

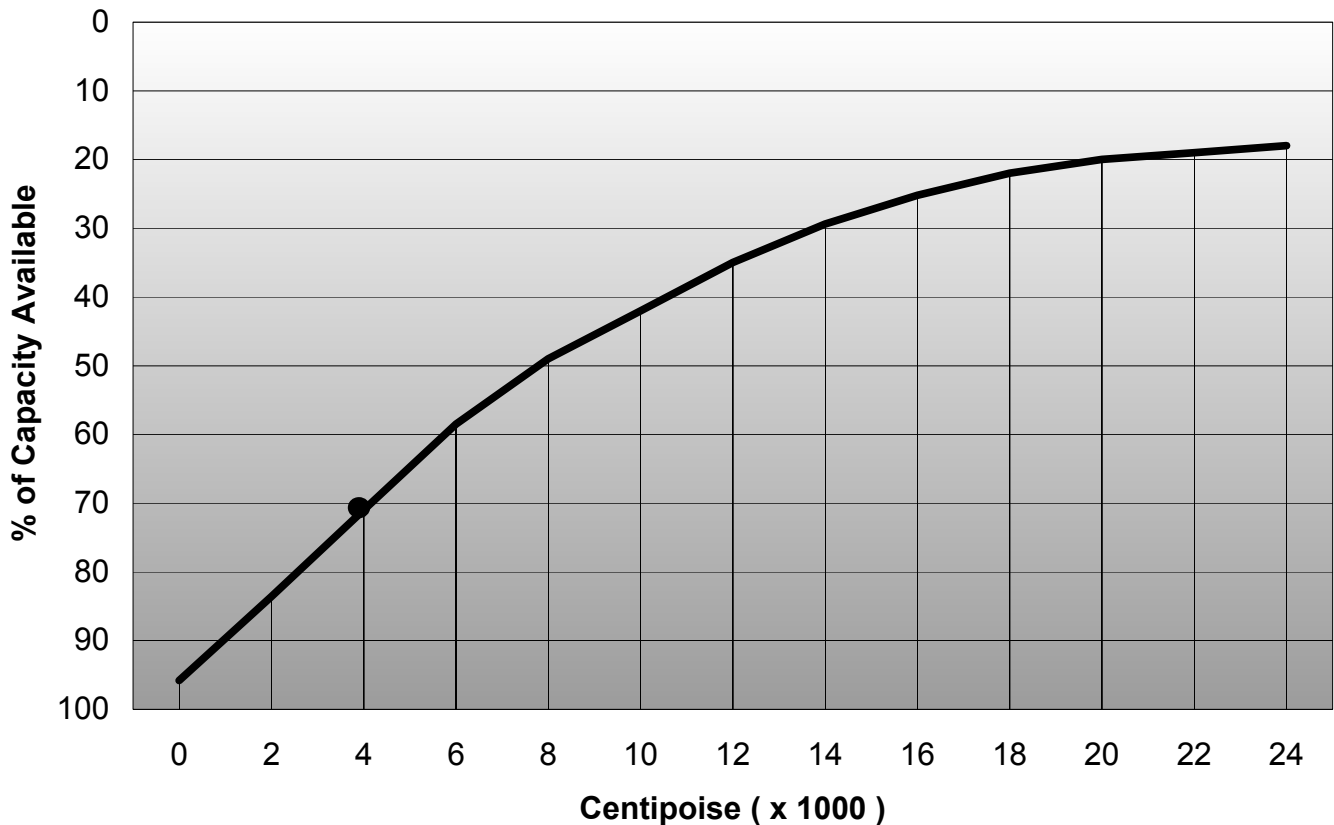
The Blagdon range of Air Operated Double Diaphragm Pumps is well suited to pumping viscous fluids. Its positive displacement principles ensure that it can handle viscous fluids relatively easily. Also, because of the nature of the pumping action the Blagdon range is extremely suitable for handling those fluids which are shear sensitive.

However, it is necessary to understand that viscosity has a detrimental effect on a pumps rated capacity. Viscosity is defined as **'the resistance of a fluid or the property of a fluid that resists any force which would tend to produce flow'**. From this definition it is easy to understand that a certain amount of the energy available at the pump will be absorbed, overcoming the **'resistance'** of a viscous fluid, what remains is then available to provide flow and pressure.

Factors which can affect the viscosity of liquids are temperature and agitation. A change of pressure usually does not affect the viscosity. A change of temperature will vary the viscosity of all liquids noticeably. Agitation only influences certain fluids, therefore fluids are usually grouped under one of three classifications.

- Newtonian Fluid- A fluid which when subjected to agitation at a constant temperature does not change in viscosity. (i.e. mineral oil).
- Dilatant Fluid- A fluid which when subjected. to agitation at a constant temperature increases in viscosity as agitation increases (i.e. clay slurries, candy compounds).
- Thixotropic Fluid- A fluid which when subjected to agitation at a constant temperature decreases in viscosity as agitation increases (i.e. molasses, waxes, corn syrup).

Below is a viscosity correction curve which should be consulted when sizing the Blagdon range of pumps in viscous applications.



EXAMPLE	Flow - 12 UKGPM (54.6 11m)
	Head - 20 ft.
A Blagdon Pump is required for the following duty:-	Media: 5.g. - 1.1
	Viscosity - 4000 centipoise

A flow rate of 12 UK gallons per minute places this duty well within the capacity of a B25 pump. (The rated output of a ball valve version of the B25 is 30 UKGPM at zero head). The published flow of 30 UKGPM is now corrected by the effect of the viscous fluid (e.g. 4000 cps @ S.g. 1.1) by reading off from the viscosity correction curve above (see dot) - available capacity is now 71%. Therefore corrected capacity is 30 x .71 = 21.3 UKGPM.

