

# HIGH-G TUBULAR BOWL SUPER CENTRIFUGE FOR PHARMACEUTICAL & BIO-TECHNOLOGY APPLICATIONS.



High Performance Centrifuges are critical to Pharmaceutical and Biotechnology applications. The high-G Supercentrifuge is designed and fabricated to comply with cGMP requirements in accordance with the requirements of pharmaceutical equipment standards. The rotating bowl is a well-balanced sealed assembly made from special high strength stainless steel, which allows no leakage and ensures that there are no compromises in achieving purity of the end product.

All metal components other than the bowl are made from S.S.316 or S.S.316L stainless steel.

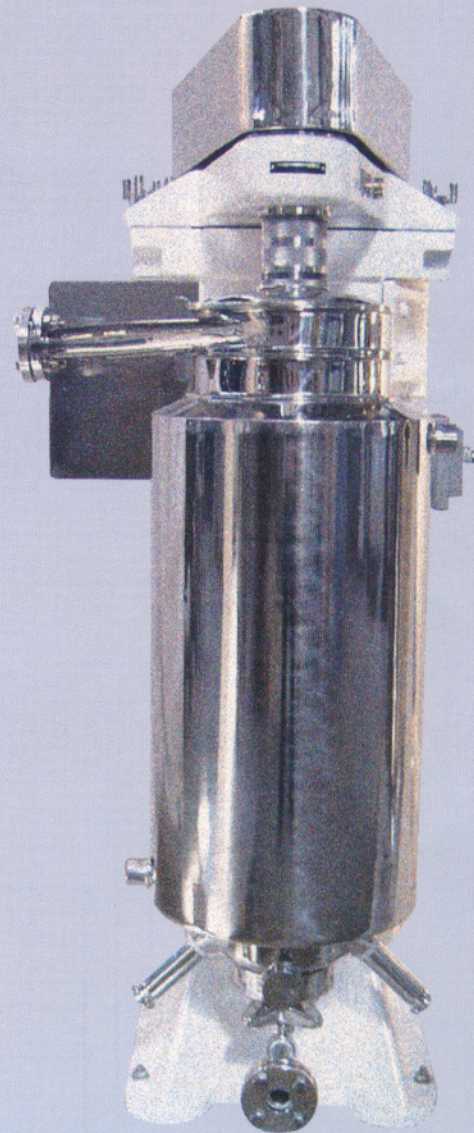
## DRIVE MOTOR:

- TEFC IP55 enclosure for non-explosion proof applications.
- Flame Proof Drive Motor for ex-proof applications.
- Variable Frequency Drives Option for control of rotating bowl speed.
- Local Start/Stop Push Button stations option available with DOL control panel.

## SPECIAL FEATURES:

The high-G-Tubular Bowl Super Centrifuge for Pharma & Biotechnology Applications are equipped with:

- High G-force up to 20000 x G (max) with an optional variable frequency drive.
- Sanitary design of all contact parts in stainless steel electro-polished to a surface finish of  $Ra \leq 0.5$  microns.
- Centrifuges are designed for Clean-Out of Place (COP) followed by Clean-in-Place (CIP) and with a steam cap and safety rupture disc for Sterilization-in-Place (SIP) with all product surfaces accessible to CIP and SIP fluids. The Centrifuges are designed for Sterilization with saturated steam at 1.0 bar g (121°C).
- Material and Manufacturing procedures meet cGMP requirements and care is taken to avoid or eliminate dead-legs, dead pockets or crevices, in so far as is possible and to enhance cleanability of all product contact surfaces.
- In-built centripetal pump is provided for pressurized liquid centrate discharge.
- Jacketed barrel is provided as an optional feature for temperature control with cooling media circulation for removal of frictional heat.
- O Rings and gaskets are in EPDM or Viton elastomers of biocompatible grade.
- The Centrifuges are designed for compliance with either BL-1-LS or BL-2-LS Bio-hazard containment.
- Mylar or equivalent bowl liners are supplied as standard for harvesting of solids batch wise.



## APPLICATIONS:

Typical applications encompass:

- E.Coli whole Cells
- E.Coli Lysed Cells.
- Cell Debris (mammalian)
- Virus with particle size 0.06 microns
- Production of ATGAM
- Protein Precipitate (NH<sub>4</sub>SO<sub>4</sub>)
- Protein Precipitate (PEG)
- Injectable Proteins.
- rDNA injectables
- Vaccines (conjugate proteins)
- Plasma Fractionation
- Yeast Cell Debris
- Cryo precipitate
- Stroma (cell wall Fragment)
- Gamma-Globulin
- Interlukin IV
- Polishing of solutions (removal of fines)
- Prothrombin

## THE PRODUCT LINE:

The product line is available with free draining, easy-to-clean sanitary/hygienic finished product contact surfaces:

- In two sizes, Model AS-16 and Model AS-26
- In two degrees of containment viz.
  - VB which is steam sterilisable with 1.0 barg saturated steam (121°C) to BL-1-L containment.
  - SP which is steam sterilisable with 1.0 barg saturated steam (121°C) to BL-2-LS containment, without any dismantling.

## SPECIFICATION:

Sr. no.	Machine Size	AS-16 VB	AS-26 VB	AS 26 (Asceptic)
1.	Sterilization with saturated steam at 1.0barg (121°C)	Yes	Yes	Yes
2.	Sanitary Design	Yes	Yes	Yes.
3.	Bowl Speed, rpm (max.)	7000	17000	17000
4.	G-force (max.)	17000	20000	20000
5.	Bowl Solids Holding Capacity (litres)	3.5	5.25	5.25
6.	Total Bowl Capacity (litres)	6.0	9.0	9.0
7.	Bowl Weight, Kg (full)	~ 21	~ 31	~ 31
8.	Approx. Bowl Weight, Kg (full)	21	31	31
9.	Asceptic Operation	To BL-1-LS containment	To BL-1-LS containment	To BL-2-LS containment
10.	Shipping Data (Gross weight) kg	~ 545	~ 865	~ 865
11.	Motor KW for driving centrifuge	2.2	4.0	4.0

## TYPICAL INDICATIVE SEPARATIONAL PERFORMANCE:

Sr. no.	Bio-Pharma Product	Separational Performance of			
		AS-16 VB/SP		As26 VB/SP	
		Capacity (l/hr)	% Recovery	Capacity (l/hr)	% Recovery
1.	E.Coli (whole Cells)	170	99.0	300	99.0
2.	E.Coli (Lysed Cells)	85		150	
3.	Virus Particles (0.06µ) grown on cell lines (PCV=1.5%)	5.0	85	8.0	85
4.	Fractionation of Human Blood	90		140	
5.	Yeast cell Debris	115	99	180	99
6.	Cell Debris (Mammalian)	168	98	260	98
7.	Protein Precipitate (NH <sub>4</sub> SO <sub>4</sub> )	30	98	48	98
8.	Protein Precipitate (PEG)	35	95	55	95
9.	Gamma Globulin	29	99	45	99
10.	Cryo Precipitate	125	99	195	99

\* Expected nearly complete recovery.



D-221, M.I.D.C., T.T.C., Thane-Belapur Road, Nerul, Navi Mumbai - 400 706.  
 Tel: +91-22-65166630, 27632503 / 2520 / 2528 / 2539 . Fax: +91-22-27632560  
 E-mail: info@pennwalt.com / pennwalt@vsnl.in Website: http://www.pennwalt.com