SECTION 1. IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1 Product identifier

Product name: CBright 1002 IPA

Substance: ALUMINIUM PASTE IN ISOPROPANOL

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

Identified uses: Pigments

1.3 Details of the supplier of the safety data sheet.

Manufacturer: CARLFORS BRUK AB
BOX 44
SE-561 21 HUSKVARNA SWEDEN
Tel: +46 36389500
E-mail: cb@carlfors.se

1.4 Emergency telephone number.

Emergency number: +46 8337043

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture:

Classification according to: CLP/GHS EC No 1272/2008.
Flam. Sol. 1. H228
Stot SE 3. H336
Eye Irrit. 2. H319

Note T regulation (EC) No 1272/2008: This product may be marketed in a form which does not have the physical hazards as indicated in the entry in part 3. Tests were done according to Transport of dangerous goods, Manual of tests and criteria.

Additional Information: See section 16.

2.2 Label elements:

Label elements according to Regulation (EC) No 1272/2008 (CLP).

Hazard pictograms: GHS02, GHS07

Signal word: Danger
Hazard Statements:
H228 Flammable solid.
H319 Cause serious eye irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements:
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243 Take action to prevent static discharges.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P370 + P378 In case of fire: Use sand, mineral wool or special powder for metal fire, never use water, halones, foam or carbon dioxide.
P402 + P404 Store in a dry place. Store in a closed container.

2.3 Other hazards:
Material can release vapours that readily form flammable mixtures. Vapours are heavier than air and may spread along floors.

SECTION 3. COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

3.2 Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Cas-no:</th>
<th>Einecs no:</th>
<th>REACH registration no:</th>
<th>Contents %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium powder</td>
<td>7429-90-5</td>
<td>231-072-3</td>
<td>01-2119529243-45-0051</td>
<td>48-52</td>
</tr>
<tr>
<td>GHS/CLP-classification:*</td>
<td>Flam. Sol. 1, H228</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Cas-no:</th>
<th>Einecs no:</th>
<th>REACH registration no:</th>
<th>Contents %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isopropanol</td>
<td>67-63-0</td>
<td>200-661-7</td>
<td>01-2119457558-25-xxxx</td>
<td>48-52</td>
</tr>
</tbody>
</table>

* See section 16.

SECTION 4. FIRST-AID MEASURES

4.1 Description of first aid measures:

General information: No additional information available.

Inhalation: Fresh air and rest, possibly breathing help.

Skin contact: Take of contaminated clothes, wash skin with water and soap.

Eye contact: Remove any contact lenses. Rinse immediately with plenty of water, also under the eyelids. Call doctor if irritation persists.

Ingestion: Don't induce vomiting. Call doctor. Rinse mouth with water.
4.2 Most important symptoms and effects, both acute and delayed: Inhalation of isopropanol can cause dizziness, tiredness, nausea and headache.

4.3 Indication of any immediate medical attention and special treatment needed: No further relevant information available.

SECTION 5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media:

Suitable extinguishing agents: Extinguish fire with sand and mineral wool. Can also be extinguished with foam or carbon dioxide during the first minutes when the solvent in the aluminium paste is burning. After a short time, when the solvent has burned, it is a metal fire, and then only use sand, mineral wool or special powder for metal fires.

Unsuitable extinguishing agents: Do not use water.

5.2 Special hazards arising from the substance or mixture: Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited. Vapours of isopropanol are heavier than air and may spread along floors.

5.3 Advice for firefighters: No special measures required.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:
Wear protective equipment. Eliminate fire and explosion risk by keeping ignition sources out of the area.

6.2 Environmental precautions:
Do not allow product to reach sewage system or water resources. Inform authorities in case product reaches water or sewage system.

6.3 Methods and material for containment and cleaning up:
Collect mechanically. Pay attention to the fire, explosion and health hazards caused by the product. Absorb with liquid binding material (sand, diatomite, universal binders, sawdust) and put in a dry receptacle. Do not flush with water or aqueous cleaning agents. Dispose of waste material in accordance with local, state or federal regulations.

6.4 Reference to other sections:
See section 7 for safe handling. See section 8 for protective equipment. See section 13 for waste treatment methods.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling:
Good ventilation. Mechanical ventilation and local exhaust can be needed. Keep drums closed as far as possible. Avoid direct contact with aluminium paste. No smoking, fire, sparks or welding. Prevent sparks arising from static electricity.

Wash hands during breaks and at the end of the work. Keep away from foodstuffs, beverages and feed. Do not eat, drink, smoke or sniff while working. Water for eye flushing to be available.

