



PROCESS EQUIPMENT

CONTAINED POWDER DISCHARGE



Process Equipment



Offering optimum operator and product protection

Contained Product Discharge

Innovative design is the key feature behind the Extract Technology range of process off loading systems. These provide state of the art sealing systems for a wide range of bags, drums, boxes and bulk containers. The off loading systems are designed to discharge product from a variety of process vessels and containers such as Filter Dryers, Centrifuges, Blenders, IBCs and FIBC's.

These devices are available, as a stand-alone item providing the most basic form of containment at source, termed '**Primary**' or alternatively can be incorporated into a more developed and sophisticated system providing '**Secondary**' protection or containment.

In addition to Extracts containment and handling solutions full turnkey installations may be offered integrating a number of key process steps in to one supply.

System Integration

- Milling
- Weighing
- Sampling
- Process feed devices
- Vacuum transfer systems
- Post hoists
- Drum tippers
- Big bag dischargers



Inward Seal with Vacuum Transfer System

Sealing Heads

Primary Protection OEL 1000 – 100µg/m³

Sealing heads are designed to provide primary operator and product protection for the discharge of pharmaceutical product or fine chemicals.

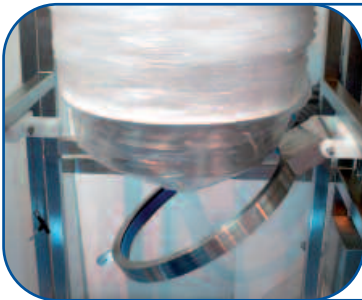
Design Advantages

- Guaranteed containment levels
- Available in a wide range of materials “solvent compatibility”
- FDA approved seals
- cGMP design throughout “minimum of ledges, easy clean surfaces”
- EX controls (UL and Atex approved)
- Low cost/Low maintenance
- Optional – N2 Purge/CIP Cap/support frames/ weighing systems

Special Features

Integrated annular exhaust complete with modulating exhaust valve.

This valve provides a low rate of exhaust during filling (displaced air removal only) and a high rate of extraction when the seal is deflating, capturing airborne material and assisting in operator necking and tying the liner.



Inward sealing head

- Single liner and continuous liner compatible
- Zero cross contamination “INWARD SEAL”
- Suits multiple liner sizes
- Excellent for multi product discharge
- High pressure – low profile seal
- Low maintenance

Outward sealing head

- Single liner and continuous liner compatible
- Available in a range of different sizes
150 – 600mm dia liners
- Industry standard for liner loading



Downward sealing head

- Rigid drum and IBC compatible
- Available in a range of different sizes
150 – 600mm dia
- No additional IBC attachments required (Split Butterfly)
- Easily retro-fitted

Compression sealing head

- Rigid drum and IBC compatible – available in a range of different sizes 150 – 600mm dia
- No additional IBC attachments required (Split Butterfly)
- Easily retro-fitted



Continuous Liner Discharge

Secondary Protection OEL 1-50µg/m³



Milling Off Load

Inward Inflating
Continuous Liner

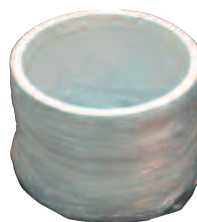


On disconnection of any make and break connection "sealing head inflate/deflate" the issue of powder discharge from the upstream process chute into the atmosphere becomes a contamination issue not only for the operator and surrounding environment but also for the product. By forming a continuous flexible barrier between the process and the surrounding environment this can be prevented.

Design Advantages

- Increased levels of containment 1-50µg/m³
- Reduced commercial outlay.
(No additional secondary containment)
- Reduced maintenance
- Elimination of cross contamination
- EX controls (UL and ATEX approved)
- Ergonomically friendly design
- Fully passivated finish

By using pre-loaded cassettes, downtime and specialist skills are eliminated. Using a preloaded cassette is quick, convenient and clean. Cassettes can be offered in a range of sizes and in a range of quantities.



Pre-Loaded Liner



Air Assisted Liner Load
Tables for Manual Loading

Horizontal Laminar Flow Booths

Secondary Protection OEL 1-50 $\mu\text{g}/\text{m}^3$

Applying process connection devices to Extract Technology's well established wide range of Laminar Flow Booths further increases the boundaries of containment. These booths provide what is known as "Secondary protection" to existing transfer devices improving the level of protection provided. These secondary enclosures are available in a limitless range of sizes to suit the process container being filled or discharged from.

Design Advantages

Once through laminar airflow being provided by a rear mounted distribution plate termed a "plenum plate".

