Pharmatech
Innovation in Pharmaceutical Engineering

MultiBlend Blenders

Blenders

New

Instant Blend Analysis
Blending End Point Determination System

GMP correct blending systems for the laboratory & small scale production use

Contents

Section 1 - Blenders

Section 2 - Special Technology

Section 3 - Blender Accessories

Maximum Loads

Throughout this brochure the Maximum Load has been given for each type of blender - these figures should be used for guidance only as the Maximum Load depends upon the container shape as well as the batch weight. Contact ***Pharmatech*** for confirmation that a particular machine will be suitable for your application.

Another batch of Multiblend MB400s undergoing construction at the ***Pharmatech*** factory in Coleshill

CE Mark

All Pharmatech blenders comply with the relevant legislation and are CE marked.

Special Machines

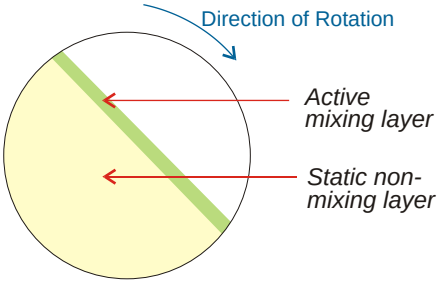
Pharmatech has many years of experience in the design and construction of blenders. If the exact blender that you require is not shown in this brochure then contact ***Pharmatech*** we have the capability to manufacture 'one-off' blenders or to customise one of our existing blenders so that it meets your exact requirements.

Container Fill & Ullage

Pharmatech recommend that the blending container is not more than 66% full. The 'unused' space (ullage) is required during blending to allow the product to move around and blend efficiently. The amount of ullage required will vary from product to product.

The diagram opposite shows blending taking place as the 'active' product layer tumbles over the static non-mixing lower layer within a rotating shell.

Under-filling the blending container often results in the product sliding in the container and not mixing.



Cross Section through a blending system

ATEX (Ex) Rating

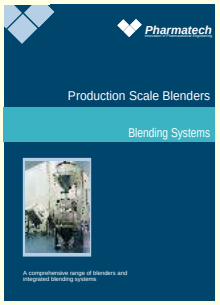
Standard Multiblend blenders are not ATEX rated, however they can be constructed to comply with any level of ATEX rating. Discuss your ATEX rating requirements with ***Pharmatech*** to ensure that your equipment is suitable and safe for the environment in which it is operating.

Ex Rated MB100

Need a Production Scale Blender ?

There is a ***Multiblend*** blender to suit every batch volume from 0.1 litres right up to about 700 litres. If your batch volume is greater than 700 litres then please request a copy of our Production Blenders Brochure.

- Batch volumes up to 4000 litres
- Blending containers up to 6000 litres
- All container shapes: V-shells, IBCs, Double Cones and Scholl Blenders
- Special container shapes
- ATEX rated on request
- Contact ***Pharmatech*** for further details.



1250L Double Cone Blender (Asymmetric design)

750L V Shell Blender

See Page 17 for further information

Multiblend MB005 & MB015

The MB005 and MB015 are both ideal for applications such as sample blending, formulation development and even very small scale manufacturing. The compact design means that these machines are suitable for use on bench tops or they can be mounted on a trolley for added mobility.

MB005 with a 3 litre V shell

Standard Features

- All stainless steel construction
- GMP correct design
- Variable speed from 3 to 30 rpm
- HMI Controls
- Interlocked safety guard
- Suitable for all shapes of containers up to 5 litres
- Quick change container system
- 230v 50Hz supply
- Vertical Autopark
- CE mark

Essential Laboratory Equipment

Options

- PLC Controls
- Printer
- ATEX rating (to any standard)
- Non standard voltages
- Validation Documentation (DQ, IQ, OQ & FAT)
- Container Attachment

Moving your blender

The MB005 and MB015 are too heavy to be carried by one person. A trolley allows either blender to be easily moved from room to room.

Pharmatech manufacture a range of custom built trolleys - see page 31 for more details.

MB005 on a Type A Trolley

Container Clamp

The blending container is securely held to the drive unit by means of a hand operated clamp.

Suitable for all container shapes

Mini-drum | V Shell | IBC | Double Cone

Blend with containers of any shape and any size (1 to 5 litres). All blending containers are quickly and easily interchanged.

Maximum Load

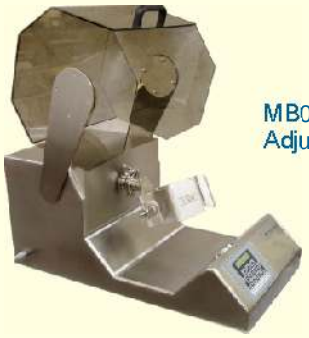
For a product with a bulk density of 1g/cc the maximum loads will be:

MB005 = 3.5kg (3.5 litres) of product in a 5 litre shell

MB015 = 10kg (10 litres) of product in a 15 litre shell

Adjustable Clamp

The Adjustable Clamp is designed to work with all Mini-drum sizes from 1 litre up to 5 litres. The sides of the clamp are easily adjusted to securely hold the mini-drum during blending.



MB005 with an Adjustable Clamp

5L MiniDrum in an Adjustable Clamp

The Adjustable Clamp holds the Mini-drum at an angle of 25º from the vertical axis. This ensures an efficient asymmetric blending action.

The Adjustable clamp can be fitted to both the MB005 and the MB015.

ATEX Rated

The MB0005 & MB015 are can be ATEX rated to any standard - please ask for details:

ATEX Rated MB005

Note: The electrical controls are mounted in a special enclosure inside the trolley.

The Trolley is fitted with a metal castor to ensure that it is earthed at all times

Operator Controls

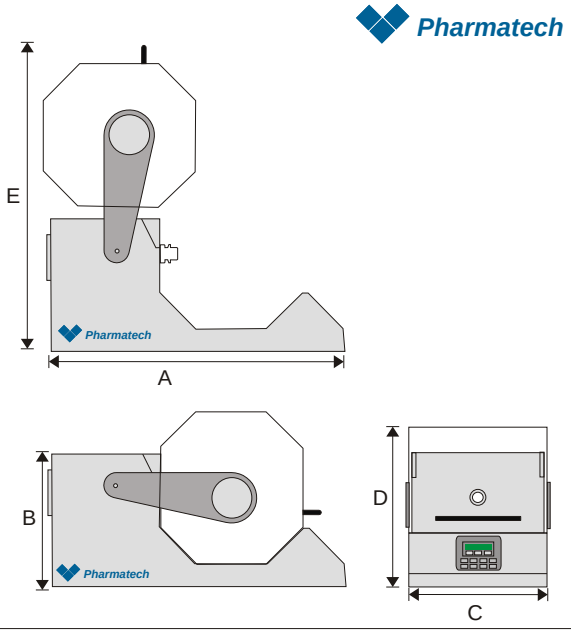
The MB0005 & MB015 are supplied with HMI Controls as standard. HMI features include:

- 2 line LCD control panel
- Allows the operator to input blend parameters such as blend time and blend speed
- Provides the operator instructions, machine status and an error message

Technical Details

	MB005	MB015
Dimensions		
A	820mm	1125mm
B	370mm	500mm
C	430mm	500mm
D	490mm	660mm
E	900mm	1160mm
Weight (without containers)	46kg	60kg
Power Supply	230v 50Hz 1 phase*	230V 50Hz 1 phase*
Motor size	60w	120w
IP Rating	IP55	IP55
Useful Turning Moment	5Nm	15Nm
Blending Containers	1 to 5 litres	1 to 15 litres

* Special voltages on request - ask for details



Multiblend MB030

The MB030 has been developed by ***Pharmatech*** as a mobile laboratory scale blender. It is the ideal machine for scale up work and small scale production work.

The MB030 is designed to be highly versatile and can blend containers of any shape or size (1 to 30 litres). All blending containers are quickly and easily interchanged using a clampband system.

MB030 with a 10 litre IBC

Standard Features

- All stainless steel construction
- GMP correct design
- Variable speed from 3 to 30 rpm
- Mobile - easy to push and steer
- HMI Controls
- Tachometer - to display the speed of rotation
- Non Ex rated
- CE mark
- See-through, interlocked safety guard
- Suitable for all shapes of containers
- Suitable for handling up to 20 litres of product
- Quick change container system
- Electrical - 230v 50Hz supply (other voltages on request)
- Retractable power lead
- Vertical autopark

Options

- PLC Controls
- Printer
- ATEX rating (to any standard)
- Non standard voltages
- Validation Documentation (DQ, IQ, OQ & FAT)
- Container Attachment

Rear view of the MB030

Maximum Container Size

Container ShapeSize	Max. Container Volume*	Max. Batch
Drum	30 litres	20 litres
V Shell	25 litres	17 litres
Double Cone	30 litres	20 litres
IBC	30 litres	20 litres

*The Maximum batch volume should be 66% of the total container volume, this gives the product room to move during blending

Operator Controls

The standard MB030 is supplied with HMI Controls. 2 line LCD control panel. The unit allows the operator to input blend parameters such as blend time and blend speed and also provides the operator with instructions, machine status and error messages.

