

SAFETY DATA SHEET

Chromium Trioxide

This Safety Data Sheet contains information concerning the potential risks to those involved in handling, transporting and working with the material, as well as describing potential risks to the consumer and the environment. This information must be made available to those who may come into contact with the material or are responsible for the use of the material. This Safety Data Sheet is prepared in accordance with formatting described in the Regulation (EU) No 453/2010, and described in CLP Regulation (EC) No 1272/2008.

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Chemical Name: Chromium Trioxide
CAS No.: 1333-82-0
EINECS No: 215-607-8
REACH Registration No.: 01-211-9458868-17-0010

1.2 Relevant identified uses of the substances or mixture and of the company/undertaking

Identified uses: Intermediate, Formulation of preparations, Surface treatments, Use of catalysts containing chromium trioxide, small scale laboratory use of chromium trioxide.

Uses advised against: All consumer use

1.3 Details of the supplier of the safety data sheet

Non-EU Manufacturer
Company name: JSC "Aktyubinsk Chromium Chemicals Plant"
Address: 030015, Aktobe, Kazakhstan
Phone number: +7 7132 536501
Fax number: +7 7132 536508
E-mail of the person responsible for the SDS: ves@azhs.kz

1.4 Emergency telephone number

In case of emergency:
Emergency telephone number: +7 7132 536517
Hours of operation: 24/7

Section 2. Hazards Identification**2.1 Classification of the substance or mixture**

Harmonised Classification according to Regulation (EC) No. 1272/2008 (CLP)
Ox. Sol. 1. H271 Carc. 1A. H350 Muta. 1B. H340 Repr. 2. H361F Acute Tox. 2. H330 Acute Tox. 3. H311 Acute Tox. 3. H301 STOT RE 1. H372 Skin Corr. 1A. H314 Resp. Sens. 1. H334 Skin Sens. 1. H317 Aquatic Acute 1. H400 Aquatic Chronic 1. H410 STOT SE 3. H335

For full text of hazard statements, see section 16.

Physicochemical hazards: A strong oxidiser.

Human health:

May cause cancer. May cause genetic defects. May damage fertility. May damage the unborn child. Fatal if inhaled. Causes severe skin burns and eye damage. Toxic if swallowed.

Environment:

Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008:

**Signal Word**

Danger

Hazard Statements

Annex to extended Safety Data Sheet (eSDS):

Downstream user exposure scenario for Chromium Trioxide

1	Exposure Scenario 1
<p>Intermediate in the Manufacture of other Chromium Substances</p> <p>Processes Covered:</p> <p>Environmental Releases</p> <p>ERC6a: Industrial use resulting in manufacture of another substance (use of intermediates)</p> <p>Worker Processes</p> <p>PROC01: Use in closed process, no likelihood of exposure. PROC02: Use in closed, continuous process with occasional controlled exposure. PROC03: Use in closed batch process (synthesis or formulation). PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing).</p> <p>Product Category</p> <p>PC19: Intermediate</p>	
<p>Contributing Environmental Scenario: Environmental exposure arising due to Intermediate use of Chromium Trioxide in the Manufacture of other Chromium Substances.</p>	
<p>Contributing Worker Scenario: Worker exposure arising due to transfer from storage drums/barrels to reactor vessel, day to day operation of the closed system reactor and cleaning and maintenance of the reactor.</p>	
2.1	Contributing scenario 1 controlling environmental exposure for ES 1
<p>Environmental exposure arising due to Intermediate use of Chromium Trioxide in the Manufacture of other Chromium Substances.</p> <p>Section 2.1 describes the environmental releases that may occur during the intermediate use of Chromium Trioxide in the manufacture of other Chromium Substances. These releases may occur due to emission to wastewater or through emission to the atmosphere. If emission to wastewater occurs on-site treatment in an industrial waste water treatment plant will be required in order to lower downstream emissions to the environment. Removal efficiencies in the industrial WWTP operates at 99.99% efficiency. The WWTP also reduces the majority of Cr(VI) present to Cr(III) and alkaline substances added to precipitate chromium hydroxide which is insoluble in water, allowing for its removal to landfill, incineration or recycling. Emissions to the municipal STP should be avoided.</p> <p>Emissions to air should be removed by scrubbing. As a minimum it is expected that off gas removal efficiency of 99% would be required. Emissions to local air (after scrubbing) should have a concentration of no more than 0.0027mg/M³.</p>	
<p>Product characteristics</p> <p>The produced substance is a non-flammable, non-dusty solid. The substance has a high melting point (196°C) and is of low volatility.</p>	
<p>Amounts used</p>	

