

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1 Product identifier**

- Trade name GALDEN® HT55

1.2 Relevant identified uses of the substance or mixture and uses advised against**Uses of the Substance/Mixture**

- Heat transfer medium
- Solvent
- Lubricant
- For industrial use only

1.3 Details of the supplier of the safety data sheet**Company**

Syensqo (Shanghai) International Trading Co., Ltd.
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Tel: +86 21 2350 1000

E-mail address

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1.4 Emergency telephone number

+61 2 8014 4558 [CareChem 24]
MULTI LINGUAL EMERGENCY NUMBER (24/7)
Europe/Latin America/Africa: +44 1235 239 670 (UK)
Middle East/Africa speaking Arabic: +44 1235 239 671 (UK)
Asia Pacific : +65 3158 1074 (Singapore)
China : 400 120 6011 (toll-free, access from China only)
North America : +1 800 424 9300

SECTION 2: Hazards identification**2.1 Classification of the substance or mixture****Work Health and Safety Regulation 2011**

- Not classified as a Hazardous chemical under the regulation above.

SUSMP (AU)

- Not scheduled
Please use the original publication to check for specific uses, specific conditions or threshold limits that might apply for this chemical.

2.2 Label elements**Work Health and Safety Regulation 2011**

- Not labelled as a Hazardous chemical under the regulation above.

2.3 Other hazards which do not result in classification

- Long-term (chronic) aquatic hazard, H413: May cause long lasting harmful effects to aquatic life.
Category 4
- Thermal decomposition can lead to release of toxic and corrosive gases.

SECTION 3: Composition/information on ingredients**3.1 Substance**

- Chemical nature Perfluorinated oligomers

Information on Components and Impurities

Chemical name	CAS-No.	Concentration [%]
1-Propene, 1,1,2,3,3,3-hexafluoro-, oxidized, polymd.	69991-67-9	> 99.9
Non-hazardous ingredients *		Balance

* (Ingredients present at non-hazardous concentrations, according to criteria of SWAC (Australia), and the Hazardous Substances (Classification) Regulations 2001 (New Zealand), based on available information).

3.2 Mixture

- Not applicable, this product is a substance.

SECTION 4: First aid measures**4.1 Description of first aid measures****In case of inhalation**

- Move to fresh air in case of accidental inhalation of fumes from overheating or combustion.
- Oxygen or artificial respiration if needed.

In case of skin contact

- Wash off with soap and water.

In case of eye contact

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If eye irritation persists, consult a specialist.

In case of ingestion

- Drink 1 or 2 glasses of water.
- Do NOT induce vomiting.
- If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed**In case of inhalation****Effects**

- No known effect.

In case of skin contact**Effects**

- No skin irritation

In case of eye contact**Symptoms**

- Redness

In case of ingestion

Symptoms

- Ingestion may provoke the following symptoms:
- Nausea
- Vomiting
- Diarrhoea

4.3 Indication of any immediate medical attention and special treatment needed**Notes to physician**

- None

SECTION 5: Firefighting measures**5.1 Extinguishing media****Suitable extinguishing media**

- Water
- powder
- Foam
- Dry chemical
- Carbon dioxide (CO₂)

Unsuitable extinguishing media

- None

5.2 Special hazards arising from the substance or mixture

- The product is not flammable.
- Not explosive
- In case of fire hazardous decomposition products may be produced such as: Gaseous hydrogen fluoride (HF), Fluorophosgene

5.3 Advice for firefighters**Special protective equipment for firefighters**

- Wear self-contained breathing apparatus and protective suit.
- When intervention in close proximity wear acid resistant over suit.

Further information

- Evacuate personnel to safe areas.
- Approach from upwind.
- Protect intervention team with a water spray as they approach the fire.
- Keep containers and surroundings cool with water spray.
- Keep product and empty container away from heat and sources of ignition.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures****Advice for non-emergency personnel**

- Prevent further leakage or spillage if safe to do so.

Advice for emergency responders

- Ensure adequate ventilation.
- Material can create slippery conditions.
- Sweep up to prevent slipping hazard.
- Keep away from open flames, hot surfaces and sources of ignition.

