



Pharmatech
Innovation in Pharmaceutical Engineering

Production Scale Blenders

Blending Systems



A comprehensive range of
blenders and integrated
blending systems

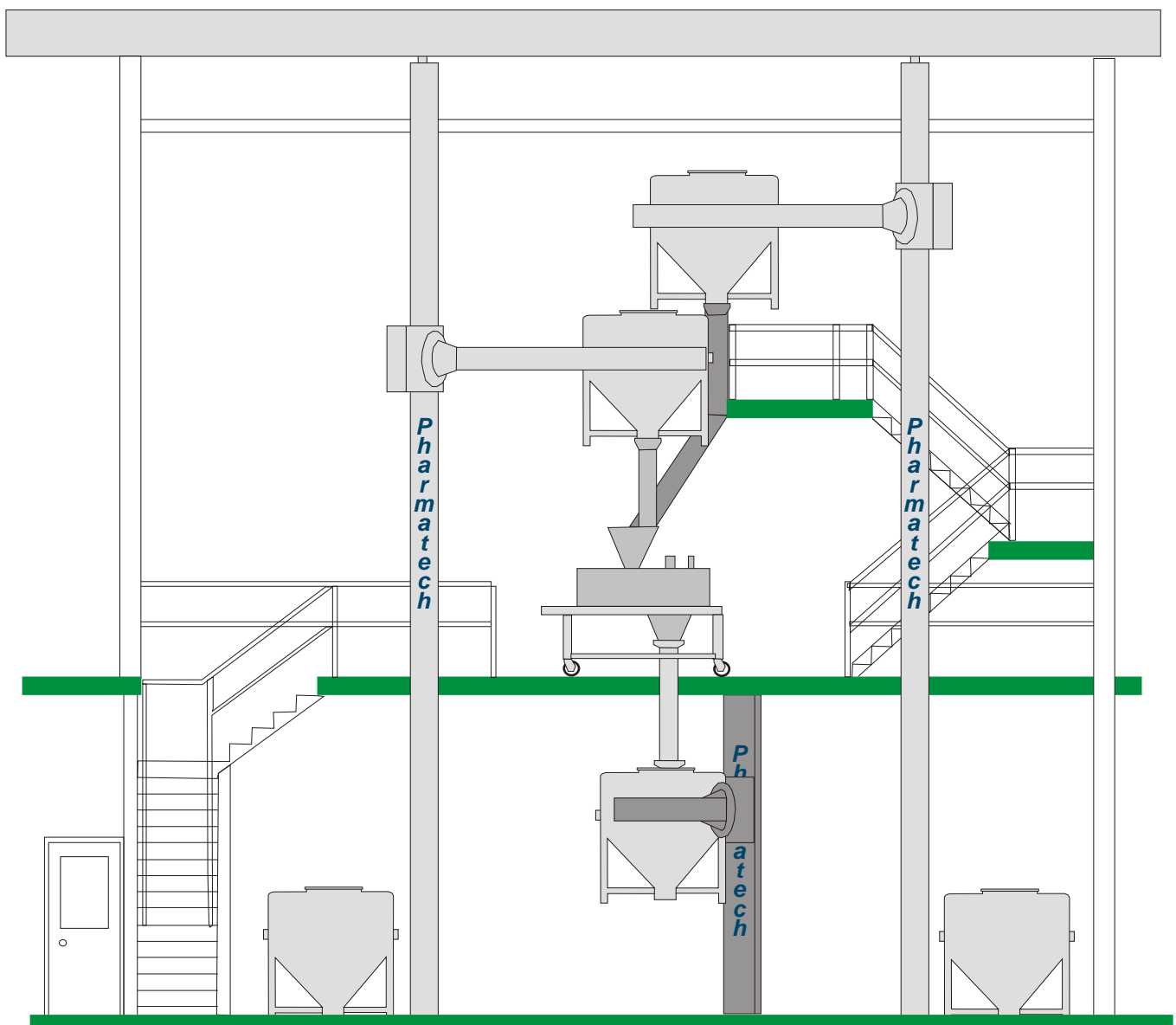


Customised System Solutions from *Pharmatech*

Right:-
FBD Bowl Inverter
& mill feeding an
IBC also an IBC
Hoist Blender.



