

SAFETY DATA SHEET

SECTION 1- CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

| | |
|---------------------------------|---|
| Chemical name (Product name) | Hardener F-10 |
| Product number | 880110 |
| SDS Number | rdjp160-2 |
| Manufacturer/Supplier | SOLAR CO.,Ltd. |
| Address | 1-7,Nunobiki-cho-2-chome,Chuo-ku Kobe 651-0097, Japan |
| Division | Technical development department. |
| Phone | +81-790-49-2366 |
| Fax | +81-790-49-1588 |

SECTION 2- HAZARDS IDENTIFICATION

GHS classification

PHYSICAL HAZARDS Flammable solid Not classified

Organic peroxides Type D

HEALTH HAZARDS Acute toxicity (inhalation: vapors) Category4

Serious eye damage/eye irritation Category2B

Skin sensitization Category 1

Germ cell mutagenicity Category2

Reproductive toxicity Category2

Specific target organ toxicity (Single exposure)
Category 2 (Respiratory system)

Specific target organ toxicity (Single exposure)
Category 3 (Anesthetic system,Respiratory tract
irritation)

Specific target organ toxicity (Repeated exposure)
Category 2(Bone, Central nervous system)

ENVIRONMENTAL
HAZARDS

Hazardous to the aquatic environment (Acute)
:Category2

Hazards not stated here are "Not applicable" or
"Classification not possible".

GHS label
Symbols



Signal words

Danger

Hazard statements

H242 Heating may cause a fire

H317 May cause an allergic skin reaction

H320 Causes eye irritation

H332 Harmful if inhaled

H335 May cause respiratory irritation

H336 May cause drowsiness or dizziness

H341 Suspected of causing genetic defects

H361 Suspected of damaging fertility or the unborn
child

H371 May cause damage to organs

H373 May cause damage to organs through
prolonged or repeated exposure

H401 Toxic to aquatic life

Precautionary statements

【Prevention】

Obtain special instructions before use.(P201)

Do not handle until all safety precautions have been
read and understood.(P202)

Keep away from heat, hot surfaces, sparks, open
flames and other ignition sources. No
smoking.(P210)

Keep/Store away from clothing/combustible
materials. (P220)

Keep only in original container. (P234)

Do not breathe gas.(P260)

Do not breathe mist/vapours/spray.(P260)

Do not breathe dust/fumes.(P260)

Wash hands thoroughly after handling. (P264)

Wash eyes thoroughly after handling. (P264)

Do not eat, drink or smoke when using this product.
(P270)

Use only outdoors or in a well-ventilated area.
(P271)

Contaminated work clothing should not be allowed
out of the workplace.(P272)

Avoid release to the environment. (P273)

Wear protective gloves/eye protection/face
protection. (P280)

【Response】

IF ON SKIN: Wash with plenty of soap and water.
(P302+P352)

IF INHALED: Remove to fresh air and keep at rest
in a position comfortable for breathing. (P304+P340)

IF IN EYES: Rinse cautiously with water for several
minutes. Remove contact lenses, if present and
easy to do. Continue rinsing. (P305+P351+P338)

If exposed: Call a POISON CENTER or
doctor/physician.(P308+P313)

Call a POISON CENTRE or doctor/physician if you
feel unwell. (P312)

Get medical advice/attention if you feel unwell.
(P314)

Specific treatment. (P321)

If skin irritation or rash occurs: Get medical
advice/attention.(P333+P313)

If eye irritation persists: Get medical
advice/attention. (P337+P313)

Take off contaminated clothing and wash it before
reuse. (P362+P364)

【Storage】 Store in well-ventilated place. Keep container tightly closed. (P403+P233)

Store locked up.(P405)

Protect from sunlight.(P410)

Keep cool. Store at temperatures not exceeding(P411+P235)

Store away from other materials. (P420)

【Disposal】 Dispose of contents/container in accordance with the Waste Disposal and Public Cleansing Law and related laws and regulations. (P501)

SECTION 3- COMPOSITION/INFORMATION ON INGREDIENTS

Classification of the substance or mixture: Mixture

| Chemical name or generic name | Concentration or concentration ranges | Chemical formula | Reference number in gazetted list in Japan | | CAS No. |
|--|---------------------------------------|------------------|--|----------|---------|
| | | | METI No. | ISHL No. | |
| | | | (ENCS No.) | | |
| See below for materials related to three lows of the SDS(Note 1) | | | | | |

The Industrial Safety and Health Law

Dangerous goods and hazardous substances should be notified name. (Act: Article 57-2, Enforcement Ordinance: Article 18-2-1/2 Attached Table 9)