This plate, provided with a series of perforations, gives an even flow of air over the open front face of the booth and into the enclosure at a rate of 0.5m/second.

This assists in the removal of any airborne particulate that may be present in the atmosphere from the make/break connection for example at release of the container (liner, drum etc.) from the process containment device.

Single point termination for the filtration and fan system, this being coupled within to the process containment device.

- Fully welded construction providing a minimum of corners and crevices
- Fully passivated finish
- Ergonomically friendly design
- EX controls (UL and ATEX approved)



Booth with Outward Seal



Booth with Continuous Liner



**High Containment
Booth <1 $\mu\text{g}/\text{m}^3$**

Options

- Fine dust and HEPA filter systems, together with fans
- Barrier protection flexible/rigid screens <1 $\mu\text{g}/\text{m}^3$
- Continuous liner
- Mobile units
- CIP spray balls and wash caps
- Integrated process equipment – milling, weighing, sampling, conveying
- Choice of sealing heads

X-Flow Booths

Secondary Protection OEL 1-50µg/m³

In late 1997, Extract Technology pioneered the development of the cross or 'X-Flow' booth as it is more commonly known.

The principle of the design is to provide an autonomous system that generates its own supply of air rather than exhausting away the vast quantities of plant air. This is important in clean room applications where the cost of producing a clean room environment air can be very expensive in terms of the air handler specification.

Supplying clean HEPA filtered air across the process rather than pulling air from the front of the unit also ensures that turbulence is reduced and the product is protected.



X-Flow Booth via an Inward Inflating Seal into Drums and FIBCs



X-Flow Booth Off-Loading via a Mill

Design Advantages

- Reduced air-handling capacity within the process area
- Operator and product protection
- Reduced airflow turbulence around operator
- Terminal HEPA filtration
- Compact design
- On board fan and filter system fine dust and HEPA filtration
- CIP compatible
- EX controls (UL and ATEX approved)
- Numerous installations worldwide
- Choice of Primary containment
 - Inward inflating seal
 - Outward inflating seal
 - Downward inflating seal
 - Compression seal
- Fully welded construction providing a minimum of corners and crevices
- FDA approved material
- Fully passivated finish

Optional

- Barrier protection flexible/rigid screens <1µg/m³
- Continuous liner
- Mobile units
- CIP spray balls and wash caps
- Integrated process equipment – milling, weighing, sampling, conveying



X-Flow Booth Off-Loading into Drums

Pack Off Isolators

Secondary Protection OEL < 1µg/m³

Designed to provide operator and product protection to the highest degree. Creating a physical barrier between the operator and product these units are capable of handling some of the most potent pharmaceutical compounds.

Design Advantages

- Upper and lower viewing panels complete with glove and PharmaPort™
- HEPA filtered supply and exhaust system
- Stainless steel construction with 0.8 Ra finish externally and mirror polished feed chute
- Internally radiused corners providing ease of cleaning internally
- Negative pressure cascade between chambers and surrounding room environment, providing an in-draught at an open aperture, airlock door, PharmaPort™ etc.
- CIP drain tun dish for wash through of main chute
- Spray balls included for isolator wash down
- EX controls (UL and ATEX approved)



**Filter Dryer
Pack Off Isolator**



Pack Off and Milling Isolator

- Choice of primary containment devices
 - Inward inflating seal
 - Outward inflating seal
 - Downward inflating seal
 - Compression seal
- Pneumatically inflating seal heads to suit either single or continuously lined drums
 - Inflatable door seals
 - Nitrogen purge facility
 - Integrated weighing systems
 - Pre loaded liner cassettes
- Low pressure nitrogen inertion system providing fast purge and trickle flow to maintain inert conditions



Inflatable Door Seal

Design and Build

Extract Technology prides itself on being able to offer a “one-stop shop” approach to process equipment. With over 25 years of process equipment experience clients can be confident that many of the key processing and material handling steps required in any pharmaceutical or fine chemical design can be handled under one roof.

Extract Technology also offers installation, commissioning and IQ/OQ validation by our fully trained engineers to ensure the system conforms to your requirements. To complete the package, our dedicated Spares and Service Department will supply total aftermarket support.



Positively Pressurised Test Enclosure

- Design and mock up
- Manufacture and assembly
- Pre-delivery testing – FAT
- Installation
- Commissioning and validation – I/Q & O/Q
- Full documentation packages
- Training – SOP generation
- Spares and service



Units in Assembly

Extract Technology are also able to offer other Engineered Solutions such as Rigid and Flexible Isolators, Containment Booths, Sampling and Dispensing Facilities.

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