Product information ci 20 (corrosion inhibitor)

Application
ci 20 is an inhibitor for closed and semi-open cooling and heating systems. Depending on the process conditions (raw water quality; max process temperature), it can be used in low-salt water with low residual hardness, soft water or completely demineralised water.

The corrosion inhibition is done by formation of a protective layer. Therefore, the oxygen does not affect the efficacy. In particular, temporary standstill corrosion is also prevented.

Properties
ci 20 inhibits all steel materials. The pH value of the circulating water should be adjusted between 7.0 and 10.5. The polymer in ci 20 stabilizes the residual hardness and dispersed existing deposits such as lime and iron oxides and also insoluble solids. The application concentration of ci 20 depends on the maximum process temperature, the flow velocity, as well as the salt content and is individually determined by your gwk engineer.

Appearance: Clear, yellowish to brown liquid
Active substances: Phosphonate, polymers, non-ferrous metal inhibitor, molybdate
Density (20°C): 1.05 kg/dm$^3$
pH-value: approx. 9

The statements made here are not product specification, they are for information only.

Dosing
The dosing quantity of ci 20 is depends on the existing system water volume and the existing process conditions. Usual application concentrations for ci 20 in systems with regular water replacement:

- 4.000 – 5.000 g/m$^3$ for hard water with LSI value max. 2.5 and maximum process temperature 95°C,
- 4.000 – 5.000 g/m$^3$ for soft water (0°dH) and maximum process temperature 140°C,
- 5.000 g/m$^3$ for completely demineralised water and maximum process temperature 225°C.
- 6000 – 7000 g/m$^3$ in systems with low water refreshment rate

The product content is determined on-site by means of the Mo-Testkit (gwk art. no. 8110575). The target concentration of molybdenum Mo$^{6+}$ is 50-60 mg/l for a dosing rate of 4000-5000 g/m$^3$, 70-80 mg/l for a dosing rate of 6000-7000 g/m$^3$.

Handling
Suitable personal protective measures are listed in the safety data sheet.

Important note
Each of our products is supplied with a safety data sheet. The safety data sheets contain important information on occupational safety and health protection, on the basis of which our customers can create appropriate work instructions to protect their employees and customers against harmful effects when handling the materials. Before using the gwk products in your plant, it should be ensured that the safety data sheets have been read and understood by your supervisory staff and your competent employee.

Shelf life / storage
1 year in unopened container.
3 months in opened container.
The data refer to the following storage conditions: cool (5°C-20°C), frost-free, dark, dry place.

Delivery container
10kg canister, 25kg canister, 200kg drum

All statements, information and data contained herein are considered by us to be accurate and reliable, but make no guarantee nor any express or implied warranty of the properties and also are not a guarantee of the commercial or technical suitability for a particular use. We therefore accept no responsibility for them. They are only intended to serve as a basis for your observations, investigation and verification. Findings and suggestions on our part regarding the possible use of our product is without any guarantee that such use does not infringe the industrial property rights of others; they should not be regarded as suggestions for patent infringement.
SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
cl 20

Product code: gwkci20

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

Use of the substance/mixture
Water treatment chemicals

Uses advised against
No information available.

1.3. Details of the supplier of the safety data sheet

Company name: Gesellschaft Wärme und Kältetechnik mbH
Street: Scherl 10
Place: D-58540 Meinerzhagen
Telephone: +49 2354 7060 - 0
Telefax: +49 2354 7060 - 156
e-mail (Contact person): info@gwk.com
Internet: www.gwk.com
Responsibler Department: Wassertechnik

1.4. Emergency telephone number: +49 (0) 30 30686700

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No. 1272/2008

Hazard categories:
Skin corrosion / irritation: Skin irritation. 2
Serious eye damage / eye irritation: Eye irritation. 2
Respiratory or skin sensitization: Sens. Skin 1

Hazard statements:
Causes skin irritation.
Causes serious eye irritation.
May cause an allergic skin reaction.

2.2. Label elements

Regulation (EC) No. 1272/2008

Hazard components for labelling
None.

Signal word: Attention
Pictograms:
Hazard statements
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H319 Causes serious eye irritation.

Precautionary statements
P261 Avoid breathing dust / fume / gas / mist / vapors / spray.
P280 Wear protective gloves / protective clothing / eye protection / face protection.
P302 + P352 IF ON SKIN: Wash with plenty of water.
P333 + P313 In case of skin irritation or rash: Get medical advice / attention.
P362 + P364 Remove contaminated clothing and wash before reuse.

