Solutions Portfolio

Complete Quality Management

2024

SUN NUCLEAR
A MIRION MEDICAL COMPANY

Better Quality Management. Better Care.

Sun Nuclear provides the broadest range of advanced Patient Safety solutions.

SunSCAN™ 3D
Next-Generation Cylindrical Water Scanning System

See pgs. 36-38 for details.

PATIENT Pa MACHINE Ma DOSIMETRY Do LASER La DIAGNOSTIC Dx

Trusted.

Hospitals & clinics worldwide choose Sun Nuclear.

Linac manufacturers, imaging manufacturers, researchers, and scientific associations leverage Sun Nuclear solutions routinely, too. Collectively, the fields of Radiation Therapy and Diagnostic Imaging count on us to help:

- ***Mitigate errors***
- ***Reduce inefficiencies***
- ***Validate technologies and techniques***
- ***Elevate clinical care***

Through 40 years of service, we have come to know Quality Management from all angles — and we're proud of the unique role we play in protecting Patient Safety.

Today, Sun Nuclear is stronger than ever as the cornerstone of Mirion Medical, a growing division within Mirion.

Mirion Medical innovations power the fields of Radiation Therapy QA, Diagnostic Imaging QA, Occupational Dosimetry, Nuclear Medicine and Medical Imaging Tables and Accessories. Comprised of distinct business units including Sun Nuclear, Dosimetry Services, Biodex, and Capintec, the Mirion Medical group is dedicated to offering healthcare practitioners and patients a safer, more efficient healthcare experience -- in pursuit of The Science of Better.

Learn more: mirion.com/medical

40
Years Serving the Radiation Oncology and Diagnostic Imaging Fields

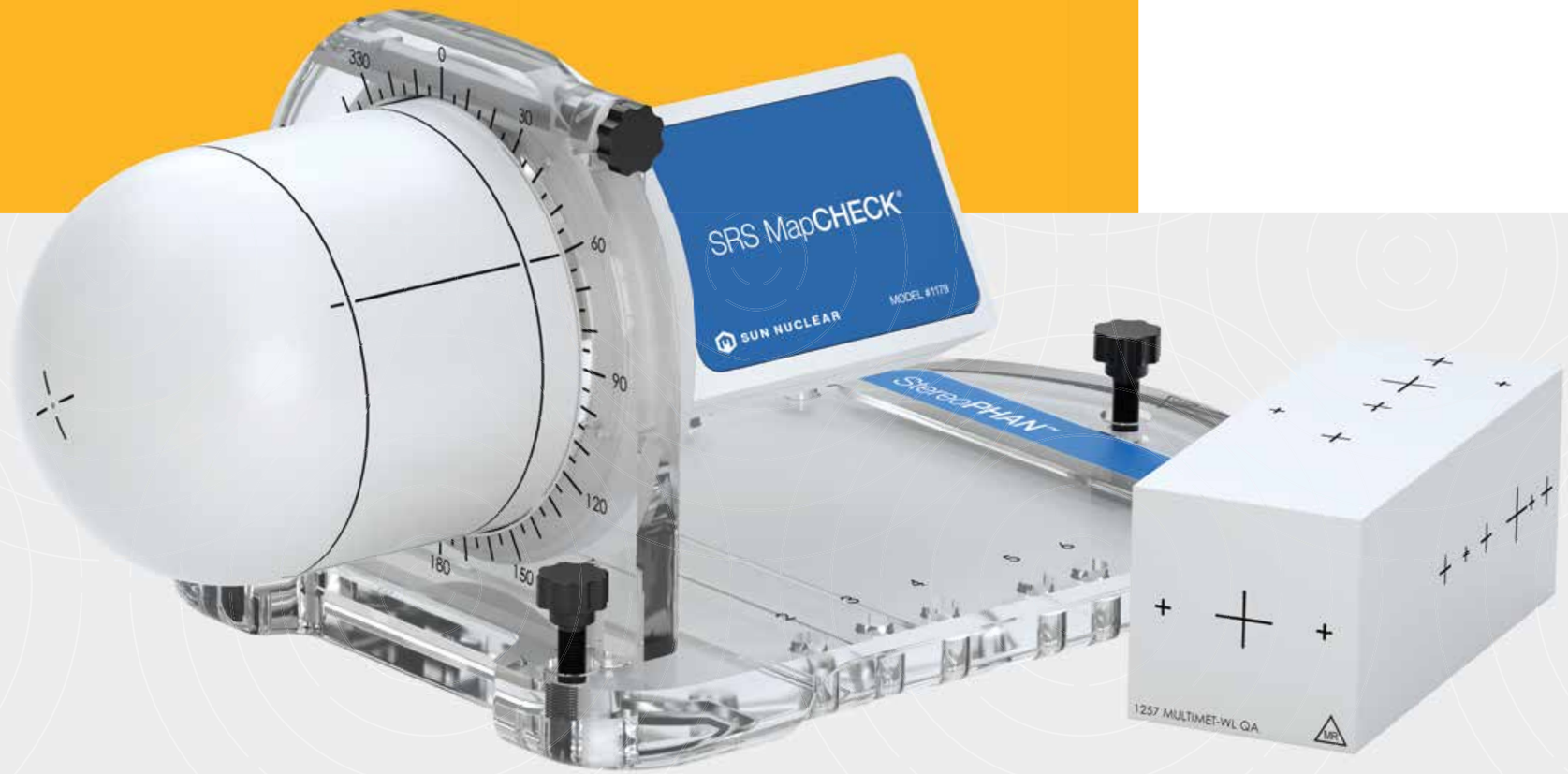
130+
Countries with Sun Nuclear Solutions

5,000+
Worldwide Cancer Treatment Facilities Use Sun Nuclear Solutions

>90%
of U.S. Cancer Treatment Centers Use Sun Nuclear Solutions

20+
Countries with SunServices™ Team Member Representation

Independence.
It’s the essence of everything we do.



