HORIZON®

HIGH THROUGHPUT LOW VOLUME SUBVISIBLE PARTICLE ANALYSIS

25 µL MINIMUM VOLUME
96 SAMPLE AUTOMATION
1 MINUTE PER SAMPLE

YOUR POSSIBILITIES JUST EXPANDED

Comprehensive Answers Fast

Conduct comprehensive, multiparameter screening experiments in hours and find your most stable formulation at lightning speed.

Analyze Samples Earlier

Perform particle analysis on precious early-stage samples and get key stability insights on your formulations. Don’t waste time just because you didn’t have enough sample to run competent subvisible analysis.

More Replicates, Higher Confidence

The HORIZON® system enables 10x more experiments than other particle analyzers and automatically analyzes and plots the data for you.

Walk-Away Automation

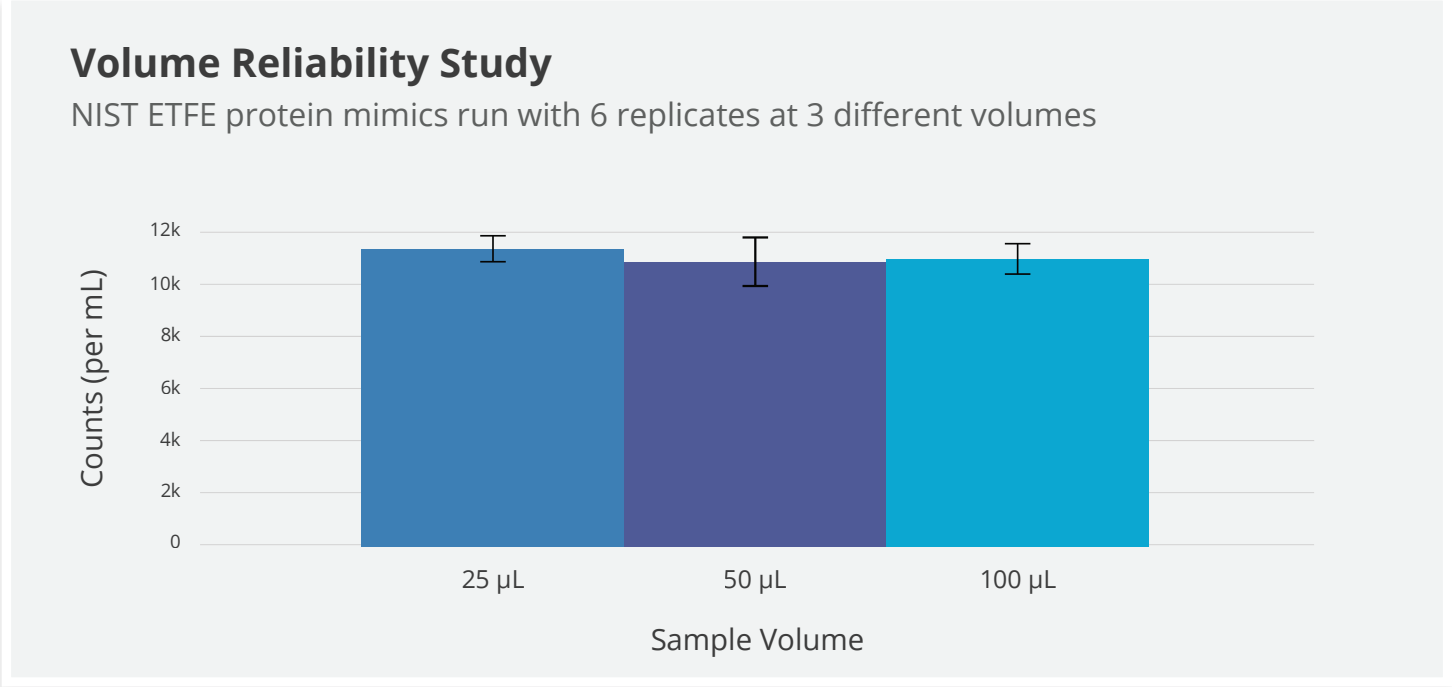
You don't need to babysit the HORIZON® system. Run 96 samples at a time and see your experiment status from across the room.

Save Time and Money

Protein therapeutics are very expensive and hard to make. Save plenty of sample to do all the other experiments you planned on running.

RELIABLE DATA AT LOW VOLUMES

Don't have enough sample to go around? No problem.



With such small volume requirements, it's easy to run samples in duplicate, in triplicate or even with a whole 96-well plate of replicates. The HORIZON® software suite automatically plots results for you, breaking out conditions, combining replicates and adding error bars.

