

## Safety data sheet for product

### 1. PRODUCT AND COMPANY IDENTIFICATION

- Product name: Lithium ion rechargeable battery cell
- Product code: None  
(All models Sanyo manufactured and whose capacity is less than or equal to 5.4Ah, including the cell branded as Panasonic, excluding the cell whose shape is prismatic and two or more side of short / middle / long side excess 12mm/85mm/110mm.)
- Company name: Sanyo Electric Co., Ltd.
- Address: 222-1 , Kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number: +81-799-24-4111
- Fax number: +81-799-23-2879
- Emergency telephone number: [Weekday] +81-799-23-3931 [Night and holiday] +81-799-24-4131

### 2. HAZARDS IDENTIFICATION

- Classification : Not Applicable  
For the battery cell, chemical materials are stored in a hermetically sealed metal or metal laminated plastic case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.  
However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by miss-use, the gas release vent will be operated. The battery cell case will be breached at the extreme, hazardous materials may be released.  
Moreover, if heated strongly by the surrounding fire, acrid gas may be emitted.
- **Most important hazard and effects**  
Human health effects:  
Inhalation: The steam of the electrolyte has an anesthesia action and stimulates a respiratory tract.  
Skin contact: The steam of the electrolyte stimulates a skin. The electrolyte skin contact causes a sore and stimulation on the skin.  
Eye contact: The steam of the electrolyte stimulates eyes. The electrolyte eye contact causes a sore and stimulation on the eye. Especially, substance that causes a strong inflammation of the eyes is contained.  
Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.
- Specific hazards:  
If the electrolyte contacts with water, it will generate detrimental hydrogen fluoride.  
Since the leaked electrolyte is inflammable liquid, do not bring close to fire.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation: Preparation
- Information about the chemical nature of product: \*1

Portion	Material name	Concentration range (wt %)
Positive electrode	Lithium transition metal oxidate (Li[M] <sub>m</sub> [O] <sub>n</sub> *2)	20~60
Positive electrode's base	Aluminum	1~10
Negative electrode	Carbon	10~30
Negative electrode's base	Copper	1~15
Electrolyte	Organic electrolyte principally involves ester carbonate	5~25
Outer case	Aluminum, iron, aluminum laminated plastic	1~30

\*1 Not every product includes all of these materials.

\*2 The letter M means transition metal and candidates of M are Co, Mn, Ni and Al. One compound includes one or more of these metals and one product includes one or more of the compounds. The letter m and n means the number of atoms.

#### 4. FIRST-AID MEASURES

##### **Spilled internal cell materials**

- Inhalation:  
Make the victim blow his/her nose, gargle. Seek medical attention if necessary.
- Skin contact:  
Remove contaminated clothes and shoes immediately. Wash extraneous matter or contact region with soap and plenty of water immediately.
- Eye contact:  
Do not rub one's eyes. Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

##### **A battery cell and spilled internal cell materials**

- Ingestion:  
Make the victim vomit. When it is impossible or the feeling is not well after vomiting, seek medical attention.

#### 5. FIRE-FIGHTING MEASURE

- Suitable extinguishing media: Plenty of water, carbon dioxide gas, nitrogen gas, chemical powder fire extinguishing medium and fire foam.
- Specific hazards: Corrosive gas may be emitted during fire.
- Specific methods of fire-fighting: When the battery burns with other combustibles simultaneously, take fire-extinguishing method which correspond to the combustibles. Extinguish a fire from the windward as much as possible.
- Special protective equipment for firefighters:
  - Respiratory protection: Respiratory equipment of a gas cylinder style or protection-against-dust mask
  - Hand protection: Protective gloves
  - Eye protection: Goggle or protective glasses designed to protect against liquid splashes
  - Skin and body protection: Protective cloth

#### 6. ACCIDENTAL RELEASE MEASURES

Spilled internal cell materials, such as electrolyte leaked from a battery cell, are carefully dealt with according to the followings.

- Precautions for human body:  
Remove spilled materials with protective equipment (protective glasses and protective gloves). Do not inhale the gas as much as possible. Moreover, avoid touching with as much as possible.
- Environmental precautions: Do not throw out into the environment.
- Method of cleaning up: The spilled solids are put into a container. The leaked place is wiped off with dry cloth.
- Prevention of secondary hazards: Avoid re-scattering. Do not bring the collected materials close to fire.

