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

Product identifier
Castolin FLUX 157

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

Use of the substance/mixture
Brazing flux

Details of the supplier of the safety data sheet

Responsible for the safety data sheet: sds@gbk-ingelheim.de
Emergency telephone:+49 (0) 6132 / 84463 (GBK Gefahrut Buero GmbH, Ingelheim)

Company name: Castolin Eutectic Limited
Street: Unit 10, Merse Road
Place: GB-B98 9NZ Worcestershire
Telephone: +44 (0) 1527 5822 00
Telefax: +44 (0) 1527 5822 01

SECTION 2: Hazards identification

Classification of the substance or mixture

Indications of danger : Corrosive, Harmful, Dangerous for the environment
R-phrases:
Harmful if swallowed.
Causes burns.
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Brazing/welding vapours and fumes from brazing/welding may cause metal fumes fever. Symptoms can appear 4 to 12 hours after. (headache, dizziness, dryness, cough, nausea and fever)
May cause irritation by prolonged inhalation of brazing/welding fumes.

GHS classification

Hazard categories:
Acute toxicity: Acute Tox. 4
Skin corrosion/irritation: Skin Corr. 1B
Serious eye damage/eye irritation: Eye Dam. 1
Specific target organ toxicity - single exposure: STOT SE 3
Hazardous to the aquatic environment: Aquatic Acute 1
Hazardous to the aquatic environment: Aquatic Chronic 1

Hazard Statements:
Harmful if swallowed.
Causes severe skin burns and eye damage.
May cause respiratory irritation.
Very toxic to aquatic life with long lasting effects.

Label elements

Signal word: Danger
Pictograms: GHS05-GHS07-GHS09
Hazardous components which must be listed on the label

Zinc chloride

Hazard statements

H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H335 May cause respiratory irritation.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements

P285 In case of inadequate ventilation wear respiratory protection.
P314 Get medical advice/attention if you feel unwell.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P501 Dispose of contents/container to waste treatment facility in accordance with local and national regulations.

Other hazards

Welding and brazing processes can cause spatter, melting metal and UV/IR heat can cause burns or start fires. During welding- and brazing processes formed metallic fumes are suspected of being cancer causing agents.

SECTION 3: Composition/information on ingredients

Mixtures

Hazardous components

<table>
<thead>
<tr>
<th>EC No</th>
<th>Chemical name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>231-592-0</td>
<td>Zinc chloride</td>
<td>&gt;50 %</td>
</tr>
<tr>
<td>7646-85-7</td>
<td>Xn, C, N R22-34-50-53</td>
<td></td>
</tr>
<tr>
<td>030-003-02</td>
<td>Acute Tox. 4, Skin Corr. 1B, Aquatic Acute 1, Aquatic Chronic 1; H302 H314 H400 H410</td>
<td></td>
</tr>
<tr>
<td>225-186-4</td>
<td>ammonium chloride</td>
<td>5-10 %</td>
</tr>
<tr>
<td>12125-02-9</td>
<td>Xn, Xi R22-36</td>
<td></td>
</tr>
<tr>
<td>017-014-00-8</td>
<td>Acute Tox. 4, Eye Irrit. 2; H302 H319</td>
<td></td>
</tr>
<tr>
<td>231-667-8</td>
<td>Sodium fluoride</td>
<td>0,1-5 %</td>
</tr>
<tr>
<td>7681-49-4</td>
<td>T, Xi R25-36/38-32</td>
<td></td>
</tr>
<tr>
<td>009-004-00-7</td>
<td>Acute Tox. 3, Eye Irrit. 2, Skin Irrit. 2; H301 H319 H315</td>
<td></td>
</tr>
</tbody>
</table>

Full text of R- and H--phrases: see section 16.

SECTION 4: First aid measures

Description of first aid measures

After inhalation
Take affected person into fresh air.
Consult a physician if necessary.

After contact with skin
In case of contact with skin wash off with soap and water.

After contact with eyes
In case of contact with eyes rinse thoroughly with plenty of water and seek medical advice.

After ingestion
Rinse mouth.
As soon as possible, take phials of calcium chloride and seek hospital.
Do not induce vomiting.

Most important symptoms and effects, both acute and delayed
Causes burns.

R phrases
22 Harmful if swallowed.
34 Causes burns.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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

SECTION 5: Firefighting measures

Extinguishing media

Suitable extinguishing media
Use fire fighting measures that suit the environment and products stored

Advice for firefighters
Wear full protective suit. In case of fire, wear suitable respiratory equipment with positive air supply.
Do not release chemically contaminated water into drains, soil or surface waters. Sufficient measures must be taken to retain water used for extinguishing.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
In case of vapour formation use respirator.
Ensure adequate ventilation.
Use personal protective clothing.

Environmental precautions
Do not discharge into the drains or bodies of water.

Methods and material for containment and cleaning up
Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder).
Shovel into suitable container for disposal.

Reference to other sections
Observe protective instructions (see Sections 7 and 8).
Information for disposal look up chapter 13.

