

# SAFETY DATA SHEET according to Regulation (EC) No. 1907/2006

## CLORIOUS2 (Notif 1085)

Version 1.0

Print Date 26.11.2015

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### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Trade name : CLORIOUS2 (Notif 1085)  
 Substance name : Chlorine dioxide... %  
 Index-No. : 017-026-01-0  
 CAS-No. : 10049-04-4  
 EC-No. : 233-162-8

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Biocide  
 Uses advised against : At this moment we have not identified any uses advised against

#### 1.3. Details of the supplier of the safety data sheet

Company : Brenntag N.V.  
 Nijverheidslaan 38  
 BE 8540 DEERLIJK  
 Telephone : +32-56 77 69 44  
 Telefax : +32-56 77 57 11  
 E-mail address : info@brenntag.be - www.brenntag.be

#### 1.4. Emergency telephone number

Emergency telephone number : Antipoison Center - Brussels  
 TEL: +32(0)70/245.245

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

REGULATION (EC) No 1272/2008			
Hazard class	Hazard category	Target Organs	Hazard statements
Corrosive to metals	Category 1	---	H290
Acute toxicity (Oral)	Category 3	---	H301

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Eye irritation	Category 2	---	H319
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For the full text of the H-Statements mentioned in this Section, see Section 16.

### Most important adverse effects

- Human Health : Over the solution there is a gas phase that might contain a chlorine dioxide concentration depending on vapor pressure. Chlorine dioxide gas is very toxic when inhaled and an environmental hazard. It causes extensive damage to the lungs if inhaled! Highly toxic vapours are formed when the solution is sprayed or in the event of leaks. When handling the gas, it is imperative to observe the notes in section 7.
- Physical and chemical hazards : See section 9/10 for physicochemical information.
- Potential environmental effects : See section 12 for environmental information.

## 2.2. Label elements

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

- Hazard symbols :  
- Signal word : Danger
- Hazard statements : H290 May be corrosive to metals.  
H301 Toxic if swallowed.  
H319 Causes serious eye irritation.
- Precautionary statements
- Prevention : P260 Do not breathe gas/ mist/ vapours/ spray.  
P280 Wear protective gloves/ eye protection/ face protection.  
P273 Avoid release to the environment.
- Response : P330 Rinse mouth.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P337 + P313 If eye irritation persists: Get medical advice/ attention.  
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.

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Disposal : P501 Dispose of contents/ container in accordance with the local/regional/international regulations.

### Additional Labelling:

Be careful when opening! Do not breathe vapors.  
Use biocides safely. Always read the label and product information before use.

### Hazardous components which must be listed on the label:

- Chlorine dioxide... %

### 2.3. Other hazards

For Results of PBT and vPvB assessment see section 12.5.

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Chemical nature : Aqueous solution

		Classification (REGULATION (EC) No 1272/2008)	
Hazardous components	Amount [%]	Hazard class / Hazard category	Hazard statements
<b>chlorine dioxide... %</b>			
Index-No. : 017-026-01-0	> 0,3 - < 0,8	Met. Corr.1	H290
CAS-No. : 10049-04-4		Acute Tox.3	H301
EC-No. : 233-162-8		Skin Corr.1B	H314
		Aquatic Acute1	H400
		STOT SE3	H335

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

General advice : First aider needs to protect himself. Remove from exposure, lie down. Take off all contaminated clothing immediately. Wash contaminated clothing before re-use.

If inhaled : Move to fresh air. If breathing is difficult, give oxygen. If breathing has stopped, apply artificial respiration. If unconscious place in recovery position. Symptoms may be delayed. Call a physician immediately.

In case of skin contact : If on skin, rinse well with water. Consult a physician.

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| In case of eye contact | : Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes. Protect unharmed eye. Consult an eye specialist immediately. Go to an ophthalmic hospital if possible. |
| If swallowed           | : Rinse the mouth and spit the fluids out. Immediately give large quantities of water to drink. Do NOT induce vomiting. Risk of aspiration! Call a physician immediately.                         |

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

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|----------|--|
| Symptoms | : Lung irritation, Irritation of respiratory system. Shortness of breath, Cough, Headache, Nausea, Vomiting, Severe eye irritation, Lachrymation, running nose, Erythema |
| Effects  | : This product causes extensive damage to the lungs if inhaled!  |

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

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| Treatment | : Treat symptomatically. In case of lung irritation, first treatment with dexametason aerosol (spray). |
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## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