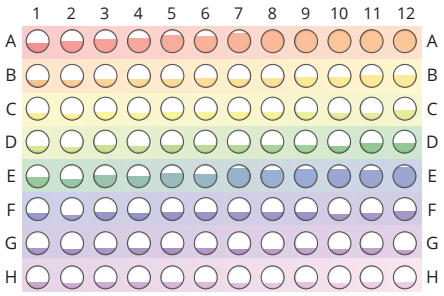
FLUIDICS-FREE AND LOW-VOLUME

The HORIZON® instrument is a fluidics-free particle analyzer, which means there's less stress and you can get accurate and reproducible counts with a fraction of the volume that flow imagers require. Why?

- No dead volume
- No need to prime a flow cell
- No washing
- No clogging or leaks

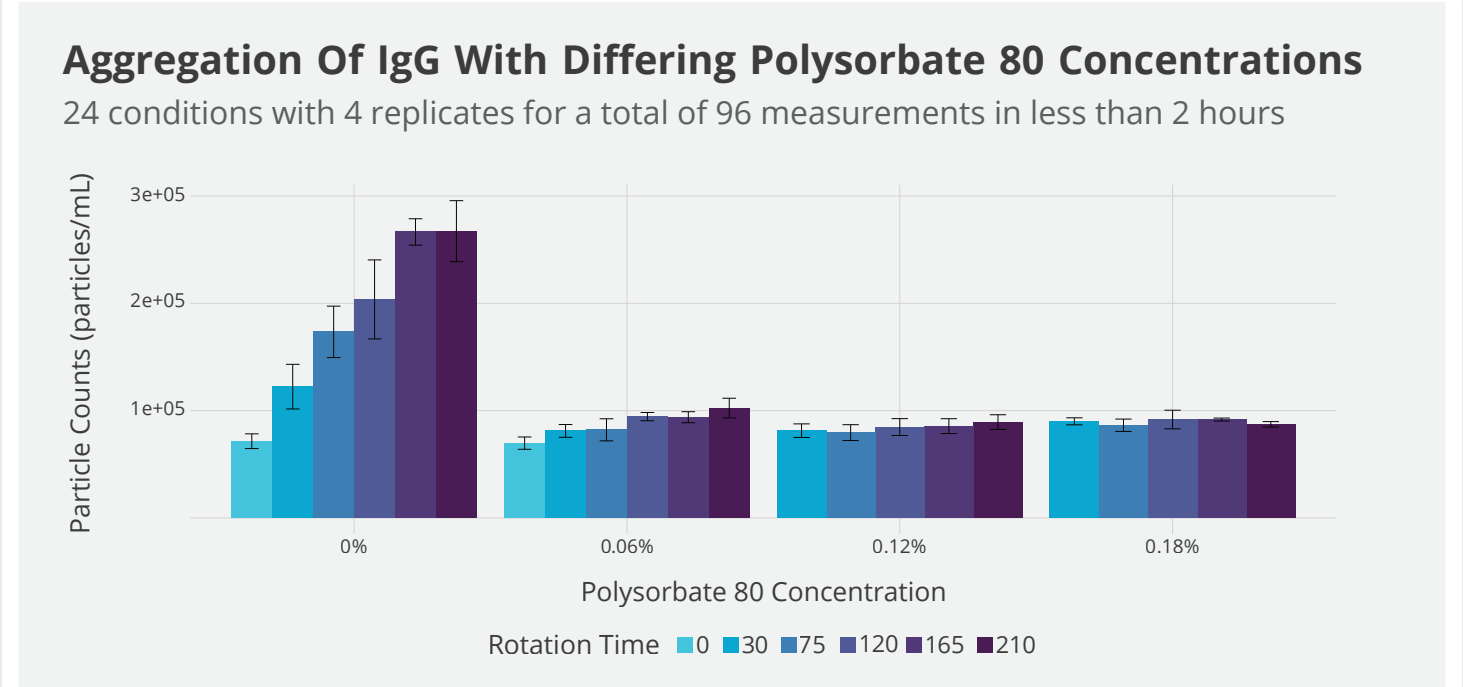
AUTOMATED PLATE ANALYSIS

The HORIZON® system uses the latest in automated membrane imaging, robotics, and asynchronous computing for quick, hands-free processing for up to 96 samples at a time. Measurements are rapidly conducted in parallel: removing bottlenecks (like a flow cell) and allowing for incredible speeds.