6.2 Environmental precautions

- Discharge into the environment must be avoided.
- Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

- Soak up with inert absorbent material.
- Suitable material for picking up.
- Dry sand
- Earth
- Shovel into suitable container for disposal.

6.4 Reference to other sections

- Refer to protective measures listed in sections 7 and 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Ensure adequate ventilation.
- Use personal protective equipment.
- Keep away from heat and sources of ignition.
- To avoid thermal decomposition, do not overheat.
- Take measures to prevent the build up of electrostatic charge.
- Clean and dry piping circuits and equipment before any operations.
- Ensure all equipment is electrically grounded before beginning transfer operations.

Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures/Storage conditions

- Keep away from heat and sources of ignition.
- Keep in properly labelled containers.
- Keep away from combustible material.
- Keep away from incompatible products
- Provide tight electrical equipment well protected against corrosion.
- Refer to protective measures listed in sections 7 and 8.

Packaging material

Suitable material

- Polyethylene

7.3 Specific end use(s)

- Contact your supplier for additional information

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

- Contains no substances with occupational exposure limit values above their regulatory reporting threshold.

Threshold limit values of by-products from thermal decomposition:**Components with national occupational exposure limits**

Components	Value type	Value	Basis
Hydrogen fluoride	Peak limit	3 ppm 2.6 mg/m3	Australia. Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment
	Expressed as :Fluorine		
Carbonyl difluoride	TWA	2 ppm 5.4 mg/m3	Australia. Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment
Carbonyl difluoride	STEL	5 ppm 13 mg/m3	Australia. Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment

Components with other occupational exposure limits

Components	Value type	Value	Basis
Hydrogen fluoride	TWA	0.5 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Danger of cutaneous absorption Expressed as :Fluorine		
Hydrogen fluoride	C	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Danger of cutaneous absorption Expressed as :Fluorine		
Carbonyl difluoride	TWA	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
Carbonyl difluoride	STEL	5 ppm	USA. ACGIH Threshold Limit Values (TLV)

8.2 Exposure controls**Control measures****Engineering measures**

- Provide local ventilation appropriate to the product decomposition risk (see section 10).
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

Individual protection measures**Respiratory protection**

- In case of insufficient ventilation, wear suitable respiratory equipment.
- In the case of vapour formation use a respirator with an approved filter.
- In case of decomposition (see section 10), use an air breathing apparatus with face mask.
- Use only respiratory protection that conforms to international/ national standards.

Hand protection

- Wear protective gloves.

Suitable material

- Nitrile rubber
- PVC

- Neoprene gloves
- butyl-rubber
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

Eye protection

- Tightly fitting safety goggles.

Skin and body protection

- Wear work overall and safety shoes.

Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

Environmental exposure controls

- Dispose of rinse water in accordance with local and national regulations.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties**

<u>Physical state</u>	liquid (20 °C) (1,013 hPa)
<u>Colour</u>	colourless
<u>Odour</u>	odourless
<u>Odour Threshold</u>	No data available
<u>Melting point/freezing point</u>	<u>Pour point:</u> < -110 °C (1,013.25 hPa)
<u>Initial boiling point and boiling range</u>	<u>Boiling point/boiling range:</u> 55 °C (1,013 hPa)
<u>Flammability (solid, gas)</u>	Not applicable
<u>Flammability (liquids)</u>	The product is not flammable.
<u>Flammability/Explosive limit</u>	<u>Lower flammability/explosion limit:</u> Type: Lower flammability limit Not flammable under the condition of the test (65 °C) (1013.25 hPa) Method: according to a standardised method vapour, in air <u>Upper flammability/explosion limit:</u> Type: Upper flammability limit Not flammable under the condition of the test (65 °C) (1013.25 hPa) Method: according to a standardised method vapour, in air
<u>Flash point</u>	open cup Method: according to a standardised method No flash up to boiling point
<u>Auto-ignition temperature</u>	No data available
<u>Decomposition temperature</u>	> 290 °C

