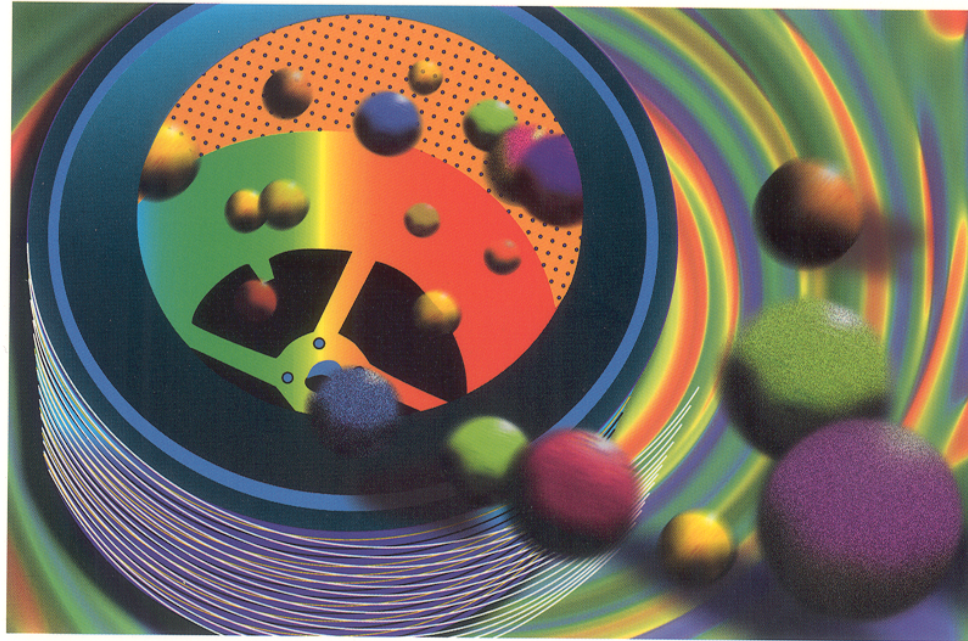
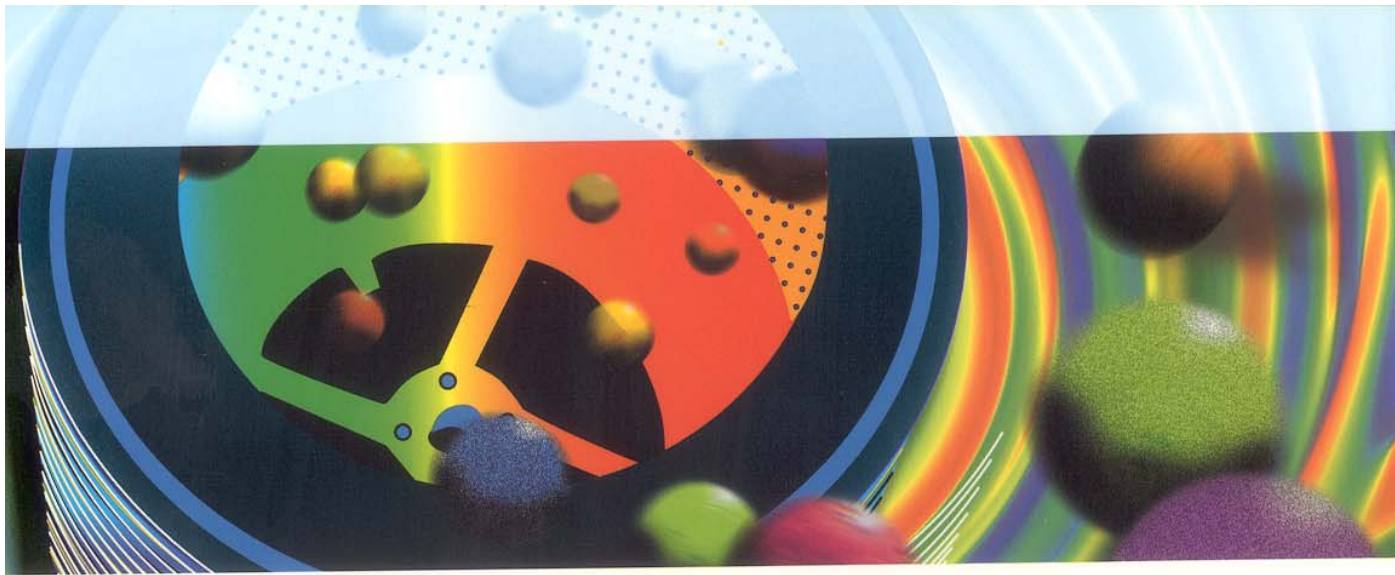


