

freeslate jr.

Biologics formulation

Walk up, set up your run and walk away. Freeslate jr. automates the manual measurements you do one by one at the bench. Choose a combo of high-throughput pH with visual inspection, visual inspection with viscosity or viscosity with pH. Crank through more samples in a single day, get them done the same way every time and check out a broader developability and formulation space.

Applications

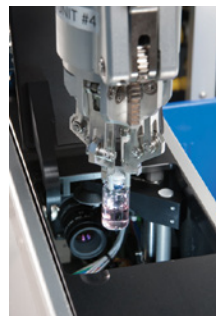
- Rapidly characterize a wide range of protein formulations with limited material
- Perform developability and preformulation screens
- Evaluate formulation robustness
- Formulation development
- Manage and track formulations and analytical results to facilitate rapid scientific decisions

Key features

- Automate pH, viscosity and visual inspection
- Use a wide range of vials and 96-well plates
- Check the pH of a 96-well plate in approximately 30 minutes
- Measure viscosity of protein formulations up to 1,000 cP with only 100 µL of sample
- Grab color, turbidity and visible particle count all in one shot
- Capture images and archive them for easy re-analysis



freeslate jr. configured for biologics formulation



Visual inspection station



Multi-channel pH probes



Viscosity station



Example freeslate jr. deck configured for biologics formulation

- | | |
|-----------------------|-----------------------------|
| 1 Vial/plate gripper | 5 3-Position plate rack |
| 2 Waste bin | 6 Visual inspection station |
| 3 Viscosity station | 7 Vial/plate hotel |
| 4 Tool and plate rack | |

Available options

Visual inspection station (VIS) analyses

Includes:

- Visual particle analysis
- Turbidity
- Color measurement

Vial size: 2–20 mL

Recommended sample volume: 1 mL in 2 mL serum vial

Measurement time: 2–3 min per vial

Suspended visible particle detection

Minimum particle size detected: 80 μ m

Maximum solution viscosity: 30–35 cP

Particle count accuracy:

- **No particles:** 0 particles detected
- **1–3 particles:** Detect at least 1 particle
- **4–9 particles:** Actual particle count \pm 2 particles
- **10–25 particles:** Actual particle count \pm 5 particles

Turbidity

Measurement range: 10–1000 NTU

Measurement accuracy: \pm 5 NTU (for non-absorbing samples)

Repeatability: \leq 3 NTU for 10 consecutive samples

Color measurement

Color: Correct match of Euro Pharmacopeia BY1–BY7 standards

pH measurement

Configuration: Single or 4-channel probe

Measurement time per 96-well plate: ~ 34 minutes

Range: pH 1–13

Resolution: 0.01 pH units

Repeatability: \pm 0.1 pH units

Viscosity station

Measurement range: 2–100 cP

Accuracy: \pm 0.5 cP + 10% of the actual viscosity

Repeatability: StDev $<$ 0.5 cP + 5% of mean

Sample volume: 100 μ L

Minimum volume in well: 200 μ L

Temperature range: 4–40 $^{\circ}$ C

Temperature accuracy: \pm 1 $^{\circ}$ C

Measurement time: 6 min/sample

Throughput: 10 samples/h

Vial/plate gripper

Plate size: Standard microtiter

Vial size: 1–125 mL

Total mass: Up to 3 kg

Viscous liquid dispenser

Technology: Positive displacement tip (PDT)

Disposable tip capabilities: 100 μ L from Rainin

Vortexing station

Orbital: Up to 2000 rpm max

Maximum vortexing mass: 860 g

Off-deck third-party instrument virtual integration

- DLS
- HPLC
- cIEF

Other systems available for virtual integration.

Please contact Unchained Labs for a full list of systems.

Facilities requirements

Physical

- **With integrated enclosure:**
105 cm W x 90.4 cm D x 140 cm H ~150 kg
- **With integrated table option:**
167 cm W x 90.4 cm D x 200 cm H ~240 kg

Electrical

- **freeslate jr.**
110–220 \pm 10% VAC, 50–60 Hz, 16 A
- **Computer:**
US: 115 V \pm 10 %, 60 Hz, 10 A
EU: 220–230 V \pm 10 %, 50 Hz, 16 A

Compressed dry air: 0.5–0.9 MPa (70–130 PSI), 16L/min (8 mm hose)



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