STANDARD IMAGING®

PRODUCT **CATALOG** 2015-2016

Setting the standard for ADVANCING RADIATION QA™ in healthcare

Our Mission

We provide valued products and resources to the medical physics community by wisely leveraging technology and fostering relationships to achieve both customer and employee loyalty.

Our Values

Respect, Teamwork, Integrity, Citizenship, Family, Learning, Fun

STANDARD IMAGING®

The continuous **DEDICATION** to first-class customer service, forging long-standing partnerships and fostering **INNOVATION** helps Standard Imaging pave an intuitive path to **SUPERIOR QA**.

Since Standard Imaging was founded in 1989, these tenants have guided the company's growth from a basement in Middleton, Wisconsin, to a full service radiation calibration and quality assurance instrument manufacturer. Beginning with the HDR 100 Well Chamber, Standard Imaging has leveraged relationships with the top 50 cancer centers in the United States, and physicists worldwide, to provide its customers with practical, precise products for their daily, monthly and annual quality assurance needs.

QA BeamChecker™ Plus

Exceptional Service, Expert Support

Standard Imaging prides itself on competent, comprehensive customer service. Knowledgeable, friendly service specialists consult in-house resources such as physicists, engineers and product managers to provide quick, concise responses. These representatives work tirelessly to ensure an easy transition of Standard Imaging products into clinical QA workflow.

Physicists' Response to Standard Imaging Support

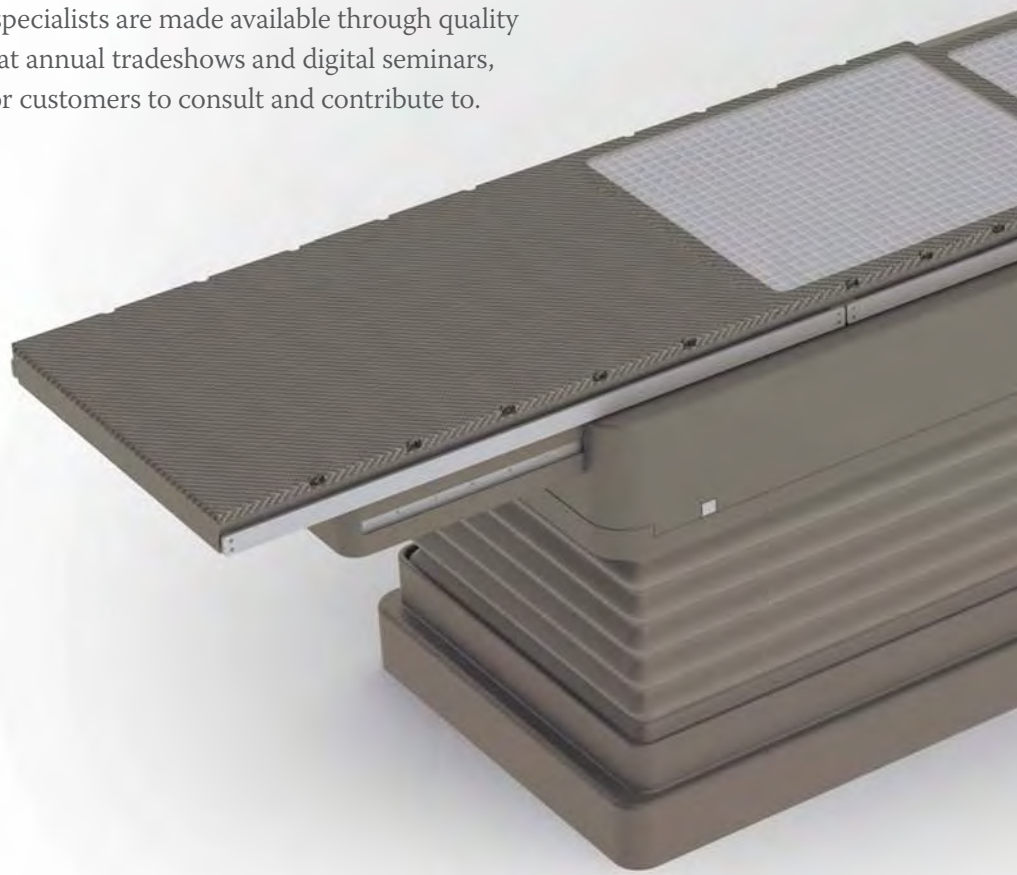
"Kraig Krause [Standard Imaging Technical Support Manager] was nothing but excellent in helping me, great guy and very knowledgeable. Just the kind of support I look for in vendors and products that I buy or would recommend to others." – 6/8/2012

"I am 100% satisfied with the customer service. Employees are very knowledgeable and efficient. All my questions were addressed quickly and solved nicely - great job Standard Imaging." – 3/27/2012

Progress by Partnership

Innovators under Standard Imaging's roof are constantly collaborating with domestic and international partners to define and refine opportunities for clinical solutions. Lack of rigid department boundaries and internal red tape means ideas produced by this two-way communication can be quickly integrated into products.

These industry experts and clinical specialists are made available through quality assurance symposiums, booth talks at annual tradeshows and digital seminars, creating a broad information base for customers to consult and contribute to.



DoseView™ 3D

Fostering Innovation

Over 20 years in the radiation therapy industry have transformed Standard Imaging from a minute staff in a one-room office to over 60 employees housed in a 37,000 square-foot, eco-friendly facility, equipped with the most sophisticated equipment for the production of radiation calibration instruments in the United States.

The growth in resources and staff has allowed Standard Imaging's employees to satisfy their appetite for innovation. Propelled by clinical research and steered by vetted product managers, Standard Imaging's hardware and software engineers are able to solve QA dilemmas through the generation of new instruments and evolution of pre-existing tools. This fusion of creation and refinement has expanded Standard Imaging's product line to include electrometers, ion chambers, phantoms, QA software, beam QA instruments and brachytherapy calibration devices ideally suited to its customers' needs.

PIPSPRO SOFTWARE

The rapid progress of Radiation Therapy has created the need for Quality Assurance testing far greater in scope and effort than in the past. Sophisticated intensity-modulated radiation treatments rely on near-perfect multileaf collimator operation, while advanced imaging technologies for Image-Guided Radiation Therapy rely not only on image quality, but the spatial coincidence of treatment and imaging frames of reference.

TG-142 recommends a suite of daily, monthly, and annual tests to meet the challenge of modern clinical radiation therapy Quality Assurance. In addition to defining the tests for recently-developed technologies, TG-142 identifies the need to test against established baselines and track and trend results. All of these new QA obligations, necessary for a safe and effective clinic, increase physicists' work load and further strain busy schedules.

PIPSpro efficiently consolidates TG-142 QA workload by incorporating over 30 procedures into one easy-to-use platform. When used in conjunction with specialized phantoms from Standard Imaging, PIPSpro becomes an indispensable part of your QA process, giving you confidence that your clinic is operating within specifications.

> "PIPSpro software and phantoms are valuable tools for streamlining over 30 of the TG-142 tests, automating data analysis, and providing documentation of the test results. By providing quantifiable and repeatable results, PIPSpro makes it easier for our center to become compliant with TG-142."
>
> **Rick Baker**
> *Physics Applications Specialist*
> *Iowa Health Des Moines -*
> *John Stoddard Cancer Center*

PIPSpro TG-142 Coverage

TABLE II

Monthly

Mechanical

- Light/radiation field coincidence
- Jaw position indicators
- Cross-hair centering

TABLE III

Annual

Mechanical

- Collimator rotation isocenter
- Gantry rotation isocenter
- Couch rotation isocenter
- Coincidence of radiation and mechanical isocenter

TABLE V

Multileaf Collimation

Weekly

- Qualitative test, aka "picket fence"

Monthly

- Setting vs radiation field for two patterns
- Travel speed
- Leaf position accuracy

Annual

- MLC transmission
- Leaf position repeatability
- MLC spoke shot
- Coincidence of light field and x-ray field
- Segmental IMRT
- Moving window IMRT

TABLE VI

Imaging

Daily

Planar kV and MV (EPID) imaging

- Positioning/repositioning
- Imaging and treatment coordinate coincidence

Cone-beam CT (kV and MV)

- Imaging and treatment coordinate coincidence
- Positioning/repositioning

Monthly

Planar MV imaging (EPID)

- Imaging and treatment coordinate coincidence
- Scaling
- Spatial resolution
- Contrast
- Uniformity and noise

Planar kV imaging

- Imaging and treatment coordinate coincidence
- Scaling
- Spatial resolution
- Contrast
- Uniformity and noise

Cone-beam CT (kV and MV)

- Geometric distortion
- Spatial resolution
- Contrast
- HU constancy
- Uniformity and noise

Film images can be used in all modules with the exception of Imager QA and Stereotactic, where image quality and positioning are critical variables that cannot be maintained using film. DICOM images are supported in all modules. Raw images are supported for ExacTrac and Cyberknife kV planar imager QA.

TG-142 Made Easy

Designed with a convenient and optimized workflow in mind

Why thousands of users in over 700 clinics choose PIPSpro as their TG-142 software:

- Simple, clean and consistent user interface
- Easy-to-read reports, charts, and graphs
- PDF and comma separated variable (CSV) results export
- Multiple open modules for streamlined workflow
- Physicist-controlled editor for creating testing baselines
- Tracking and trending for test results
- Quick Selects™ for organizing tests and accessing test results
- Automatic image compositing for EPID MLC QA and StarShot images
- Centralized database for easy configuration and accessibility to results

Faster QA with Quick Selects™

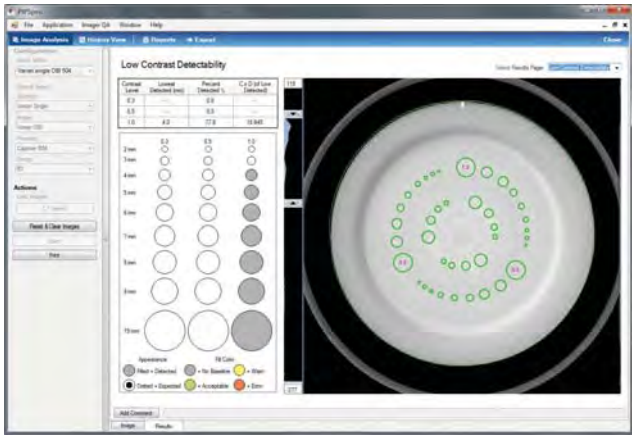
In Imager QA, Quick Selects are customizable collections of parameters that allow a variety of machine, imager, phantom, and energy combinations to be saved. Using Quick Selects, one-click activation provides an easy means to recall tests and track your results. Quick Selects are used in the Imager QA and the Logfile-Based MLC QA modules and, because of their power, will be used throughout PIPSpro.

*The **TG-58 Report** encourages users to demand the use of a tool such as PIPSpro QC Software at acceptance to help ensure that the EPID is indeed operating at or above specifications.**

* Michael G. Herman, et al, "Clinical Use of Electronic Portal Imaging: Report of AAPM Radiation Therapy Committee Task Group 58," **Med. Phys.** 28 (5), May 2001

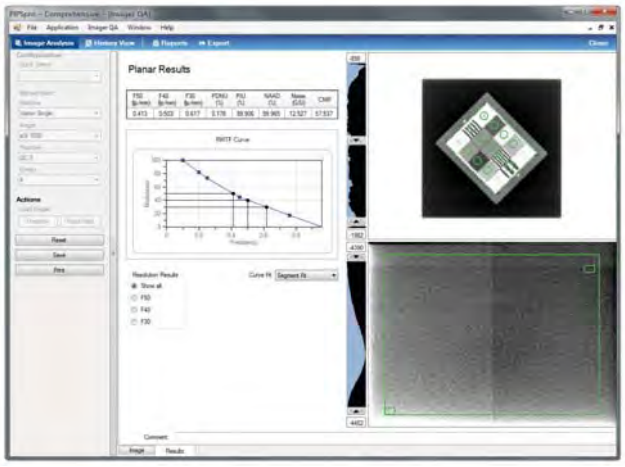
Powerful Imager QA

Consolidated TG-142 QA for volumetric and planar imaging



CT Imaging QA

Using cone beam or diagnostic images obtained with any of the Catphan phantoms (503, 504, 600), PIPSpro automatically finds analysis image slices and performs required TG-142 tests (geometric distortion, spatial resolution, contrast, HU constancy, uniformity and noise). Results are colored green ("Pass"), amber ("Alert"), or red ("Fail") for easy viewing of status (this scheme is used throughout PIPSpro).

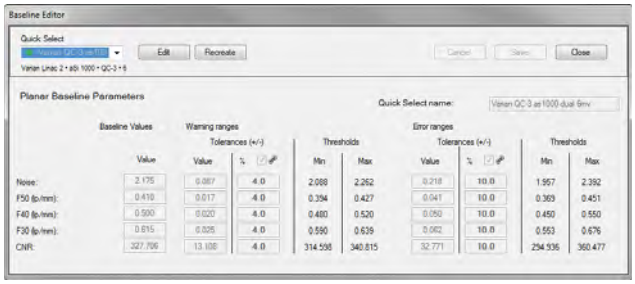


Planar Imaging QA

PIPSpro kV planar imaging QA uses images obtained with Standard Imaging's QC-kV1 phantom or Leeds Test Objects' TOR CDR phantom. Testing is supported for kV imagers integrated with linear accelerators as well as images from ExacTrac, Cyberknife, and C-Arms. EPID MV planar imaging QA uses Standard Imaging's calibrated QC-3 phantom.

Automatic Region Identification Is Key

By automatically identifying analysis regions, subjectivity is reduced and results consistency is improved.



Baseline Editor

Individual baselines can be created for each combination of linear accelerator, imager, phantom, and energy that you test using Quick Selects. This unique and powerful feature allows you to choose representative measurements, combine them, and set alert and warning tolerances for your imaging systems.

COMPLETE MLC QA

Cover all TG-142 MLC QA tests with EPID images and logfiles

	Image-Based	Logfile-Based
Matched Segments, aka "Picket Fence"	✓	
Setting vs radiation field for two patterns (non-IMRT)	✓	
Travel speed – leaf speed loss (IMRT)*		✓
Leaf position accuracy (IMRT)		✓
Average of leaf and interleaf transmission, all energies	✓	
Leaf position repeatability*		✓
MLC spoke shot	✓	
Coincidence of light field and x-ray field, all energies	✓	
Segmental IMRT (step and shoot) test		✓
Moving window IMRT (four cardinal gantry angles)		✓

Adapted from TG-142, TABLE V: Multileaf collimation

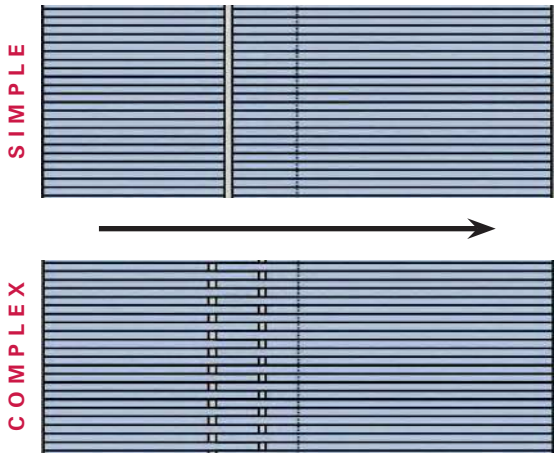
**With logfile-based analysis, PIPSpro is the only commercial software solution able to measure quantitative leaf speed loss and leaf position repeatability.*

PIPSpro MLC QA gives you actionable, quantitative results that allow you to track and trend all TG-142 requirements, delivering critical information that may indicate an impending MLC failure or indicate the need to recalibrate your machine for the best possible clinical outcomes. Step & Shoot and VMAT parameters are tested in any direction using MLC leaf pattern files (*.mlc, *.dva).

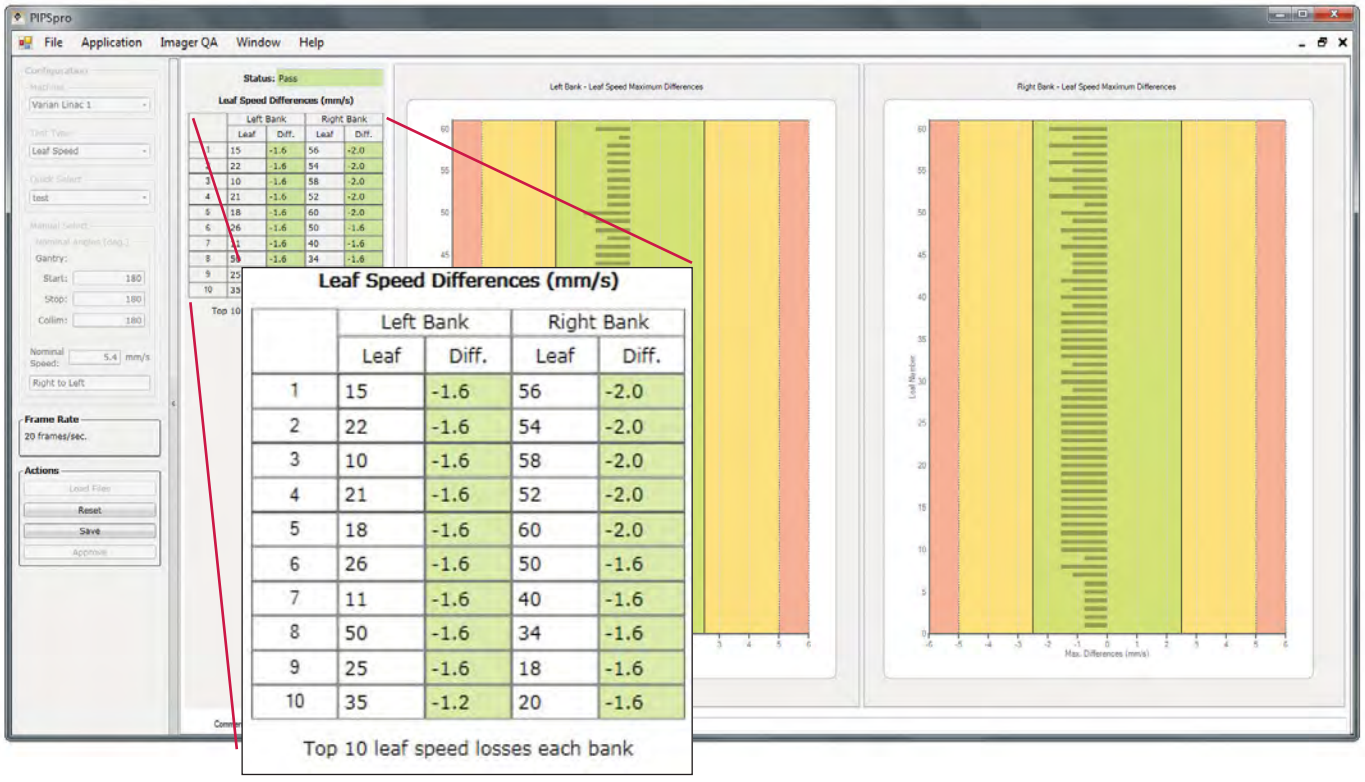
> ***PIPSpro is the first commercial machine QA software to determine leaf speed loss. Systems that report only maximum and mean leaf speed cannot be used to calculate leaf speed loss, as required by TG-142,"*** notes Standard Imaging medical physicist Shannon Holmes, Ph.D.

PIPSpro features automatic compositing of EPID MLC images, so you don't need to use third-party products to combine individual images.

In simple leaf speed tests, all leaves travel together



In complex leaf speed tests, every other leaf moves, maximizing inter-leaf friction

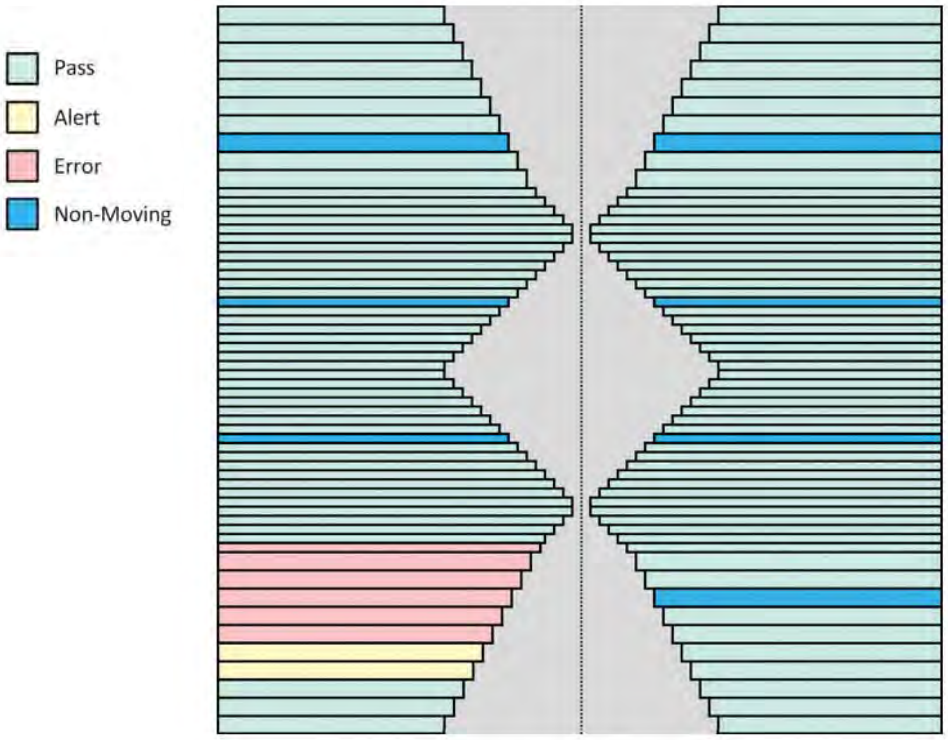


Leaf Speed Differences (mm/s)

	Left Bank		Right Bank	
	Leaf	Diff.	Leaf	Diff.
1	15	-1.6	56	-2.0
2	22	-1.6	54	-2.0
3	10	-1.6	58	-2.0
4	21	-1.6	52	-2.0
5	18	-1.6	60	-2.0
6	26	-1.6	50	-1.6
7	11	-1.6	40	-1.6
8	50	-1.6	34	-1.6
9	25	-1.6	18	-1.6
10	35	-1.2	20	-1.6

Top 10 leaf speed losses each bank

PIPSpro is able to measure quantitative leaf speed loss, not just deliver a qualitative result.



Leaf speed status in a repeatability test

Comprehensive Machine and IGRT QA

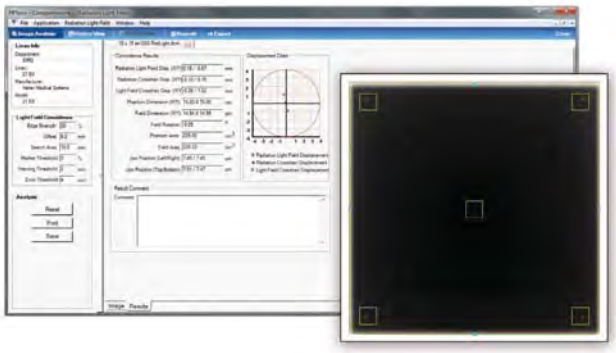
Track and trend results for classic TG-142 tests

Radiation Light Field Analysis

PIPSpro uses a single image taken with custom phantoms (FC-2, Center Marker) to calculate:

- Radiation and light field coincidence
- Radiation and crosshair displacement
- Light field and crosshair displacement
- Jaw position measurements
- Light field rotation

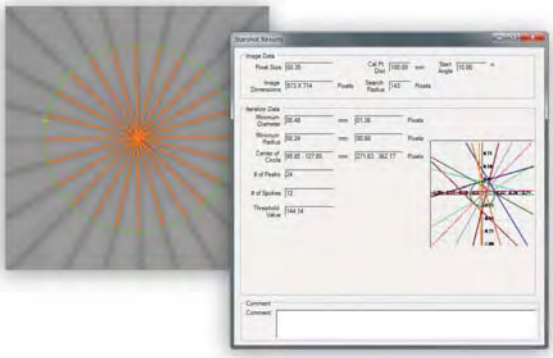
Works for light fields defined by jaws or MLCs.



Starshot Analysis

PIPSpro's StarShot module uses EPID MV or film images to measure rotational deviations in gantry, collimator, and couch mechanical isocenters. Results are expressed as the minimum diameter containing all spokes at the central point of intersection. Unlike competing software, PIPSpro features automatic compositing of individual EPID spoke images, so you don't need to use third-party products to combine images.

Works for spoke images defined by jaws or MLCs.

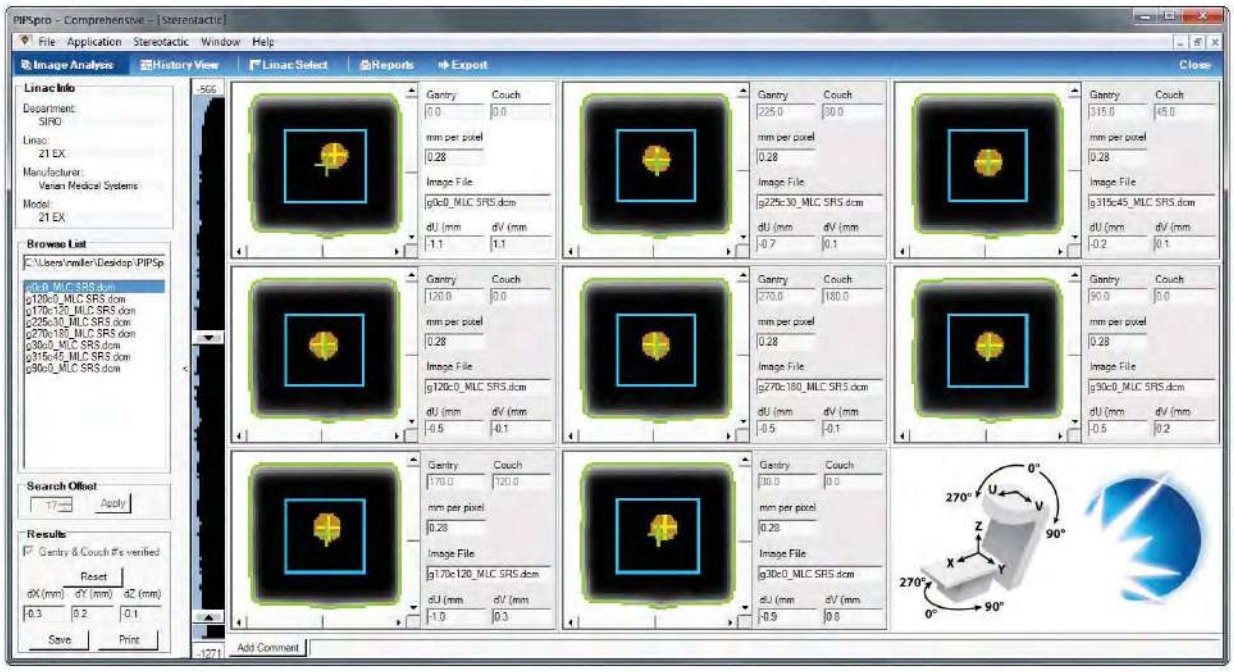


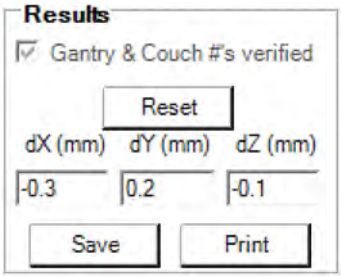
Daily IGRT QA Tracking

When using Image-Guided Radiation Therapy (IGRT) in the clinic, daily testing is recommended to verify that your imaging coordinate system is precisely aligned with your treatment coordinate system. TG-142 recommends two tests: "Imaging and treatment coordinate coincidence" and "Positioning/repositioning". Use the Standard Imaging MIMI (Multi-Image Modality Isocentricity) phantom with image registration software to calculate known 3D (x, y, z) and 6D (add couch pitch, yaw and roll) offsets. PIPSpro allows you to record your daily offsets and track and trend your results.

Precise Stereotactic 3D Analysis

Quick, easy, precise, and actionable



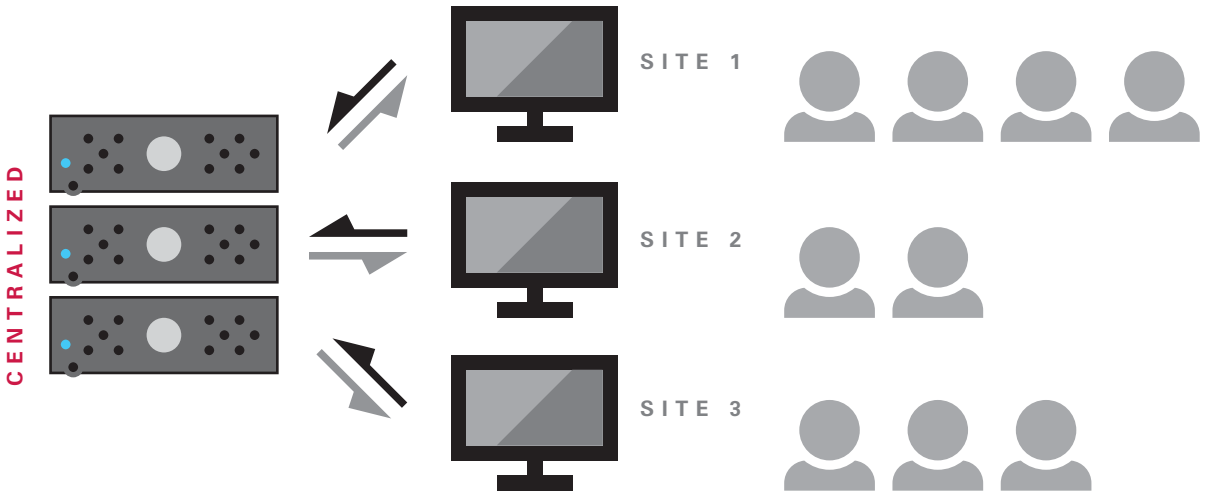


Use Standard Imaging's Winston-Lutz phantom to measure the difference between the radiation isocenter and the mechanical isocenter for a linear accelerator. A number of images are taken with your portal imager using fixed angles or angles of your choice.

- Automatically load and analyze any images, including DICOM images, for cones or MLC's.
- Automatically get 2D radiation/mechanical offsets for each image.
- Automatically get an optimal 3D offset to correct patient offset errors.
- 3D analysis with x, y, z results that help you improve patient positioning.

Centralized Database Management

Simplify your QA by keeping all your data centralized and secure



PIPSpro can use a local or centralized database server. As a result, PIPSpro is the choice of small, large and multi-location treatment centers across the world. PIPSpro has the feel of a desktop application using a centralized server, but gives you the power to organize your sites into divisions and departments assigning users permissions to the departments and tasks that they need to do their work.

Features include:

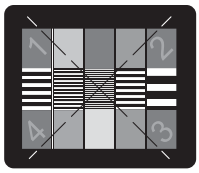
- Single access point controls division, department, linac, and user configuration
- Centralized data access point allows enterprise-wide access to data, results, and trending
- Unparalleled data security
- Citrix server support on enterprise wide systems
- DICOM router offers convenient access and routing of files by constantly listening for new images and automatically sorting them by file type and date into a directory of the users choosing

ORDERING INFORMATION

PIPSPRO SOFTWARE **REF 91310**

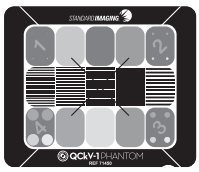
PHANTOMS

RECOMMENDED



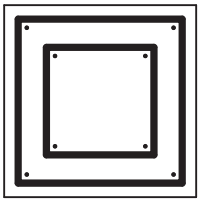
QC-3 Phantom
CALIBRATED PHANTOM
REF 71350

Used to test the image quality from electronic portal imaging devices (EPIDs).



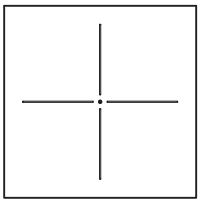
QCkV-1 Phantom
CALIBRATED PHANTOM
REF 71451

Ideal for kV imaging systems, including Varian, Elekta, BrainLAB and Cyberknife.



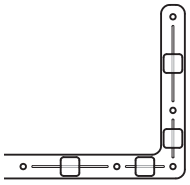
FC-2 Phantom
REF 72187

For performing the radiation field vs. light field test and jaw position testing



Light Field Cross Hair Marker
REF 72247

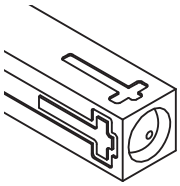
For performing the radiation field vs. light field test and jaw position testing



MLC QA Phantom
REF 72277

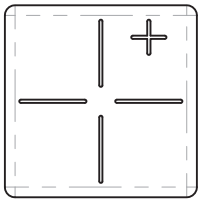
For analyzing individual leaf positions of multi-leaf collimators (MLC)

ADDED VALUE



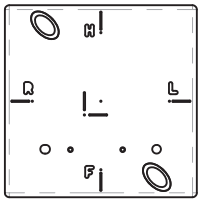
Winston Lutz Pointer Phantom
PIPSpro recognizes most ball marker phantoms
REF 72285

Expedite and simplify verification of sub-millimeter isocenter treatment setup.



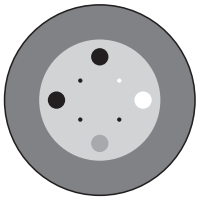
Winston Lutz Cube Phantom
PIPSpro recognizes most ball marker phantoms
REF 91345

Expedite and simplify verification of sub-millimeter isocenter treatment setup.



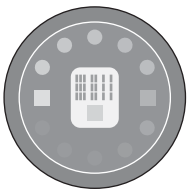
MIMI Phantom *(Multiple Imaging Modality Isocentricity Phantom)*
REF 91240

Ensure image guidance accuracy by measuring the coincidence of isocenter prescribed by the lasers, treatment beam and image guidance systems.



Catphan
purchased through your linac vendor

Compatible with model 503, 504, and 600 phantoms



Leeds Test Objects
purchased through your linac vendor

Routine test objects designed to be used quickly and easily on a regular basis

Phantom holders available for CyberKnife and ExacTrac imagers make PIPSpro a complete QA software for all imaging delivery systems

PIPSpro Software SPECIFICATIONS

OPERATING SYSTEM	WINDOWS 7 (SP1) *or better* WINDOWS 8.1 (SP1) *or better* .NET 4.0 *or better*
PROCESSOR	Intel® or AMD® 350 MHz or greater
MEMORY	1 GB (3 GB recommended)
HARD DRIVE	512 MB free space for software installation. Sufficient space to store image data files. 3GB or greater if installing SQL Server Express on the install host.
SCREEN	1152×864 XGA+(4:3) 1600×900 (16:9) or higher 16 bit HiColor or greater
CD–ROM DRIVE	2X speed or greater
VIRTUAL MACHINES	Must support WMI (Windows Management Instrumentation) Citrix XenDesktop and Citrix XenApp
DATABASE MANAGEMENT	SQL Server 2008 R2 (or SQL Server Express equivalent) minimum
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE
RECOMMENDED SOFTWARE	Microsoft Excel

QA PILOT SOFTWARE

All clinics are tasked with recording, reporting and archiving vast amounts of data to document machine performance for accreditation and auditing. QA Pilot allows you to achieve the goal of making these tasks more manageable. No more spreadsheets or multiple program management. Access and manage all of your QA data in real time from one secure, unified location anywhere internet is available. Open QA Pilot to collect, compare, report, analyze and share data from a number of linacs, systems and users on any web-capable device. Automatically import data from commonly used QA devices and analyze and approve the results.

Implement daily, monthly and yearly reports in a program built around TG-142, allowing you to easily navigate and configure required QA compliance. QA Pilot is a fast and easy way to keep track of all machine QA and ensure confidence that your equipment is in tolerance. Simple dashboard views allow for quick overview of individual machine performance.

"I can gather and manage all my QA data and documents in one place and I'm not limited to one particular QA vendor so I can use different QA devices across multiple facilities. The really exciting thing about this cloud-based solution is the future directions of radiation therapy QA for data management and decision making."

