1. Identification of the substance/mixture and of the company/undertaking

Product Detail: 3980 Electrically Conductive Adhesive (Shieldokit)
Use of the substance/mixture: Conductive Glue (component A)
Manufacturer / supplier: Holland Shielding Systems B.V.
Jacobus Lipsweg 124
3316 BP Dordrecht
the Netherlands
Ph: +31(0)78 - 204 90 00
Fax: +31(0)78 - 204 90 08
www.hollandshielding.com
info@hollandshielding.com

2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

<table>
<thead>
<tr>
<th>Hazard categories</th>
<th>Hazard categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin corrosion/irritation</td>
<td>Skin Irr. 2</td>
</tr>
<tr>
<td>Serious eye damage/eye irritation</td>
<td>Eye Irr. 2</td>
</tr>
<tr>
<td>Respiratory or skin sensitisation</td>
<td>Skin Sens. 1</td>
</tr>
<tr>
<td>Hazardous to the aquatic environment</td>
<td>Aquatic Acute 1</td>
</tr>
<tr>
<td>Hazardous to the aquatic environment</td>
<td>Aquatic Chronic 1</td>
</tr>
</tbody>
</table>

Hazard Statements
- Causes skin irritation
- May cause an allergic skin reaction
- Causes serious eye irritation
- Very toxic to aquatic life with long lasting effects

2.2. Label elements

Hazardous components which must be listed on the label
Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700)
1,4-bis(2,3 epoxypropoxy)butane, butanedioldiglycidyl ether

Signal word: Warning
Pictograms: GH507, GH509

Hazard statements
- H315 Causes skin irritation
- H317 May cause an allergic skin reaction
- H319 Causes serious eye irritation
- H410 Very toxic to aquatic life with long lasting effects

Precautionary statements
- P273 Avoid release to the environment.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P302+P352 IF ON SKIN: Wash with plenty of water.
- P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

2.3. Other hazards
No data available.
3980 - Shieldokit Conductive Glue (component A)

3 Composition/information on ingredients

3.2. Mixtures

Chemical characterization
Silver pigmented adhesive

Hazardous components

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-22-4</td>
<td>Silver powder</td>
<td>7440-22-4</td>
<td></td>
<td>Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1, Aquatic Chronic 2; H339 H315 H317 H411</td>
<td>01-2119555669-21</td>
<td>Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1, Aquatic Chronic 2; H339 H315 H317 H411</td>
<td>01-2119555669-21</td>
<td>Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1, Aquatic Chronic 2; H339 H315 H317 H411</td>
<td>01-2119555669-21</td>
</tr>
<tr>
<td>500-033-5</td>
<td>Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight &lt;= 700)</td>
<td>15 - &lt; 20 %</td>
<td></td>
<td>500-033-5</td>
<td>Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight &lt;= 700)</td>
<td>15 - &lt; 20 %</td>
<td>Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight &lt;= 700)</td>
<td>15 - &lt; 20 %</td>
<td></td>
</tr>
<tr>
<td>25068-38-6</td>
<td>1,4-bis(2,3 epoxypropoxy)butane, butanedioldiglycidyl ether</td>
<td>25068-38-6</td>
<td></td>
<td>1,4-bis(2,3 epoxypropoxy)butane, butanedioldiglycidyl ether</td>
<td>219-371-7</td>
<td>Acute Tox. 4, Acute Tox. 4, Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1; H332 H312 H319 H315 H317</td>
<td>219-371-7</td>
<td>Acute Tox. 4, Acute Tox. 4, Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1; H332 H312 H319 H315 H317</td>
<td>219-371-7</td>
</tr>
<tr>
<td>603-074-00-8</td>
<td>Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1, Aquatic Chronic 2; H339 H315 H317 H411</td>
<td>603-074-00-8</td>
<td></td>
<td>219-371-7</td>
<td>Acute Tox. 4, Acute Tox. 4, Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1; H332 H312 H319 H315 H317</td>
<td>219-371-7</td>
<td>Acute Tox. 4, Acute Tox. 4, Eye Irrit. 2, Skin Irrit. 2, Skin Sens. 1; H332 H312 H319 H315 H317</td>
<td>219-371-7</td>
<td></td>
</tr>
</tbody>
</table>

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

4. First aid measures

4.1. Description of first aid measures

General information
Remove contaminated soaked clothing immediately. In the event of persistent symptoms receive medical treatment.

