

Safety Data Sheet (SDS)

According to Regulation (EC) No 1907/2006 (REACH), Annex II(COMMISSION REGULATION (EU) No 2015/830)

SKYCHDA

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Revision date: Not applicable

Version: R0001.0001

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Substance name : 1,4-Cyclohexanedicarboxylic acid
 EC No. : 214-068-6
 REACH Registration No. : 17-2119445173-45-0000 (expired)
 CAS No. : 1076-97-7

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

- Resins for coatings and paints, engineering plastics, polyester

1.2.2. Uses advised against

- Use for recommended use only.

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier : SK Chemicals Co., Ltd
 Address : 718, Cheoyong-ro, Nam-gu, Ulsan, Republic of Korea 44784
 Telephone : +82-2-2008-2496

1.4. Emergency telephone number

EU-wide emergency number : 112

See section 16.6 for the list of telephone number of National Helpdesks in the European Economic Area.

SECTION 2: HAZARD IDENTIFICATION

2.1. Classification of the substance/mixture

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

- Acute toxicity (oral) : Category4, H302
 - Serious eye damage/irritation : Category2, H319

2.2. Label elements

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

* Hazard Pictogram(s)



* Signal word : Warning

* Hazard statement(s)

- H302 Harmful if swallowed
 - H319 Causes serious eye irritation

* Precautionary statement(s)

1) Prevention

- P264 Wash hands thoroughly after handling.
 - P270 Do not eat, drink or smoke when using this product.
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.

2) Response

- P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
 - P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

- P330 Rinse mouth.
- P337+P313 If eye irritation persists: Get medical advice/attention.

3) Storage

- Not applicable

4) Disposal

- P501 Dispose of contents/container in accordance with local/regional/national/international regulation

*** Indication of danger**

- Not available

2.3. Other hazards

- Not available

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**3.1. Substances**

Name	EC No.	CAS No.	REACH registration No.	% [weight]	Classification [1272/2008/EC]
1,4-Cyclohexanedicarboxylic acid	214-068-6	1076-97-7	17-2119445173-45-0000 (expired)	≥ 98	Not classified

3.2. Mixtures

- Not applicable

SECTION 4: FIRST AID MEASURES**4.1. Description of first aid measures****General**

- No general information.

Inhalation

- When exposed to large amounts of steam and mist, move to fresh air.
- Take specific treatment if needed.

Skin contact

- Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes.
- Wash contaminated clothing thoroughly before re-using.

Eye contact

- Do not rub your eyes.
- Immediately flush eyes with plenty of water for at least 15 minutes and call a doctor/physician.
- Go to the hospital immediately if symptoms (flare, irritate) occur.
- Remove contact lenses if worn.

Ingestion

- Please be advised by doctor whether induction of vomit is demanded or not.
- Rinse your mouth with water immediately.

4.2. Most important symptoms and effects, both acute and delayed

- Not available

4.3. Indication of any immediate medical attention and special treatment needed

- Notify medical personnel of contaminated situations and have them take appropriate protective measures.

SECTION 5: FIREFIGHTING MEASURES**5.1. Extinguishing media****Suitable extinguishing media**

- Small fire : dry sand, dry chemical, alcohol-resistant foam, water spray, regular foam, CO2
- Large fire : water spray, regular foam

Unsuitable extinguishing media

- Avoid use of high pressure water streams

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products

- May be ignited by heat, sparks or flames.
- Containers May explode when heated.
- Some of these materials May burn, but none ignite readily.
- Fire will produce irritating and/or toxic gases(CO, CO2).
- If inhaled, May be harmful.
- Some fluids May cause dizziness and suffocation through the vapor.

5.3. Advice for firefighters

- Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
- In case of conflagration, use automatic fire sprinkler. Major fire may require withdrawal, allowing the object itself to burn.
- Avoid inhalation of materials or combustion by-products.
- Do not approach the tank surrounded by fire until it is extinguished.
- Use appropriate extinguishing measure suitable for surrounding fire.
- Keep containers cool with water spray.
- Use fire fighting procedures suitable for surrounding area.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

- Protective equipment: Wear proper protective equipment.
- Emergency procedures: Not applicable
- If required, notify relevant authorities according to all applicable regulations.