Todd Pawlicki, Ph.D.
Chief of Physics

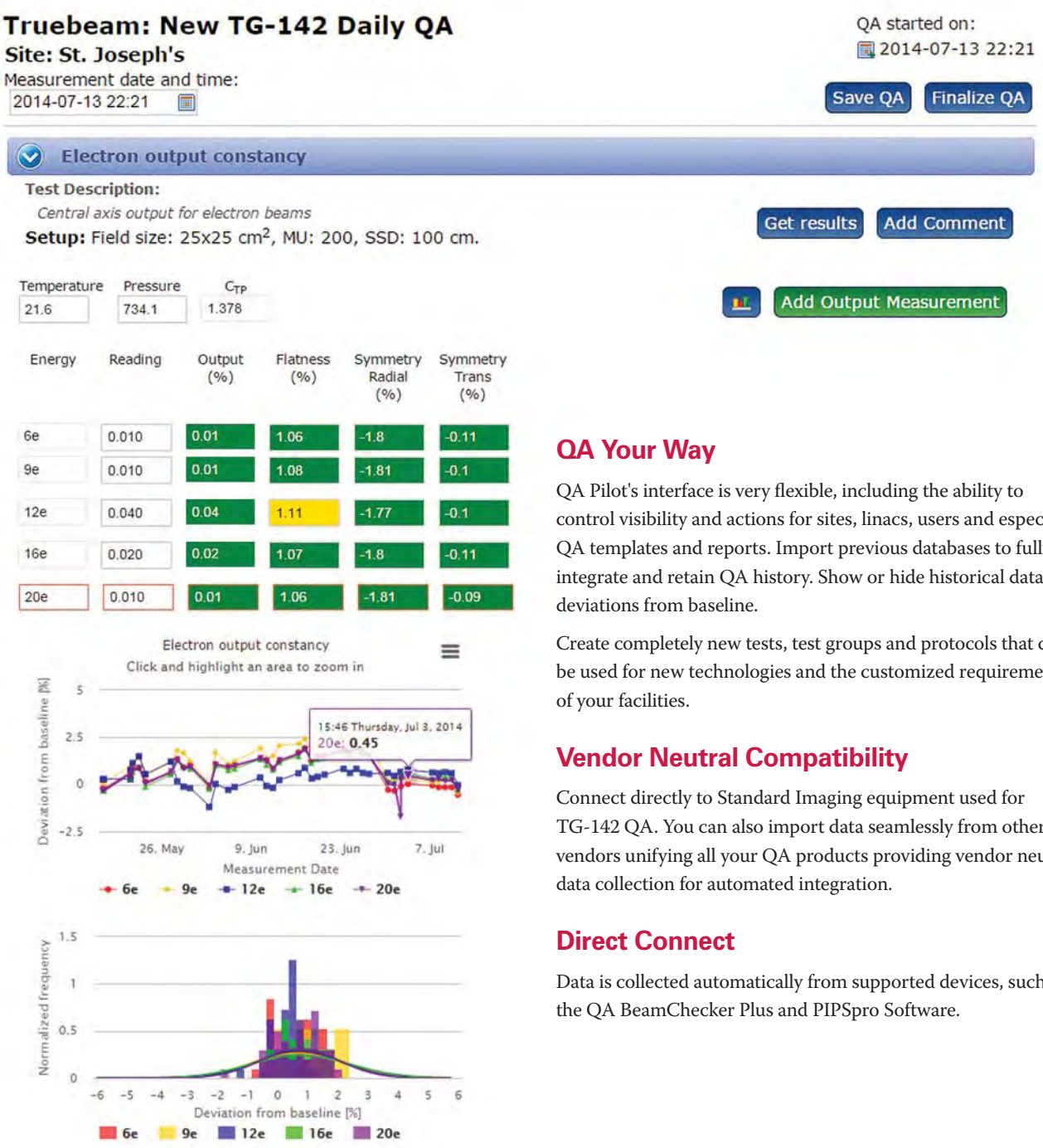
A New Way to View QA

QA Pilot is a QA management system developed with a TG-142 workflow in mind

Record data for ALL tests in TG-142 protocol	✓
Trend results with TG-142 or custom specifications	✓
Automatic e-mail alert notifications when tolerances are exceeded	✓
Longitudinal and distribution plots for all numerical data	✓
HIPPA/HITECH compliant network	✓
Retrieve data automatically from multiple common daily QA devices	✓
Build new protocols with provided templates	✓
Accessible from any internet connected device	✓
Access data from multiple devices with single license	✓
SaaS (Software as a Service)	✓
Capital expenditure	*None*
Software installation	*None*
Store calibration documentation with specific QA devices	✓
Manage QA equipment across your organization	✓
Complete control of users viewing and entering QA tasks per department or network	✓
Save and resume in progress QA activities	✓

PERFORM QA

Access from any internet enabled device, including mobile, to view the dashboard report, manage equipment tolerance, receive push notifications and communicate with responsible staff



QA Your Way

QA Pilot's interface is very flexible, including the ability to control visibility and actions for sites, linacs, users and especially QA templates and reports. Import previous databases to fully integrate and retain QA history. Show or hide historical data deviations from baseline.

Create completely new tests, test groups and protocols that can be used for new technologies and the customized requirements of your facilities.

Vendor Neutral Compatibility

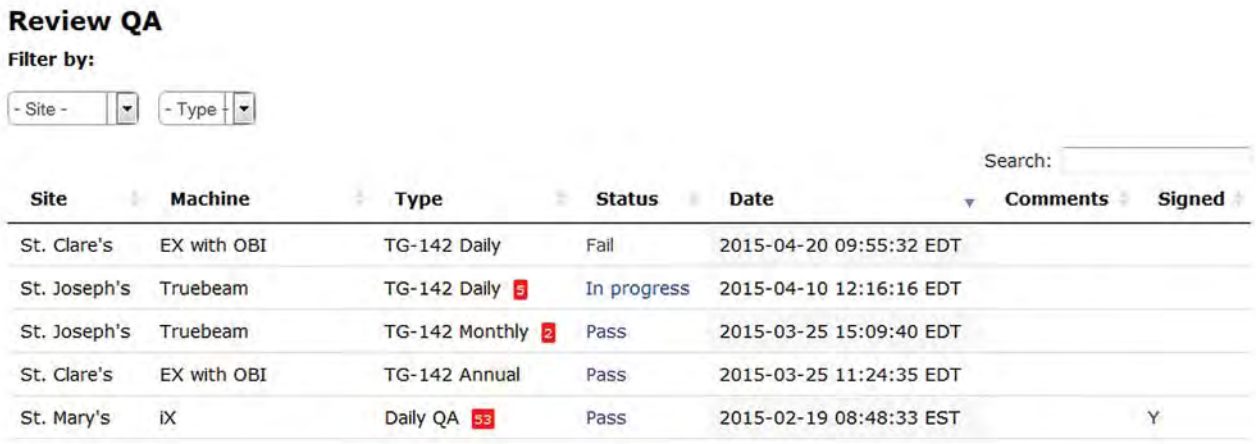
Connect directly to Standard Imaging equipment used for TG-142 QA. You can also import data seamlessly from other vendors unifying all your QA products providing vendor neutral data collection for automated integration.

Direct Connect

Data is collected automatically from supported devices, such as the QA BeamChecker Plus and PIPSpro Software.

REVIEW QA

Easy-to-read overview of machine QA workflow with actionable data

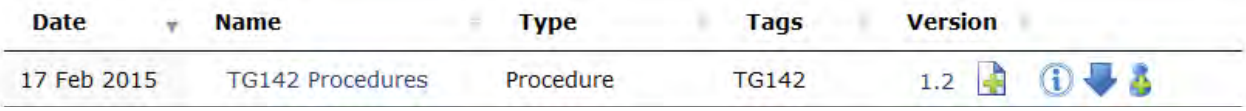


Powerful QA Workflow with Document Sign Off

Workflow actions are stored and easily accessible to clinicians and administrators for seamless communication. Implement document signoff requirements from one or more individuals or roles. You can set deadlines for signoffs with automatic email alerts sent to the appropriate individuals.

Real-Time Performance Monitoring and Email Alerts

Get an at-a-glance overview of all your machines with the ability to see reported data. Instant out-of-tolerance email alerts and easily identifiable notifications help you respond before errors become clinically relevant.



Document Manager

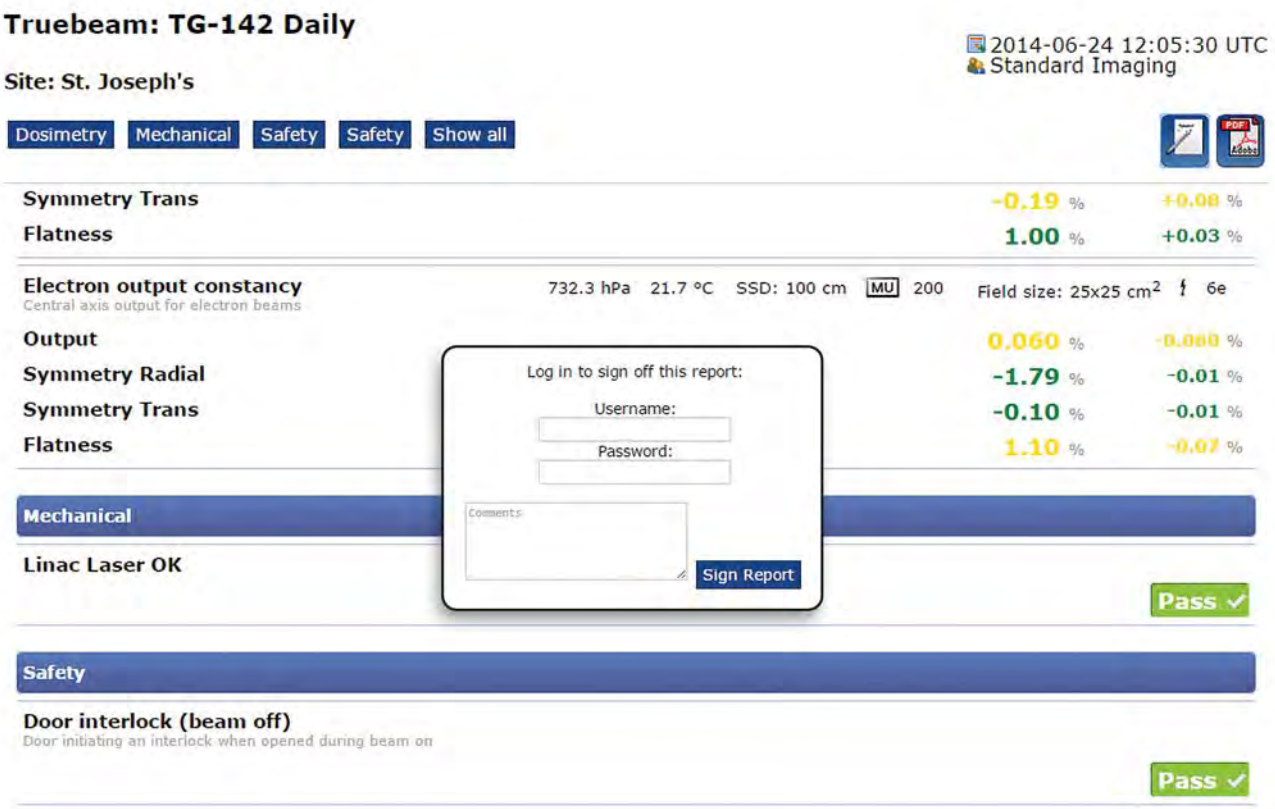
Store legacy QA data and calibrations; control and keep procedures with a built in Document Repository.

Document Management Asset Accreditation

Store and manage your QA and certification related materials. Upload version-controlled files effortlessly from anywhere in your organization, ensuring current versions of policies and procedures are available during inspections. Assign documents for review by creating due dates, sign off and restrictions for select personnel.

QA Reporting

Powerful QA reports & trending for a fast, easy way to keep track of all linac QA



Customizable Interface

Create baseline and tolerances and then compare at a glance across all QA devices.

Historical Trends

All numerical measurements can be trended over time with a customized view that can be set by date or energy. Tolerance and alert limits can also be displayed on the plots to easily view changes in data over time.

Equipment Manager

Upload and store all relevant documents associated with calibrations and apply calibration factors automatically to your data when appropriate. Reminders can be set up to ensure you're reminded when calibration on your equipment is due for recalibration.

ORDERING INFORMATION

QA PILOT SOFTWARE **REF 91348**

WHY QA PILOT?

QA data in the cloud is secure, easy to manage and optimized for mobile devices

QA DATA IN THE CLOUD

Security

provides data encryption and backup

Convenience

installation free with easy access anywhere

Accountability

peer-to-peer review with secure collaboration

No Maintenance Required

Software as a Service (SaaS) platform means:

- No software installation/management necessary
- Only internet access is required
- No internal in-house servers or IT support needed

Secure Data

Data is securely stored, double encrypted and password protected on Amazon servers, meeting all HIPAA and EU compliance standards.

Easy Calibration Management

No more searching for calibration documents. QA Pilot allows you to store calibration information and documents for your devices. Reminders will alert you of pending calibration expirations.

Mobile Optimized

Access from a mobile enabled device for dashboard reports, manage equipment tolerances, receive push notifications, and communicate with responsible staff.

IMPROVE CLINIC OPERATIONS

How does QA Pilot improve safety?

- At-a-glance analysis and status of all required tests and machine performance
- Be notified immediately when a machine is out of tolerance
- World class data integrity with HIPAA Compliant Amazon Servers, securing all your data

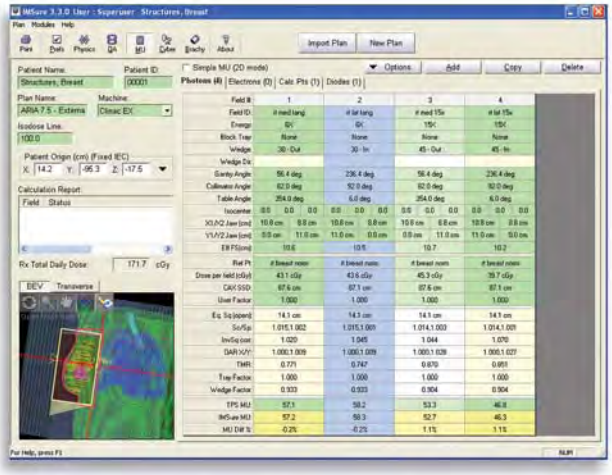
How does QA Pilot make my clinic more efficient?

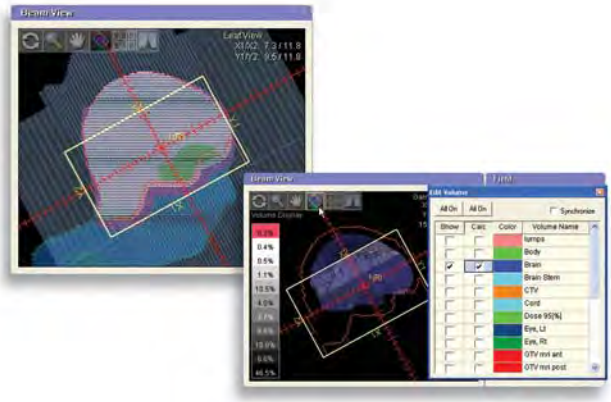
- See how your clinic compares to others with similar machines with distribution plotting
- Easily store and produce all reports on-demand for the ACR and other regulatory agencies
- Easy to use, browser based software, connecting all your clinics/machines together
- Assignable user rights allowing you to schedule and follow up on non-compliance

FAST, PRECISE

Unprecedented accuracy from the patented "3-Source Model" algorithm, easy standard plan MU checks, and uniquely comparative IMRT Plan QA — no film, no phantom, no linac time required

IMSURE QA SOFTWARE





INTUITIVE MU DOSE CALCULATIONS

Automate hand calculations of conventional plans or create simple plans with just a few clicks. A single screen for inputs, outputs and field-to-field comparisons offers quick review and easy editing of plans.

ACCURATE IMRT AND RapidArc™ DOSE VERIFICATIONS

The patented Stanford University "3-Source Model" results in extremely accurate dose calculations for segmented treatments such as IMRT, RapidArc™, or field-in-field plans.

STRUCTURE SPECIFIC IN-DEPTH IMRT PATIENT QA

Imported treatment planning system fluence is directly compared to independently calculated fluence in IMSure for analysis of the entire field instead of a single point. Import patient contours to allow comparison of fluence for each region of interest in the plan.

CYBERKNIFE PLAN VERIFICATIONS

Fast and easy verification of plan monitor units (MU) and dose for both composite and per projection analysis.

RAPIDARC PLAN CALCULATION SIMPLIFIED

The ARC QA Tool helps limit the complex calculations associated with RapidArc plans by splitting plan files into user-defined sub-arcs.

FAST, ACCURATE BRACHYTHERAPY CHECKS

Perform second checks of HDR, LDR and permanent implant plans on an intuitive, single page interface. Imports DICOM-RT plan files from treatment planning systems and utilizes TG-43 formulism for dose calculations.

THOROUGH STEREOTACTIC QA

Expedite confirmation of cone-based or MLC-based SRS plans with IMSure's easy-to-use stereotactic features

Features

Validated Results

- IMSure QA is proven as effective as measurements and TPS
- The performance of IMSure QA Software has been verified in multiple publications

Intuitive MU Dose Calculations

- Check MU or specific-point dose quickly and easily
- Support for hard wedges, Varian Enhanced Dynamic Wedge, Elekta Motorized (Omni) wedge and Siemens Virtual Wedge
- Patient contours can be imported to assist in visualization or to account for flash (missing tissue)
- Single screen for inputs, outputs and field-to-field comparisons for quick plan review
- Block editor for quickly checking effects of changes in field size
- Extensive support for in-vivo dose prediction
- Unparalleled accuracy for calculating plans that utilize .decimal compensators

Accurate Dose Calculations of IMRT

- Multiple dose calculation points, including off-axis calculations
- Patented 3-Source Model more accurately models high-gradient/low-dose regions of small fields
- Linac parameters such as photon source, head scatter from primary collimators and flattening filters, and MLC leakage are accurately modeled

For segmented plans verify the whole field, not just a single point

- Calculated fluence compares directly with the TPS predicted fluence for in-depth plan analysis
- Import patient contours and specify regions of interest for structure specific analysis
- Compare to either the true patient plan or a phantom plan
- Compares plans in six different ways, including difference maps, gamma maps and histograms

Cyberknife Plan Verification

- Composite and per projection verification of plan monitor units (MU) and dose

Simple Physics Interface and Reporting

- Supports unlimited machines, energies, treatment planning systems and record & verify systems
- Completely characterizes output aspects from linear accelerator for simulated dose delivery
- Easily imports TPS fluence maps, MLC leaf sequence files in DICOM RT and RTP format, and provides graphical representation of beam data
- Provides hard copy output for billing and patient documentation and electronic output for paperless record keeping (in U.S. use CPT Code 77300)

Quick, Easy Brachytherapy Plan Checks

- 3D views of calculation reference points and sources in the orthogonal, sagittal, transverse and coronal planes.
- Calculate at reference source strength or automatically decay source strength to a user-specified date and time
- In-depth calculation results provide dose contributions to each calculation point from any individual dwell position

RapidArc Plan QA

- Split RapidArc plans into user-defined sub-arcs
- Reset gantry, collimator and couch angles to 0 to create fluence maps for each sub-beam and conduct a full evaluation of the plan.
- The 77300 code for basic dosimetry calculations can be billed for each field for which a calculation is performed.

Specialized Stereotactic Checks

- Calculate MLC and cone-based stereotactic treatments based on dose-rate in DICOM files.
- Create specific energies in physics module to accurately model small fields found in stereotactic plans

IMSure QA Software (REF 91326) SPECIFICATIONS

OPERATING SYSTEM	Windows® XP Windows Vista® Windows® 7
PROCESSOR	Intel® or AMD®, 600 MHz or greater
MEMORY	256 MB or greater
HARD DRIVE	50 MB or greater
SCREEN RESOLUTION	1024 x 768 or higher
CD–ROM DRIVE	2X speed or greater
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE

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PERFORMANCE VALIDATION

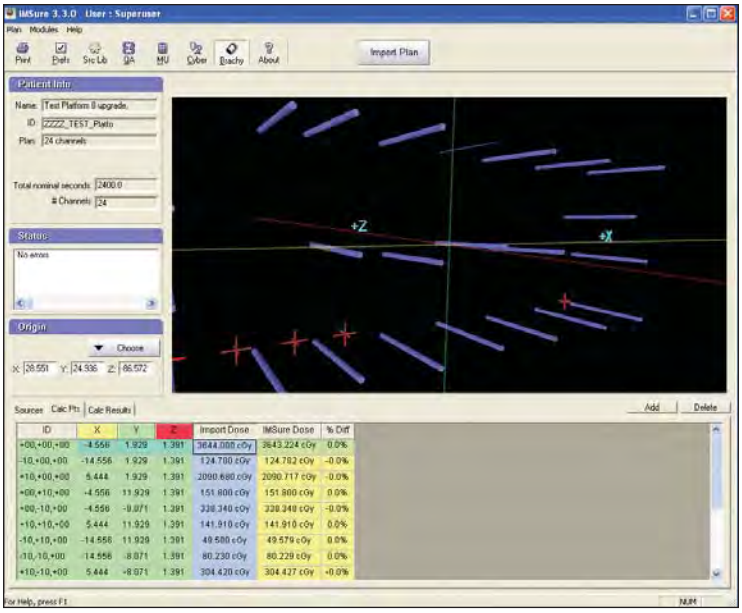
1. Parminder S. Basran and Milton K. Woo, "An analysis of tolerance levels in IMRT quality assurance procedures," **Med. Phys.** 35, 2300 (2008), DOI:10.1118/1.2919075
2. Todd Pawlicki, Sua Yoo, et al, "Moving from IMRT QA measurements toward independent computer calculations using control charts," **Radiotherapy and Oncology** 89 (2008) 330–337
3. Y. Yang, L. Xing, J. G. Li, J. Palta, Y. Chen, Gary Luxton, A. Boyer, "Independent dosimetric calculation with inclusion of head scatter and MLC transmission for IMRT," **Med. Phys.** 30 (11), November 2003.
4. Yong Yang, Lei Xing, Arthur L. Boyer, Yixin Song, Yimin Hu, "A three-source model for the calculation of head scatter factors," **Med. Phys.** 29 (9), September 2002.
5. L .Xing, Y. Chen, G. Luxton, J. G. Li and A. L. Boyer, "Monitor unit calculation for an intensity modulated photon field by a simple scatter-summation algorithm," **Phys. Med. Biol.** 45 (2000) N1–N7.
6. Lei Xing and Jonathan G. Li, "Computer verification of fluence map for intensity modulated radiation therapy," **Med. Phys.** 27 (9), September 2000.
7. Daniel A. Low, William B. Harms, Sasa Mutic, and James A. Purdy, "A technique for the quantitative evaluation of dose distributions," **Med. Phys.** 25 (5), May 1998

ORDERING INFORMATION

IMSURE QA SOFTWARE REF 91326

FAST, EASY BRACHY QA

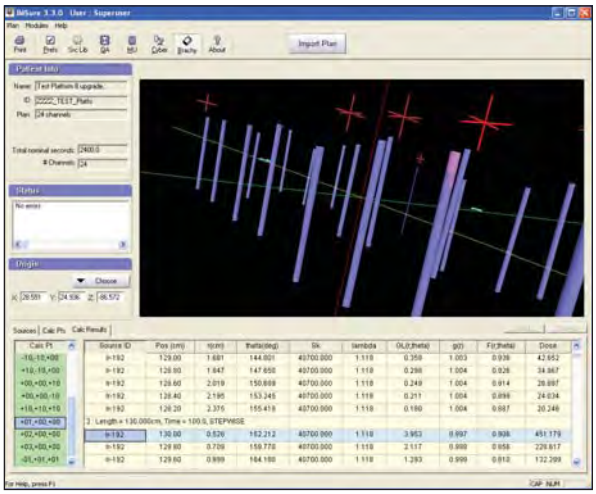
Perform second checks of HDR, LDR, and permanent implant plans on an intuitive, single page interface



IMSURE QA SOFTWARE
BRACHYTHERAPY

FAST, ACCURATE BRACHYTHERAPY PLAN CHECKS

Imports DICOM-RT plan files from treatment planning systems and utilizes the TG-43 formulism for dose calculations (Comparison to plan is in percentage difference).



VISUALIZE SOURCES IN 3D

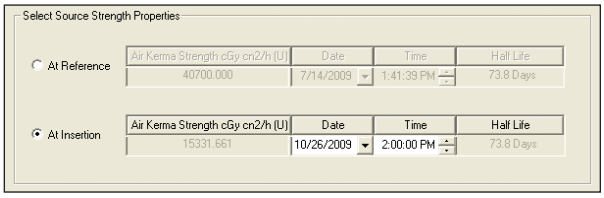
View calculation reference points and sources, including catheters and dwell positions, in three dimensions with keyboard shortcuts for viewing orthogonal, sagittal, transverse and coronal planes.

IN-DEPTH ANALYSIS OF EACH DWELL POSITION

Choose the calculation point and dwell position of interest and each will be highlighted in the 3D view. The dose contribution to the chosen calculation point and corresponding dwell position is shown along with the factors used in the calculation enabling easy analysis of every facet of the plan.

AUTOMATIC DECAY OF SOURCE STRENGTH

Choose whether to calculate the dose based on the reference source strength stored in the source library or at the source strength at any date and time specified, including the time of implantation.



Features

Accurate Dose Calculations

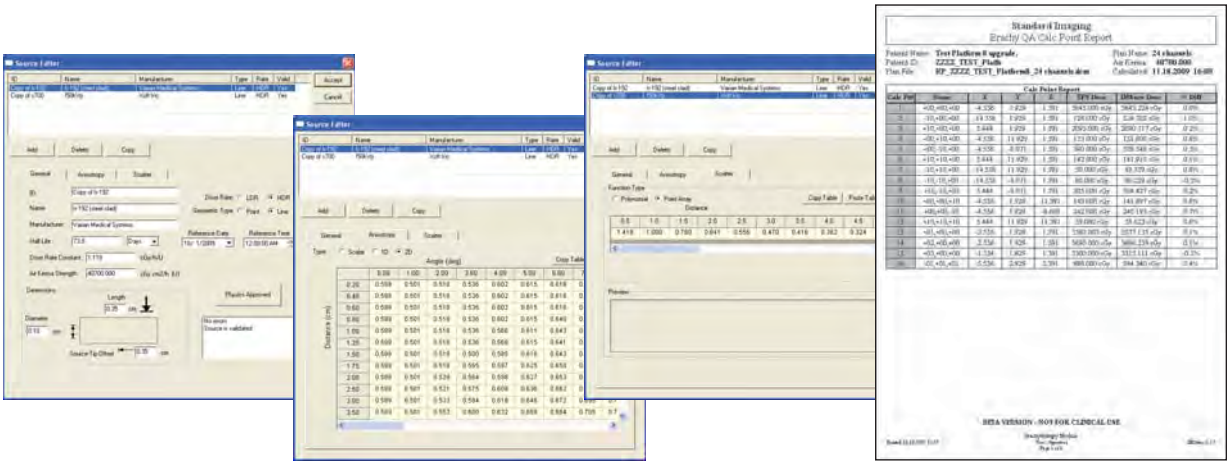
- Utilizes TG-43 formulism for dose calculations
- Calculate up to 30 points simultaneously
- Calculate at reference source strength or automatically decay source strength to a user specified date and time
- In-depth calculation results provide dose contributions to each calculation point from any individual dwell position
- Choose summary and detailed reports, according to preferences, and export to Excel® or PDF

Integrated Source Library

- Easily create new LDR or HDR point or line source types
- Preset with most common HDR and LDR sources
- Use either scalar, 1D, or 2D tables for anisotropy
- Use either polynomial fit or 1D tables for radial dose function (scatter)

3D Display

- Visualize each catheter and dwell position
- Rotate and zoom view
- Keyboard shortcuts for standard views: Orthogonal, Sagittal, Coronal and Transverse



IMSure QA Software Brachytherapy SPECIFICATIONS

OPERATING SYSTEM	MICROSOFT® WINDOWS® XP WINDOWS VISTA® WINDOWS 7
PROCESSOR	Intel® or AMD®, 600 MHz or greater
MEMORY	256 MB or greater
HARD DRIVE	50 MB or greater
SCREEN RESOLUTION	1024 x 768 or higher
CD–ROM DRIVE	2X speed or greater
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE

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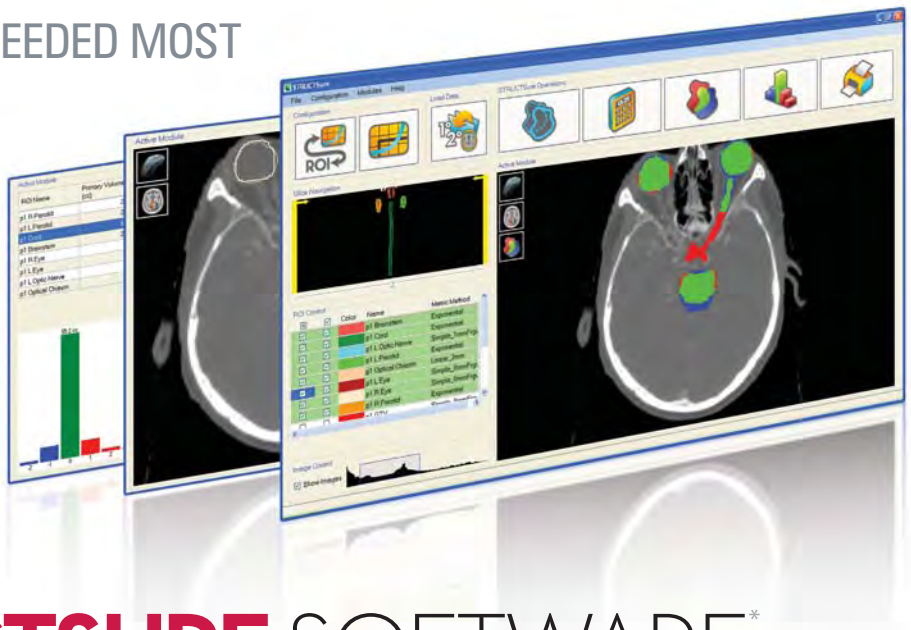
ORDERING INFORMATION

IMSURE QA SOFTWARE BRACHYTHERAPY REF 91331

QA WHERE IT IS **NEEDED MOST**

The first quality assurance tool for one of the most critical steps in the treatment planning process, the contouring of structures



STRUCTSURE SOFTWARE*

STRUCTURES ARE CRITICAL

Accurately contouring both the target and critical structures is vitally important to the preparation of a treatment plan and is widely considered to be the biggest and most unpredictable source of error in radiation oncology.

StructSure Software imports pairs of DICOM RT structure datasets and evaluates them both qualitatively and quantitatively.

StructSure analysis is volumetric and quantitative, not just comparing "closed loop contours" but rather generating 3D volumes of critical structures and tracing errors in all 3-dimensions.

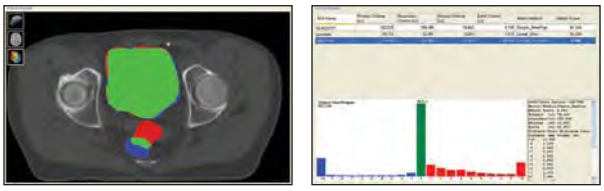
IMPROVE CONTOURING CONSISTENCY

Until now, there has not been a robust tool to quantitatively assess the performance and accuracy of contouring "systems" (system = operator, software, data output). Maintaining consistency and adhering to facility or industry protocols is virtually impossible to evaluate without a QA tool.

With StructSure QA Software you can easily and quickly analyze pairs of datasets which can be utilized to train your personnel or evaluate the abilities of a new staff member. With StructSure you will have confidence that each treatment plan created in your facility starts with contours that meet your standards.

AUTOMATED TOOLS NEED QA

If you are considering an automatic contouring tool StructSure QA Software can assist you in comparing the capabilities of each system and in properly commissioning the usage of the system(s) you choose to use clinically. Using a baseline and approved structure set as the primary you can assess how each automated tool under consideration can re-produce the manually delineated structures so you can be sure you are purchasing the device that best meets your expectations.



In this example of auto-contouring vs. manual-contouring, the auto-contouring system performs well for the bladder but performs poorly for the rectum.

If you already own an auto-contouring system use StructSure for commissioning to determine where the tool excels and which contours require manual intervention. You can also use StructSure to test and commission new releases of auto-contouring software to determine what improvements have been made and to re-validate to ensure that no errors were introduced.

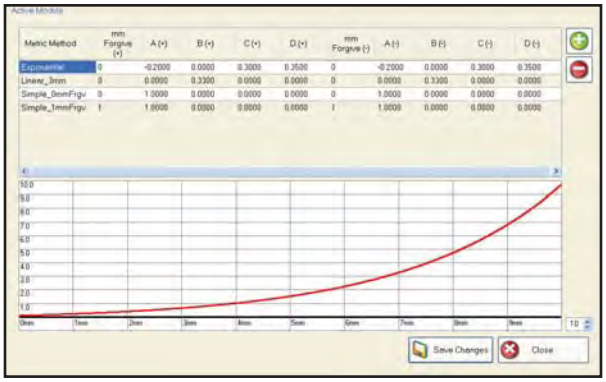
**patent pending*

Features

Customizable metrics give you control over your QA

StructSure QA Software features a patent pending method of creating customizable metrics to meet your QA needs. An intuitive metric parameter generation module makes it easy to create different metrics for different regions of interest.

- For structures where exact precision is not required, set a forgiveness distance so that any voxel that is within the forgiveness region is not penalized
- Use the arithmetic or exponential function for increased penalties based on distance

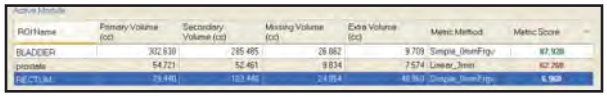


- For complete control over your QA, set different penalty functions for extra voxels and missing voxels
- All analyses are done in 3D space, not just for axial slices or contour "loops"

Once a metric is created, set default metrics for each common structure for ease of use and consistency in evaluations.

Visualization tools for easy interpretation of results

StructSure QA Software reports a score for each set of matching regions of interest that are evaluated. A 100 score signifies a perfect match, then, depending on the metric used, penalties are applied for missing and extra voxels found in the secondary set of structures. Scoring is an excellent way to determine how well your two structure sets are alike or different but determining why they are or are not alike can be the most important aspect of your analysis.



An example of a StructSure scoring report

Structure offers easy to use visualization tools that allow you to quickly interpret where the two sets differ and possibly why they differ. This can assist you in training by giving you tangible data that you can share with the trainee showing them where and how to improve. In the case of automated tools you may be able to use the data to adjust parameters of the automated system to improve performance.

Changing the opacity of the difference regions reveals the 3D image slice below to analyze why differences may exist between structure sets

StructSure QA Software SPECIFICATIONS

OPERATING SYSTEM	Microsoft® Windows® 2000 Microsoft® Windows® XP
PROCESSOR	Intel® or AMD®, 600 MHz or greater
MEMORY	256 MB or greater
HARD DRIVE	50 MB or greater
SCREEN RESOLUTION	1024 x 768 or higher
CD–ROM DRIVE	2X speed or greater
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE

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ORDERING INFORMATION

STRUCTSURE SOFTWARE **REF 91340**

WORKFLOW **IMPROVED**

Clinically proven workflow tools result in time and cost savings and better patient experiences through improved communication and faster planning

RT WORKSPACE SOFTWARE

CLINICALLY PROVEN WORKFLOW SOFTWARE

Developed in conjunction with a busy radiation oncology clinic, RT Workspace responds to the need for organization and improvement of the patient planning process. Workflow is improved and patient's experience is enhanced through better communication, reduced waste and lower administrative costs.

From patient entry through plan approval to plan finalization RT Workspace guides the entire process in a way that Record and Verify Systems do not offer. With automatic notifications, each professional in the process knows when a task requires their attention increasing efficiency and productivity by reducing workflow interruptions. Gain confidence knowing that all steps are completed before a patient shows up for their first treatment.

Testimonial

"I have really loved working with this incredibly user friendly software, and I honestly think it has improved the quality of care we are able to provide at this clinic."

Candace Bletscher, MS

IDENTIFY INEFFICIENCIES WITH WORKFLOW ANALYSIS TOOLS

Because every step in the process is time stamped and recorded in the secure RT Workspace database workflow analysis is only a click away. Use the workflow analysis tools built into RT Workspace to determine where productivity and efficiency issues exist and see exactly where improvements to the process may have the most effect.

PHYSICS TOOLS AT YOUR FINGERTIPS

Increase efficiency by keeping important physics information in a single easily accessed location, the RT Workspace secure database.

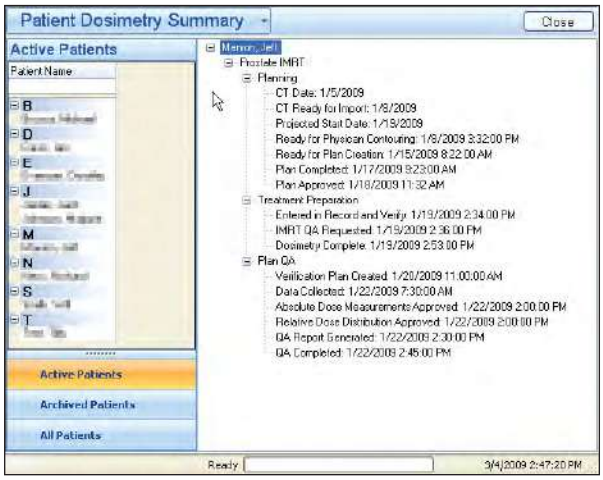
- Calibration information is tracked and automatic notifications alert you when equipment is due for re-calibration
- Collect, store and analyze monthly linear accelerator QA with a TG-40 compliant module
- Collect, analyze, store and create reports on patient specific IMRT QA according to your existing physics QA protocols

Features

Workflow Tools

From any workstation access electronic whiteboards and instantly assess where a patient's plan is in the process and who is assigned the next task(s).

- When a process is finished the professional assigned the next task is notified immediately
- The Dosimetry-Summary board provides an instant snapshot of where a patient is in the planning process



- Specialized boards for LDR Brachytherapy and Radiosurgery provide better workflow control of your planning processes

In Depth Physics Tools

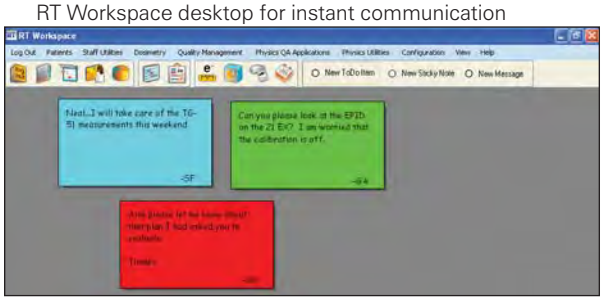
Collect, organize and analyze machine QA and patient specific QA information in one convenient, secure location.

