

Material Safety Data Sheet

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Product Name: SFCPC-DC-1 DRY CLEANING SOLVENT

Other Name: -

Recommended uses and restrictions on use: It is a kind of odorless dry-washing oil with extremely low aromatic hydrocarbon content in conformity with environmental protection requirements, and suitable to be used for dry-washing of top quality clothing made of woolen, silk and viscose materials etc.

Name of manufacturer or supplier: TENOIT CO., LTD.

Company address: Room 4, 5FL., No. 109, Sec. 6, Mingquan East Road, Taipei, Taiwan

EMERGENCY TELEPHONE NUMBER: TEL (886) 2 8792-2185 8792-2187

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Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

Mixture: Chemical properties : Aliphatic hydrocarbons

Chinese and English names of the Hazardous ingredients	Concentration or concentration ranges (%)
Octane CAS NO.111-65-9	8~13
Nonane CAS NO.111-84-2	21~27

Section 3 - HAZARDS IDENTIFICATION

Product hazard class: Flammable liquids Category 3; Skin corrosion/irritation Category 3; Serious eye damage/irritation Category 2; Aspiration hazard Category 1; Hazardous substance to aquatic environment Category 2 (chronic toxicity)

Label content:

1. Symbolic representations: Flame, exclamatory mark, hazards to health and environment.
2. Signal words: Danger.
3. Hazard statements: (1) Flammable liquid and vapour; (2) Causes mild skin irritation; (3) Causes serious eye irritation; (4) May be fatal if swallowed and enters airways; (5) Be toxic to aquatic life and have extended continuous effect.
4. Precautions to hazards: (1) No smoking; (2) Use personal protective equipment; (3) In case of fire, extinguish with dry powder, foam, carbon dioxide or water mist; (4) Flush the affected eye/skin with a large amount of water immediately in case of eye/skin contact; (5) Don't induce vomiting if swallowed, send the victim to hospital immediately.

Other hazards:-

Section 4 - FIRST AID MEASURES

The first aid measures for different exposure routes:

Inhalation: If inhaled, move the victim to a cool, quiet and well-ventilated place from the scene. If the victim has a pale face, help him/her lie flat, and raise his/her feet high and support with something; If having a red face, help him/her move his/her head to one side, raise his/her feet high and support with something, loosen his/her neckline and strap, and send him/her to hospital immediately.

Skin contact: In case of skin contact, move the victim away from the contaminated zone, remove his/her cloth on the affected skin, and flush the affected area with clean water and soap under a tap. If the victim feels roasting or stabbing

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pain on the affected skin, send him/her to hospital immediately for emergent medical treatment as scald. If the victim only feels dry, but no pain on the affected skin, and the affected skin doesn't turn red, observe him/her for 6 hours to see if it is necessary to send to hospital.

Eye contact: In case of eye contact, move the victim away from the contaminated zone, flush his/her affected eye for more than 15 minutes under a tap or at an eye rinser, open the victim's upper and lower eyelids and ask him/her to rotate his eye ball slowly to make a thorough flushing. If the victim feels continuous pain, send him to an ophthalmologist for further treatment.

Ingestion: If swallowed, remove the swallowed solvent from the victim's stomach ASAP (with active carbon @ kg/kg body weight). Don't induce the victim to vomit, for fear of causing lung complication. At the same time, loosen the victim's neckline and strap, and send him/her to hospital immediately.

The most important symptoms and hazardous effects: Possibly cause irritation effects to the respiratory tract, skin and eyes, affected parts including the lung and neural system. Possibly cause bad reactions to the neural system due to extended inhalation of large amounts of oil gas. Also likely cause dermatitis and conjunctivitis..

The protection of first aidersl:

1. Wear personal protective clothing (including solvent-proof gloves), perform first aid on the victim at a safe place, and avoid contact with contaminant.
2. Wear chemical goggles.

