



SAFETY DATA SHEET

1,1,1,2,2,4,5,5,5-NONAFLUORO-4-(TRIFLUOROMETHYL)-3-PENTANONE

This SDS adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

SECTION 1 – IDENTIFICATION OF SUBSTANCE

PRODUCT IDENTIFIER

Trade Name :

ORIENT 5112

Chemical Name : 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone

Synonyms : CF₃CF₂C(O)CF(CF₃)₂, FK-5-1-12, perfluoro(2-methyl-3-pentanone)

Chemical formula : C₆F₁₂O

CAS number : 756-13-8

RELEVANT IDENTIFIED USES OF THE SUBSTANCE

Relevant identified uses : Streaming and flooding fire protection

DETAILS OF THE SUPPLIER OF THE SAFETY DATA SHEET

Registered company name : Orient Corporation Pte. Ltd.

Address : 29 Loyang Drive, Singapore, 508944

Email : CORPORATE@ORIENTCORPORATION.COM

Phone Number : +65 6543-0070 (Singapore)

Emergency Phone : 1-800-424-9300 (within USA and Canada)

Number : 1-703-527-3887 (outside USA and Canada)

SECTION 2 – HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE

| Non-hazardous chemical. According to NFPA 704 and HMIS hazard rating schemes.

NFPA 704 HAZARD CLASSIFICATION

HEALTH = 1

FLAMMABILITY = 0

REACTIVITY = 0

SPECIAL HAZARDS = None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency

response personnel to address the hazards that are presented by short-term, acute exposure to materials under conditions of fire, spill or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS HAZARD CLASSIFICATION

HEALTH = 1
FLAMMABILITY = 0
REACTIVITY = 1
PROTECTION = X (Section 8)

Hazardous Material Identification System (HMIS) hazard ratings are designed to inform employees of chemical hazard in the workplace. The provided ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS ratings are to be used with a fully implemented HMIS program.

NFPA/ HMIS HAZARD INDEX

0 = MINIMAL HAZARD, 1 = SLIGHT HAZARD, 2 = MODERATE HAZARD, 3 = SERIOUS HAZARD, 4 = SEVERE HAZARD, X = DEPENDING ON THE USE CONDITIONS

Label elements

Hazard pictogram(s) : Not Applicable

Signal word : Not Applicable

Hazard statement(s)

H412 : Harmful to aquatic life with long lasting effects.

Precautionary statement(s) Prevention

P273 : Avoid release to the environment.

Precautionary statement(s) Response: Not Applicable

Precautionary statement(s) Storage: Not Applicable

Precautionary statement(s) Disposal

P501 : Dispose of contents/ container in accordance with local regulations.

SECTION 3 – COMPOSITION/ INFORMATION ON INGREDIENTS

Substances

INGREDIENT NAME	CAS NUMBER	% [WEIGHT]
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	756-13-8	>99.9

SECTION 4 – FIRST AID MEASURES

Description of first aid measures

Eye Contact	: Flush eyes with plenty of water immediately. If sign or symptom persists, get medical attention without delay.
Skin Contact	: Wash affected area with water (and soap if available). If sign or symptom persists, get medical attention in event of irritation.
Inhalation	: Move the person to get fresh air. If sign or symptom persists, get medical attention.
Ingestion	: Immediately give the person a glass of water. First aid is not generally required, if in doubt, get medical attention. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

See Section 11. Toxicological information.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 – FIREFIGHTING MEASURES

Extinguishing media

- There is no restriction on the type of extinguisher which may be used.
- Use extinguishing media suitable for surrounding area.

Special hazards arising from the substance or mixture

Fire Incompatibility : Avoid contamination with oxidizing agents, such as nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may occur.