- TG-40 (TRS-398, TRS-277) compliant monthly linear accelerator QA
- Patient specific IMRT QA
- Interface with the QA BeamChecker™ Plus for automatic patient specific electron monitor unit (MU) calculations
- Functional and mechanical tolerance checks on equipment
- Store and analyze QA information in one location with reporting capability

Communications Tools

RT Workspace allows you to instantly keep in touch with other RT Workspace users.

- Place electronic 'Sticky Notes' on other user's RT Workspace desktop for instant communication

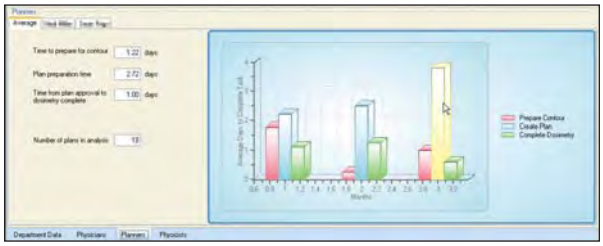


- View other user's To Do List to keep processes moving forward, e.g. if you are covering for a colleague on vacation
- RT Workspace email system is secure and HIPAA compliant
- Integrated department calendars and scheduling calendars assist in planning and provide visibility to potential workflow issues

Workflow Analysis

RT Workspace can be used in the implementation of lean management techniques to eliminate waste and increase efficiency by optimizing your workflow

- Detailed information about the time it takes to complete each step in the patient planning process allows you to identify where improvements are needed the most



RT Workspace Software SPECIFICATIONS

OPERATING SYSTEM	
CLIENT:	Microsoft® Windows® 2000 SP3 OR Microsoft® Windows® XP
SERVER:	Microsoft® Windows® XP OR Windows® Server 2003
PROCESSOR	Intel® or AMD®, 600 MHz or greater
MEMORY	256 MB (1 GB recommended)
HARD DRIVE	50 MB or greater
SCREEN RESOLUTION	800 x 600 (1024 x 768 recommended)
CD–ROM DRIVE	2X speed or greater
SCREEN COLOR DEPTH	256 colors or greater
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE
RECOMMENDED SOFTWARE	Microsoft Excel

Specifications subject to change without notice.

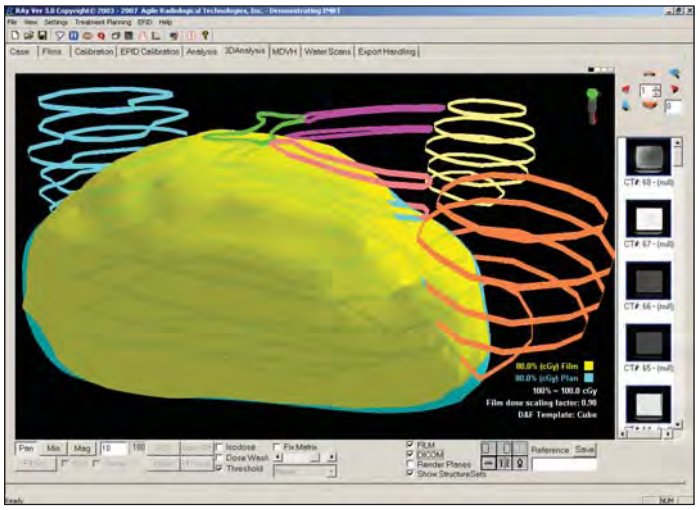
ORDERING INFORMATION

RT WORKSPACE SOFTWARE REF 91335

POWERFUL, EASY TO USE

The Radiation Analyzer - RAy™ Film Dosimetry Software provides all standard analyses necessary for detailed IMRT QA, patient-specific CyberKnife QA, and other frequent QA tasks. For thousands less, RAy includes advanced features not found in other film dosimetry software.

Advanced 3D View showing the 3D planned dose distribution compared to the 3D measured distribution showing excellent coverage of the target and sparing of organs at risk



RAY™ FILM DOSIMETRY SOFTWARE

3D MULTI-SLICE VOLUMETRIC FILM/PLAN ANALYSIS

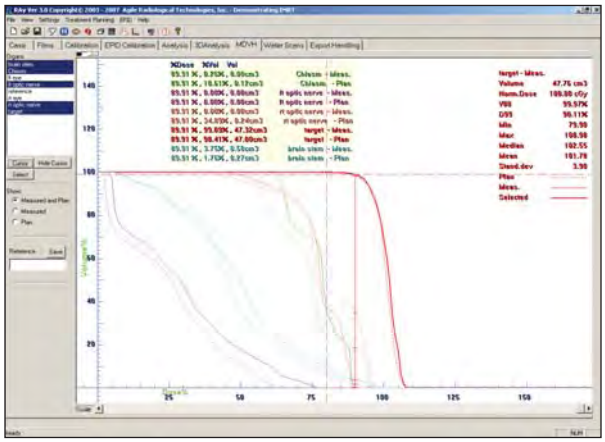
Import all available slices of the treatment plan, or select as many as needed to perform plan validation. Change from one slice to the next with one click of a button.

3D RENDERED VOLUMETRIC FILM/PLAN ANALYSIS

Import the 3D dose matrix from the treatment planning system and compare directly to 3D measured data acquired with a stacked film set.

MEASURED DVH/PLANNED DVH COMPARISON

Using 3D volumetric information perform a comprehensive quantitative analysis by generating and comparing measured DVH vs. planned DVH.



CYBER-KNIFE PATIENT-SPECIFIC QA

Compare both 2D or 3D film measurements to Cyberknife planning data. Cyberknife specific tools allow for fast
registration based on tracking fiducials.

ELECTRONIC PORTAL IMAGING DEVICE (EPID)

Use EPID images or other filmless technology as input for filmless IMRT fluence validation.

MORE MEANINGFUL ANALYSIS

Add another dimension to your analysis by overlaying qualitative threshold isodose lines over quantitative information such as gamma, distance-to-agreement, percent dose difference, or DTA + % Dose Difference maps.

SAVE AND SHARE YOUR WORK

For each case, save data into one integrated .ray file so you can easily archive, retrieve, and share the complete case information with local or remote co-workers.

SUPERIOR CUSTOMER SERVICE

Unlimited support for the first year means answers are readily available when you need them.

Features

Dose Mapping

- Isodose
- Dose Wash
- Threshold Dose
- % Dose Difference
- Distance to Agreement
- DTA+%Dose Difference
- Gamma Analysis
- Qualitative and Quantitative analyses overlay
- BMP or JPG export of any analysis picture

Profiles and Gradients

- Profile and Gradient
- Symmetry and Flatness
- Energy Check (PDD)
- ASCII export of all 1-D analysis data

Small Field Dosimetry

- SRS Collimator Profile
- SRS Collimator Output Factors
- Small Electron Profile
- Small Electron Cutout Factors

Other Tests

- MLC Calibration Report for calibrating and maintaining calibrated leaf positions based on radiological leaf edge
- Dynamic Wedge QA
- Complementary Water Scans Module compares film results to benchmarked stored water scans.
- Light vs. Radiation
- Star Shot for radiation isocenter identification

Data Input

Film digitization is possible through all TWAIN compliant film digitizers including VIDAR® and Flat-Bed scanners; in 8, 12 and 16 bit.

Treatment planning data import is validated for the following planning systems:

- Varian® Eclipse™
- CMS® XiO®
- Nucletron® TMS, THERAPLAN®, and Oncentra®
- Philips® Pinnacle³®
- Corvus®
- BrainLAB®
- Accuray® CyberKnife®

RAy FILM DOSIMETRY Software SPECIFICATIONS

OPERATING SYSTEM	Microsoft® Windows® 2000 Microsoft® Windows® XP
MEMORY	512 MB or greater
INTERFACE	Available SCSI port for film scanner connection

Eclipse™ is a trademark of Varian Medical Systems Inc. XiO® is a registered trademark of CMS, Inc. THERAPLAN® and Oncentra® are registered trademarks of Nucletron B.V. Pinnacle³® is a registered trademark of Philips Electronics N.V. Corvus® is a registered trademark of Best®nomos®. BrainLAB® is a registered trademark of BrainLAB AG. CyberKnife® is a registered trademark of Accuray Incorporated. Windows® is a registered trademark of Microsoft Corporation. Specifications subject to change without notice.

ORDERING INFORMATION

RAY FILM DOSIMETRY SOFTWARE

A Global **Reputation for Excellence**

For over 35 years top research institutes and standards laboratories world-wide have used Exradin Detectors for a broad range of dosimetry measurements in diverse radiation environments.

The Exradin line continues to build upon vetted ion chambers like the Exradin A12 and Exradin A1 with innovative tools such as the W1 Scintillator. Our passion for metrology, expertise in engineering and dedication to durability ensures that each detector we produce embodies this tradition of quality workmanship and exacting precision.

The Exradin Advantage

Better Components

- Waterproof construction eliminates the need for sleeves or protective coatings.
- Robust materials are more durable than typical chambers (i.e. PMMA thimble tips), and therefore are more suitable for routine measurements.
- Excellent inherent conductivity negates the need for coatings found in other chambers, which can flake off and require careful handling.
- Collector, guard and shell are made of conductive material developed by Dr. Francis Shonka, the creator of A150 tissue-equivalent, C552 air-equivalent and D400 polystyrene-equivalent plastics.

Unmatched Durability

- An Exradin A12 farmer-type chamber survived three 1 meter drop tests onto a hard floor, in three different orientations, without a change in calibration.*

Superior Stability

- Advanced guard design creates a consistent collecting volume with uniform field lines, providing a stable, repeatable signal.
- Exradin detectors feature some of the quickest settling times of any manufacturer.
- Exceptionally wide guard rings on all parallel plate chambers eliminate perturbation volume effects.

Ideal Design for Improved Accuracy

- The Collecting volumes of Exradin Ion Chambers are defined by the guard, not an insulator, creating a significantly more stable signal than competing detectors.
- Axially symmetric design ensures a uniform isotropic response.
- Collection efficiencies of 99.9% or greater.
- Chamber vents through a flexible tube surrounding the triaxial cable; ideal for use in water or plastic phantoms.
- Homogeneous construction on most chambers.

Quick Response upon Hookup

- Ionization currents can be read immediately after electrometer and extension cable transients subside because Exradin Ion Chambers do not exhibit voltage soakage or stem effect.
- Exradin chambers typically have ± 10 x 10-15 amp leakage.

** "Evaluation of a Water-proof, Homogeneous Farmer-Type Ion Chamber for Orthovoltage and High Energy X-Rays and Electron Beams". V.M. Tello, A. Lawyer, C. Chu, J.A. BenComo and W.F. Hanson, presented at AAPM July 1996*

EXRADIN Ion Chambers Product Matrix

	THIMBLE ION CHAMBERS								CT ION CHAMBERS	
MODEL	**1**	**A1SL**	**2**	**A18**	**A28**	**A19**	**A12**	**A12S**	**A101**	**A17**
Collecting Volume	0.053 cc	0.053 cc	0.53 cc	0.123 cc	0.125 cc	0.62 cc	0.64 cc	0.24 cc	4.54 cc	1.91 cc
Centroid of Collecting Volume from exterior tip of shell	3.86 mm	4.06 mm	6.96 mm	5.26 mm	4.47 mm	13.0 mm	12.9 mm	5.79 mm		
Centroid of Collecting Volume from exterior surface of window										
Outside Diameter of Shell Collecting Volume	6.0 mm	6.35 mm	11.4 mm	6.9 mm	8 mm	7.1 mm	7.1 mm	7.1 mm	10.0 mm	12.7 mm
Inside Diameter of Shell Collecting Volume	4.0 mm	4.0 mm	9.5 mm	4.9 mm	5.8 mm	6.1 mm	6.1 mm	6.1 mm	8.0 mm	6.0 mm
Window Collector Gap										
Shell Wall Thickness	1.0 mm	1.1 mm	1.0 mm	1.0 mm	1.1 mm	0.5 mm	0.5 mm	0.5 mm	1.0 mm	3.3 mm
Collector Diameter	1.0 mm	1.0 mm	4.6 mm	1.0 mm	1.0 mm	1.0 mm	1.0 mm	1.0 mm	2.5 mm	2.5 mm
Guard Ring Width (Radial)										
Collector Length	4.4 mm	4.4 mm	8.4 mm	6.4 mm	6.4 mm	21.6 mm	21.6 mm	7.5 mm	100 mm	80 mm
Window Material*										
Window Thickness										
Shell/Entry Window, Collector and Guard Material*	A, T	A	A, P, T	A	A	A	A	A	A	A
Nominal Air Kerma Calibration Factor†	5.4E+8 Gy/C	5.4E+8 Gy/C	5.4E+7 Gy/C	2.3E+8 Gy/C	2.3E+8 Gy/C	4.5E+7 Gy/C	4.4E+7 Gy/C	1.2E+8 Gy/C	6.2E+6 Gy/C	1.5E+7 Gy/C
Recommended Polarizing Voltage	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V
Nominal Leakage	± 10 x 10^{-15} amp									
Maximum Polarizing Voltage	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V
Waterproof	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Included Buildup Cap	None	None	None	Co-60	Co-60	Co-60	Co-60	Co-60	None (1)	Co-60 integral

* ***MATERIAL:*** ***A*** *– C552 Shonka air-equivalent plastic* ***P*** *– D400 polystyrene-equivalent plastic* ***T*** *– A150 Shonka tissue-equivalent plastic*

† *Nominal calibration factor for Co-60 at 22° C*

(1) comes included with an acrylic sleeve to adapt chamber to fit Ø0.50 in (12.7 mm) phantom holes

(2) waterproofing cap is PMMA, 1.0mm entry window, TG-51 compliant

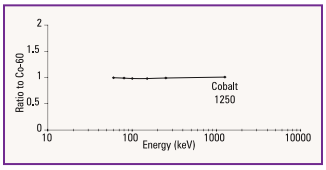
MICRO ION CHAMBERS			PARALLEL PLATE ION CHAMBERS						SPHERICAL ION CHAMBERS				
14	**A14SL**	**A16**	**A10**	**11**	**11TW**	**A20**	**Magna A600**	**Magna A650**	**A3**	**A4**	**A5**	**A6**	**A8**
0.015 cc	0.015 cc	0.007 cc	0.050 cc	0.62 cc	0.93 cc	0.074 cc	1.50 cc	3.46 cc	3.6 cc	30 cc	100 cc	800 cc	15.7 L
2.21 mm	2.39 mm	1.65 mm											
			1.0 mm	2.0 mm	1.5 mm	1.8 mm	4.0 mm	4.0 mm					
6.0 mm	6.35 mm	3.4 mm							19.6 mm	39.1 mm	63.1 mm	120.4 mm	323.2 mm
4.0 mm	4.0 mm	2.4 mm							19.1 mm	38.1 mm	57.2 mm	114.4 mm	311.2 mm
			2.0 mm	2.0 mm	3.0 mm	5.0 mm	7.95 mm	7.95 mm					
1.0 mm	1.1 mm	0.5 mm							0.25 mm	0.5 mm	3.0 mm	3.0 mm	6.0 mm
0.3 mm	0.3 mm	0.3 mm	5.4 mm	20.0 mm	20.0 mm	1.93 mm	12.7 mm	21.9 mm	2.1 mm	4.1 mm	6.5 mm	11.6 mm	22.4 mm
			4.3 mm	4.4 mm	4.4 mm	1.2 mm	3.9 mm	7.6 mm					
1.5 mm	1.5 mm	1.27 mm							13.3 mm	24.9 mm	37.3 mm	74.0 mm	166.7 mm
			3.86 mg/cm^2 Kapton	1.0 mm, A, P, or T	3.86 mg/cm^2 Kapton	7.72 mg/cm^2 Kapton	3.86 mg/cm^2 Kapton	3.86 mg/cm^2 Kapton					
			0.05 mm	1.0 mm	0.05 mm	0.09 mm	0.05 mm	0.05 mm					
A, T	SHELL ONLY A	A	A	A, P, T	A, P, T	A	A	A	A	A	A	A	A
1.9E+9 Gy/C	1.9E+9 Gy/C	4.1E+9 Gy/C	5.6E+8 Gy/C	4.6E+7 Gy/C	3.0E+7 Gy/C	3.8E+8 Gy/C	1.9E+7 Gy/C	8.2E+6 Gy/C	9.0E+8 R/C	1.1E+8 R/C	3.3E+7 R/C	4.2E+6 R/C	2.1E+5 R/C
300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	300 V	500 V	800 V	1000 V	1000 V
± 10 x 10^{-15} amp													
1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	400 V	400 V	1000 V	1000 V	1000 V	1000 V	1000 V
Yes	Yes	Yes	Yes, with included cap (2)	Yes	Yes, with included cap (2)	No	No	No	No	No	No	No	No
None	None	Co-60	None	None	None	None	None	None	None	None	Co-60 integral	Co-60 integral	Co-60 integral

THIMBLE ION CHAMBERS

Strict manufacturing tolerances and waterproof construction make Exradin Thimble Ion Chambers ideal for dosimetry calibrations in water, air and other phantom materials.

EXRADIN A19 ION CHAMBER 0.62 cc

Classic Farmer®



The A19 fits existing plastic phantom cavities and build-up caps, limiting perturbation and minimizing settling time in absolute dosimetry calibration. This chamber is characterized for TG-51 procedures.

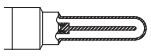
ORDERING INFORMATION

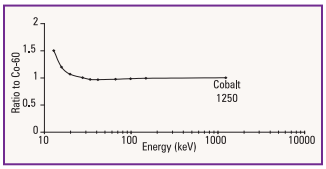
EXRADIN A19 ION CHAMBER REF 92734

Farmer is a registered trademark of PTW Freiburg GmbH

EXRADIN A12 ION CHAMBER 0.64 cc

Farmer-type





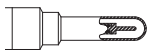
Characterized in TG-51 and TRS-398, the A12 has fast settling time and a removable stem for superior absolute dosimetry calibrations in water, air or phantoms.

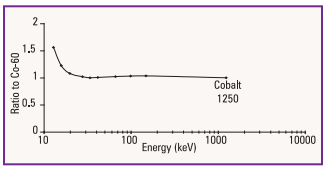
ORDERING INFORMATION

EXRADIN A12 ION CHAMBER REF 92700

EXRADIN A12S ION CHAMBER 0.24 cc

Farmer-type





The A12S is designed for absolute dosimetry calibrations in water, air or phantoms. The collector of the A12S is approximately one-third the size of the A12, confining collecting volume to the tip of the chamber.

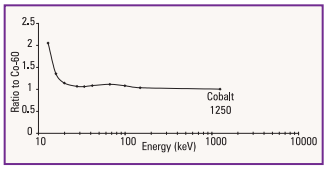
ORDERING INFORMATION

EXRADIN A12S ION CHAMBER REF 92725

THIMBLE ION CHAMBERS
continued

EXRADIN A1 ION CHAMBER 0.053 cc

Miniature Shonka – *T1 also available*



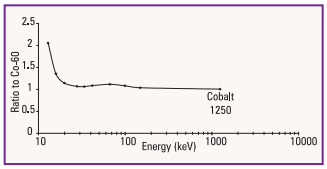
The Exradin A1 has the same internal dimensions and collecting volume as the A1SL, yet the larger diameter is ideal for use in solid phantoms. This chamber is characterized in TG-51 and TRS-398.

ORDERING INFORMATION

EXRADIN A1 ION CHAMBER REF 92705

EXRADIN A1SL ION CHAMBER 0.053 cc

Slimline Miniature Shonka



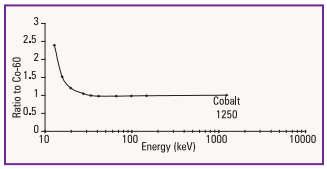
The A1SL, available in air or tissue equivalent plastic, provides a perfect balance between fast scanning and point-dose measurements within 1cm in water, air or phantom materials. This chamber is characterized for TG-51 procedures.

ORDERING INFORMATION

EXRADIN A1SL ION CHAMBER REF 92722

EXRADIN A2 ION CHAMBER *0.53 cc*

Spokas – *P2, T2 also available*



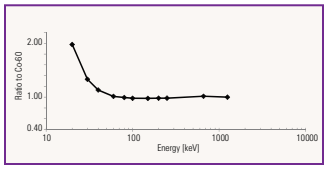
The A2 is ideal for precise measurement of exposure and air kerma in photon beams and absorbed dose in photon, electron, proton and other beams. This chamber is available in air, polystyrene and tissue equivalent plastic. It is also available in magnesium with gas flow capabilities.

ORDERING INFORMATION

EXRADIN A2 ION CHAMBER REF 92718

EXRADIN A28 ION CHAMBER 0.125 cc

Scanning



The Model A28 Chamber features exceptional omni-directional spatial resolution for relative dosimetry scanning in water phantoms and use in minute field measurements.

ORDERING INFORMATION

EXRADIN A28 ION CHAMBER REF XXXXX

MICRO ION CHAMBERS

Superior small-field dosimetry to assess pinpoint radiation in IMRT, stereotactic, orthovoltage, x-rays and superficial skin therapy.

EXRADIN A16 ION CHAMBER 0.007 cc

Micropoint

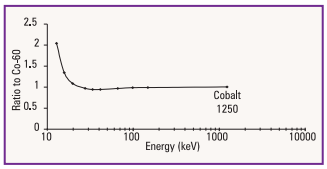
The Model A16 microchamber measures extremely small field sizes (3.4 mm x 3.4 mm); allowing for exceptional spatial resolution and exact pinpoint beam profile characterization. These attributes make the A16 ideal for stereotactic radiosurgery and IMRT applications.

ORDERING INFORMATION

EXRADIN A16 ION CHAMBER REF 92726

EXRADIN A14 ION CHAMBERS 0.015 cc

Microchamber – *T14, P14 also available*



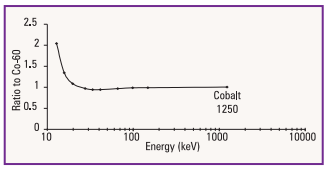
The Model A14 microchamber has the exact internal dimensions and collecting volume as the Model A14SL, yet a larger diameter is ideal for use in solid phantoms.

ORDERING INFORMATION

EXRADIN A14 ION CHAMBER REF 92711

EXRADIN A14SL ION CHAMBERS 0.015 cc

Slimline Microchamber



The Model A14SL is capable of measuring extremely small field sizes of 4 mm by 6 mm, allowing for exceptional spatial resolution and exact pinpoint beam profile characterization. This helps assess radiation fields during IMRT and stereotactic radiosurgery.

ORDERING INFORMATION

EXRADIN A14SL ION CHAMBER REF 92723

CT ION CHAMBERS

Exradin CT Chambers are durable detectors for performing the measurements necessary in the CTDI (computed tomography dose index) calculations described in TG-74.

EXRADIN A101 ION CHAMBER 4.54 cc

CT

The A101 performs the measurements necessary for calculating the CTDI as described in TG-74. It has excellent response uniformity over the chamber length, with variation less than ±3%.

ORDERING INFORMATION

EXRADIN A101 ION CHAMBER REF 92680

EXRADIN A17 ION CHAMBER 1.91 cc

Slice Therapy

The A17 is tailored for MV and tomotherapy applications such as weekly QA checks or patient dose verification with phantoms and water tanks. It has excellent response uniformity over the chamber length, with variation less than ±1.5%.

ORDERING INFORMATION

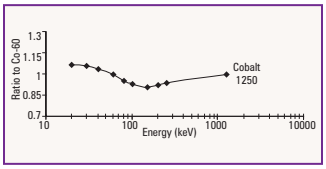
EXRADIN A17 ION CHAMBER REF 92675

PARALLEL PLATE CHAMBERS

Exradin Parallel Plate Chambers ensure precision in depth-dose measurements by providing uniform field lines even at low energies.

EXRADIN A10 ION CHAMBER 0.050 cc

Markus®-type Parallel Plate



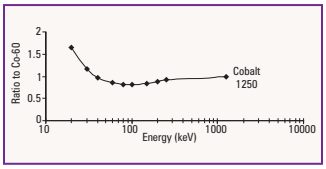
The A10 Markus-type chamber provides excellent spatial resolution for dose distribution measurements in a water phantom. An acrylic waterproof cap is included with this chamber for use in TG-51 electron beam protocols.

ORDERING INFORMATION

EXRADIN A10 ION CHAMBER REF 92702

EXRADIN A11 ION CHAMBER 0.62 cc

Parallel Plate – *T11, P11 also available*



Waterproof A11 Roos-type chamber may be operated while fully submerged without any protective sheath; ideal for repeated TG-51/TRS-398 dose distribution measurements in a water phantom.

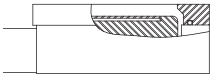
ORDERING INFORMATION

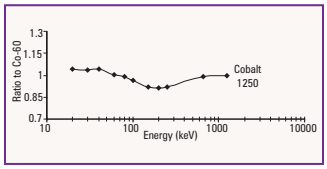
EXRADIN A11 ION CHAMBER REF 92701

† Ref: Calculations for Plane-Parallel Ion Chambers in 60Co Beams Using the EGSnrc Monte Carlo Code, Med. Phys. 30 (2), February 2003

EXRADIN A11TW ION CHAMBER 0.93 cc

Thin Window Parallel Plate – *T11TW, P11TW also available*





The A11TW is tailored for use in superficial therapy and low energy diagnostic beams. The thin-window design provides nearly constant response over the entire diagnostic energy range.

ORDERING INFORMATION

EXRADIN A11TW ION CHAMBER REF 92708

EXRADIN A20 ION CHAMBER 0.074 cc

Low Energy X-Ray

The A20 is a low-energy x-ray chamber for assessing and calibrating pinpoint radiation fields for x-rays, stereotactic and TG-61 compliant superficial skin therapy.

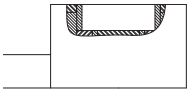
ORDERING INFORMATION

EXRADIN A20 ION CHAMBER REF 92736

PARALLEL PLATE CHAMBERS
continued

EXRADIN MAGNA A600 ION CHAMBER 1.50 cc

Diagnostic Parallel Plate



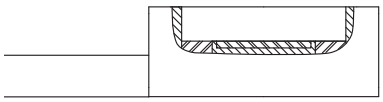
The A600 chamber is designed for consistent air kerma, absorbed dose and exposure measurements. Vented and fully-guarded, this chamber is perfectly suited for mammography and general diagnostic x-ray regions.

ORDERING INFORMATION

EXRADIN A600 ION CHAMBER REF 92600

EXRADIN MAGNA A650 ION CHAMBER 3.46 cc

Diagnostic Parallel Plate



The A650 chamber is a vented and fully guarded ion chamber for use in mammography and general diagnostic energy x-ray regions.

ORDERING INFORMATION

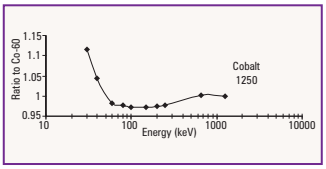
EXRADIN A650 ION CHAMBER REF 92650

SPHERICAL ION CHAMBERS

Exradin Spherical Ion Chambers are relied upon by standards laboratories worldwide for precise measurement of radiation exposure and exposure rates. They are easily positioned and are excellent for in-air measurements.

EXRADIN A3 ION CHAMBER 3.6 cc

Shonka-Wyckoff Spherical



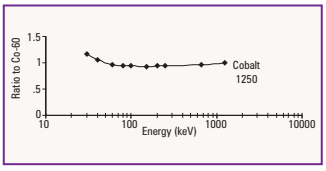
3.6cc collecting volume is ideal for laboratory transfer standards and secondary standards for exposure measurements.

ORDERING INFORMATION

EXRADIN A3 ION CHAMBER REF 92717

EXRADIN A4 ION CHAMBER 30 cc

Shonka-Wyckoff Spherical



30cc collecting volume is ideal for laboratory transfer standards, secondary standards for exposure measurement and integrating exposure over a large area.

ORDERING INFORMATION

EXRADIN A4 ION CHAMBER REF 92715

SPHERICAL ION CHAMBERS
continued

EXRADIN A5 ION CHAMBER 100 cc

Shonka-Wyckoff Spherical

100cc collecting volume is ideal for secondary standards for exposure measurement, integrating exposure over a large area and room scatter measurements.

ORDERING INFORMATION

EXRADIN A5 ION CHAMBER REF 92724

EXRADIN A6 ION CHAMBER 800 cc

Shonka-Wyckoff Spherical

800cc collecting volume is ideal for secondary standards for exposure measurements, integrating exposure over a large area and room scatter measurements.

ORDERING INFORMATION

EXRADIN A6 ION CHAMBER REF 92716

EXRADIN A8 ION CHAMBER 15.7 L

Shonka-Wyckoff Spherical

- Relied upon by standards laboratories worldwide

  Exradin Shonka-Wyckoff Spherical Chambers are designed for the measurement of radiation exposure and exposure rates. They are easily centered for precise positioning and are excellent for 'in air' measurements.
- Fast, precise measurement

  Chamber design assures there are no stem or voltage soakage effects, providing more confident measurements
- Durable construction, build to last

  Durable C552 Shonka air-equivalent plastic produces excellent conductivity and years of reliable use

Features

- Proven guard design yields stable, precise measurements and minimizes settling time by creating uniform field lines
- Shell, collector, and guard are made of durable, long lasting Shonka conductive plastic
- Use of homogeneous material throughout the chamber minimizes perturbation of the beam due to the presence of the chamber and optimizes measurements
- Axially symmetric design of the chamber provides an uniform, isotropic response
- A non-removable, triaxial BNC connector is mounted to the neck of the Model A8
- The Model A8 has no stem, instead mounting to an included Acrylic Support Stand
- Model A8 venting is located on the chamber neck
- Collecting volume is 15.7 liters

ORDERING INFORMATION

EXRADIN A8 ION CHAMBER REF 92737

REFERENCE-CLASS DOSIMETRY

The only reference-class microchamber

EXRADIN A26 ION CHAMBER

PATENT PENDING

REFERENCE-CLASS QUALITY FOR SMALL FIELDS

Experience the same measurement quality in a microchamber you have come to expect from your reference chamber.

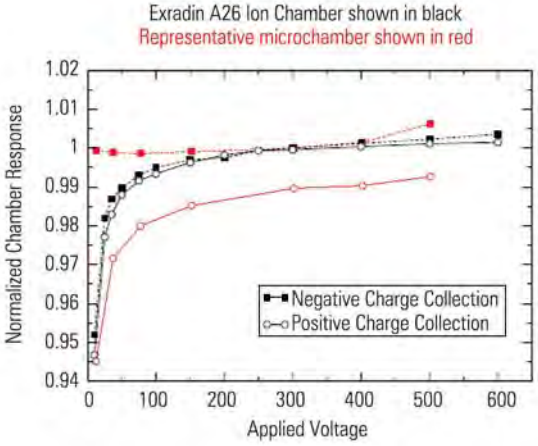
- Rapid settling
- Stable, reproducible measurements
- Realistic and meaningful ion recombination corrections
- Minimal polarity dependence
- Minimal energy dependence

REDUCE VOLUME AVERAGING EFFECTS

Uniform 4.3mm diameter spot size reduces volume averaging effects and eliminates angular dependencies of volume averaging.

FULLY-GUARDED MICRO-CHAMBER

Each Exradin thimble chamber has a guard that extends well beyond the insulator's surface, thus ensuring that the electric field defining the chamber's collecting volume is cleanly shaped by the guard.

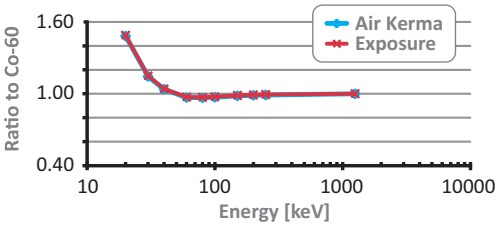


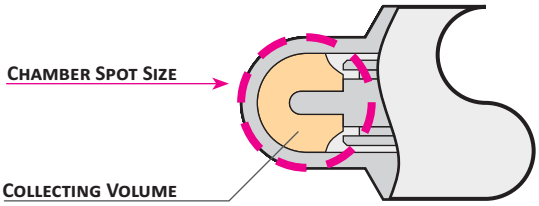
Courtesy of Miller, Jessica R., Ph.D. *Characterization and optimization of microionization chambers* Dissertation, University of Wisconsin - Madison ProQuest/UMI, 2013 (Publication No. 3606471)

The Exradin A26 Ion Chamber does not exhibit the polarity effects seen in microchambers.

The Exradin Advantage

- Inherently waterproof construction eliminates the need for sleeves or protective coatings.
- Rugged conductive plastic provides years of use.
- Lack of stem-effect and low leakage for precise, reliable measurements.
- Versatile for absolute dosimetry calibrations in water, air or other phantom material.
- Minimal settling time.





Definition of Reference Class Chamber*	Reference Class IEC / TG 51	Exradin A26
P_{leak}: Leakage	< 0.1%	✓
P_{pol}: Polarity	< 0.4% correction	✓
P_{pol}: Polarity	< 0.5% max variation	✓
P_{ion}: ion recombination	Linear with dose per pulse	✓
Initial recombination	Within 0.3% of unity	✓
Polarity dependence of P_{ion}:	< 0.1% between positive and negative bias	✓
Chamber stability	within 0.3% change over 2 years	Chamber is not yet 2 years old

** per IEC 60731 and TG 51*

EXRADIN A26 ION CHAMBER (REF 92746) SPECIFICATIONS

COLLECTING VOLUME	0.015 cm^3
SPOT SIZE	4.3 mm
CENTROID OF THE COLLECTING VOLUME (from exterior tip of shell)	1.98 mm
OUTSIDE DIAMETER OF SHELL COLLECTING VOLUME	4.3 mm
INSIDE DIAMETER OF SHELL COLLECTING VOLUME	3.3 mm
SHELL WALL THICKNESS	0.5 mm
INCLUDED BUILDUP CAP	Co-60

SHELL, COLLECTOR AND GUARD MATERIAL	
C552 Shonka air-equivalent plastic	
MAXIMUM POLARIZING VOLTAGE	1000 V
NOMINAL LEAKAGE CURRENTS	± 10 fA
WATERPROOF	Yes
PRODUCT STANDARDS	CE 0413
Designed to meet IEC60601-1, IEC60731	
PATENT PENDING	

Specifications subject to change without notice.

ORDERING INFORMATION

EXRADIN A26 ION CHAMBER REF XXXXXX

MICRO FIELD MEASUREMENTS

The Exradin D1V and D1H diodes maximize spatial resolution and minimize angular dependence, allowing for consistent, accurate small-field stereotactic measurements.

EXRADIN D1H & D1V DIODES

WHY USE AN EXRADIN DIODE?

Exradin diodes produce flatter profiles and sharper resolution with a smaller active measurement area than traditional ion chambers. This allows for the precise measurement of minute fields while still achieving high visibility of the beam's penumbra.

MINIMIZE ANGULAR DEPENDENCE

A common problem when performing measurements using diode-based detectors is angular dependence or significant variation in signal depending on the orientation of the detector. Exradin diodes help minimize this concern with less than 0.5% angular dependence when tilted up to 20° to the beam, providing more confidence in your results when measuring the penumbra or edge of the beam.

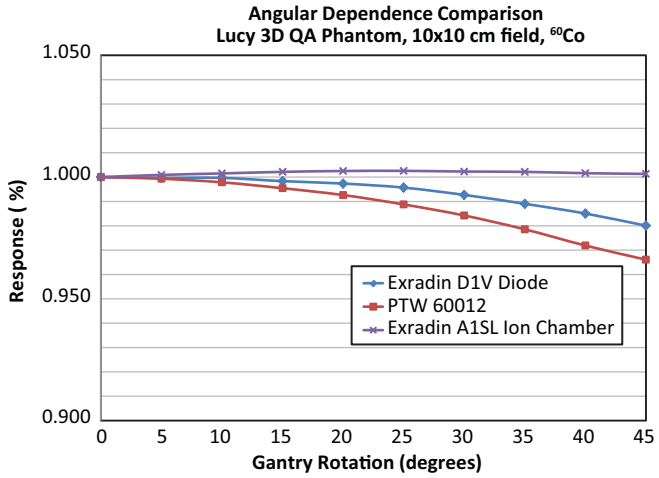
SPECIALIZED FOR SMALL FIELDS

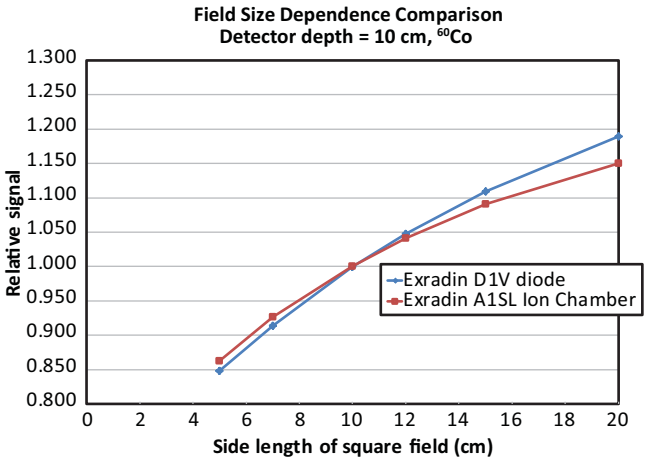
The Exradin D1V and D1H diodes facilitate several measurement modalities in small fields.

