

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)

00000009881

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

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

Product information

Trade name : Genetron® AZ-20 (R-410A)

Number : 00000009881

Recommended use of the chemical and restrictions on use : Refrigerant

Company : Honeywell International, Inc.
101 Columbia Road
07962-1057 Morristown, NJ US

For further information, please contact: : 800-522-8001
In China: 021-28942149
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : **Medical: 1-800-498-5701 or +1-651-523-0309**
: **Transportation: 1-800-424-9300 or +1-703-527-3887**
: **In China: 4001-204937**
: (24 hours/day, 7 days/week)

2. HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification of the substance or mixture : Gases under pressure, Liquefied gas

GHS Label elements, including precautionary statements

Symbol(s) :



Signal word : Warning

Hazard statements : Contains gas under pressure; may explode if heated.

Precautionary statements : **Storage:**
Protect from sunlight. Store in a well-ventilated place.

Other hazards which do not result in classification : Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating.
May cause cardiac arrhythmia.
May cause frostbite.
May irritate skin.

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)

00000009881

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

May irritate eyes.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Substance

Chemical Name	CAS-No.	Concentration
Pentafluoroethane	354-33-6	50.00 %
Pentafluoroethane		
Difluoromethane	75-10-5	50.00 %
Difluoromethane		

4. FIRST AID MEASURES

- 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.
- Skin contact : After contact with skin, wash immediately with plenty of water.
If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering.
If symptoms persist, call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
In case of frostbite water should be lukewarm, not hot.
If symptoms persist, call a physician.
- Ingestion : Unlikely route of exposure.
As this product is a gas, refer to the inhalation section.
Do not induce vomiting without medical advice.
Call a physician immediately.
- Notes to physician : Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.
Treat frost-bitten areas as needed.

5. FIREFIGHTING MEASURES

Genetron® AZ-20 (R-410A)**00000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

- 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.
- Specific hazards during firefighting : Contents under pressure.
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.
In case of fire hazardous decomposition products may be produced such as:
Hydrogen halides
Hydrogen fluoride
Carbon monoxide
Carbon dioxide (CO₂)
Carbonyl halides
- Special protective equipment 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.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : 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.
Avoid accumulation of vapours in low areas.
Unprotected personnel should not return until air has been tested and determined safe.
Ensure that the oxygen content is $\geq 19.5\%$.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
The product evaporates readily.
- Methods and materials for containment and cleaning up : Ventilate the area.

Genetron® AZ-20 (R-410A)**00000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

7. HANDLING AND STORAGE**Handling**

Precautions for 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.
Follow all standard safety precautions for handling and use of compressed gas cylinders.
Use authorized cylinders only.
Protect cylinders from physical damage.
Do not puncture or drop cylinders, expose them to open flame or excessive heat.
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.

Storage

Conditions for safe storage, including any incompatibilities : 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.
Protect cylinders from physical damage.
Store away from incompatible substances.

Advice on common storage :

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Components with workplace control parameters—**

Components	CAS-No.	Value	Control parameters	Update	Basis

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)**000000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

Difluoromethane Difluoromethane	75-10-5	TWA : time weighted average	(1,000 ppm)	1994	Limit established by Honeywell International Inc.
		TWA : time weighted average	2,200 mg/m3 (1,000 ppm)	2007	US. Workplace Environmental Exposure Level (WEEL) Guides
Pentafluoroethane Pentafluoroethane	354-33-6	TWA : time weighted average	(1,000 ppm)		Limit established by Honeywell International Inc.
		TWA : time weighted average	4,900 mg/m3 (1,000 ppm)	2007	US. Workplace Environmental Exposure Level (WEEL) Guides

Appropriate engineering controls

General room ventilation is adequate for storage and handling.
Perform filling operations only at stations with exhaust ventilation facilities.

Individual protection measures, such as personal protective equipment

- Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.
Wear a positive-pressure supplied-air respirator.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
- Hand protection : Leather gloves
In case of contact through splashing:
Protective gloves
Neoprene gloves
Polyvinyl alcohol or nitrile- butyl-rubber gloves
- Eye protection : Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes
- Skin and body protection : Avoid skin contact with leaking liquid (danger of frostbite).

