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

1.1 Product identifier
Chemical name: 2-Furaldehyde
Synonyms: Furan-2-carbaldehyde, 2-Furfuraldehyde, Furan-2-carboxaldehyde, 2-Furylmethanal, Fural, 2-Formyl furan, Furanaldehyde, Pyromucis aldehyde, Ant Oil.
Formula: C₅H₄O₂
Molecular mass: 96.09
CAS-No.: 98-01-1
EC-No.: 202-627-7
Registration number: 01-2119486861-27-0002

1.2 Relevant identified uses of the substance or mixture and uses advised against
Relevant identified uses of the substance or mixture
- Intermediate for manufacturing furan derivates
- Use of Furfural as intermediate in pesticide production
- Manufacturing of blends / formulations
- Manufacturing of polymers
- Use of Furfural in the manufacturing of abrasive wheels, brake linings and refractories - by using formulations
- Use of Furfural in the petroleum refining industry as extraction agent
- Professional end use of acid resistant coating – by using formulations
- Spray turf indoor uses
- Spray turf outdoor uses
- Dripper indoor uses
- Dripper outdoor uses
- Spray indoor uses
- Spray outdoor uses
Uses advised against: None

1.3 Details of the supplier of the safety data sheet
Importer: International Furan Chemicals B.V.
Address: Rotterdam Airportplein 7
              3045 AP ROTTERDAM
              The Netherlands
Telephone number: +31 10 238 05 55
Telefax number: +31 10 238 05 50
E-mail address: sales@furan.com

1.4 Emergency telephone numbers
Emergency: +32 14 58 45 45 (24 h / 24 h)
Medical information
- England and Wales: 0844 892 01 11 (NPIS London, for healthcare professionals)
- Scotland: 08454 24 24 24 (NHS 24)
- Republic of Ireland: +353 (0) 1 837 99 64 (for healthcare professionals)
+353 (0) 1 809 25 66 (for healthcare professionals)

SECTION 2: Hazards identification
2.1 Classification of the substance or mixture
According to Regulation (EC) No. 1272/2008 (EU-GHS / CLP)
Hazard Classes / Hazard Class-, Category- and -Statement Codes
- Flammable liquid: Flam. Liq. 3, H226
- Acute toxicity: Acute Tox. 2, H330
- Acute toxicity: Acute Tox. 3, H301
- Acute toxicity: Acute Tox. 4, H312
- Eye irritation: Eye Irrit. 2, H319
- Skin irritation: Skin Irrit. 2, H315
- Specific target organ toxicity – single exposure: STOT SE 3, H350
- Carcinogenicity: Carc. 2, H351
- Hazardous to the aquatic environment: Aquatic Chronic 3, H412

For full text of Hazard statements: see subsection 2.2.
2.2 Label elements

According to Regulation (EC) No. 1272/2008 (EU-GHS / CLP)

Hazard pictograms

Signal word: Danger

Hazard statements
- H226: Flammable liquids and vapour.
- H330: Fatal if inhaled.
- H301: Toxic if swallowed.
- H312: Harmful in contact with skin.
- H319: Causes serious eye irritation.
- H315: Causes skin irritation.
- H335: May cause respiratory irritation.
- H351: Suspected of causing cancer.
- H412: Harmful to aquatic life with long lasting effects.

Precautionary statements
- P201: Obtain special instructions before use.
- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P271: Use only outdoors or in a well-ventilated area.
- P280: Wear protective gloves / protective clothing / eye protection.
- P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
- P304 + P310: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice / attention.
- P301 + P310: IF SWALLOWED: Immediately call a POISON CENTER / doctor / physician.
- P302 + P352: IF ON SKIN: Wash with plenty of water / soap.
- P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P308 + P313: IF exposed or concerned: Get medical advice / attention.
- P501: Dispose of contents / container to a specialised processing facility for disposal in accordance with local / regional regulations.

* on label

2.3 Other hazards

Furfural does not meet the criteria for PBT or vPvB according to Regulation 1907/2006.