Production sites may use up to 400 tonnes per annum, with approximately 1,000 tonnes used per year in the European Union. According to the guidance for this tonnage band, the default REACH number of emission days per year are 20 days, however, with continuous emissions, it may be up to 365 emission days per year.	
Frequency and duration of use	
Frequency of exposure is estimated to be 220 days per year, with an 8 hour working day.	
Environmental factors influenced by risk management	
Flow rate of receiving water at least 18,000 m ³ per day. Dilution of STP emissions at least 10 fold.	
Other operational conditions affecting environmental exposure	
Production takes place in a highly specialized indoor facility with emissions to air being scrubbed before release. Reactions are performed under closed conditions, with transfer pipelines are either fully or partially closed systems.	
Technical conditions and measures at process level (source) to prevent release	
Transfer operations are carried out indoors in dedicated facilities, under a hood to reduce potential emissions. Total losses to water are measured.	
Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil	
Waste water should be emitted to either the on-site WWTP or to the municipal STP for smaller facilities with less than 10kg per day loss to wastewater. If an onsite WWTP is available emission to surface water after treatment should be less than 0.0002 % per day Cr (III). Emissions to air after scrubbing should be less than 0.5 kg per day. Sludge from the on-site WWTP should not be spread to soil. Substances present in waste water is chemically treated on site to reduce Chromium Trioxide to Cr(III), which is insoluble in water. This solid waste will be sent as waste for landfill, incineration or recycling.	
Organizational measures to prevent/limit releases from site	
Workers are fully trained in order to prevent accidental release and exposures are monitored to ensure airborne concentrations are within acceptable levels.	
Conditions and measures related to municipal STP	
If emissions to the municipal STP are to be made they should be limited to 10 kg per day. Removal efficiencies in the standard STP are estimated to be 99%. The emission volume of the STP should be at least the default of 2,000 m ³ per day.	
Conditions and measures related to external treatment of waste for disposal	
Residues from scrubbers may be sent to external waste treatment, on-site effluent treatment or recycled back into the manufacturing process. Sludge is recycled, incinerated or sent to landfill. Cr(III) residues are sent as solid waste to landfill, incineration or recycling.	
Conditions and measures related to external recovery of waste	
There is no envisaged external recovery of waste. Waste sludge is reduced and then incinerated.	
2.2	Contributing scenario 2 controlling worker exposure for transferring of substance from barrel to reactor vessel
Worker exposure arising due to Intermediate use of Chromium Trioxide in the Manufacture of other Chromium Substances.	
Section 2.2 describes the potential exposure to workers during the intermediate use of chromium trioxide. The potential exposure arises from the transfer of the substance from its storage source (barrel/drum) to the reactor vessel in order for the reaction to take place. Workers involved in this transfer of the substance will be exposed in the manual handling of the substance from barrel/drum to reactor vessel. Appropriate PPE and onsite control parameters are in place to limit the risk of exposure to workers involved in this task.	
Product characteristics	
The produced substance is a non-flammable, non-dusty solid. The substance has a high melting point (196°C) and is of low volatility.	
Amounts used	
Production sites may use up to 400 tonnes per annum, with approximately 1,000 tonnes used per year in the European Union.	
Frequency and duration of use exposure	
Workers perform standard shifts of 8 hours per day and have standard working years of 220 days per year. Transfer of chromium trioxide is generally a short duration task, with limited potential for exposure.	