#### 7. HANDLING AND STORAGE

- Handling suggestions
  - Do not connect the positive terminal to the negative terminal with electrical wire or chain.
  - Avoid polarity reverse connection when installing the battery to an instrument.
  - Do not wet the battery with water, seawater, drink or acid; or expose to strong oxidizer.
  - Do not damage or remove the external tube.
  - Keep the battery away from heat and fire.
  - Do not disassemble or reconstruct the battery; or solder the battery directly.
  - Do not give a mechanical shock or deform.
  - Do not use unauthorized charger or other charging method. Terminate charging when the charging process doesn't end within specified time.
- Storage
  - Do not store the battery with metalware, water, seawater, strong acid or strong oxidizer.
  - Make the charge amount 30~50% then store at room temperature or less (temperature= -20~35 degree C) in a dry (humidity: 45~85%) place. Avoid direct sunlight, high temperature, and high humidity.
  - Use insulative and adequately strong packaging material to prevent short circuit between positive and negative terminal when the packaging breaks during normal handling. Do not use conductive or easy to break packaging material.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION (WHEN THE ELECTROLYTE LEAKS)**

- Control parameters  
ACGIH has not been mentioned control parameter of electrolyte.
- Personal protective equipment  
Respiratory protection: Respirator with air cylinder, dust mask  
Hand protection: Protective gloves  
Eye protection: Goggle or protective glasses designed to protect against liquid splashes  
Skin and body protection: Working clothes with long sleeve and long trousers

**9. PHYSICAL AND CHEMICAL PROPERTIES**

- Appearance  
Physical state: Solid  
Form: Cylindrical or Prismatic or Pouch (laminated)  
Color: Metallic color or black(without tube if it has tube)  
Odor: No odor

**10. STABILITY AND REACTIVITY**

- Stability: Stable under normal use
- Hazardous reactions occurring under specific conditions
  - Conditions to avoid: When a battery cell is exposed to an external short-circuit, crushes, deformation, high temperature above 100 degree C, it will be the cause of heat generation and ignition. Direct sunlight and high humidity.
  - Materials to avoid: Conductive materials, water, seawater, strong oxidizers and strong acids.
  - Hazardous decomposition products: Acrid or harmful gas is emitted during fire.

**11. TOXICOLOGICAL INFORMATION****Organic Electrolyte**

- Acute toxicity:  
LD<sub>50</sub>, oral - Rat 2,000mg/kg or more
- Irritating nature: Irritative to skin and eye

**12. ECOLOGICAL INFORMATION**

- Persistence/degradability:  
Since a battery cell and the internal materials remain in the environment, do not bury or throw out into the environment.

**13. DISPOSAL CONSIDERATIONS**

- Recommended methods for safe and environmentally preferred disposal:

**Product (waste from residues)**

Specified collection or disposal of lithium ion battery is required by the law like as "battery control law" in several nations. Collection or recycle of the battery is mainly imposed on battery's manufacturer or importer in the nations recycle is required.

**Contaminated packaging**

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates, dispose as industrial wastes subject to special control.

**14. TRANSPORT INFORMATION**

In the case of transportation, avoid exposure to high temperature and prevent the formation of any condensation. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

**UN regulation**

- **UN number: 3480 (3481 when the battery is contained in equipment or packed with equipment)**
- Proper shipping name:  
Lithium ion batteries ("lithium ion batteries contained in equipment" or "lithium ion batteries packed with equipment")
- Class: 9 \*
- Packing group: II \*

*\* However this product is defined as above, it is **not** recognized as "DANGEROUS GOODS" or is treated as almost non-DANGEROUS GOODS when its transport condition accords with instructions or provisions depend on region and transportation mode.*

*About the instructions or provisions, please see descriptions in box brackets of following regulations.*

**Regulation depends on region and transportation mode**

- Worldwide, air transportation:  
IATA-DGR [As non-DANGEROUS GOODS: "packing instruction 965 section II" /  
Almost as above however displayed as DANGEROUS GOODS: "packing instruction 965 section IB"]  
(When batteries are packaged with equipments or contained in equipments, refer packing instruction  
966 or 967 instead of 965.)
- Worldwide, sea transportation:  
IMO-IMDG Code [special provision 188]
- Europe, road transportation:  
ADR [special provision 188]

**15. REGULATORY INFORMATION**

- Regulations specifically applicable to the product:  
Wastes Disposal and Public Cleaning Law [Japan]  
Law for Promotion of Effective Utilization of resources [Japan]  
US Department of Transportation 49 Code of Federal Regulations [USA]

*\* About overlapping regulations, please refer to Section 14-TRANSPORT INFORMATION.*

**16. OTHER INFORMATION**

- ***This safety data sheet is offered an agency who handles this product to handle it safely.***
- The agency should utilize this safety data sheet effectively (put it up, educate person in charge) and take proper measures.
- ***The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.***
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

**Reference**

Dangerous Goods Regulations – 56th Edition Effective 1 January 2015: International Air Transport Association (IATA)  
IMDG Code – 2014 Edition: International Maritime Organization (IMO)  
The European Agreement concerning the International Carriage of Dangerous Goods by Road – 2015:  
The United Nations Economic Commission for Europe (UNECE)

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First edition: Apr. 28, 2010  
Prepared and approved by  
Technical Administration Group  
Portable Rechargeable Battery Business Division  
Sanyo Electric Co., Ltd.