Cyclohexanone (Designated number by Laws:231) (Less than 5%)

Silica (Designated number by Laws: 312)(1%~10%)

Dibenzoyl peroxide (Designated number by Laws:282) (10%~20%)

Hydrogen peroxide (Designated number by Laws: 126)(Less than 1%)

SECTION 4- FIRST AID MEASURES

| | |
|----------------------------|--|
| Inhalation | <p>In case of feeling unwell by inhalation of vapor/gas, move into fresh air and keep at rest, and seek medical assistance.</p> <p>If breathing is difficult or not breathing, give artificial respiration immediately. Get medical advice/attention immediately.</p> |
| Skin contact | <p>Remove/Take off all contaminated clothing or shoes immediately.</p> <p>Gently wash with plenty of soap and water. Do not use solvents, thinner.</p> <p>If abnormal changes are observed in appearance, or irritant or pain persists, or if you feel unwell, seek medical assistance.</p> |
| Eyes contact | <p>Flush carefully with plenty of clean water for at least 15 minutes immediately. Consult an ophthalmologist.</p> <p>Hold eyelids open and away from eyeballs with fingers to ensure that all surfaces are flushed thoroughly.</p> <p>Remove contact lenses, if present and easy to do.</p> |
| Ingestion | <p>Rinse mouth well with clean water.</p> <p>Do not induce vomiting unless.</p> <p>Never give anything by mouth to an unconscious person.</p> <p>Get medical advice/attention immediately.</p> |
| Protection for first-aides | <p>Wear safety equipments as indicated in section 8 (EXPOSURE CONTROL/PERSONAL PROTECTION) during handling.</p> |

SECTION 5- FIRE FIGHTING MEASURES

| | |
|----------------------------------|---|
| Suitable extinguishing media | <p>Watering or water spray is desirable. If there is no water, use powder, carbon dioxide, the general of the foam.</p> |
| Special fire fighting procedures | <p>Use designated extinguishing media.</p> <p>Extinguish the fire from the windward side of the fire.</p> |

Remove surrounding combustible materials immediately.

Cool surrounding equipment with water spray.

Special protective equipment and precautions for fire-fighters

Wear suitable Self-Contained Breathing Apparatus (SCBA), Chemical proof protective clothing.

SECTION 6- ACCIDENTAL RELEASE MEASURES

Personal precautions (protective equipment and emergency measures)

Provide ventilation adequately until finishing process.

Wear suitable protective equipment as indicated in section 8 during handling.

Exclude non-essential personnel.

Environmental precautions

Prevent from entering into drains, ditches, basement or closed place.

Methods and materials for containment and cleaning up

Collect in a sealable container and keep wet until disposal. Don't dry.

Prevention measures against secondary accident

Properly treat deposits, waste and etc., on the basis of the applicable laws and regulations.

Keep wet by watering.

Remove the sources of ignition promptly.

SECTION 7- HANDLING AND STORAGE

Handling

Technical measures

Take equipment measures and wear suitable protective equipment as indicated in section 8 (EXPOSURE CONTROL/PERSONAL PROTECTION) .

Prohibit the use of the high temperature, spark and fire of around.

Precautions for safe handling

Close container tightly after each use.

In order to avoid the decomposition, once taken out of this product is not returned to the original container.

Do not handle until all safety precautions have been read and understood.

Wash body, face, hands, eyes thoroughly after handling.

Storage

Appropriate storage conditions

Keep container tightly closed.

Store in a dark, cool and well ventilated area.

Store at under 30 °C.

SECTION 8- EXPOSURE CONTROL/PERSONAL PROTECTION

| Component | Management Concentration | Allowable concentration (Society for Occupational Health) | Allowable concentration (ACGIH) |
|-------------------|--------------------------|---|----------------------------------|
| Benzoyl peroxide | | | TWA 5 mg/m ³ , STEL - |
| Cyclohexanone | 20ppm | 25ppm(100mg/m ³) | TWA 20 ppm, STEL 50 ppm (Skin) |
| Hydrogen peroxide | | | TWA 1 ppm, STEL - |

Facility Protection

If steam or the fume and mist is generated, install a local exhaust system.

If the dust is generated in the grinding work of the cured product, install a local exhaust ventilation or dust collector.

Install shower, hand-wash, cleansing facilities close to handling location, and clearly display the position.

Personal protection equipments

Respiratory protection

Use dust mask in the grinding work of the cured product.