HMI Panel


Ergonomic, easy to use controls

Blending Containers

The MB030 can blend with containers of any shape. The most common container shapes are drum, V-shell, IBC and Double Cone.

- Any size or shape
- Replicate existing containers
- Scale models of production shells
- Special shaped containers available on request, contact ***Pharmatech*** for details


Mini-drum

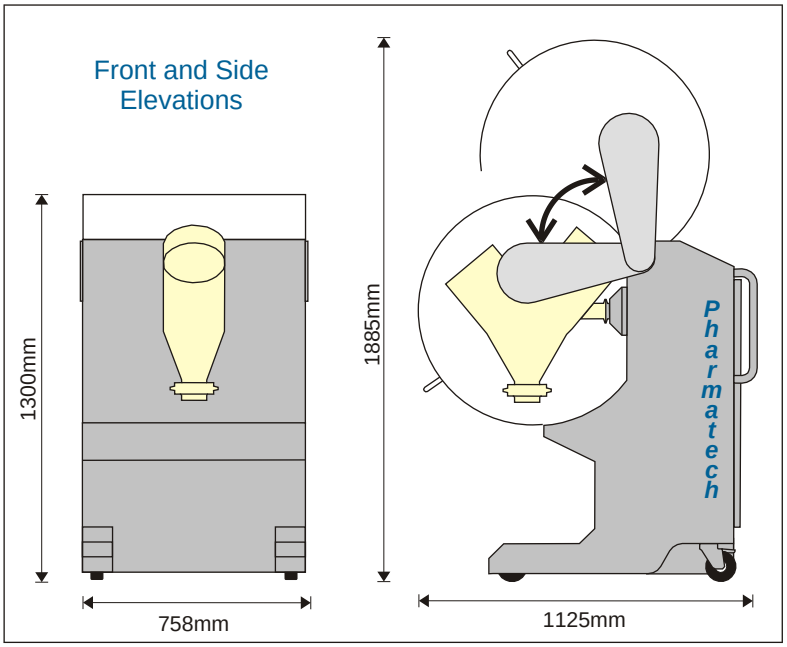

V Shell


IBC


Double Cone

Technical Details

Dimensions:	See Drawing
Power Supply:	230v 50Hz 1 phase (Other voltages on request)
IP Rating:	IP54
Approx. Weight:	155kg (Drive unit only)
Max. Batch Volume:	20 litres
Max. Batch Weight:	20kg



Pharmatech
Innovation in Pharmaceutical Engineering

Multiblend MB100

***Pharmatech's* Multiblend MB100** has been developed as a free standing, mobile blending machine for blending powders and granules. It is ideally suited for larger scale laboratory and for small scale production use.

The MB100 is fitted with quick change clamp systems that allow the blending container to be quickly and easily changed between blends. Both drive units are fitted with an Autopark facility so that the blending container always stops in the vertical position at the end of blending.

Low Level MB100 drive unit with 50 litre drum and Type B Guards

High Level MB100 (Ex Rated) with Type A Guards

Standard Features

- All 304 stainless steel construction
- Variable speed: 5 to 30 r.p.m.
- Dual display LCD timer
- HMI Controls
- 240V (220V) 50Hz supply
- Chassis is fitted with castors
- Autopark facility
- Safety barrier circuit
- GMP correct design
- Relay logic printed circuit board controls
- CE marked

HMI controls supplied as standard for non ex rated MB100 drive units

Options

- Change casing to 316 stainless steel
- Change chassis height to vary the height of the centre of rotation
- Remote operator controls
- PLC controls & printer
- Non standard voltages
- Ex-rated and intrinsically safe
- Interlocked guarding (See Pages 30 - 31)
- Validation Documentation to cGMP (DQ, IQ, OQ & FAT)
- Make machine non-mobile (price reduction)
- Tilting Band Clamp for use with drums (See Page 9)

Versatile blenders with built in mobility

75 litre V shell on a loading trolley (for a high level MB100)

Notes:
Trolleys are required when the shell and contents weigh over 15kg. The trolley ensures the shell is presented at the correct height to the drive axle coupling.

Machine Height

The MB100 is available in two different forms:

Low Level - ideal when loading from trolleys (i.e. drums)

High Level - to allow the blending container to be discharged into a receiving container underneath

Tel: +44 (0)1675 467636 Fax: +44 (0)1675 467582 www.pharmatech.co.uk Email: info@pharmatech.co.uk

Maximum Load

For a product with a bulk density of 1g/cc the maximum loads will be:

MB100 = 65kg (65 litres) of product in a 100 litre shell

Low Level MB100 with Type A Guards

Tilting BandClamp

The drive shaft on the MB100 is horizontal, this is ideal when blending with V-shells, IBCs or double cones however for efficient blending drums should be tilted to an angle of about 25° from the vertical.

A Tilting Band Clamp allows drums to be loaded from normal trolleys and then tilted (to 25° from the vertical) for blending.

MB100 with a Tilting BandClamp holding a 100L drum

Technical Details

Dimensions
- See drawing

Power Supply
- 240V (220V) 50Hz 1 phase
- 24V control circuit

Motors
- Motor Size - 750w
- Useful turning moment - 100Nm

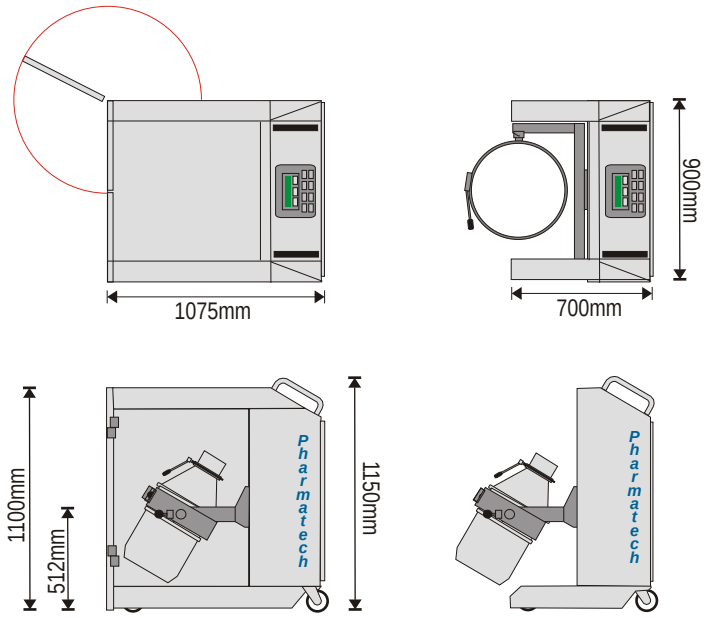
Casing
- 304 Stainless Steel
- 180 grit finish

Ex rating
- None (extra cost option)

IP Rating
- Drive Unit - IP54

Weight
- Varies according to height of machine - Approx. 100kg

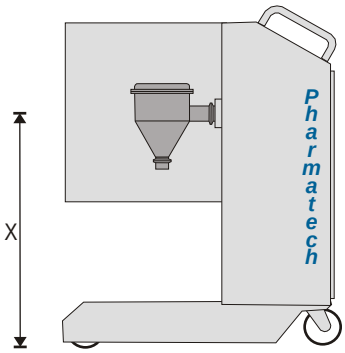
General Arrangement of a LOW level MB100



With built in guards

Without guards

General Arrangement of a HIGH level MB100



X - Height of Drive Shaft. This height is adjusted so that the blending container can be discharged directly into a new container placed underneath.

Multiblend MB400

The **Multiblend MB400** has been designed and developed, by ***Pharmatech***, primarily as a drum blender to handle standard 200 litre drums. The MB400 is suitable for use in both development laboratories and in production areas (NB. the MB400 can also use other container sizes and shapes eg. IBC, double cone and V shell).

Many production processes are based around batch sizes of 1500 to 2000 litres making the MB400 ideally suited for blending tenth scale batches. The MB400 is designed for use as a production blender for smaller batch sizes.