Additional advice on labelling
The product is classified and labelled according to EC directives or corresponding national laws.

2.3. Other hazards
No information available.

SECTION 3: Composition/information on ingredients

3.2. Mixtures
Chemical characterization
Formulation of preparations (mixtures)

Hazardous components

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-14-7</td>
<td>benzotriazole</td>
<td>&lt; 5 %</td>
</tr>
<tr>
<td>202-394-1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Classification according to Regulation (EC) No. 1272/2008 [CLP]</td>
<td></td>
</tr>
<tr>
<td>1310-73-2</td>
<td>sodium hydroxide</td>
<td>&lt; 2 %</td>
</tr>
<tr>
<td>215-185-5</td>
<td></td>
<td></td>
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<tr>
<td>01-2119436643-00</td>
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<td></td>
</tr>
<tr>
<td>23783-26-8</td>
<td>hydroxyphosphonoacetic acid</td>
<td>&lt; 5 %</td>
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<tr>
<td>405-710-8</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Classification according to Regulation (EC) No. 1272/2008 [CLP]</td>
<td></td>
</tr>
</tbody>
</table>

Full text of H and EUH statements: see section 16.

Further Information
No information available.

SECTION 4: First aid measures

4.1. Description of first aid measures
General information
Remove contaminated, saturated clothing immediately.

After inhalation
Move victim to fresh air. Instruct person to keep calm and warm.

After contact with skin
After contact with skin, wash immediately with plenty of water and soap.

After contact with eyes
If product gets into the eye, keep eyelid open and rinse immediately with large quantities of water, for at least 5 minutes. Subsequently consult an ophthalmologist.

After ingestion
Rinse mouth immediately and drink plenty of water. Never give anything by mouth to an unconscious person or a person with cramps.

4.2. Most important symptoms and effects, both acute and delayed
No information available.

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

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media
Water. Foam. ABC powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
High power water jet.

5.2. Special hazards arising from the substance or mixture
In the event of a fire: Nitrogen oxides (NOx). Hydrogen chloride (HCl). Carbon monoxide

5.3. Advice for firefighters
In case of fire: Wear self-contained breathing apparatus.

Additional information
Collect contaminated fire extinguishing water separately. Do not allow entering drains or surface water.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Wear personal protection equipment.

6.2. Environmental precautions
Prevent spread over a wide area (e.g. by containment or oil barriers).

6.3. Methods and material for containment and cleaning up
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

6.4. Reference to other sections
Take up mechanically, placing in appropriate containers for disposal.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Advice on safe handling
No special measures are necessary.

Advice on protection against fire and explosion
No special fire protection measures are necessary.

Further information on handling
No special handling instructions are necessary.
7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels
Keep/Store only in original container.

Advice on storage compatibility
Keep away from food, drink and animal feedingstuffs.

Further information on storage conditions
Conditions to avoid: frost.

7.3. Specific end use(s)
No information available.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Exposure limits (EH40)

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Substance</th>
<th>ppm</th>
<th>mg/m³</th>
<th>fibres/ml</th>
<th>Category</th>
<th>Origin</th>
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<tr>
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</tbody>
</table>

Additional advice on limit values
No information available.

8.2. Exposure controls

Appropriate engineering controls
No information available.

Protective and hygiene measures
Do not eat, drink, smoke or sneeze at the workplace.

Eye/face protection
Tightly sealed safety glasses.

Hand protection
Passenger-LQ

Skin protection
No information available.

Respiratory protection
No information available.

Environmental exposure controls
No information available.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: liquid
Colour: brown
Odour: characteristic

pH-Value (at 20 °C):
8 - 10 DIN 19268

Changes in the physical state
Section 9: Other information

No information available.

Section 10: Stability and reactivity

10.1. Reactivity
No information available.

10.2. Chemical stability
No information available.

10.3. Possibility of hazardous reactions

10.4. Conditions to avoid

10.5. Incompatible materials

10.6. Hazardous decomposition products
No information available.

Further information
No information available.

Section 11: Toxicological information

11.1. Information on toxicological effects

Toxicokinetics, metabolism and distribution
No information available.

Acute toxicity
Based on available data, the classification criteria are not met.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Exposure route</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>95-14-7</td>
<td>benzotriazole</td>
<td>oral</td>
<td>ATE</td>
<td>500 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23783-26-8</td>
<td>hydroxyphosphonoacetic acid</td>
<td>oral</td>
<td>ATE</td>
<td>500 mg/kg</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

Irritation and corrosivity

Causes skin irritation.
Causes serious eye irritation.

