



DELIVERING
INNOVATION
TO PROTECT

 extract-technology.com

CONTAINMENT SOLUTIONS

DOWNFLOW BOOTHS



DOWNFLOW BOOTH

OPERATOR PROTECTION
TO $<100\mu\text{g}/\text{m}^3$
(ACHIEVABLE $<1\mu\text{g}/\text{m}^3$)

SAMPLING FACILITY

CUSTOM DESIGN TO SUIT
THE CUSTOMER'S SPECIFIC
APPLICATION



FACILITIES



CONTAINMENT ISOLATOR

OPERATOR
PROTECTION
TO $<1\mu\text{g}/\text{m}^3$

ISOLATOR



PACK OFF AND PROCESS

DUST FREE
OFFLOAD TO
cGMP STANDARD

PACK OFF



Achievable
Operator
Exposure
Levels (OEL) of

$1\mu\text{g}/\text{m}^3$

(task duration), process dependant

Complete containment solutions based around an innovative range of Downflow Containment Booths bring different features and benefits to your application. But all have one thing in common: they provide a **Guaranteed Working Environment**.

When you need to provide a clean, contained environment for the safe handling of powders in **dispensing, weighing, sampling, or subdivision operations**, our PharmAir booths are a highly effective option.



Safe Working
Depths to

2.2m

As a provider of total containment solutions we can tailor Downflow Containment Booths to your exact requirements. However, you will find a summary of some of our standard optional features.

- > Stainless steel or epoxy – coated mild steel construction.
- > High efficiency EC fan system
- > Safe change filters
- > Overhead lighting within supply plenum
- > Mobile workbenches
- > Hazardous area electrics
- > Flush mounted computer integration
- > Front/side access doors
- > Glass walls and windows
- > Floor/coving interfaces
- > PLC controlled audible and visual alarm packages
- > Pallet stop rails
- > Cooling coils and controls
- > Increased internal height
- > Photo sensitive lighting
- > High level exhausts grilles
- > Incorporation of lifting and tipping equipment
- > Materials and personnel airlocks systems
- > Roller conveyors, rapid roller doors and turntables

“Extract Technology have designed their new energy efficient Downflow Booth boasting **energy savings of up to 70%** compared to that of conventional systems.”

Extract Technology has prided itself on being at the forefront of Booth design for the last 30 years, and as such has continued to invest in R&D to ensure the ever changing demands of the Pharmaceutical and Biotech industries are met. In order to achieve this impressive saving Extract Technology looked at every aspect of the design from component selection to airflow design. Not only did this result in a more energy efficient system but it also presented an opportunity to look at cost reduction as a whole for the Booth. This culminated in a design which was far more cost effective both in the short and long term with **key benefits** such as:

- 70% ENERGY SAVINGS
- LOWER CAPITAL COST
- SHORTER LEAD TIMES DUE TO BATCH COMPONENT PRODUCTION AND MODULAR DESIGN
- FLUSH LIGHT FITTINGS WITH TERMINAL HEPA FILTERS.
- IMPROVED LIGHTING LEVELS WITH EASY LIGHT ACCESS
- MODULAR CONSTRUCTION AND MULTIPLE CONFIGURATIONS TOGETHER WITH AN EXTENSIVE LIST OF OPTIONS
- LOWER NOISE LEVELS DUE TO IMPROVED FAN AND CEILING PLENUM DESIGN
- QUICKER INSTALLATION AND COMMISSIONING TIMES





5D CONTAINMENT SCREENS

Incorporating the Extract Technology patented Flexible® or Rigid Screens into a Downflow Booth provides a physical barrier between the active product and the operator, thereby immediately improving the attainable containment levels.

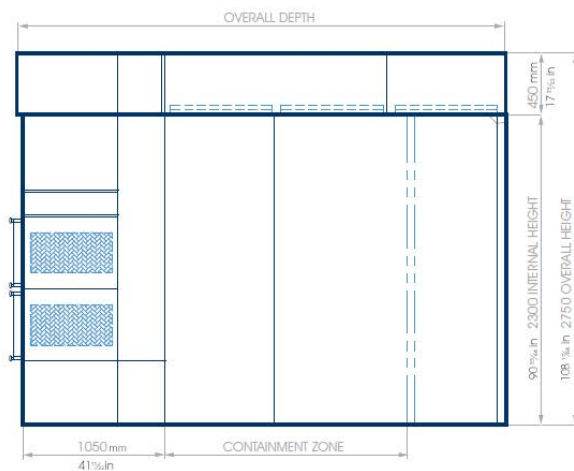
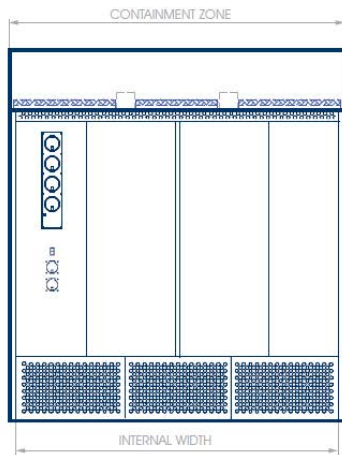
Independent tests have confirmed that levels of **<1µg/m³** can be achieved, depending upon the application.