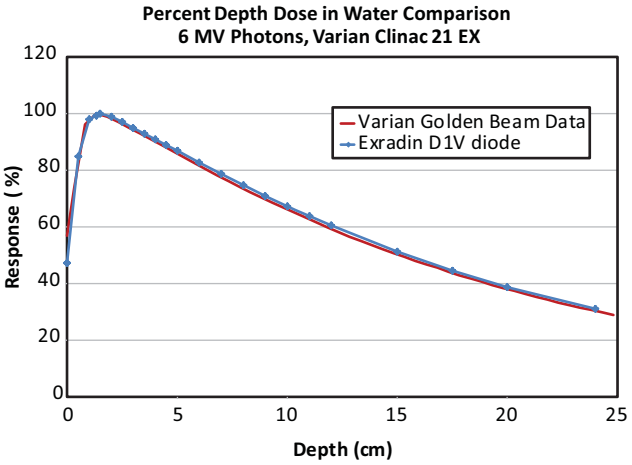
- The D1V's diode face is perpendicular to the beam when upright, making it ideal for photon scanning applications and use in water phantoms and the Lucy 3D QA Phantom.
- The D1H's diode face is perpendicular to the beam when flat, for use inside traditional plastic phantoms.

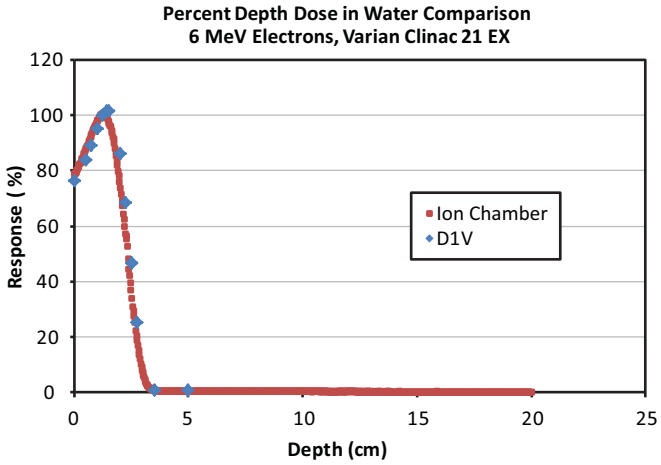
Both the D1V and D1H provide superior measurement of field sizes up to 20 x 20 cm^2 with excellent spatial resolution and minimal noise.

Performance Data









EXRADIN D1H & D1V DIODES SPECIFICATIONS

DIODE TYPE	P-type Si
MATERIALS	C552 shell for EMI shielding and durability, potted with near-water equivalent epoxy to eliminate air gaps
OUTSIDE DIAMETER	
D1V (REF 92740)	Ø 6.88 mm (0.271") x 46.2 mm (1.817")
D1H (REF 92741)	6.88 mm (0.271") x 6.88 mm (0.271") x 34.8 mm (1.37")
DIAMETER OF SENSITIVE AREA	1 mm^2 x ~0.05 mm thick
EFFECTIVE DEPTH BELOW SURFACE	0.8 mm
INTENDED ENERGY RANGE	Photons: ^{60}Co – 25 MV
	Electrons: 6 – 20 MeV
LOW-NOISE TRIAXIAL CABLE	50 ohms, 29 pF/ft, 1.5 m long
CONNECTOR	Triax BNC (others available upon request)
WATERPROOF	Yes, may be used in water phantoms

SIGNAL POLARITY	positive	**OPERATING VOLTAGE** 0 VDC bias
RADIATION RESPONSE, TYP		~5 nC/Gy
LEAKAGE CURRENT, TYP		< 100 fA
TEMPERATURE DEPENDENCE, TYP		<0.4 % / °C
SENSITIVITY DECREASE (AT 6 MV)		<1.0 % per kGy
DOSE TO PULSE DEPENDENCY		> 99.5% over relevant clinical range
DOSE LINEARITY		> 99.9%
FIELD SIZE DEPENDENCY		> 97.0%
INTENDED FIELD SIZE FOR USE		up to (20 x 20) cm^2
DIRECTIONAL DEPENDENCE		< ± 0.5% tilting ± 20°
OPERATING PARAMETERS	*Temperature*	15 to 35 °C
	Relative Humidity	20 to 80% non-condensing
	Pressure	650 to 770 mmHg

Specifications subject to change without notice.

ORDERING INFORMATION

EXRADIN D1V DIODE REF 92740
EXRADIN D1H DIODE REF 92741

SIMPLY, DOSE

The Exradin W1 Scintillator is a new, near-water equivalent detector that achieves paramount precision by significantly decreasing beam disturbance.

EXRADIN W1 SCINTILLATOR

MINIMIZE BEAM PERTURBATION AND CORRECTIONS

The W1's unprecedented characteristics closely mimic water, easing data collection by negating many measurement corrections required with other detectors

- Near water equivalence
- Linear dose response
- Dose rate independence
- Energy independence within the MV range

IDEAL FOR MEASUREMENT AND CHARACTERIZATION OF SMALL FIELDS

1mm spatial resolution makes the W1 a perfect tool for stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) QA. This includes compatibility with the Lucy 3D QA Phantom for use in stereotactic systems such as:

- Gamma Knife®
- CyberKnife®
- BrainLab®
- Varian®
- Elekta®
- TomoTherapy®

CONSISTENT, CONVENIENT SETUP

Integration with the Exradin Scintillator Calibration Slab and water equivalent phantoms allows for easy, repeatable measurements.

AUTOMATICALLY CORRECT FOR CHERENKOV EFFECT

Pair the W1 with the SuperMAX Electrometer to effectively eliminate Cherenkov effect without the need for extraneous calculations.

SuperMAX software provides an intuitive interface for scintillator setup and measurement and is a key component to achieve the best measurement results

The patented **Exradin W1 Scintillator** is the ideal small field measurement tool overcoming dependencies present in conventional detectors

Exradin **Scintillator Calibration Slab** with cover for consistent setup during baseline and measurement procedures

EXRADIN W1 SCINTILLATOR (REF 92739) SPECIFICATIONS

EXRADIN W1 SCINTILLATOR

DIMENSIONS

Scintillating fiber:	1.0 mm diameter x 3.0 mm long
Scintillator housing:	2.8 mm diameter x 42 mm long
Optical fiber:	1.0 mm diameter core x 2.2 mm diameter jacket x 3 m long
Photodiode enclosure (LxWxH):	77 x 51 x 42 mm
Weight:	0.63 kg (1.4 lbs)

MATERIALS

Scintillating fiber:	Polystyrene with ABS plastic enclosure and polymide stem
Optical fiber:	Acrylic (PMMA) with Polyethylene jacket
Optical fiber minimum bend radius:	6 cm
Scintillating fiber physical density:	1.05 g/cm^3
Nominal response:	60 pC / Gy
Radiation degradation:	~ 2% / kGy

EXRADIN SCINTILLATOR CALIBRATION SLAB

DIMENSIONS

Lid (LxWxH):	300 x 300 x 8.5 mm
Base (LxWxH):	300 x 300 x 11.5 mm
Assembled (LxWxH):	300 x 300 x 20 mm
Crosshair alignment lines:	10 x 10 cm
Weight (assembled):	2.15 kg (4.75 lbs)
Materials:	Acrylic or Virtual Water

OPERATING PARAMETERS

Pressure:	650 to 770 mm Hg
Temperature:	15 to 30 °C
Relative humidity:	20 to 80%

PRODUCT STANDARDS Designed to meet IEC 60601-1, CE 0413 CE

PATENT US Patent Number 8183534

Specifications subject to change without notice.

ORDERING INFORMATION

EXRADIN W1 SCINTILLATOR REF 92739

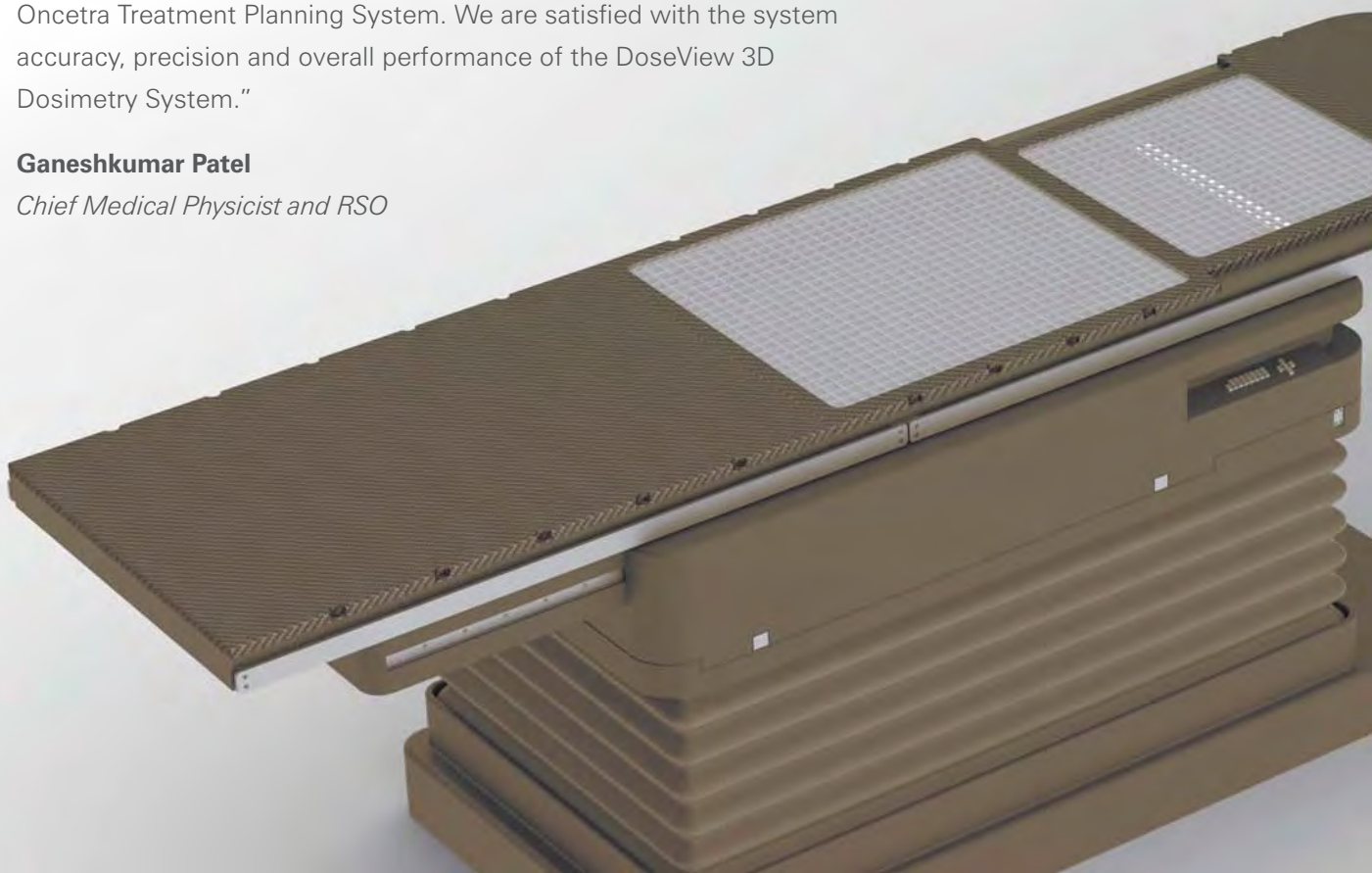
DOSEVIEW 3D

Continuing the legacy of our world renowned QA products, such as Exradin Ion Chambers and electrometers, the DoseView 3D provides customers with the quality and integrity they demand in a 3D water scanning phantom. Save time and improve data quality at a price that won't strain your budget.

The DoseView 3D's rigid, one-piece cast aluminum frame and reliable components maintain accuracy even after thousands of repetitions. The lift and reservoir cart streamlines setup, use and storage of the phantom. It comes complete with automatic fill and drain functionality, as well as a variety of precision positioning features. The DoseView 3D's intuitive software is equipped with robust data export functionality, programmable automatic acquisition scan queuing and a suite of data processing tools that facilitate efficient scanning for both novice and expert users.

"We have commissioned both Monaco Treatment Planning System and Oncetra Treatment Planning System. We are satisfied with the system accuracy, precision and overall performance of the DoseView 3D Dosimetry System."

Ganeshkumar Patel
Chief Medical Physicist and RSO



Wireless PC Communication

Communicate wirelessly with the DoseView 3D once a standard serial cable is run into the vault. **The only direct connection needed to the phantom is a power cable.**

Designed for Consistency, Convenience

1 Robust Construction Provides Foundation for Accuracy, Consistency

Manufactured with a rigid, one-piece cast aluminum frame and stainless steel leadscrews, the DoseView 3D provides a durable platform for repeated QA testing. This construction ensures consistent measurement accuracy within ±0.1mm per axis.

2 Precise, Three-Point Leveling

The DoseView 3D's three leveling screws are mounted above the phantom's scanning volume, making it easy to fine-tune leveling even when the phantom is filled with water.

3 Fewer Cables, Faster Setup, Better Data

A fast-acquisition electrometer and motion controller are mounted on board the DoseView 3D, reducing the length of detector cables required for testing. This lessens settling time and opportunity for cable leakage, streamlining setup. Only one cord is needed to power the entire phantom.

4 Durable, Accurate Stepper Motors

The DoseView 3D's 5 stepper motors maintain superior precision over the phantom's lifetime, minimizing degradation even after 30,000 repetitions.

5 Convenient, Wireless Pendant

An intuitive wireless pendant allows for easy vault operation without restricting movement around the phantom and linear accelerator. The pendant's audible and visual cues and backlit display makes configuring and controlling the DoseView 3D a straightforward process for any user. Fine-tune positioning with 0.1mm per-press step mode.

6 Thorough, Automatic Phantom Drain

The automatic drain feature and advanced suction drain lets users empty the DoseView 3D while cleaning up the rest of their QA materials. The advanced suction drain ensures that you return to an empty tank, not a quarter-inch of standing water.

7 Keep cables organized during testing

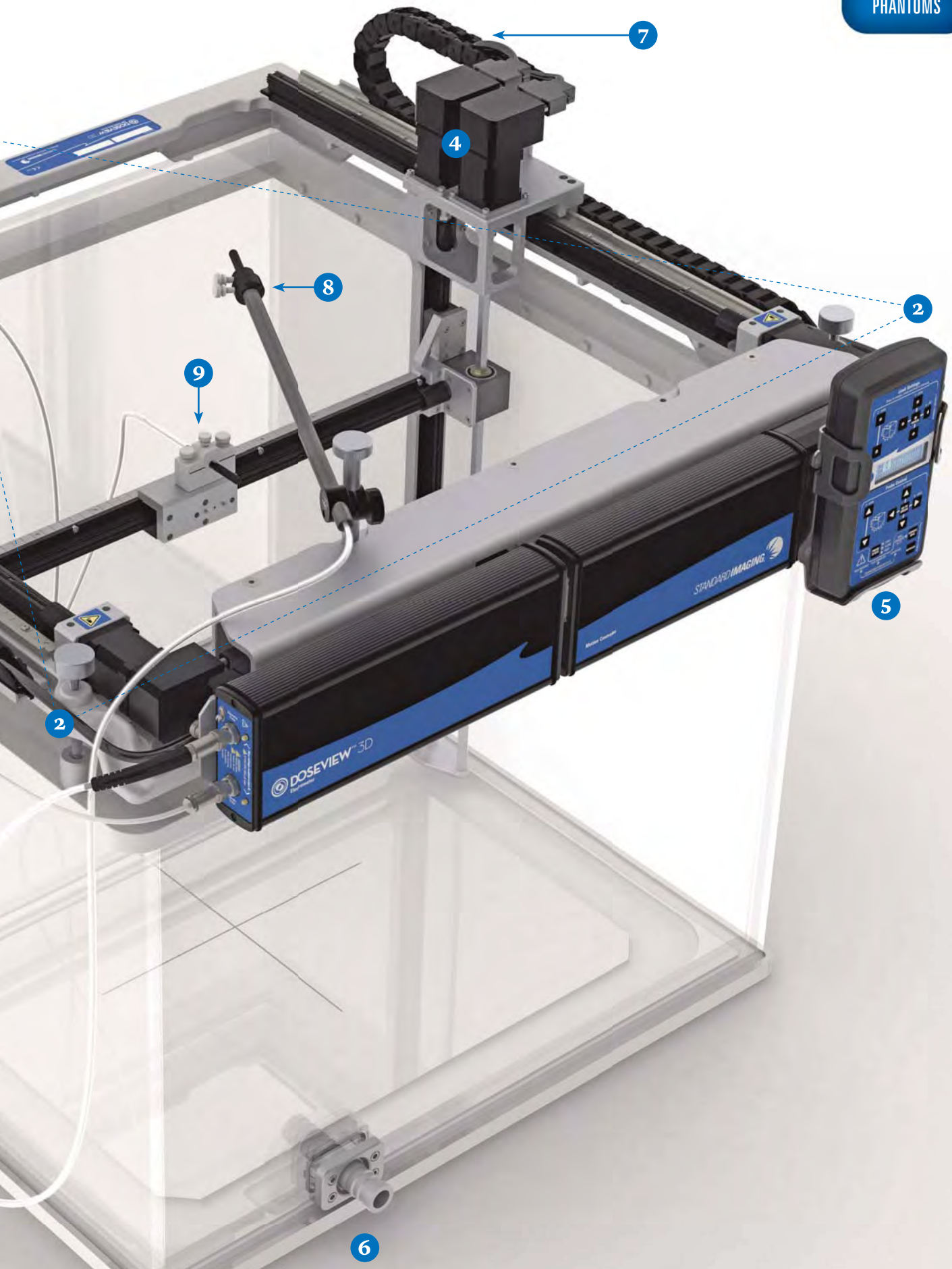
Cable carriers keep the motor connections compact and unobtrusive throughout the entire range of motion.

8 Reference Detector Holder

This modular detector holder can be used in 3 length configurations to accommodate a wide range of field sizes. A carbon fiber support tube prevents reference detector vibration during scanning.

9 Sample Detector Holder

A series of included holders can be positioned either horizontally or vertically while maintaining a consistent origin location using the Detector Alignment System.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DOSEVIEW™ 3D
STANDARD IMAGING

Built for Accuracy

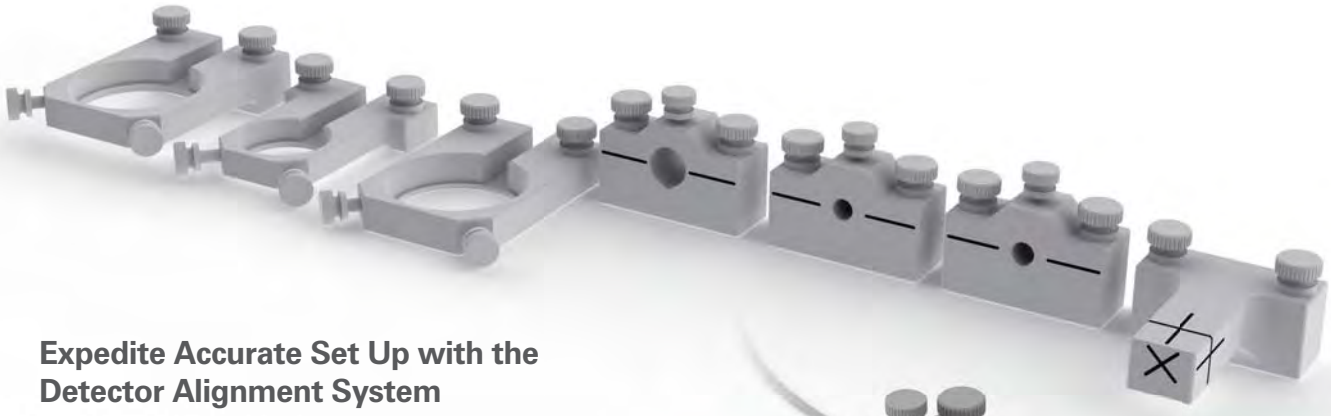
New High-Speed Electrometer

The DoseView 3D Electrometer is a dual-channel, fast-acquisition electrometer that continues Standard Imaging's renowned reputation for precision and efficiency. Bias voltage can be enabled independently per channel for chamber/diode simultaneous operation. Mounted on board the phantom, this electrometer can also be positioned in a separate location per the user's convenience. Low noise performance helps ensure post-processing operations are kept to a minimum.

Accurate, Reliable Exradin Ion Chambers

For over 35 years, Exradin's quality has been recognized by the top research institutes and standard laboratories in the world. The DoseView 3D comes with two Exradin A28 Ion Chambers (0.125cc), producing sustained accuracy and confidence in your QA testing.

Time Saving Features

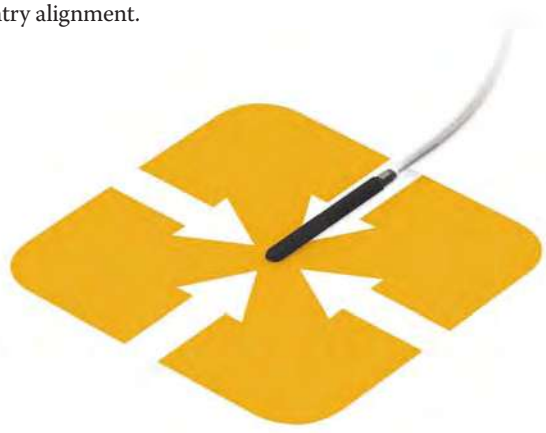


Expedite Accurate Set Up with the Detector Alignment System

Innovative detector-holder system places the center of all detectors at the same position relative to the water's surface, allowing users to swap detectors without resetting isocenter/origins. Initial setup is performed with the crosshair alignment jig which provides ample surface area and fiducials to aid in matching to the ODI and/or room lasers. This bracket system is compatible with Exradin Ion Chambers and supports chambers and diodes from most other manufacturers. This system ensures faster setup time and provides confidence in accurate leveling and beam center positioning.

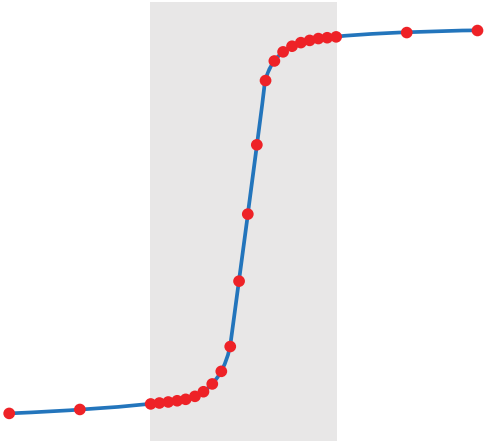
Automatically find beam center

Once leveling is performed, the DoseView 3D determines the center of a radiation field by locating the field edges using an ion chamber or diode. This test can be performed at multiple depths to identify any issues with system leveling and/or gantry alignment.



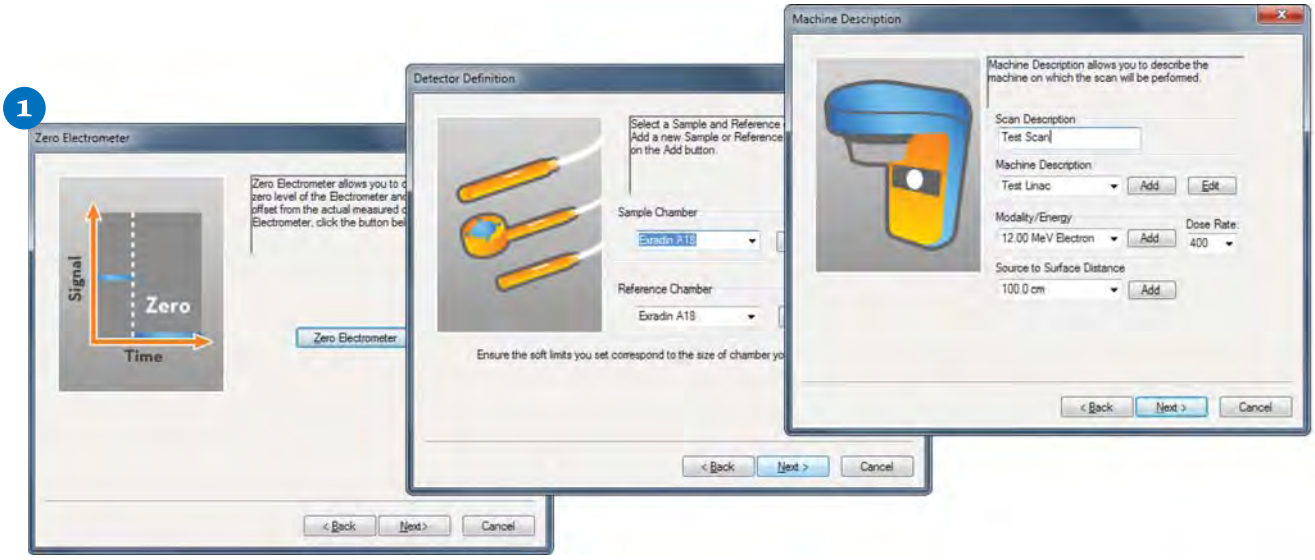
Variable step size acquisition

The DoseView 3D can be programmed to move in varying step sizes throughout a scan. Implement tighter steps toward the penumbra to account for increased variability without significantly increasing overall scan time.



More resolution in high gradient region

Easy to Use Software Modules

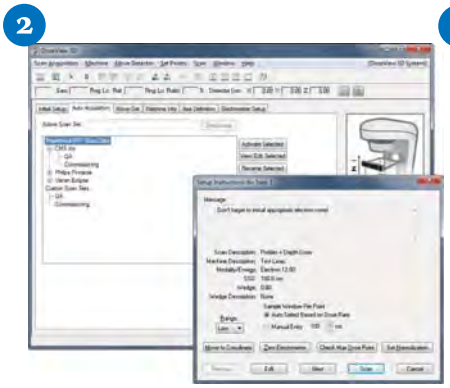


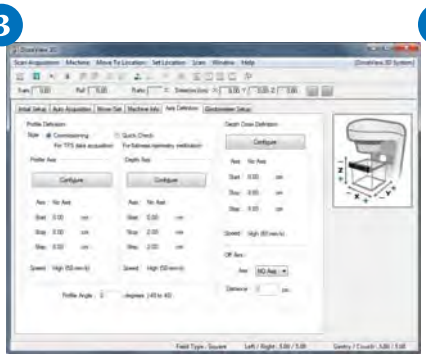
Scan Acquisition

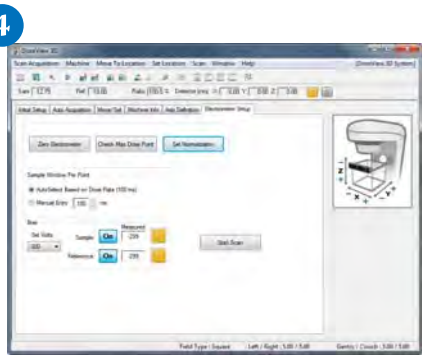
1. Setup wizard guides users through data acquisition in an easy to learn, step-by-step progression. Manual setup offers flexibility for more detailed control of scans
2. Prior to setup, create a set of scan routines in Auto Acquisition mode and save them for use in later testing. Scan sets can be implemented and organized on a TPS or custom basis to streamline commissioning and QA procedures.
3. Acquire depth dose and profile data in single setup operation
4. Resume scans and preserve data, even if the beam shuts off
4. Auto sampling and minimal range selection takes the guesswork out of electrometer setup

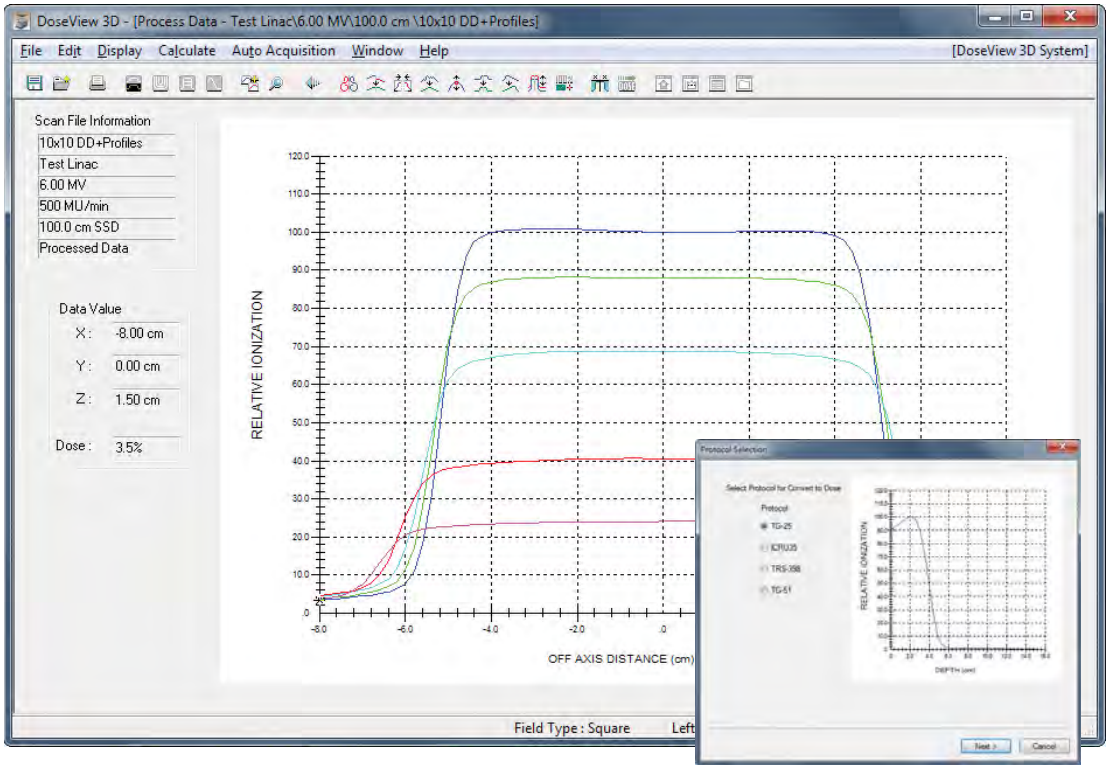
Table Generation

Quickly create PDD, TAR and TPR/TMR data tables for printing or exporting, using CAX data acquired from the DoseView 3D or manually entered values.









The Convert to Dose module supports most current US and international dose conversion protocols including TG-51 and TRS-398

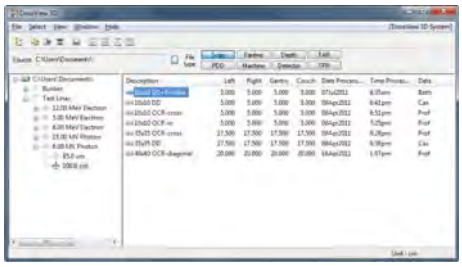
Scan Processing

The Scan Processing Module features a comprehensive suite of tools facilitating data manipulation, including:

- Mirror Data: Replace one half of a profile with a mirrored copy of the other half
- Average Data: Average scan points at equal distances from the central axis to create a new symmetrical profile
- Concatenate Data: Combine two half scans together to form large profiles
- Smooth Data: A suite of algorithms allows removal of unwanted noise or anomalies from a scan file
- Point Edit: Edit the relative dose level of any point in a profile or CAX scan
- Profile Center: Re-center profile data based on the data on either side of the central axis
- Surface Shift: Shift the Z-axis of profile and/or CAX data for effective point of measurement corrections
- Normalize Data: Re-normalize data to a specific point or global maximum
- DoseView 3D always preserves raw measurements, ensuring no valuable data is accidentally overwritten

Database Management

Facilitates browsing, editing, re-organization and printing of existing scan files, making pertinent data readily available. Scan data is stored in a hierarchy of machine → energy → SSD so specific files are always easy to find.



Treatment Planning System Export

Transition scan data to a variety of treatment planning systems, including:

- Varian Eclipse
- Philips Pinnacle
- Elekta XiO
- Elekta Monaco
- Prowess Panther
- Elekta Oncentra

All supported TPS systems are included at no additional charge.

Lift and Reservoir Cart, Precision Positioning Platform

Fully Integrated with Lift and Reservoir in One

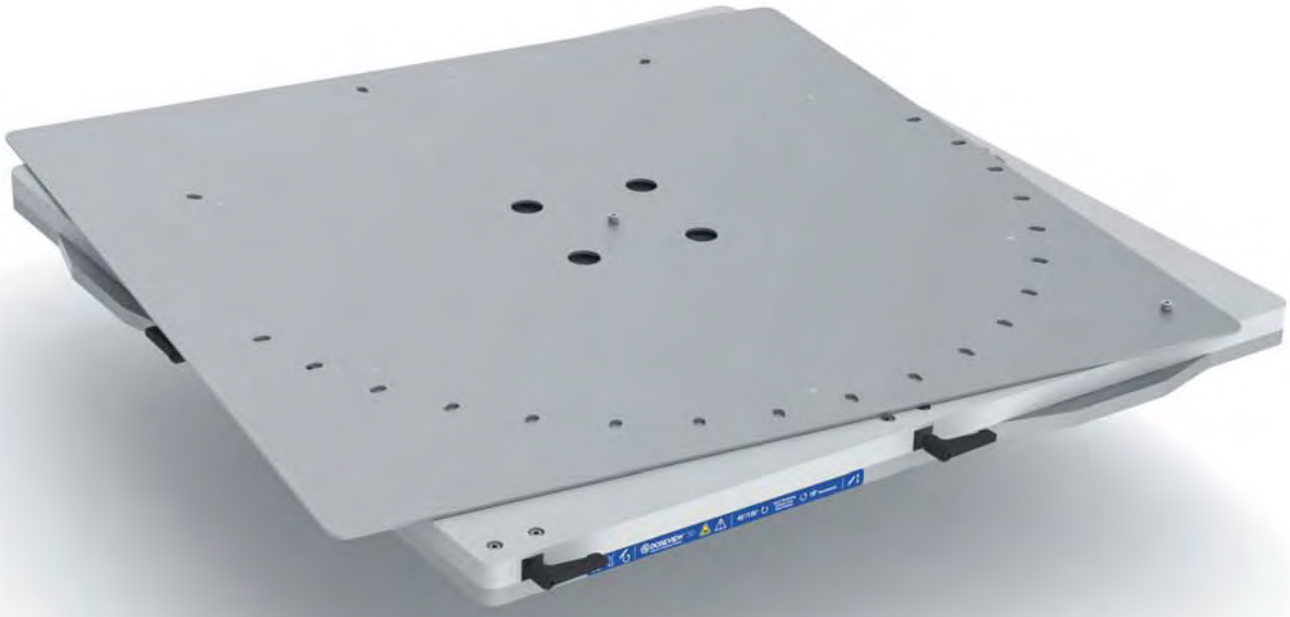
The DoseView 3D's cart contains both an electronic lift mechanism and 60 gallon (265 liter) water reservoir, resulting in hassle-free storage and setup. Additionally, a convenient storage area holds the power supply and other accessories. The lift and pump are powered by a single power cable, and a power pass-through cable allows convenient connection to the water phantom.

Auto-Fill, Auto-Drain Operations

Automatic tank-fill and tank-drain functionality allows users to prep the DoseView 3D while taking care of other setup tasks. The water phantom's advanced suction drain ensures that the tank is thoroughly drained upon completion of testing.

Extensive Adjustments Capabilities

The Precision Positioning Platform provides an ideal medium for maneuvering the DoseView 3D. This added flexibility allows subtle X and Y axis movements up to ±12.5mm, phantom rotation of ±1° and positive engagement at 10°, 45° and 90° intervals. Achieve consistent detector orientation during in-plane, cross plane and diagonal scans.



Working Together for Complete Support

Standard Imaging's acclaimed customer service and support ensures an easy transition of the DoseView 3D into your QA workflow and will guide you through any issues that may arise in the future.

For more information on warrantees and additional maintenance and support packages please contact your Standard Imaging Account Manager or regional distributor.

Visit **www.standardimaging.com** or call **800-261-4446** for more details.

DOSEVIEW 3D SPECIFICATIONS

MOTION CONTROL SYSTEM

Maximum Speed	50 mm/s
Positioning Accuracy	± 0.1 mm per axis
Positioning Repeatability	± 0.1 mm per axis
PC Communication	Wireless or wired via RS-232
Control Method	Onboard controls, PC or via wireless pendant

WATER PHANTOM (ACRYLIC TANK ONLY)

Outer Dimensions	[LENGTH × WIDTH × HEIGHT]	704 mm x 693 mm x 570 mm
Scanning Dimensions	[LENGTH × WIDTH × HEIGHT]	500 mm x 500 mm x 410 mm
Wall Thickness	12 mm	
Other	Replaceable Fill/Drain Port	

LIFT CART AND RESERVOIR

Outer Dimensions	[LENGTH × WIDTH]	1247 mm x 762 mm
Vertical Range	685 mm – 1185 mm (tank base to floor)	
Water Pump	Electric fill, gravity drain	
Water Capacity	60 gal (227 liters)	
Fill Speed	6-7 min	
Drain Speed	16-20 min	

PRECISION POSITIONING PLATFORM

X / Y Fine Adjustment	±12.5 mm
Fine rotational adjustment	±1°
Discreet engagement	10°, 45°, and 90° intervals

DOSEVIEW 3D ELECTROMETER

Channels	2
Bias Voltage	0, ±150 to 450 (VDC) in 50 volt increments
Range	2 pC – 999,999 nC
Resolution	10 fC
Connector Type	Triaxial BNC or TNC

EXRADIN A28 ION CHAMBER

Collecting Volume	0.125 cc
Centroid of Collecting Volume	4.47 mm from tip of chamber
Collector Diameter	1.0 mm
Outside Diameter of Sensitive Region	8.0 mm
Nominal Leakage Currents	$\pm 10 \times 10^{-15}$ A
Shell, Collector, Guard Material	Shonka air-equivalent plastic C552
Waterproof	Yes

DOSEVIEW 3D SOFTWARE

System Requirements

Operating System	Microsoft® Windows® XP SP3 or greater Microsoft Windows 7, 32 and 64 bit Microsoft Windows 8.1, 32 and 64 bit
Processor	Intel® or AMD®, 350 MHz or greater
Memory	256 MB or greater
Hard Drive	30 MB or greater
Screen Resolution	1024 x 768 or greater
CD-ROM Drive	2X speed or greater
Connectivity	9-pin serial RS-232 port or USB port with USB to RS-232 adapter

DoseView 3D REF 92260, DoseView 3D Lift and Reservoir Cart REF 72260

ORDERING INFORMATION

DOSEVIEW™ 3D REF 92260

AUTOMATE ABSORBED DOSE TO WATER MEASUREMENTS

Automatically acquire depth-dose measurements in a durable, TG-51 and TRS-398 compliant 1D water scanning system.