Vertical Axis Batch Centrifuges





Vertical Axis Batch Centrifuge

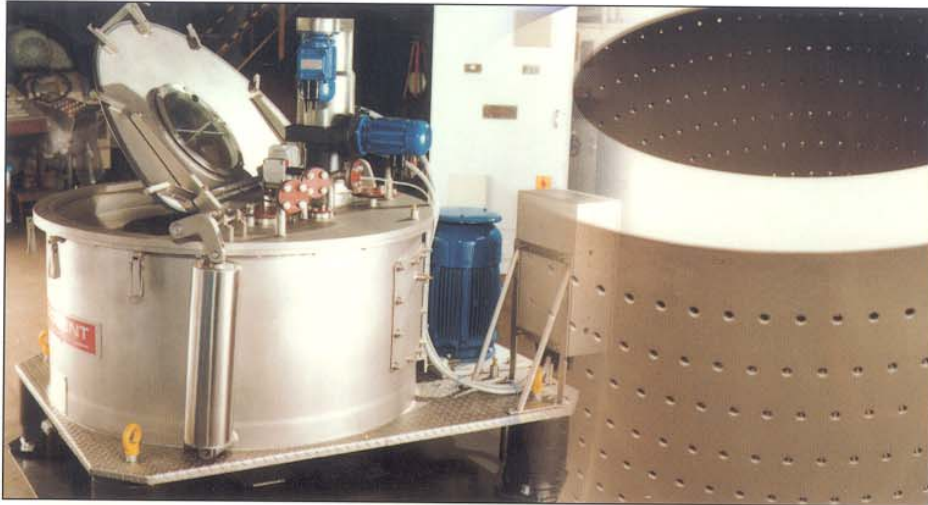
Broadbent Vertical Axis Batch Centrifuges have been synonymous with solid-liquid separation for over a century and have been in constant use across the global spectrum of process industries.

Broadbent's innovative advances in technology make the Company's Vertical Axis Batch Centrifuges the preferred choice in the pharmaceutical and fine chemical process sectors.

The Company's designs are driven by the requirements of the end-user, and are also based on over 135 years of accumulated experience. This experience is uniquely recorded in a data-base, which includes the results of many actual trials undertaken in the Broadbent Process Laboratory. This leads to close co-operation between the process, design, and production teams. Every aspect of centrifuge design manufacturing, and customer support is handled in-house.