Low noise levels
(**<75 dBA**)

DESIGN FEATURES

- Available in epoxy coated mild steel, 304/316L stainless steel or a combination of both
- Various heights and widths (up to 6m) are available
- Custom filtration designs with a minimum of fine dust and then Hepa filters in either the technical stack or the ceiling plenum
- Single pass/once through airflow systems used in applications where solvent vapours are present

DIMENSIONS



Booth size	External width (mm/in)	Internal width (mm/in)	Overall depth (mm)			Chilled water flow rate l/sec (gpm)	Fused supply (Amps)*
			"L" model (containment depth 1200mm/44in)	"LS" model (containment depth 1800mm/71in)	"LX" model (containment depth 2300mm/90in)		
1.5m	1500/59"	1400/55"	2750/108"	3630/143"	4425/174"	0.13 (2)	25
2.0m	2100/83"	2000/79"	2750/108"	3630/143"	4425/174"	0.13 (2)	25
2.5m	2500/98"	2400/94"	2750/108"	3630/143"	4425/174"	0.13/0.26 (2/4) (LX)	25
3.0m	3000/118"	2900/114"	2750/108"	3630/143"	4425/174"	0.13/0.26 (2/4) (LS & LX)	25
3.5m	3600/142"	3500/138"	2750/108"	3630/143"	4425/174"	0.26 (4)	25
4.0m	4200/165"	4100/161"	2750/108"	3630/143"	4425/174"	0.26 (4)	25
4.5m	4600/181"	4500/177"	2750/108"	3630/143"	4425/174"	0.26 (4)	32
5.0m	5000/197"	4900/193"	2750/108"	3630/143"	4425/174"	0.26/0.39 (4/6) (LX)	32

Standard Internal Height on all Booths: 2300mm/90" – Standard Overall Height on all Booths: 2750mm/108" – Standard Technical Area Depth: 1050mm/41" US dimensions are approximate. *480VAC 3 Phase Power



TURNKEY

package solutions

Providing a suitable **cGMP environment** for operators to perform either sampling or dispensing tasks in a safe and comfortable atmosphere, Extract Technology facilities are high class state of art pieces of equipment. Complete with **material and personnel airlocks and a downflow booth**, the facility operates with a positive pressure to aid in achieving a clean cGMP environment.

Though **made to order**, facilities are usually designed around our standard downflow booth sizes which can be suitably selected to accommodate the client's process. Facilities can be designed to house **any operations from small scale sampling to large material handling** processes - operational aids such as post hoists, conveyor lines, workbenches etc. can be integrated into the equipment.

CUSTOM

design to suit process

Hazardous Ratings

available

DESIGN FEATURES

Internal furnishings

Battery backup LED lighting in airlocks

PLC control with touch screen HMI interface available

Signalling between facility and clients BMS available

Rapid roller shutter doors for material entry and exit

Single Pass airflow for solvent/liquid handling available, complete with full air handling packages

Cascading pressure regime

SECONDARY CONTAINMENT SOLUTIONS

A wide variety of secondary containment solutions can be used in conjunction with the Extract Technology Pack Off Heads to improve the overall containment level.

These include Horizontal Laminar Flow Booths, X-Flow Booths, Isolators and Continuous Liner Discharges.

CONTINUOUS LINER DISCHARGE

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.

AVAILABLE OPTIONS

- > Mobile Work Benches
- > Hazardous area electrics
- > Flush mounted computer integration
- > Pallet stop rails
- > Cooling coils and controls
- > Increased internal height
- > Incorporation of lifting and tipping equipment
- > Materials and personnel airlocks systems
- > Roller conveyors, rapid roller doors and turntables
- > Customisation available on request

Integrated exhaust complete with modulating exhaust valve. This valve provides a low rate of exhaust during filling (displaces 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.



