

Genetron® 410A

000000009881

Version 4.3

Revision Date 06.11.2025

Supersedes 3

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

Product name : Genetron® 410A

SDS-number : 000000009881

Type of product : Mixture

Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.
In accordance to the Article 14 (4) of the REACH Regulation (EC) No 1907/2006, exposure estimation and risk characterisation is not required.

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

Use of the Substance/Mixture : Refrigerant

Uses advised against : none

1.3. Details of the supplier of the safety data sheet

Company : SOLSTICE ADVANCED MATERIALS IRELAND LIMITED
1st Floor, Liffey Trust Centre,
117-126 Sheriff Street Upper
D01 YC43 Dublin
Ireland

Solstice Advanced Materials
US, Inc.
115 Tabor Road
Morris Plains, NJ 07950-2546
USA

Telephone : +353 1 447 9350

For further information,
please contact: : SafetyDataSheet@solstice.com

1.4. Emergency telephone number

Emergency telephone number : +1-703-527-3887 (ChemTrec-Transport)
+1 303-739-1378 (Medical)
: Poison Control Center:
United Kingdom: (+44) 844 892 0111

SECTION 2: Hazards identification

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2.1. Classification of the substance or mixture**REGULATION (EC) No 1272/2008**

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	:		
Signal word	:	Warning	
Hazard statements	:	H280	Contains gas under pressure; may explode if heated.
Precautionary statements	:	P260	Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
		P280	Wear protective gloves/ eye protection/ face protection.
		P284	In case of inadequate ventilation wear respiratory protection.
		P304 + P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
		P308 + P313	IF exposed or concerned: Get medical advice/ attention.
		P410 + P403	Protect from sunlight. Store in a well-ventilated place.

Special labelling of certain products: : Contains fluorinated greenhouse gases

2.3. Other hazards

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the liquid may cause frostbite. This substance/mixture contains no components

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considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients**3.1. Substances**

Not applicable

3.2. Mixtures

Chemical name	CAS-No. Index-No. EC-No.	Classification 1272/2008	Concentration	Remarks
Difluoromethane	75-10-5 200-839-4	Flam. Gas 1B; H221 Press. Gas ; H280	50 %	
Pentafluoroethane	354-33-6 206-557-8	Press. Gas ; H280	50 %	

Remaining components of this product are non-hazardous and/or are present at concentrations below reportable limits.

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.

SECTION 4: First aid measures**4.1 Description of first aid measures***General advice:*

First aider needs to protect himself. Move out of dangerous area. Take off all contaminated clothing immediately.

Inhalation:

Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician. Do not give drugs from adrenaline-ephedrine group.

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Skin contact:

Rapid evaporation of the liquid may cause frostbite. In case of contact with liquid, thaw frosted parts with water, then remove clothing carefully. Wash with plenty of water. Consult a physician. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use.

Eye contact:

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

Ingestion:

Ingestion is unlikely because of the physical properties and is not expected to be hazardous. As this product is a gas, refer to the inhalation section.

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

Do not give adrenaline or similar drugs.

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

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

The product is not flammable.

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.2. Special hazards arising from the substance or mixture

This product is not flammable at ambient temperatures and atmospheric pressure.

However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources.

Container may rupture on heating.

Cool closed containers exposed to fire with water spray.

Do not allow run-off from fire fighting to enter drains or water courses.

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Fire may cause evolution of:

Halogenated compounds

Hydrogen fluoride

Carbon oxides

Carbonyl halides

5.3. Advice for firefighters

In the event of fire and/or explosion do not breathe fumes.

Wear self-contained breathing apparatus and protective suit.

No unprotected exposed skin areas.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

SECTION 6: Accidental release measures**6.1. Personal precautions, protective equipment and emergency procedures**

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Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear personal protective equipment. Unprotected persons must be kept away. Remove all sources of ignition. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Ensure that the oxygen content is $\geq 19.5\%$.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. The product evaporates readily.

6.3. Methods and materials for containment and cleaning up

Ventilate the area.

