 (Hazard statement: H330: Fatal if inhaled.)
Skin corrosion/irritation:	Reason for no classification: conclusive but not sufficient for classification
Serious damage/eye irritation:	Reason for no classification: conclusive but not sufficient for classification
Respiration sensitization:	Reason for no classification: data lacking
Skin sensitization:	Skin Sens. 1B (Hazard statement: H317: May cause an allergic skin reaction.)
Aspiration hazard:	Reason for no classification: data lacking
Reproductive Toxicity:	Repr. 2 (Hazard statement: H361: Suspected of damaging fertility or the unborn child) Effects on or via lactation: Reason for no classification: data lacking
Germ cell mutagenicity:	Muta. 2 (Hazard statement: H340: May cause genetic defects)
Carcinogenicity:	Carc. 1A (Hazard statement: H350: May cause cancer <via inhalation >.)
Specific target organ toxicity - single:	STOT Single Exp. 3 (Hazard statement: H335: May cause respiratory irritation.) Affected organs: Upper respiratory tract Route of exposure: Inhalation
Specific target organ toxicity - repeated:	Reason for no classification: conclusive but not sufficient for classification

**For environmental hazards:**

Hazards to the aquatic environment:	Aquatic acute 1 (H400: Very toxic to aquatic life). Aquatic chronic 1 (H410: Very toxic to aquatic life with long lasting effects).
Hazardous to the atmospheric environment:	Reason for no classification: data lacking

**EC PREPARATION LABELLING:** (Directive 1999/45/EC)

1. If the concentration of this substance exceeds 0.1%, the preparation is labelled «carcinogen» and sentences R45 and/or R49 are mandatory depending on the case.
2. If the concentration of this substance
  - exceeds 25% on a weight basis : «N/Dangerous for the environment», R50/53;
  - is between 2.5 and 25% on a weight basis : «N/Dangerous for the environment», R51/53;
  - is between 0.25 and 2.5% on a weight basis : R52/53.

**GERMANY****- Wassergefährdungsklasse WGK (VwVwS) : WGK 3**

**16. OTHER INFORMATION (Continued)****USA**

- **RTECS number:** GB 3300000 (Register of Toxical Effects of Chemical Substances)

- Substance included in the EPA TSCA inventory.

- **Cercla Rating (scale 0-3):** Health 3 - Fire 0 - Reactivity 0 - Persistence 3

- **NFPA Rating (scale 0-4):** Health 3 - Fire 0 - Reactivity 0.

- Substance labelled and classified HMIS third edition: H = 3\* - F = 0 - PH = 1.

- **HMIS III:** The HMIS III ratings are from the HMIS Third Edition. There have been significant changes made to the system. "PH" stands for "Physical Hazard" as defined in the OSHA Haz Com Standard and replaces the former code "R" for "Reactivity". For a more detailed explanation of the system and the ratings, please contact our Offices at INT = 33 (0)1 30 40 57 57.

**International status of the product**

- **Europ EC:**
- a) REACH status: The substance is registered according regulation REACH 1907/2006/EC.
  - b) EINECS registered substance.
  - c) ∇ Listed into the Candidate list of **Substances of Very High Concern** for authorization (19/12/2011).
  - d) Starting from 20 June 2011, producers and importers of articles shall notify ECHA within six months, after a substance has been included in the Candidate List, if the substance is present in those articles in quantities totaling over one tonne, per producer or importer per year, and if the substance is present in those articles above a concentration of 0.1 % weight by weight. This is required for producers and importers of articles when all conditions of Article 7(2) are met according REACH regulation 1907/2006/EC.

Exemption from obligation possible on the basis of: A notification is not required when:

- o The substance has already been registered for that use (see e-sds hereunder),
- o Exposure of humans and the environment can be excluded during the use and disposal of the article.

In such cases, the producer or importer shall however supply appropriate instructions to the recipient of the article.

Upon request of a consumer, the article supplier has to provide relevant safety information about SVHC (Article 33(2) 1907/2006/EC) when the concentration in article exceeds the 0.1% threshold.

e) **This product does not meet with:**

- o **RoHS** directive 2002/95/EC (*Restriction of the use of certain Hazardous Substances in electrical and electronic equipment*) for Lead, Cadmium, hexavalent Chromium, Mercury, Diphenylethers Polybrominated and Polybromated Biphenyls,
- o **ELV** (*End Life of Vehicles*) directive 2000/53/EC.

- **USA:** TSCA registered.
- **Australia :** Listed in the AICS.
- **Canada :** Domestic Substance List (DSL).
- **Japan :** MITI Listed MITI.
- **Philippines** PICCS registered

**End of safety data sheet**

*This information contained herein is based on the present state of our knowledge.*

*The above data is given without liability.*

**Modifications compare to the former version :**      □ : Addition.      ∇ : Text modification.