Below:-
Planning Sketch of a Powder Processing Station. The
contents of two IBCs are sieved and then loaded into a
new IBC which is then blended



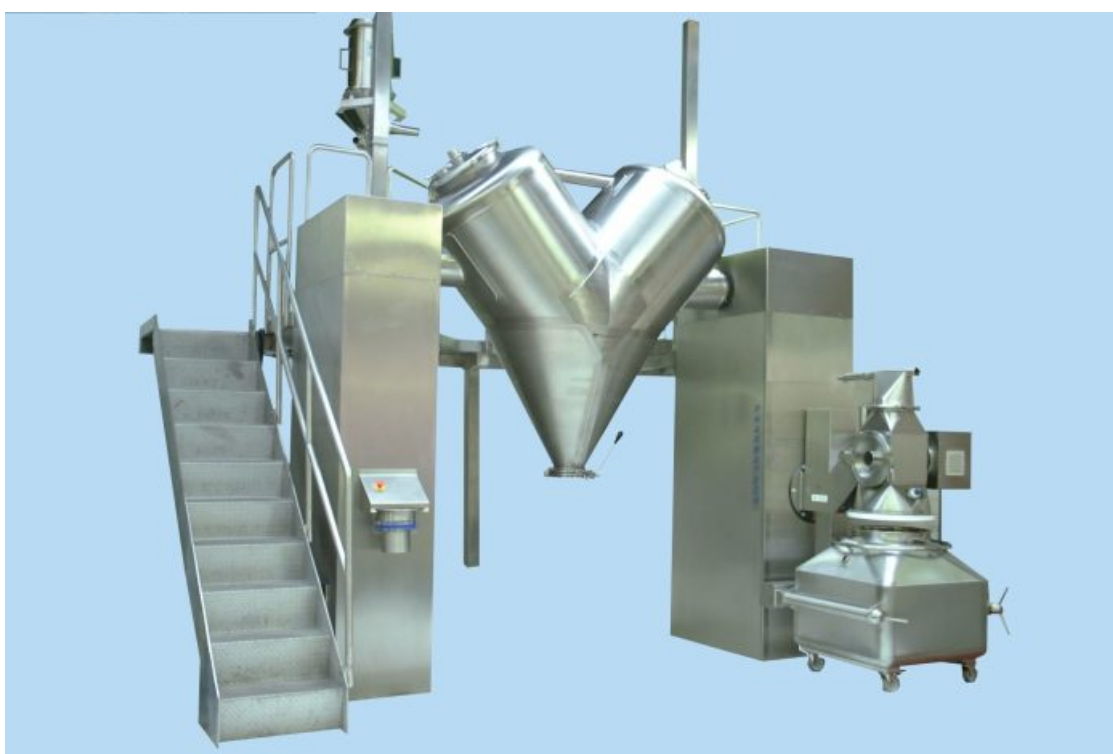
Blending Systems

by Pharmatech

The Complete Blending Solution

Pharmatech are world leaders in designing and manufacturing blenders and blending systems for powders and granules in the pharmaceutical and allied industries.

Our philosophy is simple - to build the blender that is right for your application. You should not have to change your process to accommodate your new blender. This simple philosophy has led to many innovative and effective designs from Pharmatech.



Pharmatech equipment is designed to be as user friendly as possible. Our experienced designers work along side pharmacists who have years of hands-on experience of working in pharmaceutical production environments.

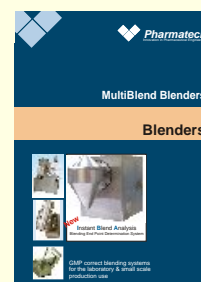
Blenders do not operate in isolation. For maximum efficiency the blender has to be fully integrated into the process flow within the production facility. Pharmatech therefore supply not just blenders but the **Complete Blending Solution**.

Need a smaller blender?

Batch size 500ml to 500 litres?

Pharmatech have a range of highly versatile, smaller blenders which are ideal for laboratory, scale-up and small scale production use.

For further details please request a copy of the Multiblend Brochure.





V-Shell Blenders



3500 litre V-Shell Blender, double plinth design
The blender is loaded directly from IBCs presented on a hoist

V-Shell Blenders are designed so that they provide an intensive mixing action. As the V-Shell rotates the product is repeatedly divided and then mixed together.

- Any size up to 6000 litres
- Single or Double plinth designs

Single Plinth or Double Plinth?