MB400 with a 200 litre drum

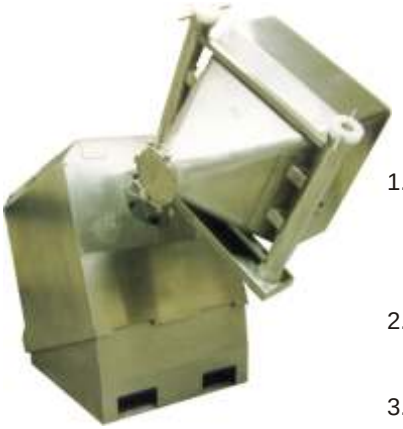
Standard Features

- All 304 stainless steel construction
- Tilting mechanism provides asymmetric blending action for drums and eliminates manual handling
- Variable speed: 5 to 30 r.p.m.
- Dual display LCD timer
- Membrane Button Panel - Start, Stop, Raise, Lower, Increase Speed & Decrease speed
- Requires 415V (380V) 50Hz 3 phase supply
- Emergency stop button
- Relay Logic Printed Circuit Board controls for reliability and easy maintenance
- Safety barrier circuit
- Can handle containers of up to 300 litres in volume (200 litres of product) with a bulk density of 0.7g/cc
- GMP correct design
- CE marked
- Low maintenance
- Blend in tilted or vertical position

Options

- All 316 stainless steel construction
- Add a Tachometer to display the blending speed
- Add a pallet truck base to make the machine mobile
- Ex rated (to any standard)
- Non standard voltages
- Interlocked guards (See Pages 31 - 32)
- Controls to IP65
- PLC controls and printers
- Validation Documentation to cGMP (DQ, IQ, OQ & FAT)
- Plinths to raise the centre of rotation
- Container attachment (See Pages 22 - 23)
- Single phase electrical supply

Customised to your requirements



MB400 with a 150 litre IBC

Notes:

1. The machine has tilted back to allow the IBC to be lifted from its trolley. The trolley is removed before blending starts.
2. This machine is fitted with a pallet truck base for movement.
3. The drive unit is fitted with Universal Arms to allow various sized IBCs to be used on the same MB400

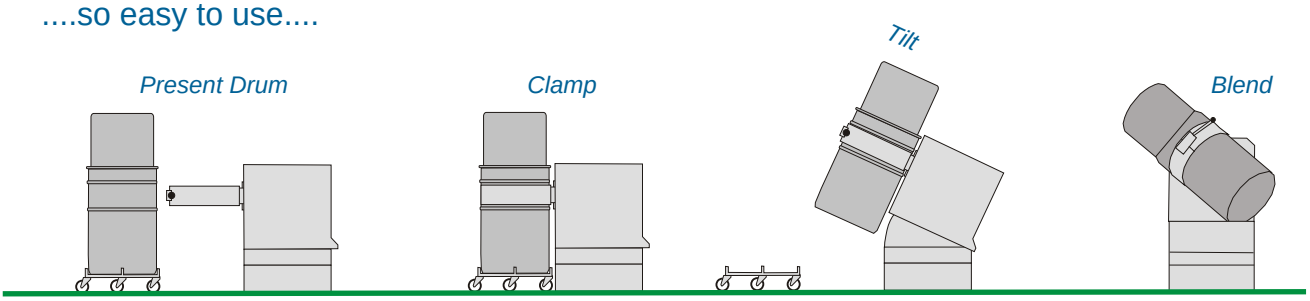
Efficient and Ergonomic Design

The ability of the MB400 to tilt back ensures:

- A highly efficient asymmetric blending action is achieved
- Minimal Manual Handling - the blending container is lifted from its trolley, blended and then returned to its trolley

See Page 14 for example process flows

....so easy to use....



MB400 loading sequence

Maximum Load

For a product with a bulk density of 1.0g/cc the maximum loads will be:

MB400 = 200kg (200 litres) of product in a 300 litre shell

On-Site Trials

A Demonstration MB400 is available for use by customers for on-site trails. The Demonstration Blender comes complete with a free-standing operator control panel and infra-red light guards.

Contact ***Pharmatech*** for details and availability.

Demonstration MB400

Rugged and robust design

Technical Details

Dimensions
- See drawing

Power Supply
- 415V (380V) 50Hz 3 phase
- 24V control circuit

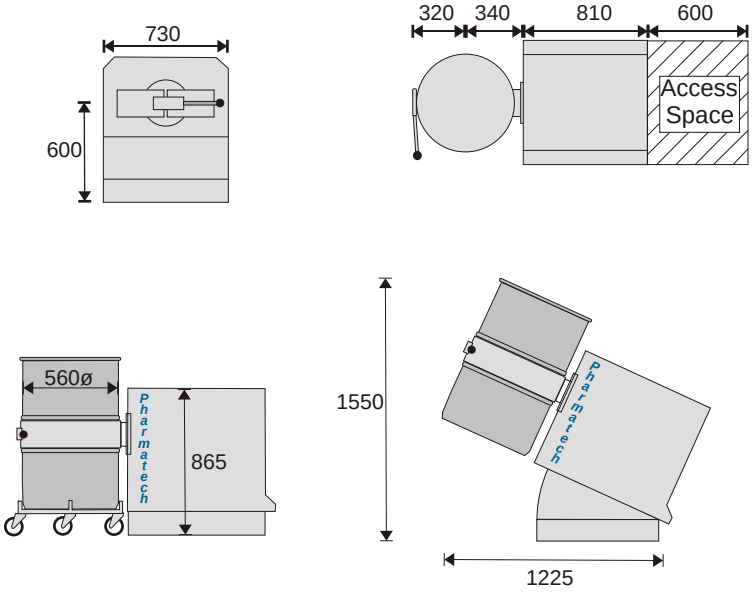
Motors
- Motor Size - 2.2kw
- Useful turning moment - 400Nm
- Maximum Load - 200kg

Casing
- 304 Stainless Steel
- 180 grit finish

Ex rating
- None (available as an extra cost option)

IP Ratings
- Drive Unit - IP65
- Control Panel - IP54 (option IP65)

Weight
- Approx. 200kg



General Arrangement of an MB400 with a 200 litre drum

NB. All dimensions in mm

Pharmatech
Innovation in Pharmaceutical Engineering

Multiblend 'A' Series Blenders
MB400A, MB800A, MB1200A & MB2000A

The 'A' series machines are a range of different sizes of blenders but they all share the same basic design principle. The **Multiblend MB400A, MB800A**, **MB1200A** and **MB2000A** have been designed as highly versatile blenders that are ideal for use as production blenders and for scaling up laboratory processes.

MB800A with 500 litre drum and 250 litre Top Hat

Note: Drum is secured with a double, heavy duty clamp band

MB400A with a Standard Band Clamp for a 200litre drum

Design

The MB800A and MB1200A can handle any shape of container (drums, IBCs, Double Cones, V shells, Cubes etc.).

If a drum is to be used the drive units are designed so that they can tilt the load and provide a highly efficient asymmetric blending action.

Efficient Asymmetric Blending Action

Standard Features

- Rugged all 304 stainless steel construction
- Load is tilted - Asymmetric blending action
- GMP correct design
- CE marked
- Variable speed
- Remote control box fitted with membrane button panel
- Robust contols
- Blend in the tilted or vertical position

Maximum Load

The maximum load for a particular blender will depend upon the batch weight and batch volume as well as the shape of the blending container.

Contact ***Pharmatech*** to confirm the correct size blender for your application.

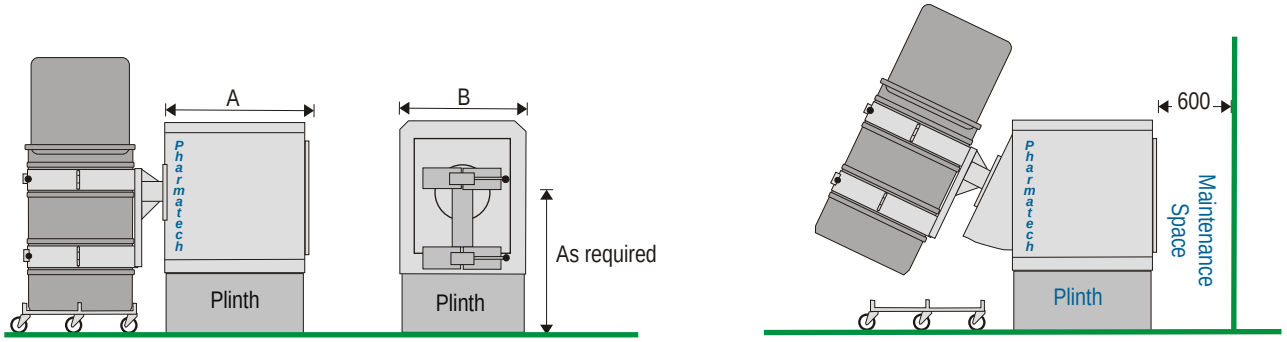
Blender	Max. Container Volume	Max. Batch Weight
MB400A	300 litres	200kg
MB800A	500 litres	275kg
MB1200A	750 litres	350kg
MB2000A	1000 litres	500kg

Options

- Add a tachometer to display (not control) speed
- Plinth to raise the centre of rotation
- Non standard voltages
- Ex-rated and intrinsically safe
- Interlocked guards (See Pages 30 - 31)
- PLC controls with optional printers
- Validation documentation (DQ, IQ, OQ & FAT) to cGMP
- All container shapes and sizes - IBCs, V shells, Double Cones and Cubes etc.
- Through wall installation
- Container Attachment (See Pages 22 - 23)

Tel: +44 (0)1675 467636 Fax: +44 (0)1675 467582 www.pharmatech.co.uk Email: info@pharmatech.co.uk

Technical Details



'A' Series Blender with drum and Top Hat

NB. All dimensions are in mm

	MB400A	MB800A	MB1200A	MB2000A
Dimensions				
A	800mm	1050mm	1050mm	1350mm
B	900mm	920mm	920mm	1200mm
Electrical Supply	415V (380V) 50Hz 3 phase - applies to all 'A' series machines			
Motor Size	2Kw	3Kw	4Kw	5.5Kw
Weight (drive unit only)	200kg	400kg	420kg	650kg
Theoretical Turning Moment	400Nm	800Nm	1200Nm	2000Nm

Through-Wall or Free-Standing ?