Special protective equipment and precautions for fire-fighters

Fire Fighting	<ul style="list-style-type: none">• Alert fire Brigade and tell them location and nature of hazard.• Wear breathing apparatus plus protective gloves in the event of a fire.• Prevent, by any means available, spillage from entering drains or water courses.• Use firefighting procedures suitable for surrounding area.• Do not approach containers suspected to be hot.• Cool fire exposed containers with water spray from a protected location.• If safe to do so, remove containers from path of fire.• Equipment should be thoroughly decontaminated after use.
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Fire/ Explosion Hazard	<ul style="list-style-type: none">• Non-combustible.• Not considered to be a significant fire risk.• Heating may cause expansion or decomposition leading to violent rupture of containers.• May emit corrosive, poisonous fumes.• Decomposes on heating and produces acrid and toxic fumes of: carbon dioxide (CO₂), hydrogen fluoride and other pyrolysis products typical of burning organic material.
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SECTION 6 – ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none">• Clean up all spills immediately.• Avoid breathing vapors and contact with skin and eyes.• Using personal protective equipment to control personal contact with the substance.• Contain and absorb spill with sand, earth or inert material.• Wipe up.• Place in an appropriate labelled container for waste disposal.
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Major Spills	<p>Moderate hazard.</p> <ul style="list-style-type: none">• Clear area of personnel.• Alert Fire Brigade and provide location and nature of hazard.• Wear breathing apparatus and gloves.• Avoid spillage from entering drains or water course by any means available.• Stop leak if safe to do so.• Contain and absorb spill with sand, earth or inert material.• Collect recoverable product into an appropriate labelled container for recycling.• Wash area and avoid runoff from entering drains.• After cleaning up, decontaminate all protective clothing and equipment prior to storing and re-using.• If contamination of drains occurs, advise emergency services.
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SECTION 7 – HANDLING AND STORAGE

Precautions for safe handling

- Safe handling**
- Storage in sealed containers may result in pressure buildup, open carefully.
 - Always release caps or seals slowly to ensure low dissipation of vapors.
 - Prevent all personal contacts, including inhalation.
 - Wear personal protective clothing and equipment when risk of exposure occurs.
 - Use in a well-ventilated area.
 - Avoid contact with moisture and incompatible materials.
 - Do not eat, drink or smoke when handling.
 - Keep container securely sealed when not in use.
 - Prevent physical damage to containers.
 - Always wash hands with soap and water after handling.

- Other Information**
- Store in original containers.
 - Keep containers securely sealed.
 - Store in a cool, dry, well-ventilated area.
 - Store away from incompatible materials and foodstuff containers.
 - Protect containers against physical damage and check regularly for leaks.

Conditions for safe storage, including any incompatibilities

- Suitable container**
- Store in bulging containers.
 - Packing as recommended by manufacturer.
 - All containers should be clearly labelled and free from leaks.

- Storage incompatibility**
- Separate from alcohol and water.
 - Avoid strong bases.
 - Avoid direct sunlight and UV light.

SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

EXPOSURE LIMIT:

Chemical name	Limit type
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	TWA: 150 ppm

TWA: Time-Weighted-Average

Exposure Controls

Appropriate engineering controls	<ul style="list-style-type: none">Local exhaust ventilation is required to control exposures to below exposure limits.Provide adequate ventilation in warehouse or closed storage area.
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Personal Protection

Eye and face protection	<ul style="list-style-type: none">Safety glasses with side shields.Chemical goggles if wearing contact lenses.
Skin protection	<ul style="list-style-type: none">See hand section below.
Hands/ feet protection	<ul style="list-style-type: none">Gloves must be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.
Body protection	<ul style="list-style-type: none">See other section below.
Other protection	<ul style="list-style-type: none">Skin cleansing cream.Eye wash unit.
Respiratory protection	<ul style="list-style-type: none">Type AX filter of sufficient capacity. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly or not properly fitted.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

APPEARANCE	:	Colorless, low odor liquid
MOLECULAR WEIGHT (G/MOL)	:	316.04
BOILING POINT	:	49.2 °C / 120.6 °F
FREEZING POINT	:	-108 °C / -162.4 °F
VAPOR PRESSURE @ 20 °C/68 °F	:	0.326 bar
VAPOR DENSITY (AIR=1)	:	11.6
SPECIFIC GRAVITY (H₂O=1)	:	1.6
VOC	:	1600 g/l
EVAPORATION RATE (Butyl acetate = 1)	:	>1
SOLUBILITY IN WATER	:	Nil
VISCOSITY	:	0.6 cP at 77 °F (25 °C)
pH	:	Not Applicable
AUTO-IGNITION TEMPERATURE	:	Not Applicable
FLASH POINT	:	Not Applicable