Hand protection

Use impermeable protective groves (rubber groves).

| | |
|--------------------------|--|
| Eye protection | Wear safety glasses (safety glasses with side wall, safety goggles). |
| Skin and body protection | Wear work clothes, boots and apron. |

SECTION 9- PHYSICAL AND CHEMICAL PROPERTIES

| | | |
|----------------------------------|---------------|-------------------------|
| Appearance | Physical form | Paste |
| | Color | Brown |
| Flush point | | 71°C(Seta closed style) |
| Specific gravity (Density) | | ca1.17(25°C) |
| Spontaneous ignition temperature | | No data |
| Decomposition temperature | | 45°C |

SECTION 10- STABILITY AND REACTIVITY

| | |
|-----------------------------------|--|
| Stability | Unstable against heat. |
| Possibility of hazardous reaction | Contains a self-reactive substances that cause self-heating decomposed by the temperature rise and contamination. May explosively decompose on contact with amines, acid, alkali, transition metal compounds other and reducing substances. |
| Condition to avoid | Avoid direct sunlight. Don't handle in an area where the risk of fire and heat generation. Avoid Intense friction and shock. |
| Hazardous decomposition products | No information available. |

SECTION 11- TOXICOLOGICAL INFORMATION

| | | |
|-----------------------------------|------------|--|
| Acute toxicity | Inhalation | Based on the acute toxicity estimate of mixtures of ≥ 2500 ppm to < 20000 ppm. It was set as Category 4. |
| Serious eye damage/eye irritation | | Based on the Category 2B Serious eye damage/eye irritation is present in the mixture as all ingredient at a concentration $\geq 10\%$. It was set as Category 2B. |

| | |
|--|---|
| Skin sensitization | Based on the component of Category 1 Skin sensitization are $\geq 1\%$. It is corresponding to the Category 1. |
| Germ cell mutagenicity | Based on the Category 2 mutagen is present in the mixture as ingredient at a concentration $\geq 1\%$. It was set as Category 2. |
| Reproductive toxicity | Based on the Category 2 Reproductive toxicant is present in the mixture as all ingredient at a concentration $\geq 3\%$. It was set as Category 2. |
| Specific target organ toxicity (Single exposure) | Based on the component of Category 3 (Anesthetic system) specific target organ toxicity are $\geq 20\%$. It is corresponding to the Category 3 (Anesthetic system). |
| | Based on the component of Category 1 Specific target organ toxicity (Respiratory system) are $\geq 1\%$ to $<10\%$. It is corresponding to the Category 2 (Respiratory system). |
| | Based on the component of Category 3 (Respiratory tract irritation) specific target organ toxicity are $\geq 20\%$. It is corresponding to the Category 3 (Respiratory tract irritation). |
| Specific target organ toxicity (Repeated exposure) | Based on the Category 1 Specific target organ toxicity (Bone) is present in the mixture as all ingredient at a concentration $\geq 1\%$ to $<10\%$. It was set as Category 2 (Bone). |
| | Based on the Category 1 Specific target organ toxicity (Central nervous system) is present in the mixture as all ingredient at a concentration $\geq 1\%$ to $<10\%$. It was set as Category 2 (Central nervous system). |

SECTION 12- ECOLOGICAL INFORMATION

Hazardous to the aquatic environment (Acute)

Based on the (Toxicity multiplying factor $\times 10 \times$ Category 1 Hazardous to the aquatic environment (Acute)) and Category 2 are present in the mixture as all ingredient at a concentration $\geq 25\%$. It was set as Category 2 (Hazardous to the aquatic environment (Acute)).

SECTION 13- DISPOSAL CONSIDERATIONS

Residual waste

Waste disposal should be in accordance with existing federal, state and local environmental control laws.

Entrust disposal to officially recognized expert traders or disposal dealers with the permission of the prefectural governor, or entrust to local public entities if they are dealing disposal.

Contaminated containers and packaging

Recycle used containers by cleaning or dispose appropriately in accordance with official regulation.

Dispose of empty container after eliminating contents completely.

SECTION 14- TRANSPORT INFORMATION

International regulation Marine transport

Follow IMO provisions

| | |
|--|--------------------------------|
| UN No. | 3106 |
| Proper Shipping Name | ORGANIC PEROXIDE TYPE D, SOLID |
| Class | 5.2 |
| Marine Pollutant | Not applicable |
| Transport in bulk according to MARPOL 73/78, Annex II ,and the IBC code. | Not applicable |

Air Transport Follow ICAO/IATA provisions

| | |
|----------------------|--------------------------------|
| UN No. | 3106 |
| Proper Shipping Name | ORGANIC PEROXIDE TYPE D, SOLID |
| Class | 5.2 |

