



# Difluoromethane (R32)

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: January 3, 2023

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Version: 2.0

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
Trade name : Difluoromethane (R32)  
CAS-No. : 75-10-5  
Product code : HFC-32  
Formula : CH<sub>2</sub>F<sub>2</sub>



#### 1.2. Recommended use and restrictions on use

No additional information available

#### 1.3. Manufacturer

Ruyuan Dongyangguang Fluorine Co., Ltd.  
Chlor-Alkali Industry Base, Development Zone of Ruyuan County, GUANGDONG, CHINA  
512721  
T +86-(0)751-5286592  
[zhanggh.ginny@dyg-hec.com](mailto:zhanggh.ginny@dyg-hec.com)

#### 1.4. Emergency telephone number

Emergency number : +86-(0)532-83889090

### SECTION 2: Hazard(s) identification

#### 2.1. Classification of the substance or mixture

##### GHS-US classification

Flammable gases, Category 1 : Extremely flammable gas.  
Gases under pressure : Liquefied gas : Contains gas under pressure; may explode if heated.

#### 2.2. GHS Label elements, including precautionary statements

##### GHS-US labelling

Hazard pictograms (GHS-US) :



Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : Extremely flammable gas.  
Contains gas under pressure; may explode if heated.  
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.  
MAY CAUSE FROSTBITE.  
MAY FORM EXPLOSIVE MIXTURES WITH AIR.

Precautionary statements (GHS-US) : Do not handle until all safety precautions have been read and understood.  
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
Do not get in eyes, on skin, or on clothing.  
Use only outdoors or in a well-ventilated area.  
Store in a well-ventilated place.  
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
Eliminate all ignition sources if safe to do so.  
IF INHALED:  
Remove person to fresh air and keep comfortable for breathing.  
Get medical advice/attention.  
IF ON SKIN:  
Thaw frosted parts with lukewarm water. Do not rub affected area.  
Get immediate medical advice/attention.  
DO NOT REMOVE THIS PRODUCT LABEL (or equivalent wording).  
Protect from sunlight when ambient temperature exceeds 52 °C (125 °F).  
Use a back flow preventive device in the piping.  
Close valve after each use and when empty.  
Never put cylinders into unventilated areas of passenger vehicles.  
Read and follow the Safety Data Sheet (SDS) before use.

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### 2.3. Other hazards which do not result in classification

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite

### 2.4. Unknown acute toxicity (GHS US)

Not applicable

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

| Name                                        | Product identifier | %      | GHS-US classification                        |
|---------------------------------------------|--------------------|--------|----------------------------------------------|
| Difluoromethane (R32)<br>(Main constituent) | (CAS-No.) 75-10-5  | > 99.9 | Flam. Gas 1, H220<br>Press. Gas (Liq.), H280 |

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

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.

First-aid measures after skin contact : In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Obtain medical assistance.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Most important symptoms and effects, both acute and delayed : Refer to section 11.

### 4.3. Immediate medical attention and special treatment, if necessary

None.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray or fog. Dry powder.

Unsuitable extinguishing media : Carbon dioxide. Do not use water jet to extinguish.

### 5.2. Specific hazards arising from the chemical

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

Hazardous combustion products : Carbonyl fluoride. Carbon monoxide. Hydrogen fluoride.

### 5.3. Special protective equipment and precautions for fire-fighters

Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Specific methods : Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems. If possible, stop flow of product. Use water spray or fog to knock down fire fumes if possible. Move containers away from the fire area if this can be done without risk.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Try to stop release. Evacuate area. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Eliminate ignition sources. Ensure adequate air ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Act in accordance with local emergency plan. Stay upwind.

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### 6.1.1. For non-emergency personnel

No additional information available

### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

Try to stop release.

### 6.3. Methods and material for containment and cleaning up

Methods and material for containment and cleaning up : Keep area evacuated and free from ignition sources until any spilled liquid has evaporated (ground free from frost).

### 6.4. Reference to other sections

See also sections 8 and 13.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Safe handling of the gas receptacle : Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect cylinders from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating cylinder valve, discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.