V-Shell Blenders up to 1000 litres in size can be either single or double plinth machines. The advantages of a single plinth machine are:

- The machine takes up less room
- The machine can easily be installed through wall

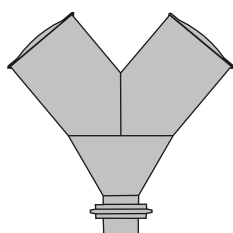


Above: 1250 litre V-Shell Blender, double plinth design

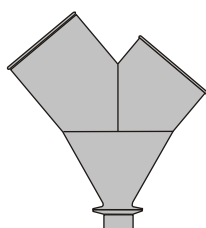
Any size up to 6000 litres

V-Shell Shape

Pharmatech can manufacture V-Shells to any specification, the most usual shapes are Symmetrical or Asymmetrical.



Symmetrical V-Shell



Asymmetric V-Shell



Above - 750 litre V-Shell Blender, single plinth design

Double Cone Blenders



5000 litre Double Cone Blender, double plinth design

Double Cone blenders provide an efficient but gentle blending action. They are usually designed as fixed shell blenders (where the Double Cone is permanently attached to the support plinths).

The Double Cone Blender shown opposite has a twin plinth design. The right plinth houses the drive motor and electrical cabinet,

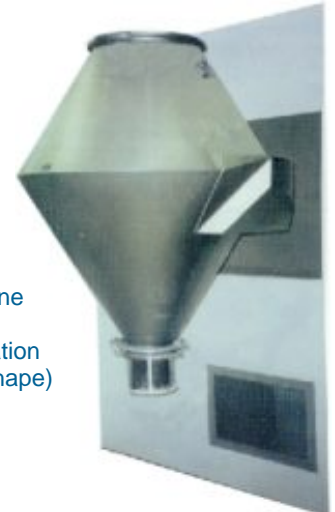


Asymmetric 1250 litre Double Cone. Irregular shape provides a more intensive blending action

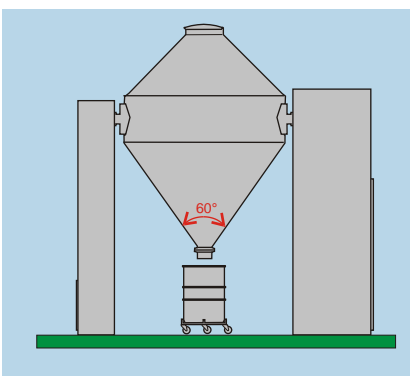
Blender Features

- Any size up to 6000 litres
- All stainless steel construction
- GMP correct design
- Single Plinth or Double Plinth Designs
- Free standing or through wall
- Ex rated to any standard
- Full Validation Documentation

Any size up to 6000 litres



800 litre Double Cone Blender Through Wall Installation (Non standard cone shape)

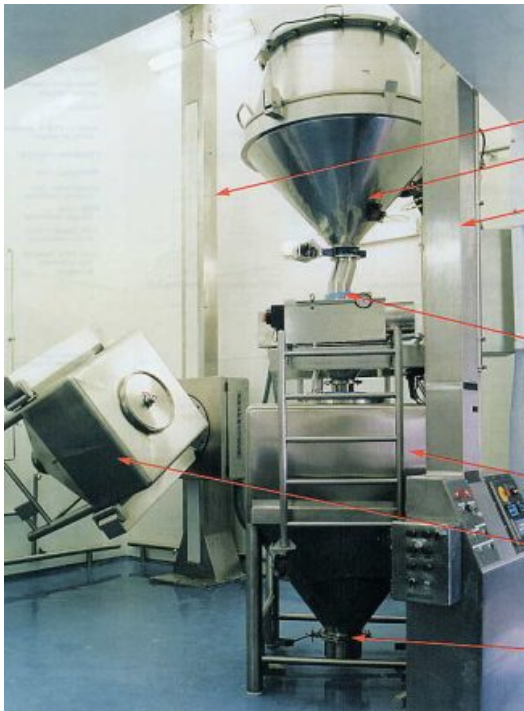


Double Cone Shape

Pharmatech can manufacture double cones to any specification, this is very useful if an existing double cone needs to be replicated, or there may be other considerations such as room height.

For optimum performance Pharmatech usually recommends a Double Cone with a 60° internal angle in the lower cone, this ensures efficient blending and good product discharge.

IBC Blenders



IBCs (Intermediate Bulk Containers) are highly efficient blending containers due to their irregular shape.

The real advantage of using IBCs is that they can be charged and discharged away from the blender. This means that the blender does not get contaminated with product.

IBC Blenders are therefore ideal for use in multi-product environments where the machine will be required to blend a number of different products within a short period.

