

Groundbreaking High Containment Filtration and Drying Technology

Powder Systems Ltd (PSL) is now providing world-leading high containment lab glass filtration and drying technology as part of their existing FilterBox range.

The new GFD™ FilterBox (glass filter dryer containment system) offers a small-scale solution to PSL's larger FilterBox products. PSL FilterBox technology has been extensively developed and refined to provide an optimum solution that combines PSL's two core focuses 'Filtration and Drying' and 'High Containment'.

FilterBox Technology

The FilterBox is revolutionary technology consisting of a small to large-scale agitated nutsche filter dryer (ANFD) or GFD being completely integrated within a PSL isolator. The FilterBox provides high containment when handling highly potent APIs and other highly active or cytotoxic compounds.

The FilterBox achieves containment to nanogram levels protecting both the product and the operator during operations including charging, sampling, filtration, drying and discharging. The cleaning procedure can be performed safely and thoroughly as the full vessel can be easily accessed in a contained environment. Interconnecting nozzles, pipes,

discharge plug assembly can be dismantled without containment breach and the base and plug and o-rings can be cleaned and maintained in a contained environment.

The FilterBox provides a more compact design compared to traditional separate agitated nutsche filter dryer and containment products, reducing floor space requirement and impact on the plant design. The FilterBox solution is easily scalable for laboratory to industrial production including 0.002m² to 0.3m² ANFDs.



PSL 0.125m² FilterBox

The GFD Filterbox

The GFD Filterbox is part of the FilterBox family and can comprise 0.002m² to 0.05m² GFDs as part of PSL's MINI LAB, LAB and MAXI LAB

glass filter dryer range. The GFD works on a vacuum, has a heated jacket for drying and a removable filtration basket for collection of the product. This miniature version of a PSL production size filter dryer allows process development during early stages and facilitates scale-up to commercial applications.

PSL has been established for 22 years and is an original pioneer of high containment systems with extensive experience providing advanced filtration and drying products. PSL's engineering department works in tandem with process experts to guarantee reliable, scalable and repeatable production of high quality contained filtration and drying solutions from laboratory to commercial applications.



Inside view of the GFD FilterBox



PSL Achieves 2ng in OEL Test

Powder Systems Ltd (PSL) is a pioneering manufacturer of high containment systems and has long been recognised as one of the most reliable containment suppliers in the world. For over 10 years now PSL has achieved nanogram containment levels with their glovebox isolator systems. With the ever increasing demands of oncology and high potent products the need for high containment with lower OEL levels has become a necessity.

OEL Test Method

PSL provides an OEL test as part of the client's onsite PQ to fully validate the performance of their isolators. A protocol in accordance with the SMEPAC guidelines is applied whereby the standard isolator operation is conducted with micronized lactose at a particle size of d50 = 20µm. For the results shown below, 12 sampling points on the operator and isolator were used to collect the data.

OEL Test Results

The following table shows typical OEL test results for PSL's standard Dispensing Isolator, where product is dispensed from bulk-size drums and sub-divided into small quantities.

The results show the sampling value during the OEL test, and the equivalent on an 8-hour TWA. The sampling 'Airborne Concentration of Lactose' is fundamental data that is used to

Sample Details	Sampling Time (minutes)	Mean Flow Rate (l.min-1)	Total Volume (m3)	Mass of Lactose Detected (µg)	Airborne Concentration of lactose (µg.m-3)	8-hour TWA Exposure (µg.m-3)
Run 1	82	2.0	0.164	< 0.0025	< 0.015	< 0.0026
Run 2	92	1.95	0.179	< 0.0025	< 0.014	< 0.0027
Run 3	78	2.0	0.156	< 0.0025	< 0.016	< 0.0026

Latest OEL test results from a standard PSL Dispensing Isolator – verified by independent industrial hygienists*

produce the 8-hour TWA. In this test the sampling period was 1 hour 20 minutes with a result of 15 nanograms on average, producing an 8-hour TWA of 2.6 nanograms (the detection limit of micronized lactose in the OEL test is 2 nanograms over the 3 runs).

PSL's Containment Guarantee

With PSL isolators achieving validated OEL test results of 2 nanograms, our clients have the potential to handle the most potent products available on the market.

PSL's high containment products have been designed to fulfil a range of applications including: dispensing and sampling, charging, drum filling, off-loading (continuous liner system), milling and micronizing, sieving and tray drying



PSL Dispensing Isolator

Estuary Business Park
Liverpool, L24 8RG, UK
+44 151 448 7700
www.powersystems.com

*This does not include an allowance for statistical safety multiples.