

SAFETY DATA SHEET



Gaskleen® Purifier Assemblies employing AresKleen™ NH3P Purification Material

Section 1. Identification

- GHS product identifier** : Gaskleen® Purifier Assemblies employing AresKleen™ NH3P Purification Material
- Other means of identification** : Not available.
- Part number** : Not available.
Not available.
- Product type** : Solid-Article.

Identified uses

Suitable for use with the following gases/vapors: Ammonia (NH3)

Not suitable for reactive fluoride gases such as F₂, HF or BF₃.
Please refer to the appropriate Gaskleen purifier product data sheet from Pall Corporation for gas specific part numbers. The data included in this Safety Data Sheet (SDS) is applicable to a welded metal assembly containing AresKleen NH3P Purification Material—generally referred to as 'AresKleen NH3P purification material' throughout the SDS. Once the Gaskleen Purifier Assembly is installed and exposed to a process gas, the SDS for that gas must be consulted in conjunction with this SDS to determine the possible hazards.
Purifiers are shipped under slight pressure of 5 – 15 psig purified argon.

- Supplier** : Pall Corporation
25 Harbor Park Drive
Port Washington, NY 11050
Phone: (516) 484-5400
Web: www.Pall.com
- e-mail address of person responsible for this SDS** : reach_coordinator@pall.com
Pall_Cortland_CSC@Pall.com
- Emergency telephone number (with hours of operation)** : CHEMTREC, U.S. : 1-800-424-9300
International: +1-703-527-3887
24 hours/day, 7 days/week
- Country of Origin:** : Made in USA.

Section 2. Hazards identification

- OSHA/HCS status** : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

- Classification of the substance or mixture** : Not classified.

GHS label elements

- Signal word** : No signal word.
- Hazard statements** : No known significant effects or critical hazards.
- Precautionary statements**
- General** : Read Pall Instructions for use, prior to installing. Keep out of reach of children. If medical advice is needed, have product label and this document at hand.



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Section 2. Hazards identification

- Prevention** : Not applicable.
- Response** : Not applicable.
- Storage** : Not applicable.
- Disposal** : Not applicable.
- Hazards not otherwise classified** : None known.

Section 3. Composition/information on ingredients

- Substance/mixture** : Mixture (Article)
- Other means of identification** : Not available.

CAS number/other identifiers

- CAS number** : Not applicable.
- Product code** : Not available.

Ingredient name	%	CAS number
Stainless Steel 316	80 - 100	
Organolithium Polymer	0 - 20	Proprietary
Lithium amide	<1	7782-89-0
Ammonia, anhydrous	<1	7664-41-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

- Eye contact** : Unlikely route of exposure if used under recommended conditions. Wash with water, continuing for 10 minutes. Remove contact lenses and raise eyelid first. Seek medical attention if adverse symptoms are experienced.
- Inhalation** : Unlikely route of exposure if used under recommended conditions. If dust resulting from damage to the unit is inhaled, remove casualty to fresh air. Seek medical attention if adverse symptoms are experienced.
- Skin contact** : Unlikely route of exposure if used under recommended conditions. If experiencing irritation, wash with soap and water. Seek medical attention if irritation or other symptoms are experienced.
- Ingestion** : Unlikely route of exposure if used under recommended conditions. Rinse mouth with water and give plenty of water to drink. Do not induce vomiting unless instructed to do so by medical personnel.

Most important symptoms/effects, acute and delayed

Potential acute health effects

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

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Section 4. First aid measures

Over-exposure signs/symptoms

- Eye contact** : No known significant effects or critical hazards.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : No known significant effects or critical hazards.
- Ingestion** : No known significant effects or critical hazards.

Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

- Suitable extinguishing media** : In the event of exposed purification material extinguishers rated for Class D fires should be used. Dry powder extinguishers are also acceptable.
- Unsuitable extinguishing media** : In the event of exposed purification material water or carbon dioxide extinguishers should not be used as they may cause further reaction.

