

MEASURING RANGE

Model 35 Direct Indicating Viscometer

ROTOR-BOB	R1 B1	R2 B1	R3 B1	R1 B2	R1 B3	R1 B4
BASIC DATA						
Rotor Radius, R _o , cm	1.8415	1.7588	2.5866	1.8415	1.8415	1.8415
Bob Radius, R _j , cm	1.7245	1.7245	1.7245	1.2276	0.8622	0.8622
Bob Height, L, cm	3.800	3.800	3.800	3.800	3.800	1.900
Shear Gap, in Annulus, cm	0.1170	0.0343	0.8261	0.6139	0.9793	0.9793
Radii Ratio, R _j / R _o	0.9365	0.9805	0.667	0.666	0.468	0.468
Maximum Use Temperature, °C (°F)	93 (200)	93 (200)	93 (200)	93 (200)	93 (200)	93 (200)
Minimum Use Temperature, °C (°F)	0 (32)	0 (32)	0 (32)	0 (32)	0 (32)	0 (32)
Overall Instrument Constant, K	300.0	94.18	1355	2672	7620	15,200
Standard F1 Torsion Spring $\eta = Kf\theta/N$						
SHEAR STRESS RANGE						
Shear Stress Constant for Effective Bob Surface k ₂ , cm ⁻³	0.01323	0.01323	0.01323	0.0261	0.0529	0.106
Shear Stress Range, dynes/cm² $\gamma = k_1 k_2 \theta$						
F 0.2 $\theta = 1^\circ$	1.02	1.02	1.02	2.01	4.1	8.2
F 0.2 $\theta = 300^\circ$	307	307	307	605	1225	2450
F 0.5 $\theta = 1^\circ$	2.56	2.56	2.56	5.04	10.2	20.4
F 0.5 $\theta = 300^\circ$	766	766	766	1510	3060	6140
F1 $\theta = 1^\circ$	5.11	5.11	5.11	10.1	20.4	40.9
F1 $\theta = 300^\circ$	1533	1533	1533	3022	6125	12,300
F2 $\theta = 1^\circ$	10.22	10.22	10.22	20.1	40.8	81.8
F2 $\theta = 300^\circ$	3066	3066	3066	6044	12,250	24,500
F3 $\theta = 1^\circ$	15.3	15.3	15.3	30.2	61.3	123
F3 $\theta = 300^\circ$	4600	4600	4600	9067	18,400	36,800
F4 $\theta = 1^\circ$	20.4	20.4	20.4	40.3	81.7	164
F4 $\theta = 300^\circ$	6132	6132	6132	12,090	24,500	49,100
F5 $\theta = 1^\circ$	25.6	25.6	25.6	50.4	102	205
F5 $\theta = 300^\circ$	7665	7665	7665	15,100	30,600	61,400
F10 $\theta = 1^\circ$	51.1	51.1	51.1	100.7	204	409
F10 $\theta = 300^\circ$	15330	15330	15330	30,200	61,200	123,000
SHEAR RATE RANGE						
Shear Rate Constant k ₃ , sec ⁻¹ per rpm	1.7023	5.4225	0.377	0.377	0.268	0.268
Shear Rate range, sec⁻¹ $\dot{\gamma} = k_3 N$						
N = 0.9 rpm	1.5	4.9	0.4	0.4	0.24	0.24
N = 1.8 rpm	3.1	9.8	0.7	0.7	0.48	0.48
N = 3 rpm	5.1	16.3	1.1	1.1	0.80	0.80
N = 6 rpm	10.2	32.5	2.3	2.3	1.61	1.61
N = 30 rpm	51.1	163	11.3	11.3	8.0	8.0
N = 60 rpm	102	325	22.6	22.6	16.1	16.1
N = 90 rpm	153	488	33.9	33.9	24.1	24.1
N = 100 rpm	170	542	37.7	37.7	26.8	26.8
N = 180 rpm	306	976	67.9	67.9	48.2	48.2
N = 200 rpm	340	1084	75.4	75.4	53.6	53.6
N = 300 rpm	511	1627	113	113	80.4	80.4
N = 600 rpm	1021	3254	226	226	161	161
VISCOSITY RANGE IN CENTIPOISE⁽¹⁾						
Minimum Viscosity⁽²⁾ 600 rpm maximum	0.5 ⁽³⁾	0.5 ⁽³⁾	2.3	4.5	12.7	25
Maximum Viscosity⁽⁴⁾						
Model 35A & 35SA, 3 rpm minimum	30,000	9,400	135,000	270,000	762,000	1,500,000
Model 35A/SR 12 & 35SA/SR 12, 0.9 rpm min.	100,000	31,400	400,000	890,000	2,550,000	5,000,000

Notes:

- (1) Computed for standard Torsion Spring (f = 1.) For other torsion springs multiply viscosity range by f factor.
- (2) Minimum viscosity is computed for minimum shear stress and maximum shear rate.
- (3) For practical purposes the minimum viscosity is limited to 0.5 cP because of Taylor Vortices.
- (4) Maximum viscosity is computed for maximum shear stress and minimum shear rate.