After inhalation
Move to fresh air in case of accidental inhalation of vapours or decomposition products. In the event of symptoms refer for medical treatment.

After contact with skin
Wash off immediately with soap and plenty of water. Consult a doctor if skin irritation persists.

After contact with eyes
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Consult a physician.

After ingestion
Immediately give plenty of water (if possible charcoal slurry). Never give anything by mouth to an unconscious person. Do not induce vomiting. Summon a doctor immediately.

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

4.3. Indication of any immediate medical attention and special treatment needed
Treat symptoms.
5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Foam, carbon dioxide (CO2), dry chemical, water-spray.

Unsuitable extinguishing media
Full water jet.

5.2. Special hazards arising from the substance or mixture

Fire may produce:
Irritant/corrosive, flammable as well as toxic distillation gases (carbonization gases).

5.3. Advice for firefighters

Use breathing apparatus with independent air supply.

Additional information
Cool containers at risk with water spray jet.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

In case of vapour formation use respirator.
Ensure adequate ventilation.
Use personal protective clothing.
Keep away from sources of ignition - No smoking.

6.2. Environmental precautions

Clean contaminated surface thoroughly.
Do not discharge into the drains/surface waters/ground water.

6.3. 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.

6.4. Reference to other sections

Observe protective instructions (see Sections 7 and 8).
Information for disposal see section 13.

7. Handling and storage

7.1. Precautions for safe handling

Advice on safe handling
Keep container tightly closed.
Use only in thoroughly ventilated areas.
Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion
No special protective measures against fire required.
7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels
Keep container tightly closed in a dry, cool and well-ventilated place.
Protect against direct sun radiation.
Keep container tightly closed.

Advice on storage compatibility
Incompatible with:
• Oxidizing agents
• Acids and bases

Further information on storage conditions
Keep away from food, drink and animal feeding stuffs

7.3. Specific end use(s)
Metallisation

8. Exposure controls/personal protection

8.1. Control parameters

<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>
</tr>
</thead>
<tbody>
<tr>
<td>84-66-2</td>
<td>Diethyl phthalate</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>TWA (8 h)</td>
<td>WEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>10</td>
<td>-</td>
<td>10 STEL (15 min)</td>
<td>WEL</td>
</tr>
<tr>
<td>7440-22-4</td>
<td>Silver, metallic</td>
<td>-</td>
<td>0.1</td>
<td>-</td>
<td>TWA (8 h)</td>
<td>WEL</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>STEL (15 min)</td>
<td>WEL</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Appropriate engineering controls
Ensure adequate ventilation, especially in confined areas.

Protective and hygiene measures
Do not inhale vapours.
Wash hands before breaks and immediately after handling the product.
When using do not eat, drink or smoke.
Avoid contact with skin, eyes and clothing.
Keep away from sources of ignition - No smoking.
Remove and wash contaminated clothes before re-use.

Eye/face protection
Eye wash bottle with pure water (EN 15154).
Tightly fitting goggles (EN 166).

Hand protection
Protective gloves resistant to chemicals made off butyl, minimum coat thickness 0.7 mm, permeation resistance (wear duration) > 60 minutes. This recommendation refers exclusively to the chemical compatibility and the lab test conforming to EN 374 carried out under lab conditions. 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.
3980 - Shieldokit Conductive Glue (component A)

Skin protection
Long sleeved clothing (EN 368).
Safety footwear (EN 345).

Respiratory protection
Use suitable breathing apparatus if there is inadequate ventilation.

