APIEZON® N

Cryogenic
High Vacuum Grease

Apiezon N Grease

◆ Thermal coupling medium

◆ Sensor mounting medium

◆ Sample mounting medium

◆ Cryogenic vacuum seal

◆ Silicone & halogen free

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 characteristics at low temperatures are especially important. The product is also widely used at ambient temperatures, information on which is in the data sheet "Apiezon L, M & N - Vacuum Greases."

Thermal coupling medium

Apiezon 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.

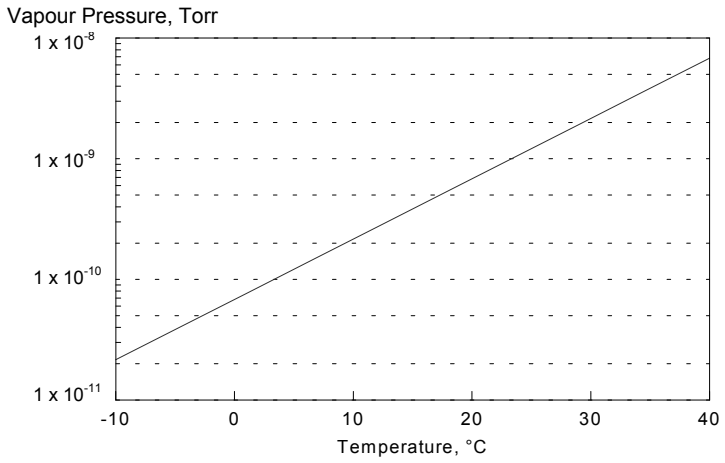
With its ability to fill the micropores of adjoining surfaces, and its resistance to cracking and crazing at low temperatures, Apiezon N grease increases the area of contact and therefore improves thermal coupling across the whole contact area.

Although the absolute thermal conductivity value of Apiezon N grease is less than that for Indium, the NASA Ames Research Center, have shown a significant practical improvement in heat transfer across pressed metallic joints augmented with Apiezon N grease compared to those augmented with Indium. For more information on this work, please contact us directly.

In addition, Apiezon 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 manufacturing applications.

Easy to apply, the grease provides a simple, efficient and cost effective 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 Image (MRI) magnets, cryostats and scientific instruments (including electron microscopes).

Vapour pressure over working temperature range



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Typical Properties

Dropping point – ASTM.D 566-02,	*°C*	42 to 52
	°F	108 to 126
Typical working temperature range,	*°C*	-269 to 30
	°F	-452 to 86
Vapour pressure @ 20°C / 68°F, Torr		6×10^{-10}
Relative density @ 20° C / 68°F		0.911
Resistant to radiation		Not recommended
Outgassing characteristics - ASTM .E 595-93(2003)e1		
TML		<1%
CVCM		<0.1%
Lubricity 4 Ball Test – ASTM .D 2596-97(2002)e1, *kg*		150
Coefficient of expansion per °C over 20°C - 30°C		0.00072
Thermal conductivity, w/m°C	*@ 20°C*	0.194
	@ -269°C	0.095
Volume resistivity, V.R., Ω cm		2.0×10^{16}
Permittivity		2.3
Loss tangent		<0.0001
Surface breakdown at flash over, kV		27
Electrical strength, V/mil(0.”001)		820

Sensor mounting medium

Apiezon 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., Apiezon 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 improved 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

Apiezon 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 vapour pressure graph over leaf.

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.

Apiezon 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 Resistant

Since N grease is 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.

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August 2005