SECTION 3: Composition / information on ingredients

3.1 Substances

<table>
<thead>
<tr>
<th>Main constituent</th>
<th>Identity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Furaldehyde</td>
<td>CAS-No. 98-01-1</td>
<td>&gt;98 %</td>
</tr>
<tr>
<td></td>
<td>EC-No. 202-627-7</td>
<td></td>
</tr>
</tbody>
</table>

Classified impurities or stabilizers

None

SECTION 4: First aid measures

4.1 Description of first aid measures

Inhalation: Fresh air, rest, half upright position. Get medical advice / attention if you feel unwell.

Skin contact: Remove contaminated clothes, rinse skin with water or shower. If skin irritation occurs: get medical advice / attention.

Eye contact: First rinse with plenty of water (remove lenses if possible). If eye irritation persists: get medical advice / attention.

Ingestion: Rinse mouth. Immediately call a doctor / physician if you feel unwell.

4.2 Most important symptoms and effects, both acute and delayed

Respiratory irritation (nose and upper respiratory tract). Eye and skin irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Information on medical attendance: Not necessary.
SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing media
- Powder, water spray, alcohol-resistant foam, carbon dioxide.

Unsuitable extinguishing media
- Water jet, alcohol unstable foam.

5.2 Special hazards arising from the substance or mixture
Hazardous combustion products
- May produce toxic fumes of carbon monoxide if burning.

Additional hazards
- Extreme generation of heat in the case of larger fires.

5.3 Advice for fire-fighters
Protective actions
- In case of fire: keep containers cool by spraying with water.
- Retain contaminated extinguishing water; do not allow entering into the sewage system.
- In the case of larger fires: Cordon affected area.

Special protective equipment
- Self-contained respiratory protective device.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Information for non-emergency personnel
- In the case of large quantities: Use filter respirator for organic vapours (filter type A).
- Use personal protective equipment to avoid any contamination of skin, eyes and personal clothes. Remove potential sources of ignition. Do not smoke.
- Assure sufficient ventilation.

Information for emergency responders
- If available, observe corporate hazard-control and emergency plans.

6.2 Environmental precautions
- In the case of spills: Avoid penetration into the sewage canal, surface water and ground water.
- In the case of accidental release: Do not discharge in surface water, sewers or soil.

6.3 Methods and material for containment and cleaning up
Advice on spillage containment
- Take up small amounts spilled product with an inert absorbent. Dispose of as hazardous waste.
- Dam spilled large amounts in and suck carefully; recycle if possible.

Appropriate clean-up procedures
- Collect remainder in inert absorbent and dispose of as hazardous waste. Wash away remainder with water.

Inappropriate containment or clean-up techniques
- None known.

6.4 Reference to other sections
- See also the sections 8 and 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Recommendations for safe handling
- Use only in well ventilated areas.
- Only transfer into suited and resistant containers. Containers have to be properly labelled.
- Keep away from heat / sparks / open flames / hot surfaces and do not smoke.
- Above 60 °C: use in a closed system.

Advice on general occupational hygiene
- The usual precautionary measures when handling chemicals have to be observed.
7.2 **Conditions for safe storage, including any incompatibilities**

**Protection against incompatible substances**
Keep away from oxidants, strong acids and strong bases. The substance affects many synthetic materials; store only in original packing.

**Protection against ambient influences**
Protect against heat and solar radiation. Recommended storage temperature: 20 °C. Store in a dark area.

**Maintenance of the integrity of the substance**
Not required.

7.3 **Specific end use(s)**
If used in food: comply with food safety regulation (HACCP).

