

Oil for Rotary Vacuum Pumps **ULVOIL[®] R-7000/R-7500/R-8000**

Due to their extremely high chemical stability, R-7000, R-7500, and R-8000 oil is particularly well suited for use in pumps that process reactive gases, in the semiconductor industry. These oil combines chemical stability on the level of synthetic fluorine based oil with the ease of handling and cost effectiveness of petroleum based oil.



Features

- Super R Series oil is synthetic hydrocarbon based vacuum pump oil containing a newly developed aromatic ring for semiconductor processes. These oil provide excellent thermal resistance, oxidation resistance, and chemical resistance.
- Main advantages of Super R Series oil
 - Compared to petroleum (mineral oil) based pump oil, Super R Series oil are stronger relative to exhaust gases such as NO_x O₂, O₃, and halogen compounds. Super R Series oil has a lifespan of 20 to 30 times greater than mineral oil and are optimized for use in oil-sealed rotary vacuum pumps, that pump special gases (Super R-7500).
 - Although very hard particles enter the pump along with corrosive (active) gases during semiconductor production processes, Super R series oil has an excellent capability to evenly disperse these particles. A great reduction in the number of oil replacements can therefore be realized (Super R-7500).
 - When an oil filter is used, the replacement period is greatly extended since very few mesh clogs occur. In addition, overhauls are easy, since contaminants do not easily accumulate inside the piping and pumping system (Super R-7500).
 - Since Super R series oil consists of synthetic hydrocarbon with an aromatic ring structure, oil replacement and disposal at the time of overhauls can be handled in the same way as conventional petroleum (mineral oil) based oil.

Specifications

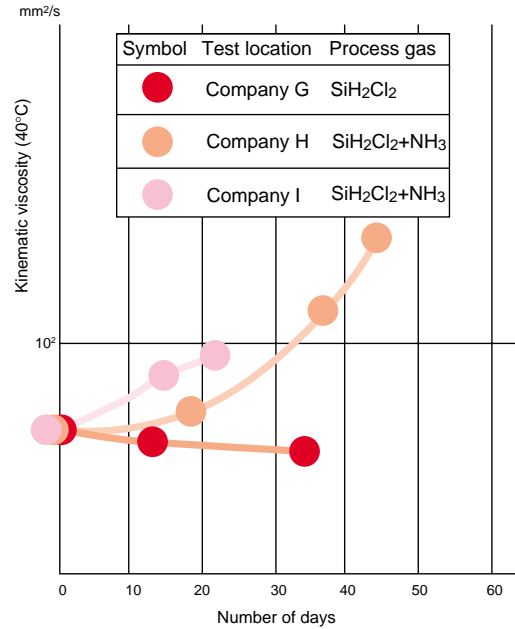
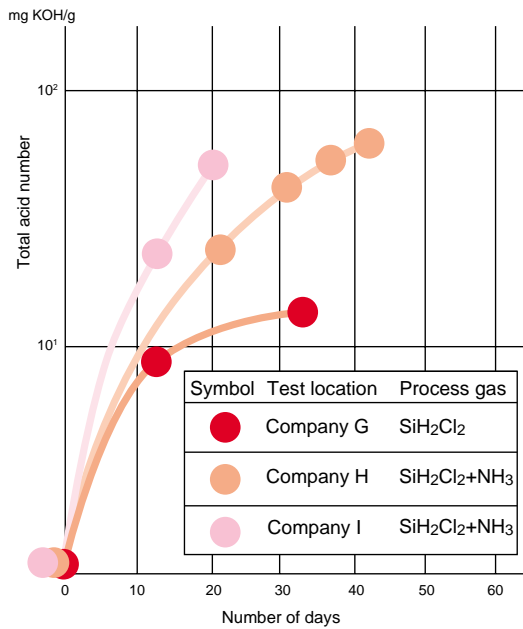
Item	Model	Hydrocarbon based synthetic oil			Test method	
		Super R-7000	Super R-7500	Super R-8000		
Ultimate pressure	Pa	<7 x 10 ⁻¹	<7 x 10 ⁻¹	<7 x 10 ⁻¹	Internal ULVAC evaluation method	
Characteristics	Color	Light brown, transparent	Brown, transparent	Light brown, transparent	Visual evaluation	
	Kinematic viscosity	40°C mm ² /s	68	68	78	JIS K 2283
		100°C mm ² /s	10	10	12	JIS K 2283
	Viscosity index		110	115	140	JIS K 2283
	Water content	%	<0.01	<0.01	<0.01	JIS K 2275
	Total acid number	mg KOH/g	<0.1	<0.5	<0.1	JIS K 2501
	Density	g/cm ³	0.91	0.91	0.91	JIS K 2249
	Ignition point	°C	220	220	220	JIS K 2265
Pour point	°C	-20	-20	-20	JIS K 2269	
Features		Long life, All-purpose pump oil	Oil containing dust separating agent	High viscosity index	—	
Main applications		Active gas pumping, Etching	Dust and gas pumping, LPCVD	Pumps operating at high temperatures with high loads, Asher	—	
Container	L	4.0	4.0	4.0	—	

Super R Series: Technical Data

Super R-7500

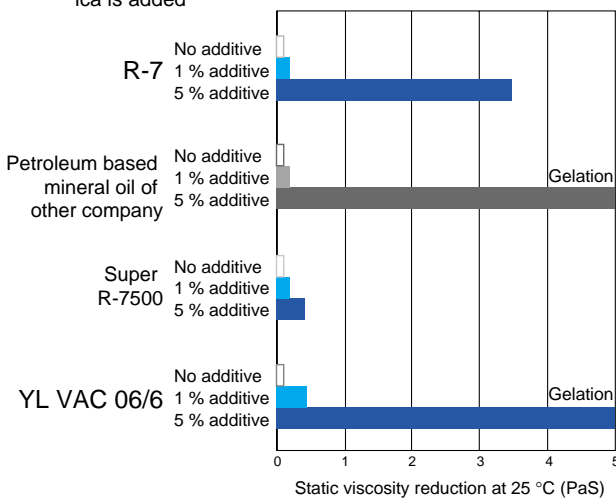
Test parameters: Test system nameLP-CVD
 Process gas.....SiH₂Cl₂, NH₃
 Test oilULVOIL Super R-7000
 Oil-sealed rotary vacuum pump usedD-330 without oil filter (made by ULVAC)
 Number of operation days43 days (24hr operation)

Test results: Change in oiliness over time



Dust resistance

Dust resistance: Static viscosity change when colloidal silica is added



Test results: Metallic contamination of oil

Change in metallic contamination of oil over time

Operation time (days)	Metallic elements (quantity: ppm)										
	Fe	Pb	Cu	Cr	Al	Ni	Sn	Si	B	Na	P
0 (New oil)	0	0	0	0	0	0	0	0	0	0	0
21	12	0	0	0	0	0	0	3,942*	0	0	0
28	13	0	0	0	0	0	0	6,071*	0	0	0
36	13	0	0	0	12	0	0	8,915*	0	0	0
43	13	0	0	0	12	0	0	11,880*	0	0	0

* Contamination by reaction products of CVD process gas

Hydrofluoride resistivity

Hydrofluoride resistivity: Viscosity reduction after hydrofluoride added and mixing