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|--------------------------------|---|
| Suitable extinguishing media   | : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Unsuitable extinguishing media | : Dry powder, Carbon dioxide (CO <sub>2</sub> )   |

### 5.2. Special hazards arising from the substance or mixture

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|--------------------------------------|---|
| Specific hazards during firefighting | : Risk of violent reaction. Vapours are heavier than air and may spread along floors. Heating or fire can release toxic gas. Substances mentioned below can be released if the product is involved in a fire: chlorine dioxide, Chlorine, hydrogen chloride, Oxygen |
|--------------------------------------|---|

### 5.3. Advice for firefighters

- |   |   |
|---|---|
| Special protective equipment for firefighters | : In the event of fire, wear self-contained breathing apparatus. Complete suit protecting against chemicals. In the event of fire and/or explosion do not breathe fumes.  |
| Further advice                                | : Heating will cause a pressure rise - with risk of bursting. Cool closed containers exposed to fire with water spray. Collect contaminated fire extinguishing water separately. This must not be discharged into drains. |

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### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions : Provide adequate ventilation. Wear personal protective equipment. Keep away unprotected persons. Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind. Avoid contact with skin and eyes. Do not breathe gas/fumes/vapour/spray.

#### 6.2. Environmental precautions

Environmental precautions : Do not allow uncontrolled discharge of product into the environment. Local authorities should be advised if significant spillages cannot be contained.

#### 6.3. Methods and materials for containment and cleaning up

Methods and materials for containment and cleaning up : Ventilate the area. The gas phase is highly reactive. Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders). Keep in suitable, closed containers for disposal. Treat recovered material as described in the section "Disposal considerations". Never return unused material to storage receptacle.

Further information : Reduce with sodium sulphite or sodium bisulphite solution.

#### 6.4. Reference to other sections

See Section 1 for emergency contact information.  
See Section 8 for information on personal protective equipment.  
See Section 13 for waste treatment information.

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Advice on safe handling : Use only with adequate ventilation (e.g. ventilation, exhaust equipment) and in closed systems. Do not breathe vapours. Use respirator with appropriate filter if vapours or aerosol are released. Avoid contact with eyes. Emergency eye wash fountains and emergency showers should be available in the immediate vicinity.

Hygiene measures : Take off all contaminated clothing immediately. Wash contaminated clothing before re-use. Do not breathe gas/fumes/vapour/spray. Avoid contact with the skin and the eyes. Keep away from food, drink and animal feedingstuffs. Smoking, eating and drinking should be prohibited in the application area. Wash hands before breaks and at the end of workday.

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### 7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers	: Store in a place accessible by authorized persons only. Keep only in the original container. Suitable materials for containers: HDPE fluorinated, stabilized; glass; ceramics; As the density of the product is higher than that of air, there must be no lower areas (ditches, cellar rooms or similar) in the direct vicinity. Unsuitable materials for containers: Metals
Advice on protection against fire and explosion	: The product is not flammable. Normal measures for preventive fire protection.
Further information on storage conditions	: Protect against light. Keep tightly closed in a dry and cool place. Keep away from heat. Protect from contamination. Keep in a well-ventilated place. The product should be stored in collecting containers. Ideally, provision of mechanical and monitored ventilation system.
Advice on common storage	: Materials to avoid: Reducing agents, Acids, Metals, organic materials. Keep away from combustible material.
Storage temperature	: 0 - 50 °C

### 7.3. Specific end use(s)

Specific use(s)	: Biocidal product
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## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Other Occupational Exposure Limit Values		

Belgium. OEL, Time Weighted Average (TWA):  
0,1 ppm, 0,28 mg/m<sup>3</sup>

Belgium. OEL, Short Term Exposure Limit (STEL):  
0,3 ppm, 0,84 mg/m<sup>3</sup>

### 8.2. Exposure controls

#### Appropriate engineering controls

Refer to protective measures listed in sections 7 and 8.

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### Personal protective equipment

#### *Respiratory protection*

Advice : Use respirator with appropriate filter if vapours or aerosol are released.  
In case of insufficient ventilation, wear suitable respiratory equipment.  
Recommended Filter type:  
Combination filter: B-P2

#### *Hand protection*

Advice : Wear suitable gloves.  
Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).  
The following materials are suitable:  
PVC  
Nitrile rubber  
Protective gloves should be replaced at first signs of wear.

