

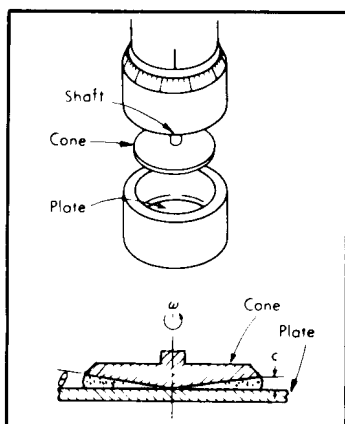
CONE/PLATE VISCOMETER



INTRODUCTION

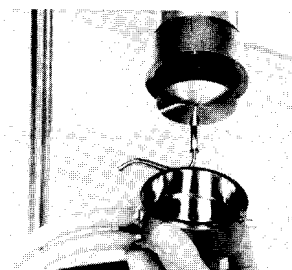
The Wells-Brookfield Cone/Plate Viscometer gives researchers a sophisticated instrument for routinely determining absolute viscosity of fluids in small sample volumes. Its cone and plate geometry provides the precision necessary for development of complete rheological data.

PRINCIPLE OF OPERATION



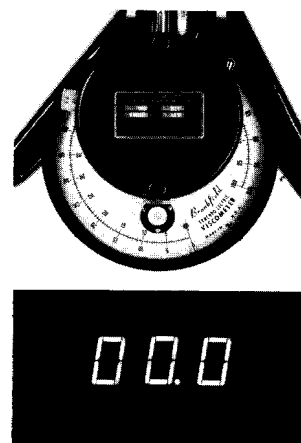
The Wells-Brookfield Cone/Plate Viscometer is a precise torque meter which is driven at discrete rotational speeds. The torque measuring system, which consists of a calibrated beryllium-copper spring

connecting the drive mechanism to a rotating cone, senses the resistance to rotation caused by the presence of sample fluid between the cone and a stationary flat plate.



The resistance to the rotation of the cone produces a torque that is proportional to the shear stress in the fluid. The amount of torque is indicated either on a dial or digital

display, depending on model. This reading is easily converted to absolute centipoise units (mPa·s) from pre-calculated range charts. Alternatively, viscosity can be calculated from the known geometric constants of the cone, the rate of rotation, and the stress related torque. (See Page 10).

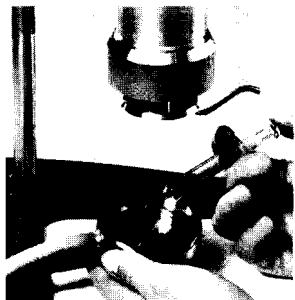


CONE/PLATE VISCOMETER RANGES - CENTIPOISE (mPa·s)
DIGITAL LVTD/DIAL READING LVT

3.0° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-41 2 ml SAMPLE	CONE # CP-52 0.5 ml SAMPLE
60	120.0	19.2	155.33
30	60.0	38.4	310.66
12	24.0	96.0	776.64
6	12.0	192.0	1,553.3
3	6.0	384.0	3,106.6
1.5	3.0	768.0	6,213.1
0.6	1.2	1,920.0	15,532.8
0.3	0.6	3,840.0	31,065.6
1.565° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-42 1 ml SAMPLE	CONE # CP-51 0.5 ml SAMPLE
60	230.0	10.00	80.90
30	115.0	20.00	161.80
12	46.0	50.00	404.50
6	23.0	100.00	809.00
3	11.50	200.00	1,618.00
1.5	5.75	400.00	3,236.0
0.6	2.30	1,000.0	8,090.0
0.3	1.15	2,000.0	16,180.0
0.8° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-40 0.5 ml SAMPLE	CONE # CP-50 0.2 ml SAMPLE
60	450.0	5.14	41.36
30	225.0	10.28	82.72
12	90.0	25.70	206.80
6	45.0	51.40	413.60
3	22.5	102.80	827.20
1.5	11.25	205.60	1,654.4
0.6	4.50	514.00	4,136.0
0.3	2.25	1,028.0	8,272.0

*Shown are typical ranges. Other torque calibrations and rotational speeds are available.