6.1.2. For emergency responders

- Wear proper personal protective apparatus as indicated in Section 8 and avoid skin contact and inhalation.
- Ventilate closed spaces before entering.
- Do not touch spilled material. Stop leak if you can do it without risk.
- Handle the damaged containers or spilled material after wearing appropriate protective equipment

6.2. Environmental precautions

- Prevent runoff and contact with waterways, drains or sewers.
- If large amounts have been spilled, inform the relevant authorities.
- Avoid dispersal of spilt material and runoff and contact with waterways, drains and sewers. If large spills, advise emergency services.

6.3. Methods and material for containment and cleaning up

6.3.1. For containment

- Clean up all spills immediately.
- Clear area of personnel and move up wind.
- Stop leak if safe to do so.

6.3.2. For cleaning up

- Large spill : Stay upwind and keep out of low areas. Dike for later disposal.
- Notify the central and local government if the emission reach the standard threshold.
- Disposal of waste shall be in compliance with the Wastes Control?Act
- Appropriate container for disposal of spilled material collected.
- Small liquid state spills: Appropriate container for disposal of spilled material collected.
- Put the spilled material in an appropriate containers and clean the contaminated area

6.3.3. Other information

- Slippery when spilt.

6.4. Reference to other sections

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for information on disposal.

SECTION 7: HANDLING AND STORAGE**7.1. Precautions for safe handling**

- Avoid direct physical contact.
- Since emptied containers retain product residue(vapor, liquid, solid) follow all MSDS and label warnings even after container is emptied.
- Comply with all applicable laws and regulations for handling
- Dealing only with a well-ventilated place.

7.2. Conditions for safe storage, including any incompatibilities

- Save in cool, dry and well ventilated place.
- Do not apply direct heat.
- Do not apply any physical shock to container.
- Keep in the original container.
- Prevent static electricity and keep away from combustible materials or heat sources.
- Do not eat, drink or smoke when using this product.

7.3. Specific end use(s)

- See Section 1 for information on 1.2 Relevant identified uses.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**8.1. Control parameters****8.1.1. Occupational exposure limits****European Union (EU) Commission Directive 2006/15/EC (IOELVs)**

- Not available

European Union (EU) Commission Directive 2006/15/EC (IOELVs) - Skin

- Not available

Greece Occupational Exposure Limits

- Not available

Netherlands Occupational Exposure Limits

- Not available

Denmark Indicative List of Organic Solvents

- Not available

Denmark List of Limit Values for Dust

- Not available

Latvia Occupational Exposure Limit Values (OELV) for Chemical Substances in the Work Environment AtmbExcel Air & Hydraulics⁹

- Not available

Latvia Carcinogens and their Occupational Exposure Limit Values (OELV)

- Not available

Bulgaria Occupational Exposure Limits

- Not available

Bulgaria Limit values for the chemical agents in the air at the working environment

- Not available

Sweden Occupational Exposure Limit Values

- Not available

Sweden Occupational Exposure Limit Values and Measures against Air Contaminants

- Not available

Spain Changes Proposed for Occupational Limit Values

- Not available

Spain Occupational Exposure Limit for Chemical Agents

- Not available

Slovak Republic Highest Admissible Exposure Limits

- Not available

Slovak Republic Highest Admissible Exposure Limits - Solid aerosols predominately with fibrogenic effect

- Not available

Slovak Republic Highest Admissible Exposure Limits - Solid aerosols with possible fibrogenic effect

- Not available

Slovak Republic Highest Admissible Exposure Limits - Solid aerosols predominately with nonspecific effect

- Not available

Ireland Occupational Exposure Limits

- [1,4-Cyclohexanedicarboxylic acid] - Occupational Exposure Limit Value (8-hour reference period) : 10 mg/m³ (Dusts non-specific total inhalable)

UK Workplace Exposure Limits (WELs)

- Not available

Austria Technical Exposure Limits (TRK Values)

- Not available

Austria Occupational Exposure Limits - Maximum Workplace Concentrations (MAK)

- Not available

Italy Occupational Exposure Limits

- Not available

Czech Republic Occupational Exposure Limits (PEL and NPK-P)

- Not available

Czech Republic Occupational Exposure Limits - Dusts predominately with fibrogenic effect

- Not available

Czech Republic Occupational Exposure Limits - Dusts with possible fibrogenic effect

- Not available

Czech Republic Occupational Exposure Limits - Dusts predominately with nonspecific effect

- Not available

Czech Republic Occupational Exposure Limits - Dusts predominately with irritating effect

- Not available

Czech Republic Occupational Exposure Limits - Mineral fibrous dusts

- Not available

Poland Workplace Maximum Allowable Concentration - Dust

- Not available

Poland Workplace Maximum Allowable Concentration

- Not available

France Threshold Limit Values for Occupational Exposure - VLE/VME

- Not available

Finland Occupational Exposure Levels - Concentrations Known to be Harmful

- Not available

Hungary Occupational Exposure Limits

- Not available

8.1.2. Recommended Monitoring Procedures

- Personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

8.1.3. DNEL/PNEC - Values

- Not available

8.2. Exposure controls

8.2.1. Appropriate engineering controls

- Business owner is recommended to maintain below recommended exposure limits for the working place with general exhaust of gas/vapour/mist/fume.

