

Solstice® ZD, Solstice® 1233zd (E)

Version 2.0

Revision Date 24.06.2015

Supersedes 1

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name : Solstice® ZD, Solstice® 1233zd (E)
SDS-number : 000000018007
Type of product : Substance
Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.
Chemical Name : trans-1-Chloro-3,3,3-trifluoropropene
CAS-No. : 102687-65-0
Registration number : 01-2119855084-38

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

Use of the Substance/Mixture : Refrigerant
Power cycle fluid
Heat transfer fluid

Uses advised against : none

1.3. Details of the supplier of the safety data sheet

Company : Honeywell International Inc. Honeywell International, Inc.
101 Columbia Road 101 Columbia Road
07962-1057 Morristown Morristown, NJ 07962-1057
USA USA
Telephone :
Telefax :
For further information, please contact: : PMTEU Product Stewardship:
SafetyDataSheet@Honeywell.com

1.4. Emergency telephone number

Emergency telephone number :

2. HAZARDS IDENTIFICATION


2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

Chronic aquatic toxicity Category 3
H412 Harmful to aquatic life with long lasting effects.
Gases under pressure Liquefied gas
H280 Contains gas under pressure; may explode if heated.

2.2. Label elements

REGULATION (EC) No 1272/2008

Hazard pictograms : 

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Signal word	:	Warning	
Hazard statements	:	H280 H412	Contains gas under pressure; may explode if heated. Harmful to aquatic life with long lasting effects.
Precautionary statements	:	P281 P260 P273 P308 + P313 P410 + P403	Use personal protective equipment as required. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Avoid release to the environment. IF exposed or concerned: Get medical advice/ attention. Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

Do not breathe vapours or spray mist.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substance

Chemical Name	CAS-No. Index-No. Registration number EC-No.	Classification 1272/2008	Concentration	Remarks
trans-1-Chloro-3,3,3-trifluoropropene (Active ingredient)	102687-65-0 01-2119855084-38 700-486-0	Aquatic Chronic 3; H412 Press. Gas Press. Gas; H280	> 99	1*

1* - For specific concentration limits see Annexes of 1272/2008

N.C.* - Non-hazardous substance - for information only

3.2. Mixture

Not applicable

Occupational Exposure Limit(s), if available, are listed in Section 8.
For the full text of the H-Statements mentioned in this Section, see Section 16.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation:

Move to fresh air. Artificial respiration and/or oxygen may be necessary. Call a physician immediately.

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Skin contact:

After contact with skin, wash immediately with plenty of water. Take off contaminated clothing and shoes immediately. Wash clothing before reuse. Call a physician immediately.

Eye contact:

Remove contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 5 minutes. Call a physician immediately.

Ingestion:

Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician immediately.

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

no data available

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

Treat symptomatically.

See Section 11 for more detailed information on health effects and symptoms. :

5. FIREFIGHTING MEASURES

5.1. Extinguishing media

Suitable extinguishing media:

Water spray
Dry powder
Foam
Carbon dioxide (CO₂)

Extinguishing media which shall not be used for safety reasons:

High volume water jet

5.2. Special hazards arising from the substance or mixture

Possibility of generating hazardous reactions during a fire due to the presence of F and Cl groups. Heating will cause pressure rise with risk of bursting. Cool closed containers exposed to fire with water spray. This product is not flammable at ambient temperatures and atmospheric pressure.

5.3. Advice for firefighters

Wear full protective clothing and self-contained breathing apparatus. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Immediately contact emergency personnel. Wear personal protective equipment. Unprotected persons must be kept away. Ensure adequate ventilation. In case of insufficient ventilation wear suitable respiratory equipment.

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6.2. Environmental precautions

Should not be released into the environment. Do not flush into surface water or sanitary sewer system. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g. by containment or oil barriers).

6.3. Methods and materials for containment and cleaning up

Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13). Minimize contact of spilled material with soils to prevent runoff to surface waterways. Place spilled material in an appropriate container for disposal.

6.4. Reference to other sections

For personal protection see section 8.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Advice on safe handling:

Do not breathe vapours or spray mist. Do not use in areas without adequate ventilation.

Advice on protection against fire and explosion:

Can form a combustible mixture with air at pressures above atmospheric pressure. Keep product and empty container away from heat and sources of ignition.

Hygiene measures:

Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers:

Keep away from direct sunlight. Keep only in the original container in a cool, well ventilated place away from acids.

7.3. Specific end use(s)

Specific use information:

Restricted to professional users.