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage**7.1. Precautions for safe handling***Advice on safe handling:*

Handle with care. Avoid inhalation of vapour or mist. Do not get in eyes, on skin, or on clothing. Wear personal protective equipment. Use only in well-ventilated areas. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Use authorized cylinders only. Protect cylinders from physical damage. Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material. Do not remove screw cap until immediately ready for use. Always replace cap after use.

Advice on protection against fire and explosion:

The product is not flammable. Can form a combustible mixture with air at pressures above atmospheric pressure.

7.2. Conditions for safe storage, including any incompatibilities*Requirements for storage areas and containers:*

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Keep containers tightly closed in a dry, cool and well-ventilated place. Storage rooms must be properly ventilated. Ensure adequate ventilation, especially in confined areas. Store away from incompatible substances.

Further information on storage conditions:

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Store in original container.

7.3. Specific end use(s)

Specific use information:

Restricted to professional users.

For industrial use only.

SECTION 8: Exposure controls/personal protection**8.1. Control parameters****Components with workplace control parameters**

Contains no substances with occupational exposure limit values.

DNEL/ PNEC-Values

Component	End-use/impact	Exposure duration	Value	Exposure routes	Remarks
Difluoromethane	Workers / Long-term systemic effects		7035 mg/m ³	Inhalation	
Difluoromethane	Consumers / Long-term systemic effects		750 mg/m ³	Inhalation	
Pentafluoroethane	Workers / Long-term systemic effects		16444 mg/m ³	Inhalation	
Pentafluoroethane	Consumers / Long-term systemic effects		1753 mg/m ³	Inhalation	

Component	Environmental compartment / Value	Remarks
Difluoromethane	Fresh water: 0,142 mg/l	Assessment factor: 1000

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Difluoromethane	Fresh water sediment: 0,534 mg/kg dw	
Pentafluoroethane	Fresh water: 0,1 mg/l	Assessment factor: 1000
Pentafluoroethane	Fresh water sediment: 0,6 mg/kg dw	

8.2. Exposure controls**Occupational exposure controls**

The Personal Protective Equipment must be in accordance with EN standards:respirator EN 136, 140, 149; safety glasses EN 166; protective suit: EN 340, 463, 468, 943-1, 943-2; gloves EN 374, 511; safety shoes EN-ISO 20345.

Do not breathe vapor.

Engineering measures

General room ventilation is adequate for storage and handling.

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)

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Hand protection:

Glove material: Viton®

Gloves must be inspected prior to use.

Replace when worn.

Protective gloves against cold

(EN 511)

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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 glasses with side-shields conforming to EN166
Face-shield

Skin and body protection:

Avoid skin contact with leaking liquid (danger of frostbite).
Wear cold insulating gloves/ face shield/ eye protection.

Environmental exposure controls

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

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

- | | | |
|-------------------------------------|---|-------------------------------|
| (a) Physical state | : | gaseous |
| (b) Colour | : | colourless |
| (c) Odour | : | weak |
| (e) Boiling point/boiling range | : | -48,5 °C |
| (g) Lower and upper explosion limit | : | Lower explosion limit
None |
| | : | Upper explosion limit
None |

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- (h) Flash point : Not applicable
- (i) Auto-ignition temperature : No data available
- (j) Decomposition temperature : 250 °C
- (k) pH : neutral
- (m) Solubility(ies) : Water solubility:
1,5 g/l
- (n) Partition coefficient: n-octanol/water : log Pow 1,48
Medium: Ethane, pentafluoro- (HFC-125)
- (n) Partition coefficient: n-octanol/water : log Pow 0,21
Medium: Difluoromethane (HFC-32)
- (o) Vapour pressure : 14.844 hPa
at 21,1 °C

33.798 hPa
at 54,4 °C
- (p) Density and / or relative density : 1,08 g/cm3
at 21,1 °C
- (q) Relative vapour density : 3
(Air = 1.0)
- (r) Particle characteristics : No data available

9.2 Other Information

Polymer characteristics : No data available

Evaporation rate : > 1
Method: Compared to CCl4.

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SECTION 10: Stability and reactivity**10.1. Reactivity**

Stable under normal conditions.

10.2. Chemical stability

No data available

10.3. Possibility of hazardous reactions

Hazardous polymerisation does not occur.