### SECTION 8: Exposure controls / personal protection

#### 8.1 Control parameters

<table>
<thead>
<tr>
<th>Country</th>
<th>8 hours (TWA)</th>
<th>Short term (15 min.)</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mg/m³ ppm</td>
<td>mg/m³ ppm</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>20</td>
<td>5</td>
<td>skin</td>
</tr>
<tr>
<td>Belgium</td>
<td>8</td>
<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>10</td>
<td>2.5</td>
<td>8 2</td>
</tr>
<tr>
<td>Denmark</td>
<td>7.9</td>
<td>2</td>
<td>15.8 4</td>
</tr>
<tr>
<td>Finland</td>
<td>8</td>
<td>2</td>
<td>20 (TWA) 5 (TWA)</td>
</tr>
<tr>
<td>France</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>(previous 20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>8</td>
<td>2</td>
<td>20 5</td>
</tr>
<tr>
<td>Netherlands</td>
<td>(previous 8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>8</td>
<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>Poland</td>
<td>10</td>
<td>2.5</td>
<td>25</td>
</tr>
<tr>
<td>Portugal</td>
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<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>Slovakia</td>
<td>7.9</td>
<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>Slovenia</td>
<td>20</td>
<td>5</td>
<td>skin</td>
</tr>
<tr>
<td>Spain</td>
<td>8</td>
<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>Sweden</td>
<td>8</td>
<td>2</td>
<td>20 (TWA) 5 (TWA)</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8</td>
<td>2</td>
<td>skin</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>8</td>
<td>2</td>
<td>20 (TWA) 5 (TWA)</td>
</tr>
</tbody>
</table>

The exposure limits may be exceeded before the odour is perceived.

**DNEL / DMEL**

**Workers short term exposition**
- DNEL worker (acute, inhalation - systemic) 152 mg/m³
- DNEL worker (acute, inhalation - local) 20 mg/m³

**Workers long term exposition**
- DNEL worker (long-term, inhalation - systemic) 17.8 mg/m³
- DNEL worker (long-term, inhalation - local) 8 mg/m³
- DNEL worker (long-term, dermal - systemic) 4 mg/kg bw/day

**Consumers short term exposition**
- DNEL general population (acute, inhalation - systemic) 136 mg/m³
- DNEL general population (acute, inhalation - local) 20 mg/m³
- DNEL general population (acute, oral - systemic) 2.4 mg/kg bw/day

**Consumers long term exposition**
- DNEL general population (long-term, inhalation - systemic) 8 mg/m³
- DNEL general population (long-term, inhalation - local) 8 mg/m³
- DNEL general population (long-term, oral - systemic) 2.4 mg/kg bw/day
- DNEL general population (long-term, dermal - systemic) 2.4 mg/kg bw/day

**PNEC**
Aquatic
- **fresh water**  \( P_{\text{NEC}} \text{aquatic (freshwater)} \) 0.033 mg/L
- **marine water**  \( P_{\text{NEC}} \text{aquatic (marine water)} \) 0.0033 mg/L
- **intermittent release**  \( P_{\text{NEC}} \text{aquatic (intermittent release)} \) 0.027 mg/L

Sedimentary
- **fresh water sediment**  \( P_{\text{NEC}} \text{sediment} \) 0.12 mg/kg sediment dw
- **marine water sediment**  \( P_{\text{NEC}} \text{marine-sediment} \) 0.012 mg/kg sediment dw

Terrestrial
- **soil**  \( P_{\text{NEC}} \text{soil} \) 2.6 mg/kg dw

Sewage treatment
- **sewage treatment plants**  \( P_{\text{NEC}} \text{STP} \) 7.6 mg/L

Secondary poisoning
- **food chain**  \( P_{\text{NEC}} \text{oral} \) 35.3 mg/kg food

Negligible potential to bioaccumulate in the food chain (logKow <3).

### 8.2 Exposure controls

#### 8.2.1 Appropriate engineering controls
Ventilation and local exhaust.

#### 8.2.2 Individual protection measures, such as personal protective

##### a) Eye/face protection
Safety goggles (EN 166).

##### b) Skin protection
- **Hand protection**
  - Gloves butyl rubber 0.7 mm  Breakthrough time > 8 hours (EN 374)
  - Gloves neoprene 0.75 mm  Breakthrough time 2 hours (EN 374)
- **Other**
  - Protective clothing (EN 304/EN 14605).