For industrial use only.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits:

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
trans-1-Chloro-3,3,3-trifluoropropene	WEEL TWA	800 ppm		We are not aware of any national exposure limit.

TWA - Time weighted average

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DNEL/ PNEC-Values

Component	End-use / Impact	Exposure duration	Value	Exposure routes	Remarks
trans-1-Chloro-3,3,3-trifluoropropene	Workers / Long-term systemic effects		1779 mg/m ³	Inhalation	
trans-1-Chloro-3,3,3-trifluoropropene	Consumers / Long-term systemic effects		379 mg/m ³	Inhalation	

Component	Environmental compartment / Value	Remarks
trans-1-Chloro-3,3,3-trifluoropropene	Fresh water: 0,038 mg/l	Assessment factor: 1000
trans-1-Chloro-3,3,3-trifluoropropene	Marine water: 0,0038 mg/l	Assessment factor: 10000
trans-1-Chloro-3,3,3-trifluoropropene	Fresh water sediment: 0,691 mg/kg dw	
trans-1-Chloro-3,3,3-trifluoropropene	Marine sediment: 0,0691 mg/kg dw	
trans-1-Chloro-3,3,3-trifluoropropene	Soil: 0,126 mg/kg dw	

8.2. Exposure controls**Occupational exposure controls**

Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.

Engineering measures

Use with local exhaust ventilation.
Perform filling operations only at stations with exhaust ventilation facilities.

Personal protective equipment*Respiratory protection:*

In case of insufficient ventilation wear suitable respiratory equipment.
Self-contained breathing apparatus (EN 133)

Hand protection:

Glove material: Viton (R)
Vitoject® 890
Gloves must be inspected prior to use.
Replace when worn.

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Remarks: Supplementary note: The specifications are based on information and tests from similar substances by analogy.

Due to varying conditions (e.g.temperature or other strains) it must be considered that the usage of a chemical protective glove in practice may be much shorter than the permeation time determined in accordance with EN 374.

Since actual conditions of practical use often deviate from standardised conditions according EN 374 the glove manufacturer recommends to use the chemical protective glove in practice not longer than 50% of the recommended permeation time.

Manufacturer's directions for use should be observed because of great diversity of types .

Suitable gloves tested according EN 374 are supplied e.g. from KCL GmbH, D-36124 Eichenzell, Vertrieb@kcl.de

Eye protection:

Safety goggles

Skin and body protection:

Protective footwear

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Form	:	liquid, clear
Colour	:	colourless
Odour	:	slight
molecular weight	:	130,5 g/mol
Melting point/range	:	< -90 °C Method: OECD Test Guideline 102
Boiling point/boiling range	:	19 °C
Flash point	:	Method: ISO 2719 Not applicable
Flammability (solid, gas)	:	The product is not flammable. Method: Flammability (gases)
Ignition temperature	:	380 °C at 986,8 - 1.035,9 hPa Method: DIN 51794
Oxidizing properties	:	The substance or mixture is not classified as oxidizing.
Lower explosion limit	:	None
Upper explosion limit	:	None
Vapour pressure	:	1.516 hPa

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	at 30 °C
Vapour pressure	: 1.065 hPa at 20 °C
Density	: 1,27 g/cm ³
Water solubility	: 1,90 g/l at 20 °C Method: OECD Test Guideline 105
Partition coefficient: n-octanol/water	: log Pow 2,2 at: 25 °C
Relative vapour density	: (Air = 1.0) not determined

9.2 Other Information

no additional data available

10. STABILITY AND REACTIVITY

10.1. Reactivity

no data available

10.2. Chemical stability

no data available

10.3. Possibility of hazardous reactions

no data available

10.4. Conditions to avoid

Heating will cause pressure rise with risk of bursting
Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
Keep away from direct sunlight.

10.5. Incompatible materials

Strong oxidizing agents
Magnesium
Finely divided aluminium

10.6. Hazardous decomposition products

In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)
Carbonyl halides
Gaseous hydrogen chloride (HCl).

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Gaseous hydrogen fluoride (HF).

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute oral toxicity:

Not applicable

Acute dermal toxicity:

Not applicable

Acute inhalation toxicity:

LC50

Species: Rat

Value: 120000 ppm

Exposure time: 4 h

Skin irritation:

Species: Rabbit

Result: No skin irritation

Exposure time: 4 h

Method: OECD Test Guideline 404

Eye irritation:

Not applicable

Respiratory or skin sensitisation:

Result: Does not cause skin sensitisation.

Classification: Patch test on human volunteers did not demonstrate sensitisation properties.