Genetron® AZ-20 (R-410A)**000000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

	Wear cold insulating gloves/ face shield/ eye protection.
Hygiene measures	: Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Keep working clothes separately.
Protective measures	: Do not breathe vapour. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: Liquefied gas
Colour	: colourless
Odour	: weak
pH	: Note: neutral
Boiling point/boiling range	: -48.5 °C
Flash point	: Note: not applicable
Evaporation rate	: > 1 Method: Compared to CCl4.
lower flammability limit	: Note: None
upper flammability limit	: Note: None
Vapour pressure	: 14,844 hPa at 21.1 °C(70.0 °F) 33,798 hPa at 54.4 °C(129.9 °F)
Vapour density	: 3 Note: (Air = 1.0)

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)

000000009881

Version 1.0 0 Issuing date 02/01/2012 Revision Date 02/01/2012 Print Date 07/24/2013

Density	:	1.08 g/cm ³ at 21.1 °C
Water solubility	:	1.5 g/l
Partition coefficient: n-octanol/water	:	log Pow: 1.48 Test substance: Ethane, pentafluoro- (HFC-125) log Pow: 0.21 Test substance: Difluoromethane (HFC-32)
Ignition temperature	:	> 750 °C
Decomposition temperature	:	> 250 °C
Ozone depletion potential (ODP)	:	0

10. STABILITY AND REACTIVITY

Chemical stability	:	Stable under normal conditions. Hazardous polymerisation does not occur. Stable under normal conditions.
Possibility of hazardous reactions	:	Hazardous polymerisation does not occur.
Conditions to avoid	:	Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C. Decomposes under high temperature. Some risk may be expected of corrosive and toxic decomposition products. Can form a combustible mixture with air at pressures above atmospheric pressure. Do not mix with oxygen or air above atmospheric pressure.
Incompatible materials to avoid	:	Finely divided aluminium Potassium Calcium Powdered metals Aluminium Magnesium Zinc
Hazardous decomposition products	:	In case of fire hazardous decomposition products may be produced such as:

Genetron® AZ-20 (R-410A)**000000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

Hydrogen fluoride
Carbonyl halides
Carbon monoxide
Carbon dioxide (CO₂)

11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity

Pentafluoroethane : > 769000 ppm
Exposure time: 4 h
Species: rat

Difluoromethane : LC50: > 520000 ppm
Exposure time: 4 h
Species: rat

Sensitisation

Pentafluoroethane : Cardiac sensitization
Species: dogs
Note: No-observed-effect level
75 000 ppm
Lowest observable effect level
100 000 ppm

Difluoromethane : Cardiac sensitization
Species: dogs
Note: No-observed-effect level
>350 000 ppm

Repeated dose toxicity

Pentafluoroethane : Species: rat
Application Route: Inhalation
Exposure time: (4 Weeks)
NOEL: 50000 ppm
Subchronic toxicity

Difluoromethane : Species: rat
Application Route: Inhalation
Exposure time: (90 d)
NOEL: 50000 ppm
Subchronic toxicity

Germ cell mutagenicity

Pentafluoroethane : Test Method: Ames test
Result: negative

Difluoromethane : Test Method: Ames test
Result: negative

Genetron® AZ-20 (R-410A)**000000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