SECTION 7: Handling and storage

Precautions for safe handling
Advice on safe handling
Keep container tightly closed.
SDS 01790

Avoid contact with skin, eyes and clothing. Use only in well-ventilated areas. ANSI Z49.1 Safety in Welding, Cutting and allied processes.

Further information on handling
When using, do not eat, drink or smoke.

Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels
Incompatible with strong acids and oxidizing agents.

Advice on storage compatibility
Do not store together with food.

Further information on storage conditions
Keep in closed original container.

Specific end use(s)
Brazing flux

SECTION 8: Exposure controls/personal protection

Control parameters

Exposure limits (EH40)

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>ml/m³</th>
<th>mg/m³</th>
<th>F/ml</th>
<th>Category</th>
<th>Origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>12125-02-9</td>
<td>Ammonium chloride, fume</td>
<td>-</td>
<td>10</td>
<td></td>
<td>TWA (8 h)</td>
<td>WEL</td>
</tr>
<tr>
<td>12125-02-9</td>
<td></td>
<td>-</td>
<td>20</td>
<td></td>
<td>STEL (15 min)</td>
<td>WEL</td>
</tr>
<tr>
<td>16984-48-8</td>
<td>Fluoride (inorganic as F)</td>
<td>-</td>
<td>2.5</td>
<td></td>
<td>TWA (8 h)</td>
<td>WEL</td>
</tr>
<tr>
<td>16984-48-8</td>
<td></td>
<td>-</td>
<td>-</td>
<td></td>
<td>STEL (15 min)</td>
<td>WEL</td>
</tr>
<tr>
<td>7646-85-7</td>
<td>Zinc chloride, fume</td>
<td>-</td>
<td>1</td>
<td></td>
<td>TWA (8 h)</td>
<td>WEL</td>
</tr>
<tr>
<td>7646-85-7</td>
<td></td>
<td>-</td>
<td>2</td>
<td></td>
<td>STEL (15 min)</td>
<td>WEL</td>
</tr>
</tbody>
</table>

Exposure controls

Occupational exposure controls
Provide appropriate exhaust ventilation at machinery and at places where dust or smoke can be generated.

Protective and hygiene measures
At work do not eat, drink and smoke. Wash hands and skin before breaks and after work. When using, do not eat, drink or smoke. Avoid contact with skin, eyes and clothing. ANSI Z49.1 Safety in Welding, Cutting and allied processes.

Respiratory protection
Use suitable breathing apparatus if there is inadequate ventilation. Multi-purpose filter ABEK/P3
Hand protection
Protective gloves resistant to chemicals made off nitrile, Minimum coat thickness 0.4 mm, Permeation resistance (wear duration) approx. 480 minutes, i.e. protective glove <Camatril 735> made by www.kcl.de.
Requirements can vary as a function of the use. Therefore it is necessary to adhere additionally to the recommendations given by the manufacturer of protective gloves.
This recommendation refers exclusively to the chemical compatibility and the lab test conforming to EN 374 carried out under lab conditions.

Eye protection
Safety goggles with side protection.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties
Physical state: Liquid
Colour: 
Odour: Odourless

Test method
pH-Value (at 20 °C): ~ 3

Changes in the physical state
Boiling point: n.a.
Flash point: n.a.
Water solubility: Soluble (at 20 °C)

Other information
No data available.

SECTION 10: Stability and reactivity

Reactivity
Contact with acids liberates toxic gas.

Chemical stability
Stable under normal conditions.

Possibility of hazardous reactions
Contact with acids liberates toxic gas.

Conditions to avoid
Hydrogen fluoride is liberated on heating at high temperatures in the presence of water vapor.
Contact with acids liberates toxic gas.

Incompatible materials
Contact with strong acids liberates hydrogen fluoride.
Evolution of ammonia under influence of alkalies.

Hazardous decomposition products
Hydrogen fluoride is liberated on heating at high temperatures in the presence of water vapor.

SECTION 11: Toxicological information
Information on toxicological effects

Acute toxicity
Harmful if swallowed.
Brazing/welding vapours and fumes from brazing/welding may cause metal fumes fever. Symptoms can appear 4 to 12 hours after. (headache, dizziness, dryness, cough, nausea and fever)

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Exposure routes</th>
<th>Method</th>
<th>Dose</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>7646-85-7</td>
<td>Zinc chloride</td>
<td>Acute oral toxicity</td>
<td>LD50</td>
<td>350 mg/kg</td>
<td>Ratte</td>
</tr>
<tr>
<td>12125-02-9</td>
<td>ammonium chloride</td>
<td>Acute oral toxicity</td>
<td>LD50</td>
<td>1440 mg/kg</td>
<td>Ratte</td>
</tr>
<tr>
<td>7681-49-4</td>
<td>Sodium fluoride</td>
<td>Acute oral toxicity</td>
<td>LD50</td>
<td>52 mg/kg</td>
<td>Ratte</td>
</tr>
</tbody>
</table>

Irritation and corrosivity
Causes burns.

Further information
The product was classified on the basis of the calculation procedure of the preparation directive (1999/45/EC).

