

Dultmeier Sales

Viscous Liquids

Viscosity Measures a Liquid's Resistance to Flow

VISCOSITY CONVERSION TABLE							
SAYBOLT UNIVERSAL SSU	STOKES	CENTI STOKES	POISES*	CENTI* POISES	ENGLER SECONDS	REDWOOD NO. 1 SECONDS	TYPICAL LIQUIDS AT 70° F.
31	.010	1.00	.008	.8	54	29.0	WATER
35	.025	2.56	.020	2.05	59	32.1	KEROSENE
50	.074	7.40	.059	5.92	80	44.3	NO. 2 FUEL OIL
80	.157	15.70	.126	12.60	125	69.2	NO. 4 FUEL OIL
100	.202	20.20	.162	16.20	150	85.6	TRANSFORMER OIL
200	.432	43.20	.346	34.60	295	170	HYDRAULIC OIL
300	.654	65.40	.522	52.20	470	254	SAE 10W OIL
500	1.10	110.00	.88	88.0	760	423	SAE 10 OIL
1,000	2.16	220.00	1.73	173	1,500	896	SAE 20 OIL
2,000	4.4	440.00	3.52	352	3,000	1,690	SAE 30 OIL
5,000	10.8	1,080.00	8.80	880	7,500	4,230	SAE 50 OIL
10,000	21.6	2,160.00	17.00	1,760	15,000	8,460	SAE 60-70 OIL
50,000	108.0	10,800.00	88.00	8,800	75,000	43,660	MOLASSES B
100,000	216.0	21,600.00	173.00	17,300	150,000	88,160	MOLASSES C

*Poises/centipoises are given for oil of .8 spec. gravity, relationship is centistokes x specific gravity = centipoises.

Pumping Viscous Liquids with Centrifugal Pumps

Centrifugals are generally not suitable for pumping viscous liquids. However, **liquids with viscosities up to 2000 SSU can be handled with centrifugal pumps.**

Percent reduction in flow and head and percent increase in power when pumping viscous liquid instead of water are shown in the adjacent table. The volume and pressure of the pump will be reduced according to the following table.

Viscosity SSU	30	100	250	500	750	1000	1500	2000
Flow Reduction GPM %	-	3	8	4	19	23	30	40
Head Reduction Feet %	-	2	5	11	14	18	23	30
Horsepower Increase %	-	10	20	30	50	65	85	100

Pumping of Viscous Liquids with Gear Pumps

Gear pumps are well suited for pumping of viscous liquids if the following rules are observed.

- 1) Pump speed (RPM) must be reduced. Use table No. 1 below as guide.
- 2) Suction/discharge lines must be increased by at least 1, or better 2 pipe sizes over the size of the pump ports.

- 3) Horsepower of the motor must be increased over whatever power would be required for pumping water under the same pressure & flow. Use table No. 2 below which gives the percentage increase in horsepower for various pressures & viscosities.

TABLE NO. 1 SPEED REDUCTION	
Viscosity in SSU	Recommended Speed (RPM)
50	1725
500	1500
1,000	1300
5,000	1000
10,000	600
50,000	400
100,000	200

TABLE NO. 2 % INCREASE IN HORSEPOWER							
PRESSURE PSI	VISCOSITY IN SSU						
	30	500	1000	5000	10000	50000	100000
2	-	30	60	120	200	300	400
20	-	25	50	100	160	260	350
40	-	20	40	80	120	220	300
60	-	15	30	60	105	180	250
80	-	12	25	50	90	150	200
100	-	10	20	40	80	120	150