<u>pH</u>	<u>pKa:</u> Non ionisable product
<u>Viscosity</u>	<u>Viscosity, dynamic</u> : 0.748 mPa.s (20 °C) 0.931 mPa.s (20 °C) <u>Viscosity, kinematic</u> : 0.35 mm ² /s (20 °C) Method: ASTM D 445 0.46 mm ² /s (20 °C) Method: ASTM D 445
<u>Solubility</u>	<u>Water solubility:</u> 0.47 mg/l (20 °C)Method: OECD Test Guideline 105
<u>Partition coefficient: n-octanol/water</u>	log Pow: 5.58 (20 °C) Method: OECD Test Guideline 107
<u>Vapour pressure</u>	296 hPa (20 °C)
<u>Density</u>	No data available
<u>Relative density</u>	1.66 - 1.69 (20 °C) (1,013.25 hPa)
<u>Relative vapor density</u>	No data available
<u>Particle characteristics</u>	<u>Particle size:</u> Not applicable
<u>Evaporation rate (Butylacetate = 1)</u>	No data available
9.2 Other information	
<u>Explosiveness</u>	not considered as explosive, Structure-activity relationship (SAR)
<u>Oxidizing properties</u>	Not considered as oxidizing, Structure-activity relationship (SAR)
<u>Self-ignition</u>	> 600 °C (1,010 hPa) Method: according to a standardised method By analogy
<u>Surface tension</u>	Not considered as surface-active, Structure-activity relationship (SAR)
<u>Molecular weight</u>	350 - 500 g/mol
<u>Henry's Constant</u>	13792979 - 20660426 Pa.m ³ /mol (20 °C)

SECTION 10: Stability and reactivity

10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

- Stable under recommended storage conditions.
- Metals promote and lower decomposition temperature
- In presence of titanium and its alloys the decomposition temperature decreases to 260°C.

10.3 Possibility of hazardous reactions

- No dangerous reaction known under conditions of normal use.

10.4 Conditions to avoid

- Avoid to use in presence of high voltage electric arc and in absence of oxygen.
- Keep away from flames and sparks.
- To avoid thermal decomposition, do not overheat.

10.5 Incompatible materials

- non-aqueous alkalis
- Lewis acids (Friedel-Crafts) above 100°C
- Aluminum and magnesium in powder form above 200°C

10.6 Hazardous decomposition products

- Gaseous hydrogen fluoride (HF).
- Fluorophosgene

SECTION 11: Toxicological information**11.1 Information on toxicological effects****Acute toxicity****Acute oral toxicity**

LD50 : > 5,000 mg/kg - Rat , male and female
Method: OECD Test Guideline 401
Unpublished internal reports

Acute inhalation toxicity

LC50 - 4 h (vapour) : > 1,627 mg/l - Rat , male and female
Method: OECD Test Guideline 403
Unpublished internal reports

Acute dermal toxicity

LD50 : > 2,000 mg/kg - Rat , male and female
Method: OECD Test Guideline 402
Unpublished internal reports
No data available

Acute toxicity (other routes of administration)**Skin corrosion/irritation**

Rabbit
No skin irritation
Method: OECD Test Guideline 404
Unpublished internal reports

Serious eye damage/eye irritation

Rabbit
No eye irritation
Method: OECD Test Guideline 405
Unpublished internal reports

Respiratory or skin sensitisation

Buehler Test - Guinea pig
Does not cause skin sensitisation.
Method: OECD Test Guideline 406
Unpublished internal reports

Mutagenicity**Genotoxicity in vitro**

Ames test
with and without metabolic activation

negative
Method: OECD Test Guideline 471
Information given is based on data obtained from similar substances.
Unpublished internal reports

Chromosome aberration test in vitro
with and without metabolic activation

negative

Method: OECD Test Guideline 473

Information given is based on data obtained from similar substances.

Unpublished internal reports

In vitro gene mutation study in mammalian cells

Strain: Mouse

with and without metabolic activation

negative

Method: OECD Test Guideline 490

Unpublished internal reports

Genotoxicity in vivo

In vivo micronucleus test - Rat

male

Oral

Method: OECD Test Guideline 474

negative

Information given is based on data obtained from similar substances.