## Material Safety Data Sheet

### 1. Product and Company Identification

**Important Note:** As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use. This battery is an article pursuant to 29 CFR 1910.1200 and, as such, is not subject to the OSHA Hazard Communication Standard requirement. The information contained in this Material Safety Data Sheet contains valuable information critical to the safe handling and proper use of the product. This MSDS should be retained and available for employees and other users of this product.

#### Commercial product name

INR18650-15Q

#### Use of the substance/preparation

Lithium-Ion battery

#### Manufacturer

SAMSUNG SDI Co., LTD

#### Address

HQ: 150-20, Gongse-ro, Giheung-gu, Yongin-si, Gyeonggi-do, Korea

#### Company/undertaking identification

Emergency Contact(Chemtrec)

1-800-424-9300: US and Canada / 1-703-527-3887: International

#### **Further Information**

Battery-System: Lithium-Ion (Li-ion)

Nominal Voltage: 3.6V

Rated Capacity: 1.5Ah

Wh rating: 5.4Wh

Anode (negative electrode): based on intercalation graphite

Cathode (positive electrode): based on lithiated metal oxide (Cobalt, Nickel, Manganese)

#### **Remark:**

The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. SAMSUNG SDI Co., Ltd. makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.

### 2. Hazards Identification

#### **Route(s) of Entry**

There is no hazard when the measures for handling and storage are followed.

#### **Signs and Symptoms of Exposure**

In case of cell damage, possible release of dangerous substances and a flammable gas mixture.



OSHA Hazard Communication: This material is not considered hazardous by the OSHA Hazard Communication Standard 29CFR 1910.1200.

Carcinogenicity (NTP): Not listed  
 Carcinogenicity (IARC): Not listed  
 Carcinogenicity (OSHA): Not listed

**Special hazards for human health and environment**

There is no hazard when the measures for handling and storage are followed.  
 In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

**3. Composition/information on ingredients**

**Hazardous components**

CAS-No.	Chemical name	Quantity
7439-89-6	Iron	< 21%
7440-50-8	Copper	< 18%
12031-65-1	Lithium nickelate	< 15%
7782-42-5	Graphite	< 12%
12057-17-9	Lithium manganese oxide	< 10%
7429-90-5	Aluminium	< 8%
616-38-6	dimethyl carbonate	< 5%
9002-88-4	Polyethylene	< 4%
96-49-1	1,3-Dioxolan-2-one	< 2%
21324-40-3	lithium hexafluorophosphate(1-)	< 2%
623-53-0	Ethyl methyl carbonate	< 2%
9003-07-0	1-Propene homopolymer	< 2%
7440-02-0	Nickel	< 1%
24937-79-9	1,1-Difluoroethene homopolymer	< 1%
1333-86-4	Carbon black	< 1%
25640-14-6	1,4-Benzenedicarboxylic acid dimethyl ester polymer with 1,4-cyclohexanedimethanol and 1,2-ethanediol	< 1%
9010-94-0	2-Methyl-2-propenoic acid methyl ester polymer with 1,3-butadiene, ethenylbenzene and 2-propenenitrile	< 1%
554-13-2	lithium carbonate	< 1%
114435-02-8	4-Fluoro-1,3-dioxolan-2-one	< 1%
35239-19-1	2-Propenoic acid polymer with butyl 2-propenoate, ethenyl acetate and 2-ethylhexyl 2-propenoate	< 1%
9003-07-04	1-Propene homopolymer	< 1%
110-61-2	Butanedinitrile	< 1%
9004-32-4	Cellulose, carboxymethyl ether, sodium salt	< 1%
14807-96-6	Talc (Mg3H2(SiO3)4)	< 1%
24968-12-5	poly(1,4-butylene terephthalate)	< 1%



7439-96-5	Manganese	< 1%
24937-78-8	Acetic acid ethenyl ester polymer with ethene	< 1%
36619-23-5	1,4-Benzenedicarboxylic acid, dimethyl ester, polymer with 1,3-propanediol	< 1%
7440-44-0	Carbon	< 1%
13463-67-7	titanium dioxide	< 1%
7440-21-3	Silicon	< 1%
25038-81-7	1H,3H-Benzo[1,2-c:4,5-c']difuran-1,3,5,7-tetrone polymer with 4,4'-oxybis[benzenamine]	< 1%
7439-95-4	Magnesium	< 1%

Full text of each relevant R phrase can be found in heading 16.