##### c) Respiratory protection
In case of insufficient local exhaust: filter respirator with filter type A for organic vapours (EN 14387).

##### d) Thermal hazards
Not applicable.

#### 8.2.3 Environmental exposure controls
Direct polluted air of the local exhaust ventilation out of the plant in a manner in accordance with environmental regulations.

### SECTION 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>Colourless to yellow oily liquid.</td>
</tr>
<tr>
<td>Odour</td>
<td>Characteristic: pungent, almond.</td>
</tr>
<tr>
<td>Odour threshold (mg/m3)</td>
<td>0.25 - 1.0</td>
</tr>
<tr>
<td>pH</td>
<td>3.5 - 4.5</td>
</tr>
<tr>
<td>Melting point / freezing point (°C)</td>
<td>– 37</td>
</tr>
<tr>
<td>Boiling point (°C) at 1013 hPa</td>
<td>162</td>
</tr>
<tr>
<td>Flash point (°C)</td>
<td>60 (closed cup)</td>
</tr>
<tr>
<td>Evaporation rate (ether=1)</td>
<td>75</td>
</tr>
<tr>
<td>Upper / lower explosive limits (vol%)</td>
<td>2.1 - 19.3</td>
</tr>
<tr>
<td>Vapour pressure at 25 °C (hPa)</td>
<td>3.33</td>
</tr>
<tr>
<td>Vapour density (air=1)</td>
<td>3.3</td>
</tr>
<tr>
<td>Relative density (water=1)</td>
<td>1.16</td>
</tr>
<tr>
<td>Solubility(ies)</td>
<td></td>
</tr>
<tr>
<td>- Solubility in water at 20 °C (g/l)</td>
<td>83</td>
</tr>
<tr>
<td>- Solubility in fat</td>
<td>Good</td>
</tr>
<tr>
<td>Partition coefficient (log K octanol/water)</td>
<td>0.41</td>
</tr>
<tr>
<td>Auto-ignition temperature (°C)</td>
<td>392</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Viscosity at 25 °C (mPa.s)</td>
<td>1.49</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Non explosive</td>
</tr>
<tr>
<td>Oxidising properties</td>
<td>None</td>
</tr>
</tbody>
</table>
9.2 Other information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscibility with</td>
<td>Solvents (acetone, ethanol, ether, xylene, chloroform, petroleum ether, ethyl acetate)</td>
</tr>
<tr>
<td>Conductivity (pS/m)</td>
<td>$1.5 \times 10^8$</td>
</tr>
<tr>
<td>Heat of combustion (kJ/kg)</td>
<td>24 410</td>
</tr>
<tr>
<td>Surface tension at 20 °C (mN/m)</td>
<td>43.5</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

10.1 Reactivity

The substance may polymerize violently (resinification) under the influence of strong acids or strong bases. Reacts violently with oxidants.

10.2 Chemical stability

Oxidizes slowly on exposure to air.
Decomposes slowly on exposure to light.
Discolour on exposure to light and resinifies.

10.3 Possibility of hazardous reactions

Reacts violently with strong acids and strong bases with the possibility of fire and explosion (resinification).
At elevated temperatures, a risk for fire or explosion exists.

10.4 Conditions to avoid

Temperatures in storage > 40 °C should be avoided. Also contact with direct sunlight, heat sources and air. Avoid static discharge and sources of ignition (open flames, warm surfaces, sparks).
Avoid contact with combustible materials and plastics.

10.5 Incompatible materials

Strong acids or alkaline substances and oxidants. Many plastics.

10.6 Hazardous decomposition products

Upon decomposition emits carbon monoxide, carbon dioxide and/or low molecular weight hydrocarbons.