- : Cell type: Human lymphocytes
 Result: negative
- : Cell type: Chinese Hamster Ovary Cells
 Result: negative
- : Cell type: Human lymphocytes
 Result: negative
 Method: Mutagenicity (in vitro mammalian cytogenetic test)
- : Test Method: Chromosome aberration test in vitro
 Result: negative
- Germ cell mutagenicity
 Difluoromethane : Species: mouse
 Cell type: Bone marrow
 Method: Mutagenicity (micronucleus test)
 Result: negative
- Teratogenicity
 Pentafluoroethane : Species: rabbit
 Application Route: Inhalation exposure
 NOAEL, Teratog: 50,000 ppm
 NOAEL, Maternal: 50,000 ppm
 Note: Did not show teratogenic effects in animal experiments.
- Species: rat
 Application Route: Inhalation exposure
 NOAEL, Teratog: 50,000 ppm
 NOAEL, Maternal: 50,000 ppm
 Note: Did not show teratogenic effects in animal experiments.
- Difluoromethane : Species: rat
 Dose: NOEL - 50,000 ppm
 Note: Did not show teratogenic effects in animal experiments.
- Species: rabbit
 Dose: NOEL - 50,000 ppm
 Note: Did not show teratogenic effects in animal experiments.
- Further information**
 Acute toxicity : Vapours are heavier than air and can cause suffocation by
 reducing oxygen available for breathing. Rapid evaporation of
 the liquid may cause frostbite. May cause cardiac arrhythmia.

12. ECOLOGICAL INFORMATION

Genetron® AZ-20 (R-410A)**00000009881**

Version 1.0 0

Issuing date 02/01/2012

Revision Date 02/01/2012

Print Date 07/24/2013

Biodegradability
Pentafluoroethane : Result: Not readily biodegradable.
Value: 5 %
Method: OECD 301 D

Difluoromethane : Note: Minimal

Other adverse effects

Additional ecological
information : We have no quantitative data concerning the ecological
effects of this product.

13. DISPOSAL CONSIDERATIONS

CN HW China. National
Catalogue of Hazardous
Wastes : Hazardous waste

Disposal methods : In accordance with local and national regulations.

Disposal methods : Chemical residues in raw materials by the "National List of
Hazardous Wastes" (2008.8.1 entry into force) of the
regulations, a hazardous waste, pollutants are according to
Chinese state or local laws and regulations of the waste
classification. According to our law requires specialized units
to deal with commission, usually the final disposal of
incineration or other legal means to dispose of.

14. TRANSPORT INFORMATION**IATA**

UN/ID No. : UN 3163
Description of the goods : Liquefied gas, n.o.s.
(Pentafluoroethane, Difluoromethane)
Class : 2.2
Labels : 2.2
Packing instruction (cargo
aircraft) : 200
Packing instruction
(passenger aircraft) : 200

IMDG

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)

00000009881

Version 1.0 0 Issuing date 02/01/2012 Revision Date 02/01/2012 Print Date 07/24/2013

UN/ID No. : UN 3163
Description of the goods : LIQUEFIED GAS, N.O.S.
(PENTAFLUOROETHANE, DIFLUOROMETHANE)
Class : 2.2
Labels : 2.2
EmS Number 1 : F-C
EmS Number 2 : S-V

Marine pollutant : no

15. REGULATORY INFORMATION

National regulatory information

: Refer to the following regulations: Dangerous chemicals Management Ordinance, the State Council Order No. 591; GB16483-2008 MSDS content and order of items; GB-T 17519.2-2003 Material Safety Data Sheet Part 2 written rules; GB12268-2005 Name List of dangerous goods; GB6944-2005 and the name of dangerous goods classification number; GB13690-2009 chemical formula for risk classification and General; GBZ 2.1-2007 workplace hazards Part 1 occupational exposure limit chemical hazards; GB20576 ~ 20602-2006 classification of chemicals, warning labels and warning statements of safety norms

Other international regulations

Notification status

1907/2006 (EU) : This mixture contains only ingredients which have been subject to a pre-registration according to Regulation (EC) No. 1907/2006 (REACH).

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). (Can. Gaz. Part II, Vol. 144) : All components of this product are on the Canadian DSL list.

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

SAFETY DATA SHEET

{ error: graphic file not found:
C:\Program
Files\SAP\FrontEnd\sapgui\W
W\graphics\LOGO1000.bmp }

Genetron® AZ-20 (R-410A)

000000009881

Version 1.0 0 Issuing date 02/01/2012 Revision Date 02/01/2012 Print Date 07/24/2013

Korea. Existing Chemicals Inventory (KECI) : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

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

NZIOC - New Zealand : On the inventory, or in compliance with the inventory

16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 1	2
Flammability	: 1	1
Physical Hazard	: 0	
Instability	:	0

Further information

none