#### Further Information

For information purposes:

(\*) Main ingredients: Lithium hexafluorophosphate, organic carbonates

Because of the cell structure the dangerous ingredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.

Mercury content: Hg < 0.1mg/kg

Cadmium content: Cd < 1mg/kg

Lead content: Pb < 10mg/kg

#### 4. First Aid Measures

##### General information

The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

##### After inhalation

Ensure of fresh air. Consult a physician.

##### After contact with skin

In case of contact with skin wash off immediately with plenty of water. Consult a physician.

##### After contact with eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Seek medical treatment by eye specialist.

##### After ingestion

Drink plenty of water.

Call a physician immediately.

#### 5. Fire Fighting Measures

##### Suitable extinguishing media



Cold water and dry powder in large amount are applicable.  
Use metal fire extinction powder or dry sand if only few cells are involved.

**Special hazards arising from the chemical**

May form hydrofluoric acid if electrolyte comes into contact with water.  
In case of fire, the formation of the following flue gases cannot be excluded:  
Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide.

**Protective equipment and precautions for firefighters**

Wear self-contained breathing apparatus and protective suit.  
Additional information  
If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent. Cell is not flammable but internal organic material will burn if the cell is incinerated.

**6. Accidental Release Measures**

**Personal precautions**

Use personal protective clothing.  
Avoid contact with skin, eyes and clothing.  
Avoid breathing fume and gas.

**Environmental precautions**

Do not discharge into the drains/surface waters/groundwater.  
Methods for cleaning up/taking up  
Take up mechanically and send for disposal.

**7. Handling and Storage**

**Handling**

**Advice on safe handling**

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.  
Advice on protection against fire and explosion  
Keep away from open flames, hot surfaces and sources of ignition.

**Storage**

**Requirements for storage rooms and vessels**

Storage at room temperature (approx. 20°C) at approx. 20~60% of the nominal capacity (OCV approx. 3.6 - 3.9 V/cell).  
Keep in closed original container.

**8. Exposure controls/personal protection Exposure limit values Exposure limits**

Ingredient	Risk Codes	Safety Description	Hazard	Exposure Controls/Personal Protection
Cobalt oxide	R22;R43; R50/53	S24;S37;S60;S61	Xn(Harmful) N (Dangerous for the environment)	0.1 mg/m <sup>3</sup> (TWA)





Manganese (VI) oxide	R20/22	S25	Xn(Harmful)	<b>Airborne Exposure Limits:</b> - OSHA Permissible Exposure Limit (PEL): 5 mg/m <sup>3</sup> Ceiling for manganese compounds as Mn - ACGIH Threshold Limit Value (TLV): 0.2 mg/m <sup>3</sup> (TWA) for manganese, elemental and inorganic compounds as Mn
Nickel oxide	R43,R49,R53	S45,S53,S61	T(Toxic)	<b>Airborne Exposure Limits:</b> For Nickel, Metal and Insoluble Compounds, as Ni: - OSHA Permissible Exposure Limits (PEL) - 1 mg/m <sup>3</sup> (TWA). For Nickel, Elemental / Metal: - ACGIH Threshold Limit Value (TLV) - 1.5 mg/m <sup>3</sup> (TWA), A5 - Not suspected as a human carcinogen. For Nickel, Insoluble Compounds, as Ni: - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m <sup>3</sup> (TWA), A1 - Confirmed human carcinogen
Carbon	R36/37/38, R36/37, R20, R10	S22;S24/25	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	<b>Airborne Exposure Limits:</b> - OSHA Permissible Exposure Limits (PELs): activated carbon (graphite, synthetic): Total particulate = 15 mg/m <sup>3</sup>
Aluminium foil	R17,R15,R36/38,R10,R67,R65,R62,R51/53,R48/20,R38,R11,	S7/8,S43,S26,S62,S61, S36/37,S33,S29,S16,S9	F(Highly Flammable) Xn(Harmful) Xi(Irritant)	<b>Airborne Exposure Limits:</b> -OSHA Permissible Exposure Limit (PEL): 15 mg/m <sup>3</sup> (TWA) total dust and 5 mg/m <sup>3</sup> (TWA) repairable fraction for Aluminum metal as Al -ACGIH Threshold Limit Value (TLV): 10 mg/m <sup>3</sup> (TWA) Aluminum metal dusts
Copper foil	R11 R36 R37 R38	S5,S26,S16,S61,S36/37	F(Highly Flammable) N(Dangerous for the environment) Xn(Harmful) Xi(Irritant)	Copper Dust and Mists, as Cu: - OSHA Permissible Exposure Limit (PEL) - 1 mg/m <sup>3</sup> (TWA) - ACGIH Threshold Limit Value (TLV) - 1 mg/m <sup>3</sup> (TWA) Copper Fume: - OSHA Permissible Exposure Limit (PEL) - 0.1 mg/m <sup>3</sup> (TWA) - ACGIH Threshold Limit Value (TLV) - 0.2 mg/m <sup>3</sup> (TWA)
Polyvinylidene fluoride (PVdF)		S22;S24/25		