7.2 Conditions for safe storage, including any incompatibilities:
Store in a cool, well-ventilated, dry place in tightly closed containers. Protect from direct sunlight. Keep away from sources of ignition-No smoking.
SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

DNEL long-term, worker, for aluminium metal powder/dust is 3,72 mg aluminium/m3.
PNEC-values from 46-17800 µg/l depending on water chemistry.

DNEL isopropanol. Worker long term dermal 888 mg/kg bodyweight/day. Worker long term inhalation 500 mg/m3.
PNEC isopropanol. Fresh water and sea water 140,9 mg/l.

Occupational exposure limits (limit value - eight hours):

<table>
<thead>
<tr>
<th>Country</th>
<th>Aluminium powder</th>
<th>Isopropanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>10 mg/m³</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Canada - Québec</td>
<td>10 mg/m³</td>
<td>400 ppm</td>
</tr>
<tr>
<td>Denmark</td>
<td>5 mg/m³ (inhalable aerosol)</td>
<td>200 ppm</td>
</tr>
<tr>
<td></td>
<td>2 mg/m³ (respirable)</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Finland</td>
<td></td>
<td>200 ppm</td>
</tr>
<tr>
<td>France</td>
<td>10 mg/m³ (inhalable aerosol)</td>
<td>200 ppm</td>
</tr>
<tr>
<td></td>
<td>5 mg/m³ (respirable aerosol)</td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>4 mg/m³ (inhaalable aerosol)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1,5 mg/m³ (respirable aerosol)</td>
<td>200 ppm</td>
</tr>
<tr>
<td>Hungary</td>
<td>6 mg/m³ (respirable aerosol)</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>5 mg/m³ (respirable aerosol)</td>
<td>200 ppm</td>
</tr>
<tr>
<td></td>
<td>10 mg/m³ (inhalable aerosol)</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4 mg/m³ (respirable aerosol)</td>
<td>400 ppm</td>
</tr>
<tr>
<td></td>
<td>10 mg/m³ (inhalable aerosol)</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>15 mg/m³ (total dust)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 mg/m³ (respirable dust)</td>
<td></td>
</tr>
</tbody>
</table>

8.2 Exposure controls:

General protective and hygienic measures: Wash hands during breaks and at the end of the work. Keep away from foodstuffs, beverages and feed. Do not eat, drink, smoke or sniff while working.

Personal protective equipment:

Breathing equipment: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Use respiratory protection that meets the requirements of EN 141. Recommended filter type: A or combination filter A-P2.

Protection of hands: Protective gloves of for example butyl rubber or nitrile rubber. Change protective gloves regularly.

Eye protection: Protective goggles if there is a risk of splashing.

Skin protection: Protective clothing.
SECTON 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties:

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Paste, gray</td>
</tr>
<tr>
<td>Odour</td>
<td>* No information</td>
</tr>
<tr>
<td>Odour threshold</td>
<td>* No information</td>
</tr>
<tr>
<td>pH</td>
<td>NA</td>
</tr>
<tr>
<td>Melting point/freezing point (°C)</td>
<td>* -89</td>
</tr>
<tr>
<td>Initial boiling point/boiling range (°C)</td>
<td>* 82</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>* 12</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>* No information</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Flammable solid</td>
</tr>
<tr>
<td>Upper/lower flammability/explosive limits</td>
<td>* 2-13 %</td>
</tr>
<tr>
<td>Vapour pressure (kPa)</td>
<td>* 4,3 (20 °C)</td>
</tr>
<tr>
<td>Vapour density (air=1)</td>
<td>* &gt; 1</td>
</tr>
<tr>
<td>Density (g/cm³)</td>
<td>0,8-1,2 (Density = volume weight)</td>
</tr>
<tr>
<td>Solubility in water (weight-%)</td>
<td>* Soluble in water.</td>
</tr>
<tr>
<td>Partition coefficient, log Pow</td>
<td>* 0,05</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>* 350</td>
</tr>
<tr>
<td>Decomposition temperature (°C)</td>
<td>* No information</td>
</tr>
<tr>
<td>Viscosity</td>
<td>NA</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>No</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>No</td>
</tr>
</tbody>
</table>

9.2 Other information:

No additional information.

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity:

Flammable solid.

10.2 Chemical Stability:

The product is stable if used and stored according to specifications.

10.3 Possibility of hazardous reactions:

Hydrogen development with water, alkali and acid.

10.4 Conditions to avoid:

Keep away from sources of ignition and heat.
10.5 Incompatible material:
Reacts with alkalis, acids, water and oxidizing agents.