The MB400A, MB800A, MB1200A and MB2000A have been designed to either be installed free-standing or through-wall.

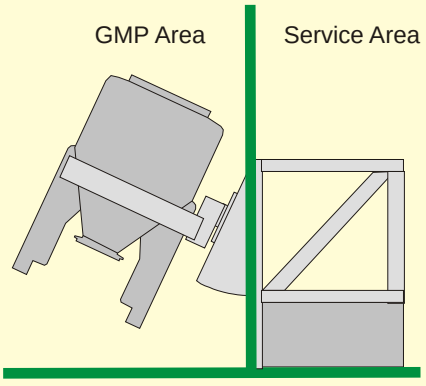
With a through-wall installation only the container and the front face of the blender are in the processing area, the remainder of the machine is in the service area on the other side of the wall.

A Through-wall installation is especially useful if a machine is to be Ex rated as the majority of the components are in the service area.

A free-standing machine is provided with a stainless steel casing. The through-wall machine does not have a casing but it is provided with a stainless steel fascia plate. The fascia plate is used to cover the gap between the edge of the machine and the wall.

Through-wall MB800A with a 400L drum and special Top Hat

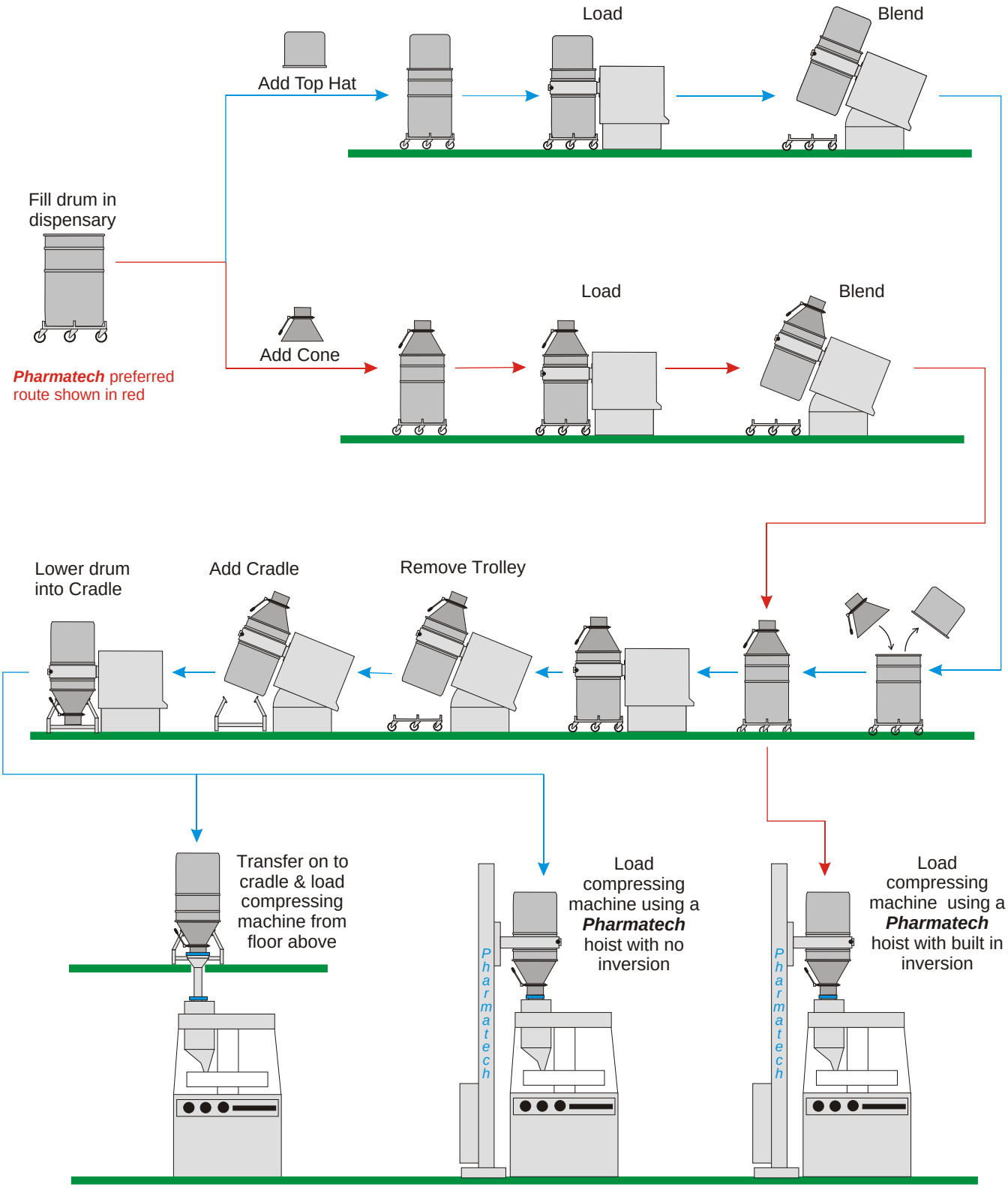
Free Standing MB2000A with a 1000L IBC



Through-wall installation

Blender Process Flow

These suggested process flows are shown with an MB400 but they can also be applied to the following Multiblend blenders: MB400A, MB800A, MB1200A and MB2000A.



LC-Series Blenders

The LC Series is a range of blenders that are ideal for cost sensitive applications. The range includes all sizes of machines from small bench top units to floor mounted machines that are suitable for small to medium scale production work. Datasheets are available for all LC-Series Blenders.

LC005

Bench Top Laboratory Blender

- All Stainless Steel construction
- Basic controls
- 240V (220V) 50Hz supply
- Adjustable Clamp
- Asymmetric blending action due to angled drive shaft - ideal for blending MiniDrums
- Can handle containers up to 5 litres (3.5 litres of product with a bulk density of up to 1g/cc)
- Easily portable - weight 12kg
- CE Marked

LC400

Scale-up blender & Small Scale Production Work

LC400 with a 100 litre double cone - blender has been modified for installation in an alcove

- Floor mounted blender
- All Stainless Steel construction
- Variable speed
- Digital timer
- 240V (220V) 50Hz supply
- Can handle containers of up to 300 litres in volume (200 litres of product) with a bulk density of 0.7g/cc
- CE Marked

LC800

Small to Medium Scale Production Work

- Floor mounted blender
- All Stainless Steel construction
- Variable speed
- Digital timer
- 415V (380V) 50Hz supply
- Can handle containers of up to 500 litres in volume (330 litres of product) with a bulk density of 0.7g/cc
- CE Marked

Customised to your requirements

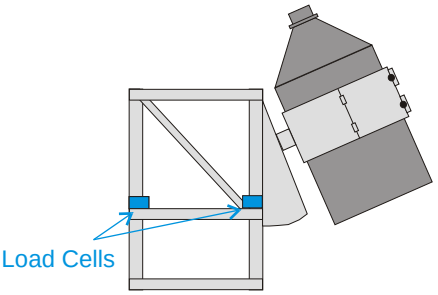
Special Blenders

At ***Pharmatech*** we frequently receive requests for blenders with special features. The features shown below can often be incorporated in the standard Multiblend range. Please contact ***Pharmatech*** if you have a special application that you would like to discuss.

Weighing Systems

Weighing cells can be installed into the frames of blenders -

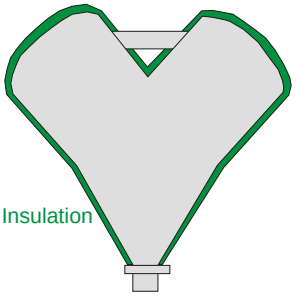
- Pre Blending - Confirm that the correct weight of ingredients have been added
- Post Blending - dispense known weights of the product
- Accurate



Jacketed Shells

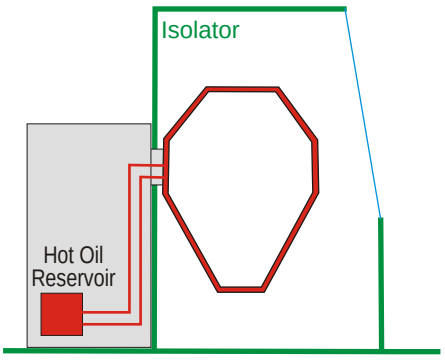
Blending containers can be jacketed.