9. Physical and chemical properties
9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour</td>
<td>Silver-grey</td>
</tr>
<tr>
<td>Odour</td>
<td>characteristic</td>
</tr>
<tr>
<td>pH-Value</td>
<td>n.a.</td>
</tr>
<tr>
<td>Initial boiling point and boiling range</td>
<td>&gt; 200 °C</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;160 °C DIN 51758</td>
</tr>
<tr>
<td>Vapour pressure (at 25 °C)</td>
<td>0,0001 hPa</td>
</tr>
<tr>
<td>Density (at 25 °C)</td>
<td>1,1 - 1,2 g/cm³</td>
</tr>
<tr>
<td>Water solubility (at 20 °C)</td>
<td>More or less insoluble</td>
</tr>
</tbody>
</table>

9.2. Other information
No data available.

10. Stability and reactivity
10.1. Reactivity
No decomposition if stored and applied as directed.

10.2. Chemical stability
Stable under normal conditions.

10.3. Possibility of hazardous reactions
No hazardous reactions known.

10.4. Conditions to avoid
No decomposition if used as directed.

10.5. Incompatible materials
Strong oxidizing agents.
Strong acids and strong bases.

10.6. Hazardous decomposition products
Carbon monoxide and carbon dioxide.

Further information
No decomposition if stored and applied as directed.

11. Toxicological information
11.1. Information on toxicological effects

Acute toxicity
Based on available data, the classification criteria are not met.
3980 - Shieldokit Conductive Glue (component A)

Acute toxicity

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Exposure routes</th>
<th>Method</th>
<th>Dose</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>25068-38-6</td>
<td>dermal</td>
<td>LD50 mg/kg</td>
<td>11400</td>
<td>Rat</td>
<td></td>
</tr>
<tr>
<td>2425-79-8</td>
<td>dermal</td>
<td>ATE</td>
<td>1100 mg/kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>inhalative vapour</td>
<td>ATE</td>
<td>11 mg/l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>inhalative aerosol</td>
<td>ATE</td>
<td>1,5 mg/l</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Irritation and corrosivity
Causes skin irritation.
Causes serious eye irritation.

Sensitising effects
May cause an allergic skin reaction. (Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight <= 700), (1,4-bis(2,3 epoxypropoxy)butane, butanedioldiglycidyl ether)

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

Severe effects after repeated or prolonged exposure
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.

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

Practical experience

Observations relevant to classification
Sensitization through skin contact possible.

12. Ecological information

12.1. Toxicity
No data available.

<table>
<thead>
<tr>
<th>CAS No</th>
<th>Chemical name</th>
<th>Aquatic toxicity</th>
<th>Method</th>
<th>Dose</th>
<th>[h]</th>
<th>[d]</th>
<th>Species</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>7440-22-4</td>
<td>Silver powder</td>
<td></td>
<td>LC50</td>
<td>0,003 mg/l</td>
<td>96</td>
<td></td>
<td>Oncorhynchus mykiss</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>EC50</td>
<td>0,00022 mg/l</td>
<td>48</td>
<td></td>
<td>Daphnia magna</td>
<td></td>
</tr>
<tr>
<td>25068-38-6</td>
<td>Reaction product: bisphenol-A-(epichlorhydrin) epoxy resin (number average molecular weight &lt;= 700)</td>
<td>Acute fish toxicity</td>
<td>LC50</td>
<td>3,6 mg/l</td>
<td>96</td>
<td></td>
<td>Leuciscus idus</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Acute crustacea</td>
<td>EC50</td>
<td>2,8 mg/l</td>
<td>48</td>
<td></td>
<td>Daphnia magna</td>
<td></td>
</tr>
</tbody>
</table>
3980 - Shieldokit Conductive Glue (component A)

12.2. Persistence and degradability
No data available.

12.3. Bioaccumulative potential
No data available.

12.4. Mobility in soil
No data available.

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

12.6. Other adverse effects
No data available.

Further information
Do not flush into surface water or sanitary sewer system.

13. Disposal considerations
13.1. Waste treatment methods

Advice on disposal
Where possible recycling is preferred to disposal.
Can be incinerated, when in compliance with local regulations.