Human factors not influence by risk management	
Respiration volume under conditions of use: 10 m ³ /d Area of skin contact with the substance under conditions of use: 0 cm ² due to the use of protective equipment during the transfer of the compound from the barrel to the reactor vessel.	
Other given operational conditions affecting worker exposure	
The transfer of chromium trioxide to the reactor vessel is carried out with local exhaust ventilation in place. Personal protective equipment is also used to minimize the potential for dermal exposure during the transfer process.	
Technical conditions and measures at process level (source) to prevent release	
The transfer of the substance from the barrel/drum to the reactor vessel takes place in a fully closed system, with LEV in place.	
Technical conditions to control dispersion from source towards worker	
LEV should be in place during transfer.	
Organizational measures to prevent/limit release	
Workers are fully trained in safe use and the use of appropriate PPE in order to prevent accidental release. Frequent monitoring for health effects is conducted by medical surveillance programs.	
Conditions and measures related to personal protection, hygiene and health.	
Protective gloves with an efficiency of greater than 90%, faceshield and overalls are worn, in addition to RPE if the system is not fully closed. LEV operates at the site of transfer of the substance to ensure there is minimal exposure.	
2.3	Contributing scenario 3 controlling worker exposure due to day to day operation of closed system reactor
Worker exposure arising due to day to day operation of closed system reactor	
Section 2.3 describes the potential exposure to workers involved in the day to day operational processes associated with the use of chromium trioxide as an intermediate occur in a closed reactor system. In order to ensure efficient operation, workers will undertake tasks to allow proper day to day operation of the closed system reactor. As the system is completely closed, there is low risk of exposure to workers, however, appropriate PPE is worn and LEV in place to minimise the potential for exposure.	
Product characteristics	
The produced substance is a non-flammable, non-dusty solid. The substance has a high melting point (196°C) and is of low volatility	
Amounts used	
Production sites may use up to 400 tonnes per annum, with approximately 1,000 tonnes used per year in the European Union. According to the guidance for this tonnage band, the default REACH number of emission days per year are 20 days, however, with continuous emissions, it may be up to 365 emission days per year.	
Frequency and duration of use exposure	
Workers perform standard shifts of 8 hours per day and have standard working years of 220 days per year. All activities involved in the day to day operation of the reactor vessel are not expected to be of a long duration.	
Human factors not influence by risk management	
Respiration volume under conditions of use: 10 m ³ /d Area of skin contact with the substance under conditions of use: 0 cm ² due to the use of protective equipment during the transfer of the compound from the barrel to the reactor vessel.	
Other given operational conditions affecting worker exposure	
All reactions occur under closed conditions, with limited opportunity for worker exposure. Protective gloves with an efficiency of 90%, faceshield and overalls are worn in the event of accidental contact during day to day operations associated with the reactor vessel.	
Technical conditions and measures at process level (source) to prevent release	
As previously mentioned, all operations occur in a closed system, with limited potential for exposure and with LEV in place. Workers involved in the day to day operation of the reactor vessel wear appropriate PPE (and RPE if LEV is not in place) to minimise dermal and inhalation contact should the opportunity for exposure arise.	
Technical conditions to control dispersion from source towards worker	
All processes occur in a closed system. During the day to day operation of the closed reactor vessel, workers wear appropriate PPE, including gloves faceshield and overalls to prevent accidental contact. All operations are	

conducted under controlled conditions, with local exhaust ventilation in place to minimise the potential for inhalation exposure.	
Organizational measures to prevent/limit release	
Workers are fully trained in the safe use of the substance and the use of appropriate PPE. All workers are actively monitored for health effects by medical surveillance programs to ensure exposure levels do not exceed acceptable levels.	
Conditions and measures related to personal protection, hygiene and health.	
Protective gloves with an efficiency of greater than 90%, faceshield and overalls are worn, in addition to RPE if LEV is not in place. LEV operates at the site of transfer of the substance to ensure there is minimal exposure.	
2.4	Contributing scenario 4 controlling worker exposure for cleaning and maintenance of reactor
Worker exposure arising due to cleaning and maintenance of the reactor.	
Section 2.4 describes the potential exposure to workers during the cleaning and maintenance of the reactor vessel used in the intermediate use of chromium trioxide. Workers will be involved in activities to ensure the reactor vessel is properly maintained to allow efficient functioning. Such activities include cleaning of the reactor and system repair. When these activities are taking place, LEV will be in place and appropriate PPE will be worn by workers to minimise the possible risk of exposure.	
Product characteristics	
The produced substance is a non-flammable, non-dusty solid. The substance has a high melting point (196°C) and is of low volatility.	
Amounts used	
Production sites may use up to 400 tonnes per annum, with approximately 1,000 tonnes used per year in the European Union.	
Frequency and duration of use exposure	
Workers perform standard shifts of 8 hours per day and have standard working years of 220 days per year. Cleaning and maintenance operations of the reactor only rarely occur.	
Human factors not influence by risk management	
Respiration volume under conditions of use: 10 m ³ /d Area of skin contact with the substance under conditions of use: 0 cm ² due to the use of protective equipment during the transfer of the compound from the barrel to the reactor vessel.	
Other given operational conditions affecting worker exposure	
All maintenance activities occur under closed conditions, with limited potential for worker exposure. Protective gloves with an efficiency of 90%, faceshield and overalls are worn in the event of accidental contact during cleaning and maintenance operations necessary for ensuring the reactor vessel can function efficiently.	
Technical conditions and measures at process level (source) to prevent release	
As previously mentioned, there is limited potential for exposure in all maintenance activities and with LEV in place. Workers involved in cleaning and maintaining the reactor vessel wear appropriate PPE (and RPE if LEV is not in place) to minimise dermal and inhalation contact should the opportunity for exposure arise.	
Technical conditions to control dispersion from source towards worker	
All processes occur in a closed system. During cleaning and maintenance activities, workers wear appropriate PPE, including gloves, faceshield and overalls to prevent accidental contact. All operations are conducted under controlled conditions, with local exhaust ventilation in place to minimise the potential for inhalation exposure.	
Organizational measures to prevent/limit release	
Workers are fully trained in the safe use of the substance and the use of appropriate PPE. All workers are actively monitored for health effects by medical surveillance programs to ensure exposure levels do not exceed acceptable levels.	
Conditions and measures related to personal protection, hygiene and health.	
Protective gloves with an efficiency of greater than 90%, faceshield and overalls are worn, in addition to RPE if LEV is not in place. LEV operates at the site of transfer of the substance to ensure there is minimal exposure.	