HIGH LEVEL INSIGHTS AT LIGHTNING SPEED

The HORIZON® system helps you run hundreds of samples in a day with interactive software that's informative and easy to use.



To demonstrate the HORIZON® system's screening capabilities, the impact of polysorbate 80 on the stability of an off-the-shelf IgG was assessed in a simple screening test. IgG was divided into 4 tubes, and polysorbate 80 was added in increasing amounts. Next, the tubes were placed in an end-over-end tube rotator and stressed with aliquots taken out and measured at 6 different time points. Four polysorbate 80 concentrations and 6 time points result in 24 unique conditions, each of which was measured in 4 replicates for a total of 96 data points. Total measurement time was less than 2 hours. As expected, polysorbate 80 has a dramatic effect on protein stability.

BACKGROUNDED MEMBRANE IMAGING (BMI)

Fast, accurate and fully automated subvisible particle analysis for 96 samples in under 2 hours.

The HORIZON® instrument's primary analytical technique is Backgrounded Membrane Imaging (BMI). BMI has its roots in membrane microscopy, the tedious USP 788 subvisible particle lot release method by which samples are filtered through a membrane and captured particles are manually counted using a microscope.

BMI reinvents membrane imaging with modern robotics, image processing, and novel optics in a 96-well filter plate format that works just like a plate reader.

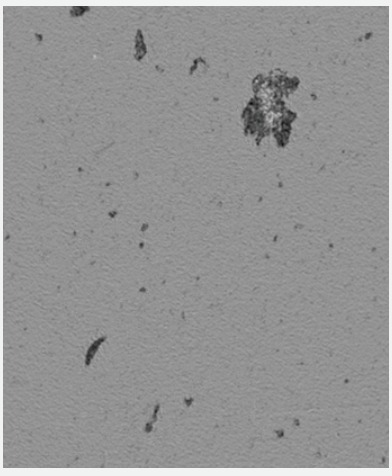
Proprietary 96-well filter plate laid out to demonstrate a complex multi-condition experiment

BACKGROUNDED IMAGES: THE HEART OF BMI

BMI uses sophisticated image-processing techniques to analyze images and acquire particle data. The key is to first take a background image of the membrane. After samples are filtered through and particles are captured, the same membrane is re-imaged, this time with particles on the surface. The background image is precisely aligned with the sample image and then subtracted on a pixel-by-pixel basis so that the background texture is eliminated and particles are revealed. Contrast is 10x greater than measurements done in liquid, sizes are calibrated with an electron microscope, and analysis is fully automated.

Background Image

Sample Image



Resulting BMI Image

HOW IT WORKS

Three easy steps will get you a 96-sample screen in under 2 hours.

BACKGROUND → **PROCESS SAMPLE** → **MEASURE**

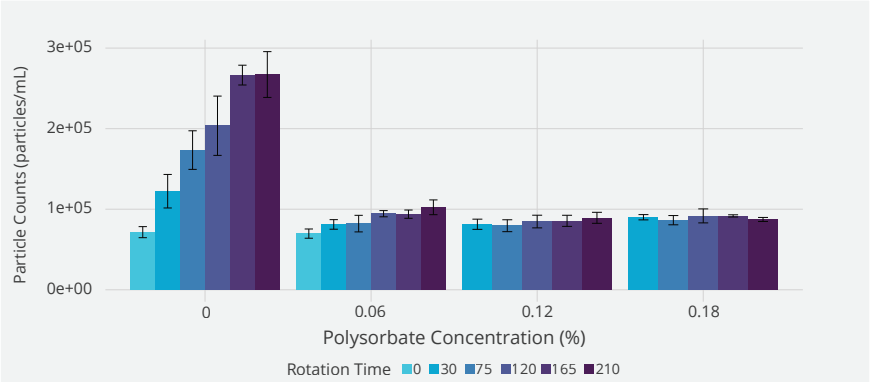
Load a filter plate and select BACKGROUND

Pipette samples into individual wells of the filter plate and vacuum through the membrane

Re-load the filter plate and select MEASURE

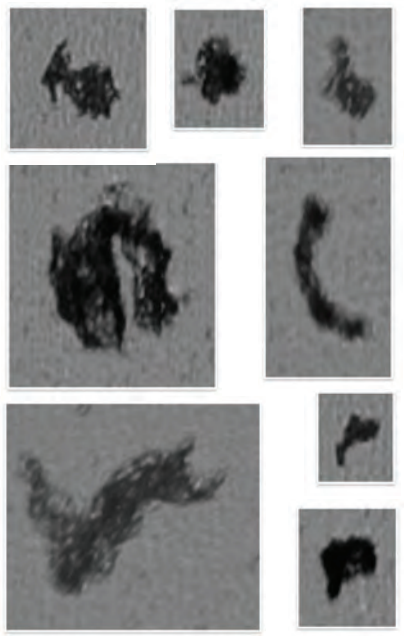
RESULTING DATA

BMI produces data comparable to other subvisible systems, plus high-level process insights with the HORIZON® system's analysis suite.

