

Single Use Horizontal Bioreactors - SUHB™

INTRODUCTION

NHB is producing next gen bioreactor systems that offer the space saving advantages of the SUHF systems. These scalable production systems reduce facility infrastructure costs and facilitate rapid market responses. NHB's Single Use Horizontal Bioreactor system (SUHB™) produces batches from 50 to 3,000 Liters in low ceiling height facilities with game changing operational benefits.

FLEXIBLE, COST EFFECTIVE SUHB™ SYSTEM

The SUHB™ systems scale out linearly to enable 3x working volume of the initial vessel size. This modular expansion capability leverages multiple proprietary agitators that maintain power density throughout the full operating range. SUHB™ has a full scaling range from 50L to 3,000L working volume.

The operating range is supported by 9 horizontal single use bag sizes which can be pressurized and completely contained within the Bag Retention Vessel (BRV). All input / output connections and instrumentation ports are reinforced to allow bag pressurization with precise back pressure control.

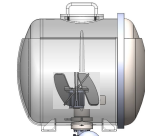
APPLICATIONS

This fully integrated, turnkey system for cell culture bioreactors allows production of high value, biologically relevant therapeutic proteins using a variety of single use disposable culture bag sizes for both non-GMP R&D processes as well as cGMP manufacturing facilities. The flexibilities from the modular, scalable, low height production system enable better operational strategies in dynamic or geographically distributed production environments.

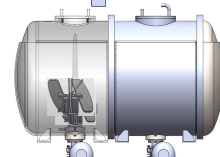
SCALE OUT

Modular expansion allows 3x increase of working volume

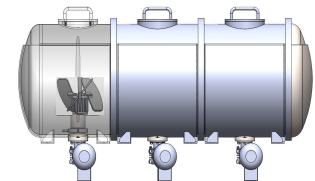
Working Volume
50L



100L



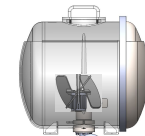
150L



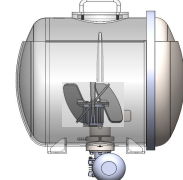
SCALE UP

Scaling working volume enables 50L - 3,000L full operating range

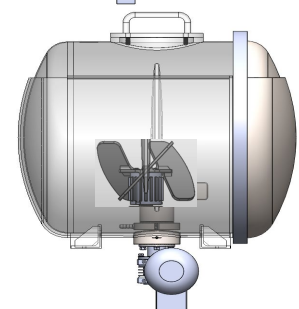
Working Volume
50L



250L



1,000L



FAMILY OF SIZES FOR ALL NEEDS

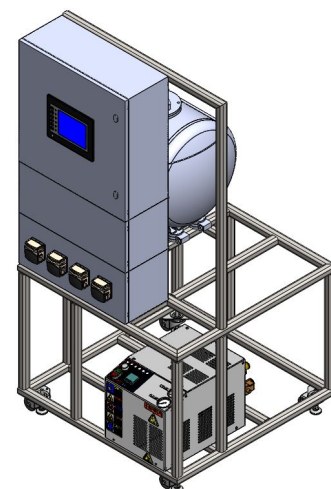
The NHB product line provides production capacities meeting typical commercial requirements. Production capacity extends beyond just working volume owing to a pressurizable system for enhanced oxygen mass transfer.

Scale	Bag Diameter (inches)	Single Module Working Volume (L)	Dual Module Working Volume (L)	Triple Module Working Volume (L)
Small	18"	50	100	150
Medium	30"	250	500	750
Large	48"	1000	2000	3000

KEY FEATURES

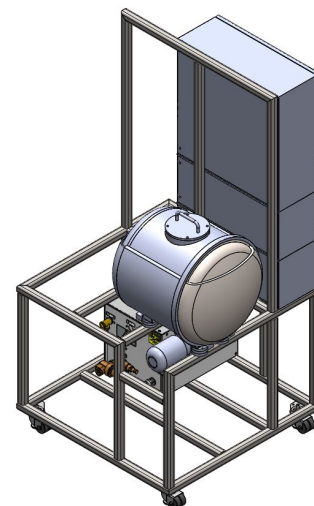
The NHB SUHB™ design encompasses many unique advantages and characteristics not possible in the current designs of SU bioreactors. Key evolutionary features include:

- PRESSURIZABLE enhances oxygen mass transfer
- LOW PROFILE all sizes fit 9 ft high clean room ceiling
- MODULAR add/remove working volume as needed
- SCALABLE full production scale range
- FLEXIBLE arrange train sizes for any given campaign
- MOBILE system and modules have lockable casters



TECHNOLOGY

The SUHB™ system is based upon numerous patents, proprietary technology, and over 100 years of industry expertise of the team behind it. SUHB™ can deliver mixing and sparge gas flows to satisfy cell culture O₂ mass transfer rates in a single use bag with low shear mixing resulting in optimal cell culture growth kinetics and metabolism for high titers of proteins, and monoclonal antibodies. A complete fully automated system on casters will fit through double 6 ft wide doors having 80" height. Expansion modules can be rolled in/out of clean room suite as needed. The BRVs' use dimpled heat transfer surface areas with a skid integrated temperature control module (TCM) for precise temperature control.



Take Operations and Production to the Next Generation with NHB's SUHB™ System

NHB is seeking thought leader customers to work with our team to deploy the SUHB™ system. The ideal customer will have specific and measurable business or production mandates where NHB can deliver a complete solution.

New Horizon Biotechnology



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