DOSEVIEW 1D

More Accurate Scans, In Less Time

Design Ensures 0.05 mm Accuracy and Repeatable Scans

- 0.05 mm precision over the entire arm travel distance.
- Engraved vertical lines expedite phantom alignment with room lasers.
- Two fill lines accommodate 20 cm and 25 cm depth measurements.

Easily Adapts to Fit Range of Detectors

- The water equivalent ion chamber bracket fits most thimble ion chambers and rigid stem parallel plate chambers.
- Alignment lines help quickly place the centriod of a detector at isocenter.
- Optional brackets available for vertically-oriented and stemless detectors.

Remote Operation with Handheld Controller

- Establish origin position and automatically return to origin with the press of a button.
- Three movement modes; fast, slow and step (0.01 mm to 100 mm).
- Easily toggle between cm/mm.
- Controller recalls the saved position for operation outside the vault.


STANDARD IMAGING
DOSEVIEW 1D
STANDARD IMAGING
DOSEVIEW 1D

Automatic 1D Scanning Routines with DoseView 1D Software

Fully Automate Depth Dose Data Collection With Doseview 1D and the Supermax or Max 4000 Electrometers

- Customize step sizes.
- Automatically accounts for water settling.
- Multiple measurements at each probe position.
- Quickly export data to a spreadsheet (.csv).
- Optional Chart displays: View rate or chart measurements plotted against depth (Table View) or time (Real-time View).
- Averaging mode: Automatic averaging of sequential readings.
- Streaming rate mode: Record unfiltered 10 hz rate readings for immediate measurement feedback.

Remote Operation of Scanning Arm

- View detector depth in real-time.
- Set/move to origin.
- Move to specific depth.
- Step probe by customizable distance.

Operate Electrometers (SuperMAX/MAX 4000) via Software

- View rate/charge measurement data in real-time.
- Set range and bias voltage.
- Perform charge collection using all modes. (timed + repeating, continuous, triggered)
- Automatic recording of data.

Additional Accessories

EXRADIN Ion Chambers

- Inherently waterproof
- Fully guarded for uniform field line measurements
- Constructed of rugged, homogeneous, conductive plastic for years of durability
- Manufactured from Shonka air equivalent and tissue equivalent plastics
- 5 year warranty

SuperMAX Electrometer

- Two independent measurement channels for ratio-based acquisition
- Easy-to-use touch-screen interface
- Comprehensive chamber library
- 5 year warranty

1 mm Lead Foil

- Absorb electrons according to TG-51 procedures
- Easily slide inside wedge tray or tape to collimator
- 20 cm x 20 cm x 1 mm
- Protective coating provides rigid strength to lead

DOSEVIEW 1D SPECIFICATIONS

DIMENSIONS

1D SCANNING ARM	*Height:* 48.26 cm (19.0 in) *Length:* 9.44 cm (3.72 in)	*Width:* 6.77 cm (2.67 in)
WATER TANK REF **91800**	*Height:* 36 cm (14.17 in) *Length:* 34 cm (13.39 in)	*Width:* 30 cm (11.81 in)
WATER TANK REF **91810**	*Height:* 36 cm (14.17 in) *Length:* 42 cm (16.54 in)	*Width:* 40 cm (15.75 in)

WATER TANK MATERIAL Clear acrylic 0.95 cm (0.375 in)

WEIGHT

1D SCANNING ARM	1.36 kg (3 lbs)
HANDHELD CONTROLLER	0.23 kg (0.5 lbs)
WATER TANK *(REF 91800, empty)*	6.35 kg (14 lbs)
WATER TANK *(REF 91810, empty)*	10.43 kg (23 lbs)

MAX SCANNING ARM TRAVEL 27.5 cm (10.8 in)

IONIZATION CHAMBER HOLDER DIAMETER ACCOMMODATION

Max: 20 mm (0.79 in) *Min:* 6 mm (0.24 in)

BACKSCATTER CLEARANCE AT 25 CM DEPTH

~ 8 cm (3.1 in) including phantom base

ACCURACY OF POSITION ± 0.05 mm (0.002 in) over entire 275.00 mm

REPEATABILITY OF POSITION ± 0.05 mm (0.002 in) over entire 275.00 mm

OPERATING CONDITIONS

PRESSURE	680 – 800 mm Hg
TEMPERATURE	10 – 40 ˚C
RELATIVE HUMIDITY	30 to 75%, non-condensing

STORAGE CONDITIONS

TEMPERATURE	-40 to 70 ˚C
RELATIVE HUMIDITY	0 to 95%, non-condensing

CABLING 100 ft extension cable provided (standard RS-232 configuration)

POWER REQUIREMENTS AC OUTPUT 12 VDC @ 1.25 A

OPTIONAL DETECTOR BRACKETS

PTW Markus® (REF 70850)

PTW Roos® (REF 70852)

Vertical Diode Holder (REF 70851)

CONFORMITY CE

SOFTWARE REQUIREMENTS

Operating System	Windows Vista® Windows® 7
Connectivity	9-pin, RS-232 serial port or USB port with USB to RS-232 adapter

Markus and Roos are registered trademarks of PTW Freiburg GmbH. Specifications subject to change without notice.

ORDERING INFORMATION

DOSEVIEW 1D REF 91800

UNRIVALED, END-TO-END STEREOTACTIC QA

Industry-leading 0.1mm accuracy minimizes errors at each link in the stereotactic quality assurance chain

LUCY 3D QA PHANTOM

Stereotactic radiosurgery (SRS) is governed by the minute, with successful treatment often hinging on fractions of a millimeter. Delivering such precisely-targeted, high-dose radiation requires a tool explicitly designed to exceed these exacting standards.

Every facet of the Lucy 3D QA Phantom is tailored to provide the superior accuracy required for SRS QA. Unrivaled 0.1mm accuracy and specialized inserts optimize the Lucy Phantom for each link of the QA chain. This precision and flexibility combine to make the Lucy Phantom ideal for any stereotactic treatment facility.

"Combined with the A16 chamber, the Lucy Phantom is an exceptional QA device. It is so easy to use with ExacTrac that we use it to perform patient specific QA for every SRS patient treated on our Novalis TX."

Jeff Campbell, MS
Medical Physicist
Integris Southwest Medical Center

Validate the Complete SRS QA Chain

- **CONFIDENT IMAGE FUSION**

  Verify the accuracy of the entire image fusion process. Point and volume CT/MRI inserts allow for consistent setup and acquisition. Fused images can be compared to measurements in the Lucy specifications to ensure sub-millimeter precision.

- **MINIMIZE TRANSFER ERRORS**

  Industry-leading manufacturing tolerances provide incomparable accuracy when contrasting distance measurements to images in treatment planning software. Since distance measurements should be evaluated at each step of the imaging process, these rigid tolerances can drastically reduce cumulative uncertainty.

- **SIMPLIFY PATIENT DOSIMETRY**

  The Lucy dosimetry inserts help quickly obtain absolute, relative and point-dose dosimetry measurements at isocenter and at exact positions off isocenter. This allows for a seamless evaluation of dosimetric accuracy.

Easy Setup with Framed and Frameless Systems

The Lucy 3D QA Phantom interfaces with most SRS frames and frameless systems for reduced setup and scanning time in CT and angiographic imaging.

- Mount the SRS frame (with Lucy) on the couch and treat within the manufacturer's exact coordinate system.
- Simulate patient positioning for frameless cranial or body SRS with the Precision Leveling and Rotational Alignment Base.
- Rotate the Lucy 360° for operation in coronal, sagittal or transverse plane.

BrainLAB

Elekta Fraxion™ / EXTEND™

Leksell Gamma Knife®

Varian / CRW/BRW

The QA Process

Verify Critical Elements of SRS

CT, MRI and Image Fusion

PRECISE, FLEXIBLE POSITIONING

The Lucy seamlessly integrates with most SRS frames and is positioned within the manufacturer's coordinate system for quick setup of CT or MRI scanning. Easily rotate the Lucy 360° for operation in coronal, sagittal or transverse plane.

SPECIALIZED INSERTS FOR QUICK FUSION QA

CT/MRI marker cylinders and volume inserts provide known volumes, geometries, densities and distances. These specialized accessories harness the 0.1mm accuracy of the Lucy to produce unparalleled precision when evaluating TPS fusion.

Design and Deliver Plan

Once images are acquired and fused, the Lucy can be customized for dose and fluence calculations. Create treatment plans based on fused images or sample tumor shapes and then deliver the plans to the Lucy for dose comparison.

Film and detectors are positioned at the exact center of the Lucy using the Dosimetry Insert, Target/Treatment Verification and Dosimetry Film Cassettes. Since these inserts are interchangeable, absolute dose is easily measured and isocentricity and distance measurements are obtained with minimal disruption.

Analyze and Export Results

COMPLETE SYSTEM QA

The Lucy Phantom provides precise spatial and dosimetric data for MRI scans, comprehensive CT scans, image fusion, localization, treatment planning, dose delivery and export to the treatment machine. Since all these tests are conducted with the same phantom, it is easier to identify steps with potential errors and reduce uncertainties over the entire treatment chain.

AUTOMATED WINSTON-LUTZ ANALYSIS

Pair the Lucy Phantom with PIPSpro Comprehensive Software for automatic Winston-Lutz analysis. The sphere of the Radiation Alignment Pointer is placed at the mechanical isocenter of the treatment room. Using the EPID, take multiple gantry or couch angle images and automatically load into PIPSpro. PIPSpro then analyzes these images to determine the absolute size and position of the radiation isocenter.

Dosimetry QA Accessory Package

DOSIMETRY INSERT FOR ION CHAMBERS AND DETECTORS

This insert positions the centroid of the ion chamber's active volume at the geometric center of the Lucy Phantom to easily measure absolute dose.

TARGET/TREATMENT VERIFICATION FILM CASSETTE

This black acrylic cassette accommodates radiochromic or conventional therapy film. It positions one 3in x 3in film at the exact center of the Lucy Phantom. Sharp markers in this cassette produce four impressions, forming a square on the film equidistant from the center for isocentricity and distance measurement tests. A fifth marker is used to identify orientation.

DOSIMETRY FILM CASSETTE FOR THREE 2.5IN X 2.5IN FILMS

This clear acrylic cassette positions three films at the exact center of the Lucy 3D QA Phantom for film dosimetry measurements. The two films on either side of the central film are separated by 2.25mm acrylic spacers.

CT Imaging QA Accessory Package

CT VOLUME INSERT WITH THREE KNOWN GEOMETRIES

This insert has three irregularly shaped air volumes of 250mm3, 750mm3 and 1750mm3. The volume insert evaluates the ability of the TPS to accurately recreate images as they are moved from one imaging system to another.

CT MARKER CYLINDERS, SET OF FOUR

Each marker cylinder contains five 2mm diameter aluminum spheres which are spaced 5mm center to center or 3mm apart. The targets within the four marker cylinders create a square 60mm on each side. When used in conjunction with the MRI Marker Cylinders, these inserts evaluate the fusion function of treatment planning programs.

ELECTRON DENSITY INSERT

This insert provides a quick and convenient check of the CT density tables used by the imaging and treatment planning systems. The insert is comprised of: Blue Water, air, trabecular bone, cortical bone and adipose.

CT GRID INSERT FOR SPATIAL DISTORTION

This two dimensional metallic grid is designed to check image distortion and symmetry. Grid lines are visible at conventional settings for CT scanners. The grid wires are 0.5mm aluminum, spaced 5mm apart and originate at the center of the insert.

MRI Imaging QA Accessory Package

MRI VOLUME INSERT WITH THREE KNOWN GEOMETRIES

This insert has three irregularly shaped volumes filled with mineral oil; used to analyze image integrity when moved from one imaging system to another.

MRI MARKER CYLINDERS, SET OF FOUR

These cylinders contain five, 2mm diameter spheres, spaced 5mm center to center or 3mm apart. The targets within the cylinders create a square 60mm on each side. When used in conjunction with the CT Marker Cylinders, these markers evaluate the fusion function of treatment planning programs.

MRI SIGNAL GENERATOR

The signal generator contains a manganese chloride solution that produces enough MRI signal strength to easily image the MRI Marker Cylinders.

Radiation Alignment Pointer

The Radiation Alignment Pointer attaches to the Precision Leveling and Rotational Alignment Base for secure positioning. The 5mm tungsten sphere tip is used for radiation, laser and optical alignment. It can be locked into a Lucy frame for easy setup and verification at isocenter with film or EPID.

WINSTON-LUTZ TEST FOR RADIATION ISOCENTER

The tungsten sphere tip of the Radiation Alignment Pointer can be imaged for the Winston-Lutz test. The sphere is placed at the mechanical isocenter of the treatment room as determined by the room lasers. The accelerator is then rotated to each required gantry angle, and the sphere is imaged with film or an EPID.

The Stereotactic Module of PIPSpro Software automates Winston-Lutz analysis and provides 3D offset measurements.

Additional Accessories

MRI ISOCENTRIC VOLUME INSERT

This insert has an isocentrically-placed target of known volume for integrated testing of CT and MR imaging, image fusion and treatment planning and a center marker sphere for isocenter-alignment.

3D VOLUMETRIC TARGET DOSIMETRY KIT

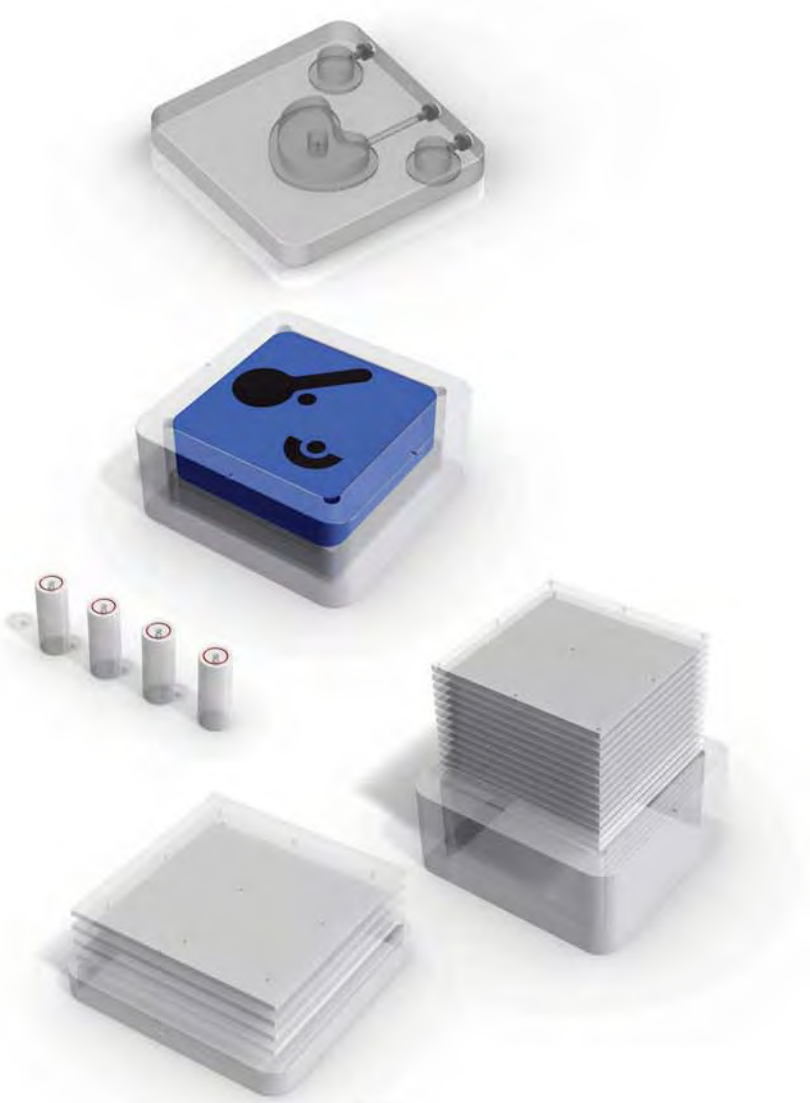
The Multiple Target Shapes Insert offers complex geometries targets of known dimensions and volumes to challenge and assess the reconstruction capabilities of the treatment planning system. Evaluate the ability of your TPS to include and avoid critical structures and then utilize the included film cassette to verify dose delivery to the target.

IGRT KV AND X-RAY ANGIOGRAPHY MARKER CYLINDERS

The IGRT kV and X-Ray Angiography Marker Cylinders are used with the CT Marker Cylinders and the MRI Marker Cylinders to evaluate the fusion function of treatment planning programs.

DOSIMETRY CASSETTE FOR THIRTEEN 2.5X2.5 INCH FILMS AND THREE 3X3 INCH FILMS

These cassettes position film in the large void in one hemisphere of the Lucy 3D QA Phantom for film dosimetry measurements. The cassette and spaces are made of clear acrylic.



DOSIMETRY INSERTS FOR TLD DETECTORS

This dosimetry insert positions up to [49 TLDs -3mm] or [85 TLDs – 1mm] in the central plane of the Lucy 3D QA Phantom. One TLD is positioned at the exact center of the phantom. The size of the cavities are [3.4 x 3.4 x 1 mm] or [1.5 x 1.5 x 1 mm].

DOSIMETRY INSERT FOR MOSFET DETECTORS

This insert positions 15 MOSFET detectors in the central plane of the Lucy Phantom. One detector is positioned at the exact center of the phantom. The size of the cavities are 2.5 x 8 x 1mm.

LUCY 3D QA PHANTOM (REF 91210) SPECIFICATIONS

LUCY 3D QA PHANTOM	Acrylic Sphere 140 mm (5.51 in) diameter
Blank Filler Plug (HEMI-C)	81 x 81 x 35 mm (3.19 x 3.19 x 1.38 in)
Blank Filler Plug (HEMI-A)	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
Accessory Port for Ionization Chambers	8 mm (.31 in) diameter
PRECISION LEVELING AND ROTATIONAL ALIGNMENT BASE	
Height	30 cm (11.81 in)
Depth	23 cm (9.06 in)
Width	20 cm (7.87 in)
Weight	3.4 kg (7.5 lbs)
DOSIMETRY QA ACCESSORIES	
Dosimetry Insert for Ion Chamber	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
Dosimetry Film Cassette for Three 2.5" x 2.5" films	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
Target/Treatment Verification - Film Cassette - Four Titanium Fiducial Markers - One Titanium Fiducial Marker for Orientation	85 x 85 x 10 mm (3.35 x 3.35 x .39 in) 60 mm (2.36 in) square pattern
Dosimetry Film Cassette for Three 3.0" x 3.0" films	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
Dosimetry Film Cassette for Thirteen 2.5" x 2.5" films	85 x 85 x 35 mm (3.35 x 3.35 x 1.38 in)
CT QA ACCESSORIES	
CT Marker Cylinders, set of four - Five 2.0 mm Aluminum Spheres per cylinder	10 mm (.39 in) length, 25 mm (.98 in) diameter 5 mm (.197 in) center-to-center
CT Volume Insert with 3 irregular known volumes - Geometry One - Geometry Two - Geometry Three	85 x 85 x 10 mm (3.35 x 3.35 x .39 in) Area 250 mm, Volume 2500 mm^3 Area 750 mm, Volume 7500 mm^3 Area 1750 mm, Volume 17500 mm^3
CT Grid Insert for spatial distortion	85 x 85 x 10 mm (3.35 x 3.35 x .39 in) 0.5 mm (.02 in) aluminum wire spaced 5 mm (.197 in) apart
MRI QA ACCESSORIES	
MRI Marker Cylinders, set of four - Five 2.0 mm mineral oil spheres per cylinder	10 mm (.39 in) length, 25 mm (.98 in) diameter 5 mm (.197 in) center-to-center
MRI Volume Insert with three known Geometries - Geometry One - Geometry Two - Geometry Three	85 x 85 x 10 mm (3.35 x 3.35 x .39 in) Area 250 mm, Volume 1700 mm^3 Area 750 mm, Volume 5250 mm^3 Area 1750 mm, Volume 12250 mm^3
MRI Signal Generator - Cavity Filled with Manganese Chloride	85 x 85 x 35 mm (3.35 x 3.35 x 1.38 in)
IMAGING QA ACCESSORIES	
IGRT Localization & Angiography Marker Cylinders, set of four - One 2.0 mm Lead Sphere in each cylinder	10 mm (.39 in) length, 25 mm (.98 in) diameter
RADIATION ALIGNMENT POINTER	
Includes 5 mm Radiation Alignment Tip	
MOSFET DOSIMETRY CASSETTE	
Cassette with 15 cavities 2.5 x 8 x 1 mm to accommodate MOSFET Diodes	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
TLD DOSIMETRY CASSETTE	
Cassette with 49 cavities 3.4 x 3.4 x 1 mm to accommodate TLDs	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)
Cassette with 85 cavities 1.5 x 1.5 x 1 mm to accommodate TLDs	85 x 85 x 10 mm (3.35 x 3.35 x .39 in)

ORDERING INFORMATION

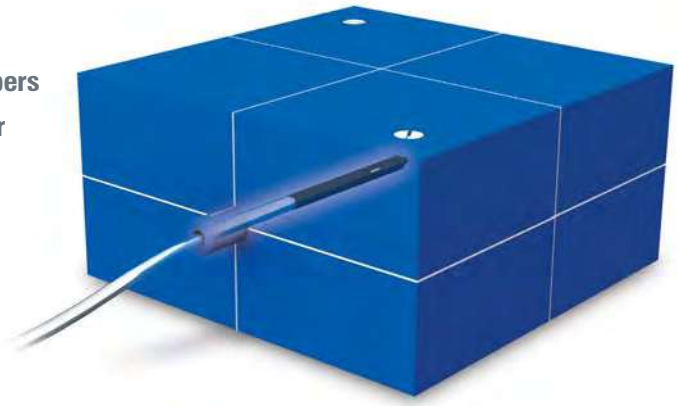
LUCY 3D QA PHANTOM **REF 91210**

Included ion chamber plugs
Model A16 Exradin Microchamber
Model A19 Exradin Classic Farmer-type Chamber

Stereotactic Dose Verification Phantom
Ion Chamber and Film Configurations shown

VERSATILE **COMMISSIONING**

Dose measurements with film and ion chambers for commissioning treatment systems and for specific plan dose verification



STEREOTACTIC DOSE VERIFICATION PHANTOM

VERSATILE USE WITH ION CHAMBERS OR FILM

Film and ion chamber dose measurements are achieved in one water equivalent phantom designed specifically for stereotactic radiosurgery.

Ion Chamber Measurements - The 2 cm Blue Water ion chamber slab has a cavity which accommodates inter-changeable ion chamber plugs, therefore one slab can accommodate several plugs drilled for different ion chambers. The ion chamber plug positions the ion chamber in the exact center of the phantom to facilitate repositioning and fast, accurate measurements. Two drilled ion chamber plugs and one solid plug are included with each phantom.

Film Dosimetry Measurements - Five water equivalent Blue Water slabs allow film to be positioned 2 mm apart for dose profile measurements of very small SRS targets. A cavity in each slab positions a 2.5 x 2.5 inch film in the exact center.

EXACT POSITIONING INDICATORS

Laser alignment lines are provided to accurately position the phantom for CT planning scans and for treatment. Gold and lead fiducial markers are implanted throughout the phantom so the CT and TPS geometric accuracy can be tested. The gold fiducial markers are placed so they are non-coplanar and non linear allowing the Cyberknife® system to accurately detect an ion chambers central collecting volume.

COMPACT SIZE FOR EASY HANDLING

The entire phantom is 20 x 20 x 10 cm in size.

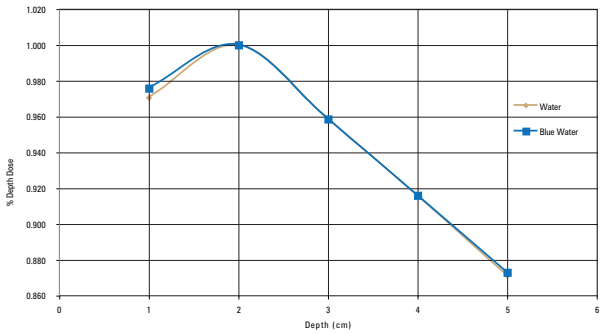
SRS DOSIMETRIC QA SLAB

The optional SRS Dosimetric QA Slab provides complex geometric targets to evaluate the imaging avoidance and inclusion components of your treatment planning system and test the accuracy of the planned dose.

Phantom Components and Accessories

Build-up Slabs

- Two 4.0 cm thick Blue Water slabs are provided. One is positioned above and the other is positioned below the film or chamber dosimetry slab to provide adequate build-up.
- White fiducial lines are located on the X, Y, Z coordinates of the phantom
- Locking pins provide a clamping mechanism to prevent the phantom slabs from moving



6 MV X-Rays
Water vs Blue Water

Ion Chamber Measurement Slab

- One 2.0 cm slab is provided with two ion chamber plugs drilled to accomodate the Exradin A16 and A19 Ion Chambers, and one solid ion chamber plug
- Additional ion chamber plugs for other ion chambers are also available

Film Measurement Slab

- Five 20 x 20 x 0.2 cm slabs are provided which have a centered pocket for one pre-cut film. Two 20 x 20 x 0.5 cm slabs, together with the build-up slabs and locking pins, secure the film slabs to provide a secure handling environment.

SRS Dosimetry QA Slab (Optional)

- This accessory contains target geometries, target densities, and known volumes for commissioning treatment planning systems. This compact phantom slab, 20 x 20 x 2 cm, provides the geometric tests needed to evaluate the imaging components of your treatment planning system. It replaces the dosimetry slabs centered in the phantom.
- The SRS Dosimetry QA Slab is an excellent phantom to evaluate the ability of your treatment planning system to accurately create DRR from CT scans.

MAX 4000 Electrometer

- 1 fA resolution for excellent sensitivity and accuracy
- Automatic threshold detection detects the start and stop of radiation exposure to measure the prescribed dose. It also allows sequential measurements without manual reset.
- Ideal for use with small field size, low volume ion chambers

Model A16 Exradin Microchamber

- Axially symmetric design
- Uniform isotropic response
- Designed to fit within a small 3.4 x 3.4 mm field size - ideal for radiosurgery

STEREOTACTIC DOSE VERIFICATION PHANTOM SPECIFICATIONS

MATERIAL DENSITIES - MAIN PHANTOM COMPONENTS **REF 91250**

Blue Water	1.09 g/cm^3
Black delrin alignment posts and thumbscrews	1.43 g/cm^3
Nylon 6/6 flathead screws	1.14 g/cm^3

MATERIAL DENSITIES - SRS DOSIMETRIC QA SLAB **REF 70650**

Blue Water	1.09 g/cm^3
Black C552 target shapes	1.76 g/cm^3
Trabecular bone plug	1.20 g/cm^3
Cortical bone plug	1.93 g/cm^3
Adipose plug	0.94 g/cm^3

DIMENSIONS (Complete phantom) *Height:* 10.00 cm, 3.94 in *Width:* 20.00 cm, 7.87 in *Length:* 20.00 cm, 7.87 in *Weight:* 4.4 kg, 9.7 lbs

DIMENSIONS (Accessory slab only) *Height:* 2.00 cm, 0.79 in *Width:* 20.00 cm, 7.87 in *Length:* 20.00 cm, 7.87 in *Weight:* 0.9 kg, 2.0 lbs

INCLUDED COMPONENTS

(1) Bottom slab with imbedded gold markers, lead BBs, and integral alignment posts
(1) Top slab with imbedded gold markers and lead BBs
(1) 2.0 cm chamber slab with generic cavity hole
(2) Ion chamber plugs (drilled for Exradin A19 and Exradin A16)
(1) Solid ion chamber plug
(2) 5.0 mm slabs
(5) 2.0 mm slabs with recessed pockets to accept 2.500" x 2.500" film
(2) Flathead nylon 6/6 screws
(2) Black delrin thumbscrews
(1) Flathead screwdriver

Specifications subject to change without notice.

ORDERING INFORMATION

STEREOTACTIC DOSE VERIFICATION PHANTOM **REF 91210**

ISOCENTER **ALIGNMENT IGRT QA**

Test the coincidence of the isocenter prescribed by the lasers, treatment beam, and image guidance systems

MIMI PHANTOM

ENSURE IMAGE GUIDANCE ACCURACY

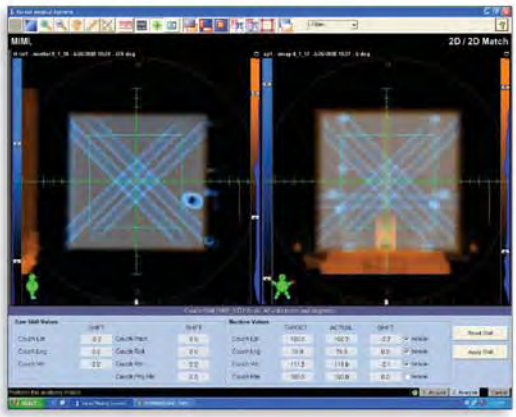
Treatment with radiation on a modern linear accelerator relies on the ability to position the patient with incredible accuracy. This is why it is critically important to verify that the systems used for positioning are all describing the same isocentric point in space as the treatment beam.

FAST, ACCURATE ALIGNMENT CHECKS

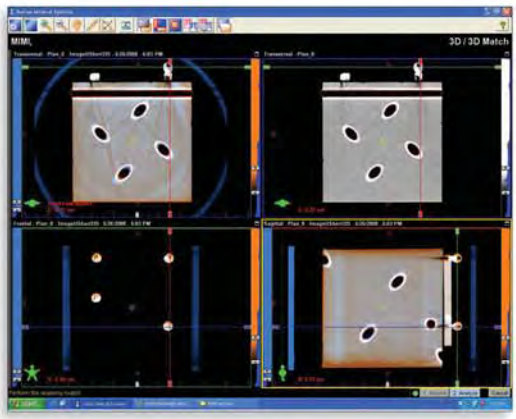
The MIMI (Multiple Imaging Modality Isocentricity) Phantom from Standard Imaging allows you to establish mechanical stability of the image guidance system by verifying the isocenter described by the MV, kV, CBCT, and other guidance systems is within accepted 1mm tolerances. This daily or weekly test can be performed in just a few minutes giving you the confidence that you can deliver the radiation prescription on target. A 6.4 mm sphere at phantom center assists with virtual and physical graticule alignment checks.

EASY ALIGNMENT DUE TO UNIQUE DESIGN

The MIMI Phantom incorporates five bone equivalent rods uniquely set so that four of them intersect at 90 degree angles when viewed in DRRs or a 2D projection image. The rods traverse the entire phantom making them visible in any image or slice allowing for easy 2D/2D and 3D/3D matching for fast verification of isocenter position.



A 2D/2D matching example with the MIMI Phantom



A 3D/3D matching example with the MIMI Phantom

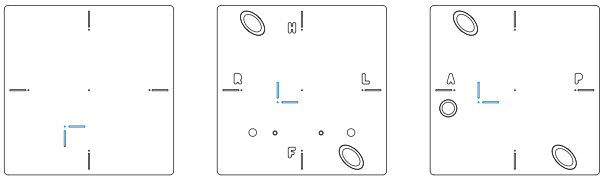
Features

Varian FramelessArray™ Optical Guidance System QA

- The MIMI Phantom features pre-drilled holes which precisely fit the Varian FramelessArray Optical Guidance System localizer. By fitting the localizer to the phantom, additional testing can be done to verify the isocenter prescribed by the optical guidance system is coincidental to the lasers and the treatment beam isocenter.

Test Automatic Table Adjustments

- The MIMI Phantom features additional cross-hair markers that are offset known distances from the true isocenter. Setting up the phantom aligned to these offsets allows you to verify the shifts prescribed by automatic table positioning systems.



Offset cross-hair markers on the MIMI Phantom, shown in blue, are on all sides except the bottom

MIMI Phantom shown with the Varian FramelessArray Optical Guidance System localizer

Test Integrated System Accuracy of:

- 3D Cone Beam registration (CBCT, OBI, XVI) systems
- MV/kV Isocentricity
- Lasers and Couch Table Adjustments
- Optical Guidance Systems
- Virtual and physical graticules

The MIMI Phantom was developed in collaboration with Peter Remejier and Marcel Van Herk of the Netherlands Cancer Institute, NKI-AVL, Amsterdam, The Netherlands

MIMI PHANTOM (REF 91240) SPECIFICATIONS

DIMENSIONS	*Height:* 5.5 in, 14 cm	*Width:* 5.5 in, 14 cm	**MATERIALS**	Acetal copolymer for main phantom Black PVC Rods (bone equivalent) (30) 1 mm stainless steel spheres 6.4 mm high contrast, non-artifact sphere in center
	Length: 5.5 in, 14 cm	*Weight:* 8.25 lbs, 3.75 kg		

FramelessArray™ is a trademark of Varian Medical Systems. Specifications subject to change without notice.

PERFORMANCE VALIDATION

Basavatia, A., Tomé, W. "Multiple Imaging Modality Isocentricity Phantom", Poster Presentation, 50th Annual Meeting of the American Association of Physicists in Medicine, Houston TX, 2008

Remejier, P., Van Herk, M. "Geometry QA Phantom for Mechanical Stability of the Image Guidance System", Presentation, World Congress of Medical Physics and Biomedical Engineering, Seoul Korea, 2006

ORDERING INFORMATION

MIMI PHANTOM REF 91240

PRECISE QA FOR STEREOTACTIC RADIOSURGERY

Expedite and simplify verification of sub-millimeter treatment setup

WINSTON-LUTZ PHANTOM

QUICK, COMPREHENSIVE STEREOTACTIC QA

A common QA procedure to verify isocenter for stereotactic radiosurgery is the Winston-Lutz Test. The Winston-Lutz Pointer Phantom facilitates ball marker alignment with the laser-described isocenter during this test, allowing for easy execution of all necessary Stereotactic QA procedures.

