

SAFETY DATA SHEET

Version 1.10
Revision Date 04.08.2010

MSDS Number 300000001984
Print Date 03.10.2010

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

Product identifier : ASTEC S3

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

Use of the Substance/Mixture : General Industrial

Restrictions on Use : No data available.

Details of the supplier of the safety data sheet : Air Products Plc
2 Millennium Gate
Westmere Drive
Crewe
Cheshire

Email Address – Technical Information : GASTECH@airproducts.com

Telephone : +44(0)8457 020202

Emergency telephone number (24h) : 1. Cylinder 0500 020202 / +44 870 190 6874
2. Bulk 0500 020202 / +44 2030 240 571
3. Medical 0500 020202 / +44 1270 218 050

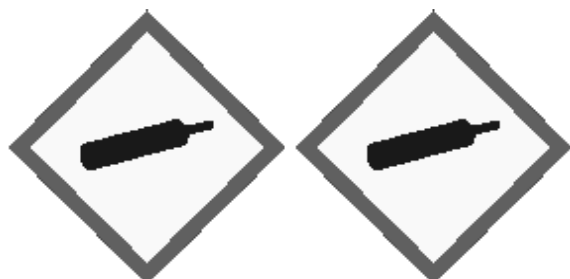
2. HAZARDS IDENTIFICATION

Classification according to Regulation 1272/2008 (CLP)

Gases under pressure - Compressed gas. H280:Contains gas under pressure; may explode if heated.

Label Elements according to Regulation 1272/2008 (CLP)

Hazard pictograms/symbols



Signal Word: Warning Warning

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Hazard Statements:

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

Storage : P403:Store in a well-ventilated place.
P410+P403:Protect from sunlight. Store in a well-ventilated place.

Classification (Directive)

Not a hazardous substance or preparation according to EC-directives
67/548/EEC or 1999/45/EC.
No EC labelling required.

Other hazards

High pressure gas.
Can cause rapid suffocation.
Self contained breathing apparatus (SCBA) may be required.

Environmental Effects

Not harmful.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture : Mixture

Components	EINECS / ELINCS Number	CAS Number	Concentration (Volume)
Carbon dioxide	204-696-9	124-38-9	2 %
Helium	231-168-5	7440-59-7	35 %
Argon	231-147-0	7440-37-1	63 %

Components	Classification (Directive)	Classification (CLP)	REACH Reg. #
Carbon dioxide		Press. Gas	
Helium		Press. Gas	
Argon		Press. Gas	

If REACH registration numbers do not appear the substance is either exempt from registration, does not meet the minimum volume threshold for registration, or the registration date has not yet come due.
Concentration is nominal. For the exact product composition, please refer to Air Products technical specifications.

4. FIRST AID MEASURES

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Description of first aid measures

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|----------------|---|
| General advice | : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped. |
| Eye contact | : Not applicable. |
| Skin contact | : Not applicable. |
| Ingestion | : Ingestion is not considered a potential route of exposure. |
| Inhalation | : Remove to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen. |

Most important symptoms and effects, both acute and delayed

- | | |
|----------|---|
| Symptoms | : Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. |
|----------|---|

Indication of any immediate medical attention and special treatment needed

No data available.

5. FIRE-FIGHTING MEASURES

Extinguishing media

- | | |
|--|---|
| Suitable extinguishing media | : All known extinguishing media can be used. |
| Extinguishing media which must not be used for safety reasons. | : No data available. |
| Special hazards arising from the substance or mixture | : Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is nonflammable and does not support combustion. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray. |
| Advice for fire-fighters | : Wear self contained breathing apparatus for fire fighting if necessary. |
| Further information | : No data available. |

6. ACCIDENTAL RELEASE MEASURES

- | | |
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| Personal precautions, | : Evacuate personnel to safe areas. Wear self-contained breathing apparatus |
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protective equipment and emergency procedures	when entering area unless atmosphere is proved to be safe. Monitor oxygen level. Ventilate the area.
Environmental precautions	: Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.
Methods and material for containment and cleaning up	: Ventilate the area.
Additional advice	: If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.

7. HANDLING AND STORAGE

Precautions for safe handling

Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shocks which may cause damage to their valve or safety devices. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F). Prolonged periods of cold temperature below -30°C (-20°F) should be avoided.

Conditions for safe storage, including any incompatibilities

Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose built compound which should be well ventilated, preferably in the open air. Stored containers should be periodically checked for general condition and leakage. Observe all regulations and local requirements regarding storage of

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containers. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material.

Specific end use(s)

Refer to section 1 or the extended SDS if applicable

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

Exposure limit(s)

Carbon dioxide	Time Weighted Average (TWA): EH40 WEL	5,000 ppm	9,150 mg/m ³
Carbon dioxide	Short Term Exposure Limit (STEL): EH40 WEL	15,000 ppm	27,400 mg/m ³
Carbon dioxide	Time Weighted Average (TWA): EU ELV	5,000 ppm	9,000 mg/m ³

If applicable, refer to the extended section of the SDS for further information on CSA.

