

INTRODUCTION

Apiezon N grease is one of today's most widely used vacuum greases within the field of cryogenics, where its ability to improve heat transfer and its craze free performance characteristic at low temperatures are especially important. The product is also widely used at ambient temperatures.

KEY FEATURES

- Thermal coupling medium
- Sensor mounting medium
- Sample mounting medium
- Cryogenic vacuum seal
- Silicone & halogen free

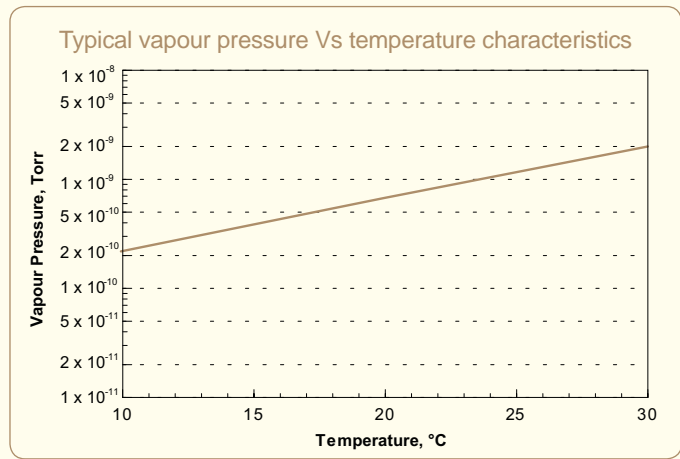
TYPICAL PROPERTIES

Melting point – ASTM.D 566	42 – 52°C
Working temperature range	-269 – 30°C
Vapour pressure @ 20°C	6 x 10 ⁻¹⁰ Torr
Relative density @ 20°C	0.911
Radiation resistant	Not recommended
Outgassing Characteristics ASTM.E 595-90	
TML	<1%
CVCM	<0.1%
Lubricity 4 Ball Test ASTM.D 2763 (IP 239)	150kg
Coefficient of expansion per °C Over 20°C – 30°C	0.00072
Thermal Conductivity	
@ 20°C	0.194w/m°C
@ -269°C	0.095w/m°C
Volume resistivity	2 x 10 ¹⁶ Ohm/cm
Permittivity	2.3
Loss tangent	<0.0001
Surface breakdown at flashover	27kV
Electric strength	820v/mil

THERMAL COUPLING MEDIUM

N grease is important for the coupling of cooling systems to superconducting magnets, cryostats, temperature sensors or any system which is required to reach cryogenic temperatures as quickly as possible. With its ability to fill the micropores of adjoining surfaces and its resistance to cracking and crazing at low temperatures, N grease increases the area of contact and therefore improves thermal coupling across the whole contact area. Although the absolute thermal conductivity value of N grease is less than that of indium, the NASA Ames Research Centre, have shown a significant practical improvement in heat transfer across pressed metallic joints augmented with N grease compared to those augmented with indium. In addition N grease does not suffer from the problem of creep, which is traditionally associated with indium, and is ideal for applications where thermal cycling occurs, as it has the ability to withstand frequent cycling between temperatures in the range of -273°C and +30°C. Low levels of magnetic susceptibility also make it ideal for certain superconductor applications.

Easy to apply, the grease provides a simple, efficient means of increasing thermal conductivity at liquid helium temperatures and is widely used in the manufacture of all types of cryogenic equipment including Magnetic Resonance imaging (MRI) magnets, cryostats and scientific instruments, including electron microscopes.



SENSOR MOUNTING MEDIUM

N grease is an ideal sensor mount, which is especially suited for the mounting of sensors within holes. Pliable at room temperature, it solidifies at cryogenic temperatures to ensure the easy mounting and removal of sensors without causing damage.

SAMPLE MOUNTING MEDIUM

Important in low temperature testing of semiconductor chips, laser diodes and crystals etc., N grease is used to improve thermal contact between the sample and sample boat or the sample boat and cold finger of a cryostat. This ensures samples at the lowest possible temperatures and improves test sensitivities. The grease is luminescent in UV light. For optical testing, cover the grease by the sample or use calibration to account for the emissions caused by the grease.