Any size up to 4000 litres



4000L IBC in a Cage Blender

Note: The IBC is secured at the top & bottom

Blender Features

- Single Plinth designs only
- Free-standing or through wall installations
- All stainless steel construction
- GMP correct design
- Suitable for IBCs up to 4000 litres in size
- Ex rated to any standard
- Range of guards available
- Hoist Blenders available
- Full validation documentation

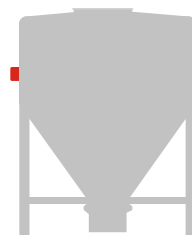


Hoist Blender with 'C' Frame Arms blending a 1500L IBC

Clamping IBCs

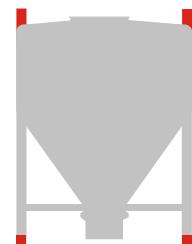
Pharmatech IBCs are designed to be clamped by means of a Clamping Bar. The clamping bar is welded along two sides of the IBC and allows the IBC to be handled by an elegant 'C' frame blender.

Where customers already have IBCs these can be secured in cage style blenders.



Clamping Bar

Pharmatech IBC with Clamping Bars for use with C Frame Blender



IBC for use with Cage Blender



Types of IBC Blender

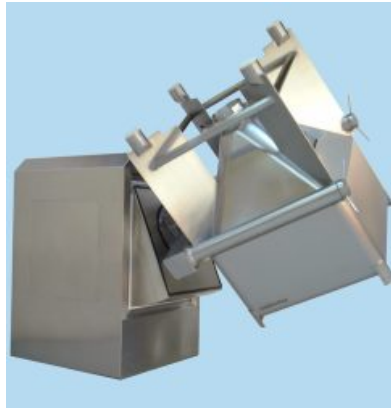
C-Frame Blender

The IBC is clamped using the Clamping Bars on the side of the IBC. The IBC is raised before blending is started.



Universal Arms

The IBC is fitted with a pair of tubes that fit over the two prongs on the drive unit. Universal Arms are suitable for IBCs up to 1000 litres in size.



Cage Blender

The Cage Blender is designed to secure the IBC at special location points fitted to the top and bottom.



IBC Hoist Blenders

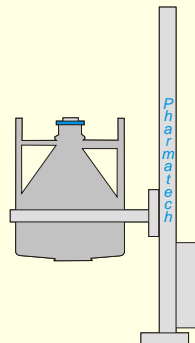
IBC Hoist Blenders allow the IBC to be raised, after blending, so that it can be discharged under gravity into for example a tablet compression machine.

Pros

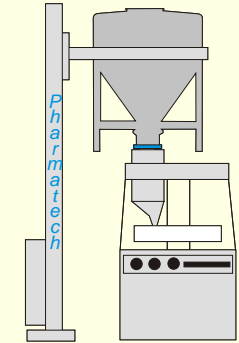
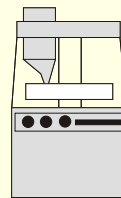
- Versatile (two machines in one)
- Ideal where space is at a premium

Cons

- Blender can not be used for next batch whilst IBC is being discharged



IBC being blended



IBC being discharged

Scholl Blenders



1500L Self Loading Scholl Blender

- 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

Drum Blenders



200 litre Drum Blender mounted on a Hoist

Drums make very convenient blending containers. They are easy to handle and they offer good blending performance. Another advantage is that they are much cheaper compared to other types of blending container.

Pharmatech manufacture a range of Drum Blenders to suit drums of any size up to 750 litres.

Blender Features

- Single Plinth designs only
- Free-standing or through wall installations
- All stainless steel construction
- GMP correct design
- Suitable for drums up to 500 litres in size (750 litres if fitted with a 250 litre Top Hat)
- Ex rated to any standard
- Range of guards available
- Full validation documentation



Drum Blender Through-wall installation



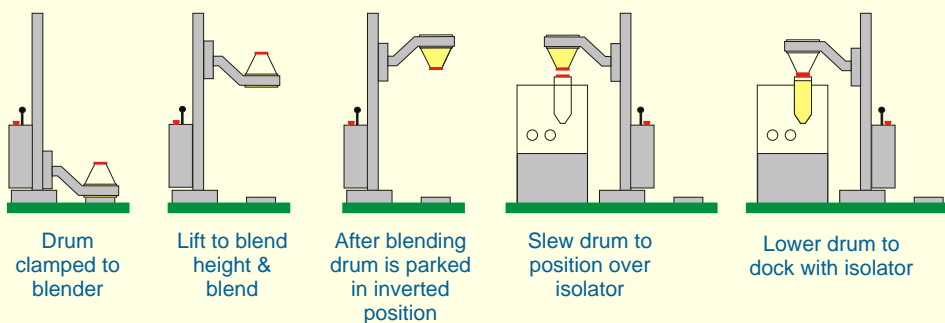
600 litre Drum Blender Free-standing installation

Any batch size up to 500 litres

Case Study - High Containment Hoist Blender

The customer required a method of blending their product and then discharging it into a hopper in an isolator.