Domestic regulation

Land transport Follow Fire Service Act and Road law

Marine transport Follow Ship Safety Act

| | |
|----------------------|--------------------------------|
| UN No. | 3106 |
| Proper Shipping Name | ORGANIC PEROXIDE TYPE D, SOLID |

| | | |
|------------------------------|--|---|
| | Class | 5.2 |
| | Marine Pollutant | Not applicable |
| | Transport in bulk according to MARPOL 73/78, Annex II ,and the IBC code. | Not applicable |
| | Air transport | Follow Aviation Law |
| | UN No. | 3106 |
| | Proper Shipping Name | ORGANIC PEROXIDE TYPE D, SOLID |
| | Class | 5.2 |
| Special safety measure | | Follow the description in the SECTION 7- HANDLING AND STORAGE |
| | | Make sure no leakage of the container, loading to avoid fall/damage and ensure a prevention of collapse of cargo at the transportation. |
| Emergency Response Guide No. | | 145 |

SECTION 15- REGULATORY INFORMATION

Chemical Substances Control Law Priority Assessment Chemical Substances (Laws and regulations Article 2 Paragraph 5)

The Industrial Safety and Health Law The working environment assessment standard (Article 65-2 (1)).

Dangerous goods and hazardous substances should be displayed the name, etc. (Act: article 57-1, Enforcement ordinance: article 18-1/2, attached table 9)

Dangerous/Explosive substances (Enforcement Order Appended Table 1-1).

Dangerous/Oxidizing substances (Enforcement Order Appended Table 1-3).

Dangerous/Flammable substances (Enforcement Order Appended Table 1-4).

| | |
|---|---|
| | Dangerous goods and hazardous substances should be notified of the names and the like (Act: article 57-2, Enforcement ordinance: article 18-2-1/2, attached table 9) |
| Water Pollution Control Act | Designated Substances (Article 2-4 Enforcement Order 3-3). Living environment hot item (Act 2, Enforcement Order 3, Ordinance to define the waste water standards 1 attached table 2) |
| Fire Service Act | Specify combustibles, Flammable solids |
| Air Pollution Control Act | Volatile Organic Compound (Act 2-4) (Notification from the Ministry of the Environment to the prefectural). |
| Act on Prevention of Marine Pollution and Maritime Disaster | No hazards substances (Enforcement Order Appended Table 1-2). Hazards liquid substances (class Y) (Enforcement Order Appended Table 1). Hazards liquid substances (class Z) (Enforcement Order Appended Table 1). |
| Foreign Exchange and Foreign Trade Act | Export Trade Control Order Articles 4-1-2 (item (ii) Approval). Export Trade Control Order attached table 2 (Export Approval). |
| Ship Safety Act | Oxidizing/Organic peroxide (Regulations for the carriage and storage of dangerous goods in ship. Articles 2 to 3 Hazardous material Appended Table 1). |
| Aviation Law | Transport ban (Enforcement Regulations 194) |
| Road Traffic Act | Passage of a vehicle is restricted (Enforcement Order Article 19-13, Articles 7, Appended Table 2 of the Japan Expressway Holding and Debt Repayment Agency notification). |
| Waste Management Public Cleansing Act | Special management industrial waste (Act 2-5, Enforcement Order Article 2-4) |

| | |
|---|---|
| Law for the Control of Export, Import and Others of Specified Hazardous Wastes and Other Wastes (Basel Act) | Hazards components of Wastes/Those provided in item 1 (a), paragraph (1) of Article 2 of the Act. |
| Labor Standards Act | Illness chemical substances (Article 75-2 of the Act, Enforcement Regulation Article 35 Appended Table 1-2 item 4-1). |
| PRTR and Promotion of Chemical Management Law(PRTR Law) | Not applicable |
| Poisonous and Deleterious Substances Control Act | Not applicable |

SECTION 16- OTHER INFORMATION

References and sources Database of Japan chemical database Ltd.

SDS of raw materials.

Disclaimer: This safety data sheet (SDS) is based on the latest sources and data which are currently available. It may be updated based on new scientific findings.

The precautions herein are for normal handling.

As cautions described are for normal usage, and it is assumed any chemical product has unknown hazard, extreme caution is required for handling. It is the user's responsibility to determine safe conditions for use of this product. For special handling, please use it in the light of suitable safety measures for application and usage.

Please contact our sales department, Inquiry for this SDS of detailed Information on ingredients and regulatory Information.

Three lows of the SDS (Note.1);

Law concerning Reporting, etc. of Release to the Environment of Specific Chemical Substances and Promoting Improvements in their Management (PRTR act).

Industrial Safety and Health Act (Article 57-2).

Poisonous and Deleterious Substances Control Act.