8.2.2. Individual protection measures, such as personal protective equipment

Hand protection

- Wear appropriate glove.

Eye protection

- Wear primary eye protection such as splash resistant safety goggles with a secondary protection face shield.
- Provide an emergency eye wash station and quick drench shower in the immediate work area.

Respiratory Protection

- Respiratory protection is ranked in order from minimum to maximum.
- Consider warning properties before use.
- Under conditions of frequent use or heavy exposure, Respiratory protection may be needed.
- Dust, mist, fume-purifying respiratory protection
- Air-purifying respirator with high-efficiency particulate filtering
- Any respiratory protection with a electromotion fan(for dust, mist, fume-purifying)
- Self-contained breathing apparatus with a corpuscle filter of high efficiency
- For Unknown Concentration or Immediately Dangerous to Life or Health : Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. Any self-contained breathing apparatus with a full facepiece.

Skin protection

- Wear appropriate clothing.

8.2.3 Environmental exposure controls

- Do not let product enter drains. For ecological information refer to section 12.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**9.1. Information on basic physical and chemical properties**

Appearance(State)	Solid(Wax)
Appearance(Color)	White
Odor	Not available
Odor threshold	Not available
pH	Neutral
Melting point/Freezing point	136~169 °C
Initial boiling point and boiling range	Not available
Flash point	235 °C
Evaporation rate	Not applicable
Flammability(solid, gas)	Not available
Upper/Lower Flammability or explosive limits	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	1.35
Solubility	Water: 800mg/L (soluble) (experiment data, EPISUITE v4.0)
Partition coefficient of n-octanol/water	1.32 (cis isomer), 0.73 (trans isomer)
Autoignition temperature	416 °C (ASTM E659)
Decomposition temperature	450 °C
Viscosity	Not available
Explosive properties	Not available
Oxidising properties	Not available

9.2. Other information

- Not available

SECTION 10: STABILITY AND REACTIVITY**10.1. Reactivity**

- Some of these materials may burn, but none ignite readily.

10.2. Chemical Stability

- This material is stable under normal temperatures and pressures.

10.3. Possibility of hazardous reactions

- Containers may explode when heated.
- Fire May produce irritating and/or toxic gases.
- Inhalation of material May be harmful.
- Some liquids produce vapors that May cause dizziness or suffocation.

10.4. Conditions to avoid

- Avoid contact with incompatible materials and condition.
- Avoid : Accumulation of electrostatic charges, Heating, Sparks, Flames and hot surfaces

10.5. Incompatible materials

- Strong oxidizing agent, Combustibles, Toxic gases (prohibited substances)

10.6. Hazardous decomposition products

- Carbon oxides may be generated by pyrolysis or combustion.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Acute toxicity**- Oral**

- [1,4-Cyclohexanedicarboxylic acid] : LD50 1903 mg/kg Rat (Route of administration: oral: gavage, female/male, OECD TG 401, GLP, ECHA)

- Dermal

- [1,4-Cyclohexanedicarboxylic acid] : LD50 > 1000 mg/kg Guinea pig (slight skin irritation, no mortality, ECHA)

- Inhalation

- Not available

11.2. Skin corrosion/irritation

- [1,4-Cyclohexanedicarboxylic acid] : slightly irritating, guinea pig (OECD Guideline 404)

11.3. Serious eye damage/irritation

- [1,4-Cyclohexanedicarboxylic acid] : moderate eye irritant, Rabbit, By 10 days after test article instillation, 3 of 3 eyes appeared normal (OECD Guideline 405)

11.4. Respiratory sensitization

- Not available

11.5. Skin sensitization

- Not available

11.6. Germ cell mutagenicity

- [1,4-Cyclohexanedicarboxylic acid] : in vitro - Mammalian Cell Gene Mutation Test: negative (mouse lymphoma L5178Y cells, with and without Metabolic activation) (OECD TG 476, GLP, ECHA)