The blender shown opposite is able to blend the drum and then is able to dock with the isolator. The product transfer is made through an Alpha Beta Port - a high degree of accuracy is required to enable the two parts of the port to join.





BlendView™

Instant Blend Analysis Blending End Point Determination System

How do I know when blending is complete?

How do I prevent over-blending?

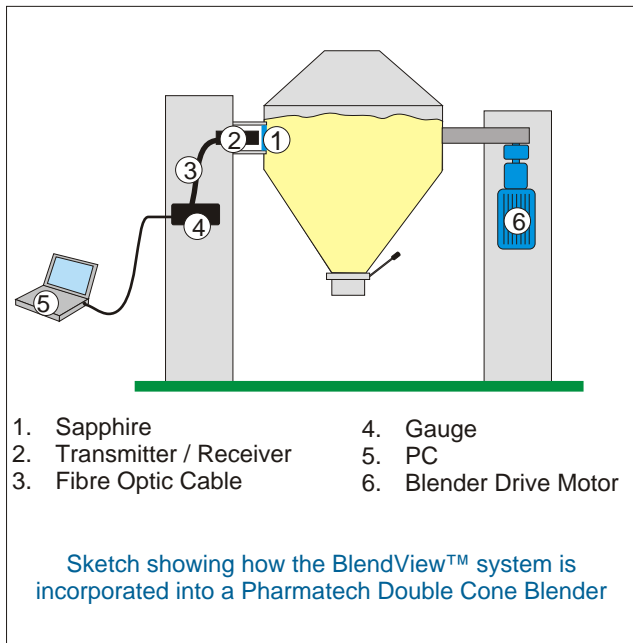
What is BlendView™?

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.

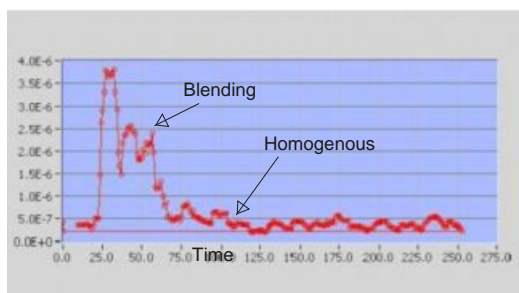
Carl Zeiss are acknowledged world leaders in optical systems and precision engineering.

BlendView™ can be supplied with any Pharmatech Blender



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 Ltd 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

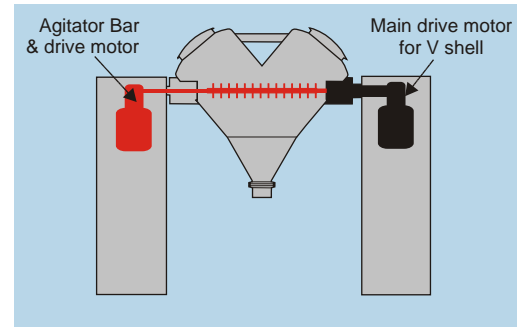
V Shell Blender with Agitator



The machine shown opposite was supplied to a customer who required a 1000 litre V Shell blender with a high speed counter rotating agitator bar.

The agitator bar is designed to provide a high shear mixing action and so is ideal for mixing highly potent and coloured substances into the batch.

This blender was also supplied with an operator gantry.



Self Loading Double Blender



Double Blender Installation

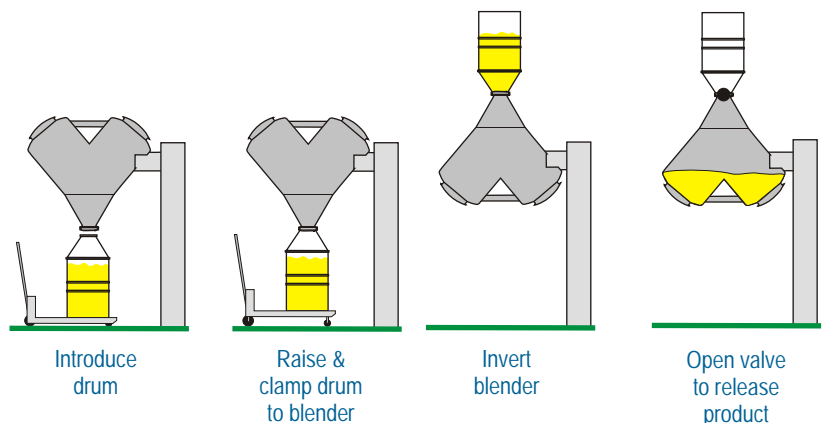
Increased Versatility

The Double Blender has two V shells. The large V shell is suitable for normal production batches.