SECTION 10 – STABILITY AND REACTIVITY

Reactivity	<ul style="list-style-type: none"> See section 7
Chemical stability	<ul style="list-style-type: none"> Product is considered stable. Unstable in the presence of incompatible materials. Hazardous polymerization will not occur.
Possibility of hazardous reactions	<ul style="list-style-type: none"> See section 7
Conditions to avoid	<ul style="list-style-type: none"> See section 7
Incompatible materials	<ul style="list-style-type: none"> See section 7
Hazardous decomposition products	<ul style="list-style-type: none"> See section 5

SECTION 11 – TOXICOLOGICAL INFORMATION

Information on Toxicological Effects/ Routes and Symptoms of Exposure

Inhaled	<ul style="list-style-type: none"> No known health effects
Ingestion	<ul style="list-style-type: none"> No known health effects
Skin contact	<ul style="list-style-type: none"> Not expected to cause significant skin irritation.
Eye	<ul style="list-style-type: none"> Not expected to cause significant eye irritation.
Chronic	<ul style="list-style-type: none"> No applicable information

Toxicological Data

Remark: If a component is disclosed in the other sections but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

(1) Skin Irritation/ Corrosion:

Chemical name	Species	Classification
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	Non-irritant

(2) Serious Eye Damage/ Irritation:

Chemical name	Species	Classification
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Rabbit	Non-irritant

(3) Skin Sensitisation:

Chemical name	Species	Classification
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Guinea pig	Weak sensitiser

(3) Acute Toxicity:

Chemical name	Route	Species	Classification
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Dermal	Sprague-Dawley rat	Low acute toxicity
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Ingestion	Sprague-Dawley rat	Low acute toxicity
1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone	Inhalation-Vapor	Sprague-Dawley rat	Low acute toxicity

Please contact the address listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity	<ul style="list-style-type: none"> No applicable information
Persistence and degradation	<ul style="list-style-type: none"> Photolytic half-life is 3 to 5 days. Degradation product from photolytic is trifluoroacetic acid (TFA).
Bio-accumulative potential	<ul style="list-style-type: none"> No applicable information
Others	<ul style="list-style-type: none"> Ozone Depletion Potential: 0 Global Warming Potential: 1 for 100-year time horizon

NOTE: Hydrolysis is not expected to be a significant degradation pathway. Product is highly insoluble in water and volatile, and use as a clean extinguishing agent would not typically result in releases to aquatic environments.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste treatment methods

Product/ Packaging disposal	<ul style="list-style-type: none"> Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. Disposal of waste product in a permitted industrial waste facility. Combustion products could include HF. Facility must be capable of handling halogenated materials. Do not allow wash water from cleaning or process equipment to enter drains. It may be necessary to collect all wash water for treatment before disposal. In all cases disposal to sewer may be subject to local laws and regulations. Where in doubt, contact the responsible authority. Recycle where possible. Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. Dispose of by: burial in a land-fill specifically licensed to accept chemical and/or pharmaceutical wastes or incineration in a licensed
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apparatus.

- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

SECTION 14 – TRANSPORT INFORMATION

As the unpressurized agent, ORIENT 5112, is not a compressed or liquefied gas, non-flammable and low in toxicity. Thus, it is an unregulated material and has no UN designation.

When shipping pressurized as a Fire Extinguishing Unit, the UN number as follows:

U.S. DOT

PROPER SHIPPING NAME : Fire Extinguisher with compressed or liquefied gas
HAZARD CLASS : 2.2 Non-flammable gas
UN NUMBER : UN1044

AIR TRANSPORT - ICAO OR IATA

PROPER SHIPPING NAME : Fire Extinguisher with compressed or liquefied gas
HAZARD CLASS : 2.2 Non-flammable gas
UN NUMBER : UN1044

WATER – IMDG

PROPER SHIPPING NAME : Fire Extinguisher with compressed or liquefied gas
HAZARD CLASS : 2.2 Non-flammable gas
UN NUMBER : UN1044

SECTION 15 – REGULATORY INFORMATION

Safety, health and environmental regulations/ legislation specific for the substance or mixture

1,1,1,2,2,4,5,5,5-Nonafluoro-4-(trifluoromethyl)-3-pentanone (CAS 756-13-8) is found on the following regulatory lists:

National Inventory	Status
Australia - AICS	All ingredients are on the inventory
Canada - DSL	All ingredients are on the inventory
Canada - NDSL	Not determined or not on the inventory and are not exempt from listing
China - IECSC	All ingredients are on the inventory
Europe – EINEC/ ELINCS/ NLP	All ingredients are on the inventory
Japan - ENCS	All ingredients are on the inventory
Korea - KECI	All ingredients are on the inventory

New Zealand - NZloC	All ingredients are on the inventory
Philippines - PICCS	Not determined or not on the inventory and are not exempt from listing
USA - TSCA	All ingredients are on the inventory

SECTION 16 – OTHER INFORMATION

Other Information

Orient Corporation urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS, and any hazards associated with the product. The above information is provided in good faith and believed to be accurate, but does not claim to be all inclusive. Since conditions for use of the product are not under the control of the company, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Users should consider these data only as a guide to the appropriate precautionary and emergency handling of the product. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here is based on data available at the time of shipping, is subject to change without notice as new information is obtained, and may not be valid for such material used in combination with any other material or in any process. However, no warranty of any kind, express or implied, is given.

Revision Date: 17/10/2018

Definitions and Abbreviations:

- TWA: Time-Weighted-Average;
- AICS: Australia Inventory of Chemical Substances;
- DSL: Domestic Substances List in Canada;
- NDSL: Non-Domestic Substance List in Canada;
- IECSC: Inventory of Existing Chemical Substances Produced or Imported in China;
- EINEC/ ELINCS/ NLP: European Inventory of Existing Commercial Chemical Substances/ European List of Notified Chemical Substances/ No-longer Polymers List;
- ENCS: Existing and New Chemical Substances in Japan;
- KECI: Korea Existing Chemicals Inventory;
- NZloC: New Zealand's Inventory of Chemicals;
- PICCS: Philippine Inventory of Chemicals and Chemical Substances;
- TSCA: Toxic Substances Control Act Chemical Substance Inventory in USA.

REACH COMPLIANCE IMPORT CERTIFICATE

ISSUED THROUGH RSCC SYSTEM OF REACH24H AS THE ONLY REPRESENTATIVE

In compliance with the registration obligation of the article 8 of the regulation (EC) no. 1907/2006 (REACH), we hereby confirm that **REACH24H Consulting Group (REACH24H, Paramount Court, Corrig Road, Sandyford, Dublin 18, Ireland)**, as the only Representative of the non-EU manufacturer, will fulfill the registration obligation of importer under this Regulation, for substance(s) as agreed in the Power of Attorney signed between REACH24H Consulting Group and the non-EU manufacturer.

REACH24H declares that the importation of substance(s) in product(s) shown in the table below

FK-5-1-12		10.000000T	PSINGOA2008001		
Substance Name	EC/List No.	CAS No.	Reference No.	REACH status	Tonnage (T)
436-710-6	436-710-6	756-13-8	01-2120426966-44-*	Full Registration	10.000000
<p>Please pay particular attention to any substance(s) shown in the table that have been registered as intermediate(s) under SCC (strictly controlled conditions). The importer shall provide REACH24H with a Declaration stating that all their uses shall be under SCC before applying for any tonnage coverage certificate(s) (REACH Compliance Import Certificate). Otherwise, the certificate will be declared invalid. Accordingly, the importer remains responsible for all his imports. REACH24H will disclose full registration number by receiving requests from enforcement authorities directly or forwarded by recipient</p>					

Trade Between		
Non-EU supplier	ORIENT CORPORATION PTE LTD	29 LOYANG DRIVE, SINGAPORE 508944
EU importer	MEDICAIR INDUSTRY SRL	VIA TORQUATO TASSO, 29 20010 POGLIANO MILANESE

is complied with REACH and will be covered by the (pre)registration. The EU importer above thus will be regarded as downstream user under REACH, and relieved of the duties of registration. This certificate is valid for importation of above-mentioned product(s) arriving at **GENOA** port in **2020-09** (could be Estimated Time of Arrival) as recorded in REACH SUPPLY CHAIN COMPLIANCE system (RSCC). If the non-EU supplier or EU importer has disagreement on the information presented, the certificate will cease to be valid.

Up-to-date information on EU importer and to-be-covered quantities shall be provided to the OR in line with *Registration Guidance 3.0* published by the ECHA. To confirm authenticity of registrations, verify certificates or have other REACH requests, send email to RCUhelp@reach24h.com



Managing Director of REACH24H Consulting Group

August 27,2020