11.7. Carcinogenicity**- IARC**

- Not available

- OSHA

- Not available

- ACGIH

- Not available

- NTP

- Not available

- EU CLP

- Not available

11.8. Reproductive toxicity

- [1,4-Cyclohexanedicarboxylic acid] : Not classified as "reproductive or developmental toxic" according to GHS.OECD TG 421, GLP Based on the clinical findings and body weight effects of adverse effects, a dose level of 500 mg / kg / day is used for maternal toxicity (NOAEL). Due to the lack of developmental effects at any dose level, the highest dose level assessed 1000 mg / kg / day is considered NOAEL for embryo / fetal development when CHDA is orally administered to graft Cr1 by gavage. Was: CD (SD) rat, OECD TG 414, GLP (ECHA)

11.9. Specific target organ toxicity(single exposure):

- [1,4-Cyclohexanedicarboxylic acid] : Oral: Severe illness, excretion, ataxia, cyanosis, shortness of breath, black eyes and anorexia. All rats treated at 400 or 800 mg/kg dose level were clinically normal until 2 days post dose. Rats that survived the 1600 mg / kg dosing level appeared normal on the next day after dosing, with the exception of some sickness and anorexia on days 1 and 2. An autopsy was not performed. (Rad/male/female/equivalent or similar guideline: OECD TG 401, GLP, ECHA)

11.10. Specific target organ toxicity(repeated exposure):

- [1,4-Cyclohexanedicarboxylic acid] : Oral (short-term repeated doses): Test compound shows no mortality, no adverse effects at any dose level, weight gain, feed consumption, hematology, serum clinical chemistry, and organ weight changes were not observed, NOEL=871 mg/kg/day(M), 894 mg/kg/day(F), Rat (OECD TG 407, GLP, ECHA)

11.11. Aspiration hazard

- Not available

SECTION 12: ECOLOGICAL INFORMATION**12.1. Toxicity****12.1.1. Fish**

- [1,4-Cyclohexanedicarboxylic acid] : LC50 > 100 mg/ℓ 96 hr Pimephales promelas (Still-water, fresh water, ECHA)

12.1.2. Invertebrate

- [1,4-Cyclohexanedicarboxylic acid] : EC50 > 100 mg/ℓ 48 hr Daphnia magna (Still-water, fresh water, ECHA)

12.1.3. Algae

- [1,4-Cyclohexanedicarboxylic acid] : EC10 12 mg/ℓ 72 hr (Still-water, fresh water, OECD TG 201, GLP, ECHA)

12.2. Persistence and degradability**12.2.1. Persistence**

- [1,4-Cyclohexanedicarboxylic acid] : 1.32 log Kow (log Pow, 22.8°C) (ECHA)

12.2.2. Degradability

- [1,4-Cyclohexanedicarboxylic acid] : BOD5/COD after 14 days 87%, after 28 days 90% (ECHA)

12.3. Bioaccumulative potential**12.3.1. Bioaccumulation**

- Not available

12.3.2. Biodegradability

- [1,4-Cyclohexanedicarboxylic acid] : 103 (%) 28 day (CO2 evolution) (ECHA)

12.4. Mobility in soil

- Not available

12.5. Results of PBT and vPvB assessment

- Not available

12.6. Other adverse effects

- Not available

SECTION 13: DISPOSAL CONSIDERATIONS**13.1. Waste treatment methods**

- Stabilization and minimization treatment by incineration or similar method can be applied, if more than two kinds of designated wastes are in mixture state and it is impractical to separate them
- Oil water separation technology shall be applied as pre-waste treatment if it is applicable
- It shall be treated by incineration
- If you have a trouble in incinerating, reclaim in a landfill based on a management and takes care of wastes designated after smashing, cutting or melting it less than 15cm.
- Anyone with business license number who generates industrial wastes shall treat the waste by him/herself or by entrusting to the legal entities who treat the wastes, recycle the wastes of others or install and operate the waste treatment facilities according to the Wastes Control Act
- Dispose of waste in accordance with all applicable laws and regulations.