GO FILMLESS WITH PIPSPRO SOFTWARE

Instead of using film, PIPSpro Comprehensive Software, when coupled with the Winston-Lutz Pointer Phantom, uses your portal imaging system to acquire images of the ball marker, automatically analyzes these images and then determines the 3D stand offset that will provide the truest isocenter for your stereotactic treatments to within 0.1mm.

for use with PIPSpro Software, PIPSpro™ Software is sold separately

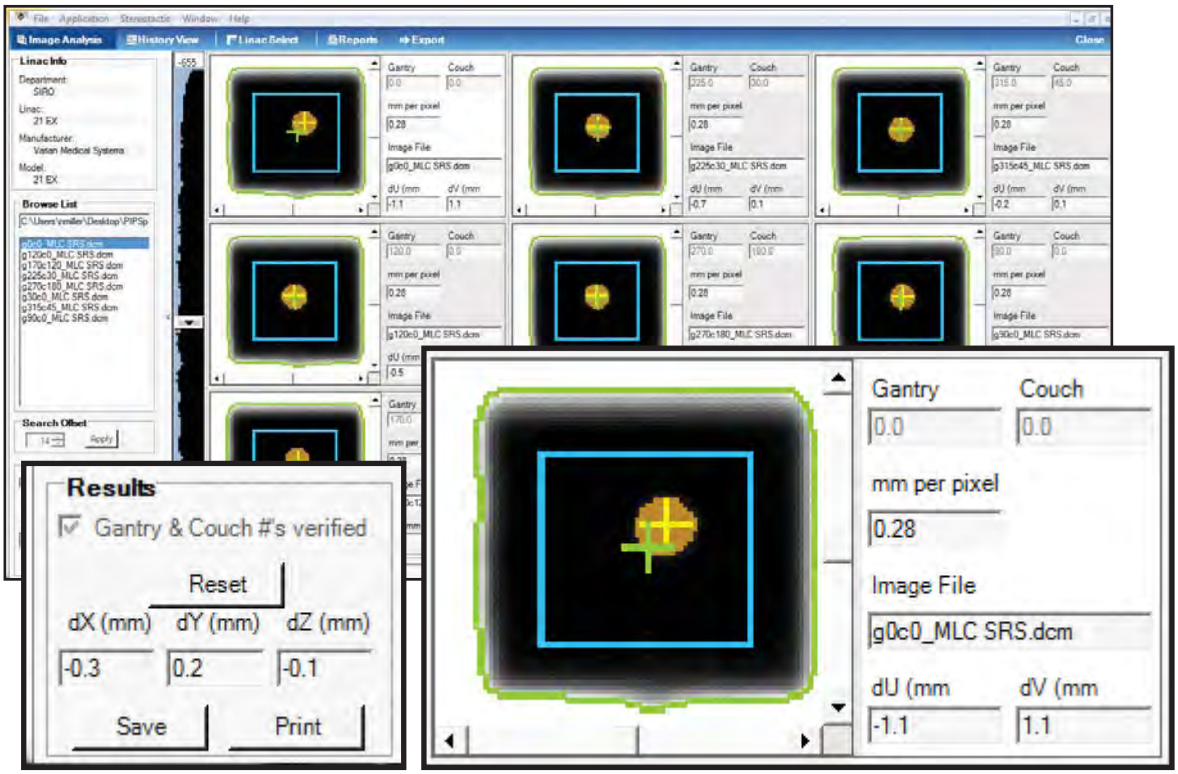
Features

Winston Lutz Pointer Phantom

- Easily adjustable for precise positioning
- Carbon fiber rods ensure stability once positioned
- 5mm tungsten carbide sphere
- White on black and black on white lines for easy alignment to either light field or lasers

PIPSpro Stereotactic Software (sold separately)

- Automatically analyzes images of the Winston Lutz Phantom
- Three dimensional offsets reported with 0.1mm accuracy
- Built in trending module to determine when action is necessary



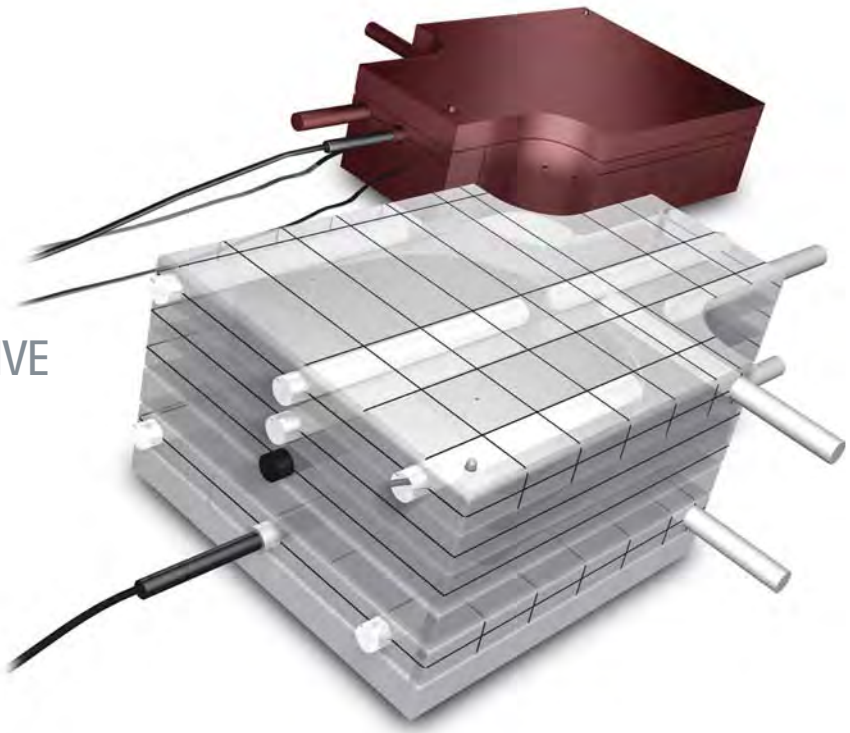
PIPSpro Stereotactic Software SPECIFICATIONS

OPERATING SYSTEM	MICROSOFT® WINDOWS® XP WINDOWS VISTA® WINDOWS 7
PROCESSOR	Intel® or AMD®, 350 MHz or greater
MEMORY	64 MB (256 MB recommended)
HARD DRIVE	50 MB or greater
SCREEN RESOLUTION	800 x 600 (1024 x 768 recommended)
CD–ROM DRIVE	2X speed or greater
SCREEN COLOR DEPTH	256-bit or greater
PRODUCT STANDARDS	Designed to meet IEC 60601-1-4 CE
RECOMMENDED SOFTWARE	Microsoft Excel

PIPSpro™ QC Software REF 91310, PIPSpro™ Comprehensive Software REF 91320. Windows® is a registered trademark of Microsoft Corporation. Specifications subject to change without notice.

ORDERING INFORMATION

WINSTON-LUTZ PHANTOM REF 72286



VERSATILE **COMPREHENSIVE**

Gain confidence in the accuracy of your treatment plans and help improve patient outcomes

IMRT DOSE VERIFICATION PHANTOM

VERIFY PATIENT IMRT TREATMENT PLANS

The anthropomorphic design of the IMRT Dose Verification Phantom mimics human anatomy which assists in set up and treatment for patient dose verification. It is ideal for prostate and head and neck regions, as well as for commissioning respiratory gated protocols because the accuracy of prescribed dose is evaluated and confirmed in simulated patient conditions. The IMRT Dose Verification Phantom is available in Acrylic REF 91230 or Virtual Water™ REF 91235 material.

ASSURE ACCURACY IN RESPIRATORY GATING WITH THE OPTIONAL RESPIRATORY GATING PLATFORM

The unique Respiratory Gating Platform REF 72249 simulates breathing providing the means to create a comprehensive program for commissioning, training, quality assurance, and dose verification of gated IMRT treatments.

FAST AND VERSATILE SET-UP HELPS COMPLETE DOSE VERIFICATION QUICKLY AND EASILY

The IMRT Dose Verification Phantom can combine absolute, relative and point dose measurements, with up to 16 chamber positions, 5 film positions and up to 9 diodes or TLDs. By using a fast coronal film orientation, the IMRT Dose Verification Phantom captures the dose contribution of all fields and segments, as well as showing hot and cold spots on the film, for comparison to the treatment plan. The IMRT Dose Verification Phantom effectively evaluates head and neck junction issues of upper neck and half beam superclav fields. It also incorporates inhomogeneity structures with bone and lung equivalents.

Features

- Solid Acrylic (Virtual Water™) **Ion Chamber Slab** has six cavities for thimble ion chamber measurement. The diameter of each cavity is 19 mm. Solid acrylic (Virtual Water) plugs are included to fill the cavities for simulated patient thickness. One solid acrylic (Virtual Water™) plug is drilled for the ion chamber of choice. A bone equivalent plug is included for bone simulation of heterogeneity measurements.
- Solid Acrylic (Virtual Water™) **Blank Slab** is a solid slab to provide simulated patient build-up material. Four 2 mm steel balls are imbedded in the slab as reference markers for 3D orientation of film on TPS.
- Solid Acrylic (Virtual Water™) **Lung Slab** has two cavities for simulated lung inserts, two cylindrical cavities for thimble ion chamber placement and a set of two tissue equivalent lung inserts for lung simulation. Optional Acrylic inserts REF 70052 (Virtual Water™ inserts REF 70053) convert the Lung Slab into a solid slab.

Ion Chamber Slab

Blank Slab

MOSFET Diode/TLD Slab

Lung Slab

Optional Accessories

- Solid Acrylic **MOSFET Diode/TLD Slab** REF 70608 (Virtual Water™ REF 72183) has nine channels for MOSFET diodes or TLD chips which can be placed at any point in a field for point dose measurements. The small channel size was designed not to perturb other measurements allowing this slab to be used as solid slab for increased patient thickness. MOSFET diodes are isotropic for dose measurements from any angle.
- Optional Acrylic **Inserts** REF 70052 (Virtual Water™ REF 70053) convert the Lung Slab into a solid slab.
- Carrying Case REF 50064 has extendable handles and wheels for easy transport.
- Simulate tumor movement with the Lung Tumor Insert REF 70170.

Respiratory Gating Platform REF 72249
with IMRT Dose Verification Phantom

REF 91230 - Acrylic IMRT Dose Verification Phantom
REF 91235 - Virtual Water™ IMRT Dose Verification Phantom

IMRT DOSE VERIFICATION PHANTOM (REF 91230) SPECIFICATIONS

INCLUDED COMPONENTS

- (2) Acrylic/Virtual Water ion chamber slabs with 6 cavities for ion chamber placement
- (2) Acrylic/Virtual Water blank slabs for build up thickness
- (2) Acrylic/Virtual Water lung slabs with cavities for simulated lungs
- (16) Solid Acrylic/Virtual Water plugs to fill unused ion chamber cavities
- (1) Plug with cavity drilled for ion chamber of your choice
- (1) Bone-equivalent plug
- (1) Lung-equivalent set with four (4) inserts for lung phantom voids
- (12) Location pins

DIMENSIONS

Height (each slab): 3.00 cm (1.18 in)
Height (six slabs): 18.00 cm (7.09 in) *Width (each slab):* 30.00 cm (11.81 in)
Length (each slab): 45.00 cm (17.72 in) *Weight (six slabs):* 22.7 kg (50.0 lbs)

PRODUCT STANDARDS CE

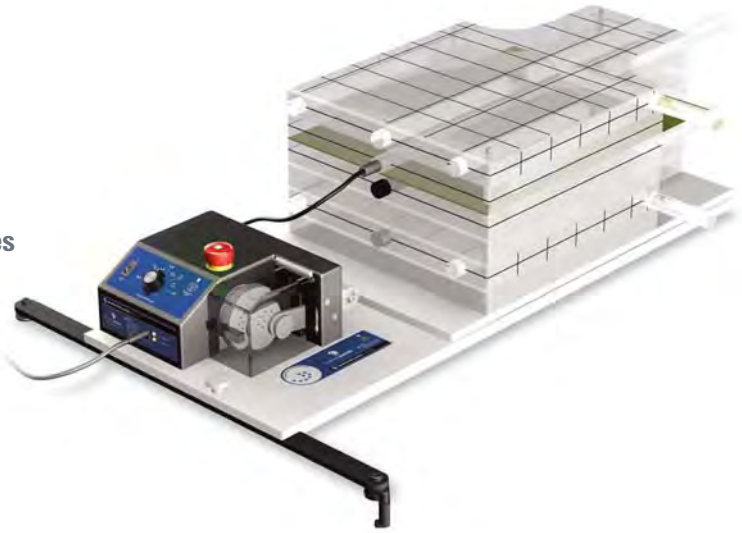
Virtual Water™ is a trademark of Med-Cal. Specifications subject to change without notice.

ORDERING INFORMATION

IMRT DOSE VERIFICATION PHANTOM **REF 91210**

EASY, COMPLETE

The unique Respiratory Gating Platform simulates breathing providing the means to create a comprehensive program for commissioning, training, quality assurance and dose verification of gated IMRT treatments



RESPIRATORY GATING PLATFORM

ACCURATELY SIMULATES BREATHING MOTION

The Respiratory Gating Platform supports and secures IMRT phantoms for placement on the CT simulator andtreatment couch. Designed for the Standard Imaging IMRTDose Verification Phantom, it also accommodates othermanufacturer's phantoms or even 2D arrays. The simulatedbreathing provides a thorough test of the entire system andthe Respiratory Gating Platform allows you to:

- Create the longitudinal movement of a target over a 5 mm to 40 mm distance to replicate tumor movement
- Relate the longitudinal movement to the respiratory amplitude to mimic and evaluate treatment plans
- Independently control the range of motion and the respiratory cycle to evaluate how a change in either one independently affects a treatment plan

ASSURES THE BEST TREATMENTS FOR PATIENTS

Commissioning followed by training with the Respiratory Gating Platform provides validation of the TPS and the

COMPREHENSIVE SYSTEM FOR EASY QA PROGRAM SETUP

The Respiratory Gating Calibration System is a convenient way to quickly and easily provide what is needed for commissioning and training. This comprehensive system is composed of the Respiratory Gating Platform, IMRT Dose Verification Phantom, MAX 4000 Electrometer and Exradin A14 SLMicrochamber. The comprehensive system allows you to:

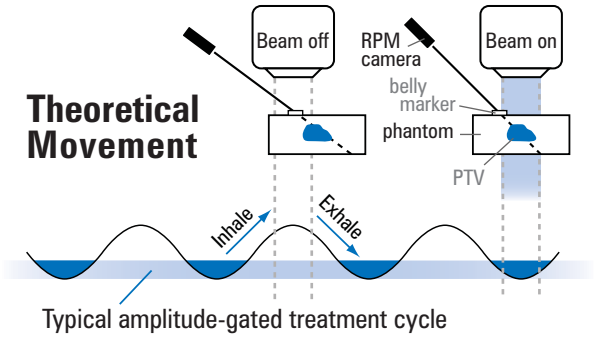
- Commission and perform quality assurance for imaging and treatment techniques such as respiratory gating and 4D radiotherapy
- Train physicians, physicists, and therapists on the implementation of imaging and treatment techniques
- Determine errors in imaging and the radiotherapy process
- Perform functional verification of the accelerator's respiratory gating features
- Perform dosimetric verification of respiratory gated treatments using ion chambers, film or diodes in theversatile IMRT Dose Verification Phantom

Features

- Simulates breathing motion
- Longitudinal movement of 5 mm to 40 mm
- Cycle interval is adjustable from 2.0 – 6.0 seconds
- Independently control the range of motion and the respiratory cycle
- Locking mechanism secures platform to couch
- Secure phantom to platform; move the entire platform with the phantom locked in place from the CT couch to the treatment couch
- Accommodates a variety of phantoms or 2D arrays
- Simulate tumor movement with the optional Lung Tumor Insert (REF 70170) for IMRT Dose Verification Phantom

1D – An Effective Solution

- Whatever the type of motion, simple or complex, regular or irregular, the Varian RPM™ camera and belly block are always monitoring belly motion. Only when the belly block is in the correct position is the target irradiated.
- In the theoretical example below, the tumor is free to move in any direction. There is only interest in irradiating the tumor in the darker blue region. This is typically during exhale, when the motion is at its minimum.
- From the camera's eye view, the respiratory signal generated by the Varian belly block is only 1D regardless of the tumor motion, so additional 2D or 3D data does not substantially improve plan accuracy.



Respiratory Gating Calibration System

MAX 4000 Electrometer

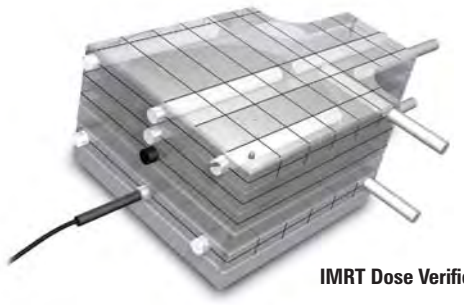
- Automatic threshold detecting trigger mode
- Excellent sensitivity — 0.001 pA to 500.00 nA, 0.01 pC to 999,999 nC
- Digital filter virtually eliminates the effect of noise
- Comprehensive display shows amp, coulomb, and collection time simultaneously
- MAX COMM™ Software for management of instrument and calibration libraries and acquired data points

Model A14SL Exradin Microchamber

- Small Volume, 0.016 cc, for excellent spatial resolution
- Small field size, 4 x 6 mm
- Uniform isotropic response
- Constructed of C552 Shonka air-equivalent plastic

IMRT Dose Verification Phantom

- Anthropomorphic design mimics human anatomy which assists in set up and treatment for patient dose verification
- Slab-based system allows for varied thicknesses; interlocking pin system secures slabs together
- Combines absolute, relative and point dose measurements, with up to 16 chamber positions, 5 film positions and optionally up to 9 diodes or TLDs
- Captures the dose contribution of all fields and segments, as well as showing hot and cold spots on the film, for comparison to the treatment plan using a fast coronal film orientation
- Incorporates inhomogeneity structures with bone and lung equivalents
- Available in acrylic or Virtual Water™ material



IMRT Dose Verification Phantom

RESPIRATORY GATING PLATFORM (REF 91150) SPECIFICATIONS

DIMENSIONS	*Height:* 12.7 cm (5 in)	*Width:* 30.5 cm (12 in)
	Length: 76.2 cm (30 in)	*Weight:* 9.1 kg (20 lbs)
RANGE OF MOTION CONTROL	5 mm - 40 mm, with 5 mm increments	
ACCURACY AND REPEATABILITY	± 0.5 mm	
POWER REQUIREMENTS	12 VDC @ 1.25 A, power supply included	

PERIOD OF OSCILLATION CONTROL	2 - 6 sec, 0.5 sec increments
ACCURACY	± 0.2 second when using: 4 Standard Imaging IMRT Phantom slabs (~34 lbs.) 6 Standard Imaging IMRT Phantom slabs (~51 lbs.) 8 Standard Imaging IMRT Phantom slabs (~68 lbs.)
REPEATABILITY	± 0.1 second for 4, 6 or 8 Standard Imaging IMRT Phantom slabs

RPM™ is a trademark of Varian Medical Systems. Virtual Water™ is a trademark of Med-Cal. Specifications subject to change without notice.

ORDERING INFORMATION

RESPIRATORY GATING PLATFORM REF 91150

HEAD-SCATTER MEASUREMENT

Measure head-scatter factors down to a 3 cm x 3 cm field size simply and easily without side scatter from a water tank

MINIPHANTOM & IN-AIR COMPARISON JIG

VERSATILE AND EASY TO USE

The detection system is comprised of an ion chamber and the columnar MiniPhantom. The MiniPhantom is a d_{max} columnar build-up cap which is 3 cm in diameter and 20 cm in length.[1,2] Scribed lines on the MiniPhantom facilitate alignment of the ion chamber's collecting volume at 10 cm from the end of the phantom. The stand also allows the MiniPhantom to be positioned horizontally for measuring beams.

[1] P.A. Jursinic and B.R. Thomadsen, "Measurement of head-scatter factors with cylindrical build-up caps and columnar miniphantoms," **Med. Phys.** 26(4), April 1999.

[2] T.Z Zhu and B.E. Bjarngard, "Head scatter off-axis for megavoltage x-rays," **Med. Phys.** 30(4), April 2003.

[3] Individual components may be purchased separately.

[4] MiniPhantom available for other Farmer-type ion chambers.

ACCOUNT FOR STRAY RADIATION

Head-scatter, the stray radiation inside the head of a linear accelerator, occurs with each machine, some of which hits the patient. This radiation must be taken into account when determining the total radiation dose given.

The Standard Imaging MiniPhantom allows the measurement of head-scatter factors with standard Farmer-type ion chambers. The phantom stand is small thereby minimizing scatter. The stand can also be used as an in-air comparison jig, allowing two ion chambers to be positioned side-by-side in a highly reproducible manner.

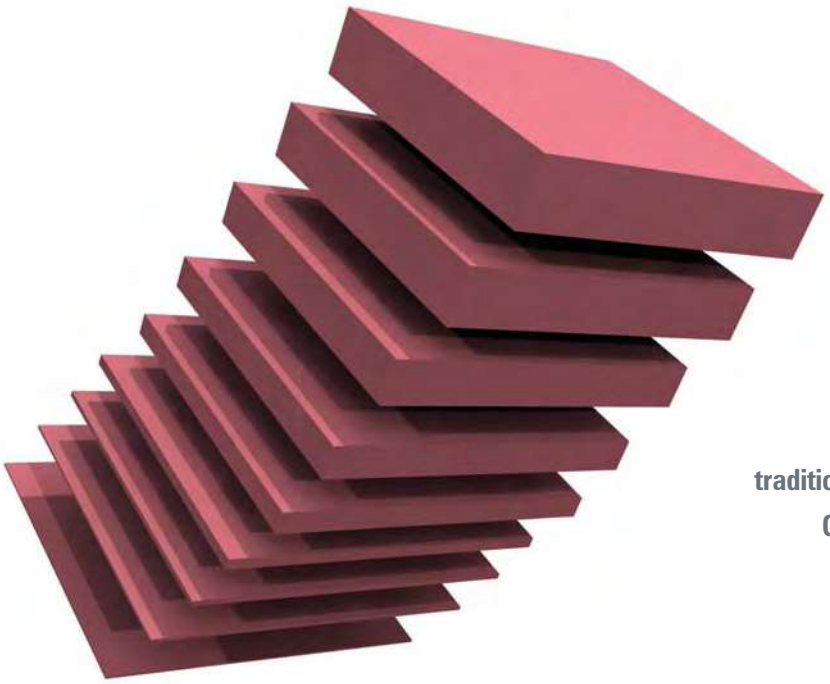
MiniPhantom SPECIFICATIONS

MiniPhantom Detection System [3], REF 72195 is comprised of:

- MiniPhantom for Exradin® A12 Farmer Type Ion Chamber [4], REF 72194
- MiniPhantom Stand/In-Air Comparison Jig, REF 72193

ORDERING INFORMATION

MINIPHANTOM & IN-AIR COMPARISON JIG REF 72193



WATER EQUIVALENT

Virtual Water is an ideal alternative to traditional water tanks for performing routine QA checks of a linear accelerator using photon or electron beams

Parallel Plate Slab

Thimble Slab

VIRTUAL WATER

CUSTOM CAVITIES AVAILABLE

Cavities are available in slabs at least 2 cm thick to accommodate most Farmer-type or parallel plate ionization chambers. Optional scribe lines are available for laser alignment.

TESTED AND CALIBRATED

Virtual Water is a true water-equivalent material. Slabs from this unique material are exceptionally strong and will not stick together when stacked or stored. Virtual Water is not affected by changes in humidity or temperature and does not exhibit charge storage effects, a problem common in other water-equivalent materials. Each production run of Virtual Water is tested at an independent calibration laboratory and certified to be within 0.5% of water at photon energies.

SETTING THE STANDARD IN WATER-EQUIVALENCY

Virtual Water slabs are made from water-equivalent material, and are developed to be free of contaminants and air. Many standard sizes and thicknesses are available and custom phantoms are available upon request.

VIRTUAL WATER SPECIFICATIONS

Density: 1.03 g/cm3
Thickness tolerance: +/– 0.15 mm
Length and width tolerance: +/– 0.5 mm
Physical form: square slabs (standard)
Sizes Available: 20 cm, 30 cm, 40 cm (standard)
Thicknesses available: 0.2 cm, 0.3 cm, 0.5 cm, 1.0 cm, 2.0 cm, 3.0 cm, 4.0 cm, 5.0 cm, 6.0 cm (standard)
Flatness: 0.2 mm
Batch Consistency: +/– 0.02% (measured)

ORDERING INFORMATION

VIRTUAL WATER Call **800.261.4446** for more info

PRECISE QA FOR **STEREOTACTIC RADIOSURGERY**

Expedite and simplify verification of sub-millimeter treatment setup.

WINSTON LUTZ CUBE PHANTOM

SIMPLE IGRT QA

The Winston- Lutz Cube Phantom's unique design includes offset alignment targets on 4 sides, making this phantom ideal for testing your system's ability to apply corrective couch shifts for 2D MV/kV planar imaging and 3D CBCT.

- Easily adjustable 6 cm x 6 cm cube for precise positioning
- Offset alignment fiducial targets on 4 sides
- 5 mm tungsten carbide sphere
- White with black crosshairs for easy alignment to either light field or lasers
- MV/kV isocentricity
- 3D Cone Beam shifts

QUICK, COMPREHENSIVE STEREOTACTIC QA

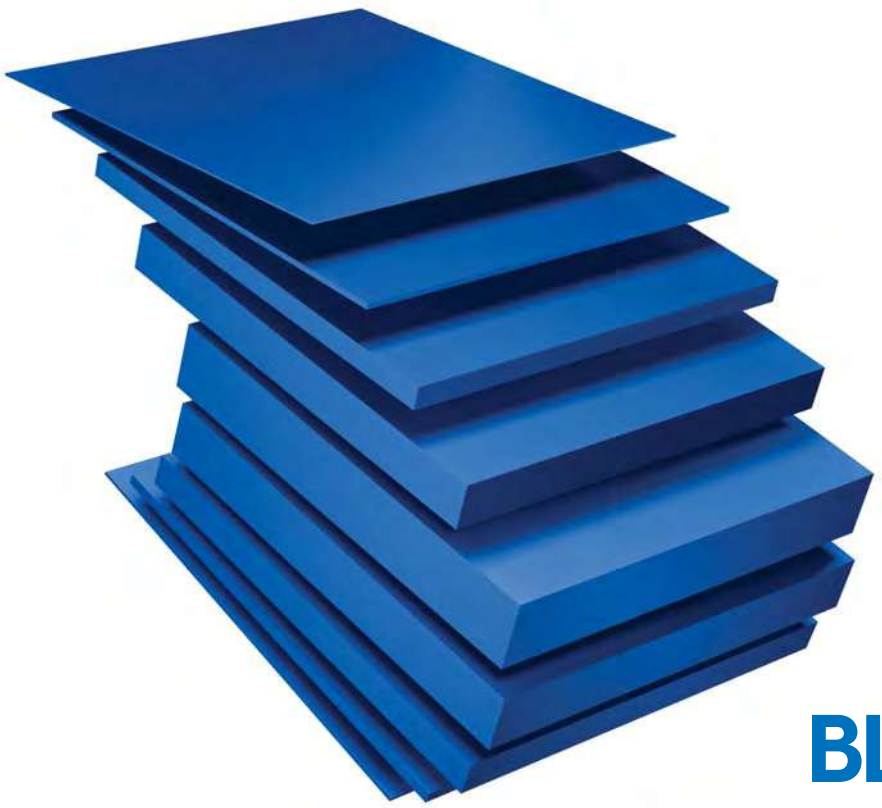
A common QA procedure to verify isocenter for stereotactic radiosurgery is the Winston-Lutz Test. The Winston-Lutz Cube Phantom combines ball marker alignment and phantom-based laser alignment allowing quick verification of radiation isocenter and laser accuracy verification of pretreatment during this test, allowing for easy execution of all necessary stereotactic QA procedures.

PIPSPRO STEREOTACTIC SOFTWARE *(SOLD SEPARATELY)*

- Automatically analyzes images of the Winston-Lutz Cube Phantom
- Analyze both cone based and MLC based treatments
- Three dimensional offsets reported within 0.1 mm accuracy
- Database saves all results for future analysis

ORDERING INFORMATION

WINSTON LUTZ CUBE PHANTOM REF 91345



PHOTON BEAM QA

Blue Water is a fast, easy-to-set-up alternative to traditional water tanks for routine checks of a linear accelerator's photon beam

BLUE WATER

Custom ion chamber plugs

Parallel Plate Slab

Thimble Slab

A NEW STANDARD IN WATER-EQUIVALENCY

- Blue Water is a water equivalent material within 1.0% for photons, and is free of contaminants and air
- Slabs from this unique material are exceptionally strong and will not stick together when stacked or stored
- Blue Water is not affected by changes in temperature or humidity

UNIQUE CHAMBER SLAB DESIGN

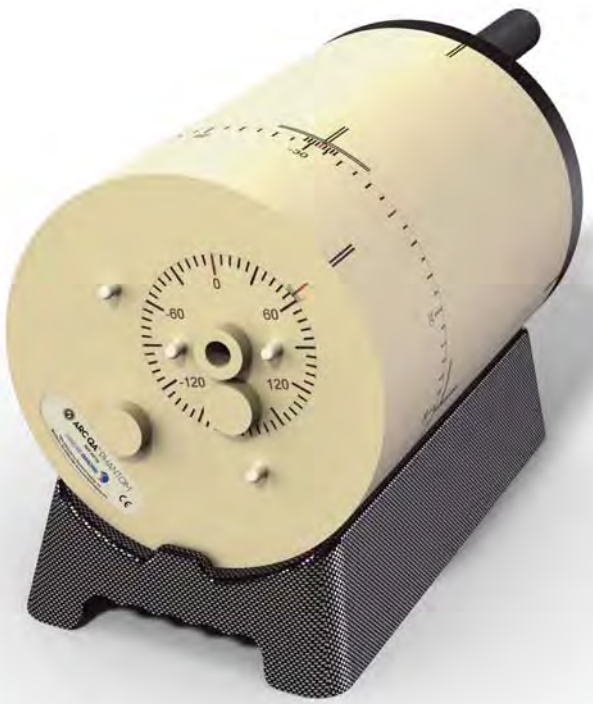
In slabs that are at least 2 cm thick, cavities are available to accommodate parallel plate ion chambers or thimble type ion chambers. Instead of having multiple slabs for each thimble type ion chamber, a single ion chamber slab is used with interchangeable ion chamber plugs.

ORDERING INFORMATION

BLUE WATER Call **800.261.4446** for more info

VERSATILE ROTATIONAL QA

The ARC QA Phantom provides machine and patient QA for rotational treatment systems such as Varian RapidArc,™ Elekta VMAT,™ and TomoTherapy®



ARC QA PHANTOM

ECONOMICAL, 2D ARRAY ALTERNATIVE

The ARC QA Phantom is a 30 cm long x 20 cm diameter cylindrical phantom constructed of water equivalent Plastic Water™ DT material. Perform absolute and relative dosimetry with confidence using proven film and traditional ion chamber detectors... no software or expensive detector equipment is required. Use familiar techniques to perform rotational QA tests, including evaluation of composite rotational dose distribution from individual arcs, gantry alignment accuracy, and rotational output rate uniformity. The ARC QA Phantom is not only useful for rotational QA, but for IMRT and IGRT QA as well.

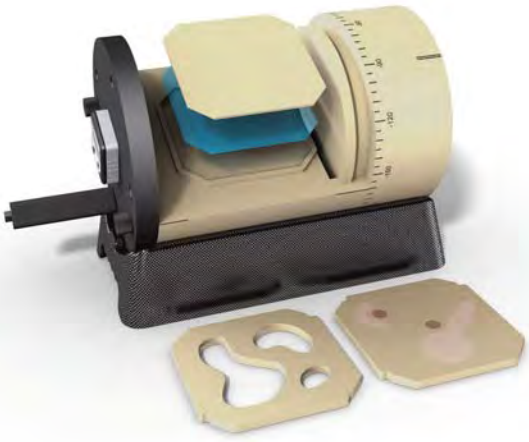
MACHINE QA CAPABILITIES

Perform commissioning and test the capabilities of the treatment system with the included CT Volume Insert and Multiple Target Shapes and Densities QA Insert.
By comparing known volumes and complex geometries between imager and treatment planning system(s), challenge and assess the TPS' reconstruction abilities and determine the cumulative uncertainties. Evaluate the ability of the TPS to include and avoid critical structures and use the included film insert to verify expected dose delivery.
Use the 3D Target Shape Insert's multiple densities to check the CT density tables utilized by the components of the imaging and planning chain.

PATIENT QA CAPABILITIES

Obtain absolute dose, relative dose, and point dose dosimetry QA measurements at isocenter and at exact positions off isocenter, using standard ion chambers and film. Chamber plug system accommodates a classic Farmer-type chamber, which can be positioned anywhere within a 13 cm diameter range on the axial face. Use the two included film inserts, positioned in the axial or the longitudinal orientation, which can be rotated freely in 360°.

ARC QA Phantom, partially disassembled, showing various inserts



Features

Facilitates Accurate Positioning

- Comprehensive laser alignment marks allow easy, repeatable positioning
- Digital Angle Gauge provides .1° precision for accurate placement and adjustments
- Positioning base provides consistent placement and easy handling with a gloss finish allowing the phantom to smoothly rotate in place

Included Accessories

- Film Insert (2 included) – Holds a 5" x 5" sheet of GAF-CHROMIC® or radiographic film. Five film markers within the insert serve as registration markers and can be used to test known distances within the phantom.
- CT Volume Insert – Has three known irregular volumes for evaluating the integrity of images moved from the imager to the treatment planning system
- Multiple Target Shapes and Densities QA Insert – Has unique geometry inserts with alternate densities for assessing treatment planning system abilities
- Chamber Plug – Supports a classic Farmer-type chamber profile such as the Exradin A19 Classic Farmer-type Ion Chamber
- Bone Density Plug – Made of bone density material for dose inhomogeneity testing
- Blank Plug (2 included) – Used to fill air voids within the phantom when unused by the chamber or bone density plugs

Quality, Modular Construction

- Constructed of Plastic Water material, water equivalent within 1%
- Inserts can be placed in the axial and/or longitudinal planes and positioned in four 90° increments within each cavity
- Front and back sections of the phantom can rotate independently for additional flexibility
- Phantom is held together securely by large thumbscrews which also provide quick, tool-free disassembly

ARC QA Phantom, shown with CT Volume Insert and Multiple Target Shapes and Densities QA Insert

ARC QA PHANTOM (REF 92735) SPECIFICATIONS

DIMENSIONS

Main Phantom	Diameter	20 cm (7.87 in)
	Length	30 cm (11.81 in)
Inserts	Length	13.7 cm (5.39 in)
	Width	13.7 cm (5.39 in)
	Height	0.8 cm (0.31 in)
Overall Phantom Weight		9.71 kg (21.40 lbs.)

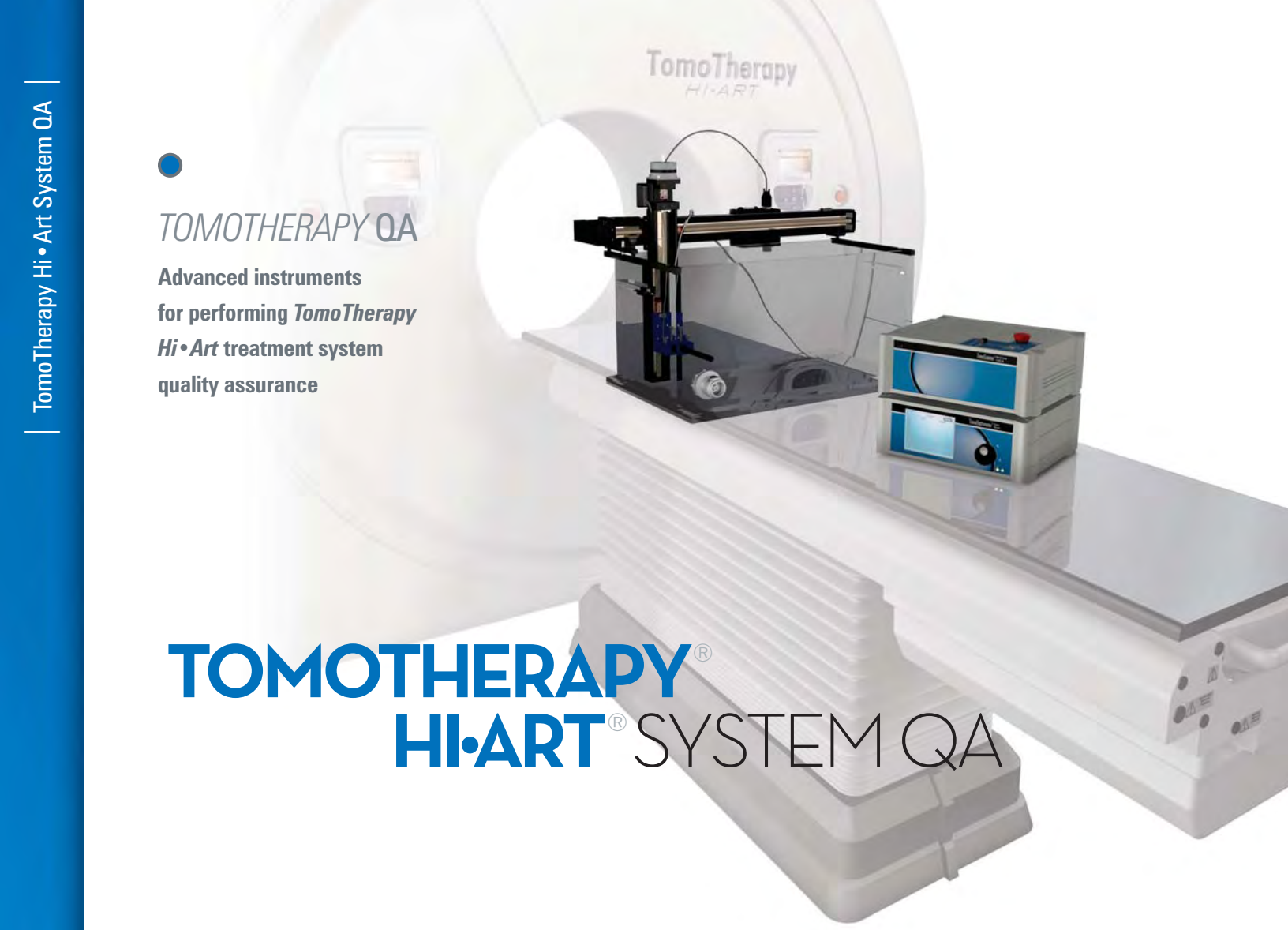
PRODUCT STANDARDS CE

INCLUDED COMPONENTS

Main Phantom
Positioning Base
(2) Film Inserts
CT Volume Insert
Multiple Target Shapes and Densities QA Insert
Chamber Plug (drilled for classic Farmer-type profile)
Bone Plug
(2) Blank Plugs
Digital Angle Gauge
(5) Thumbscrew
Rotation Handle

ORDERING INFORMATION

ARC QA PHANTOM REF 92735



TOMOTHERAPY QA

Advanced instruments for performing *TomoTherapy Hi•Art* treatment system quality assurance

TOMOTHERAPY® HI•ART® SYSTEM QA

COMPLETE, SEAMLESS SOLUTION FOR *TOMOTHERAPY* COMMISSIONING AND QUALITY ASSURANCE

TomoTherapy calibration instruments from Standard Imaging are integrated seamlessly with the *TomoTherapy Hi•Art* treatment system and offer a complete quality assurance, commissioning, and system dosimetry analysis solution that is fast and accurate.