Safe use of the product : Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment. Purge air from system before introducing gas. Take precautionary measures against static discharge. Keep away from ignition sources (including static discharges). Consider the use of only non-sparking tools. Ensure equipment is adequately earthed. The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Do not breathe gas. Avoid release of product into atmosphere.

### 7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities : Segregate from oxidant gases and other oxidants in store. All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

No additional information available

### 8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Product to be handled in a closed system. Gas detectors should be used when flammable gases/vapours may be released. Consider the use of a work permit system e.g. for maintenance activities. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available).

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Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered: PPE compliant to the recommended EN/ISO standards should be selected.

##### Hand protection:

Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves. Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk.

##### Eye protection:

Wear goggles when transfilling or breaking transfer connections. Standard EN 166 - Personal eye-protection - specifications

##### Respiratory protection:

Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known. Use gas filters with full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers. Gas filters do not protect against oxygen deficiency. Standard EN 14387 - Gas filter(s), combined filter(s) and standard EN136, full face masks .

#### Thermal hazard protection:

None in addition to the above sections.

#### Other information:

Consider the use of flame resistant anti-static safety clothing. Standard EN ISO 14116 - Limited flame spread materials. Standard EN 1149-5 - Protective clothing: Electrostatic properties. Wear safety shoes while handling containers. Standard EN ISO 20345 - Personal protective equipment - Safety footwear.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|                                            |                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------|
| Physical state                             | : Gas                                                                   |
| Colour                                     | : Colourless.                                                           |
| Odour                                      | : Ethereal. Poor warning properties at low concentrations.              |
| Odour threshold                            | : Odour threshold is subjective and inadequate to warn of overexposure. |
| pH                                         | : Not applicable for gases and gas mixtures.                            |
| Melting point                              | : -136 °C                                                               |
| Freezing point                             | : -136 °C                                                               |
| Boiling point                              | : -51.7 °C                                                              |
| Critical temperature                       | : 78.5 °C                                                               |
| Critical pressure                          | : 5830 kPa                                                              |
| Flash point                                | : Not applicable for gases and gas mixtures.                            |
| Relative evaporation rate (butylacetate=1) | : No data available                                                     |
| Relative evaporation rate (ether=1)        | : Not applicable for gases and gas mixtures.                            |
| Flammability (solid, gas)                  | : Extremely flammable gas.                                              |
| Vapour pressure                            | : 13.8 bar(a)                                                           |
| Vapour pressure at 50 °C                   | : 31.4 bar(a)                                                           |
| Relative vapour density at 20 °C           | : Not applicable.                                                       |
| Relative density                           | : 1.1                                                                   |
| Molecular mass                             | : 52 g/mol                                                              |
| Relative gas density                       | : 1.8                                                                   |
| Solubility                                 | : Water: 280000 mg/l                                                    |
| LogPow                                     | : 0.2<br>Not applicable for gas mixtures.                               |
| Auto-ignition temperature                  | : 648 °C                                                                |
| Decomposition temperature                  | : Not applicable.                                                       |
| Viscosity, kinematic                       | : No data available                                                     |

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|                      |                              |
|----------------------|------------------------------|
| Viscosity, dynamic   | : No reliable data available |
| Explosive limits     | : 14 - 31 vol %              |
| Explosive properties | : Not applicable.            |
| Oxidising properties | : Not applicable.            |

### 9.2. Other information

|                        |                                                                                                          |
|------------------------|----------------------------------------------------------------------------------------------------------|
| Gas group              | : Press. Gas (Liq.)                                                                                      |
| Additional information | : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. |

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

Can form explosive mixture with air. May react violently with oxidants.

### 10.4. Conditions to avoid

Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Avoid moisture in installation systems.

### 10.5. Incompatible materials

Air, Oxidisers. Moisture. For additional information on compatibility refer to ISO 11114.

