

Carbon Zinc Battery R03 (ER03MX,ER03X,HR03X)

Article Information Sheet

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations (According to HCS-2012 APPENDIX D TO §1910.1200)

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Version: 1.0

Safety Data Sheet is not available to article according to the OSHA Hazard Communication Standard 29 CFR 1910.1200, so AIS is provided instead of SDS.

Batteries are considered Articles under Global Harmonized Standards. This Article Information Sheet is provided according to the request of the customers.

SECTION 1: Identification

1.1. Identification

Product form : Article
Trade name : Carbon Zinc Battery R03 (ER03MX,ER03X,HR03X)

1.2. Recommended use and restrictions on use

Recommended use : Power supply.
Restrictions on use : No information available

1.3. Supplier

Supplier

Guangzhou Tiger Head Battery Group Co., Ltd.

Floor 28, Top Plaza East Tower, No. 222 Xingmin Road, Zhujiang New Town, Tianhe District, Guangzhou, China

510000

+86-020-85525623

1.4. Emergency telephone number

Emergency number : +86-020-85525623

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS US classification

Not classified

2.2. GHS Label elements, including precautionary statements

GHS US labelling

Hazard pictograms (GHS US) : None
Signal word (GHS US) : None
Hazard statements (GHS US) : Not applicable
Precautionary statements (GHS US) : Not applicable

2.3. Other hazards which do not result in classification

Batteries contain manganese dioxide which may boost combustion of other substances that may vent, ignite and produce sparks when subjected to high temperature, when damaged or abused (e.g., mechanical damage); may burn rapidly with flare-burning effect; may ignite other batteries in clothes proximity.

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Article

Name	Product identifier	%
Zinc	(CAS-No.) 7440-66-6	36.00
Manganese oxide (MnO2)	(CAS-No.) 1313-13-9	23.50
Water	(CAS-No.) 7732-18-5	13.40
Graphite	(CAS-No.) 7782-42-5	12.00
Zinc chloride	(CAS-No.) 7646-85-7	5.70
Iron	(CAS-No.) 7439-89-6	3.90
Ethene, homopolymer	(CAS-No.) 9002-88-4	2.70

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Name	Product identifier	%
Cellulose	(CAS-No.) 9004-34-6	2.00
Ammonium chloride	(CAS-No.) 12125-02-9	0.80

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation : Not an expected route of exposure.
- First-aid measures after skin contact : Not expected to present a skin hazard under anticipated conditions of normal use. No special technical protective measures are necessary.
- First-aid measures after eye contact : Not an expected route of exposure.
- First-aid measures after ingestion : Rinse mouth. Get medical attention. Never give anything by mouth to an unconscious person.

4.2. Most important symptoms and effects (acute and delayed)

No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

- Suitable extinguishing media : Use extinguishing agent suitable for surrounding fire.
- Unsuitable extinguishing media : No information available.

5.2. Specific hazards arising from the chemical

- Hazardous decomposition products in case of fire : Thermal decomposition can lead to release of irritating and toxic gases and vapors.

5.3. Special protective equipment and precautions for fire-fighters

- Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Emergency procedures : Evacuate personnel to a safe area; Ensure adequate ventilation, especially in confined areas. No flames, no sparks. Eliminate all sources of ignition. Do not breathe dust/fume/gas/mist/vapors/spray. Avoid contact with skin, eyes and inhalation of vapors.

6.1.2. For emergency responders

- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid release to the environment. Avoid dispersal of spilled material and runoff and contact with soil, water ways, drains and sewers.

6.3. Methods and material for containment and cleaning up

- Methods for cleaning up : Mechanically recover the product.
- Other information : Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Do not use organic solvents or other chemical cleaners on battery. Do not disassembly or decompose. Avoid contacting with water, avoid straight sunlight. Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Wash contaminated clothing before reuse. Keep away from heat, sparks, flame and other sources of ignition.
- Hygiene measures : Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Do not stack battery directly on another battery. Do not store batteries on electrically conductive surfaces. Keep containers tightly closed in a dry, cool and well-ventilated place. Keep locked up and out of reach of children. Keep away from food, drink and animal feeding stuffs. Store in accordance with local regulations.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Zinc (7440-66-6)	
No additional information available	
Manganese oxide (MnO₂) (1313-13-9)	
No additional information available	
Iron (7439-89-6)	
No additional information available	
Water (7732-18-5)	
No additional information available	
Graphite (7782-42-5)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m ³)	2 mg/m ³ (all forms except graphite fibers-respirable particulate matter)
USA - OSHA - Occupational Exposure Limits	
OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (synthetic-total dust) 5 mg/m ³ (synthetic-respirable fraction)
USA - IDLH - Occupational Exposure Limits	
US IDLH (mg/m ³)	1250 mg/m ³
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m ³)	2.5 mg/m ³ (natural-respirable dust)
Zinc chloride (7646-85-7)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m ³)	1 mg/m ³ (fume)
ACGIH STEL (mg/m ³)	2 mg/m ³ (fume)
USA - OSHA - Occupational Exposure Limits	
OSHA PEL (TWA) (mg/m ³)	1 mg/m ³ (fume)
USA - IDLH - Occupational Exposure Limits	
US IDLH (mg/m ³)	50 mg/m ³ (fume)
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m ³)	1 mg/m ³ (fume)
NIOSH REL (STEL) (mg/m ³)	2 mg/m ³ (fume)
Ethene, homopolymer (9002-88-4)	
No additional information available	
Cellulose (9004-34-6)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m ³)	10 mg/m ³
USA - OSHA - Occupational Exposure Limits	
OSHA PEL (TWA) (mg/m ³)	15 mg/m ³ (total dust) 5 mg/m ³ (respirable fraction)
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (total dust) 5 mg/m ³ (respirable dust)
Ammonium chloride (12125-02-9)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH TWA (mg/m ³)	10 mg/m ³ (fume)
ACGIH STEL (mg/m ³)	20 mg/m ³ (fume)
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL (TWA) (mg/m ³)	10 mg/m ³ (fume)