Exposure controls

Engineering measures

Provide natural or mechanical ventilation to prevent oxygen deficient atmospheres below 19.5% oxygen.

Personal protective equipment

- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.
Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
- Hand protection : Sturdy work gloves are recommended for handling cylinders.
The breakthrough time of the selected glove(s) must be greater than the intended use period.
- Eye protection : Safety glasses recommended when handling cylinders.
- Skin and body protection : Safety shoes are recommended when handling cylinders.
- Special instructions for protection and hygiene : Ensure adequate ventilation, especially in confined areas.
- Remarks : Simple asphyxiant.

9. PHYSICAL AND CHEMICAL PROPERTIES

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Information on basic physical and chemical properties

Appearance	: Compressed gas. Colorless gas
Odor	: No odor warning properties.
Odor threshold	: No data available.
pH	: Not applicable.
Melting point/range	: No data available.
Boiling point/range	: -209 °F (-133.7 °C)
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: No data available.
Upper/lower explosion/flammability limit	: No data available.
Vapor pressure	: No data available.
Water solubility	: Not known, but considered to have low solubility.
Relative vapor density	: 0.95 (air = 1) Lighter or similar to air.
Relative density	: 1.53 (water = 1)
Partition coefficient (n-octanol/water)	: Not applicable.
Autoignition temperature	: No data available.
Decomposition temperature	: No data available.
Viscosity	: Not applicable.
Explosive properties	: No data available.
Oxidizing properties	: No data available.
Molecular Weight	: 27.46 g/mol
Density	: 0.0011 g/cm ³ (0.069 lb/ft ³)Note: (as vapor)
Specific Volume	: 0.875 m ³ /kg (14.02 ft ³ /lb)

10. STABILITY AND REACTIVITY

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Reactivity	: Refer to possibility of hazardous reactions and/or incompatible materials sections
Chemical Stability	: Stable under normal conditions.
Possibility of hazardous reactions	: No data available.
Conditions to avoid	: No data available.
Incompatible materials	: No data available.
Hazardous decomposition products	: None.

11. TOXICOLOGICAL INFORMATION

Information on toxicological effects

Likely routes of exposure

Effects on Eye	: No adverse effect.
Effects on Skin	: No adverse effect.
Inhalation Effects	: In high concentrations may cause asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.
Ingestion Effects	: Ingestion is not considered a potential route of exposure.
Symptoms	: Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration.

Acute toxicity

Acute Oral Toxicity	: No data is available on the product itself.
Inhalation	: No data is available on the product itself.
Acute Dermal Toxicity	: No data is available on the product itself.
Skin corrosion/irritation	: No data available.
Serious eye damage/eye irritation	: No data available.
Sensitization.	: No data available.

Chronic toxicity or effects from long term exposures

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Carcinogenicity : No data available.

Reproductive toxicity : No data is available on the product itself.

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : No data available.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

12. ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish - Components

Carbon dioxide	LC50 (1 h) : 240 mg/l	Species : Rainbow trout (Oncorhynchus mykiss).
Carbon dioxide	LC50 (96 h) : 35 mg/l	Species : Rainbow trout (Oncorhynchus mykiss).

Toxicity to other organisms : No data is available on the product itself.

Persistence and degradability

No data available.

Bioaccumulative potential

No data is available on the product itself.

Mobility in soil

No data available.

Results of PBT and vPvB assessment

If applicable, refer to the extended section of the SDS for further information on CSA.

Other adverse effects

This product has no known eco-toxicological effects.

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13. DISPOSAL CONSIDERATIONS

Waste treatment methods : Contact supplier if guidance is required. Return unused product in original cylinder to supplier.

Contaminated packaging : Return cylinder to supplier.

14. TRANSPORT INFORMATION

ADR

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Argon, Helium)
Class or Division : 2
Tunnel Code : (E)
Label(s) : 2.2
ADR/RID Hazard ID no. : 20

IATA

UN/ID No. : UN1956
Proper shipping name : Compressed gas, n.o.s., (Argon, Helium)
Class or Division : 2.2
Label(s) : 2.2

IMDG

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Argon, Helium)
Class or Division : 2.2
Label(s) : 2.2

RID

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Argon, Helium)
Class or Division : 2
Label(s) : 2.2

Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

15. REGULATORY INFORMATION

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

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.

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Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.
Japan	ENCS	Included on Inventory.

WGK Identification Number: : Not water endangering.

Chemical Safety Assessment

Refer to extended SDS for CSA information

This product is either exempt from REACH, does not meet the minimum volume threshold for a CSA, or the CSA has not yet been completed.

16. OTHER INFORMATION

Ensure all national/local regulations are observed.

Hazard Statements:

H280 Contains gas under pressure; may explode if heated.

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

For additional information, please visit our Product Stewardship web site at
<http://www.airproducts.com/productstewardship/>

This Safety Data Sheet has been established in accordance with the applicable European Directives and applies to all countries that have translated the Directives in their national laws. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.