



Low Shear Flow Rates

Vena8™ Glass Coverslip Cellix Biochips

Distributed in Europe by World Precision Instruments www.wpi-europe.com

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Vena8 Glass Coverslip Cellix Biochips — Low Shear / Flow Rates

Sample	Vena8GCS — LOW FLOW RATES						Pump Recommendations
	Shear Stress (dyne/cm ²)	Shear Rate (s ⁻¹)	Flow Rate (cm ³ /s)	Flow Rate (μL/min)	Flow Rate (μL/h)	Vol (μL) for 3 min experiment	
Cell suspension	0.1	10	0.00007	4	246	12	ExiGo/Mirus; 0.1–2 dynes/cm ²
Cell suspension	0.5	50	0.00034	20	1,229	61	ExiGo/Mirus; 0.1–2 dynes/cm ²
Cell suspension	1	100	0.00068	41	2,458	123	ExiGo/Mirus; 0.1–2 dynes/cm ²
Cell suspension	2	200	0.00137	82	4,915	246	ExiGo/Mirus; 0.1–2 dynes/cm ²
Whole blood	2.25	50	0.00034	20	1,229	61	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	4.5	100	0.00068	41	2,458	123	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	22.5	500	0.00341	205	12,288	614	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	50	1,111	0.00759	455	27,307	1,365	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	67.5	1,500	0.01024	614	36,864	1,843	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	81	1,800	0.01229	737	44,237	2,212	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	90	2,000	0.01365	819	49,152	2,458	ExiGo/Mirus; 0.45–9 dynes/cm ²
Whole blood	135	3,000	0.02048	1,229	73,728	3,686	ExiGo/Mirus; 0.45–9 dynes/cm ²

Specifications of Vena8 Glass Coverslip Biochips for Low Shear / Flow Rates

	Vena8GCS — LOW FLOW RATES
Channel width, b (cm)	0.16
Channel height, h (cm)	0.016
Channel length, l (cm)	2.8
Microcapillary/channel volume (cm ³)	0.007168
Microcapillary/channel volume (μL)	7.168

Flow rate: $Q = \tau b h^2 / 6\mu$	Viscosity of cell culture suspension, $\mu = 0.01$ dynes/cm ² ·s Viscosity of whole blood, $\mu = 0.045$ dynes/cm ² ·s
Shear Stress: $\tau = 6Q\mu / b h^2$	Equivalent to: cm ³ /s = 0.001 L/s = 0.06 L/min = 60 mL/min = 60000 μL/min

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