I U C L I D

D a t a s e t

Existing Chemical	Substance ID: 10049–04–4
CAS No.	10049–04–4
EINECS Name	chlorine dioxide
EINECS No.	233–162–8
Molecular Weight	67.5
Structural Formula	OClO
Molecular Formula	ClO2

Dataset created by: EUROPEAN COMMISSION – European Chemicals Bureau

This dossier is a compilation based on data reported by the European Chemicals Industry following 'Council Regulation (EEC) No. 793/93 on the Evaluation and Control of the Risks of Existing Substances'. All (non–confidential) information from the single datasets, submitted in the IUCLID/HEDSET format by individual companies, was integrated to create this document.

The data have not undergone any evaluation by the European Commission.

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1.0.1 OECD and Company Information

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1.0.2 Location of Production Site

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1.0.3 Identity of Recipients

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1.1 General Substance Information

Substance type: inorganic
Physical status: gaseous

Substance type: inorganic
Physical status: liquid

1.1.1 Spectra

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1.2 Synonyms

Chlorine peroxide, chlorine(IV) oxide, chloroperoxyl
Source: Finnish Chemicals Oy Äetsä
Veitsiluoto Oy Paper Chemicals Oulu

Chlorine peroxide, chlorine(IV)oxide, chloroperoxyl
Source: Eka Chemicals Oy Oulu

1.3 Impurities

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1.4 Additives

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1.5 Quantity

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1.6.1 Labelling

Labelling: as in Directive 67/548/EEC
Symbols: O
T+
N
E
Specific limits: yes
R-Phrases: (6) Explosive with or without contact with air
(8) Contact with combustible material may cause fire
(26) Very toxic by inhalation
(34) Causes burns
(50) Very toxic to aquatic organisms
S-Phrases: (1/2) Keep locked up and out of reach of children
(23) Do not breathe ...
(26) In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
(28) After contact with skin, wash immediately with plenty of ...
(36/37/39) Wear suitable protective clothing, gloves and eye/face protection
(38) In case of insufficient ventilation, wear suitable respiratory equipment
(45) In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
(61) Avoid release to the environment. Refer to special instructions/Safety data sets

1.6.2 Classification

Classification: as in Directive 67/548/EEC
Class of danger: corrosive
R-Phrases: (34) Causes burns

Classification: as in Directive 67/548/EEC
Class of danger: dangerous for the environment
R-Phrases: (50) Very toxic to aquatic organisms

Classification: as in Directive 67/548/EEC
Class of danger: oxidizing
R-Phrases: (8) Contact with combustible material may cause fire

Classification: as in Directive 67/548/EEC
Class of danger: very toxic
R-Phrases: (26) Very toxic by inhalation

Classification: as in Directive 67/548/EEC
Class of danger:
R-Phrases: (6) Explosive with or without contact with air

1.7 Use Pattern

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1.7.1 Technology Production/Use

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1.8 Occupational Exposure Limit Values

Type of limit: other
Limit value:
Short term expos.
Limit value: .9 mg/m3
Schedule: 15 minute(s)
Remark: Long term exposure limit value is 0,3 mg/m3 (8h).

IDLH(Immediately dangerous to life and health, USA) value is 30 mg/m3 (10 ppm)/30 min.
Source: Finnish Chemicals Oy Äetsä

Type of limit: other
Limit value: .3 mg/m3
Short term expos.
Limit value: .9 mg/m3
Country: Finland
Remark: Exposure limit values are HTP-8h and HTP-15 min
Source: Veitsiluoto Oy Paper Chemicals Oulu

Type of limit: other
Limit value: .3 mg/m3
Short term expos.
Limit value: .9 mg/m3
Country: Finland
Remark: Occupational limit values are HTP-8h and HTP-15min.
Source: Eka Chemicals Oy Oulu

1.9 Source of Exposure

Remark: Chlorine dioxide is produced in closed chlorine dioxide reactors from sodium chlorate and hydrochloric acid or from sodium chlorate, sulfuric acid and methanol.
Chlorine dioxide is dissolved in water and used for pulp pleaching or water disinfection. The concentration of chlorine dioxide solution is ca. 8 g/l.

Finnish Chemicals Oy is producing chlorine dioxide in Kuusankoski plant, where the diluted chlorine dioxide solution is lead straight by pipe line to the customer's pleach plant.