The small V shell at the front is detachable and is ideal for 1/10th scale validation batches and for small scale production batches.

Self Loading

The product is brought to the blender in a drum. The drum and V shell are inverted through 180°, the product is then able to fall into the V shell under gravity. The drum is removed before blending.



Self Sterilising Blender



This blender was specifically designed for use in a microbial isolator for the aseptic preparation of powder blends. A number of special features were incorporated into the design:

Self Sterilising

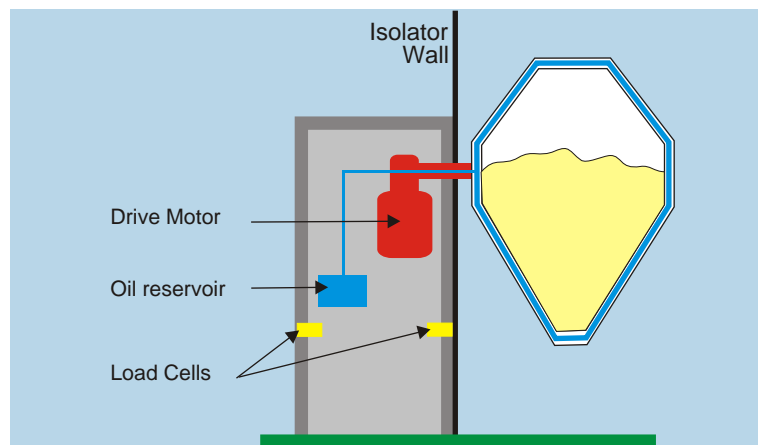
The blender has a double-skinned shell. Oil at 200°C is pumped between the layers, this then heats up the inner surface to sterilise the interior of the shell. The exterior of the shell is insulated for operator safety.

Built in weighing system

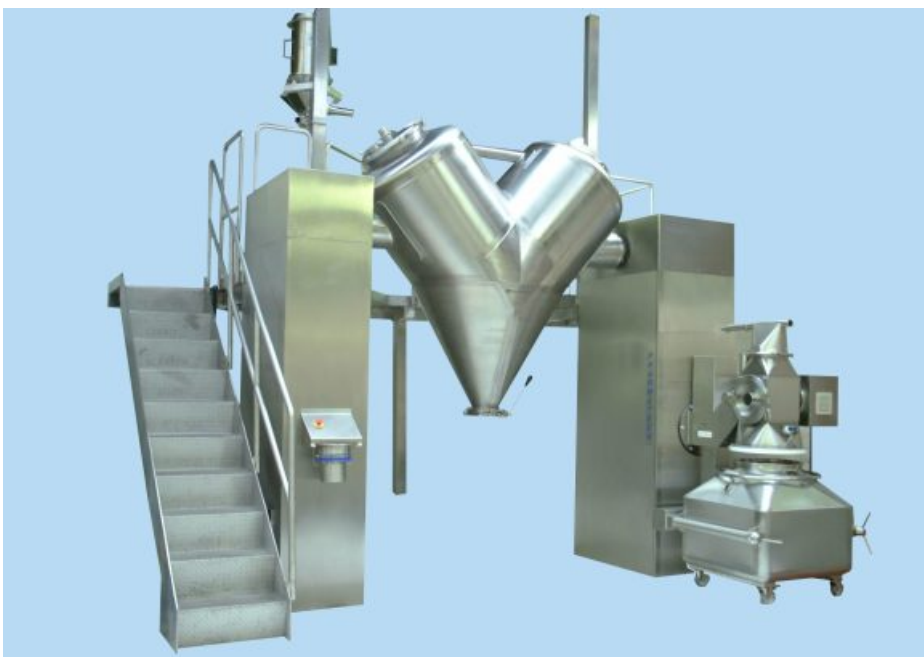
Load cells are built into the blender frame, this gives the operator a real time readout of the weight of material in the double cone shell during the charging and discharging processes

Through-wall installation

The machine is designed to be installed through an isolator wall. Only the double cone shell is in the processing area, the frame and drive motor are outside the isolator.