Waste disposal number of waste from residues/unused products
070208 WASTES FROM ORGANIC CHEMICAL PROCESSES; wastes from the MFSU of plastics, synthetic rubber and
man-made fibres; other still bottoms and reaction residues Classified as hazardous waste.

Contaminated packaging
Empty containers should be taken for local recycling, recovery or waste disposal.
Contaminated packagings are to be treated like the product itself.

14. Transport information
Land transport (ADR/RID)

14.1. UN number: UN 3082
14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver powder)
14.3. Transport hazard class(es): 9
14.4. Packing group: III

Inland waterways transport (ADN)
14.1. UN number: UN 3082
14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Silver powder)
3980 - Shieldokit Conductive Glue (component A)

14.3. Transport hazard class(es): 9
14.4. Packing group: III

Marine transport (IMDG)
14.1. UN number: UN 3082
14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (silver powder)
14.3. Transport hazard class(es): 9
14.4. Packing group: III

Air transport (ICAO)
14.1. UN number: UN 3082
14.2. UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (silver powder)
14.3. Transport hazard class(es): 9
14.4. Packing group: III

14.5. Environmental hazards
ENVIRONMENTALLY HAZARDOUS: Yes

14.6. Special precautions for user
Handle in accordance with good industrial hygiene and safety practices.

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
The transport takes place only in approved and appropriate packaging.
3980 - Shieldokit Conductive Glue (component A)

15. Regulatory information
National regulatory information

Additional information
“ZH 1/301 "Data Sheet: Polyester and Epoxide resins (M 023)"

15.2. Chemical safety assessment
For the following substances of this mixture a chemical safety assessment has been carried out:
Silver powder

16. Other information

Changes
Changes in chapter: 2, 3

Abbreviations and acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>Accord européen relatif au transport international des marchandises Dangereuses par Route</td>
</tr>
<tr>
<td>RID</td>
<td>Règlement concernant le transport international ferroviaire de marchandises dangereuses</td>
</tr>
<tr>
<td>ADN</td>
<td>Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Code for Dangerous Goods</td>
</tr>
<tr>
<td>IATA/ICAO</td>
<td>International Air Transport Association / International Civil Aviation Organization</td>
</tr>
<tr>
<td>MARPOL</td>
<td>International Convention for the Prevention of Pollution from Ships</td>
</tr>
<tr>
<td>IBC-Code</td>
<td>International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk</td>
</tr>
<tr>
<td>GHS</td>
<td>Globally Harmonized System of Classification and Labelling of Chemicals</td>
</tr>
<tr>
<td>REACH</td>
<td>Registration, Evaluation, Authorization and Restriction of Chemicals</td>
</tr>
<tr>
<td>CAS</td>
<td>Chemical Abstract Service</td>
</tr>
<tr>
<td>EN</td>
<td>European norm</td>
</tr>
<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
</tr>
<tr>
<td>DIN</td>
<td>Deutsche Industrie Norm</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent Bioaccumulative and Toxic</td>
</tr>
<tr>
<td>LD</td>
<td>Lethal dose</td>
</tr>
<tr>
<td>LC</td>
<td>Lethal concentration</td>
</tr>
<tr>
<td>EC</td>
<td>Effect concentration</td>
</tr>
<tr>
<td>IC</td>
<td>Median immobilisation concentration or median inhibitory concentration</td>
</tr>
</tbody>
</table>

Relevant H and EUH statements (number and full text)

<table>
<thead>
<tr>
<th>H STELLA</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>H312</td>
<td>Harmful in contact with skin</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
<tr>
<td>H332</td>
<td>Harmful if inhaled</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
<tr>
<td>H410</td>
<td>Very toxic to aquatic life with long lasting effects</td>
</tr>
<tr>
<td>H411</td>
<td>Toxic to aquatic life with long lasting effects</td>
</tr>
</tbody>
</table>

Further Information
Data from 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)

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