#### *Eye protection*

Advice : Tightly fitting safety goggles

#### *Skin and body protection*

Advice : Protective work clothing

### Environmental exposure controls

General advice : Do not allow uncontrolled discharge of product into the environment.  
Local authorities should be advised if significant spillages cannot be contained.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Form	: liquid
Colour	: yellow
Odour	: of Chlorine
Odour Threshold	: no data available
pH	: 2,1 - 3,5 ( 20 °C)
Melting point/range	: no data available

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Boiling point/boiling range	: ca. 100 °C
Flash point	: Not applicable
Evaporation rate	: no data available
Flammability (solid, gas)	: no data available
Upper explosion limit	: no data available
Lower explosion limit	: no data available
Vapour pressure	: 67 hPa (20 °C)
Relative vapour density	: no data available
Density	: ca. 1,01 g/cm <sup>3</sup> (20 °C)
Water solubility	: completely miscible
Partition coefficient: n-octanol/water	: no data available
Auto-ignition temperature	: no data available
Thermal decomposition	: no data available
Viscosity, kinematic	: not determined
Explosivity	: Under the stated storage conditions, no explosive air/vapour mixtures are formed.
Oxidizing properties	: Oxidizing agents

### 9.2. Other information

Corrosion to metals	: Corrosive to metals
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Advice	: No information available.
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### 10.2. Chemical stability

Advice	: Decomposes on exposure to light. Stable under recommended storage conditions.
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### 10.3. Possibility of hazardous reactions

Hazardous reactions	: The gas phase is highly reactive. Corrosive in contact with metals
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### 10.4. Conditions to avoid

Conditions to avoid : Exposure to light. Direct sources of heat.  
Thermal decomposition : no data available

### 10.5. Incompatible materials

Materials to avoid : Organic materials, flammable substances, Reducing agents, Impurities, Metals, Acids

### 10.6. Hazardous decomposition products

Hazardous decomposition : chlorine oxides, hydrogen chloride, Chlorine, Oxygen products

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

#### Data for the product

#### Acute toxicity

##### Oral

LD50 Oral : > 50 - 300 mg/kg (Test substance: 0.6 % solution of chlorine dioxide)  
Manufacturer's test

##### Inhalation

no data available

##### Dermal

no data available

#### Irritation

##### Skin

Result : no data available

##### Eyes

Result : Irritating to eyes.

#### Sensitisation

Result : Does not cause skin sensitisation. (Maximisation Test; Guinea pig)

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### CMR effects

#### CMR Properties

Carcinogenicity	:	Not classifiable as a human carcinogen.
Mutagenicity	:	Not classified due to inconclusive data.
Teratogenicity	:	Based on available data, the classification criteria are not met.
Reproductive toxicity	:	Based on available data, the classification criteria are not met.

### Specific Target Organ Toxicity

#### Single exposure

Remark	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
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#### Repeated exposure

Remark	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
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### Other toxic properties

#### Aspiration hazard

No aspiration toxicity classification,

## SECTION 12: Ecological information

### 12.1. Toxicity

<b>Component:</b>	<b>chlorine dioxide... %</b>	<b>CAS-No. 10049-04-4</b>
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#### Acute toxicity

##### Fish

LC50	:	0,021 mg/l (Danio rerio (zebra fish); 96 h) (semi-static test; Directive 67/548/EEC, Annex V, C.1.)
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#### Toxicity to daphnia and other aquatic invertebrates

EC50	:	0,063 mg/l (Daphnia magna (Water flea); 48 h) (Directive 67/548/EEC, Annex V, C.2.)
EC50	:	0,076 mg/l (Daphnia magna (Water flea); 24 h) (Directive 67/548/EEC, Annex V, C.2.)

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algae	
EC50	: 1,096 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; Directive 67/548/EEC, Annex V, C.3.)
EC50	: 0,324 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Biomass; Directive 67/548/EEC, Annex V, C.3.)
NOEC	: 0,02 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Growth rate; Directive 67/548/EEC, Annex V, C.3.)
NOEC	: 0,02 mg/l (Pseudokirchneriella subcapitata (green algae); 72 h) (static test; End point: Biomass; Directive 67/548/EEC, Annex V, C.3.)

### Chronic toxicity

#### Fish

NOEC	: $\geq 500$ mg/l (Danio rerio (zebra fish); 36 d) (flow-through test; OECD Test Guideline 210)
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#### Aquatic invertebrates

NOEC	: $\geq 500$ mg/l (Daphnia magna (Water flea); 21 d) (semi-static test; End point: Reproduction; OECD Test Guideline 211)
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### M-Factor

M-Factor (Acute Aquat. Tox.)	: 10
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## 12.2. Persistence and degradability

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Persistence and degradability		
Persistence		
Result	: Chlorine dioxide reacts in aqueous systems very quickly with other materials. By abiotic processes with organic materials and oxidisable metals mainly chlorites, chlorates and chlorides are formed.	
Biodegradability		

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Result : The methods for determining the biological degradability are not applicable to inorganic substances.