SECTION 11 Toxicological information

11.1 Information on toxicological effects

a) Acute toxicity

- Oral
  - LD$_{50}$ (rat) 100 mg/kg
- Dermal
  - LD$_{50}$ (rat) >2000 mg/kg
- Inhalation
  - LC$_{50}$ (rat, 4 hours) $\sim 1$ mg/L ($0.53 - 1.63$ mg/L)

b) Skin corrosion/irritation

The substance is irritating to skin.

c) Serious eye damage/irritation

The substance is irritating to eyes.

d) Respiratory or skin sensitisation

Concluded not to be sensitising.

e) Germ cell mutagenicity

Concluded not to be genotoxic in vivo.

f) Carcinogenicity

NOAEL (oral) 53 mg/kg bw/day
Target organ(s): digestive; liver.
Suspected of causing cancer. Liver tumors induced via mechanism involving liver toxicity. Concluded that at levels at which no liver toxicity is induced (in rats 53 mg/kg bw/d), tumors will not arise.

g) Reproductive toxicity

- Fertility/developmental
  - Concluded not to be reprotoxic.

h) Specific target organ toxicity – single exposure

- Respiratory tract
  - From acute toxicity studies, evident that the substance may cause respiratory irritation, particularly to the upper respiratory tract and the nose.
i) Specific target organ toxicity – repeated exposure
   - **Respiratory tract**
     From repeated dose toxicity studies, evident that the substance may cause respiratory irritation particularly to the upper respiratory tract and the nose. No classification warranted.

j) Aspiration hazard
   Based on available data, the classification criteria for this hazard class are not met.

11.2 Likely routes of exposure
Furfural can be easily absorbed in the lungs and from the skin, with dermal absorption of liquid furfural being approx. 3 µg/cm² per minute. Following absorption, the biological half life is 2-2.5 h.

SECTION 12: Ecological information

12.1 Toxicity
   **Aquatic compartment and sediment**
   - **Fish**
     - LC50 (fresh water, 96 h) 10.5 mg/L
     - NOEC (fresh water, 12 d) 0.33 mg/L
   - **Aquatic invertebrates**
     - EC50 (Daphnia, fresh water, 48 h) 13 mg/L
     - NOEC (Daphnia, fresh water, 21 d) 1.9 mg/L
   - **Algae and aquatic plants**
     - NOEC (algae, fresh water, 8d) 2.7 mg/L
   - **Aquatic micro-organisms**
     - EC50 760 mg/L
   - **Sediment organisms**
     Not a relevant compartment.

   **Terrestrial compartment**
   - **Soil macro-organisms**
     - LC50 (earthworm, 14 d) 406.18 mg/kg soil dw
     - NOEC (earthworm, 14 d) 225 mg/kg soil dw
   - **Anthropods**
     - NOEC (collembolan, 21 d) 37.5 mg/kg soil dw
   - **Terrestrial plants**
     - NOEC (sugarbeet) 26 mg/kg soil dw
   - **Soil micro-organisms**
     - NOEC (soil micro-organisms) 597 mg/kg soil dw

12.2 Persistence and degradability
   **Abiotic degradability**
   - **Photolysis**
     Half-life (DT50 in air) 0.44 d
   - **Biodegradability in water**
     Readily biodegradable.
   - **Biochemical oxygen demand**
     BOD (14 days) 93.5% degradation

12.3 Bioaccumulative potential
   **Aquatic bioaccumulation**
   BCF (estimation based on a calculation method) 1.41 L/kg
   No remarkable bioaccumulation potential (log Kow 0.41).

12.4 Mobility in soil
   **Adsorption/desorption**
   Koc at 20 °C (calculated) 17.1 L/kg
   **Volatilisation**
   Henry’s Law constant at 20 °C (in Pa m³/mol) 0.2

12.5 Results of PBT and vPvB assessment
   The substance does not meet the PBT and vPvB criteria according to annex XIII of Regulation (EC) No 1907/2006.

12.6 Other adverse effects
   Hazardous to water (Water hazard class 2, WGK Germany)
SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product disposal
- Recycling by distillation.
- Removal to an authorized waste incinerator for solvents or as chemical waste in accordance with local regulations. Do not discharge wastewater into sewer.

Packaging disposal
- Uncleaned empty package have to be treated like the content. The labelling of uncleaned containers must not be removed.