OUTWARD INFLATING HEAD

Forms a clean and dust tight seal within the open mouth or inner surface of either a continuous liner or single liner within customers containers

DOWNWARD INFLATING HEAD

The membrane inflates downwards to form a seal against the top of unlined drums or inlet rim of IBCs

Extract Technology also designs and manufactures **innovative process connection devices** as stand alone items to provide primary dust containment in fine chemical industries.

The **Process Pack Off Heads** are designed to offer a basic form of primary dust containment when off-loading and packing off product in the pharmaceutical or chemical industry.

INWARD INFLATING HEAD

Ensuring a clean dust tight seal as the liner (normally continuous) is compressed against the feed tube so there is no product contact with the FDA approved natural rubber seal

HORIZONTAL LAMINAR FLOW BOOTHS

A “**once through**” even laminar airflow is pulled uniformly across the work area to the rear plenum, extracting any airborne particulate away from the operator and into the fan/filter unit or to the clients own dust collection or scrubbing system.

All units are designed specifically for the application, and are supplied with a fan and motor system, suitably zoned for the application area.

A fully welded stainless steel construction, **they can also incorporate weighing and control systems as required.**



DESIGN ADVANTAGES

Guaranteed Containment Levels

Available in a wide range of materials - solvent compatible

FDA approved seals

cGMP design throughout - minimum of ledges, easy clean surfaces

Hazardous Area controls (UL and Atex approved)

Optional :

**N₂ Purge
CIP Cap
Support Frames
Weighing Systems**

X-FLOW BOOTHS

A unique design of **crossflow** or “**side to side**” airflow, removing any airborne particulate away from the operators breathing zone. Air is introduced from one of the side plenums at a constant velocity and is then exhausted at the opposite side, passing through fine dust and Hepa filters before being recirculated back into the booth.

The presence of the operators’ arms does not interfere with the airflow, thus **enhancing the containment levels** achievable to between **1-20µg/m³**.

SPECIAL FEATURES





Extract Technology Rigid Containment Isolators have been designed for handling potent compounds that can offer guaranteed levels of operator protection as low as $10\text{ng}/\text{m}^3$ (task duration).

These include designs for **sampling, dispensing** and **sub-division, mixing, milling** and **vessel charging**, as well as containing **integrated process devices** such as filter dryer units, tablet press enclosures, blenders, mills and pack off systems.

Whatever else you look for in a high containment solution, you will want it to be proven, tested and guaranteed. Extract Technology's Isolator solutions deliver all these things and more.

Containment
Levels
down to

$10\text{ng}/\text{m}^3$

Design
model in

3D

Available
with Mock Up
and

FAT

DESIGN PHILOSOPHY

The Isolator is designed to not only provide a physical barrier between the operator and the product but to also provide a controlled environment, negatively pressurised with an atmospheric condition or a reduced oxygen content using an inert gas.

To maximize both operator and equipment interfaces 3D modelling and full scale mock-ups are used extensively to facilitate the best understanding possible of the pharmaceutical process and the operators involvement whilst ensuring high levels of containment are achieved.

DESIGN FEATURES

- Ergonomic design < .
- Inflatable seals < .
- Extract Technology Pharmaport™ Glove Port < .
- 17mm / 5/8" radiused corners < .
- Fully welded 316L stainless steel fabrication < .
- Safe change "push-push" filters < .
- PLC control system < .





2. Design

We generate conceptual designs based upon proven solutions, before finally compiling product specifications, standard operating procedures (SOPs) and working schematics (P&IDs)



4. Factory Acceptance Testing

Only when the equipment is fully built and fully tested to the design parameters is it exposed to a range of tests and standard operating procedures (SOPs). These can include internal / external surface swabbing, dust in air monitoring, and full scale operational tests of performance, all being performed within our controlled test environment.

1. Mock up

We can create full scale mock-ups which take into account ancillary equipment and manipulation devices. The client review follows, at which stage any necessary modifications are made.

3. Manufacturing

Manufactured in high quality stainless or other alloy steels the Isolator fabrications are formed, welded and polished to exacting standards and client requirements.