The standard solution, available exclusively through TomoTherapy Incorporated, includes the 8 channel TomoElectrometer™, Model A17 Exradin Slice Therapy Chamber with in-air comparison jig and build-up cap, two Model A1SL Exradin Slimline Miniature Shonka Thimble Chambers, and the *TomoTherapy* Commissioning Phantom. Recommended options include the TomoScanner™ 2D Water Scanning System and six additional Model A1SL Exradin Miniature Shonka Thimble Chambers.

TOMOELECTROMETER™ 8 CHANNEL ELECTROMETER

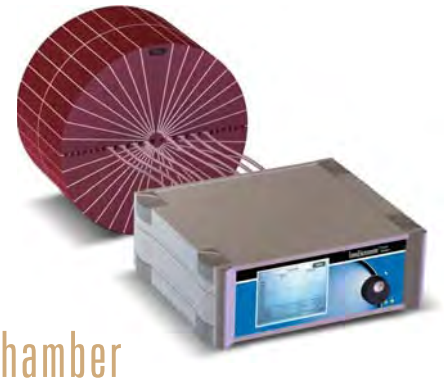
The TomoElectrometer™ is an 8 channel reference grade electrometer, with 1 fA resolution and accurately matched time constants for precision measurements. Outstanding flexibility allows the TomoElectrometer to interface with the *Hi•Art* treatment system software and operate as a stand-alone electrometer whenever multiple channel measurement is required. (TomoElectrometer is available only through TomoTherapy Inc.)

TOMOSCANNER™ 2D WATER SCANNING RADIATION BEAM ANALYZER SYSTEM

The TomoScanner is an innovative two-dimensional radiation beam analyzer designed for commissioning, data acquisition, and absolute dosimetry analysis for *TomoTherapy Hi•Art* treatment system. The custom design specifically for the Hi-Art bore and integration with the *Hi•Art* software saves setup time by following standard protocols prescribed by TomoTherapy. (TomoScanner is available only through TomoTherapy Inc.)

Model A1SL Exradin Miniature Shonka Thimble Chambers

- The small volume of the Model A1SL Exradin Miniature Shonka Thimble Chamber allows for excellent spatial resolution and exact characterization of a small area of the beam in depth dose measurements.
- Use of the 8 channel TomoElectrometer with eight Model A1SL Exradin Miniature Shonka Thimble Chambers inserted into the *TomoTherapy* Commissioning Phantom provides simultaneous measurements of patient specific QA, monthly QA, and linear array dose profile analysis of the *TomoTherapy Hi•Art* treatment system.



***TomoTherapy* Commissioning Phantom** shown with TomoElectrometer and eight Model A1SL Exradin Miniature Shonka Thimble Chambers

Model A17 Exradin Slice Therapy Chamber

- The Model A17 Exradin Slice Therapy Chamber is an inherently waterproof, unique CT ion chamber used for checking the consistency of the beam at various jaw widths. It provides an extremely flat response within ± 1.5% across its active length of 8 cm without polarity or perturbation effects.
- Fiducial marks at its center and ends provide easy setup in relation to the beam.
- The Model A17 Exradin Slice Therapy Chamber works in combination with the in-air comparison jig and matching build-up cap for helical *TomoTherapy* dose analysis.

Model A17 Exradin Slice Therapy Chamber shown with in-air comparison jig and build-up cap

HI•ART TREATMENT SYSTEM QA PRODUCTS SPECIFICATIONS

TOMOELECTROMETER CHANNELS

General Dosimetry Channels (Channels 1-4)	
RATE RANGE:	0.001 pA - 4.900 nA
CHARGE RANGE:	0.01 pC - 999,999 nC
SAMPLE RATE:	100 Hz, t = 10 msec
DETECTOR RESPONSE TIME:	500 msec (99.3% of max)
DIGITAL FILTER OF RATE MODE READINGS:	< 2 sec
Fast Response Channels (Channels 5-8)	
RATE RANGE (CHANNELS 5-7):	0.001 pA - 4.900 nA
CHARGE RANGE (CHANNELS 5-7):	0.01 pC - 999,999 nC
RATE RANGE (CHANNEL 8):	0.01 pA - 19.600 nA
CHARGE RANGE (CHANNEL 8):	0.1 pA - 999,999 nC
SAMPLE RATE:	100 Hz, t = 10 msec
DETECTOR RESPONSE TIME:	165 msec (99.3% of max)

DIMENSIONS (TomoElectrometer) *Height:* 11.7 cm, 4.6 in *Width:* 30.5 cm, 12.0 in *Length:* 26.7 cm, 10.5 in

DIMENSIONS (TomoScanner) *Height:* 11.7 cm, 4.6 in *Width:* 30.5 cm, 12.0 in *Length:* 26.7 cm, 10.5 in

DIMENSIONS Tank only (With Arms)
Inside Height: 27.9 cm, 11.0 in
Inside Width: 26.9 cm, 10.6 in
Inside Length: 60.4 cm, 23.8 in
Outside Height: 32.3 cm, 12.7 in (54.6 cm, 21.5 in)
Outside Width: 41.9 cm, 16.6 in (47 cm, 18.5 in)
Outside Length: 69.1 cm, 27.2 in (76.3 cm, 30 in)
Wall Thickness: 1.3 cm, 0.51 in (nominal)

SCANNING ARM LEADSCREW ACCURACY

RESOLUTION:	± .25 mm
REPEATABILITY:	± .25 mm

POWER

TOMOSCANNER:	36 VDC@1.39 A. Use only with supplied Globtek®, Inc. power supply model GTM21097-5048-12.0
TOMOELECTROMETER:	9 VDC@1.7 A. Use only with supplied supplied Globtek®, Inc. power supply model GTM21089-1509-T3

PRODUCT STANDARDS

TOMOELECTROMETER:	CE 0413, Externally certified IEC 60601-1, IEC 60601-1-2
WATER TANK:	CE 0413, Externally certified IEC 61010-1

QUICK AND ACCURATE
WIRE-FREE QA

Reliable and uncomplicated daily QA for linear accelerators and rotational systems

QA BEAMCHECKER™ PLUS

- **PATENTED SOFTWARE-FREE INTERFACE**

  The QA BeamChecker Plus can be used as a stand-alone unit to display a pass/fail indication for each energy via a large, brightly lit display, clearly visible from the patient monitor. Unlike other devices, the QA BeamChecker Plus does not require PC software to operate, making it an immediate, out of the box QA solution.

- **WIRELESS REAL TIME DATA COLLECTION**

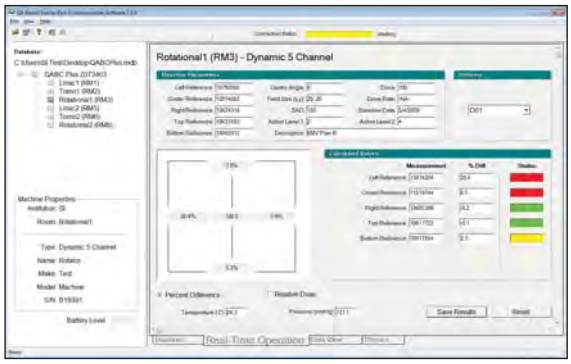
  The QA BeamChecker Plus is equipped with wireless data communication capabilities, automatically transferring measurements to the software in real time, allowing the user to view and analyze results immediately. Wireless communication means less clutter in the accelerator room, no cable replacement costs, and a safer work environment.

- **AUTOMATIC ENERGY DETECTION AND RESET**

  At beam delivery, the QA BeamChecker Plus automatically begins acquisition while simultaneously applying temperature and pressure correction, detecting the energy type, and determining beam constancy, flatness, and symmetry. The data is saved for later review, and the instrument is ready in under 10 seconds for the next energy.

- **NEW! HIGH DOSE RATE COMPATIBILITY**

  The QA BeamChecker Plus now features a better signal processing schema, eliminating any signal saturation and allowing for accurate analysis of beams delivered with high dose rates (up to 2400 MU/min), meeting the requirements for full use with flattening filter free, high does rate linear accelerators.



Dynamic 5 Channel Real-Time Operation

ORDERING INFORMATION

QA BEAMCHECKER™ PLUS **REF 90501**

Features

Reduced Trips into the Treatment Room

- Integrated build-up for all supported energies eliminates need to enter the vault between measurements and minimizes chances of error.
- Simply push a button and flip the device, the QA BeamChecker Plus switches between photon and electron modes automatically.

Real-Time Operation and Physics Modes

- As measurement occurs, Real-Time Operation Mode displays individual chamber readings along with percentage differences from baseline via software interface.
- Physics Mode enables the QA BeamChecker Plus to be used as a basic array of ion chambers and electrometers for research, experimentation, and other custom applications.

Dynamic Rotational Therapy QA

- With a combined dosimetric check, the 5 channel mode is ideal for rotational VMAT, IMAT, TomoTherapy, dynamic wedge checks or other custom tests.

Powerful Data Management

- Data can be trended, printed, signed off on and/or exported to a spreadsheet application.
- Store the QA BeamChecker Plus database on a network and access from any PC with the software installed.
- Daily QA for up to 9 treatment rooms can be performed with just one QA BeamChecker Plus.

Bluetooth® Wireless Option

- The optional Bluetooth Adapter Kit adds wireless communication for PC software functions including baseline and Real-Time operation modes.

QA BEAMCHECKER PLUS (REF 90501) SPECIFICATIONS

8 VENTED IONIZATION CHAMBERS, FULLY GUARDED

One center detector, Four quadrant detectors (7.5 cm from center), Three energy identification chambers

Chamber Volume	0.6 cm^3
Parallel Plate Separation	4.0 mm
Collection Electrode	1.39 cm diameter

INHERENT WATER-EQUIVALENT BUILDUP

Photons: 3.5 cm Electrons: 1.5 cm

SUPPORTED ENERGIES

Photons: ^{60}Co to 25 MV Electrons: 6 MeV to 25 MeV

MULTIPLE VAULT CAPABILITY

Up to 9 rooms, any combination of linear accelerator or Rotational systems

TEMPERATURE AND PRESSURE MEASUREMENT

Precision sensor on board, automatic compensation

DIMENSIONS (QABC Plus) *Height:* 6.15 cm, 2.42 in *Width:* 30.86 cm, 12.15 in *Length:* 40.64 cm, 16 in *Weight:* 5.0 kg, 11 lbs

DIMENSIONS (Power/Data Cradle) *Height:* 7.16 cm, 2.82 in *Width:* 10.16 cm, 4.0 in *Length:* 29.21 cm, 11.50 in *Weight:* 1.8 kg, 4 lbs

LIGHT FIELD ALIGNMENT 20 cm x 20 cm alignment grid for easy setup

TOMOTHERAPY ALIGNMENT

Three 2 mm embedded lead BBs, top, rear, side alignment marks

REAL TIME CLOCK Date and time stamp for all measurements

INTERNAL MEMORY Store 512 data points before transfer required

POWER/DATA CRADLE

Interface for battery charging and serial communications

Two 9 pin serial cables provided, 7.6 m (25 ft) and 33 m (100 ft)

POWER

Battery:	1.3 Ah SLA, approximately 4 hours continuous use
Charger Input:	90 - 240 VAC, 50-60 hz, IEC 60601-1 approved wall mounted power supply

SOFTWARE SPECIFICATIONS

Operating System	Microsoft® Windows® 8 Microsoft® Windows® 7 Microsoft® Windows® Vista *SP1 or higher*
Processor	Intel® or AMD®, 350 MHz or greater
Memory	256 MB or greater
Hard Drive	50 MB or greater
Screen resolution	1024 x 768 or greater

PERIPHERALS CD-ROM Drive, One available serial port

OPTIONS

Gantry Mount (REF 70500)

Additional Power/Data Cradle (REF 70502)

Serial to USB adapter (REF 70503)

Precision TomoTherapy Leveling Platform (REF 70505)

Bluetooth Adapter Kit (REF 70504)

EFFICIENT & RELIABLE **MACHINE QA**

Comprehensive beam verification and analysis

QA CROSSCHECKER

- **JUST ONE MEASUREMENT**

  Capture and analyze all your beam parameters with just a single beam delivery, allowing for quick and detailed measurements of constancy, flatness, symmetry and X,Y diagonals.

- **WATER PHANTOM FREE**

  Accuracy within 0.5% of a traditional water phantom, but none of the hassle.

- **OPTIMIZED DETECTOR LAYOUT**

  453 air-vented pixel ionization chambers with optimized geometry and 0.5 mm positioning allow for accurate machine QA, including dosimetric, mechanical, gating and MLC testing.

- **FAST AND EFFICIENT DESIGN**

  Seamless one-time setup of measurement geometry, queues, and analysis protocols.

ORDERING INFORMATION

QA CROSSCHECKER **REF 90550**

Features

Fast, Real-Time Measurements & Analysis

- Efficient execution of pre-defined queues and simultaneous measurement capability results in analysis of: field width and penumbra, flatness and wedge check, beam center, light-radiation field coincidence, dose output and energy verification.
- Full MLC test verification including positioning, picket fence and leaf speed.

Automated Archiving

- Automatic database storage ensures data integrity and enables advanced sorting, grouping, and filtering.

Customizable Interface

- Customizable measurement settings allow for creation of unique templates and data analysis with user-specified tolerances or reference measurements comparison.

Robust Reporting

- Automatically compare measurement sets of each energy with the reference values.
- Generate test reports based on chosen pass/fail criteria and reference values.
- Quickly print all measured and archived data.

Easy Data Collection & Comparison

- Easily compare data with dedicated trend analysis via the simplified yet comprehensive interface.
- Print single reports for all or individual measured parameters.
- Unique SQL database reporting allows for long term trending analysis.

Optional Gantry Holders & Build-Up Plates

- Easy to attach gantry holders enable precise and rigid mounting.
- Various build-up plates available for verification of all linac energies.

Optimized Data Collection

- 40 X 40 cm field measurement (with 76 cm SSD gantry mount).
- Parallel readout from independent electrometers.

Versatile Verification Plates

- Optional energy constancy verification plates allow for measurement of electron and photon beams.

QA CROSSCHECKER SPECIFICATIONS

Photons	^{60}Co to 25 MV
Electrons	4 to 22 MeV

ION CHAMBER

Diameter	3 mm
Height	4 mm
Volume	0.035 cm^3
In-plane Resolution	5 mm
Cross-plane Resolution	5 mm
Diagonal Resolution	7 mm

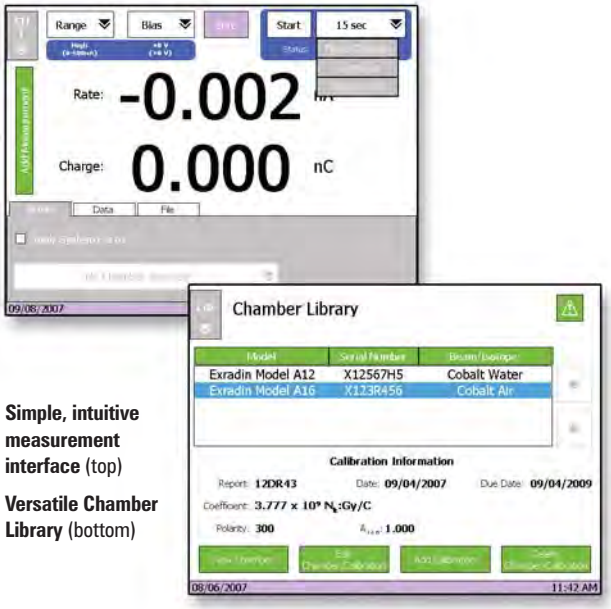
SOFTWARE SPECIFICATIONS

Operating system	Windows Vista® Windows® 7
Processor	Pentium® (or equivalent), 1.8 GHz or better
Memory	2 GB RAM or greater
Hard Drive	6 MB available, 40 GB for data archiving
Screen resolution	1024 x 768 or higher
Ports	Available Ethernet required

ADVANCED **DOSIMETRY**

A next generation, two channel, reference grade electrometer with an advanced, intuitive touchscreen interface, built-in chamber library for real-time dose and dose rate display, and 1 fA resolution

SUPERMAX ELECTROMETER



Simple, intuitive measurement interface (top)

Versatile Chamber Library (bottom)

COMPREHENSIVE BUILT-IN CHAMBER LIBRARY

A versatile chamber library is built into the SuperMAX interface, so no additional PC or software is necessary to apply system factor and temperature/pressure corrections. These factor applied measurements are even displayed in real-time side by side with raw measurement values for increased analysis capability. Over 100 different chambers and calibrations can be stored within the SuperMAX internal memory. Individual factors can be applied to either or both measurement channels.

TWO INDEPENDENT MEASUREMENT CHANNELS

The SuperMAX Electrometer features two measurement channels with independent control over range, bias voltage, and applied system factor. Both channels feature extensive range (0.001 pA to 500.0 nA, 0.001 pC to 999.9 µC) for use in a wide range of applications such as cross calibration between two chambers, isocenter versus off-axis and in-air versus in-water comparisons. The SuperMAX is designed to maximize flexibility encouraging the freedom to experiment with its measurement capabilities.

POWERFUL, YET EASY TO USE INTERFACE

The 6.4” color TFT display has a built-in touchscreen to make measurement control and data entry intuitive and enjoyable. Measurement values are shown with large type and corrected values are shown in a different color for easy viewing and confirmation of settings, even from a distance. An on-screen keypad and familiar pull down menus makes entry of settings such as bias voltage, threshold detection settings, and chamber library data nearly effortless.

Features

Versatile Charge Collection Modes

- Triggered collection with automatic start, stop, and saving of data
- Threshold detection levels programmable for both high and low range
- Timed collection from 1-600 seconds, set in 1 second increments
- Continuous Collection with manual start and stop
- Built-in speaker provides audible alert to completion of charge collection and other operations or system events

Measure with Confidence

- Ready in less than 2 minutes after power on; The SuperMAX has been designed to minimize warm up time and make a stable, repeatable measurement whenever called upon
- Designed to exceed AAPM, ADCL, and reference grade instrument specifications
- Reference class electrometer according to IEC 60731

Powerful Data Management

- Store up to 100 different chamber/system factors in the built-in chamber library, each with unique calibration
- Measurement data can be exported to .csv format as easily as saving a word processing document. The included USB flash drive can be used to transfer measurement data to a PC for further analysis.
- Create a database of sources and calculate projected source strength with the Check Source Utility

Superior Flexibility

- User-updatable software and firmware allows for future SuperMAX updates
- The adjustable handle accommodates comfortable operation and viewing angle if operator is sitting or standing

Applications

- External Beam IMRT
- LDR or HDR Brachytherapy
- Two channel operations such as cross calibration between two chambers, isocenter versus off-axis, and in-air versus in-water comparisons
- Any task where a high quality reference grade electrometer is required

SUPERMAX (REF 90018) SPECIFICATIONS

DISPLAY RANGE

RATE:	*Low Range* 0.001 pA – 500.0 pA, 1 fA resolution *High Range* 0.001 nA – 500.0 nA, 1 pA resolution
CHARGE:	*Low Range* 0.001 pC – 999.9 μC, 1 fC resolution *High Range* 0.001 nC – 999.9 μC, 1 pC resolution

CHARGE COLLECTIONS

TRIGGER:	Automatic start, stop, reset and save data based on user defined thresholds (*Start:* 0.2 – 9.9 pA; *Stop:* 0.1 – 9.8 pA)
TIMED:	User set duration (*Range:* 1 – 600 seconds; *Increment:* 1 second)
CONTINUOUS:	Unlimited duration with manual stop

REAL TIME CLOCK	Date and time stamp for all measurements for easy identification
INTERNAL MEMORY	Store preferences, >100 sources, >100 chamber/system factors
RANGE SWITCHING	User selectable — High or Low
REPEATABILITY	± 0.1% (IEC 60731 requirement: ± 0.5%)
LONG-TERM STABILITY	± 0.5% (over one year)
STABILIZATION TIME	± 0.1% (IEC 60731 requirement: ± 0.5% of value at 1 hr for measurements taken at 15 min and 6 hrs)
RESPONSE TIME	< 3 s on high range (IEC 60731 requirement: < 3 s) < 12 s on low range
NON-LINEARITY	± 0.25% (IEC 60731 requirement: ± 1.0%)

CONFORMITY	CE 93/42/EEC Reference class according to IEC 60731
ZERO DRIFT	± 0.25% of minimum effective scale reading (low/high : < ± 0.001pA/< ± 0.001nA) (IEC 60731 requirement: ± 0.5%)
ZERO SHIFT	± 0.25% of minimum effective scale reading (low/high : < ± 0.001pA/< ± 0.001nA) (IEC 60731 requirement: ± 0.5%)
DISPLAY	6.4" color TFT, touchscreen
INPUT	(2) BNC two lug, triaxial connector
BIAS VOLTAGE	Nominal ± 1000 volt bias
USER SETTINGS:	– 1000 to – 100, 0; 100 to 1000 (set in 1 volt increments)
ACCURACY:	± 0.3 volt
POWER	100-240 VAC, 0.5 A max, 50/60 Hz input to external power supply, 9 VDC, 1.7 A power supply output to electrometer input, UL/TUL listed power supply
ZEROING	Automatic zero function, user activated
OUTPUT	(2) USB ports
DIMENSIONS	*Height:* 8.1 cm, 3.2 in *Width:* 26.7 cm, 10.5 in *Length:* 21.1 cm, 8.3 in *Weight:* 2.5 kg, 5.45 lbs

OPTIONS

SuperMAX Accessory Kit (REF 72245)
Includes extra stylus, extra USB flash drive, and set of 5 extra screen protectors

SuperMAX Electrometer with TNC connector (REF 90018-C)

Specifications subject to change without notice.

ORDERING INFORMATION

SUPERMAX ELECTROMETER REF 90018

VERSATILE, ACCURATE

Reference grade instrument for use in all radiation therapy applications, such as external beam, diagnostic x-ray and mammographic x-ray, and brachytherapy including both low and high dose

MAX4000 PLUS ELECTROMETER

- **NEW LOOK, SAME ACCURATE MEASUREMENTS**

  The MAX 4000 Plus overall design and display has been redesigned for easier set-up and a clearer output of measurements and data.

- **LOW NOISE AND STABLE REPEATABILITY**

  A powerful digital microprocessor provides 0.1% repeatability and exceptionally low leakage of less than 1 fA. The built-in digital filter nearly eliminates the effects of noise, resulting in stable and precise measurements.

- **WIDE RANGE, SUPERIOR SENSITIVITY**

  0.001 pA to 500.00 nA rate range.

  0.01 pC to 999,999 nC charge range.

- **AUTOMATIC THRESHOLD DETECTION**

  Threshold detecting trigger mode automatically detects the start and stop of radiation exposure by measuring the current crossing predetermined limit thresholds allowing the flexibility required in clinical and research applications. Take sequential measurements without manual reset.

- **POWERFUL DATA MANAGEMENT**

  Connect the MAX 4000 Plus to a PC and use the included MAX COMM™ Software for fast, comprehensive control of dose and dose rate measurements, chamber libraries, remote operations, data logging, and many other advanced features.

Features and Benefits

Powerful Measurement Capabilities

- ***NEW!*** Updated timed charge collections for various increments
- Three collection modes: triggered with automatic start/stop, timed from 0-600 seconds, and continuous

Compatible with Standard Imaging Software

Use included MAX COMM Software or DV1D Software to:

- Automatic acquisition of a series of timed charge collections
- Perform basic beam profiling with continuous collection of rate measurement points over user defined intervals
- Export data in a Microsoft® Excel compatible format
- With MAX COMM Software, facilitate calculation of integrated dose and dose rate in Gy, Sv, R, Gy/min, Sv/hr, R/min, or Gym²/hr

External Beam, Stereotactic QA and More

- Quick measurements of small volume ion chambers, such as those used in IMRT or SBRT.
- Ideal for ion chambers typically used for data acquisition in water phantoms
- Great for mammographic, conventional radiology, and CT scanning applications, as well as health physics measurements

Simple, Intuitive Interface

- ***NEW!*** Simplified LCD display produces easy-to-read data
- ***NEW!*** Faster warm-up time from start up to acquisition
- Simultaneous display of amp, coulomb, and collection time minimizes the need to switch screens
- User activated, automatic zeroing function

Superior Bias Settings

- ***NEW!*** Compatible with large volume ionization chambers
- ***NEW!*** Additional bias levels for accurate determination of chamber correction factors
- Extended ± 0-450 VDC for TG-51 and 1/3 ratio IAEA TRS-398 measurements

Reference Class Confidence

- Designed to meet or exceed AAPM, ADCL, IEC 60731 reference grade instrument specification requirements

LDR or HDR Brachytherapy

- Exceptional sensitivity with quick measurements of low activity isotopes
- 0.27 mCi iodine seed, measured in the HDR 1000 Plus Well Chamber, gives a typical signal of 1.458 pA
- Also measures 10 Ci and higher iridium sources

MAX 4000 PLUS (REF 90015) SPECIFICATIONS

DISPLAY RANGE

Rate:	*Low Range* 0.001 pA – 1000.0 pA, 1 fA resolution *High Range* 0.001 nA – 500.0 nA, 1 pA resolution
Charge:	*Low Range* 0.01 pC – 999,999 nC, 10 fC resolution *High Range* 0.01 nC – 999,999 nC, 10 pC resolution

CHARGE COLLECTIONS

Trigger:	Automatic start, stop, reset based on user defined thresholds (Start: 0.2 – 9.9 pA; Stop: 0.1 – 9.8 pA)
Timed:	User set duration options will increase 1-10 (1sec increments) 15-120 (15sec increments); 120-600 (60sec increments)
Continuous:	Unlimited duration with manual stop

Range Switching	User selectable — High or Low
Display	Backlit LCD, 2x20 with 5/16"characters
Input	BNC two lug, triaxial connector
Bias Voltage User Settings	Nominal ± 450 volt bias -450 to -100, 0, 100 to 450 (Ranges in 50 Volt Increments)
Power	100-240 VAC, 0.5 A max, 50/60 Hz input to external power supply, 9 VDC, 1.7 A power supply output to electrometer input, UL/TUL listed power supply; internal, user replaceable battery: 8 hrs per charge
Zeroing	Automatic zero function, user activated
Output	Isolated RS-232; compatible with Argus QC4 or user provided software

DIMENSIONS *Height:* 7.9 cm, 3.1 in *Width:* 22.6 cm, 8.9 in
Length: 24.8 cm, 9.8 in *Weight:* 1.7 kg, 3.8 lbs

PERFORMANCE SPECS

RESOLUTION	High Range: 0.001nA Low Range: 0.001pA	IEC 60731 (Reference Class) requirement: ± 0.25%
MEASURING RANGE	High Range: 0.400 nA – 500.0 nA	Low Range: 0.400 pA – 1000.0 pA
MEASURING RANGE (CHARGE)	High Range: 0.400 nC – 999,999 nC Low Range: 0.400 pC – 999,999 nC	
REPEATABILITY	± 0.1%	IEC 60731 requirement: ± 0.5%
LONG-TERM STABILITY	± 0.5%	over one year
STABILIZATION TIME	± 0.5%	IEC 60731 requirement: ± 0.5% of value at 1 hr for measurements taken at 15 min and 6 hrs
ZERO DRIFT	High Range: < ± 0.1% Low Range: < ± 0.25%	IEC 60731 requirement: ± 0.5%
ZERO SHIFT	High Range: < ± 0.1% Low Range: < ± 0.25%	IEC 60731 requirement: ± 0.5%
NON-LINEARITY	± 0.2%	IEC 60731 requirement: ± 1.0%
RESPONSE TIME	High Range Rate: 3 s Low Range Rate: 15 s	All Ranges Charge: < 0.5 s

OPTIONS

MAX-Comm Software
MAX4000+ Electrometer with TNC connector (REF 90015-C)

CONFORMITY CE 93/42/EEC Reference class according to IEC 60731

Specifications subject to change without notice.

ORDERING INFORMATION

MAX 4000 ELECTROMETER REF 90015

VERSATILE, **AFFORDABLE**

The compact, stable, lightweight and easily transported CDX 2000B has wide amp and coulomb ranges for both external beam dosimetry measurements and precise HDR brachytherapy calibrations

CDX 2000B ELECTROMETER

NEW! EXTENDED RANGE FOR MANY APPLICATIONS

The wide range of the CDX 2000B (0.01 nA - 500.00 nA) makes it an excellent instrument for external beam, absolute dosimetry measurements with standard Farmer-type and parallel plate ion chambers. It is also reliable and precise for high dose rate brachytherapy applications.

LOW NOISE AND STABLE REPEATABILITY

A powerful digital microprocessor provides 0.1% repeatability and exceptionally low leakage of less than 5 fA. The built-in digital filter nearly eliminates the effects of noise, resulting in stable and exact measurements.

EASY TO USE WITH CONVENIENT FEATURES

Control operations with a fast, push button interface. With user activated zeroing, just press a button and it is ready to measure. The CDX 2000B operates off a rechargeable battery for up to 8 hours of continuous use.

NEW! ENHANCED BIAS SELECTION

The CDX 2000B allows a wide assortment of bias settings for performing both TG-51 and now TRS-398 measurements with support for 1/3 bias ratio settings. Apply (+/-) 450, 300, or 150 VDC to your chamber of choice with no external bias supply required.

Features

Unique Timing Capabilities

- The unique timing feature is ideally suited for HDR brachytherapy calibration measurements. The CDX 2000B can capture charge for a selected amount of time during an exposure, thereby eliminating end effects or other variable portions of an exposure.

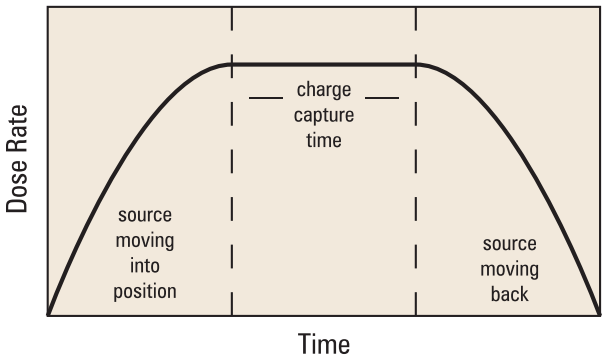
  This timed collection application is useful during the measurement of high dose rate brachytherapy sources, allowing the measurement of charge only during the time the source is in place and the rate is constant.

Simple, Intuitive Interface

- Large, easy to read LCD display is visible from a distance and in low light
- Simultaneous display of amp, coulomb, and collection time minimizes the need to switch screens
- User activated, automatic zeroing function

Measure with Confidence

- Designed to exceed AAPM, ADCL and reference grade instrument specifications
- Designed to meet or exceed requirements of IEC 60731 for reference grade instruments



CDX 2000B (REF 90001) SPECIFICATIONS

THREE MODES

RATE:	0.01 nA – 500.00 nA
CHARGE:	0.01 nC – 999,999 nC
COMBINED:	Accumulated charge and current are displayed simultaneously

CHARGE COLLECTIONS

TIMED:	User set duration (*Range:* 0 – 600 seconds; *Increment:* 15 seconds; *Resolution:* 1 second)
CONTINUOUS:	Unlimited duration with manual stop

REPEATABILITY

SHORT TERM:	± 0.1% ± 1 count
LONG TERM:	± 0.2% (maximum change over two years)
SIGNAL SETTLING TIME (typ):	1 sec.

LINEARITY ± 0.06% typical

CONFORMITY CE 93/42/EEC

ZERO DRIFT < 5 fA @ STP

DISPLAY LCD, 2 x 20 with 5/16" characters

INPUT BNC two lug, triaxial connector

BIAS VOLTAGE Nominal ± 450 volt bias

5 USER SETTINGS: – 450, – 300, – 150, 0; 150, 300, 450 (VDC)

ACCURACY: ± 0.3 volt

POWER 100-240 VAC, 0.5 A max, 50/60 Hz input to external power supply, 9 VDC, 1.7 A power supply output to electrometer input, UL/TUL listed power supply; internal battery: 8 hrs per charge

ZEROING Automatic zero function, user activated

DIMENSIONS *Height:* 2.75 in, 7 cm *Width:* 8.24 in, 22.2 cm *Length:* 9 in, 23 cm *Weight:* 3.0 lbs, 1.4 kg

Specifications subject to change without notice.

ORDERING INFORMATION

CDX 2000B ELECTROMETER REF 90001

Confidence in **Brachytherapy Source Calibration**

The top 50 cancer centers in the United States chose Standard Imaging instruments for precise high-dose rate, low-dose rate and intravascular brachytherapy calibrations – **FIND OUT WHY.**

**from US News and World Report*

Why perform independent verification?

- AAPM TG-56, TG-40 and TRS-398 recommend independent verification of source strengths.
- Without independent calibration, centers in the U.S. may miss out on reimbursement income.

HDR 1000 PLUS WELL CHAMBER

- Validated in over 50 scientific presentations and trusted by radiation standards laboratories worldwide.
- The HDR 1000 Plus Well Chamber is an air-communicating chamber, so there is no inaccuracy due to undetected gas leaks.

IVB 1000 WELL CHAMBER

The IVB 1000 Well Chamber has an active length four times longer than the HDR 1000 Plus, making it ideal for long source trains.

HDR 1000 Plus Well Chamber

IVB 1000 Well Chamber

High Dose Rate

HDR Iridium Sources

The high dose rate iridium source holder has a rubber O-ring that prevents catheter movement. Calibration is easy, requiring a fraction of the time of thimble ion chamber techniques.

HDR REF 70010
IVB REF 70044

HDR ^{192}Ir Quality Assurance Tool

Perform crucial tests of ^{192}Ir sources, including source positioning (within 0.3mm), timer accuracy and consistency of source activity.

HDR REF 70008

Nucletron microSelectron HDR Sources

Connects directly to the couple of the HDR Irradiator for output measurements with the Nucletron system.

HDR REF 72280

BEBIG Co-60 and Ir-192 Afterloader

For use with the BEBIG Remote Afterloader source catheters.

HDR REF 70110

Cesium Sources

Commonly used with manually loaded cesium sources, this source holder has a 5.0 mm diameter opening. The spacer for positioning the cesium source is removable for use with longer cesium sources and larger HDR ^{192}Ir catheters.

HDR REF 70020
IVB REF 70045

Cesium Remote Afterloading Sources

Designed for use with LDR remote after-loading treatment systems, this source holder has a 7.1 mm diameter opening. There is no spacer because the after-loading system positions the source.

HDR REF 70003
IVB REF 70046

Leipzig Applicator

Perform output verification of the Leipzig HDR applicators used with microSelectron - HDR "Classic" and v2 afterloaders.

HDR REF 70031
IVB REF 70031

Syringe Holders

Quick, convenient measurements of METASTRON® ^{89}Sr, ^{153}Sm, ^{88}Ra and ^{131}I vials and most liquids in a 5cc or 10cc syringe. Includes one 5cc syringe and one 10cc syringe.

HDR REF 70026
IVB REF 70026

Low Dose Rate

Single LDR Seed Sources

1.2 mm inner diameter tube positions individual iodine, palladium, iridium or gold seeds at the most sensitive area of the well chamber.

HDR REF 70016
IVB REF 70043

Mick® Cartridge Sources

The Mick® Cartridge source holder provides a consistency check of seed activity. A source holder positions the cartridge for a quick, reproducible measurement.

HDR REF 70024
IVB REF 70047

Bard QuickLink/MICK

Measure the source output strength of seeds within the QuickLink or MICK cartridge pack, without removing the sterile packaging.

HDR REF 72307

Seed Batch Assay Tool

Multiple measurements for up to 500 iodine or palladium seeds.

HDR REF 70022

RAPID Strand® Iodine Seed Sources

The RAPID Strand® iodine seed source holder provides a convenient, sterile method to perform a quality assurance measurement of the I-125 RAPID Strand®.

HDR REF 70023
IVB REF 70048

Nucletron selectSeed™ Sources

The Nucletron seedSelectron™ centers a source in the active area of the HDR 1000 Plus Well Chamber.

HDR REF 70030

Preloaded Needle Sources

- Facilitates calibration and visual verification of a sterilized needle filled with seeds and spacers.
- A universal luer lock offers seamless integration from seeds to the needle.

IVB REF 70051

Iridium Pin

Repeatable QA measurements with three different sized iridium wire pins such as models IRF-1, IRF-2, IREC-2 and IREL-2.

HDR REF 70095

LDR Iridium Sources

Position sources in the active area of the HDR 1000 Plus and IVB 1000 Well Chamber for measurement.

IVB REF 70009

Source Holder Product Matrix

Source Holder	HDR REF	IVB REF	Isotope	ADCL Calibration available
HDR Iridium Sources	70010	70044	HDR Iridium	Yes
HDR ^{192}Ir Quality Assurance Tool	70008		HDR Iridium	No
BEBIG Co-60 and Ir-192 Afterloader	70110		Co-60/ HDR Iridium	SSDL
Cesium Sources [5mm]	70020	70045	Cesium	Yes
Cesium Remote Afterloading Sources [7.1mm]	70003	70046	Cesium	Yes
Nucletron microSelectron HDR Sources	72280		Iodine	Yes
Leipzig Applicator	70031	70031	HDR Iridium	No
Syringe Holders	70026	70026	Metastron, ^{89}Sr, ^{153}Sm, ^{131}I, ^{223}Ra	No
Preloaded Needle Sources		70051	Iodine, Palladium	No
RAPID Strand® Iodine Seed Sources	70023	70048	Iodine	No
Nucletron selectSeed™ Sources	70030		Iodine	Yes
Single LDR Seed Sources	70016	70043	Iridium, Iodine, Palladium	Yes
Iridium Pin	70095		Iridium	Yes
Seed Batch Assay Tool	70022		Iodine, Palladium	No
LDR Iridium Sources	70009		LDR Iridium	Yes
Mick® Cartridge Sources	70024	70047	Iodine, Palladium	No
Bard QuickLink/MICK	72307		Iodine, Palladium	No
Xoft Electronic Brachytherapy	70088		Electronic	Yes
Novoste		70036	^{90}Sr/^{90}Y	Yes
X-Ray Contamination Test Tool		70042	90Sr/90Y	No
Imagyn isosleeve		70050	Iodine, Palladium	No

NOTE: One source holder may have several calibrations associated with it. For example, a source holder for Single LDR Seeds (REF 70016 and 70043) may have calibrations for iodine, palladium and LDR iridium.