Specific hazards arising from the chemical : In the event of exposed purification material there is a risk of explosion due to formation of explosive vapors. Exposed purification material will react with water/water vapor to form ammonia which can be ignited.

Hazardous thermal decomposition products : In the event of exposed purification material combustion the following products may be generated: ammonia, short-chain aliphatic hydrocarbons, aromatic hydrocarbons, lithium oxide, lithium hydroxides, and other lithium metal compounds

Special protective actions for fire-fighters : Please note the assembly contains a reactive solid material. Contact of that material with water and/or air will generate heat. Contact of the material with skin or eyes will cause burns and/or severe irritation. AresKleen NH3P Purification Material is sold contained within a sealed assembly and no fire hazard is present under ordinary conditions. If the material is released from the assembly, it should be handled according to the guidelines set forth for bulk purification material containing lithium metal.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : No action shall be taken involving any personal risk or without suitable training. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".



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Section 6. Accidental release measures

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Serious harm from accidental release during handling of the undamaged, unused article is unlikely due to the form of the product and the quantity of hazardous materials present. Dust resulting from damage to the unit is potentially water-reactive and must be disposed of as hazardous waste.

Eliminate sources of ignition and other combustible materials. Wear protective clothing as indicated in Section 8. Place in a dry container. Use care in handling container as product and container may become sufficiently hot to burn the skin. Place container in a well ventilated area free of sources of ignition and other combustible materials and let stand until material is spent.

Handling must take into consideration any contaminants on the Gaskleen Purifier assembly as a result of use.

Methods and materials for containment and cleaning up

Small spill : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill : Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Wear gloves while handling and all PPE appropriate for any of the contaminants/materials used in contact with the article, as the result of use. Ensure any areas are clear of gases. Remove purifier assembly and contain in a labeled box. Dispose of via a licensed waste disposal contractor.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8).

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

When not in use and before installation, store the Gaskleen Purifier assembly in a cool, clean, dry, well ventilated place in the unopened packaging as supplied.

Take precautions to maintain the integrity of the protective argon covering

Keep product in packaging as supplied until ready for use

Keep container tightly closed. Do not expose purification material to the atmosphere

Keep dry

Store assemblies at ambient temperature

Do not puncture container

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Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Ammonia, anhydrous	ACGIH TLV (United States, 4/2014). STEL: 24 mg/m ³ 15 minutes. STEL: 35 ppm 15 minutes. TWA: 17 mg/m ³ 8 hours. TWA: 25 ppm 8 hours. NIOSH REL (United States, 10/2013). STEL: 27 mg/m ³ 15 minutes. STEL: 35 ppm 15 minutes. TWA: 18 mg/m ³ 10 hours. TWA: 25 ppm 10 hours. OSHA PEL (United States, 2/2013). TWA: 35 mg/m ³ 8 hours. TWA: 50 ppm 8 hours.

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

Individual protection measures

- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Skin protection

- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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Section 9. Physical and chemical properties

Appearance

Physical state	: Solid. [Stainless Steel Gas Purifier.]
Color	: Outer assembly metallic.
Odor	: Not available.
Odor threshold	: Not available.
pH	: Not available.
Melting point	: Melting point of stainless steel 1400°C.
Boiling point	: Not available.
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Not available.
Vapor pressure	: Not available.
Vapor density	: Not available.
Relative density	: Not available.
Solubility	: Not applicable.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not applicable.
Viscosity	: Not available.