Blending & Conditioning Station



The product is brought into the blending room in the small IBC. The IBC is clamped to a milling station. The Milling station and IBC are then inverted so that the product falls through the mill under gravity.

A vacuum transfer unit is used to convey the conditioned product from the mill outlet into the blending shell.

After blending the product is discharged under gravity into drums.



Loading Systems

Pharmatech are the experts in the design of Blending Systems. It is very important that the correct method is used to load a blender in order to prevent problems such as :

- Dust creation
- Loss of product
- Manual handling issues
- Contamination of the product
- Contamination of the working environment

Self Loading Systems



See Page 10 for an application

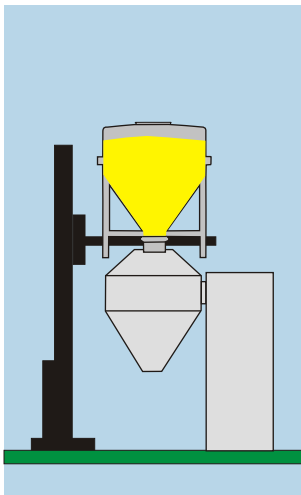
Vacuum Transfer Systems

- Ideal where there is limited headroom
- Best used in single product environments

Gravity Loading Systems

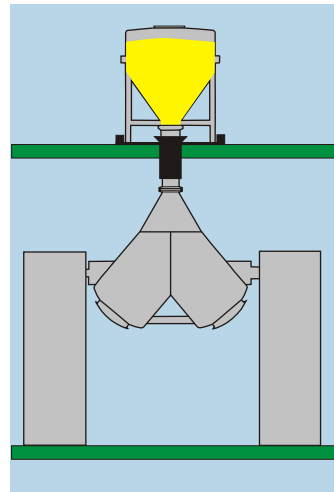
- Charging container is emptied under gravity
- Dust free transfer can be achieved

Gravity Type 1: Using a Pharmatech Hoist



Drum hoist - used to lift and invert a drum so that it can be discharged under gravity

Gravity Type 2: Using a Through-floor charging system



Through-floor IBC Discharge Station

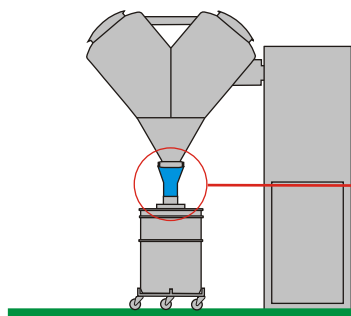
Custom systems are designed and manufactured on request

Discharge Systems

Fixed shell blenders need to be discharged into a transport container (as shown to the right) or into a conveying system (eg. A vacuum transfer system).

The great advantage with a Change Shell Blender (such as a drum or IBC blender) is the blending container can be removed from the blender for discharge.

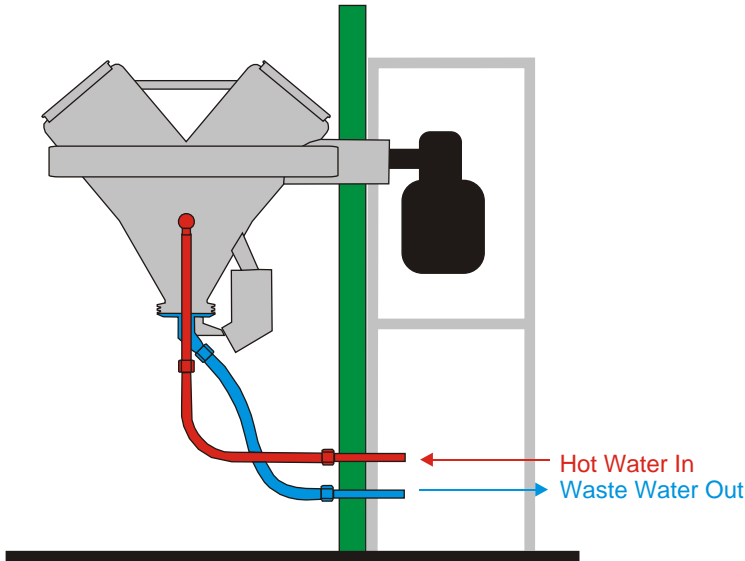
Pharmatech will custom design a discharge system to suit the customer's process and premises.



A V-Shell Blender is discharged into a drum using a flexible dust tight connection



Washing Systems



Pharmatech offer custom designed washing systems for use with our blenders.