Waste treatment-relevant information
- European waste list (EURAL) 07 01 04

SECTION 14: Transport information

14.1 UN number
- 1199

14.2 UN proper shipping name
- FURALDEHYDES

14.3 Transport hazard class(es)
- 6.1

14.4 Packing group
- II

14.5 Environmental hazards
- Marine pollutant (IMO/IMDG): No
- Hazards for tank vessels (ADN): 6.1+3

14.6 Specials precautions for user
- Classification code (ADR/RID/ADN): TF1
- Risk label(s) (ADR/RID/ADN/IMDG/IATA): 6.1 + 3
- Tunnel category (ADR/RID): (D/E)
- Hazard Identification Number (ADR/RID): 63
- Limited quantity (ADR/RID/ADN/IMDG/IATA): 100 ml
- Exempted quantity (ADR/RID/IATA): E4
- ERICard (ADR): 6-54
- Emergency Schedules (IMDG)
  - Fire schedule: Echo (F - E)
  - Spillage schedule: Delta (S - D)

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
- Ship type required (IMDG): 3
- Pollution category (IMDG): Y

SECTION 15: Regulatory information

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

Authorisations (REACH)
- Not subject to Title VII of Regulation (EC) No 1907/2006

Restrictions (REACH), SVHC
- Annex XVII of Regulation (EC) No 1907/2006 is not applicable.
- SVHC (Substance of Very High Concern) status: negative.

Control of major-accident hazards (Seveso III)
- Subject to Directive 2012/18/EU.
- Hazard category: H2 ACUTE TOXIC
  - Qualifying quantity column 2: 50 000 kg
  - Qualifying quantity column 3: 200 000 kg

List of flavouring substances
- Approved as a flavouring agent (Regulation (EC) No 872/2012).

Classification, labelling and packaging
- Regulation (EC) No 1272/2008 (CLP-Regulation)

Other EU-/national regulations
- Other applicable EU-/national regulations have to be observed.

15.2 Chemical safety assessment
- A Chemical Safety Assessment has been carried out for furfural.
SECTION 16: Other information

16.1 Changes to the previous version

<table>
<thead>
<tr>
<th>Previous version</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Removal of the classification according to Directive 67/548/EEC (EU DSD / DPD)</td>
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<tr>
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<td>Adaptation of text in subsection 2.1.</td>
</tr>
<tr>
<td></td>
<td>Addition of the numbers of the European standards for protective clothing.</td>
</tr>
<tr>
<td></td>
<td>Addition of separate information for ADR, RID, ADN, IMDG and IATA.</td>
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<tr>
<td></td>
<td>Adaptation of the regulatory information.</td>
</tr>
<tr>
<td></td>
<td>Adaptation of the abbreviations.</td>
</tr>
</tbody>
</table>

16.2 Abbreviations and acronyms

- **ADN**: Transport of dangerous goods by inland waterways
- **ADR**: Transport of dangerous goods by road
- **DNEL**: Derived No Effect Level
- **EC50**: Effect Concentration, 50 percent
- **EMCard**: Emergency Response Intervention Card
- **GHS / CLP**: Globally Harmonised System / Classification, Labelling and Packaging
- **IC50**: Inhibitory Concentration, 50 percent
- **IATA**: Transport of dangerous goods by air
- **IMDG**: Transport of dangerous goods by sea
- **LC50**: Lethal Concentration, 50 percent
- **LD50**: Lethal Dose, 50 percent
- **LOAEC**: Lowest observed adverse effect concentration
- **NOAEC**: No observed adverse effect concentration
- **NOADE**: No observed adverse effect level
- **NOEC**: No observed effect concentration
- **NOEL**: No observed effect level
- **PBT**: Persistent, Bioaccumulative and Toxic
- **PNEC**: Predicted No Effect Concentration
- **RID**: Transport of dangerous goods by rail
- **TWA**: Time Weighted Average
- **vPvB**: very Persistent and very Bioaccumulative

16.3 Literature references and sources for data

- **REACH dossier.**

16.4 Full text of hazard statements which are not written out in full under Sections 2 to 15

- **None**