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NIOSH REL (STEL) (mg/m³)	20 mg/m³ (fume)
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8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Environmental exposure controls : Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:

Under normal condition of use and handling no special protection is required for sealed battery. In the event of battery case breakage, should be wear appropriate safety gloves

Eye protection:

Under normal condition of use and handling no special protection is required for sealed battery. Use appropriate safety glasses when there is the risk of splash

Skin and body protection:

Under normal condition of use and handling no special protection is required for sealed battery. It is recommended to wear appropriate protective clothing when the battery case is broken.

Respiratory protection:

If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Solid
Colour	: No information available
Odour	: Odorless
Odour threshold	: No data available
pH	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: No data available
Flash point	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Flammability (solid, gas)	: Not flammable.
Vapour pressure	: No data available
Relative vapour density at 20 °C	: No data available
Relative density	: No data available
Solubility	: Insoluble
Partition coefficient n-octanol/water (Log Pow)	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive limits	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

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10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

No additional information available

10.6. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Not classified

Zinc (7440-66-6)	
LD50 oral rat	630 mg/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	> 5.41 mg/m ³

Manganese oxide (MnO ₂) (1313-13-9)	
LD50 oral rat	9000 mg/kg

Iron (7439-89-6)	
LD50 oral rat	30 g/kg

Water (7732-18-5)	
LD50 oral rat	> 90 ml/kg

Zinc chloride (7646-85-7)	
LD50 oral rat	1100 mg/kg
LC50 inhalation rat (mg/l)	≤ 1975 mg/m ³ (Exposure time: 10 min)

Ethene, homopolymer (9002-88-4)	
LD50 oral rat	> 2000 mg/kg

Cellulose (9004-34-6)	
LD50 oral rat	> 5 g/kg
LD50 dermal rabbit	> 2000 mg/kg
LC50 inhalation rat (mg/l)	> 5800 mg/m ³ (Exposure time: 4 h)

Ammonium chloride (12125-02-9)	
LD50 oral rat	1650 mg/kg

Skin corrosion/irritation	: Not classified
Serious eye damage/irritation	: Not classified
Respiratory or skin sensitisation	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified

Ethene, homopolymer (9002-88-4)	
IARC group	3 - Not classifiable

Reproductive toxicity	: Not classified
STOT-single exposure	: Not classified
STOT-repeated exposure	: Not classified

Zinc (7440-66-6)	
NOAEL (oral, rat, 90 days)	13.3 mg/kg bodyweight/day

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Aspiration hazard	: Not classified
Viscosity, kinematic	: No data available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general	: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.
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Zinc (7440-66-6)	
LC50 fish 1	2.16 – 3.05 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])
EC50 Daphnia 1	0.139 – 0.908 mg/l (Exposure time: 48 h - Species: Daphnia magna [Static])
LC50 fish 2	0.211 – 0.269 mg/l (Exposure time: 96 h - Species: Pimephales promelas [semi-static])
Ammonium chloride (12125-02-9)	
LC50 fish 1	209 mg/l (Exposure time: 96 h - Species: Cyprinus carpio [static])

12.2. Persistence and degradability

Zinc (7440-66-6)	
Persistence and degradability	No information available.
Ethene, homopolymer (9002-88-4)	
Persistence and degradability	No information available.

12.3. Bioaccumulative potential

Zinc (7440-66-6)	
Bioaccumulative potential	No information available.
Manganese oxide (MnO ₂) (1313-13-9)	
BCF fish 1	(no bioaccumulation expected)
Partition coefficient n-octanol/water (Log Pow)	< 0 (at 20 °C)
Zinc chloride (7646-85-7)	
BCF fish 1	16000
Ethene, homopolymer (9002-88-4)	
Bioaccumulative potential	Bioaccumulation unlikely.