The chlorine dioxide water solution is intermediate product, which is lead from a process to an other process.
Source: Finnish Chemicals Oy Äetsä

Remark: Exposure of product may take place at opening of container of chlorine dioxide water solution.
Source: Veitsiluoto Oy Paper Chemicals Oulu

Remark: Exposure of product may take place at opening of container of chlorine dioxide water.
Source: Eka Chemicals Oy Oulu

1.10.1 Recommendations/Precautionary Measures

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1.10.2 Emergency Measures

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1.11 Packaging

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1.12 Possib. of Rendering Subst. Harmless

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1.13 Statements Concerning Waste

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1.14.1 Water Pollution

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1.14.2 Major Accident Hazards

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1.14.3 Air Pollution

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1.15 Additional Remarks

Remark: Chlorine dioxide is not normally transported in vehicles. Only diluted water solutions can be transported in limited quantities.
Source: Finnish Chemicals Oy Äetsä

Remark: Catalysed by daylight chlorine dioxide decomposes to chlorine and oxygen.
Source: Veitsiluoto Oy Paper Chemicals Oulu

Remark: Chlorine dioxide decomposes to chlorine and oxygen catalyzed by daylight.
Source: Eka Chemicals Oy Oulu

1.16 Last Literature Search

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1.17 Reviews

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1.18 Listings e.g. Chemical Inventories

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2.1 Melting Point

Value: = –59 degree C
Decomposition: yes
Sublimation: no
Source: Finnish Chemicals Oy Äetsä

2.2 Boiling Point

Value: = 11 degree C at 1420 hPa
Decomposition: yes
Remark: Vapour pressure is 142 kPa (1064 mmHg) 20 oC for ClO2 and 8 kPa (60 mmHg) 15 oC for diluted water solution, where the concentration of ClO2 is 8 g/l.
Source: Finnish Chemicals Oy Äetsä

2.3 Density

Type: density
Value: = 1.01 g/cm3 at 4 degree C
Remark: The given density value is for water solution. The density of chlorine dioxide gas is 2.3 g/cm3 (air=1).
Source: Finnish Chemicals Oy Äetsä

2.3.1 Granulometry

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2.4 Vapour Pressure

Value: = 1420 hPa at 20 degree C
Source: Finnish Chemicals Oy Äetsä

2.5 Partition Coefficient

log Pow:
Method:
Year:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

2.6.1 Water Solubility

Value: = 7.5 g/l at 20 degree C
pH: ca. 2 – 3 at 8 g/l and 20 degree C
Remark: Water solubility depends on partial pressure and is 7,5 g/l (partial pressure 100 mbar, 20 oC) and 11,5 g/l (partial pressure 100 mbar, 10 oC).
Source: Finnish Chemicals Oy Äetsä

2.6.2 Surface Tension

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2.7 Flash Point

Value:
Type:
Method:
Year:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

2.8 Auto Flammability

Value:
Remark: Chlorine dioxide is not autoflammable.
Source: Finnish Chemicals Oy Äetsä

2.9 Flammability

Result:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

2.10 Explosive Properties

Result: other
Remark: In high concentrations chlorine dioxide may decompose to chlorine and oxygen by explosion.
Source: Finnish Chemicals Oy Äetsä

2.11 Oxidizing Properties

Result: other
Remark: Chlorine dioxide is strong oxidizing agent.
Source: Finnish Chemicals Oy Äetsä

2.12 Additional Remarks

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3.1.1 Photodegradation

Type: other
Light source: Sun light
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

3.1.2 Stability in Water

Type: abiotic
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

3.1.3 Stability in Soil

Type: other **Radiolabel:** no data
Concentration:
Cation exch. capac.
Microbial biomass:
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

3.2 Monitoring Data (Environment)

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3.3.1 Transport between Environmental Compartments

Type: adsorption
Media: water – air
Method:
Year:
Source: Finnish Chemicals Oy Äetsä

3.3.2 Distribution

Media: water – air
Method:
Year:
Source: Finnish Chemicals Oy Äetsä

3.4 Mode of Degradation in Actual Use

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3.5 Biodegradation

Type:
Inoculum:
Method:
Year: **GLP:**
Test substance:
Remark: No biodegration.
Source: Finnish Chemicals Oy Äetsä