### 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                                                   |
| Skin corrosion/irritation                                   | : Not classified<br>pH: Not applicable for gases and gas mixtures. |
| Serious eye damage/irritation                               | : Not classified<br>pH: Not applicable for gases and gas mixtures. |
| Respiratory or skin sensitisation                           | : Not classified                                                   |
| Germ cell mutagenicity                                      | : Not classified                                                   |
| Carcinogenicity                                             | : Not classified                                                   |
| Reproductive toxicity                                       | : Not classified                                                   |
| STOT-single exposure                                        | : Not classified                                                   |
| STOT-repeated exposure                                      | : Not classified                                                   |
| Aspiration hazard                                           | : Not classified                                                   |
| Viscosity, kinematic                                        | : No data available                                                |
| Most important symptoms and effects, both acute and delayed | : Refer to section 11.                                             |

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : Classification criteria are not met.

| Difluoromethane (R32) (75-10-5) |           |
|---------------------------------|-----------|
| LC50 96 h - Fish [mg/l]         | 1507 mg/l |
| EC50 48h - Daphnia magna [mg/l] | 142 mg/l  |
| EC50 72h - Algae [mg/l]         | 652 mg/l  |

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### 12.2. Persistence and degradability

#### Difluoromethane (R32) (75-10-5)

|                               |                            |
|-------------------------------|----------------------------|
| Persistence and degradability | Not readily biodegradable. |
|-------------------------------|----------------------------|

### 12.3. Bioaccumulative potential

#### Difluoromethane (R32) (75-10-5)

|                           |                                                                                         |
|---------------------------|-----------------------------------------------------------------------------------------|
| Log Pow                   | 0.2                                                                                     |
| Log Kow                   | Not applicable for gas mixtures.                                                        |
| Bioaccumulative potential | Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9. |

### 12.4. Mobility in soil

#### Difluoromethane (R32) (75-10-5)

|                |                                                                                                                              |
|----------------|------------------------------------------------------------------------------------------------------------------------------|
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely. |
|----------------|------------------------------------------------------------------------------------------------------------------------------|

### 12.5. Other adverse effects

|                                  |                                                                                                                                                                   |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Other adverse effects            | : No known effects from this product.                                                                                                                             |
| Effect on the ozone layer        | : None.                                                                                                                                                           |
| Global warming potential [CO2=1] | : 675                                                                                                                                                             |
| Effect on global warming         | Contains fluorinated greenhouse gases.<br>When discharged in large quantities may contribute to the greenhouse effect.<br>For quantities refer to cylinder label. |

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Waste treatment methods                                              | : Contact supplier if guidance is required. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <a href="http://www.eiga.eu">http://www.eiga.eu</a> for more guidance on suitable disposal methods. Refer to supplier's waste gas recovery programme. Toxic and corrosive gases formed during combustion should be scrubbed before discharge to atmosphere. Discharge to atmosphere in large quantities should be avoided. Do not discharge into any place where its accumulation could be dangerous. Return unused product in original cylinder to supplier. |
| Additional information                                               | : External treatment and disposal of waste should comply with applicable local and/or national regulations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| List of hazardous waste codes (from Commission Decision 2001/118/EC) | : 14 06 01 *: Chlorofluorocarbons, HCFC, HFC.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## SECTION 14: Transport information

### Department of Transportation (DOT)

In accordance with DOT

|                                |                                                  |
|--------------------------------|--------------------------------------------------|
| Transport document description | : UN3252 Difluoromethane, 2.1                    |
| UN-No.(DOT)                    | : UN3252                                         |
| Proper Shipping Name (DOT)     | : Difluoromethane                                |
| Class (DOT)                    | : 2.1 - Class 2.1 - Flammable gas 49 CFR 173.115 |
| Hazard labels (DOT)            | : 2.1 - Flammable gas                            |



|                                         |                                                                                                                                                                                                                                                              |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOT Packaging Non Bulk (49 CFR 173.xxx) | : 302                                                                                                                                                                                                                                                        |
| DOT Packaging Bulk (49 CFR 173.xxx)     | : 314;315                                                                                                                                                                                                                                                    |
| DOT Special Provisions (49 CFR 172.102) | : T50 - When portable tank instruction T50 is referenced in Column (7) of the 172.101 Table, the applicable liquefied compressed gases are authorized to be transported in portable tanks in accordance with the requirements of 173.313 of this subchapter. |