The system shown opposite uses a removable lance that is clamped to the shell in place of the discharge valve.

Flexible hoses are used to connect the lance to the services in the wall.

Positive feedback interlocks are used to ensure the safety of the operators



Washing Lance

Individually Designed & Constructed

Pharmatech Washing Systems can either be designed to take water directly from the factory water supply or where water flow rates are inadequate we can supply a skid with water storage tanks.

The CIP skid can contain one or more water tanks depending upon the washing cycle to be employed.



Single Tank CIP Skid



Twin Tank CIP Skid

Specification

- Twin Tank System
- Large tank contains - towns water at 80°C (sufficient for 2 washes)
- Small Tank contains - demineralised water at 80°C
- Recirculation loops to prevent localised cooling
- PLC controlled
- Fully monitored
- cGMP compliant

Water Temperature

The water in the tanks must be kept above 80°C to prevent microbiological growth. The tanks are fitted with recirculation loops to help ensure the water is kept moving and so local cooling does not occur. The water temperature is constantly monitored and an alarm will sound if the water temperature gets too low.

Drying Systems


Contact Pharmaetech for details about custom built drying systems for use with blenders.

Guarding Systems

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 1 - Physical Barriers

- Stainless steel fence or see-through screens are used to surround the blender
- The gate is interlocked using either micro-switches or a trapped key system
- Guards are individually designed to suit the blender size, the location and the load that is being blended.



Stainless Steel Fence & Gate System

Note:
The 2 sided system shown is ideal when a blender is sited in the corner of a large room



Clear Screen & Gate

Type 2 - Infra-red 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

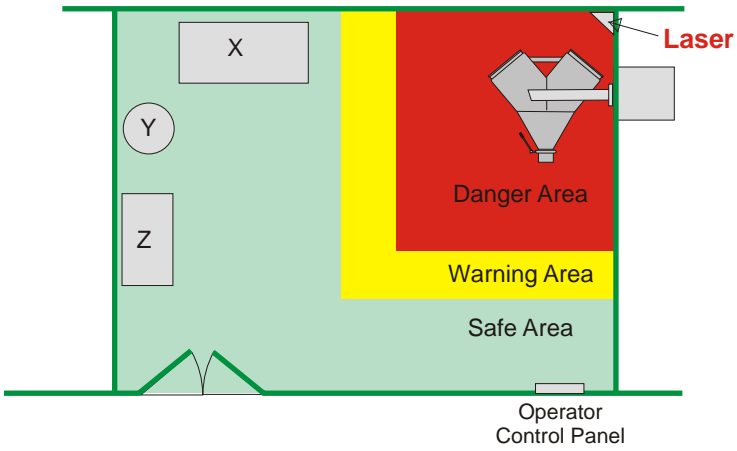


Light Guard Demonstration set up

Note:
Infra Red Light beams are invisible during operation

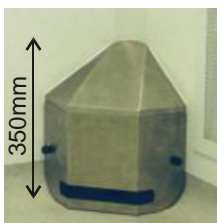
Type 3 - Laser Guard

- 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



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.



Corner Mounted Laser Guard

See page 10 for an installation photograph



Operator Control Systems

Operator controls can be supplied to any level of sophistication from basic controls for stand alone machines right up to blenders that are fully integrated with the production environment.

When choosing control systems customers need to decide which of the following features are important:

- Numeric data input (operator IDs, batch numbers etc.)
- Alpha/Numeric data input
- Batch recipes
- Hard copy printouts
- Data storage system
- Operator instructions
- Operator feedback
- Warning messages
- Error messages

Style A - 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



Surface mounted box with Membrane Button Panel controls

Style B - 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



Flush mounted box with Membrane Button Panel controls

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

Validation Documentation

Comprehensive Validation Packages are available for all Pharmatech blenders. Our validation programmes are designed to minimise your equipment-commissioning period and to get your new blender up and running as soon as possible. Please contact us to discuss your validation requirements.

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Multiblend Blenders
Laboratory & Small Scale
Production Use



Hoists



Dust Free Transfer



Drum & Keg Tippers



**Processing
Grade Drums &
IBCs**



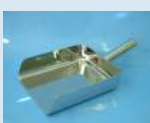
**Powder Handling
Aids**



**Sampling
Equipment**



Fluid Bed Driers



Dispensing Ware



Mixer Granulators



**Cone Mills,
Hammer Mills &
Sizing Equipment**



Tablet Coaters

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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