Notes to physicians: If inhaled, it may be helpful to provide the victim with oxygen. If swallowed, stomach lavage on the victim, may be considered.

Section 5 - FIRE FIGHTING MEASURES

Suitable fire extinguishing media : dry chemical powder, foam, carbon dioxide, water mist (no heavy water sprinkling).

Specific hazards may be encountered during fire-fighting: Toxic carbon oxides or cyclic hydrocarbons may be released when being heated or combusted.

Specific fire-fighting methods:

1. It is ineffective to extinguish the fire with water. But, water spraying may be performed to cool down the containers and vessels at the fire location, thus to avoid expansion and explosion.
2. The fire fighters must wear personal protective equipment and conduct extinguishing in the windward direction.
3. Stop solvent leakage and flow, cover the solvent spillage with an extinguishing agent, and isolate all the fire sources at the leakage zone. If possible, try all efforts to move the solvent container away, or cool down the solvent container at the fire location with water. Pay attention not to stay too close to the container when spraying water.
4. The solvent liquid remains on the water surface and spread to a far place, leading to fire spread.
5. It reacts with oxidizing agents violently.
6. Try to extinguish the fire with automatic or stationery extinguishment equipment, and prevent persons from entering into the fire location.
7. If the leakage zone has not been ignited, disperse the vapor with water mist, and

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make sure that the persons present are protected against danger from the leakage zone. Nevertheless, it is not allowed to spray water mist on the solvent leakage directly.

Special equipment for the protection of firefighters : Every fire fighter must wear a complete set of fire fighting protective clothing and use a central air supplied or self air supplied respiratory protective equipment.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions:

1. Admission into the contaminated zone by unnecessary persons must be strictly controlled or not allowed until this zone has been removed of the contaminant completely.
2. Make sure that leakage stop and contaminant removal be conducted by trained personnel.
3. If admission into the leakage zone is necessary, wear personal protective equipment and don' t contact the liquid leakage directly to avoid possible poisoning.

Environmental precautions:

1. Ventilate the contaminated zone and make sure explosion-proof devices and tools are used.
2. Isolate all the ignition sources such as fire sources and heat sources etc..
3. Inform the governmental authorities responsible for safety, sanitation, environmental protection and fire control.
4. Prevent the liquid leakage from entering into any sewer or confined space.

Methods for cleaning up:

1. Take all the fire sources away, don' t contact the liquid leakage.
2. Have the contaminated zone blocked out and persons in the vicinity evacuated.
3. Wet the leakage area with water spray to reduce vapor concentration in the air.
4. Rescuing personnel must wear positive pressure respirators when handling leakage, and other persons must evacuate away from the venue immediately.
5. Smoking and fire are absolutely not allowed in the vicinity of the contaminated zone.
6. Effectively ventilate the leakage zone, isolate the solvent source and pay attention to the explosion concentration.
7. In case of minor leakage, absorb it completely with sand or other absorbent and put the wastes collected into a dry enclosed container for further disposal.
8. In case of heavy leakage, embank the leakage zone (with soil, sand bags, concrete or polyurethane) to avoid leakage spreading, then, collect and dispose all the wastes.
9. Don' t discharge the liquid leakage into any drainage ditch, thus to prevent burning/explosion.

Section 7 - HANDLING AND STORAGE

Handling:

1. This material is an inflammable and toxic liquid. When handling, engineering control measures must be in place and operation, and personal protective equipment used properly. The workers responsible for handling must have received training regarding its hazards and safe applications.