The correct relative position of cone and plate is obtained by following a simple mechanical procedure without the need for external gauges or supplementary instrumentation.



The stationary plate forms the bottom of a sample cup which can be removed, filled with .2 ml to 2.0 ml of sample fluid (depending on cone in use), and re-mounted without

disturbing the calibration. The sample cup is jacketed and has tube fittings for connection to a constant temperature circulating bath.

The system is accurate to within 1% of the working range. Reproducibility is to within 0.2%

VERSATILITY OF APPLICATION

The Wells-Brookfield Cone/Plate Viscometer is equipped with an 8-speed transmission that has a 200:1 ratio of maximum to minimum speeds. This provides a wide variety of shear rates and viscosity ranges, which can be further extended by the use of interchangeable cone spindles. Different models can be selected to meet the specific range of viscosities and shear rates required. (See range tables)*.

Shear rates as high as 1500 sec^{-1} can be achieved with some models.

The small sample volume required permits rheological evaluations to be made on materials where sample availability is limited, such as biological fluids and thick film coatings that contain precious metals.

All wetted parts are stainless steel for corrosion resistance and ease of cleaning.

CONE/PLATE VISCOMETER RANGES - CENTIPOISE (mPa·s)
DIGITAL RVTD/DIAL READING RVT

3.0° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-41 2 ml SAMPLE	CONE # CP-52 0.5 ml SAMPLE
100	200	122.88	983
50	100	245.76	1,966
20	40	614.40	4,915
10	20	1,228.8	9,830
5	10	2,457.6	19,660
2.5	5	4,915.2	39,320
1.0	2	12,288.0	98,300
0.5	1	24,576.0	196,600
1.565° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-42 1 ml SAMPLE	CONE # CP-51 0.5 ml SAMPLE
100	384.0	64	512
50	192.0	128	1,024
20	76.8	320	2,560
10	38.4	640	5,120
5	19.20	1,280	10,240
2.5	9.60	2,560	20,480
1.0	3.84	6,400	51,200
0.5	1.92	12,800	102,400
0.8° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-40 0.5 ml SAMPLE	CONE # CP-50 0.2 ml SAMPLE
100	750.0	32.70	262
50	375.0	65.40	524
20	150.0	163.50	1,310
10	75.0	327.00	2,620
5	37.5	654.00	5,240
2.5	18.75	1,308.0	10,480
1.0	7.50	3,270.0	26,200
0.5	3.75	6,540.0	52,400

CONE/PLATE VISCOMETER RANGES - CENTIPOISE (mPa·s)
DIGITAL HBT/DIAL READING HBT

3.0° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-41 2 ml SAMPLE	CONE # CP-52 0.5 ml SAMPLE
100	200	983	7,864
50	100	1,966	15,728
20	40	4,915	39,321
10	20	9,830	78,643
5	10	19,660	157,286
2.5	5	39,320	314,572
1.0	2	98,300	786,430
0.5	1	196,600	1,572,860
1.565° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-42 1 ml SAMPLE	CONE # CP-51 0.5 ml SAMPLE
100	384.0	512	4,096
50	192.0	1,024	8,192
20	76.8	2,560	20,480
10	38.4	5,120	40,960
5	19.2	10,240	81,920
2.5	9.6	20,480	163,840
1.0	3.84	51,200	409,600
0.5	1.92	102,400	819,200
0.8° Cone Spindle			
SPEED (RPM)	SHEAR RATE (SEC ⁻¹)	CONE # CP-40 0.5 ml SAMPLE	CONE # CP-50 0.2 ml SAMPLE
100	750.0	262	2,096
50	375.0	524	4,192
20	150.0	1,310	10,480
10	75.0	2,620	20,960
5	37.5	5,240	41,920
2.5	18.75	10,480	83,840
1.0	7.50	26,200	209,600
0.5	3.75	52,400	419,200