R phrases
22 Harmful if swallowed.
34 Causes burns.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SECTION 12: Ecological information

Toxicity
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Method</th>
<th>Dose</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>7646-85-7</td>
<td>Zinc chloride</td>
<td>LC50</td>
<td>38 mg/l</td>
<td>Danio rerio 96</td>
</tr>
<tr>
<td></td>
<td>Acute crustacea toxicity</td>
<td>EC50</td>
<td>0,33 mg/l</td>
<td>Daphnia magna 48</td>
</tr>
<tr>
<td>12125-02-9</td>
<td>ammonium chloride</td>
<td>LC50</td>
<td>209 mg/l</td>
<td>Cyprinus carpio 96</td>
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<tr>
<td></td>
<td>Acute crustacea toxicity</td>
<td>EC50</td>
<td>&gt; 100 mg/l</td>
<td>Daphnia magna 48</td>
</tr>
<tr>
<td>7681-49-4</td>
<td>Sodium fluoride</td>
<td>LC50</td>
<td>925 mg/l</td>
<td>Gambusia affinis 96</td>
</tr>
<tr>
<td></td>
<td>Acute algae toxicity</td>
<td>ErC50</td>
<td>850 mg/l</td>
<td>Desmodesmus subspicatus 72</td>
</tr>
<tr>
<td></td>
<td>Acute crustacea toxicity</td>
<td>EC50</td>
<td>338 mg/l</td>
<td>Daphnia magna 48</td>
</tr>
</tbody>
</table>

Persistence and degradability
No data available.

Bioaccumulative potential
No data available.

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>12125-02-9</td>
<td>ammonium chloride</td>
<td>-4,37</td>
</tr>
</tbody>
</table>
Mobility in soil
No data available.

Results of PBT and vPvB assessment
No data available.

Other adverse effects
No data available.

Further information
Product is not allowed to discharge into the ground water or aquatic environment.

SECTION 13: Disposal considerations

Waste treatment methods
Advice on disposal
Where possible recycling is preferred to disposal. Dust and in exhaust systems separated particles dispose of in compliance with local regulations.

Waste disposal number of waste from residues/unused products
160507 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; gases in pressure containers and discarded chemicals; discarded inorganic chemicals consisting of or containing dangerous substances Classified as hazardous waste.

Waste disposal number of used product
150202 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED; absorbents, filter materials, wiping cloths and protective clothing; absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances Classified as hazardous waste.

Waste disposal number of contaminated packaging
150102 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED; packaging (including separately collected municipal packaging waste); plastic packaging

SECTION 14: Transport information

Land transport (ADR/RID)

UN number: 1840

UN proper shipping name: ZINC CHLORIDE SOLUTION

Transport hazard class(es): 8

Packing group: III

Hazard label: 8

Classification code: C1

Limited quantity: 5 l

Hazard No: 80
Tunnel restriction code: E

Inland waterways transport

**UN number:** 1840

**UN proper shipping name:** ZINC CHLORIDE SOLUTION

**Transport hazard class(es):** 8

**Packing group:** III

**Hazard label:** 8

**Classification code:** C1

**Limited quantity:** 5 L

Marine transport

**UN number:** 1840

**UN proper shipping name:** ZINC CHLORIDE SOLUTION

**Transport hazard class(es):** 8

**Packing group:** III

**Hazard label:** 8

**Limited quantity:** 5 L

EmS: F-A, S-B

Air transport

**UN/ID number:** 1840

**UN proper shipping name:** ZINC CHLORIDE SOLUTION

**Transport hazard class(es):** 8

**Packing group:** III

**Hazard label:** 8

**Limited quantity**

Passenger
- IATA-packing instructions - Passenger: 852
- IATA-max. quantity - Passenger: 5 L

Cargo
- IATA-packing instructions - Cargo: 856
- IATA-max. quantity - Cargo: 60 L
Environmental hazards

Dangerous for the environment: yes

Special precautions for user

No specific precautions required.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

The transport takes place only in approved and appropriate packaging.

Other applicable information

Additional label with symbol “fish and tree” according to subsection 5.2.1.8.3. ADR for single packagings and inner packagings with > 5 kg or 5 L, transition period ends 31.12.2010.

SECTION 15: Regulatory information

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

National regulatory information

Water contaminating class (D): 3 - highly water contaminating

SECTION 16: Other information

Changes

Changes in chapter: 2, 4, 7, 10, 12, 14, 15

Full text of R-phrases referred to under sections 2 and 3

22 Harmful if swallowed.
25 Toxic if swallowed.
32 Contact with acids liberates very toxic gas.
34 Causes burns.
36 Irritating to eyes.
36/38 Irritating to eyes and skin.
50 Very toxic to aquatic organisms.
50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
53 May cause long-term adverse effects in the aquatic environment.

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

H301 Toxic if swallowed.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Further Information

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities.
The information describes exclusively the safety requirements for the product(s) and is based on the present level of our knowledge.
The delivery specifications are contained in the corresponding product sheet.
This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations.
(n.a. = not applicable; n.d. = not determined)

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