### 12.3. Bioaccumulative potential

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Bioaccumulation		

Result : Bioaccumulation is not expected.

### 12.4. Mobility in soil

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Mobility		

: no data available

### 12.5. Results of PBT and vPvB assessment

Data for the product		
Results of PBT and vPvB assessment		

Result :

Result : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Results of PBT and vPvB assessment		

Result : The PBT or vPvB criteria of Annex XIII to the REACH Regulation does not apply to inorganic substances.

### 12.6. Other adverse effects

Data for the product		
Additional ecological information		

Result : no data available

Component:	chlorine dioxide... %	CAS-No. 10049-04-4
Additional ecological information		

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Result : no data available

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

- Product : Disposal together with normal waste is not allowed. Special disposal required according to local regulations. Reduce with sodium sulphite or sodium bisulphite.
- Contaminated packaging : Empty remaining contents. Return contaminated packaging to supplier.
- European Waste Catalogue Number : No waste code according to the European Waste Catalogue can be assigned for this product, as the intended use dictates the assignment. The waste code is established in consultation with the regional waste disposer.

### SECTION 14: Transport information

#### 14.1. UN number

3289

#### 14.2. UN proper shipping name

- ADR** : TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.  
(Chlorine dioxide)
- RID** : TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.  
(Chlorine dioxide)
- IMDG** : TOXIC LIQUID, CORROSIVE, INORGANIC, N.O.S.  
(Chlorine dioxide)

#### 14.3. Transport hazard class(es)

- ADR-Class : 6.1  
(Labels; Classification Code; Hazard identification No; Tunnel restriction code) 6.1, 8; TC3; 668; (C/E)
- RID-Class : 6.1  
(Labels; Classification Code; Hazard identification No) 6.1, 8; TC3; 668
- IMDG-Class : 6.1  
(Labels; EmS) 6.1, 8; F-A, S-B

#### 14.4. Packaging group

- ADR : I
- RID : I
- IMDG : I

#### 14.5. Environmental hazards

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Environmentally hazardous according to ADR	: no
Environmentally hazardous according to RID	: no
Marine Pollutant according to IMDG-Code	: no

### 14.6. Special precautions for user

Not applicable.

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

IMDG : Not applicable.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

- Germany	: WGK : 1; Water pollutant weak; (Self classification according to VwVwS of May, 17 1999, Annex 4)
- The Netherlands	: Water damaging: data not available Decontamination exertion: data not available
Other regulations	: Occupational restrictions: Take note of Dir 92/85/EEC on the safety and health of pregnant workers at work and of Dir 94/33/EC on the protection of young people at work.
Chlorine dioxide... %	: EU. Regulation No 1451/2007 [Biocides], Annex I, Active substances identified as existing (OJ (L 325)) EC number: 233-162-8; listed

### 15.2. Chemical safety assessment

The chemical safety assessment will be performed at a later time.

## SECTION 16: Other information

### Full text of H-Statements referred to under sections 2 and 3.

H290	May be corrosive to metals.
H301	Toxic 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.

**CLORIOUS2 (Notif 1085)****Further information**

Key literature references : Supplier information and data from the "Database of registered substances" of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

Other information : The information provided in this Safety Data Sheet is correct to our knowledge at the date of its revision. The information given only describes the products with regard to safety arrangements and is not to be considered as a warranty or quality specification and does not constitute a legal relationship.

The information contained in this Safety Data Sheet relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

|| Indicates updated section.

COMPANY INFORMATION DISTRIBUTOR		
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fax number	+32 (0)56 77 57 11	+31 (0)78 65 44 919
website	www.brenntag.be	www.brenntag.nl
e-mail	info@brenntag.be	info@brenntag.nl
activities	Distribution and export of chemicals and raw materials	
VAT number	BE0405317567	NL001375945B01
recall procedure available	Yes	
emergency number (24/365)	+32 (0)56 77 69 44	+31 (0)78 6544 944
<b>QUALITY SYSTEMS</b>		
ISO 9001	Yes	Yes
ISO 14001	Yes	Yes
ISO 22000	Yes	Yes
FSSC 22000	Yes	Yes
GMP+ -feed	Yes	Yes
OHSAS18001	-	Yes
ESAD	Yes	Yes
other	-	AEO