Design Criteria

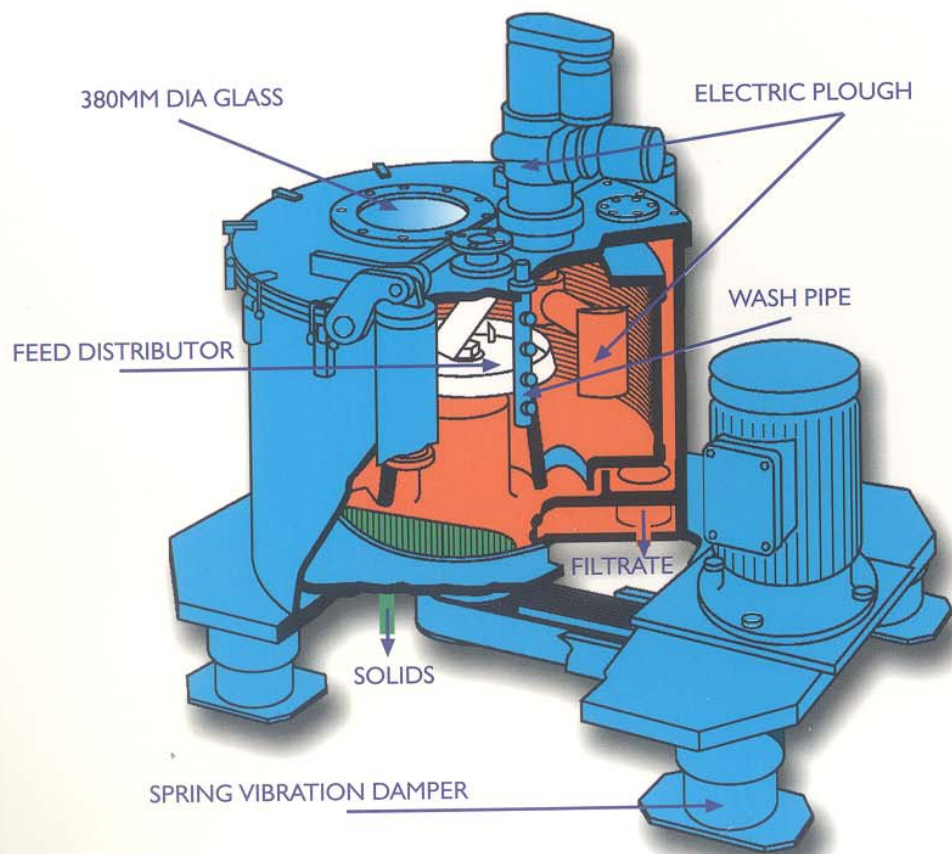


- Designed for pharmaceuticals and fine chemicals
- Maximum product containment
- Process cleanliness prioritised
- Materials of construction to match process conditions
- User-friendly PLC control
- Compact installation - small footprint/low height requirement
- No additional inertia mass
- Low operator intervention
- Low operating costs - low maintenance

- Electric variable speed drive
- Electric variable speed plough system
- Full safety features including Nitrogen purge facilities
- Conformity with CE regulations, EN 12547, ISO 9001 and all relevant standards, including cGMP where required



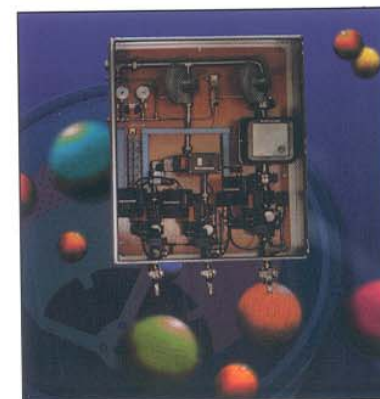
Schematic view of typical Vertical Centrifuge



- Good visual inspection during processing via sight-glass and internal illumination
- Feed distribution for maximum output and good balance
- Thorough cake-wash
- Discharge with negligible crystal breakage
- Electrically operated plough
- Residual heel removal

Inert Gas Purging

Originally designed for reliable and safe operation with centrifuges in hazardous areas, these Broadbent systems can also be used in many process plant operations where there is risk of explosion. The system, based around the I Chem E guidelines for the "Safe Operation of Centrifuges", and maintains positive flow purging and gas blanketing and has all necessary gas analysers, controls and alarms.



The Broadbent Vertical Axis Centrifuge for Pharmaceuticals and Fine Chemicals

The centrifuges in this state-of-the-art range are versatile in function, and reliable in operation. Their design is rooted in years of experience and is abreast of all relevant up-to-date developments in filtration technology. They are well suited to the efficient separation of active pharmaceutical products and of fine or bulk chemicals. They can handle freely and non-freely filtering slurries with equal facility.