3.6 BOD5, COD or BOD5/COD Ratio

Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

3.7 Bioaccumulation

Species:
Exposure period:
Concentration:
BCF:
Elimination:
Method:
Year: **GLP:**
Test substance:
Remark: Chlorine dioxide is not noticed to bioaccumulate to fishes.
Source: Finnish Chemicals Oy Äetsä

3.8 Additional Remarks

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AQUATIC ORGANISMS

4.1 Acute/Prolonged Toxicity to Fish

Type:
Species:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: Different kinds of tocity test for fishes are done.
Source: Finnish Chemicals Oy Äetsä

4.2 Acute Toxicity to Aquatic Invertebrates

Species:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

4.3 Toxicity to Aquatic Plants e.g. Algae

Species:
Endpoint:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: Chlorine dioxide is used to destroy algae. The type of the species of the algae is not known.
Source: Finnish Chemicals Oy Äetsä

4.4 Toxicity to Microorganisms e.g. Bacteria

Type: aquatic
Species:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

4.5 Chronic Toxicity to Aquatic Organisms

4.5.1 Chronic Toxicity to Fish

Species:
Endpoint:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

4.5.2 Chronic Toxicity to Aquatic Invertebrates

Species:
Endpoint:
Exposure period:
Unit: **Analytical monitoring:**
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

TERRESTRIAL ORGANISMS

4.6.1 Toxicity to Soil Dwelling Organisms

Type:
Species:
Endpoint:
Exposure period:
Unit:
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

4.6.2 Toxicity to Terrestrial Plants

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4.6.3 Toxicity to other Non–Mamm. Terrestrial Species

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4.7 Biological Effects Monitoring

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4.8 Biotransformation and Kinetics

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4.9 Additional Remarks

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5.1 Acute Toxicity

5.1.1 Acute Oral Toxicity

Type: LD50
Species: rat
Sex:
Number of Animals:
Vehicle:
Value: = 292 mg/kg bw
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

5.1.2 Acute Inhalation Toxicity

Type: LCLo
Species: rat
Sex:
Number of Animals:
Vehicle:
Exposure time: 15 minute(s)
Value: = 500 ppm
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

5.1.3 Acute Dermal Toxicity

Type:
Species:
Sex:
Number of Animals:
Vehicle:
Value:
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

5.1.4 Acute Toxicity, other Routes

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5.2 Corrosiveness and Irritation

5.2.1 Skin Irritation

Species:
Concentration:

Exposure:
Exposure Time:
Number of Animals:
PDII:
Result:
EC classificat.:
Method:
Year: **GLP:**
Test substance:
Remark: The product may irritate very slightly skin.
Source: Finnish Chemicals Oy Äetsä

5.2.2 Eye Irritation

Species: human
Concentration:
Dose:
Exposure Time:
Comment:
Number of Animals:
Result:
EC classificat.:
Method:
Year: **GLP:**
Test substance:
Remark: The vapours of the product irritate eyes.
Source: Finnish Chemicals Oy Äetsä

5.3 Sensitization

Type: no data
Species:
Number of Animals:
Vehicle:
Result:
Classification:
Method:
Year: **GLP:**
Test substance:
Source: Finnish Chemicals Oy Äetsä

5.4 Repeated Dose Toxicity

Species: **Sex:**
Strain:
Route of admin.:
Exposure period:
Frequency of treatment:
Post. obs. period:
Doses:
Control Group:
Method:
Year: **GLP:**
Test substance:
Remark: No data available.
Source: Finnish Chemicals Oy Äetsä

5.5 Genetic Toxicity 'in Vitro'

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5.6 Genetic Toxicity 'in Vivo'

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5.7 Carcinogenicity

Species: **Sex:**
Strain:
Route of admin.:
Exposure period:
Frequency of treatment:
Post. obs. period:
Doses:
Result:
Control Group:
Method:
Year: **GLP:**
Test substance:
Remark: The product is not classified carsinogenic.
Source: Finnish Chemicals Oy Äetsä

5.8 Toxicity to Reproduction

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5.9 Developmental Toxicity/Teratogenicity

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5.10 Other Relevant Information

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5.11 Experience with Human Exposure

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7.1 Risk Assessment

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