- Prevent products from getting too hot or too cold
- Can be fitted with heating and cooling systems
- Ideal for thermo-sensitive products



Self Sterilising in an Isolator

- A Jacketed blending shell is required
- Hot oil at 200°C is pumped through special pipework in between the double skins
- Dry heat sterilisation means that the interior of the of the shell does not have to be exposed to chemical sterilising agents



Evacuated Shells

- Lowering the air pressure above the product allows moisture to be evaporated more quickly
- Product is exposed to solvent for the shortest possible period

See Page 29 for further applications

Production Scale Blenders

Pharmatech can supply a comprehensive range of custom built Production Scale blenders of any shape or size up to about 6000 litres. As well as the blender we can also incorporate methods of loading and discharging as well as WIP and CIP systems.

Contact ***Pharmatech*** to discuss your blender requirements or for more detailed information about a particular style of blender.

IBC Blenders

- For any size of IBC up to 4000 litres
- Suitable for use with virtually any make of IBC
- Ideal for use in multi-product environments as the IBC can be charged and emptied away from the blender
- Hoist or plinth mounted

Hoist Blender with 'C' Frame Arms blending a 1500L IBC

4000L IBC in a Cage Blender

V Shell Blenders

- Traditional, efficient blending shape
- Any size up to 6000 litres
- Symmetrical and Asymmetrical V shells
- Cantilever or Double Pedestal construction
- Cantilever machines can easily be installed through wall for improved GMP

1500L V Shell Blender - Double Pedestal

750L V Shell Blender (Cantilever design)

Double Cone Blenders

- Gentle homogenising action
- Any size up to 6000 litres
- Cantilever or Double Pedestal construction
- Symmetrical and Asymmetrical shells
- Cantilever machines can easily be installed through wall for improved GMP

3000L Double Cone Blender

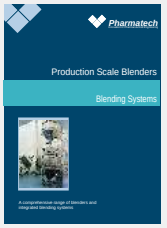
1250L Double Cone Blender (Asymmetric design)

Scholl Blenders

- Very efficient blending action
- Any size up to 6000 litres
- Cantilever construction
- Can easily be installed through wall for improved GMP
- Hoist or plinth mounted

1500L Self Loading Scholl Blender

Request a copy of our Production Scale Blenders brochure



New Innovation

Pharmatech
Innovation in Pharmaceutical Engineering

BlendView™

Instant Blend Analysis
Blending End Point Determination System

How do I know when blending is complete?

How do I prevent over-blending?

BV400 Blender

What is BlendView™?

Instant **B**lend **A**nalysis - ***Pharmatech*** and Carl Zeiss have worked together to develop a practical system that gives real-time readouts and lets the operator determine exactly when blending is complete.

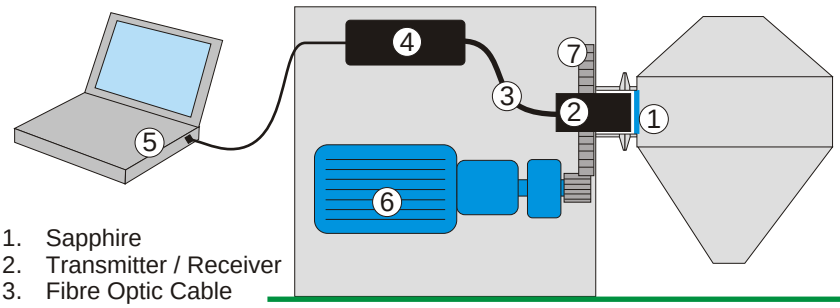
The monitoring system is non-invasive and uses near infra-red technology.

Carl Zeiss Ltd. are acknowledged world leaders in optical systems and NIR Technology.

BV030 Blender

Obtain essential PAT Data

Installation of the BlendView™ system



1. Sapphire
2. Transmitter / Receiver
3. Fibre Optic Cable
4. Gauge
5. PC
6. Blender Drive Motor
7. Main Drive Gear

The blender drive unit is fitted with an offset drive motor. This means that the centre of the drive shaft is now clear and can house the Transmitter / Receiver Unit.

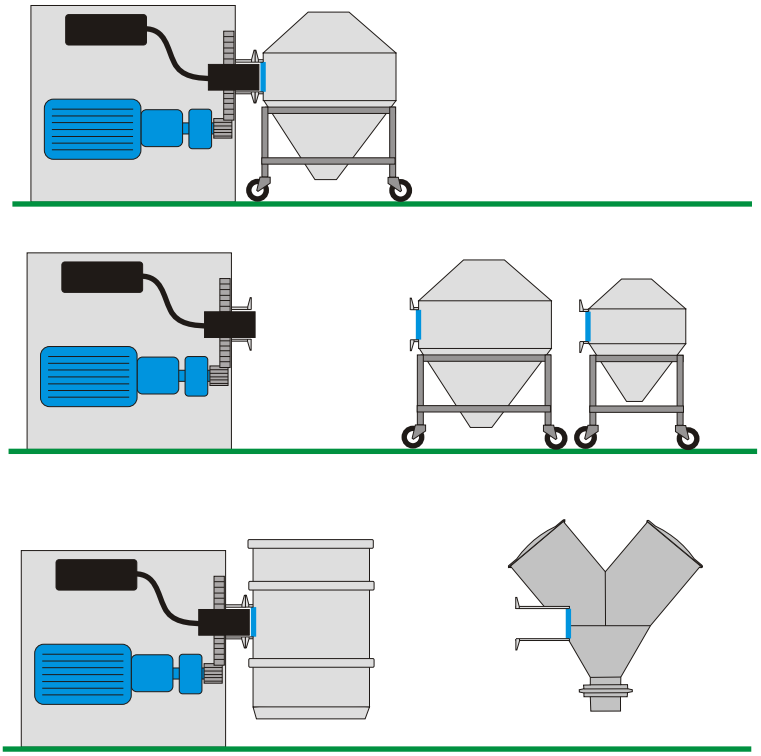
The Transmitter / Receiver Unit is kept stationary and light is shone through the sapphire into the blending container.

The blending container is held on to the drive unit by means of a clamp-band. Any shape or size of container can be used with the BlendView™ System.

Tel: +44 (0)1675 467636 Fax: +44 (0)1675 467582 www.pharmatech.co.uk Email: info@pharmatech.co.uk

New Innovation

Changing Blending Containers

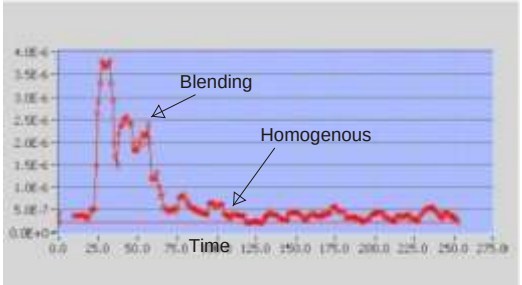


Virtually any shape or size of container can be used with the BlendView™ System.

The blending container is secured to the drive unit by means of a clamp band. This allows it to be quickly and easily changed for a different sized container or even a different shape of container.

Advantages of On-Line Monitoring with BlendView™

- Improve quality of product
- Improve manufacturing efficiency
- Develop more robust formulations
- Build-in quality
- Avoid costly batch re-processing (or even scrapping of batches)
- Ensure your process is as robust as possible
- Ensure your formulation is as robust as possible
- Reduce requirements for costly post-blending testing



Moving Block Standard Deviation Plot of Active against Blender Time at 1630nm

Customer Trials

The machine shown below is available for customer trials so that you can prove the technology using your own products. Contact ***Pharmatech*** for further information.

Notes:
The Blending container is mounted on a special trolley so that it is presented to the blender at the correct height

Agiblend Blenders

High shear mixing in removable containers

The mixing efficiency within a rotating blending shell can be improved with the addition of baffles (see page 25) or for an even greater mixing action a counter rotating agitator system can be fitted, these are ***Agiblend*** blenders.

Agiblend blenders, from ***Pharmatech***, are ideal for blending highly potent drugs or highly coloured compounds.

Counter rotating, high speed agitator bars give a high shear mixing action

Mobile Agiblend AB050 with Type A guards

Agiblend Features

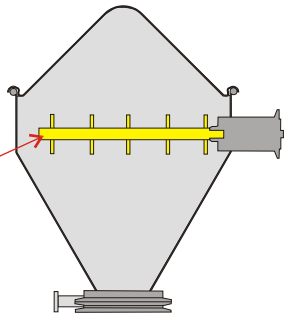
Agiblend blenders share many of the basic design features of the Multiblend range (ie. detachable containers, all stainless steel construction, GMP correct design, CE marked etc.). The Agitator system makes Agiblends even more versatile than their Multiblend counter parts.