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|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DOT Packaging Exceptions (49 CFR 173.xxx)                        | : 306                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) | : Forbidden                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)     | : 150 kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| DOT Vessel Stowage Location                                      | : D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.                                                                                                                                                                                                                          |
| DOT Vessel Stowage Other                                         | : 40 - Stow "clear of living quarters"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Emergency Response Guide (ERG) Number                            | : 115                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Other information                                                | : No supplementary information available.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Special transport precautions                                    | : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:<br>- Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted. |

### Transportation of Dangerous Goods

Not applicable

### Transport by sea

|                                       |                                                       |
|---------------------------------------|-------------------------------------------------------|
| Transport document description (IMDG) | : UN 3252 DIFLUOROMETHANE (REFRIGERANT GAS R 32), 2.1 |
| UN-No. (IMDG)                         | : 3252                                                |
| Proper Shipping Name (IMDG)           | : DIFLUOROMETHANE (REFRIGERANT GAS R 32)              |
| Class (IMDG)                          | : 2 - Gases                                           |
| Limited quantities (IMDG)             | : 0                                                   |
| MFAG-No                               | : 115                                                 |

### Air transport

|                                       |                                |
|---------------------------------------|--------------------------------|
| Transport document description (IATA) | : UN 3252 Difluoromethane, 2.1 |
| UN-No. (IATA)                         | : 3252                         |
| Proper Shipping Name (IATA)           | : Difluoromethane              |
| Class (IATA)                          | : 2                            |

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

#### Difluoromethane (R32) (75-10-5)

Listed on the United States TSCA (Toxic Substances Control Act) inventory

### 15.2. International regulations

#### CANADA

#### Difluoromethane (R32) (75-10-5)

Listed on the Canadian DSL (Domestic Substances List)

### EU-Regulations

No additional information available

### National regulations

No additional information available

### 15.3. US State regulations

No additional information available

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### SECTION 16: Other information

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Training advice : Ensure operators understand the flammability hazard.

Abbreviations and acronyms:

|  |                                                                                                           |
|--|-----------------------------------------------------------------------------------------------------------|
|  | ATE - Acute Toxicity Estimate                                                                             |
|  | CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008                         |
|  | REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006 |
|  | EINECS - European Inventory of Existing Commercial Chemical Substances                                    |
|  | CAS# - Chemical Abstract Service number                                                                   |
|  | PPE - Personal Protection Equipment                                                                       |
|  | LC50 - Lethal Concentration to 50 % of a test population                                                  |
|  | RMM - Risk Management Measures                                                                            |
|  | PBT - Persistent, Bioaccumulative and Toxic                                                               |
|  | vPvB - Very Persistent and Very Bioaccumulative                                                           |
|  | STOT- SE : Specific Target Organ Toxicity - Single Exposure                                               |
|  | CSA - Chemical Safety Assessment                                                                          |
|  | EN - European Standard                                                                                    |
|  | UN - United Nations                                                                                       |
|  | ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road                 |
|  | IATA - International Air Transport Association                                                            |
|  | IMDG code - International Maritime Dangerous Goods                                                        |
|  | RID - Regulations concerning the International Carriage of Dangerous Goods by Rail                        |
|  | WGK - Water Hazard Class                                                                                  |
|  | STOT - RE : Specific Target Organ Toxicity - Repeated Exposure                                            |

SDS US (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.*



力源电池科技（宜春）有限公司

LIYUAN BATTERY TECHNOLOGY (YI CHUN) CO., LTD.

## 电 池 规 格 书

|      |                 |
|------|-----------------|
| 客户名称 |                 |
| 品 牌  |                 |
| 产 品  | 3.0V 扣式锂-二氧化锰电池 |
| 型 号  | CR2025          |
| 制 作  | 邹陆军             |
| 审 批  | 马旭军             |
| 日 期  | 2018-02-17      |

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# 力源电池科技（宜春）有限公司

LIYUAN BATTERY TECHNOLOGY(YI CHUN) CO., LTD.