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2. Remove all the fire sources and keep this material away from incompatible substances.
3. No smoking and fire are allowed and sign "No Smoking" must be provided at the working zone.
4. This liquid will accumulate electric charge. Therefore, additional design measures shall be considered to improve its electric conductivity, such as providing earthing on all the buckets, containers, trans-containing vessels and pipes, making the earthing connection onto a bare metallic part, reducing flow velocity during liquid transport, lengthening operation time and retention time in the pipe, or perform operation at a low temperature.
5. When performing mixing operation at a place other than a closed system, make sure that an equal potential bonding be made between the container used for mixing and the transport device and container to receive the mixed liquid.
6. Any empty bucket, container, vessel or pipe may have hazardous residues. Therefore, no welding, cutting, drilling or other heat work shall be performed on this kind of object without cleaning.
7. When handling, avoid generating mist droplets or vapor. Carry out operation at a designated well-ventilated place and take the minimum amount each time. Separate the operation zone from the storage zone.

Storage:

1. Use containers made of compatible materials only and exert extreme care not to spill out when pouring into another container. Don't conduct any mixing operation at the storage zone.
2. In order not to worsen fire/explosion danger, don't use it together with other incompatible substances (such as strong oxidizing agent).
3. Don't pour any contaminated liquid back into its original storage container.
4. Label the container and have it tightly closed when not in use to avoid damage.
5. Provide clear signs at the storage zone and make all the passages free of obstructions, admission only by designated or trained personnel.
6. Check all the containers which have newly arrived for proper labeling and no damage.
7. Store the solvent containers at a cool, dry and well ventilated place, free of direct sunshine. Keep them away from any heat source, ignition source and incompatible substance.
8. Contain solvent spillage only with containers made of compatible materials.
9. Consider to provide spillage and fire detection systems, suitable automatic fire control systems or sufficient available emergency devices at the storage zone and the zone where operation in large amount happens.
10. Provide/make a ramp or doorsill or trench at the entry to the storage zone, to drain any leakage to a safe place.
11. The storage tank must be made on the ground, with its entire bottom tightly sealed against seepage, and a dike big enough to hold the entire tank volume provided surrounding the tank.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering control:

1. Provide an earthed ventilation system that doesn't generate spark, and it is

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- separated from other exhaustion systems and directly ventilates to outdoor.
2. Take local exhaustion and process isolation measures to limit the amount of vapor and mist droplets in the air.
 3. Provide sufficient air to the collecting and exhaustion system to replace the exhausted air.

Control parameters:

Hazardous Ingredient	8 hours time weighted average exposure limits (TWA)	Short-term exposure limits (STEL)	Maximum exposure limits (CEILING)	Biological standards
Octane	300 ppm(1400 mg/m ³)	375 ppm(1750 mg/m ³)	-	-
Nonane	200 ppm(1050 mg/m ³)	250 ppm(1313 mg/m ³)	-	-

Personal protective equipment:

1. Respiratory protection: Use an appropriate protective respiratory apparatus when the hazardous concentration is higher than the permissible.
2. Hand protection: Wear a pair of protective gloves when contact with the solvent is necessary.
3. Eye protection: Prevent the solvent against entering into the eyes. If the eyes may contact with the solvent, wear a pair of chemical goggles.
4. Skin and body protection: If skin and any part of the body may contact with the solvent, wear appropriate protective clothing.

Hygiene measures:

1. Use acceptable protective utensils, check them for damages every day, and replace with new ones in time.
2. Take off the contaminated clothing immediately after work, wear it again only after washing or discard, and tell the person who washes the contaminated clothing about the hazards of the contaminant.
3. No smoking or eating is allowed at the workplace.
4. Keep the workplace clean.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance(physical state,color etc.):colorless liquid		Odor:special oil smell	
Odor threshold: -	Melting point: -	pH value: -	
Flammability (solid, gas):/	Boiling point/range: 149~213 °C (300~415 °F)		
Decomposition temperature: -	Flash point: 38°C(100°F), Test method: Closed cup		
Vapor density (air=1): >1	Explosion limits: 0.7%~8.0% (reference value)		
Vapor pressure: 0.3kpa (25°C)	Auto-ignition temperature: >200°C(>392°F)		
Octanol-water partition coefficient(log Kow):-	Density(water=1):0.754-0.800(@15°C)		
Solubility: slightly soluble in water	Evaporation rate(n-butyl acetate=1):0.2		

Section 10 - STABILITY AND REACTIVITY

- Stability: stable at ambient temperature and atmospheric pressure.
- Possible hazardous reactions under specific conditions: avoid being heated, strictly prohibit smoking and fire and static electricity, cause possible explosion when mixing with air.
- Conditions to avoid: avoid being heated, strictly prohibit smoking and fire and static electricity, and isolate every kind of fire source.