- Ideal for highly potent or highly coloured blends
- Agiblend drive units are available from an AB050 right up to an AB2000A
- Agitator bars can be fitted to any shape container
- Agitator bars can be fitted to any size of container
- A range of different shaped agitator bars are available, see opposite
- Non agitator containers can be fitted to an Agiblend drive unit (as long as the container is fitted with the correct diameter flange)

Ideal for mixing highly potent or highly coloured products

Special Agiblend AB400 with 75 litre Double Cone

Cross Section through a Double Cone with an Agitator Bar



Internal view of a V Shell showing the agitator bar

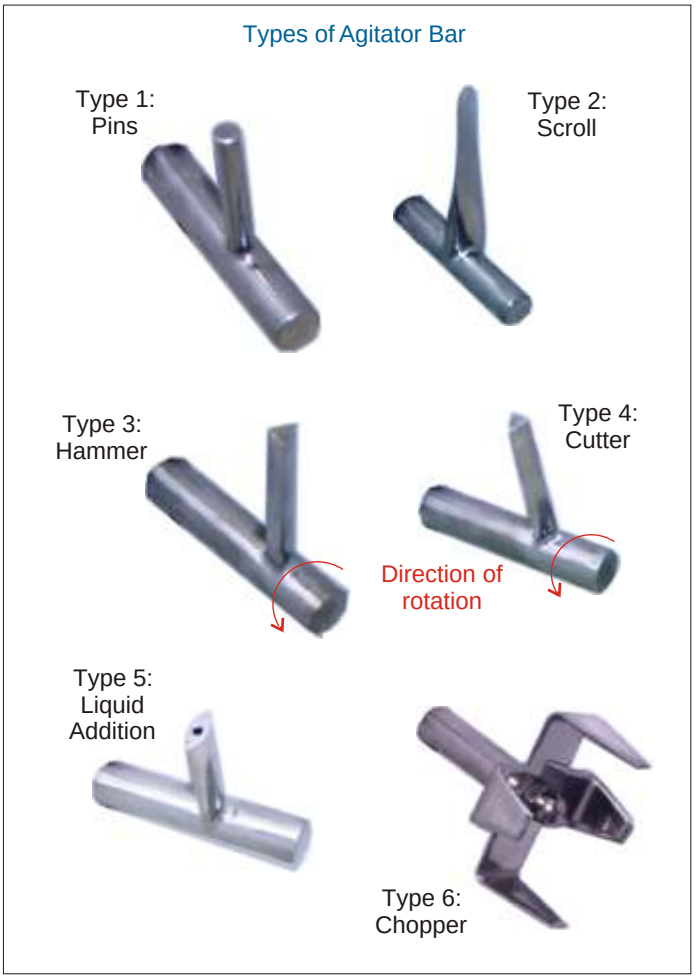
NB. The Agitator Bar is designed to be quickly and easily removed from the V Shell for cleaning.

Agitator Bar Design

The heart of the Agiblend system is the Agitator Bar. ***Pharmatech*** have designed and developed several different styles of Agitator Bars. The design of choice will vary from product to product.

- **Hammer or Knife Action** - agitators can be either sharp or blunt. An agitator with a sharp leading edge ('Cutter') will cut through the product whereas one with a blunt edge ('Hammer') will smash its way through the product. The agitator bar with an angled edge ('Scroll') will push the product around the container.
- **Length of Agitator** - the longer the agitator the greater the mixing effect
- **Standard Agitator or Chopper** - the standard agitator bar can be substituted for a high efficiency chopper blade
- **Liquid Addition** - Agiblend Blenders can be built for liquid addition via the agitator bar

Greatly improved efficiency



Blending Biohazards and Potent Substances

Removable containers mean that the ***Agiblend*** is ideal for intensive mixing of very potent substances and biohazards.

The blending container can be taken to a Biohazard Cabinet, the hazardous/potent material can be safely dispensed and sealed inside the blending container within the confines of the cabinet. The container can then be taken to the ***Agiblend*** and thoroughly mixed before it is returned to the Biohazard Cabinet for the next stage of the process.

Standard butterfly valves can be substituted with 'Alpha Beta' valves or 'Split Butterfly' valves.

Like to see a demonstration?

Contact ***Pharmatech*** for further information about the ***Agiblend*** range or to see a demonstration.

Multiblend Container Attachment

Several different methods of attaching containers to Multiblend blenders are available. The method of choice will depend upon the type of container, the size of the container as well as the planned handling procedure.

The table below indicates which style of container attachment is suitable for which size of blender.

	LC005	MB005	MB015	MB030	MB100	MB400 & MB400A	MB800A & MB1200A	MB2000A
Direct Attachment	No	**No**	No	No	**Yes**	**Yes**	**Yes**	**Yes**
Adjustable Clamp	**Yes**	**Yes**	**Yes**	No	No	No	No	No
Standard Band Clamp	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Double Band Clamp	No	No	No	No	No	No	**Yes**	**Yes**
Clamping Flange	No	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	No
Universal Arms	No	No	No	No	**Yes**	**Yes**	**Yes**	**Yes**

Contact ***Pharmatech*** for details of container attachment options for LC Sreies blenders.

Direct Attachment

- Blending container is mounted directly onto the drive shaft of the drive unit (NB. with the larger drive units the container is bolted directly on to the main bearing)
- Suitable for containers that need to be permanently mounted eg. V Shells & Double Cones
- Stub axle is welded to the side of the container
- Container changes requires the use of tools

MB400 with a 100 litre IBC

The IBC is bolted directly to the main bearing of the drive unit

Adjustable Clamp

- Suitable for use with MiniDrums up to 5 litres in size
- Allows different sized containers to be used on a single drive unit
- Container is secured by turning the hand operated nut

Adjustable Clamp on an MB005 holding a 5 litre MiniDrum

Standard Band Clamp

- Suitable for use with cylindrical containers, eg. drums
- Container secured by means of a quick release clamp
- Allows containers to be quickly and easily changed between blends
- Containers must have the same diameter (NB. clamp liners can be used to reduce the effective diameter of the band clamp)

MB400 with 200 litre drum secured with a Standard Band Clamp

Note the heavy duty over-centre securing clamp.

Double Band Clamp

- Suitable for use with large and/or heavy loads
- Use as for 'Standard Band Clamp' (see previous page)

MB800A with a 500 litre drum and 250 litre Top Hat

Clamp Liners

- For use with Standard Band Clamps
- Allows circular containers of different diameters to be used with a standard band clamp
- The liners are held in place using hand nuts

Single Band Clamp fitted with a set of Clamp Liners

Clamping Flange

- A stub axle with a flange is fitted to each of the blending containers
- The drive shaft is fitted with a similar sized flange
- The flanges on the container and the drive shaft are held together by means of a quick release clamp
- Allows containers of different shapes and sizes to be easily interchanged
- Heavy Duty version available for larger containers

Clamping Flange

Universal Arms

- Forked arms are fitted to the drive unit. A frame with two tubes is fitted to the blending container. The two arms are designed to fit through the tubes and the load is secured by a hand tightened nut on the end of each of the arms (See Page 10 for machine-in-use photograph)
- Allows containers of different shapes and sizes to be easily interchanged

MB400 fitted with Universal Arms

Special Attachments & Powered Clamping

Powered clamping for fully automated systems is available for machines MB400 and above. For specific applications special clamping systems can be designed and constructed.

Blending Containers

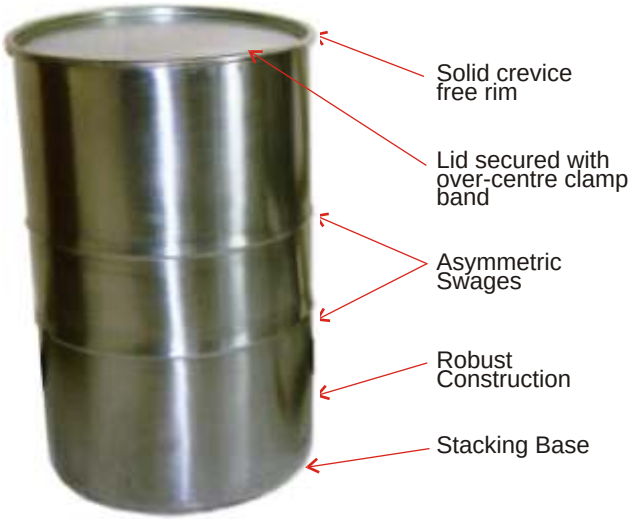
General Features

- Container volumes are quoted as total air volumes
- All product contact parts are 316 stainless steel and FDA approved silicone rubber. NB. Other stainless steels (Hastelloy C22 etc.) available.
- All sizes available - from 1 litre upwards
- Crevice free Interior
- Scaled replicas of existing shells
- GMP correct construction
- All surface finishes available (240 grit, Ra 1.0µm, is standard)
- Full documentation available eg. Certificates of Conformity. NB. Mill certificates can only be provided if they are requested at the time of ordering
- Legs & trolleys available for containers that are to be unclamped from the blender drive unit

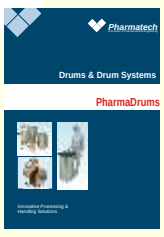
Drums

Pharmatech Processing Grade Drums are specifically manufactured to a very high specification to make them suitable for use in GMP processing areas.

