

**Specifications Tables:**

**Table 1 - Properties of Diffusion Pump Oils**

	<a href="#">AP 201</a>	<a href="#">AP301</a>	<a href="#">Oil J</a>	<a href="#">Oil K</a>
Ultimate Pressure obtainable, torr	4x10 <sup>-5</sup>	10 <sup>-7</sup>		
Average boiling point, °C at 1 torr	160	225		
Specific gravity at 20 °C	0.862	0.979	0.918	0.919
Specific Gravity at 30 °C			0.911	0.914
Density g/mL at 10°C			0.923	0.921
Density g/mL at 20°C			0.918	0.916
Density g/mL at 30 °C			0.909	0.912
Density g/mL at 40 °C			0.903	0.904
Flash Point, Pensky-Martins, oF closed (ASTM D93 and IP 36/63, open fire)	385 399	530 581	590 665 >700	645 660 >700
Viscosity, dynamic at 40 °C			3005	5160
Pour Point, ASTM, oF (D97/66)	-22	-40	30	30
Coefficient of expansion per °C (a)	0.00070		0.00070	0.00062
Coefficient of expansion per °C (b)			0.00083	0.00070
Average Molecular Weight	310	470	1130	1355
Refractive Index at 20 °C (c)	1.4760	1.453		
Thermal Conductivity w/m/ °C			0.167	0.169
Specific heat at 25 °, cal/g	0.46		0.48	0.46

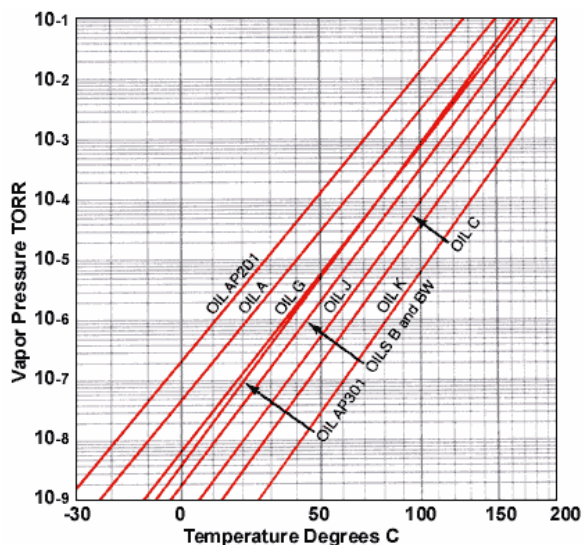
(a) over 20 °C to 30 °C (ASTM D 1903/61T)

(b) over 10 °C to 40 °C

(c) ASTM D 1807-62T Sodium Line

**Vapour pressure Curves:**

Below shows the vapor pressure curves for the oils.



One vapor-diffusion pump oil cannot meet all the requirements of the various pumps in use. For example, for large scale pumps a robust, medium high vacuum oil is required; for high vacuum work a high quality, stable, very low vapor pressure fluid is needed; for general laboratory use there is a need for a relatively inexpensive low vapor-pressure fluid. To cover these various requirements, several grades of Apiezon vapor-diffusion pump oils are available.

### **Extra Info:**

Apiezon oils are unaffected by traces of water in the vapor being pumped and will not liberate corrosive acids.

Other special advantages of the Apiezon oils over other vapor diffusion pump fluids include their resistance to many different chemical vapors likely to be pumped and good pumping speeds to give low fine side pressures without the disadvantage of very low critical backing pressures.

Apiezon oils are highly refined, specially manufactured products, and as such are tools of the specialist in high vacuum work. To obtain maximum efficiency with the equipment, the oils must be used in the proper manner according to the technique developed in this highly specialized field. Thus vapor diffusion pumps employing Apiezon oils should not be opened to the atmosphere when the oil is hot if the life of the oil is to be utilized to the maximum. Similarly the diffusion pump heaters should not be energized when the backing pressure of the pump is in excess of 0.4 torr. Increases of pressure over short periods will not harm the oil provided the pump is of suitable design.

Certain Apiezon oils are available which have been treated with a suitable anti-oxidant. These are known as the Apiezon AP series and will withstand a considerable number (500-1,000) of atmospheric exposures while hot. Apiezon Oil AP 201 is an inhibited oil for use in booster diffusion pumps. Oil AP 301 is a synthetic ester with added inhibitors and passivators.

Apiezon oils have found several interesting uses in recent years outside the original high vacuum applications for which they were formulated. To assist research workers in evaluating Apiezon oils for new applications, a comprehensive list of physical properties is given in Table 1. Figure 1 shows the vapor pressure curves for the oils.

### **Precautions:**

Apiezon products have been widely and safely used in vacuum distillation apparatus in both industry and laboratories for a number of years. As a result they should not present a health hazard assuming normal standards of industrial hygiene and safety are followed in their handling.

All Apiezon products are based on petroleum products of a low order of acute toxicity. However, certain individuals develop a rash after repeated contact. Therefore, it is recommended that gloves be worn to handle Apiezon. If Apiezon material is inadvertently in contact with the skin, wipe the area carefully, then cleanse thoroughly using a mild soap. Should any Apiezon products be heated for application, vent the fumes and avoid breathing the warm vapors.

In terms of explosion and fire, Apiezon products are considered non-hazardous.