**Additional advice on limit values**

During normal charging and discharging there is no release of product.

**Occupational exposure controls**

No specific precautions necessary.

**Protective and hygiene measures**

When using do not eat, drink or smoke. Wash hands before breaks and after work.

**Respiratory protection**

No specific precautions necessary.

**Hand protection**

No specific precautions necessary.

**Eye protection**

No specific precautions necessary.

**Skin protection**

No specific precautions necessary.

**9. Physical and Chemical Properties**

**Appearance**

Form: Solid  
Color: Various  
Odor: Odourless

**Important health, safety and environmental information**

Test method

pHValue:	n.a.
Flash point:	n.a.
Lower explosion limits:	n.a.
Vapour pressure:	n.a.
Density:	n.a.
Water solubility:	Insoluble
Ignition temperature:	n.a.

**10. Stability and Reactivity USA, EU**

**Stability**

Stable

**Conditions to avoid**

Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.

**Materials to avoid**

No materials to be especially mentioned.

**Hazardous decomposition products**

In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.

**Possibility of Hazardous Reactions**

Will not occur

**Additional information**

No decomposition if stored and applied as directed.

**11. Toxicological Information**

**Empirical data on effects on humans**

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

**12. Ecological Information**

**Further information**

Ecological injuries are not known or expected under normal use. Do not flush into surface water or sanitary sewer system.

**13. Disposal Considerations**

**Advice on disposal**

For recycling consult manufacturer.

**Contaminated packaging**

Disposal in accordance with local regulations.

**14. Transport Information**

With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B or II (2015-2016 Edition),
- The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section I B or II (56th Edition, 2015)
- The International Maritime Dangerous Goods (IMDG) Code (2014 Edition), [Special provision 188, 230]
- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations) Sections 173.185 Lithium batteries and cells,
- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type (latest version is Revision 5, Amendment 2)
- UN No. 3480

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria.

**Test results of the UN Recommendation on the Transport of Dangerous Goods**

<b>Manual of Test and Criteria (38.3 Lithium battery)</b>	<b>Test Results</b>	<b>Remark</b>
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No	Test item		
T1	Altitude Simulation	Pass	
T2	Thermal Test	Pass	
T3	Vibration	Pass	
T4	Shock	Pass	
T5	External Short Circuit	Pass	
T6	Impact/Crush	Pass	
T7	Overcharge	Pass	For pack and single cell battery only
T8	Forced Discharge	Pass	

## **15. Regulatory Information**

### **U.S. Regulations**

#### **National Inventory TSCA**

All of the components are listed on the TSCA inventory.

#### **SARA**

To the best of our knowledge this product contains no toxic chemicals subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA/EPCRA) and the requirements of 40 CFR Part 372.

### **Regulatory information EU**

#### **Labeling**

##### **Hazardous components which must be listed on the label**

As an article the product does not need to be labeled in accordance with EC directives or respective national laws.

#### **EU regulatory information**

1999/13/EC (VOC): 0 %

### **16. Other Information**

#### **Hazardous Materials Information Label (HMIS)**

Health: 0

Flammability: 0

Physical Hazard: 0

#### **NFPA Hazard Ratings**

Health: 0

Flammability: 0

Reactivity: 0

Unique Hazard:

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

R10 Flammable.

R20/22 Harmful by inhalation and if swallowed.

R22 Harmful if swallowed.

R34 Causes burns.

R40 Limited evidence of a carcinogenic effect.

R43 May cause sensitization by skin contact.



- |        |   |
|--------|---|
| R48/23 | Toxic: danger of serious damage to health by prolonged exposure through inhalation. |
| R49    | May cause cancer by inhalation.   |
| R50    | Very toxic to aquatic organisms.  |
| R53    | May cause long-term adverse effects in the aquatic environment.                     |

**Further Information**

Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release 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. 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 data sheet.