- All sizes available - 1 litre up to 500 litres
- MicroDrums available for batch sizes less than 1 litre ask for details
- Economical
- Heavy duty construction
- Easy to handle
- Hygienic solid top rim - this removes the potential cross contamination and microbiological hazard associated with a curled top rim
- Asymmetric shedding swage design - prevents product from 'holding up' when the drum is emptied
- 'O' ring seal made from FDA acceptable polymers
- Stacking base
- Increase the available blending volume of a drum by using a Top Hat or Cone



Standard 200 litre Processing Grade Drum



For further information request a copy of our PharmaDrums brochure

Top Hats

The use of Top Hats enables drums to be filled to the top for efficient storage or transport. Prior to blending the drum lid is removed and a Top Hat is clamped in place. The Top hat provides the extra space required for efficient blending.

Top Hats are stainless steel and are finished to the same standard as our drums.

MB800A with 500 litre drum and 250 litre Top Hat

Sizes of Drums and Top Hats

Volume (litres)	Processing Grade Drums			Top Hats		
	Internal Diameter (mm)	Nominal Height (mm)	Weight (kg)	Recommended Volume (litres)	Nominal Height (mm)	Weight (kg)
1	100	155	3	N/A	N/A	N/A
5	130	175	3	N/A	N/A	N/A
10	220	295	3	N/A	N/A	N/A
20	270	387	5	N/A	N/A	N/A
25	315	400	6	N/A	N/A	N/A
50	400	440	8	25	225	4
100	457	670	13	50	325	6
100	560	450	13	50	225	6
200	560	865	21	100	450	10
300	647	980	28	150	475	12
400	750	980	39	200	475	19
500	750	1210	47	250	600	23

Drum Baffles

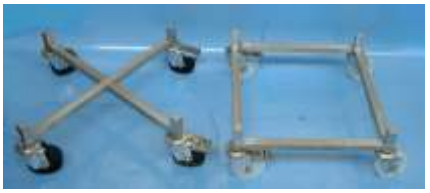
For most products blending in a standard container will be sufficient to obtain a homogenous product. If a more intensive blending action is required then ***Pharmatech*** recommend using removable Blending Baffles.

200 litre drum with removable baffles

Container Trolleys

Pharmatech have a range of different trolleys so that containers of any shape or size can be easily moved to and from the blender. The trolleys are designed to minimise the amount of manual handling.

Trolleys are manufactured from 304 stainless steel and are available with a range of different castors to suit the gross weight, floor type etc.



Standard Trolley with optional antistatic wheels and a Square Trolley with regular wheels

Special Lifting Trolley

Special IBC Trolley

Heavy Duty Drum Trolley

IBCs

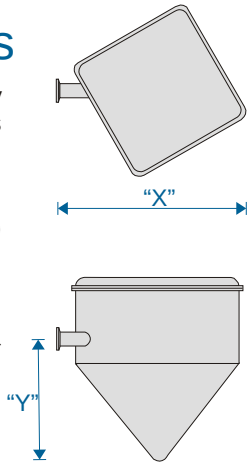
Intermediate Bulk Containers (IBCs) are available in any size from 1 litre upwards. Scaled copies of existing IBCs that are already in use in production areas can be manufactured for use in development laboratories or for scale up. ***Pharmatech*** recommend the fitting of a hygienic butterfly valve to IBCs over 10 litres.

Type 1 IBCs

Type 1 IBCs have fully removable lids. The lids are secured with toggle clamps.

NB. Shells up to 10 litres are not fitted with a valve .

See Front Cover for a photograph.

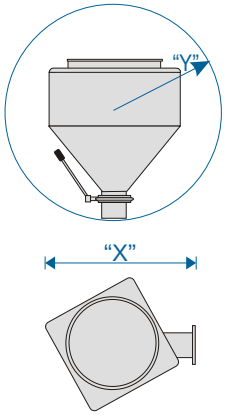


Volume (litres)	'X' Dimension (mm)	'Y' Dimension (mm)	Rotating Radius (mm)	Weight (inc. valve) (kg)
1	197	89	98	2
2	235	123	130	3
5	298	150	158	5
10	360	225	230	8
15	411	312	313	9
20	443	339	340	12
25	470	356	357	15
50	593	426	449	26

Type 2 IBCs

Type 2 IBCs have a 'drum style' lid that is secured with an over-centre clamp band.

Frame legs can be fitted to Type 2 IBCs - ask for details.



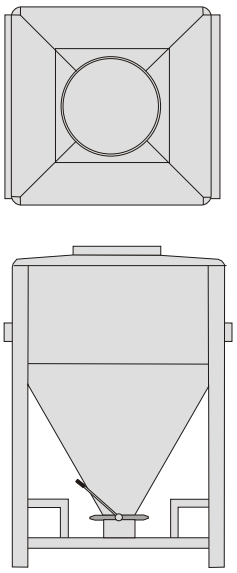
Volume (litres)	'X' Dimension (mm)	'Y' Dimension (mm)	Rotating Radius* (mm)	Weight (inc. valve) (kg)
75	197	900	475	97
100	235	900	575	100
200	298	900	645	115
300	360	900	719	130
400	411	900	791	140
500	443	900	849	151
600	470	900	885	160

* with no frame - Radius with standard frame is 1055mm

Type 3 IBCs

Type 3 IBCs are based on either a 1200mm or 1350mm square foot print. Different volumes are obtained by varying the height of the upper vertical part of the IBC. This approach allows IBCs of different volumes to be used on a single blender.

Clamping Channels are fitted to the side of Type 3 IBCs to enable them to be safely handled by blenders.

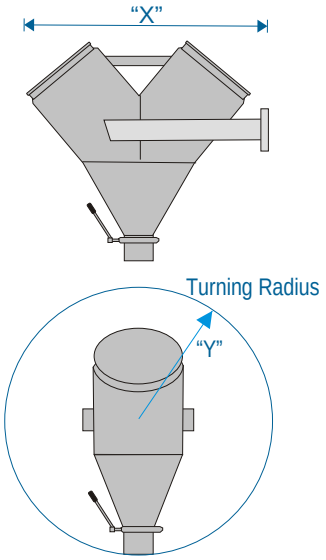


Volume (litres)	'X' Value (mm)	'Y' Value (mm)	Comments
500 to 2000	2280	1430	1200mm sq foot print
2000 to 3000	2520	1587	1350mm sq foot print

NB. Value of 'X' includes allowance for blender frame
Value of 'Y' based on 'C' Frame arms being used

V Shells

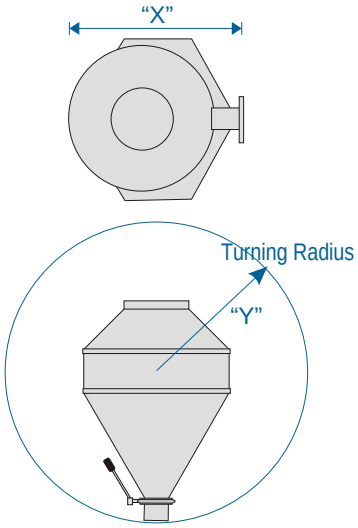
V Shells are commonly used on production blenders. ***Pharmatech*** offers a series of scaled replicas for use with Multiblend ***blenders***. Intermediate sizes of shells to those shown in the table below are available, ask for details.



Volume (litres)	'X' Value (mm)	'Y' Value (mm)
1	260	100
5	380	170
10	440	240
20	650	250
50	770	420
100	1015	505
200	1295	690
500	1675	800

NB. Shells up to 10 litres are not fitted with a valve but are fitted with a stabilising foot to allow them to stand on a bench

Double Cone Shells



Volume (litres)	'X' Value (mm)	'Y' Value (mm)
1	192	94
5	250	130
10	314	227
20	386	290
50	490	270
100	660	345
200	850	430
500	1150	580

NB. Shells up to 10 litres are not fitted with a valve but are fitted with a stabilising foot to allow them to stand on a bench

60° Lower section to aid product discharge
45° Upper section for greater asymmetry which gives improved blending

Discharge Valves

No Valve

- Valves are not recommended for containers smaller than 10 litres

Basic Butterfly Valve

- Ideal for containers between 10 & 50 litres
- Valve has a 50mm nominal bore

Hygienic Butterfly Valve

- Ideal for containers larger than 50 litres
- Range of styles and sizes are available - ask for details

10L V shell with a 50mm Basic Butterfly Valve

Hygienic Butterfly Valves

Operator Control Panels

Several different Control Types are available as are several different styles of Control Panel Enclosures. The standard control panel for most types of blenders is Style 1B ie. Membrane Button Panel in a surface mounted box (NB. see individual blender specifications for confirmation).

