

## Permetium™ Pulmonary Preclinical Imaging System: The next-generation, purpose-built, multimodal pulmonary imaging system that is elevating research to unprecedented levels.

### Truly revolutionary - natively multimodal

Permetium is the first commercially-dedicated preclinical imaging system that can quantify regional changes in pulmonary function. Powered by the highest output preclinical generator on the market today, Permetium delivers world-leading ventilation measurement data in fine detail through 4Dx's patented and revolutionary XV Technology™.

Purpose-built and multimodal, Permetium boasts fully-integrated, superior phase contrast-enhanced *in vivo* CT scanning capabilities, providing researchers with high-resolution, high-contrast structural detail that perfectly complements functional readouts. And when combined with integrated pulmonary vascular quantification abilities, XV Technology not only empowers Permetium with the ability to identify ventilation-perfusion mismatch, but it also provides researchers the power of V/Q at high-speeds, at high resolution, and without the need for contrast agents.

### Overcoming traditional scientific hurdles

Permetium is a specialist imaging system designed to conduct investigations previously unimaginable (or unaffordable) in the lab. It's built to adapt for multiple experimental subject options (mice, rats, ferrets). Researchers can use it as an X-ray device, a 3D CT scanner and a 4D CT scanner – and for a multitude of studies and experiments. And most importantly, all of the specialized lung imaging is contrast agent free.

Furthermore, Permetium is able to significantly decrease the number of animals required for experiments, as individual time-points no longer require the sacrifice of groups of animals for a readout of lung pathology. It delivers to researchers a powerful new diagnostic tool in the development of novel therapeutics and new drug compounds.

### Simple set-up – easy use

Permetium is as practical as it is technologically advanced. We've designed it with speed of experimental processes in mind; it's easy to set up, easy to operate, and easy to upload your results. The user training required is provided as part of your purchase, and includes operation and safety, as well as access to support and maintenance.

The operational modes range from simple and automated to fully manual (expert user) modes.

Out of the machine, raw data is encrypted and sent to 4Dx's secure server, where it is then analyzed and returned to you as standardized outputs via a web portal – with the guaranteed security of your data.



Permetium - XV Technology Enhanced

## XV Technology™

### Introducing XV Technology

The *in vivo* imaging methodology is at the core of today's advanced preclinical pulmonary research. Taking the *in vivo* concept a step further, XV Technology enables Permetium to image the motion of the lung tissue during the breath cycle, and yield back 4-dimensional, quantitative measurements that identify regional ventilation deficiencies with higher sensitivity and greater pinpoint accuracy than any competing system to date. This gives researchers functional, regional analysis and a superior understanding of dynamic pathophysiological processes, as well as the ability to non-invasively, and more accurately, measure quantifiable changes in disease progression over time.

# Permetium™

## No need for additional equipment

Permetium is truly an all-in-one device for lung imaging. When you purchase a Permetium, you will also receive the sample holder, as well as 4Dx's pioneering AccuVent 200™ ventilator at no additional cost. There's no need for additional equipment or expensive hardware.

## Flexibility. Efficacy. Specificity.

- Seamless integration of 4Dx function / CT structure and pulmonary vasculature quantification, all without contrast in a fully shielded, compact footprint
- Homogeneous resolution and quantitative accuracy in single or multiple simultaneous animal studies
- Accurate dual cardiac/pulmonary gated imaging across all modalities
- Accurate animal positioning with a computer-controlled animal handling system
- A large range of animal beds – mice, rats, rabbit pups and ferrets - to maximize system utility and productivity

## Service included

- 12 month warranty provided
- 12 months preventative maintenance (including onsite service visits)
- 36 months unlimited 4Dx analysis suite license for standard outputs
- Commissioning, user training and clinical engagement support

## Options

1	Customizable animal configurations (Mouse/Rat/Ferret animal handlers supplied with adjustable source/stage height)
2	Preventative maintenance for 5 Years (+ 4 years).
3	4Dx Analysis License for 5 Years (+ 2 years)
4	Discounted custom (offsite) analysis outputs

## Key features

1	High-powered micro-focus X-ray source (800 W, 70 µm spot)
2	Free standing cabinet unit with Level 1 radiation shielding with additional electronic interlock system
3	High-speed, high-sensitivity flat panel detector
4	High precision 4-axis stage system that can be operated from outside the enclosure under X-ray guidance
5	Adjustable magnification
6	Integrated 4Dx AccuVent 200 pressure-controlled ventilator
7	Integrated control software: <ul style="list-style-type: none"> <li>• Pre-programmed 4Dx, CT, 4D CT Operation, and Full Manual (expert) modes</li> <li>• Stage control</li> <li>• Ventilator control</li> <li>• Data management</li> </ul>
8	Seamless integration with 4Dx functional lung analysis
9	Analyses available: <ul style="list-style-type: none"> <li>• Structural                     <ul style="list-style-type: none"> <li>• CT</li> <li>• 4D CT</li> <li>• Contrast-free vessel quantification and segmentation</li> </ul> </li> <li>• Dynamic/Functional                     <ul style="list-style-type: none"> <li>• Regional lung motion</li> <li>• Regional ventilation</li> <li>• Regional airway flow, time constants</li> </ul> </li> </ul>
10	Detailed metadata recorded
11	Integrated X-ray source chiller unit included
12	Sample holding 'Rocket' system for fastening and attachment of samples (mouse configured)
13	3D X-ray phantom for system alignment and calibration
14	Preclinical scanner Data Acquisition Workstation including dual LCD monitors
15	Preinstalled control interface software license on Data Acquisition Workstation



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