Features:

- **GMP construction**
- **Crevice-free construction**
- **Cross-contamination secure**
- **Various materials of construction including stainless steels, Hastelloy and fluorocarbon coatings**
- **Total CIP facilities**
- **Easily changed filter medium**
- **Certified for use in Zone I area, gas group IIb, and temperature class T4**
- **Fully regenerative electric variable-speed drive**
- **Fully validated control system : GAMP compliant**
- **Self diagnostic**

The Broadbent Vertical Axis Basket Centrifuges for Flue Gas Desulphurisation (FGD) Centrifuges



These are large batch centrifuges for the dewatering of gypsum slurries resulting from the removal of SO₂ from flue gases in the fossil-fuel burning power utilities.

Installations of these machines display the following advantages:

- Well suited to the production of low chloride, low moisture commercial grade gypsum
- Superior results compared with vacuum belt filters
- Able to process a wide range of gypsum particle sizes
- High processing rates
- Finished product dewatered to 8% or less (dry weight)
- Installation controls interface with main plant controls
- Regenerative variable frequency inverter fed drives
- Low energy consumption
- Advanced chemical resistant materials of construction

(Decanting centrifuges are available for dewatering large volumes of abrasive slurries where the gypsum is used for land-fill or dyke building).

The Broadbent Laboratory and Pilot plant Centrifuges



Designed for pilot plant test production and for small batch treatment this reliable and robust machine offers customers the chance to evaluate the behaviour of their product under centrifugation.

Its features are:

- **Compactness : 260mm - 530mm diameter**
- **Full safety items**
- **Capable of installation in flameproof areas of operation**
- **Suitable for inert gas purging**
- **Various materials of construction**
- **Feed, wash, discharge facilities**
- **Single speed electric drive**

The Broadbent Process Laboratory

Broadbent has long enjoyed the benefit of its own in-house Process Laboratory fitted with the relevant analytical instrumentation and having Process Rooms equipped with centrifuge test equipment, including a large fume extraction bay equipped with Zone I electrics. Samples can be investigated and tested under machine trial conditions.



It is a key resource enabling the Company to solve separation problems presented by customers. It also permits the Company to undertake scale-up analysis to assess the implications of full plant operation with given products and processes.

Laboratory centrifuges are available for on-site testing and pre-production evaluation.



Equipment Range

TYPES		260 x 160	530 x 270	860 x 260	860 x 480	1250 x 500	1250 x 710	1250 x 1000	1500 x 1000	1600 x 1275
Basket Diameter (mm)	mm	260	530	860	860	1250	1250	1250	1500	1600
Basket Height (mm)	mm	160	270	260	480	500	710	1000	980	1275
Filtering Surface (m ²)	m ²	0.13	0.45	0.7	1.2	1.7	2.7	3.8	4.6	6.4
Volume Capacity (ltrs)	ltrs	5.6	29	65	120	300	440	620	915	1288
Max Charge (kg)	kg	7	35	78	144	360	528	744	1098	1545
Max Speed (rpm)	rpm	3000	1850	1375	1375	1075	1075	1075	850	800
Centrifugal Factor (g)	g	1300	1000	900	900	800	800	800	600	570
Motor power (kW)	kw	0.75	2.2	10	15	30	37	45	90	132
Overall Dimensions	L	0.8	1.11	1.5	1.5	2	2	2	3	3.4
	H	0.9	1.23	1.7	1.9	2	2.2	2.5	3.5	4.3
	W	0.5	0.98	1.1	1.1	1.5	1.5	1.5	2.2	2.2
Weight	kg	130	750	2800	3000	5200	5700	6000	9500	15000

Dimensions are in millimetres. Motor Power - dependent on speed, feed rate and centrifuge enclosure
All weights and dimensions are approximate.

Vertical Axis Batch Centrifuges



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