All control panels incorporate timer, key switch and an emergency stop button (Tachometers are optional extras). Dimensions given are for standard control panels. These dimensions will be confirmed in the Technical Specification.

All machines (except LC005) have variable speed, this can be controlled from the control panel or switched out of circuit to give a set speed.

Control Types

Type A - Push Buttons

- Standard push button controls
- Ex rated push buttons can be fitted - ask for details

Standard Push Button Controls (non EX rated)

Type B - Membrane Button Panel (MBP)

- Standard Membrane Button Panel (MBP) Controls
- Durable
- Flush mounted in control panel
- GMP compliant wipe clean surface
- Confirmation LEDs can be incorporated into panel

Membrane Button Panel with LEDs

Type C - Human Machine Interface (HMI)

- Advanced, flush membrane button panel
- Requires PLC controlled machine
- 2 line LCD can provide operator with:
  - Operator instructions
  - Error messages
  - Fault messages
- Operator can input data eg. batch numbers
- Can be Ex rated

Human Machine Interface

Type D - Touch Sensitive Screen

- Requires PLC controlled machine
- Video screen shows machine status
- Fully customisable
- Can be used to access PLC to run batch recipes
- Suitable for entering alpha-numeric values

Touch Sensitive Screen

Styles of Control Panels

Style 1 - Wall mounted Control Box

- Sloped upper surface for easy cleaning
- Dimensions: 500mm (H) x 350mm (W) x 100mm (D)
- Suitable for use with Control Types: A, B & C

1B Controls

(Surface mounted box with MBP controls)

Style 2 - Flush mounted Control Panel

- Flush mounted in wall for improved GMP
- Dimensions: 300mm (H) x 350mm (W) x 100mm (D)
- Suitable for use with Control Types: A, B & C

2B Controls

(Flush mounted box with MBP controls)

Printers available - ask for details

Special Applications

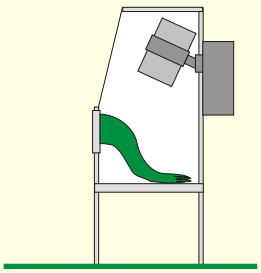
Pharmatech have supplied many 'one off' blenders for customers who have specialist applications. If you have a blending application that is not covered by any of the machines in this brochure then contact Pharmatech to discuss your project.

Isolator Blender

This blender was designed to be installed on the back of isolator cabinet with only the drum on the inside.

When the blender was not required the drum and drum clamp could be easily removed to free up space within the isolator.

See page 16 for a larger isolator blender.



Mobile MB400

- Customer wanted a fully mobile MB400 with Infra-red Light Guards
- The blender was given a special base so that it could be moved around using a pallet truck.
- The Light Guards and blender control panel were mounted in free standing units.

Guarding Systems

Rotating containers present a potential danger to operators and must therefore be guarded. All ***Pharmatech*** blenders (except the LC005) have, as standard, a safety circuit for connection to an interlocked guard system. The blenders will perform an emergency stop if the guard is opened whilst the machine is blending - the machines are designed to come to rest within 1/3 of a revolution.

Guards for MB100

Type A - Clam Shell Guards

- Guards close around the blending container
- Doors are hinged at the back so that when they are fully opened the operators have good access to the blending container attachment point
- 304 grade stainless steel, 180 grit finish (Other stainless steel grades and finishes are also available)
- Designed for use when the container is attached to the drive unit at the rear of the container

Type B - Kennel Guards

- Doors are hinged at the front of the guard
- Ideal for drum blenders as the operator only requires access to the front of the guarded area
- 304 grade stainless steel, 180 grit finish (Other stainless steel grades and finishes are also available)

Guards for Floor Mounted Blenders

These guards are suitable for the following Multiblend drive units: MB100, MB400, MB400A, MB800A, MB1200A and MB2000A. The simplest form of guarding is to put the blender in a room, site the controls outside the room and have a suitable micro-switch or trapped key on the door.

Type C - Physical Barriers

- Physical barrier surrounds the blender
- The gate is interlocked either using accredited safety barrier sensors or a trapped key system
- Guard is individually designed to suit the blender size, the location and the load that is being blended.

Stainless Steel Fence & Gate System

Glass Screen & Gate

Type D - Light Barriers

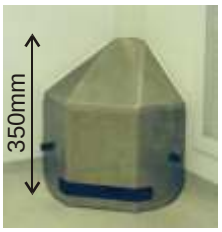
- Cutting a light beam causes the blender to Emergency Stop
- Highly effective and elegant system
- Transmitter and receiver units can be flush mounted in a wall for a GMP finish
- By increasing the number of light beams the guard can be placed closer to the rotating load

Light Guard Demonstration set up

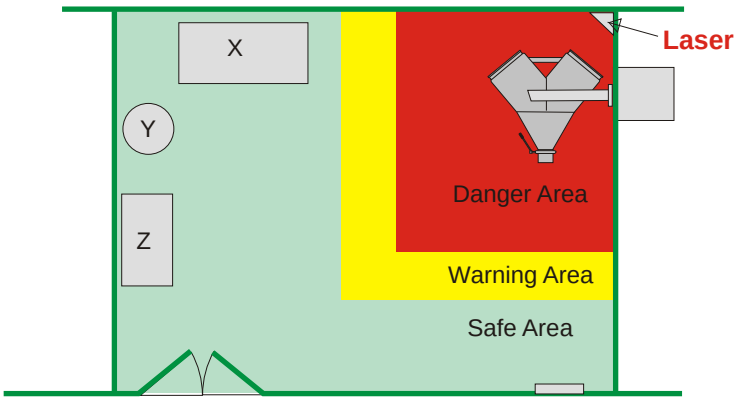
Note:
Infra Red Light beams are invisible during operation

Type E - Laser Guard

- Laser Guard unit is positioned in corner of blending suite 75mm above floor level
- Laser Guard is taught the shape of room
- Detects people or items in, or as they enter, the danger area
- Highly elegant and effective system
- Class 1 Laser - invisible and harmless to the eye
- Ideal for irregular shaped rooms
- Laser Scanner can be mounted in the wall for a high quality GMP finish
- CE marked
- Not suitable for Ex rated areas



Corner Mounted
Laser Guard



V Shell Blender guarded by a Laser System

1. During blending operators can move around **Safe Area** and operate machines 'X', 'Y' and 'Z'.
2. On entering the **Warning Area** an alarm is seen and/or heard.
3. On entering the **Danger Area** the blender will perform an emergency stop.

Blender Movement

The ability to move a blender from room to room greatly increases the versatility of the machine. ***Pharmatech*** offer several different systems for the different sizes of blenders. The MB050 and MB100 are both mobile as standard.

Bench Top Blenders

The bench top blenders (LC005, MB005 & MB015) can all be mounted on mobile trolleys. There are two styles of trolleys:

Type A:
Trolley fitted with
cupboards

Type B:
Trolley fitted with
open lower shelf

Tilting Blenders

By fitting channels to the base of the MB400 or MB400A, the drive units can be easily moved by a pallet truck. The machines also require the addition of ballast to the base of the drive for extra stability and the use of special plugs and wall sockets to allow the power and control cables to be disconnected.

Mobile MB400 fitted with
pallet truck channels

Brochure Request Service

For more detailed information photocopy this page, tick the brochures that you require and then fax the sheet back to us.

Name: .....

Company:.....

Address:.....

.....

.....

.....

Job Title: .....

Tel: .....

Fax:.....

E-mail: .....

Tick Box to request brochure

Production Scale Blenders ☐

Hoists ☐

Dust Free Transfer ☐

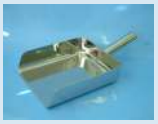
Drum & Keg Tippers ☐

Processing Grade Drums & IBCs ☐

Powder Handling Aids ☐

Sampling Equipment ☐

Fluid Bed Driers ☐



Dispensing Ware ☐

Mixer Granulators ☐

Cone Mills, Hammer Mills & Sizing Equipment ☐

Tablet Coaters ☐

Pharmatech is a division of Terriva Ltd.

Pharmatech
2 Forge Mills Park, Station Road,
Coleshill, Warwickshire. B46 1JH. UK.
Tel: +44 (0)1675 467636 Fax: +44 (0)1675 467582
Email: info@pharmatech.co.uk www.pharmatech.co.uk