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Materials to avoid : strong oxidizing agents (such as peroxide, nitrate, perchlorate), nickel carbonyl + oxygen.

Hazardous decomposition products: toxic carbon oxides such as carbon monoxide will be released when thermal decomposition happens.

Section 11 - TOXICOLOGICAL INFORMATION

Routes of exposure: inhalation, skin, eye, ingestion

Symptoms: Dizziness, loss of harmony, weakness, asthma, difficult breathing, irritation to the skin, dry skin, irritation to the eyes, roasting pain, lachrymation, turning red and pain, conjunctivitis, bellyache, abdomen distention, nausea, vomit, diarrhoea, infirmity, dizziness, slow breathing, spasm or even loss of consciousness.

Acute toxicity:

Inhalation:

Nonane:

1. Cause irritation to the nose and throat.
2. Have symptoms such as headache, tiredness, dizziness, disorder, nausea, trembling and breathing difficulty.
3. Cause loss of consciousness or even life when exposure to a very high concentration.

Octane:

1. Cause slight anaesthesia when exposure to high concentration vapor. Cause irritation to the nose and throat, headache, dizziness, sleepiness, consciousness disorder, nausea and breathing difficulty when exposure.
2. Cause loss of consciousness or even life when exposure to an extreme high concentration.

Skin:

Nonane: Cause slight irritation when exposure to it.

Octane: 1. Possibly cause irritation when directly contacting with liquid octane.
2. Possibly cause rubefaction, inflammation or blistering.

Ingestion:

Nonane:

1. Cause symptoms such as nausea, vomit, abdominal enlargement, headache and depression etc. when swallowed.
2. Cause serious irritation to the lung or damages to the lung tissue (pulmonary edema) or even death if entering into the lung when swallowing or vomiting.

Octane:

1. Possibly cause symptoms such as nausea, vomit, abdominal distention and depression etc. if swallowed.
2. Possibly cause damages to the lung tissue or chemical pneumonia if entering into the lung.

Eyes:

Nonane:

1. Cause irritation to the eyes when exposure to its high temperature vapor.
2. Possibly cause temporary red eyes and pain when exposure to its liquid.

Octane:

1. Cause irritation to the eyes when exposure to its high temperature vapor.

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<p>2. Possibly cause red eyes and pain when exposure to its liquid.</p> <p>(1)LC50 (test animal, route of exposure): Nonane: 3200 ppm/4H (rat, inhalation). Octane: 5630mg/kg (rat, swallow).</p> <p>(2)LD50 (test animal, route of exposure): Nonane:>15 g/kg (rat, swallow).</p>
<p>Chronic toxicity or long-term toxicity: Skin:</p> <p>1. Nonane: Cause irritation and dermatitis (inflammation, rubefaction and enlargement). 2. Octane: Possibly cause irritation to the skin and dermatitis if extended exposure.</p>
<p style="text-align: center;">Section 12 - ECOLOGICAL INFORMATION</p>
<p>Ecological toxicity:</p> <p>1. LC50 (fish): - 2. EC50 (aquatic invertebrates): - 3. Bio-concentration factor (BCF): -</p>
<p>Persistence and degradability: Octane:</p> <p>1. It may volatilize into the atmosphere, and is decomposed by reacting with photochemical products when in its gaseous state, having a half life about 1.84 days. 2. It may volatilize easily in a water body, and be absorbed onto sediment or suspended solids. It will not easily be light decomposed or hydrolyzed. It may be also decomposed by microorganisms. 3. It may volatilize into the atmosphere when in a water body, having half lives 3.1 hours and 29.8 days obtained respectively from simulation river and lake tests.</p> <p>Nonane:</p> <p>1. Its vapor pressure is 4.45 mmHg (25°C). It may volatilize into the atmosphere, and gaseous nonane forms hydrogen-oxygen free radicals through photochemical reaction. 2. It may volatilize easily in a water body, and be absorbed onto sediment or suspended solids. It will not easily be light decomposed or hydrolyzed. It may be also decomposed by microorganisms. 3. It may volatilize into the atmosphere when in a water body. It has a half life of about 78 days obtained from simulation pond test considering the factor of absorption effect.</p>
<p>Bioaccumulative potential: Octane: It may be accumulated in an aquatic organism. Nonane: It may be accumulated in an aquatic organism.</p>
<p>Mobility in soil: Octane: It may be absorbed by soil and has low mobility when present in a soil body. Nonane: It may be absorbed by soil and has low mobility when present in a soil body.</p>
<p>Other adverse effects: -</p>
<p style="text-align: center;">Section 13 - DISPOSAL CONSIDERATIONS</p>
<p>Waste disposal: 1. Used solvent shall be recovered in a safe and reliable way, and disposed in an acceptable device by a trained & experienced operator using proper personal</p>

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protective equipment. 2. It shall be disposed by following the relevant laws and regulations regarding waste disposal. 3. It may be disposed by a special incineration method. 4. It shall be disposed in conformity with the applicable environmental protection laws and regulations.	
Section 14 - TRANSPORT INFORMATION	
United Nation number: UN 1993 UN Proper shipping name: SFCPC-DC-1 DRY CLEANING SOLVENT Transport hazard class: Category III flammable liquid Packing group: III Marine pollutant (Yes/No): No Special transportation measure and precautionary conditions: -	
Section 15 - REGULATORY INFORMATION	
1. Rules of Labor EHS Facilities; 2. Rules of Dangerous Goods and Hazardous Material Labeling and Identification; 3. Rules of Preventions for Organic Solvent Poisoning; 4. Hazardous Material Content in the Atmosphere of Labor Working Environment; 5. Rules of Road Traffic Safety; 6. Waste Clean Act; 7. Storage and Disposal Regulations for Industrial Wastes and Facility Standard; 8. Standard for Setting up Materials Hazardous to Public and Combustible High Pressure Gases and Safety Administration Means.	
Section 16- OTHER INFORMATION	
Literature references	1. GHS website by Council of Labor Affairs, EY; 2. HSDB (Hazardous Substances Data Bank), CHEM pendium CD, 99-3; 3. OHS CD data bank; 4. TLVs and Other Occupational Exposure Values, ACGIH CD, 1999
Remark: Throughout this MSDS, “-” used stands for “relevant information is not available currently” and “/” “this column is not suitable to this material” .	

Disclaimer :The information contained herein is based upon data believed to be reliable and reflects our best professional judgment. It is the responsibility of the user to determine the suitability of the material for their purpose. No warranty is expressed or implied, is given.

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Name : SFCPC-DC-1 DRY CLEANING SOLVENT

Hazardous ingredients : Octane 、 Nonane

Signal words: Danger

Hazard statements:

- (1) Flammable liquid and vapour;
- (2) Causes mild skin irritation;
- (3) Causes serious eye irritation;
- (4) May be fatal if swallowed and enters airways ;
- (5) Be toxic to aquatic life and have extended continuous effect.

Precautions to hazards:

- (1) No smoking;
- (2) Use personal protective equipment;
- (3) In case of fire, extinguish with dry powder, foam, carbon dioxide or water mist;
- (4) Flush the affected eye/skin with a large amount of water immediately in case of eye/skin contact;
- (5) Don' t induce vomiting if swallowed, send the victim to hospital immediately.