10.4. Conditions to avoid

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Heating will cause pressure rise with risk of bursting
Some risk may be expected of corrosive and toxic decomposition products.
Can form a combustible mixture with air at pressures above atmospheric pressure.

10.5. Incompatible materials

Finely divided aluminium
Potassium
Calcium
Powdered metals
Aluminium
Magnesium
Zinc

10.6. Hazardous decomposition products

Halogenated compounds
Hydrogen fluoride
Carbonyl halides
Carbon oxides

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SECTION 11: Toxicological information**11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008****(a) Acute toxicity***Acute oral toxicity:*

Not applicable

Acute dermal toxicity:

No data available

Acute inhalation toxicity:

LC50

Species: Rat

Value: > 800000 ppm

Exposure time: 4 h

Test substance: Ethane, pentafluoro- (HFC-125)

LC50

Species: Rat

Value: 520000 ppm

Exposure time: 4 h

Test substance: Difluoromethane (HFC-32)

Acute toxicity (other routes of administration):

No data available

(b) Skin corrosion/irritation:

No data available

(c) Serious eye damage/eye irritation:

No data available

(d) Respiratory or skin sensitisation:

No data available

(h) STOT-single exposure:

No data available

(i) STOT - repeated exposure:

Species: Rat

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NOAEL: 20000 ppm

(j) Aspiration hazard:

No data available

11.2. Information on other hazards*Endocrine disrupting properties*

No data available

Other information:

Ethane, pentafluoro- (HFC-125): Cardiac sensitisation threshold (dog): 75000 ppm.

Difluoromethane. (HFC-32): Cardiac sensitisation threshold (dog): 350000 ppm.

SECTION 12: Ecological information**12.1. Toxicity***Toxicity to fish:*

No data available

Toxicity to aquatic plants:

No data available

Toxicity to aquatic invertebrates:

No data available

12.2. Persistence and degradability

No data available

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. Endocrine disrupting properties

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No data available

12.7. Other adverse effects

Accumulation in aquatic organisms is unlikely.

SECTION 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. 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.

SECTION 14: Transport information**14.1 UN number or ID number**

ADR/RID:3163

IMDG:3163

IATA:3163

14.2 UN proper shipping name

ADR/RID:LIQUEFIED GAS, N.O.S.(PENTAFLUOROETHANE, DIFLUOROMETHANE)

IMDG:LIQUEFIED GAS, N.O.S.(PENTAFLUOROETHANE,DIFLUOROMETHANE)

IATA:Liquefied gas, n.o.s.(Pentafluoroethane, Difluoromethane)

14.3 Transport hazard class(es)

ADR/RID:2.2

IMDG: 2.2

IATA: 2.2

14.4 Packaging group

No data available

14.5 Environmental hazards

ADR/RID:no

Marine pollutant: no

14.6 Special precautions for user

IMDG Code segregation group according chapter 3.1.4.4 : NONE,

14.7 Maritime transport in bulk according to IMO instruments

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No data available

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Basis	Value	Remarks
Substances of very high concern (SVHC)		This product does not contain substances of very high concern according to Regulation (EC) No Article 57 above the respective regulatory 1907/2006 (REACH), concentration limit of ≥ 0.1 % (w/w).

Global warming potential :
2.088

Other inventory information

USA. List of Active Substances on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory, as amended
All substances listed as active on the TSCA inventory

Australian Inventory of Industrial Chemicals
All components are listed on the inventory, regulatory obligations/restrictions apply

Canada. Domestic Substances List (DSL), as amended
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. Existing Chemicals Inventory (KECI)
On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)
On the inventory, or in compliance with the inventory

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

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Thailand. Existing Chemicals Inventory from FDA (TECI List)
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory (TCSI)
On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information**Text of H-statements referred to under heading 3**

Difluoromethane : H221 Flammable gas.
H280 Contains gas under pressure; may explode if heated.

Pentafluoroethane : H280 Contains gas under pressure; may explode if heated.

Further information

All directives and regulations refer to amended versions.
Vertical lines in the left hand margin indicate a relevant 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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This information should not constitute a guarantee for any specific product properties.
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