10.6 Hazardous decomposition products:
No dangerous decomposition products known.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects:
Isopropanol: LD$_{50}$ oral (rat): 5840 mg/kg (OECD TG 401). Inhalation LC$_{50}$ (rat 6 h): 25 mg/l (OECD TG 403). LD$_{50}$ dermal (rabbit): 13900 mg/kg (OECD TG 402).
Aluminium powder: Oral LD$_{50}$ (rat) > 2000 mg/kg bw. Inhalation LC$_{50}$ (rat) > 888 mg/m$^3$. Inhalation NOAEC (rat) = 10 mg/m$^3$.
Inhalation may cause dizziness, tiredness and headache.
Skin contact: Degreasing, which may cause irritation and redness.
Eyes: Causes smart.
Ingestion: Large amounts may cause nausea and vomiting.

The above symptoms above refer to isopropanol, which is a part the aluminum paste.

Aluminum powder and isopropanol is not carcinogenic, mutagenic or toxic to reproduction.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity:
Aluminium powder and isopropanol is not classified as dangerous for the environment.

Isopropanol
LC$_{50}$ Fish 96h: 9640 mg/l (Pimephales promelas).
LC$_{50}$ Daphnia magna 24 h: > 9714 mg/l
EC$_{50}$ algae 72 h: > 100 mg/l (Scenedesmus subspicatus)

The product aluminium paste in isopropanol is not classified as dangerous for the environment.

12.2 Persistence and degradability:
Isopropanol: 53 % (5 d, directive 67/548/EEC). Isopropanol is readily biodegradable.

12.3 Bioaccumulative potential:
No information.

12.4 Mobility in soil:
Aluminium paste is a solid material and is not expected to penetrate into the soil.

12.5 Results of PBT and vPvB assessments:
This product is not, or does not contain, a substance that is a PBT or a vPvB.

12.6 Other adverse affects:
No additional information available.
SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods:

Dispose of waste material in accordance with local, state or federal regulations. Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

European waste catalogue: 170409 – Metal waste contaminated with dangerous substances.

Empty contaminated packaging thoroughly. They can be recycled after thorough and proper cleaning.

SECTION 14. TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>ADR/RID</th>
<th>IATA</th>
<th>IMDG</th>
</tr>
</thead>
<tbody>
<tr>
<td>1325</td>
<td>1325</td>
<td>1325</td>
</tr>
<tr>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
</tr>
<tr>
<td>II</td>
<td>II</td>
<td>II</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14.2 UN proper shipping name:

Flammable solid, organic, n.o.s. (contains isopropanol and aluminium powder)

14.5 Environmental hazards: No

14.6 Special precautions for user:

Handling and storage according to section 7.

14.7 Transport in bulk according to Annex II of Marpol 73/78 and the IBC Code:

NA

SECTION 15. REGULATORY INFORMATION

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


15.2 Chemical safety assessment: No

SECTION 16. OTHER INFORMATION

H225 Highly flammable liquid and vapor.
H228 Flammable solid.
H319 Cause serious eye irritation.
H336 May cause drowsiness or dizziness.
Flam. Liq. 2 = Flammable liquid, category 2
Flam. Sol. 1 = Flammable solid, category 1
STOT SE 3 = Specific organ toxicity – single exposure, category 3

List of abbreviations

ADR Accord Européen relatif au transport international des marchandises dangereuses par Route.
CAS No. Chemical abstracts service number.
SAFETY DATA SHEET
according to 1907/2006/EC, article 31

CBright 1002 IPA

CLP Regulation on Classification, Labelling and packaging of Substances and Mixtures.
CSR Chemical safety report
DNEL Derived NO-Effect Level.
EINECS European Inventory of Existing Commercial Substances.
EWC European Waste Catalogue.
IATA International Air Transport Association
ICAO International Civil Aviation Organization
IMDG International Maritime Dangerous Goods
IMO International Maritime Organization
LC Lethal Concentration
LD Lethal Dose
Marpol International Convention for the Prevention of Pollution from ships.
NOAL No observable adverse effect level.
NOEL/NOEC No observed – effect level/concentration.
PBT Persistent, biaccumulative, toxic.
PNEC Predicted No-Effect Concentration.
REACH Registration, Evaluation, Authorisation, and restriction of Chemicals.
RID Règlement concernant le transport international ferroviaire de marchandises dangereuses.
TWA Time-weighted average.
vPvB Very persistent, very biaccumulative

Revision has been done under following sections 6 and 7. Take the place of 2017-11-29.