Cardiac sensitization

Species: dogs

Cardiac sensitisation threshold (dog): 25000 ppm.

Repeated dose toxicity:

Species: Rat

Application Route: Inhalation

Exposure time: 90 d

LOAEL: 4000 ppm

Method: OECD Test Guideline 413

Note: Subchronic toxicity

Germ cell mutagenicity:

Test Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)

Result: negative

Species: Rat

Cell type: Bone marrow

Method: Mutagenicity (micronucleus test)

Result: negative

Test Method: Unscheduled DNA synthesis

Species: Rat

Result: negative

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Species: Mouse
Cell type: Bone marrow
Method: Mutagenicity (micronucleus test)
Result: negative

Reproductive toxicity:

Test Type: Two-generation study
Method: OECD Test Guideline 416
Species: Rat
Route of Application: inhalation (gas)
General Toxicity - Parent: NOEL: 5.000 ppm
General Toxicity F1: NOEL: 5.000 ppm
Fertility: NOEL: 15.000 ppm
Early Embryonic Development: NOEL: 15.000 ppm

Method: OECD Test Guideline 414
Species: Rat
Route of Application: inhalation (gas)
General Toxicity Maternal: NOEL: 15.000 ppm
Developmental Toxicity: NOEL: 10.000 ppm

Method: OECD Test Guideline 414
Species: Rabbit
Route of Application: inhalation (gas)
General Toxicity Maternal: NOAEC: 15.000 ppm
Developmental Toxicity: NOAEC: 15.000 ppm

Aspiration hazard:
no data available

Other information:
no data available

12. ECOLOGICAL INFORMATION

12.1. Toxicity

Toxicity to fish:

LC50
Species: Oncorhynchus mykiss (rainbow trout)
Value: 38 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to aquatic plants:

EC50
Growth inhibition
Species: Pseudokirchneriella subcapitata (green algae)
Value: > 215 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

NOEC
Growth rate

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Species: Pseudokirchneriella subcapitata (green algae)
Value: 115 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to aquatic invertebrates:

EC50
Immobilization
Species: Daphnia magna (Water flea)
Value: 82 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

12.2. Persistence and degradability

Biodegradability : Biodegradation: 0 %
Exposure time: 28 d
Result: Not readily biodegradable.
Method: OECD 301 D

12.3. Bioaccumulative potential

no data available

12.4. Mobility in soil

no data available

12.5. Results of PBT and vPvB assessment

no data available

12.6. Other adverse effects

no data available

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product:

Offer surplus and non-recyclable solutions to a licensed disposal company. Refer to manufacturer/supplier for information on recovery/recycling.

Remarks:

The classification of the product may meet the criteria for a hazardous waste. Classification: 14.06.01

Further information:

Provisions relating to waste:
EC Directive 2006/12/EC; 2008/98/EEC
Regulation No. 1013/2006

For personal protection see section 8.

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14. TRANSPORT INFORMATION

ADR/RID

UN Number : 3163
Description of the goods : LIQUEFIED GAS, N.O.S.
(TRANS-1-CHLORO-3,3,3-TRIFLUOROPROPENE)
Class : 2
Classification Code : 2A
Hazard Identification : 20
Number :
ADR/RID-Labels : 2.2
Environmentally hazardous : no

IATA

UN Number : 3163
Description of the goods : Liquefied gas, n.o.s.
(Trans-1-Chloro-3,3,3-trifluoropropene)
Class : 2.2
Hazard Labels : 2.2

IMDG

UN Number : 3163
Description of the goods : LIQUEFIED GAS, N.O.S.
(TRANS-1-CHLORO-3,3,3-TRIFLUOROPROPENE)
Class : 2.2
Hazard Labels : 2.2
EmS Number : F-C, S-V
Marine pollutant : no

15. REGULATORY INFORMATION

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

Other inventory information

US. Toxic Substances Control Act
On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act
On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL)
All components of this product are on the Canadian DSL.

Japan. Kashin-Hou Law List
On the inventory, or in compliance with the inventory

Korea. Toxic Chemical Control Law (TCCL) List
On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act
Not in compliance with the inventory

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China. Inventory of Existing Chemical Substances
On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand
Not in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has been carried out.

16. OTHER INFORMATION

Further information

All directives and regulations refer to amended versions.
Vertical lines in the left hand margin indicate an amendment from the previous version.

Abbreviations:

EC European Community
CAS Chemical Abstracts Service
DNEL Derived no effect level
PNEC Predicted no effect level
vPvB Very persistent and very bioaccumulative substance
PBT Persistent, bioaccumulative und toxic substance

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. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.

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