Section 10. Stability and reactivity

Reactivity	: If the AresKleen NH3P Purification Material in an assembly is exposed to toxic or corrosive gases or gases containing toxic elements, the material may contain these toxic materials or reaction products thereof. It may exhibit the characteristic of toxicity as defined in the hazardous waste regulations 40 CFR 261 Subpart Cor D. Refer to applicable SDS for the specific toxic or corrosive gas in use to determine appropriate containment and disposal requirements.
Chemical stability	: The purification material in the Assembly will react with strong oxidizing agents and air. Avoid contact with these types of compounds except as per intended use as outlined in the product literature.
Possibility of hazardous reactions	: Under recommended conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	: In the event of exposed purification material avoid exposure to high concentrations of oxygen, water, and other incompatibilities.
Incompatible materials	: The purification material in the assembly is incompatible with Lewis Acids, oxidizing agents, water, carbon dioxide, oxygen, air, halogenated hydrocarbons, and metal hydrides.

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Section 10. Stability and reactivity

Hazardous decomposition products : In the event of exposed purification material the following products of decomposition may be generated: ammonia, short-chain aliphatic hydrocarbons, aromatic hydrocarbons, lithium oxide, lithium hydroxides, and other lithium metal compounds

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Ammonia, anhydrous	LC50 Inhalation Gas.	Rat	9500 ppm	1 hours
	LC50 Inhalation Gas.	Rat	2000 ppm	4 hours

Irritation/Corrosion

There is no data available.

Sensitization

There is no data available.

Carcinogenicity

There is no data available.

Specific target organ toxicity (single exposure)

There is no data available.

Specific target organ toxicity (repeated exposure)

There is no data available.

Aspiration hazard

There is no data available.

Information on the likely routes of exposure : Dermal contact.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : No known significant effects or critical hazards.

Ingestion : No known significant effects or critical hazards.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Long term exposure

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Potential immediate effects : No known significant effects or critical hazards.

Potential delayed effects : No known significant effects or critical hazards.

Potential chronic health effects

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

There is no data available.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Ammonia, anhydrous	Acute EC50 29.2 mg/L Marine water	Algae - Ulva fasciata - Zoea	96 hours
	Acute LC50 2080 µg/L Fresh water	Crustaceans - Gammarus pulex	48 hours
	Acute LC50 0.53 ppm Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 300 µg/L Fresh water	Fish - Hypophthalmichthys nobilis	96 hours
	Chronic NOEC 1 mg/L Fresh water	Algae - Skeletonema costatum	3 days
	Chronic NOEC 0.204 mg/L Marine water	Fish - Dicentrarchus labrax	62 days

Persistence and degradability

There is no data available.

Bioaccumulative potential

There is no data available.

Mobility in soil

Soil/water partition coefficient (K_{oc}) : There is no data available.

Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is

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Section 13. Disposal considerations

not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	IMDG	IATA
UN number	UN1390	UN1390	UN1390
UN proper shipping name	Alkali metal amides	Alkali metal amides	Alkali metal amides
Transport hazard class(es)	4.3 	4.3 	4.3 
Packing group	II	II	II
Environmental hazards	No.	No.	No.
Additional information	<u>Reportable quantity</u> 11111.1 lbs / 5044.4 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-

AERG : 139

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption:** Not determined
United States inventory (TSCA 8b): All components are listed or exempted.
Clean Water Act (CWA) 311: Ammonia, anhydrous

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

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Section 15. Regulatory information

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Ammonia, anhydrous	0.1 - 1	Yes.	500	-	100	-

SARA 304 RQ : 11111.1 lbs / 5044.4 kg

SARA 311/312

Classification : Not applicable.

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
Ammonia, anhydrous	0.1 - 1	Yes.	Yes.	No.	Yes.	No.

SARA 313

No products were found.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : None of the components are listed.

Pennsylvania : None of the components are listed.

California Prop. 65

No products were found.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health : 2 Flammability : 0 Physical hazards : 0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health : 2 Flammability : 0 Instability : 0

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Section 16. Other information

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Date of issue mm/dd/yyyy : 02/28/2016
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Version : 2
Revised Section(s) : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16.

Prepared by : KMK Regulatory Services Inc.

Key to abbreviations

: ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Notice to reader

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