

Appendix C – Measurement Range

Measuring Range for M5500 Viscometers

ROTOR/BOB	R1 B1	R1 B2	R1 B3	R1 B4	R1 B5
BASIC DATA					
Rotor Radius (cm)	1.8415	1.8415	1.8415	1.8415	1.8415
Bob Radius (cm)	1.7245	1.2276	0.8622	0.8622	1.5987
Bob Height (cm)	7.620	7.620	7.620	3.810	7.620
Shear Gap in Annulus (cm)	0.1170	0.6139	0.9793	0.9793	0.2428
Radii Ratio, R_1/R_0	0.9365	0.3770	0.2682	0.2682	0.8503
Maximum Use Temperature (°C)	93	93	93	93	93
Minimum Use Temperature (°C)	0	0	0	0	0
SHEAR STRESS RANGE					
Shear Stress Range W/ 0.1 Resilience (dynes/cm ²)	0.1~1,250	0.2~2,241	0.4~4,482	0.8~8,964	0.1~1,250
Shear Stress Range Standard (dynes/cm ²)	1~10,000	2~17,930	4~40,000	8~80,000	1~10,000
SHEAR RATE RANGE					
Shear Rate Constant k_3 , sec ⁻¹ per rpm	1.7023	0.377	0.268	0.268	0.850
Shear Rate Range, sec ⁻¹ $\dot{\gamma} = k_3 N$					
N = 0.0001 rpm	0.00017	0.000038	0.000027	0.000027	0.000085
N = 0.01 rpm	0.017	0.0038	0.0027	0.0027	0.0085
N = 1 rpm	1.7	0.38	0.27	0.27	0.85
N = 10 rpm	17	3.8	2.7	2.7	8.5
N = 100 rpm	170	37.7	26.8	26.8	85.0
N = 1,100 rpm	1,873	415	295	295	935
VISCOSITY RANGE IN CENTIPOISE					
Minimum Viscosity W/ 0.1 Resilience ⁽¹⁾	0.005	0.048	0.136	0.271	0.038
Maximum Viscosity W/ 0.1 Resilience ⁽²⁾	588,000,000	47,200,000	14,800,000,000	29,600,000,000	2,631,579
Minimum Viscosity Standard ⁽¹⁾	0.05	0.48	1.36	2.71	0.38
Maximum Viscosity Standard ⁽²⁾	5,880,000,000	472,000,000	148,000,000,000	296,000,000,000	26,315,789
Note ⁽¹⁾ Calculated with maximum shear rate and minimum reading.					
Note ⁽²⁾ Calculated with minimum shear rate and maximum reading.					