

Medium Temperature Vacuum Grease

January 2018

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Introduction

Apiezon T grease is a versatile filled hydrocarbon grease for multi-purpose sealing applications in the low to medium vacuum range at medium temperatures.

The key features of the product are shown in the table opposite.

Temperature range

Apiezon T grease can be used over a wide range of temperatures from 10°C to 120°C, while its optimum consistency is retained at temperatures of 25°C to 50°C.

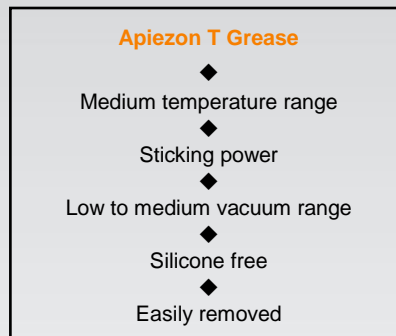
Silicone free

As a hydrocarbon based grease, T grease is highly resistant to "creep" or "carry over", a phenomenon associated with silicone-based products. Silicone has a tendency to travel away from the area of application and contaminate adjacent surfaces.

The creep resistance of Apiezon T grease benefits scientific users as it reduces sample contamination and the risk of interference in analytical techniques such as infra-red and mass spectrometry, etc. are avoided.

Silicone contamination is of particular concern in surface coating applications such as industrial paint or metal deposition processes, as trace amounts of silicone on surfaces prevent the adherence of paint and poor or incomplete coverage results. In semiconductor manufacture, yields can be severely affected by silicone contamination.

When using silicone-free Apiezon T grease the problems associated with creep and contamination are avoided.



Added cushioning

A high molecular weight polymeric additive gives Apiezon T grease a tenacious consistency and provides extra cushioning between mated surfaces.

By absorbing vibrations in equipment Apiezon T grease is invaluable in fragile glass to glass joints which continually risk fracture.

Sticking power

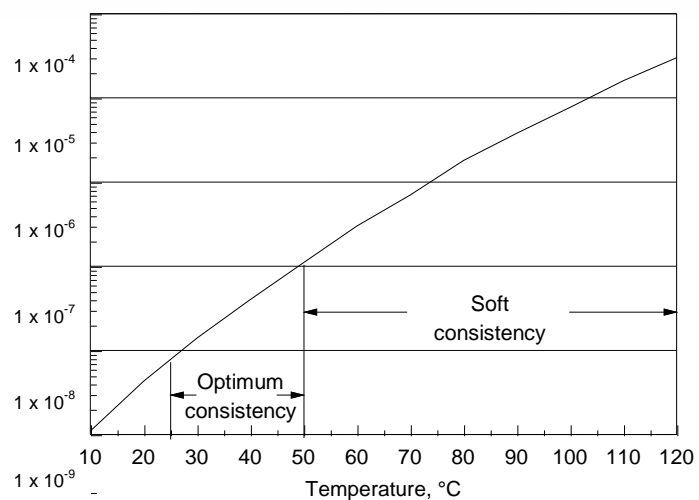
Apiezon T grease is a very tenacious grease conferring excellent cohesive strength. Mated joints when joined together stay together, ensuring an efficient gas tight seal.

Under vacuum

At its higher operating temperature range, Apiezon T grease exhibits good vacuum properties in the lower to medium vacuum range, while at lower temperatures it can be used in the high vacuum range. Full information on the vapour pressure of Apiezon T grease is shown in the graph below.

Vapour pressure over working temperature range

Vapour Pressure, Torr



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"Gettering" action

Apiezon T grease is manufactured from a unique feedstock containing a high proportion of branched and unsaturated hydrocarbons. These complex structures give Apiezon T grease a very high molecular weight and consequently strong powers of absorption, particularly for other hydrocarbon molecules.

Strong absorption properties ensure that Apiezon T grease has a powerful "gettering" action, i.e. the power to absorb greasy or chemical impurities on metal and glass surfaces. This is of value in the electronics industry where scrupulous cleanliness is required.

Apiezon T grease has no contaminating effect on electrical equipment and is easily removed by hydrocarbon solvents, taking with it many trace impurities which are not removed by solvents alone.

Easily removed

Apiezon T grease is easily removed by wiping with a soft clean lint free cloth. Any residues of grease can be washed away with warm soapy water or by using any aromatic hydrocarbon solvent (toluene, xylene). For a more environmentally friendly solvent, we recommend Limonene.

Apiezon hydrocarbon greases are not soluble in alcohols (ethanol, IPA) or ketones (acetone, MEK) so these cannot be used for cleaning.

Apiezon T grease works when you want it to, but is easily removed when you don't.

Typical Properties

Physical property		Value
<i>Dropping point - ASTM.D 566</i>	°C	112 to 137
	°F	233 to 278
<i>Typical working temperature range</i>	°C	10 to 120
	°F	50 to 248
<i>Vapour pressure @ 20°C / 68°F, Torr</i>		4.6 x 10 ⁻⁹
<i>Relative density @ 20°C / 68°F, Torr</i>		0.912
<i>Resistant to radiation</i>		Not recommended
Thermal / Electrical Property		
<i>Coefficient of expansion per °C over 20°C - 30°C</i>		0.00073
<i>Volume resistivity, Ω cm</i>		3.3 x 10 ¹²
<i>Permittivity</i>		2.3
<i>Loss tangent</i>		<0.0001
<i>Surface breakdown at flash over, kV</i>		24
<i>Electrical strength, V/mil(0.001")</i>		730

Compatibility

Apiezon T grease is compatible with a wide range of o-ring materials including:-

- ▶ Viton
- ▶ Silicone
- ▶ Nitrile (>30% nitrile content)
- ▶ Nylon
- ▶ Polyurethane
- ▶ Polyethylene
- ▶ Polypropylene

Due to the hydrocarbon base Apiezon T grease is not compatible with:-

- ▶ EPDM (ethylene propylene diene M-class rubber)
- ▶ EPR (ethylene propylene rubber)
- ▶ Butyl rubber
- ▶ PVC seals

Shelf life

The shelf life of Apiezon T grease is ten years from date of manufacture, providing the product is in the original unopened packaging and has been stored at ambient (10 to 30°C) temperature.

Barrier to oxygen transmission

Apiezon T grease has found a niche as a barrier to oxygen transmission in both vacuum and non-vacuum areas of use.

Industry approvals

Apiezon T grease is used extensively throughout all areas of science and industry. It has gained prestigious approvals for use from both NATO and the US Navy.