SECTION 14: TRANSPORT INFORMATION**14.1. UN No.****14.1.1. UN No. (ADR/RID/ADN)**

- Not applicable

14.1.2. UN No. (IMDG CODE/IATA DGR)

- Not applicable

14.1.3. UN No. (ICAO)

- Not applicable

14.2. UN proper shipping name

- Not applicable

14.3. Transport hazard class(es)**14.3.1. ADR/RID/ADN Class**

- Not applicable

14.3.2. ADR/RID/ADN Class

- Not available

14.3.3. ADR Label No.

- Not applicable

14.3.4. IMDG Class

- Not applicable

14.3.5. ICAO Class/Division

- Not applicable

14.3.6. Transport Labels

- Not applicable

14.4. Packing group**14.4.1. ADR/RID/ADN Packing group**

- Not applicable

14.4.2. IMDG Packing group

- Not applicable

14.4.3. ICAO Packing group

- Not available

14.5. Environmental hazards

- Not applicable

14.6. Special precautions for user

- Local transport follows in accordance with Dangerous goods Safety Management Law.
- Package and transport follow in accordance with Department of Transportation (DOT) and other regulatory agency requirements.
- EmS FIRE SCHEDULE : Not available
- EmS SPILLAGE SCHEDULE : Not available
- Air transport(IATA): Not subject to IATA regulations.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

- Not applicable

SECTION 15: REGULATORY INFORMATION**15.1. Safety, health and environmental regulation / legislation specific for the substance or mixture****15.1.1. Europe regulatory****15.1.1.1 REACH Restricted substance under REACH**

- Not applicable

15.1.1.2 REACH Substances subject to authorization under REACH

- Not applicable

15.1.1.3 REACH SVHC

- Not applicable

15.1.1.4 Europe PBT

- Not applicable

15.1.1.5 European Union (EU) Transport of Dangerous Goods by Road - Dangerous Goods List

- Not applicable

15.2. Chemical Safety Assessment

- Not conducted

SECTION 16: OTHER INFORMATION**16.1. Indication of changes**

- The Safety Data Sheet has been reviewed and the data therein were revised and laid out according the requirements of the Commission Regulation (EC) No. 1907/2006

16.2. Abbreviations and acronyms

- 1272/2008 CLP : Classification, Labelling and Packaging regulation.
- REACH : Registration, Evaluation and authorisation of chemical substances.
- DNEL : Derive no effects level
- PNEC : Predicted no effect concentration

16.3. Key literature references and sources for data

- This Safety Data Sheet was compiled with data and information from the following sources: RTECS, ECOSAR, HSDB, SIDS SIAP, ChemWATCH, CESAR, Chemical DB

16.4. Classification procedure

- The mixture classification has been derived based on the classification of the individual components in accordance with the rules set out in Regulation (EC) No 1272/2008 (CLP) as well as the translation tables in Annex VII to the same regulation.

16.5. Training advice

- Not applicable

16.6. Further information

- The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.
- 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.
- Contact National Helpdesks, List of Telephone Numbers : AUSTRIA (Vienna Wien) +43 1 515 61 0, BELGIUM (Brussels Bruxelles) +32 070 245 245, BULGARIA (Sofia) +359 2 9888 205, Croatia +385 1 2348 342 CZECH REPUBLIC (Prague Praha) +420 224 919 293 or +420 224 915 402, DENMARK (Copenhagen) 82 12 12 12, ESTONIA (Tallinn) 112, FINLAND (Helsinki) +358 9 471 977, FRANCE (Paris) +33 1 45 42 59 59, GERMANY (Berlin) +49 30 19240, GREECE (Athens Athinaï) +30 210 77 93 777, HUNGARY (Budapest) +36 80 201 199, ICELAND (Reykjavik) +354 543 2222 or 112, IRELAND (Dublin) +353 1 8379964 or +353 1 809 2166, ITALY (Rome) +39 06 305 4343, LATVIA (Riga) 112 or +371 6704 2473, LITHUANIA (Vilnius) +370 5 236 20 52 or +370 687 53378, Luxembourg +352 70 245 245, MALTA +356 2122 4071, NETHERLANDS (Bilthoven) +31 30 274 88 88, NORWAY (Oslo) 22 591300, POLAND (Gdansk) +48 58301 65 16 or +48 58 349 2831, PORTUGAL (Lisbon Lisboa) 808 250 143, ROMANIA (Bucharest) +40 21 3183606 SLOVAKIA (Bratislava) +421 2 54 77 4166, SLOVENIA (Ljubljana) + 386 41 650 500, SPAIN +34 91 562 04 20(spanish language) or +34 91 768 98 00(You can request to be served in English), SWEDEN (Stockholm) 112 or +46 10 456 6700 (mon-fri 9.00-17.00), UNITED KINGDOM (London) 112 or 0845 4647 (NHS Direct).