12.4. Mobility in soil

Zinc (7440-66-6)	
Ecology - soil	No information available.
Ethene, homopolymer (9002-88-4)	
Ecology - soil	No information available.

12.5. Other adverse effects

No additional information available

SECTION 13: Disposal considerations

13.1. Disposal methods

Waste treatment methods	: Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations	: Dispose of contents/container in accordance with licensed collector's sorting instructions.

SECTION 14: Transport information

Department of Transportation (DOT)

In accordance with DOT

Not regulated

Transportation of Dangerous Goods

Not regulated

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Transport by sea

Not regulated

Air transport

Not regulated

SECTION 15: Regulatory information

15.1. US Federal regulations

Zinc (7440-66-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Subject to reporting requirements of United States SARA Section 313	
CERCLA RQ	454 kg no reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is >100 µm
Manganese oxide (MnO₂) (1313-13-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Iron (7439-89-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Water (7732-18-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Graphite (7782-42-5)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
Zinc chloride (7646-85-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
CERCLA RQ	1000 lb
Ethene, homopolymer (9002-88-4)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711).
Cellulose (9004-34-6)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
EPA TSCA Regulatory Flag	XU - XU - indicates a substance exempt from reporting under the Chemical Data Reporting Rule, (40 CFR 711).
Ammonium chloride (12125-02-9)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory	
CERCLA RQ	5000 lb

15.2. International regulations

CANADA

Zinc (7440-66-6)	
Listed on the Canadian DSL (Domestic Substances List)	
Manganese oxide (MnO₂) (1313-13-9)	
Listed on the Canadian DSL (Domestic Substances List)	
Iron (7439-89-6)	
Listed on the Canadian DSL (Domestic Substances List)	
Water (7732-18-5)	
Listed on the Canadian DSL (Domestic Substances List)	
Graphite (7782-42-5)	
Listed on the Canadian DSL (Domestic Substances List)	
Zinc chloride (7646-85-7)	
Listed on the Canadian DSL (Domestic Substances List)	

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Ethene, homopolymer (9002-88-4)
Listed on the Canadian DSL (Domestic Substances List)
Cellulose (9004-34-6)
Listed on the Canadian DSL (Domestic Substances List)
Ammonium chloride (12125-02-9)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

Zinc (7440-66-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Manganese oxide (MnO2) (1313-13-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Iron (7439-89-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Water (7732-18-5)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Graphite (7782-42-5)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Zinc chloride (7646-85-7)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Cellulose (9004-34-6)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Ammonium chloride (12125-02-9)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

National regulations

Zinc (7440-66-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)
Manganese oxide (MnO2) (1313-13-9)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on the Japanese ISHL (Industrial Safety and Health Law) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Japanese Pollutant Release and Transfer Register Law (PRTR Law) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)
Iron (7439-89-6)
Listed on the AICS (Australian Inventory of Chemical Substances) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the Korean ECL (Existing Chemicals List) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory)

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Water (7732-18-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Graphite (7782-42-5)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Zinc chloride (7646-85-7)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Japanese Poisonous and Deleterious Substances Control Law
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Ethene, homopolymer (9002-88-4)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Cellulose (9004-34-6)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

Ammonium chloride (12125-02-9)

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)

15.3. US State regulations

No additional information available

SECTION 16: Other information

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Key or legend to abbreviations and acronyms used in the safety data sheet

TDG	Transport of Dangerous Goods
ADR	: European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMDG	: International Maritime Dangerous Goods
IATA	: International Air Transport Association
ADN	: European Agreement Concerning the International Carriage of Dangerous Goods by Inland Waterway
RID	: Regulations Concerning the International Carriage of Dangerous Goods by Rail
PBT	: Persistent, Bioaccumulative and Toxic
vPvB	: Very Persistent and Very Bioaccumulative
DNEL	: Derived No Effect Level
PNEC	: Predicted No Effect Concentration
LC50	: Lethal Concentration 50
LD50	: Lethal Dose 50
EC50	: Effective Concentration 50
TWA	: Time Weighted Average
STEL	: Short Term Exposure Limit

Key literature references and sources for data

ECHA: <http://echa.europa.eu/>

IFA GESTIS: [http://gestis-en.itrust.de/nxt/gateway.dll?f=templates\\$fn=default.htm\\$vid=gestiseng:sdbeng](http://gestis-en.itrust.de/nxt/gateway.dll?f=templates$fn=default.htm$vid=gestiseng:sdbeng)

HSDB: <http://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

ICSC: <http://www.ilo.org/dyn/icsc/showcard.home>

eChemPortal: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

NITE-CHRIP: http://www.nite.go.jp/en/chem/chrip/chrip_search/srhInput

GHS HazCom 2012

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.