

Ultra High Vacuum Lubricating Grease

January 2018

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Introduction

With a vapour pressure of lower than 10^{-10} Torr at 20°C, Apiezon AP100 is a lubricating grease designed for use with equipment present within ultra high vacuum systems.

The key features of AP100 are shown in the table opposite.

Excellent Lubrication

Containing PTFE, Apiezon AP100 exhibits extremely high levels of lubricity. Indeed, with a lubricity 4 Ball Test value of 450 kg, it provides eight times the level of lubrication offered by conventional petroleum based lubricating greases.

Apiezon AP100 is thus ideal for use in stepping motors and gearboxes where it affords protection against abrasion and corrosion, particularly under high load conditions.

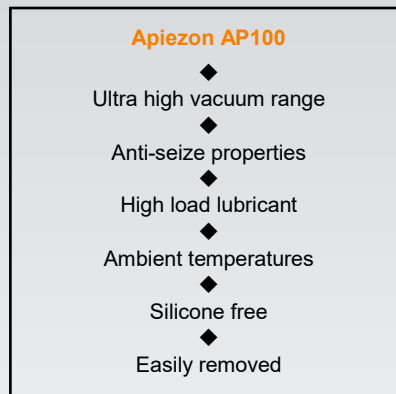
It can also be used to prevent the seizure of glass joints, stopcocks and taps or the corrosion of small metal fastenings.

Ultra High Vacuum

As the vapour pressure graph opposite demonstrates, Apiezon AP100 exhibits extremely low vapour pressure characteristics at ambient temperatures and can be used with confidence under ultra high vacuum conditions.

Ambient temperatures

Apiezon AP100 is formulated for use at ambient temperatures.



Easily removed

Apiezon AP100 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.

AP100 works when you want it to, but is easily removed when you don't.

Silicone free

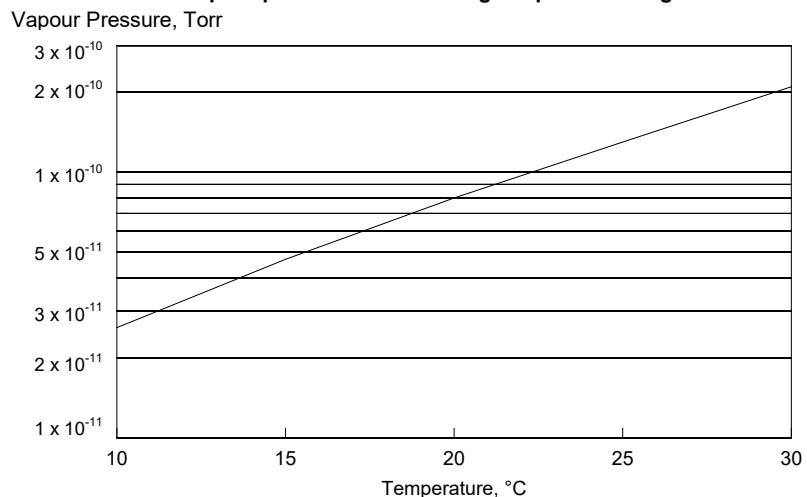
As a hydrocarbon based grease, Apiezon AP100 is highly resistant to "creep" or "carry over", a phenomenon associated with silicone-based products. Silicone has a tendency to travel away from the area of application and contaminate adjacent surfaces.

The creep resistance of Apiezon AP100 benefits scientific users as it reduces sample contamination and the risk of interference in analytical techniques such as infra-red and mass spectrometry.

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. Likewise in semiconductor manufacture, yields can be severely affected by silicone contamination.

When using silicone-free Apiezon AP100 the problems associated with creep and contamination are avoided.

Vapour pressure over working temperature range



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"Gettering" action

Apiezon AP100 grease is manufactured from a unique feedstock containing a high proportion of branched and unsaturated hydrocarbons. These complex structures give AP100 a very high molecular weight and consequently strong powers of absorption, particularly for other hydrocarbon molecules.

Strong absorption properties ensure that Apiezon AP100 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.

AP100 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.

Typical Properties		
<i>Typical working temperature range</i>	°C	10 to 30
	°F	50 to 86
<i>Dropping point - ASTM.D 566</i>	°C	42 to 52
	°F	108 to 126
<i>Vapour pressure @ 20°C / 68°F, Torr</i>		7 x 10 ⁻¹¹
<i>Relative density @ 20°C / 68°F, Torr</i>		1.042
<i>Outgassing characteristics - ASTM.E 595</i>		
<i>TML</i>		<1%
<i>CVCM</i>		<0.1%
<i>Lubricity 4 Ball Test - ASTM.D 2596, kg</i>		450

Compatibility

Apiezon AP100 is compatible with a wide range of o-ring materials including:-

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

Due to its hydrocarbon base, Apiezon AP100 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 AP100 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.