CRYOGENIC VACUUM SEAL

N grease exhibits extremely low vapour pressures at ambient temperatures, which are further improved by reductions in temperature to the cryogenic region, as demonstrated by extrapolation of the graph above. Its low temperature resistance to cracking is of particular benefit in vacuum sealing of cryosystems, where N grease can be relied upon to maintain an effective, crack free seal for long periods, even when subject to frequent thermal cycling. N grease is widely used to ensure vacuum or pressure tight seals in, among others, vacuum lines, cold traps, optical ports on electron microscopes, stopcocks, ground glass joints, taps, Schlenk lines and liquid helium hoses. It can also be used to improve cryogenic o-ring seals by filling surface or o-ring imperfections.

MIGRATION RESISTANCE

Since N grease is a hydrocarbon based, it does not suffer from the problems of "creep" or traditionally associated with silicone greases and hence avoids the risk of sample contamination or clouding of optical surfaces.

SAFETY DATA

PRODUCT NAME: Apiezon N Grease

PRODUCT CODE: **A-APG-TYPEN****1 COMPOSITION/INFORMATION ON INGREDIENTS**

Hydrocarbon grease.

No hazardous ingredients.

CAS Nos 8012-95-1.

2 HAZARD INFORMATION

This product is not classified as hazardous.

3 FIRST AID MEASURES

EYES: Irrigate with copious quantities of water.

SKIN: Wash with soap and water.

INHALATION: None envisaged.

INGESTION: Do not induce vomiting Seek medical attention.

4 FIRE FIGHTING MEASURES

Suitable extinguishing media:

- Carbon dioxide, dry powder, foam or water fog.

- Do not use water jets.

Special exposure hazards:

- None.

Special protective equipment:

- None.

5 ACCIDENTAL RELEASE MEASURES

Personal precautions:

- Spilt product constitutes a slip hazard.

Avoid contact with eyes.

Environmental precautions:

- None.

Decontamination procedures:

- Place in containers. See para 12 re disposal.

6 HANDLING AND STORAGE

Handling:

- No special precautions required.

Storage:

- No special precautions required.

7 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering control measures:

- None required

Hand / skin protection:

- Wash hands after use.
- For prolonged or repeated skin contact, gloves are recommended.

Eye protection:

- None required.

8 PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Semi solid
Colour	Yellow brown
Odour	None
Melting Point	42°C to 52°C
Flash Point	>200°C
Autoignition Point	>250°C
Explosive Limits	Not determined
Relative Density @ 20°C	0.911
Water Solubility	Insoluble

9 STABILITY & REACTIVITY

Stability

Will not polymerise

Conditions to avoid

Temp > 120°C

Materials to avoid

Strong oxidising agents

Hazardous Decomposition products None known

10 TOXICOLOGICAL INFORMATION

Based on the product's components:

Oral LD50 (rat) >2g/kg

Dermal LD50 (rabbit) >2g/kg

Acute Health Effects:

EYES: May cause transient irritation

INHALATION: Low volatility makes inhalation unlikely.

INGESTION: May cause nausea, vomiting and diarrhoea.

Chronic Health Effects:

SKIN: Repeated and prolonged skin contact may cause skin disorders.

11 ECOLOGICAL INFORMATION

Environmental: When used and/or disposed of as indicated no adverse environmental effects are foreseen.

Mobility: Non-volatile/ Insoluble in water.

Degradability: Slowly biodegradable in aerobic conditions.

12 DISPOSAL CONSIDERATIONS

Product and packaging must be disposed of in accordance with local and national regulations. May be incinerated.

13 TRANSPORT CLASSIFICATION

Not classified as hazardous for transport by air, sea, road or rail.

14 REGULATORY INFORMATION

All chemical substances in this material are included on the TSCA Inventory of chemical substances.