HDR 1000 PLUS WELL CHAMBER (REF 90008) SPECIFICATIONS

ADCL CALIBRATIONS HDR ^{192}Ir and/or LDR radionuclides from various manufacturers as requested

ACTIVE VOLUME 245 cm^3

CONNECTOR Two lug triax BNC (standard)
TNC, Type M, or BNC + Banana (optional)

RANGE 10 U to 80 MU 0.01 mCi to 20 Ci

CABLE 3 ft, 1 m

BIAS VOLTAGE ± 300 volts, typical

LEAKAGE Less than 50 fA

STABILITY 0.2% (Reproducibility over 2 years)

RESPONSE ± 0.5% over 25 mm at center of axis

SENSITIVITY

SOURCE	Current to Air Kerma Strength (U=1uGym^2/h)	Current to Apparent Activity
HDR Iridium:	2.1 pA/U	8.6 nA/Ci
Cesium:	2.0 pA/U	5.6 nA/Ci
LDR Iridium:	2.3 pA/U	9.1 nA/Ci
Iodine:	4.3 pA/U	5.4 nA/Ci
Palladium:	2.1 pA/U	2.4 nA/Ci

A_{ion} 0.9996, typical

ACCESSORIES Case (REF 50004)
Wall mount accessory (REF 70007)
(5) Interlocking 1" lead rings (REF 70125)
Carrying case for any Comprehensive Calibration System (REF 70012)

DIMENSIONS *Height:* 6.1 in, 15.6 cm *Insert Diameter:* 1.4 in, 3.5 cm
Diameter: 4 in, 10.2 cm *Insert Height:* 4.8 in, 12.1 cm
Weight: 6.1 lbs, 2.7 kg

Specifications subject to change without notice.

IVB 1000 WELL CHAMBER (REF 90009) SPECIFICATIONS

ACTIVE VOLUME 475 cm^3

CONNECTOR Two lug triax BNC (standard)
TNC, Type M, or BNC + Banana (optional)

RANGE 10 U to 80 MU 0.01 mCi to 20 Ci

CABLE 3 ft, 1 m

BIAS VOLTAGE ± 300 volts, typical

LEAKAGE Less than 50 fA

STABILITY 0.2% (Reproducibility over 2 years)

RESPONSE ± 0.3% over 100 mm at center of axis, typical

SENSITIVITY

SOURCE	Current to Air Kerma Strength (U=1uGym^2/h)	Current to Apparent Activity
HDR Iridium:	2.2 pA/U	9.0 nA/Ci
Cesium:	2.1 pA/U	5.9 nA/Ci
LDR Iridium:	2.4 pA/U	9.5 nA/Ci
Iodine:	4.3 pA/U	5.5 nA/Ci
Palladium:	2.3 pA/U	2.6 nA/Ci

Approx. 38.5 nA/Gy/s for ^{90}Sr/^{90}Y

ACCESSORIES Case (REF 50026) included
(4) Interlocking 1" lead rings (REF 70025)
Carrying case for Comprehensive Calibration System (REF 70012)

DIMENSIONS *Height:* 10.2 in, 25.9 cm *Insert Diameter:* 1.4 in, 3.5 cm
Diameter: 4 in, 10.2 cm *Insert Height:* 8.8 in, 22.4 cm
Weight: 8.0 lbs, 3.6 kg

Specifications subject to change without notice.

PROSTATE **BRACHYTHERAPY**

Convenient, efficient instruments that facilitate Brachytherapy seed handling; from sorting, transporting, sterilizing, and storage

SEED SLIDER LOADING SYSTEM

SEED SLIDER

MOST EFFICIENT INSTRUMENT FOR LOADING SEEDS AND SPACERS

The Seed Slider is specifically designed to be the most efficient instrument for loading seeds and spacers into prostate implant needles. Clinicians align the seeds and spacers into a slot per treatment prescription and encapsulate the seeds and spacers using a cover. The needles lock onto one side of the Seed Slider with a Luer-Lok® and a needle stylet is inserted to smoothly push the seeds and spacers into the treatment needle. The Seed Slider when used with the Seed Sterilization and Sorting Tray can be sterilized together saving time and effort.

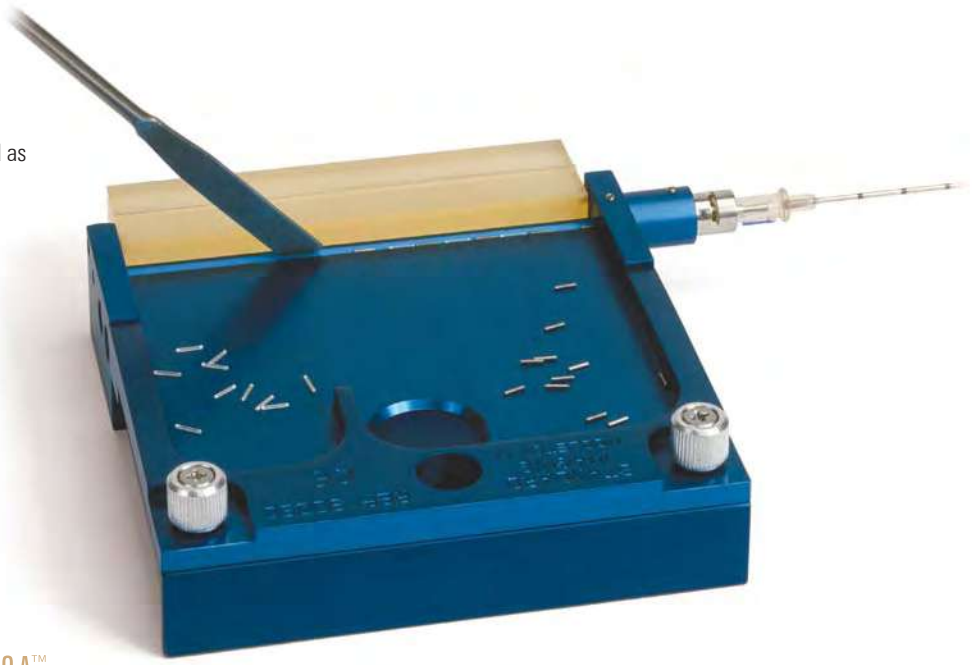
Features

- Minimize the risk of dropping seeds
- View and verify seeds and spacers easily on the loading slot to confirm positioning before loading into needles
- Lock needles onto one side of the Seed Slider with a Universal Luer-Lok®
- Universal Luer-Lok® is adjustable to fit implant needles
- Combine the Seed Sterilization and Sorting Tray with the Seed Slider for protection from radiation. Store seeds inside the tray and access as needed
- Simply take seeds out of the tray wells and slide into position using the provided spatula
- Fast loading … 25 needles in about 8 minutes

ORDERING INFORMATION

SEED SLIDER **REF 90090**

The Seed Slider can be used as a stand alone instrument



Components of the Seed Sterilization and Sorting Tray:
Sorting Tray bottom, **Loading Cover** center,
Sterilization Cover on left,
Shielding Cover *(optional, REF 72012)* on right

SEED STERILIZATION & SORTING TRAY

FACILITATES SEED STERILIZATION

Sterilization of LDR Brachytherapy seeds is necessary before patient treatment. The Seed Sterilization and Sorting Tray is designed to allow clinicians to sort seeds into ten separate wells, 0.4 inches deep and 0.63 inches in diameter, according to source strength. Each well is stamped with a number for identification and can easily hold 10 to 20 seeds. The Seed Sterilization and Sorting Tray is 6.3 inches in diameter and fits easily into all autoclaves. One typical drying cycle completely dries the seeds before the tray is removed from the autoclave. Other seed storage devices may leave seeds wet, making them more difficult to handle.

REDUCES RADIATION EXPOSURE

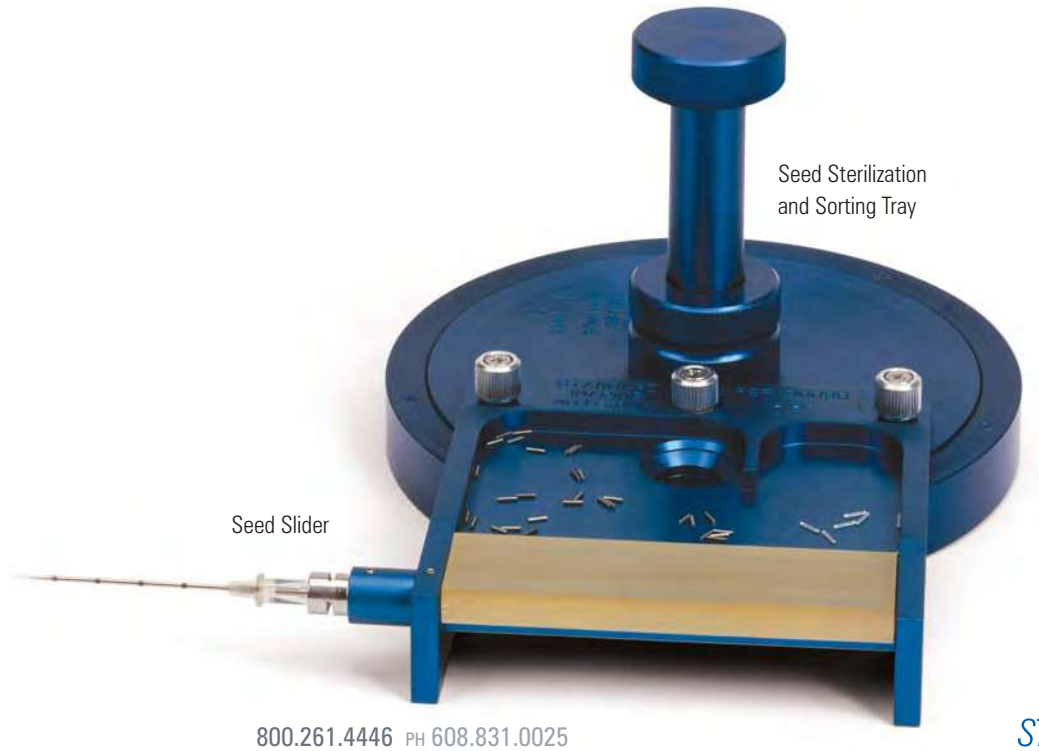
Before and after seed sterilization the 3/16" aluminum loading cover of the Seed Sterilization and Sorting Tray is locked down over the wells to shield clinicians from radiation. The loading cover has one hole in it and can be rotated so the hole is positioned over one well at a time. During use, seeds from only that well are exposed while being loaded into the treatment system. The un-exposed wells are then shielded to prevent exposure from the wells not being used. The hole can also be positioned between two wells to prevent any exposure from LDR seeds in the wells. The loading cover can be locked in place to prevent spilling seeds while transporting them.

Features

- Stores seeds in 10 different wells while shielding the operator from radiation
- Loading Cover exposes one well at a time or covers all wells
- Combine the Seed Sterilization and Sorting Tray with the Seed Slider and Seed Alignment Tray to speed up the needle loading process, while minimizing seed handling and exposure
- Sterilization cover secures seeds during sterilization
- The autoclave dries seeds completely in one cycle
- Optional Shielding Cover, REF 72012, locks in place to secure seeds in wells and helps prevent spilled seeds during transport

ORDERING INFORMATION

SEED STERILIZATION & SORTING TRAY **REF 90085**



Seed Sterilization and Sorting Tray

Seed Slider

Seeds in the tray well

COMPLETE SOLUTIONS

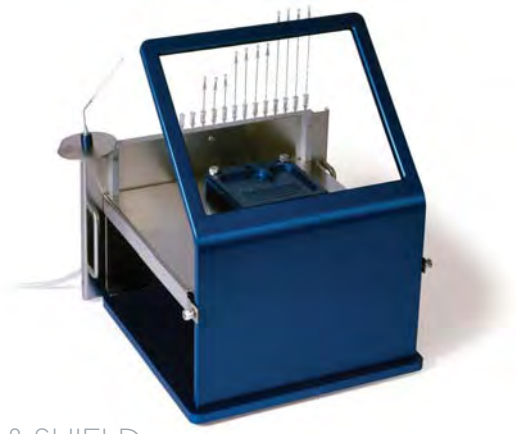
Comprehensive selection of instruments for prostate implant programs

SEED HANDLING & NEEDLE LOADING INSTRUMENTS

NEEDLE LOADING PLATFORM & SHIELD WITH VERTICAL NEEDLE HOLDER

CONVENIENT, ERGONOMIC WORK STATION

The Needle Loading Platform and Shield with Vertical Needle Holder provides a convenient work station for loading, counting and handling seeds prior to loading needles. Its ergonomic design brings work up to a comfortable seated level, limiting movement and translates into more efficiency in the needle loading procedure, saving time. When used as a complete system, the Needle Loading Platform and Shield with Vertical Needle Holder creates a radiation shielded work environment.



ORDERING INFORMATION

NEEDLE LOADING PLATFORM & SHIELD WITH VERTICAL NEEDLE HOLDER **REF 90072**

NEEDLE LOADING SHIELD

SUPERIOR RADIATION PROTECTION

The Needle Loading Shield is designed to shield clinicians from radiation exposure while loading prostate implant needles with iodine or palladium seeds. The shield is constructed of 3/8 inch aluminum and ¼ inch, 0.56 mm Pd equivalent leaded glass, which equals 22 HVL of protection for iodine seeds. For 100 iodine seeds at 0.4 mCi, exposure behind the glass is reduced to 6.4 x 10-15 R/h. For 100 iodine seeds at 1.0 mCi, exposure behind the glass is reduced to 1.6 x 10-14 R/h. The Needle Loading Shield is also available as a component in the Needle Loading Platform and Shield with Vertical Needle Holder system.

Features

- 11 inch wide shield allows protection to head and torso, allowing you to work comfortably around it
- Lead glass window measure 10 x 8 inches
- The upright component is removable for storage

ORDERING INFORMATION

NEEDLE LOADING SHIELD **REF 90070**

SEEDVAC

SIGNIFICANTLY REDUCES RADIATION EXPOSURE

SeedVac™ is a vacuum driven instrument designed to pull prostate implant seeds and spacers into a clear tube tip. Seeds are drawn into the tube tip by placing a finger over the hole on the hand piece to create a vacuum. The prescribed sequence of seeds and spacers is visually verified in the tube tip before being placed into the needle. Seeds and spacers are then placed into an implant needle simply by lifting the finger off of the hole. A circular brass shield near the end of the hand piece provides radiation protection to the hand during the loading procedure. Components can be steam sterilized between each use.

Features

- Fast loading, 25 needles in about 5 minutes
- Minimal radiation exposure, maximum distance from seeds
- Works like a vacuum tweezers

ORDERING INFORMATION

SEEDVAC **REF 90091**

VERTICAL NEEDLE HOLDER

FACILITATES NEEDLE LOADING PROCESS

The Vertical Needle Holder holds low dose rate Brachytherapy needles in place for loading and provides 1/16 inch stainless steel shielding for loaded needles. When stored in the Needle Holder, needles are already positioned for an autoradiograph to verify and document the loading sequence. The Vertical Needle Holder is also available as a component in the Needle Loading Platform and Shield with Vertical Needle Holder system.

Features

- Vertical Needle Holder conveniently positions 20 needles in numbered positions for easy loading
- Needle tips are not in danger of blunting as needles are suspended in the Needle Holder
- Using any L-block shield, the Needle Holder can be used as stand alone device for storing loaded needles

ORDERING INFORMATION

VERTICAL NEEDLE HOLDER **REF 90073**

SEED ALIGNMENT TRAY

REDUCE RADIATION EXPOSURE

The Seed Alignment Tray is used with the SeedVac™ to conveniently load LDR brachytherapy needles and reduce radiation exposure to clinicians. The Seed Alignment Tray can be used alone or fitted to the Seed Sterilization and Sorting Tray.

Features

- Six grooves are provided to align seeds in one direction for easy pickup with SeedVac™
- Uniform seed alignment helps reduce arm movement and speeds the needle loading process
- The Seed Alignment Tray can be combined with the Seed Sterilization and Sorting Tray for protection from radiation
- Seeds are simply transferred out of the tray wells and slid into position using the provided spatula and reverse action tweezers

ORDERING INFORMATION

SEED ALIGNMENT TRAY **REF 90089**

SEED HANDLING & NEEDLE LOADING INSTRUMENTS

continued

NEEDLE CRADLE

SECURE, SHIELDED STORAGE FOR PROSTATE IMPLANT NEEDLES

The Needle Cradle consists of eleven rows and thirteen columns for holding loaded low dose rate prostate implant needles. A light weight, stainless steel needle guard slips over the needle cradle shielding clinicians from radiation exposure and prevents bumping of needle stylets.

Features

- Eleven horizontal rows provide more space for difficult cases or large prostates
- Fully enclosed design means complete shielding from radiation
- Needle guard minimizes space requirements, facilitates handling, and provides a sturdy work area
- Needle cradle can be used to store needles horizontally or vertically

ORDERING INFORMATION

SEED SLIDER **REF 90095**

SEED SENSOR

POINT SOURCE RADIATION MONITOR FOR FINDING LOST SEEDS

The Seed Sensor™ radiation monitor is highly collimated so the detector can locate a loose seed in a needle loading work area. The detecting area is as directional as a flashlight which helps quickly identify the position of a lost seed on a table or in a room. Other survey meters are typically unable to locate a small, implant seed because they are not designed to be directional.

The Seed Sensor™ is shielded to resist extraneous radiation and to reduce background radiation, so it is very useful in detecting sources in areas where other radioactive sources are located.

Features

- Ideal for quick survey of implant rooms and needle loading stations
- Sensitive to 50 cm for the lowest energy prostate implant sources
- Palm sized, fits easily into a lab coat pocket, 1.25 x 3.25 x 6.25 inches
- Geiger-Mueller tube detector
- Acitivity: a 1 mCi palladium seed can be detected at 100 cm
- A 41 cm diameter field is covered at a 100 cm distance
- Powered by one alkaline 9 VDC battery, estimated life is 20 hours

ORDERING INFORMATION

SEED SENSOR **REF 90065**

LEAD SEED POUCH KIT

SAFELY ADDRESS PATIENT SEED HANDLING CONCERNS

Following LDR iodine and palladium seed implantation for prostate cancer, patients may pass seeds after they leave a medical center. The Protective Lead Seed Pouch Kit is a simple yet effective way to address seed handling issues and patient concerns following LDR brachytherapy treatment. For the convenience and protection of patients, the kit provides supplies for radioactive seed collection, a plastic vial to hold them, and a convenient 0.2 mm lead equivalent lined pouch for transporting the vial back to the institution. Protective Lead Seed Pouch Kits are reimbursable using CPT code 99070 and satisfy the NRC regulations for proper disposal of LDR brachytherapy seeds.

ORDERING INFORMATION

LEAD SEED POUCH KIT **REF 90080**

SEED STERILIZATION PILL BOX

FACILITATES SEED STERILIZATION

The Seed Sterilization Pill Box is designed to allow sterilization of a large number of iodine or palladium seeds at one time. The Seed Sterilization Pill Box includes a bottom well to hold the seeds, a screen to place over the seeds during sterilization, and a cover which can be locked in place during transport. The solid construction assures stability and maximum shielding during handling. Inner rounded corners keep seeds positioned for easy removal.

Features

- Solid stainless steel construction assures stability
- Cover can be secured for safe handling while transporting seeds
- Rounded inner corners keep seeds positioned for easy removal
- Fully autoclavable; steam autoclave only

ORDERING INFORMATION

SEED STERILIZATION PILL BOX **REF 90086**

MICK MAGAZINE STERILIZER

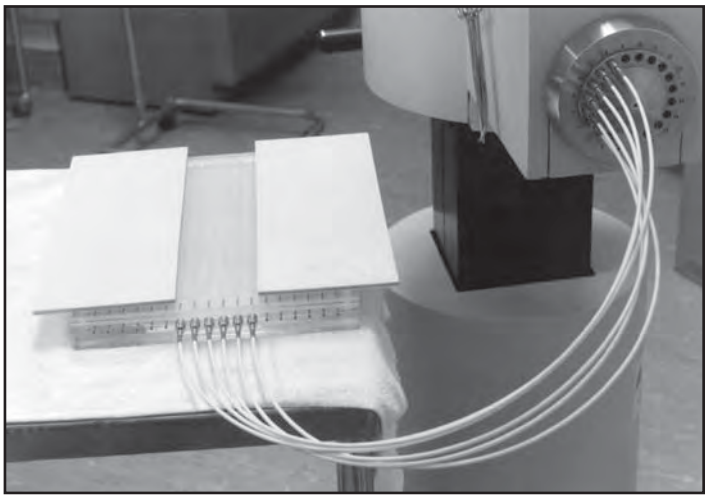
FACILITATES SEED STERILIZATION

The Mick® Magazine Sterilizer easily accommodates 12 loaded Mick® Magazines and offers more convenient handling than lead shipping containers. The magazines are secured during transportation, sterilization, and the drying cycle. Thick aluminum walls provide maximum shielding and a vent at the base of each well allows the water to drain so that magazines are completely dried in one drying cycle.

ORDERING INFORMATION

MICK MAGAZINE STERILIZER **REF 90087**

FOR HDR AND LDR **BRACHYTHERAPY**



Developed by Robert Luthmann, PhD
Atlantic Beach, FL
The Luthmann QA Tool in position for advancement of the HDR source.

LUTHMANN QA TOOL

FOR HDR QUALITY ASSURANCE

Accurate positioning of the HDR ^{192}IR- source is essential for proper treatment. The Luthmann Source Positioning QA Tool has been developed to perform required quality assurance checks for your HDR unit.

- Determine the distance to the most distal position.
- Verify the accuracy of HDR unit's stepping motor in positioning the source for up to 18 channels at one time.
- Perform quick, daily constancy checks of source positioning by the HDR unit.
- Verify accuracy of the stepping motor in positioning the source at dwell positions in each channel.
- Eliminate the need for expensive and cumbersome video camera and monitor.
- Provide excellent hard copy documentation for QA files.

FOR LDR QUALITY ASSURANCE TESTS OF RIBBON ISOTOPES

Upon receipt of LDR sources, the following quality assurance tests are useful to verify the integrity of your LDR sources.

- Confirm the relative uniformity of sources.
- Verify custom loading of ribbons.
- Visual verification of source spacing.
- Provide excellent hard copy documentation for QA files.

For HDR QA

Test One
Performed Upon System Acceptance and After Source Changes

Purpose: The purpose of this test is to:

1. Determine the distance from the HDR unit to the most distal position of the source.
2. Verify accuracy of the stepping motor in positioning the source at various dwell positions in each channel.
3. Verify the integrity of each of the localization dummies used clinically for HDR source position localization.

Frequency: Test One is performed at the time of machine acceptance, after source change and at specific intervals as a QA check to verify the integrity of each localization dummy.

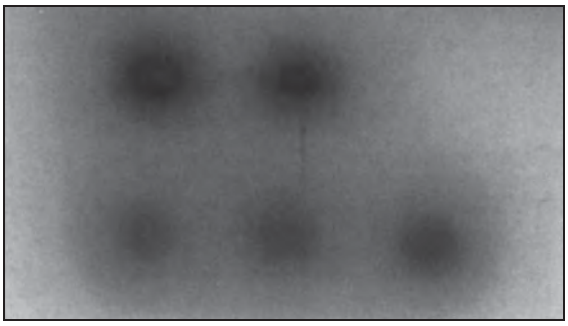
Test Two,
Periodic Quality Assurance Tests

Purpose: The purpose of this test is to act as a constancy check for the three parameters in Test One.

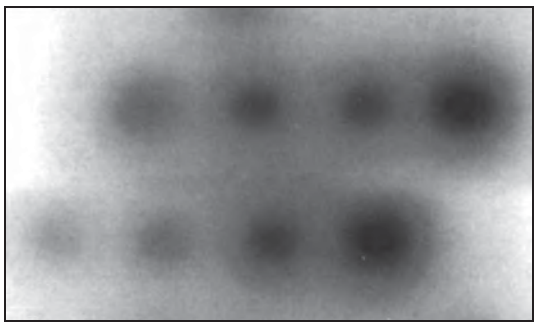
Frequency: Test Two is performed on a daily basis before the HDR unit is used clinically for patient treatment.

For LDR QA

The Luthmann Source Positioning QA Tool provides for an autoradiograph of the sources and visual inspection of the spacing of ribbon seeds. The ribbons with multiple seeds are placed in the channels for the autoradiograph. Steel rulers placed along the outer two channels can be used for visual verification.



Autoradiograph showing relative uniformity of sources.



Autoradiograph confirming custom loading of sources.

LUTHMANN QA TOOL (REF 90011) SPECIFICATIONS

TOOL DIMENSIONS

Height:	*2.7 cm (1.06 in)*	*Width:*	*22.2 cm (8.75 in)*
Length:	*32.4 cm (12.75 in)*	*Weight:*	*1.8 kg (4 lbs)*

LEAD BLOCKER DIMENSIONS

Height:	*0.32 cm (0.125 in)*	*Width:*	*10.16 cm (4 in)*
Length:	*30.48 cm (12 in)*	*Weight:*	*1.4 kg (3 lbs)*

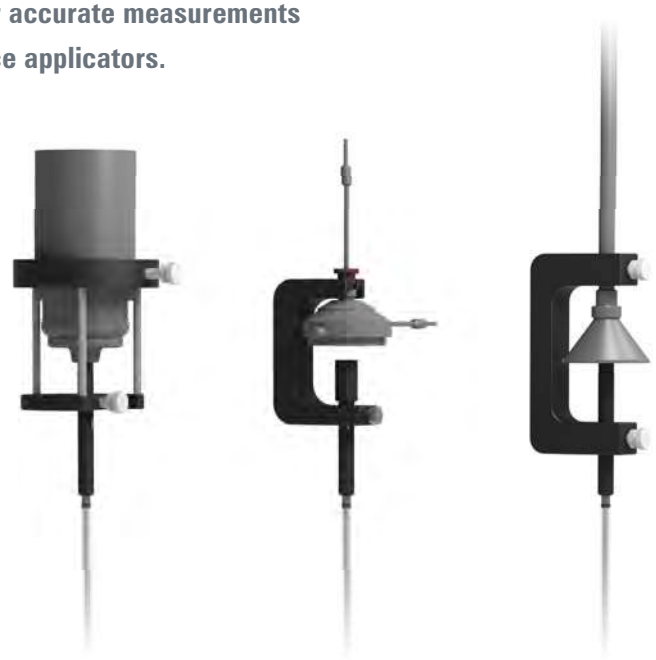
Specifications subject to change without notice.

ORDERING INFORMATION

LUTHMANN QA TOOL REF 90011

VERSATILE, COMPREHENSIVE

Securely position the Exradin A20 end-window parallel plate ionization chamber for accurate measurements with various types of surface applicators.



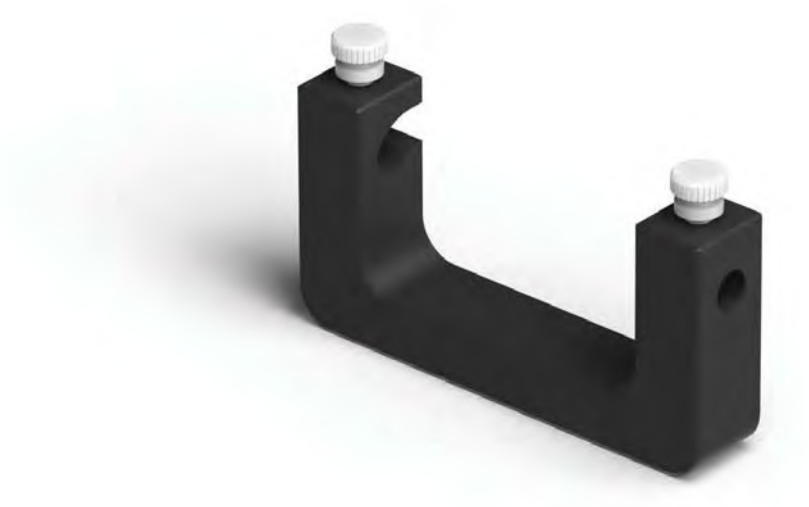
SUPERFICIAL CHAMBER HOLDERS

Varian Surface Applicator Fixture

Chamber and applicator holder accommodates both the horizontal and vertical type solid conical surface applicators available from Varian.

ORDERING INFORMATION

VARIAN SURFACE APPLICATOR FIXTURE **REF 71737**

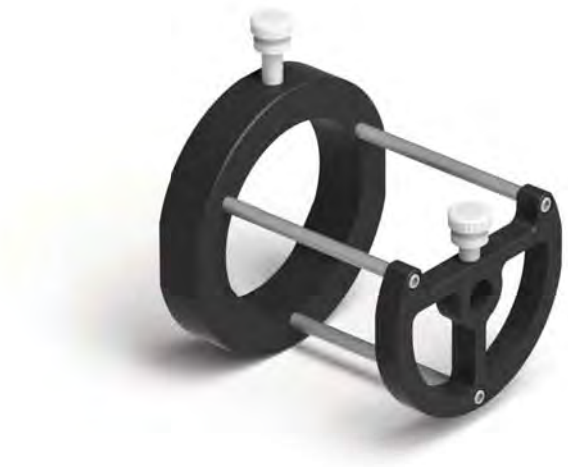


Xoft (an iCAD subsidiary) Surface Applicator Fixture

Chamber and applicator holder secures the ion chamber in the center of the surface applicators available from Xoft (an iCAD subsidiary).

ORDERING INFORMATION

XOFT SURFACE APPLICATOR FIXTURE **REF 71736**



Elekta Esteya Surface Applicator Fixture

Chamber and applicator holder accommodates the Esetya treatment nozzle and surface applicators and ensures that the A20 chamber is positioned in the center of each applicator cap.

ORDERING INFORMATION

ELEKTA ESTEYA SURFACE APPLICATOR FIXTURE **REF 71739**

WARRANTY

Standard Imaging, Inc. sells this product under the warranty herein set forth. The warranty is extended only to the buyer purchasing the product directly from Standard Imaging, Inc. or as a new product from an authorized dealer or distributor of Standard Imaging, Inc.

For a period provided in the table below from the date of original delivery to the purchaser or a distributor, this Standard Imaging, Inc. product, provided in the table, is warranted against functional defects in design, materials and workmanship, provided it is properly operated under conditions of normal use, and that repairs and replacements are made in accordance herewith. The foregoing warranty shall not apply to normal wear and tear, or if the product has been altered, disassembled or repaired other than by Standard Imaging, Inc. or if the product has been subject to abuse, misuse, negligence or accident.

PRODUCT	WARRANTY
Standard Imaging Ionization Chambers	5 years
Standard Imaging Detectors	1 year
Standard Imaging Well Chambers	2 years
Standard Imaging Electrometers	5 years
Standard Imaging BeamChecker Products	2 years
Standard Imaging Software Products	1 Year
All Other Standard Imaging Products	1 year
Standard Imaging Custom Products	1 year
Standard Imaging Remanufactured Products	180 days
Standard Imaging Custom Select Products	90 days
Consumables	90 days
Serviced Product	90 days (for service performed)
Resale Products	As defined by the Original Equipment Manufacturer
ADCL Product Calibration *(Standard Imaging uses the UW-ADCL forrecalibrations required under warranty)*	0 - 90 days = 100% of ADCL Calibration Costs 91 - 182 days = 75% of ADCL Calibration Costs 183 – 365 days = 50% of ADCL Calibration Costs 366 – 639 days = 25% of ADCL Calibration Costs (days from date of shipment to customer)

Standard Imaging's sole and exclusive obligation and the purchaser's sole and exclusive remedy under the above warranties are, at Standard Imaging's option, limited to repairing, replacing free of charge or revising labeling and manual content on, a product: (1) which contains a defect covered by the above warranties; (2) which are reported to Standard Imaging, Inc. not later than seven (7) days after the expiration date of the warranty period in the table; (3) which are returned to Standard Imaging, Inc. promptly after discovery of the defect; and (4) which are found to be defective upon examination by Standard Imaging Inc. All transportation charges (including customs, tariffs, duties and brokerage fees) are the buyer's responsibility. This warranty extends to every part of the product excluding consumables (fuses, batteries, or glass breakage) or material reactions. Standard Imaging, Inc. shall not be otherwise liable for any damages, including but not limited to, incidental damages, consequential damages, or special damages. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days.

This warranty is in lieu of all other warranties, express or implied, whether statutory or otherwise, including any implied warranty of fitness for a particular purpose. In no event shall Standard Imaging, Inc. be liable for any incidental or consequential damages resulting from the use, misuse or abuse of the product or caused by any defect, failure, malfunction or material reactions of the product, whether a claim of such damages is based upon the warranty, contract, negligence, or otherwise.

This warranty represents the current standard warranty of Standard Imaging, Inc. Please refer to the labeling or instruction manual of your Standard Imaging, Inc. product or the Standard Imaging, Inc. web page for any warranty conditions unique to the product.

CUSTOMER RESPONSIBILITY

This product and its components will perform properly and reliably only when operated and maintained in accordance with the instructions contained in this manual and accompanying labels. A defective device should not be used. Parts which may be broken or missing or are clearly worn, distorted or contaminated should be replaced immediately with genuine replacement parts manufactured by or made available from Standard Imaging Inc.

> CAUTION: Federal law in the U.S.A. and Canadian law restrict the sale, distribution, or use of this product to, by, or on the order of a licensed medical practitioner. The use of this product should be restricted to the supervision of a qualified medical physicist. Measurement of high activity radioactive sources is potentially hazardous and should be performed by qualified personnel.
>
> CAUTION: As desired by IAEA, English is the default language for labeling and manuals. If translated versions are available, resolve any differences in favor of the English versions.
>
> WARNING: Proper use of this device depends on careful reading of all instructions and labels.
>
> WARNING: Where applicable, Standard Imaging products are designed to be used with the versions of common radiation delivery devices, treatment planning systems and other products or systems used in the delivery of ionizing radiation, available at the time the Standard Imaging product is released. Standard Imaging does not assume responsibility, liability and/or warrant against, problems with the use, reliability, safety or effectiveness that arise due to the evolution, updates or changes to these products or systems in the future. It is the responsibility of the customer or user to determine if the Standard Imaging product can be properly used with these products or systems.

Should repair or replacement of this product become necessary after the warranty period, the customer should seek advice from Standard Imaging Inc. prior to such repair or replacement. If this product is in need of repair, it should not be used until all repairs have been made and the product is functioning properly and ready for use. After repair, the product may need to be calibrated. The owner of this product has sole responsibility for any malfunction resulting from abuse, improper use or maintenance, or repair by anyone other than Standard Imaging Inc.

The information in this manual is subject to change without notice. Please see www.standardimaging.com for the latest information. No part of this manual may be copied or reproduced in any form or by any means without prior written consent of Standard Imaging Inc.

SERVICE POLICY

If service, including recalibration, is required, please contact Standard Imaging's Customer Service department by phone or email prior to shipping the product. Standard Imaging's Customer Service and Technical Service staff will attempt to address the product issue via phone or email. If unable to address the issue, a return material authorization (RMA) number will be issued. With the RMA number, the product can be returned to Standard Imaging. It is the responsibility of the customer to properly package, insure and ship the product, with the RMA number clearly identified on the outside of the package. The customer must immediately file a claim with their carrier for any shipping damage or lost shipments. Return shipping and insurance is to be pre-paid or billed to the customer, and the customer may request a specific shipper. Items found to be out of warranty are subject to a minimum service fee of 1 hour labor (excluding recalibrations) for diagnostic efforts and require a purchase order (PO) before service is performed. With concurrence from customer, the product may be replaced if it is unserviceable or if the required service is cost prohibitive. Products incurring service charges may be held for payment. Standard Imaging does not provide loaner products. See the Standard Imaging Warranty and Customer Responsibility for additional information.

RETURN POLICY

No merchandise will be accepted for credit without prior approval of return. Please contact Standard Imaging's Customer Service Department to receive a return authorization number before returning any merchandise for exchange or credit. Products manufactured by Standard Imaging must be returned within thirty days of receipt of order in 'like new' condition. No credit will be given for products returned after thirty days from receipt of order. A minimum twenty percent restocking fee will be charged on all returned merchandise. All materials returned must be shipped pre-paid. Credit for returned goods will be issued to customer's account for use against future purchases of merchandise only. Special orders, custom products, re-sale (not manufactured by Standard Imaging) products, and ADCL calibrations will not be accepted for return credit or exchange.

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Contact Us

At Standard Imaging, we take great pride in maintaining active channels of communication between ourselves, our customers, our distributors and the medical physics community, so that we may better address issues within our field.

Your feedback, whether it is a phone call or email, is integral to our mission of improving patient care through the advancement of radiation calibration and quality assurance instruments.

To contact Standard Imaging and for more information on our products, please visit www.standardimaging.com or call 800-261-4446 / 608-831-0025 to speak with a sales representative.

Hours of Operation

Monday – Thursday: 7:30 am – 4:30 pm CST
Friday: 8:00 am – 2:30 pm CST

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