Sensitising effects
Based on available data, the classification criteria are not met.
Carcinogenic/mutagenic/toxic effects for reproduction
Based on available data, the classification criteria are not met.

STOT-single exposure
Based on available data, the classification criteria are not met.

STOT-repeated exposure
Based on available data, the classification criteria are not met.

Aspiration hazard
Based on available data, the classification criteria are not met.

Specific effects in experiment on an animal
No information available.

Additional information on tests
Classification for mixtures and used evaluation method according to regulation (EC) No 1272/2008 [CLP]

Practical experience
Observations relevant to classification
No information available.

Other observations
No information available.

Further information
No information available.

SECTION 12: Ecological information

12.1. Toxicity
The product has not been tested.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Aquatic toxicity</th>
<th>Dose</th>
<th>h</th>
<th>d</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>1310-73-2</td>
<td>sodium hydroxide</td>
<td></td>
<td>45.4 mg/l</td>
<td>96 h</td>
<td>Onchorhynchus mykiss</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
Technically correct releases of minimal concentrations to adapted biological sewage treatment facility, will not disturb the biodegradability of activated sludge.

12.3. Bioaccumulative potential
Does not accumulate in organisms.

Partition coefficient n-octanol/water

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
12.4. Mobility in soil
No information available.

12.5. Results of PBT and vPvB assessment
No information available.

12.6. Other adverse effects
No information available.

Further information
No information available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Advice on disposal
Waste key product: Dispose of waste according to "Kreislaufwirtschafts- und Abfallgesetz (KrW-/AbfG)".

Contaminated packaging
Contaminated packages must be completely emptied and can be re-used following proper cleaning. Packing which cannot be properly cleaned must be disposed of.

SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number:
No dangerous good in the sense of these transport regulations.

14.2. UN proper shipping name:
No dangerous good in the sense of these transport regulations.

14.3. Transport hazard class(es):

14.4. Packing group:
Hazard label:
Classification code:
Special Provisions:
Limited quantity:
Excepted quantity:
Transport category:
Hazard No:
Tunnel restriction code:

Inland waterways transport (ADN)

14.1. UN number:
No dangerous good in the sense of these transport regulations.

14.2. UN proper shipping name:
No dangerous good in the sense of these transport regulations.

14.3. Transport hazard class(es):

14.4. Packing group:
Hazard label:
Classification code:
Special Provisions:
Limited quantity:
Excepted quantity:

Marine transport (IMDG)

14.1. UN number:
No dangerous good in the sense of these transport regulations.

14.2. UN proper shipping name:
No dangerous good in the sense of these transport regulations.

14.3. Transport hazard class(es):

14.4. Packing group:
Hazard label:
Special Provisions:
Limited quantity: 
Excepted quantity: 
EmS: 

Air transport (ICAO-TI/IATA-DGR) 

14.1. UN number: No dangerous good in the sense of these transport regulations. 
14.2. UN proper shipping name: No dangerous good in the sense of these transport regulations. 
14.3. Transport hazard class(es): . 
14.4. Packing group: . 
Hazard label: . 
Special Provisions: . 
Limited quantity Passenger: . 
Passenger LQ: . 
Excepted quantity: . 
IATA-packing instructions - Passenger: . 
IATA-max. quantity - Passenger: . 
IATA-packing instructions - Cargo: . 
IATA-max. quantity - Cargo: . 
Danger releasing substance: . 

14.6. Special precautions for user 

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code 

Other applicable information 

SECTION 15: Regulatory information 

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

EU regulatory information 

Additional information 

No information available. 

National regulatory information 

Water contaminating class (D): 1 – slightly water contaminating 

Biocide registry number: . 

SECTION 16: Other information 

Relevant H and EUH statements (number and full text) 

H302 Gesundheitsschädlich bei Verschlucken. 
H314 Verursacht schwere Verätzungen der Haut und schwere Augenschäden. 
H315 Verursacht Hautreizungen. 
H317 Kann allergische Hautreaktionen verursachen. 
H319 Verursacht schwere Augenreizung. 
H373 Kann die Organe schädigen bei längerer oder wiederholter Exposition. 
H412 Schädlich für Wasserorganismen, mit langfristiger Wirkung. 

Further Information 
The information is based on present level of our knowledge. It does not, however, give assurances of product properties and establishes no contract legal rights.
The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)