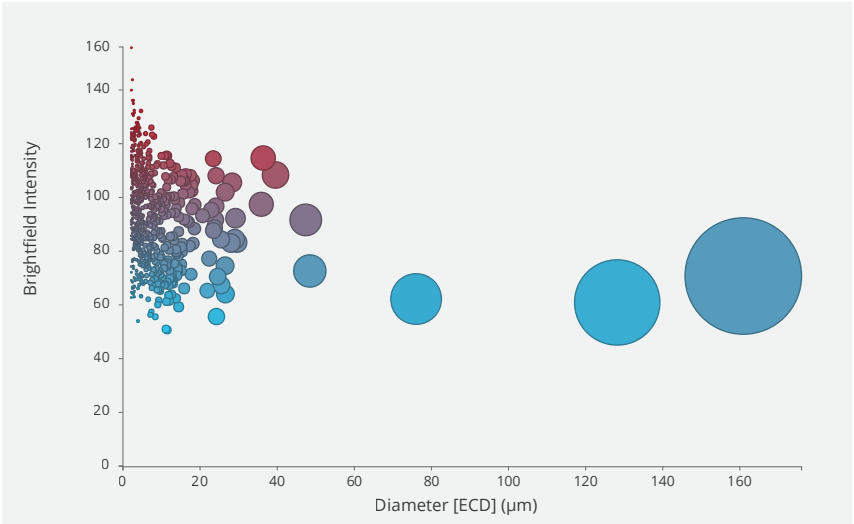


A complex multi-condition IgG aggregation with differing polysorbate concentrations, run in under 2 hours

Single particle images for every particle



Interactive scatter plots of individual wells allow you to visualize your data by multiple particle characteristics



KEY ADVANTAGES OF BMI

	BMI	Light Obscuration	Flow Imaging
Low Volume Requirements	✔ Requires 25 µL, 20x less than competition	✖ Requires 5 mL	✖ Requires 500 µL
Highly Reproducible	✔ CVs of polydisperse samples under 6%	✖ Highly variable on polydisperse samples	✖ Highly variable on polydisperse samples
Consumable	✔ ZERO particle carryover, ZERO cross-contamination , ZERO washing	✖ Multiple components that require washing	✖ Expensive flow cell that requires washing
High Refractive Index Contrast	✔ Dry-based measurement = Analyze small and dim particles with higher fidelity	✖ Low-contrast, liquid-based measurement	✖ Low-contrast, liquid-based measurement
Fluidics-Free	✔ ZERO purge volume, ZERO leaking, ZERO clogging	✖ Fluidics-based	✖ Fluidics-based
No Confounding Particles	✔ Air bubbles are not measured	✖ Air bubbles counted as particles	✖ Air bubbles counted as particles
Instrument Compatibility	✔ Particles are captured on a membrane where they can be analyzed later with other instruments	✖ Sample ends up in waste, no additional analysis possible	✖ Sample ends up in waste, no additional analysis possible

PRODUCT SPECIFICATIONS

Technology	Backgrounded Membrane Imaging (BMI)
Particle Size Range	2 µm minimum to 4 mm maximum (ECD)
Minimum Sample Volume	5 µL qualitative, 25 µL quantitative
Max Sample Volume	>1 mL
Maximum Concentration	600,000 particles/mL (polydispersed ETFE)
Max Allowable Viscosity	35.5 cP (75% glycerol)
Membrane Pore Size	0.4 µm
Throughput	1 minute per sample (no washing)
Sample Format	96-well filter
Illumination Modes	Brightfield and side illumination
Software	All-in-one software suite (capture, image, and data analysis)
Refractive Index Impact	None (imaging in air)
Cross-Contamination	None (zero carryover)
Washing	None (disposable consumable)
Air Bubbles	Not measured (filtered away)
Light Source	LED 465 nm and LED 455 nm
Power	Universal input (90–264 Vac)
Instrument Dimension	13.5 in x 18 in x 13 in
Instrument Weight	56 lbs