Unpublished internal reports

No data available

Carcinogenicity

Toxicity for reproduction and development

Toxicity to reproduction/Fertility

Reproduction/Developmental toxicity screening test - Rat, male and female,
inhalation (vapour)

General Toxicity - Parent NOAEC: > 20 mg/l

Fertility NOAEC F1: > 20 mg/l

OECD Test Guideline 422

no impairment of fertility has been observed, Unpublished internal reports

Developmental Toxicity/Teratogenicity

Reproduction/Developmental toxicity screening test - Rat, male and female,
inhalation (vapour)

General Toxicity Maternal NOAEC: > 20 mg/l

Developmental Toxicity NOAEC F1: > 20 mg/l

Method: OECD Test Guideline 422

No effect observed on development, Unpublished internal reports

STOT

STOT - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

STOT - repeated exposure

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Oral 28-day - Rat, male and female

NOEL: 1000 mg/kg

Method: OECD Test Guideline 407

Unpublished internal reports

Inhalation (vapour) 28-day - Rat , male and female
NOAEC: 9842 ppm
Method: OECD Test Guideline 412
No significant adverse effects were reported
Information given is based on data obtained from similar substances.
Unpublished internal reports

Inhalation (vapour) 90-day - Rat , male
NOAEC: 10075 ppm
Method: OECD Test Guideline 413
No significant adverse effects were reported
Information given is based on data obtained from similar substances.
Unpublished internal reports

Inhalation (vapour) 28-day - Rat , male and female
NOAEC: > 20 mg/l
Method: OECD Test Guideline 422
No significant adverse effects were reported
Unpublished internal reports

Experience with human exposure
CMR effects

No data available

Mutagenicity

The product is considered to be non-mutagenic based on an overall assessment of the data from animal and/or in vitro testing.

Teratogenicity

Animal testing did not show any effects on foetal development.

Reproductive toxicity

No evidence of adverse effects on sexual function and fertility, and on development, based on animal experiments.
Not classified as toxic for the reproduction (fertility and/or development) according to GHS criteria
No data available
Description of possible hazardous to health effects is based on experience and/or toxicological characteristics of several components.
Thermal decomposition can lead to release of toxic and corrosive gases.

Aspiration toxicity
Further information

SECTION 12: Ecological information

12.1 Toxicity

Aquatic Compartment

Acute toxicity to fish

- 96 h : - Danio rerio (zebra fish)
semi-static test
Analytical monitoring: yes

Method: OECD Test Guideline 203
No significant deleterious effects observed up to the highest concentration tested
Unpublished internal reports

Acute toxicity to daphnia and other aquatic invertebrates

EC50 - 48 h : - Daphnia magna (Water flea)
semi-static test
Analytical monitoring: yes
Method: OECD Test Guideline 202
No significant deleterious effects observed up to the highest concentration tested
Unpublished internal reports

Toxicity to aquatic plants

- 72 h : - Pseudokirchneriella subcapitata (green algae)
static test
Analytical monitoring: yes
End point: Growth rate
Method: OECD Test Guideline 201
No significant deleterious effects observed up to the highest concentration tested
Unpublished internal reports

Toxicity to microorganisms

NOEC - 3 h : 1,000 mg/l - activated sludge
Analytical monitoring: no
Method: OECD Test Guideline 209
Unpublished internal reports

Chronic toxicity to fish

No data available

Chronic toxicity to daphnia and other aquatic invertebrates

No data available

12.2 Persistence and degradability**Abiotic degradation****Stability in water**

Method: Structure-activity relationship (SAR)
Stable

Physical- and photo-chemical elimination

No data available

Biodegradation**Biodegradability**

The substance does not fulfill the criteria for ready biodegradability and ultimate aerobic biodegradability
Structure-activity relationship (SAR)

Degradability assessment

The product is not considered to be rapidly degradable in the environment

12.3 Bioaccumulative potential**Partition coefficient: n-octanol/water**

Not relevant
Direct and indirect exposure of the aquatic compartment is unlikely.