This calculation shows that the available capacity left, taking into account the viscous fluid, is 21.3 UKGPM. 12 UKGPM being less than the available capacity means that a B25 will be suitable for this duty.

PLEASE NOTE: This correction formula should be used as a guide only as there is no proven empirical formula for double diaphragm pumps viz a viz viscosity correction.

Poise	CENTIPOISE	DuPont Parlin 7	DuPont Parlin 10	Fisher 1	Fisher 2	Ford Cup 2	Ford Cup 4	Gardner Holdt Bubble	Gardner Lithographic	Krebs Units	Saybolt Universal SSU	Zahn 1	Zahn 2	Zahn 3	Zahn 4	Zahn 5	Sears Craftsman Cup	Redwood No.1 Sec	Engler Degrees	Saybolt Furol Sec	Redwood No.2 Sec	
0.1	10	27	11	20			5	A4			60	30	16					54	1.84			
0.15	15	30	12	25			8	A3			80	34	17					70	2.35			
0.2	20	32	13	30	15	12	10				100	37	18					98	2.90			
0.25	25	37	14	35	17	15	12	A2			130	41	19					106	3.48			
0.3	30	43	15	39	18	19	14	A1			160	44	20					125	4.10			
0.4	40	50	16	50	21	25	18	A			210	52	22				19	165	5.39			
0.5	50	57	17		24	29	22			30	260	60	24				20	203	6.78			
0.6	60	64	18		29	33	25	B		33	320	68	27				21	245	8.05	30.8		
0.7	70		20		33	36	28			35	370		30				23	286	9.40	35.0	30.05	
0.8	80		22		39	41	31	C		37	430		34				24	327	10.60	40.0	34.00	
0.9	90		23		44	45	32			38	480		37	10			26	368	11.80	44.7	37.85	
1	100		25		50	50	34	D		40	530		41	12	10		27	409	14.25	47.8	41.90	
1.2	120		30		62	58	41	E		43	580		49	14	11		31	485	15.95	58.2	49.80	
1.4	140		32			66	45	E		46	690		58	16	13		34	570	18.55	66.8	57.90	
1.6	160		37				50	G		48	790		66	18	14		38	645	21.10	76.4	66.00	
1.8	180		41				54		000	50	900		74	20	16		40	735	23.90	86.3	74.15	
2	200		45				58	H		52	1000		82	23	17	10	44	815	26.75	95.8	82.35	
2.2	220						62	I		54	1100			25	18	11		900	28.15	104.6	90.00	
2.4	240						65	J		56	1200			28	19	12		985	33.60	113.5	97.75	
2.6	260						68			58	1280			30	21	13		1060	34.65	124.5	105.60	
2.8	280						70	K		59	1380			32	22	14		1140	37.25	137.5	114.90	
3	300						74	L		60	1475			34	24	15		1235	39.85	143.2	123.75	
3.2	320							M			1530			36	25	16		1300	42.35	151.8	131.65	
3.4	340							N			1630			39	26	17		1390	45.00	161.3	139.50	
3.6	360							O		62	1730			41	28	18		1465	47.75	171.5	149.00	
3.8	380										1850			43	29	19		1550	50.10	180.0	157.55	
4	400							P		64	1950			46	30	20		1635	52.45	189.5	166.35	
4.2	420										2050			48	32	21		1695	52.95	199.5	171.65	
4.4	440							Q			2160			50	33	22		1790	54.20	209.5	183.50	
4.6	460							R		66	2270			52	34	23		1837	60.60	218.4	188.65	
4.8	480								00	67	2380			54	36	24		1950	63.85	228.9	198.75	
5	500							S		68	2480			57	37	25		2045	65.95	239.4	208.85	
5.5	550							T		69	2660			63	40	27		2240	72.85	259.7	229.95	
6	600							U		71	2900			68	44	30		2433	79.50	287.6	248.50	
7	700									74	3375				51	35		2850	92.30	332.4	289.60	
8	800								0	77	3880				58	40		3270	106.45	380.1	329.75	
9	900							V		81	4300				64	45		3690	119.50	427.8	368.85	
10	1000							W		85	4600					49		4000	133.50	479.6	408.70	
11	1100									88	5200					55						
12	1200									92	5620					59						
13	1300							X		95	6100					64						
14	1400								1	96	6480											
15	1500									98	7000											
16	1600									100	7500											
17	1700									101	8000											
18	1800							Y			8500											
19	1900										9000											
20	2000									103	9400											
21	2100										9850											
22	2200										103000											
23	2300							Z	2	105	10750											
24	2400									109	11200											
25	2500							Z1		114	11600											
30	3000									121	14500											
35	3500							Z2	3	129	16500											
40	4000									133	18500											
45	4500							Z3		136	21000											
50	5000										23500											
55	5500										26000											
60	6000							Z4	4		28000											
65	6500										30000											
70	7000										32500											
75	7500										35000											
80	8000										37000											
85	8500										39500											
90	9000										41000											
95	9500										43000											
100	10000							Z5	5		46500											
110	11000										51000											
120	12000										55500											
130	13000										60000											
140	14000										65000											
150	15000							Z6			69500											
160	16000										74000											
170	17000										80000											
180	18000										83500											
190	19000										88000											
200	20000										93000											
300	30000										140000											

All viscosity comparisons are as accurate as possible with existing information. Comparisons are made with materials having a specific gravity of one.

To extend range of only the kinematic Saybolt Universal, Redwood No 1 and Engler Scales Multiply by 10, the viscosities on these scales between 100 and 1000 Centistokes on the Kinematic Scale and the corresponding viscosities on the other 3 scales. For further extension multiply these scales as above by 100 or a higher power of 10.

Example:

1500 Centistokes = 150 X 10 CS 695 X 10 SUS