## 1. 【范围】

本承认书的各种技术参数仅适用于 3V 锂锰扣式电池 CR2025，该电池由力源电池科技（宜春）有限公司生产。

## 2. 【技术参数】

表一：

| 项 目    | 单位            | 数值    | 条 件                                                  |
|--------|---------------|-------|------------------------------------------------------|
| 公称电压   | V             | 3.0   | 无负载                                                  |
| 公称容量   | mAh           | 150   | 20℃时标准电阻 15kΩ<br>放电至 2V                              |
| 瞬时短路电流 | mA            | ≥250  | 时间≤0.5 秒                                             |
| 开路电压   | V             | ≥3.20 | 无负载                                                  |
| 贮存温度   | ℃             | 0~35  | 室温                                                   |
| 标准重量   | g             | 2.4   | 每只电池                                                 |
| 放电时间   | 初始值           | 标准值   | 在负载 7.5KΩ、20~25℃<br>的温度、终止电压为<br>2.0V 的情况下持续放电<br>时间 |
|        |               | 最小值   |                                                      |
|        | 经 12 个月贮存后的数值 | 标准值   |                                                      |
|        |               | 最小值   |                                                      |

表二：

| 保存条件 | 条件              | 特性值    |
|------|-----------------|--------|
| 自放电率 | 常温常湿条件下贮存 12 个月 | 不大于 5% |

## 3. 【产品规格和测试方法】

除非特别说明，所有的测试都在下列常温条件下进行：环境温度：20~25℃  
环境湿度：65±20%。见表三

## 4. 【使用注意事项】

4.1 正确安装和使用电池,防止短路和装错正负极。

4.2 安装前要检查电池极端和所用器具及其接点，以保证清洁和导电，所用器具不能造成短路。

4.3 新电池不要与使用过的电池混用，不同牌号、等级和品种的电池不要混用，以免增加漏液的可能性。

4.4 电池使用后不得加热，充电或其它的手段反复使用，以免发生爆炸、破

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损和漏液。

4.5 不得将电池投入火中，也不要拆卸电池，以免发生危险。

4.6 妥善保管微型电池，以防幼儿误吞。

4.7 要注意电池的规定贮存期限。

表三：

| 序号 | 测试项目     | 测试方法                                                                                    | 标准          |               |
|----|----------|-----------------------------------------------------------------------------------------|-------------|---------------|
| 1  | 外形尺寸     | 用精确度大于 0.02mm 的游标卡尺测试时，为防止电池短路，卡尺的一端卡头上应贴上一层绝缘材料                                        | 直径          | 20.0(-0.20)mm |
|    |          |                                                                                         | 高度          | 2.5(-0.20)mm  |
| 2  | 开路电压     | 万用表的精确度不低于 0.25%，内阻大于 1MΩ                                                               | ≥3.20V      |               |
| 3  | 瞬时短路电流   | 用万用表测试时，每次时间不超过 0.5 秒，避免重复测试，若需再次测试时，时间间隔应在半小时以上                                        | ≥250mA      |               |
| 4  | 外观       | 目测                                                                                      | 外观平整、光洁、无锈迹 |               |
| 5  | 放电容量     | 在 20~25℃ 的温度和 65±20% 的湿度的条件下放置 8 小时以上，在负载 7.5 KΩ，终止电压为 2.0V 的情况下持续放电时间时所测容量(新电：生产后三个月内) | ≥375h       |               |
| 6  | 振摔测试     | 将合格样品放在振动机的振台上，启动振动机，振动频率为 10-15 次/分钟，持续振动一小时                                           | 电池性能稳定      |               |
| 7  | 高温耐漏液测试  | 在 45℃ 的条件下贮存 30 天                                                                       | 无漏液         |               |
| 8  | 过放电耐漏液测试 | 在电池终止电压达到 2.0V 后，持续放电 5 小时                                                              | 无漏液         |               |