3 Exposure estimation and reference to its source

Information for contributing scenario 1:

The following PEC values were calculated using EUSES 2.1

PEC	Values
PEC in sewage	0.004 mg/L (Cr(III)) 0 mg/L (Cr(VI))
PEC in aquatic compartment: Freshwater	0.0004 mg/L (Cr(III)) 0 mg/L (Cr(VI))
Marine Water	0.00004 mg/L (Cr(III)) 0 mg/L (Cr(VI))
PEC in sediments: Freshwater sediments	3.88×10^4 mg/kg d.w. (Cr(III))
Marine water sediments	3.8×10^5 mg/kg d.w. (Cr(III))
PEC in soil and groundwater: Agricultural soil	1.39×10^{-4} mg/kg ww (Cr(III))
Grassland	1.39×10^{-4} mg/kg ww (Cr(III))
Groundwater	8.03×10^{-4} mg/L (Cr(III))
PEC in air: annual average	8.03×10^{-4} mg/L (Cr(III))

The following RCR values were obtained:

Compartment	RCR Values
Freshwater	0.044
Marine Water	0.044
Freshwater sediments	6.47×10^{-6}
Marine sediment	6.47×10^{-6}
Agricultural soil	1.58×10^{-5}
Grassland	1.58×10^{-5}
STP (EUSES model)	0.0002
STP (measured data)	0.0025 – 0.003

Information for contributing scenario 2:

The following values were obtained using MEASE

PROC 8b: Dermal Exposure – 0.0004 mg/kg bw/d CrO₃
 Inhalational Exposure - 0.004 mg/m³ CrO₃
 RCR Inhalation exposure - 0.02
 PROC 9: Dermal Exposure - 0.00037 mg/kg bw/d CrO₃
 Inhalational Exposure - 0.004 mg/m³ CrO₃
 RCR Inhalation exposure - 0.02

Information for contributing scenario 3:

The following values were obtained using MEASE

PROC 1: Dermal Exposure - 0.00018 mg/kg bw/d CrO₃
 Inhalational Exposure - 0.01 mg/m³ CrO₃
 RCR Inhalation exposure - 0.5

Information for contributing scenario 4:

The following values were obtained using MEASE

PROC 2: Dermal Exposure	-	0.0004 mg/kg bw/d CrO ₃
Inhalational Exposure	-	0.01 mg/m ³ CrO ₃
RCR Inhalation exposure	-	0.5
PROC 3: Dermal Exposure	-	0.00018 mg/kg bw/d CrO ₃
Inhalational Exposure	-	0.004 mg/m ³ CrO ₃
RCR Inhalation exposure	-	0.02

4

Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Environmental releases:

In order to work within the boundaries of the ES the following conditions should be met:

- Emission to air after scrubbing less than 0.0027 mg/M³
- If an on-site WWTP is used the WWTP sludge should not be spread to soil
- If an onsite WWTP is used emission from the plant to surface water should be no more than 0.0002% per day
- Residues from scrubbers may be sent to external waste treatment, on-site effluent treatment or recycled back into the manufacturing process.
- Cr(III) residues are sent as solid waste to landfill, incineration or recycling.

Worker exposure:

In order to work within the boundaries of the ES the following conditions should be met:

- Transfer operations are conducted in closed facilities.
- The transfer of chromium trioxide to the reactor vessel is carried out with local exhaust ventilation in place.
- LEV should be in place in transfer areas and in the system housing the reactor vessel during activities such as cleaning, general maintenance of the reactor and in the day to day activities to ensure its efficient functioning.
- Workers should wear protective gloves, faceshield and overalls at all times while in the transfer area, during day to day operations and during the cleaning and maintenance operations.
- Where the potential for dermal exposure exists, gloves with a minimum efficiency of 90% should be worn.
- Health monitoring should be conducted regularly to ascertain the potential levels of exposure.
- All worker exposures were below the DNEL, indicating safe use. The inhalation DNEL was determined to be 0.02mg/m³.