COMPREHENSIVE RANGE OF CONTAINMENT ISOLATORS



DISPENSING
AND SUB-DIVISION



FILTERING AND
TRAY-DRYING



PROCESS
OFFLOADING



SAMPLING

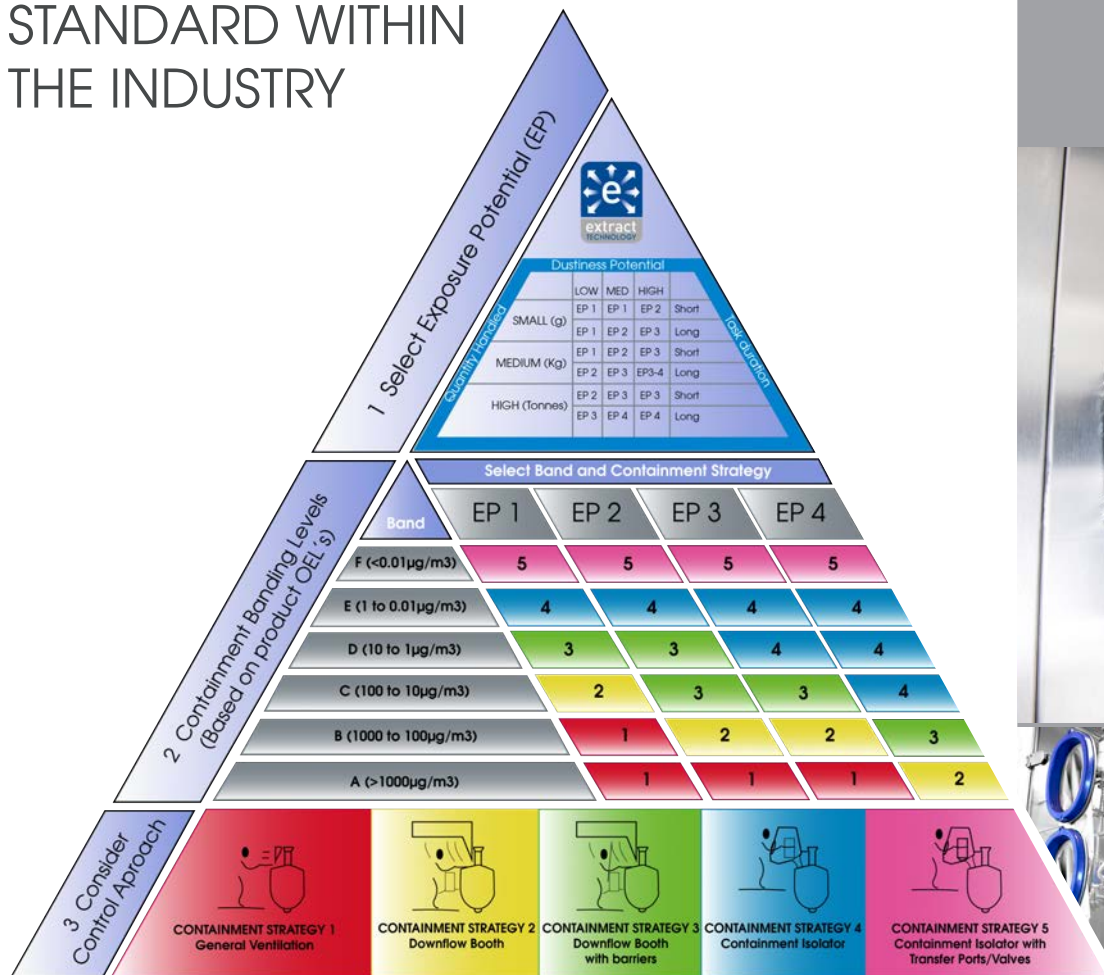
AVAILABLE OPTIONS

As a provider of total containment solutions we can tailor High Containment Isolators to your exact requirements. However, you will find a summary of some of the main options below:

- > Multiple chambers
- > Drum/product manipulation devices
- > Integration of proprietary contained transfer devices e.g. Rapid Transfer Ports, Split Butterfly Valves etc
- > Controlled environment re: temperature, humidity and oxygen content
- > Fully integrated WIP/CIP clean systems including wash lances, rotary spray balls and solvent atomizing devices
- > Raise/lower systems
- > Dispensing equipment including scales, displays, printers and dispensing management systems.



EXTRACT TECHNOLOGY'S CONTAINMENT PYRAMID IS SET TO CREATE A STANDARD WITHIN THE INDUSTRY



Designed to satisfy both current and projected industry standards it provides pharmaceutical and chemical companies with a clear guide to assessing the level of containment required to safely handle differing hazardous materials



DEFINING THE CONTROL STRATEGY

The selection grid at the heart of the Control Strategy Pyramid permits the exposure potential rating and operator exposure band to intersect at the recommended Control Strategy selection. This is a simple cross reference to identify the correct equipment to be used to control and handle a specific process.

FOR MORE INFORMATION ON CONTAINMENT SOLUTIONS PLEASE VISIT OUR WEBSITE OR CONTACT US DIRECTLY:

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