5. 【3.0V 扣式锂-二氧化锰电池剖面图】（详见第 6 页）

6. 【放电图】（详见第 7 页）

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## Battery Data Sheet

|             |                                    |
|-------------|------------------------------------|
| MESSRS      |                                    |
| BRAND       |                                    |
| PRODUCT     | 3.0V LITHIUM-MANGANESE BUTTON CELL |
| MODEL       | CR2025                             |
| PREPARED BY | ZOU LU JUN                         |
| APPROVED BY | MA XU JUN                          |
| DATE        | FEB. 17, 2018                      |



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## LIYUAN BATTERY TECHNOLOGY(YI CHUN) CO., LTD.

### 1. 【SCOPE】

This specification applies to the following 3.0v lithium button cell CR2025 made by LIYUAN BATTERY TECHNOLOGY(YI CHUN) CO., LTD.

### 2. 【RATINGS】

TABLE I :

| ITEM                                |                         | UNIT     | SPECIFICATIONS | CONDITIONS                                                                      |
|-------------------------------------|-------------------------|----------|----------------|---------------------------------------------------------------------------------|
| Nominal voltage                     |                         | V        | 3.0            | Standard discharge                                                              |
| Nominal capacity                    |                         | mAh      | 150            | At 20 °C $\Omega$ discharge<br>standard resistance 15 k to 2 v                  |
| Instantaneous short-circuit current |                         | mA       | $\geq 250$     | Time $\leq 0.5$ second                                                          |
| Off-load voltage                    |                         | V        | $\geq 3.20$    |                                                                                 |
| Storage temperature                 |                         | °C       | 0~35           |                                                                                 |
| Standard weight                     |                         | g        | 2.4            | Unit cell                                                                       |
| Service output                      | Initial                 | Standard | 375h           | Continuous discharge with load 7.5k $\Omega$ , till 2.0v end-voltage at 20~25°C |
|                                     |                         | Minimum  | 360h           |                                                                                 |
|                                     | After 12 months storage | Standard | 356h           |                                                                                 |
|                                     |                         | Minimum  | 340h           |                                                                                 |

TABLE II :

| ITEM                | CONDITIONS                                                                                                            | CHARACTERISTICS |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------|
| Self-discharge rate | Stored for 12 months at normal temperature, then continuously discharged with 15k $\Omega$ load till 2.0v end-voltage | $\leq 5\%$      |

### 3. 【PERFORMANCE AND TEST METHODS】

Unless otherwise stated, all the testing is carried out under the condition: environmental temperature, 20 °C~25 °C; environmental humidity, 65 $\pm$ 20%. Please refer to Table III

### 4. 【SUGGESTIONS AND CAUTIONS】

- 4.1 Install batteries correctly.
- 4.2 Ensure the contact points to be clean and conductive.
- 4.3 Do not mix different types, different brands batteries to serve together.
- 4.4 Do not heat, recharge the batteries.
- 4.5 Do not dispose of the batteries in fire.
- 4.6 Keep away from the small children, if swallowed promptly see doctor.
- 4.7 Pay attention to the producing date.

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TABLE III:

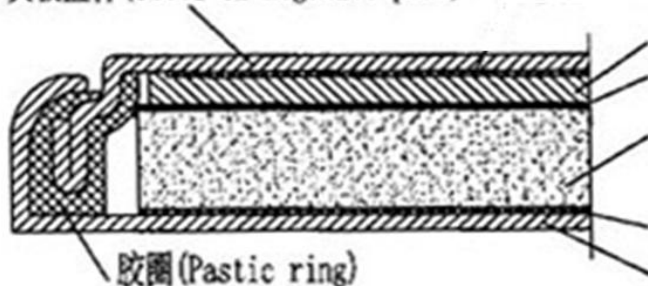
| No | ITEM                                | TEST METHODS                                                                                                                                                                                        | STANDARD                                        |                 |
|----|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|-----------------|
| 1  | Dimensions                          | Using vernier caliper (accuracy $\geq 0.02$ ) while avoiding short-circuit                                                                                                                          | Diameter                                        | 20.0 (-0.20) mm |
|    |                                     |                                                                                                                                                                                                     | Height                                          | 2.5(-0.20) mm   |
| 2  | Off-load voltage                    | Using multimeter (accuracy $\geq 0.25\%$ ) internal resistance $\geq 1M\Omega$                                                                                                                      | $\geq 3.20v$                                    |                 |
| 3  | Instantaneous short-circuit current | Time of short-circuit should be less than 0.5 second and avoid repeated test within half an hour                                                                                                    | $\geq 250\text{ mA}$                            |                 |
| 4  | Appearance                          | Eyeballing                                                                                                                                                                                          | Bright, clean, no rust, no leakage, And no flaw |                 |
| 5  | Capacity                            | Continuously discharge for 8 hours with load $7.5k\Omega$ , temperature at $20\sim 25^{\circ}\text{C}$ , humidity at $65 \pm 20\%$ till 2.0v end-voltage (for fresh battery only: within 3 months ) | $\geq 375h$                                     |                 |
| 6  | Vibration test                      | Put battery on the platform of the vibrations machine, start the machine and adjust the frequency form 10 times per minute to 15 times per minute. keep it running for an hour                      | Characteristics keep stability                  |                 |
| 7  | Leakage at high temperature         | Stored under temperature ( $45^{\circ}\text{C}$ ) for 30 days                                                                                                                                       | No leakage allowed                              |                 |
| 8  | Over discharge Test                 | After 2.0v end-voltage, continuously discharged for 5 hours                                                                                                                                         | No leakage allowed                              |                 |

## 5. 【BENCH SECTION OF 3.0V LITHIUM MANGANESE DIOXIDE BUTTON CELL】

### 3.0V扣式锂-锰电池剖面图

#### Bench Section of 3.0V Lithium Manganese Dioxide Button Cell

负极盖体(Steel of negative pole)



负极锂片(Slice of Lithium)

隔膜(Septum)

正极片(Slice of positive pole)

正极集流网(Collector of positive pole)

正极壳体(Steel of positive pole)

胶圈(Pastic ring)

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## 6. 【DISCHARGE CHARACTERISTICS】



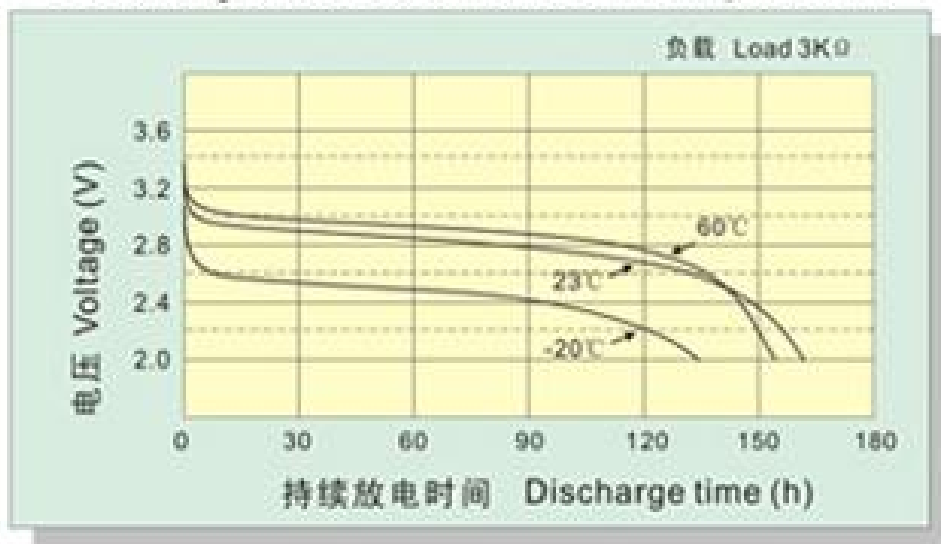
### 负载放电特性

#### Discharge Characteristics on Load



### 温度放电特性

#### Discharge Characteristics on Temperature



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