Bioconcentration factor (BCF)

Bioaccumulation is unlikely.
Direct and indirect exposure of the aquatic compartment is unlikely.

12.4 Mobility in soil**Adsorption potential (Koc)**

Adsorption/Soil
Koc: 41667.75
Method: Calculation method

Known distribution to environmental compartments

Ultimate destination of the product : Air
Fate models
Predicted distribution to environmental compartments

12.5 Results of PBT and vPvB assessment This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Global warming potential

By analogy

100-year global warming potential: 10,000 estimated

Ecotoxicity assessment

Short-term (acute) aquatic hazard

Not classified due to data which are conclusive although insufficient for classification.
No acute environmental hazard identified.

Long-term (chronic) aquatic hazard

May cause long lasting harmful effects to aquatic life.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product Disposal

- Can be incinerated, when in compliance with local regulations.
- The incinerator must be equipped with a system for the neutralisation or recovery of HF.
- Dispose of in accordance with local regulations.

Advice on cleaning and disposal of packaging

- Empty containers can be landfilled, when in accordance with the local regulations.

SECTION 14: Transport information

Road and Rail transport – ADG (Australia)

not regulated

IMDG

not regulated

IATA

not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office.

SECTION 15: Regulatory information

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

Poison Schedule (SUSMP Australia)

- Not scheduled

- Please use the original publication to check for specific uses, specific conditions or threshold limits that might apply for this chemical.

Notification status

Inventory Information	Status
United States TSCA Inventory	- Listed as active on the TSCA inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
Australian Inventory of Industrial Chemicals (AIIC)	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Japan. ISHL - Inventory of Chemical Substances	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory - This substance/mixture can only be imported by Syensqo. Contact Syensqo for further details.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- Listed on Inventory
Taiwan. Chemical Substance Inventory (TCSI)	- Listed on Inventory
EU. European Registration, Evaluation, Authorization and Restriction of Chemical (REACH)	- If product is purchased from Syensqo in Europe it is in compliance with REACH, if not please contact the supplier.

Additional Information

- For European Inventory (REACH) purposes, This product is identified as: Hexafluoropropene, oxidized, oligomers, reduced, fluorinated (CAS-No. : 161075-00-9)

SECTION 16: Other information**Full text of H-Statements**

- H413: May cause long lasting harmful effects to aquatic life.

Key or legend to abbreviations and acronyms used in the safety data sheet

- C: Ceiling limit
- Peak limit: Exposure standard - peak
- STEL: Exposure standard - short term exposure limit
- TWA: Exposure standard - time weighted average
- ca.: approximately
- ADR: European Agreement on International Carriage of Dangerous Goods by Road.
- ADN: European Agreement on the International Carriage of Dangerous Goods by Inland Waterways.
- RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
- IATA: International Air Transport Association.
- ICAO-TI: Technical Instructions for Safe Transport of Dangerous Goods by Air.
- IMDG: International Maritime Dangerous Goods.
- TWA: Time weighted average
- ATE: Estimated value of acute toxicity
- EC: European Community number
- CAS: Chemical Abstracts Service.
- LD50: Substance that causes 50% (half) death in the test animals group (Median Fatal Dose).
- LC50: Substance concentration causing 50% (half) death in the test animals group.
- EC50: Effective Concentration of the substance causing the maximum of 50%.

- PBT: Persistent, Bioaccumulative and Toxic substance.
- vPvB: Very Persistent and Very Bioaccumulative.
- GHS/CLP/SEA: Classification, labeling, packaging regulation
- DNEL: Derived No Effect Level
- PNEC: Predicted No Effect Concentration
- STOT: Specific Target Organ Toxicity

Not all acronyms listed above are referenced in this SDS.

Further information

- Distribute new edition to clients
- This data sheet contains changes from the previous version in section(s):
- See section 8
- See section 11

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. The information exclusively relates to the designated product in its unaltered state. Safety and health hazards may change if such product is used in combination with other materials or in any other manufacturing process. Users are responsible for compliance with all regulations linked to product related activities, and to use the products in accordance with technical instructions given by Syensqo, if any.