Unrelenting
for safer, more effective treatments.

Independent Quality Management empowers clinical physicists to be guardians of Patient Safety, and to efficiently fulfill complex safety requirements.

Unbiased
for truth in data and analysis.

Independent Quality Management — free from the bias of self-checking — drives accurate, standardized data analysis and redundancies essential to reducing risk.

Unencumbered
to stay focused on catching errors.

In an expanding universe of imaging and treatment variables, independent Quality Management detects and prevents clinically relevant errors — ensuring safety is never taken for granted.

“A critical aspect of a QA program is independence; that is, the QA procedures conducted to assure the quality and accuracy of the product or process must be independent of the product or process itself.”

G.S. Ibbott, Journal of Physics: Conference Series 250 012001 (2010)

SunServices™

We deliver expert support for independent Quality Management.

Through our SunServices team, Sun Nuclear provides protection for your investments in Patient Safety and your clinical program.

With deep experience across the continuum of Quality Management, we know the world in which you work – and deliver the responsiveness your department demands.

- 100 Support Team Members in 20+ Countries
- Professional Services to Ease Technology Adoption
- Onsite or Online World-Class Training
- Industry-Leading Service Expertise

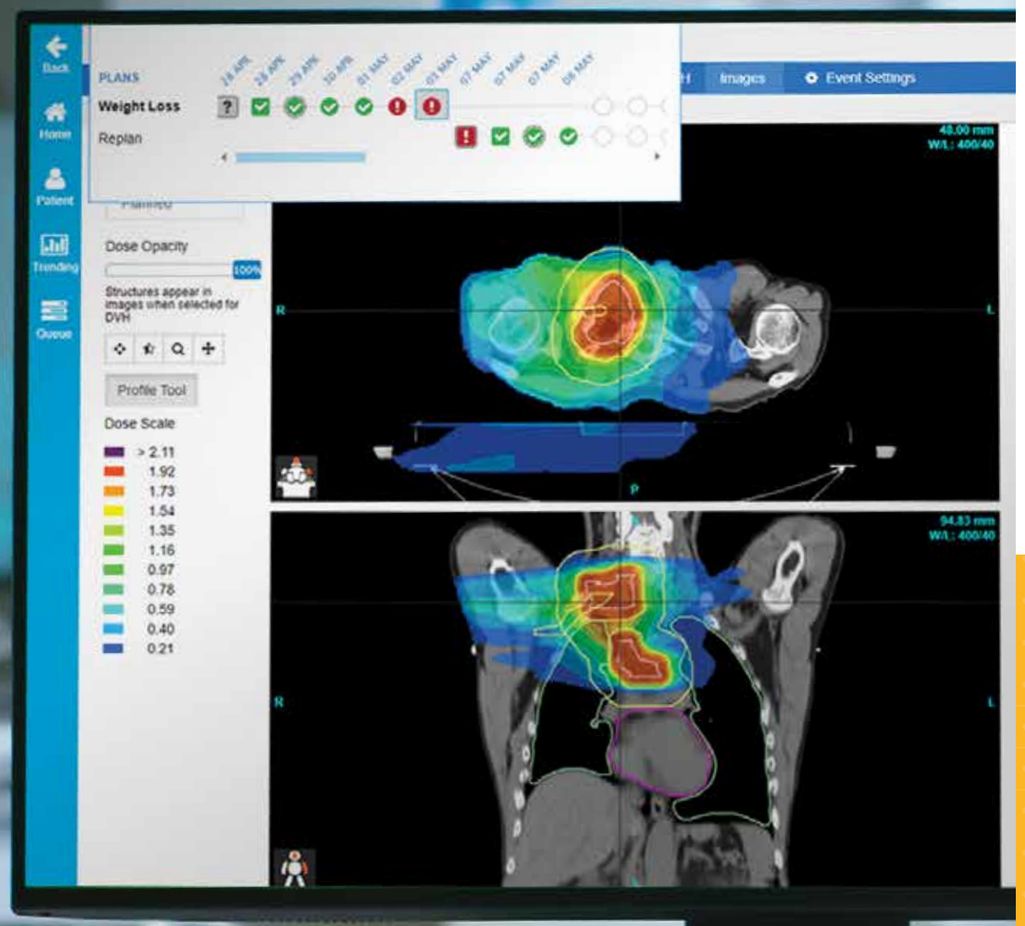
Our Melbourne, Florida-based 5,000 sq. ft. Training Center features a fully-functional linac bunker, lab-style classroom and large lecture hall.

10-point Quality Service repair for Sun Nuclear solutions are available at strategically-located SunServices Centers.

SunCHECK® Platform

Powering Quality Management in Radiation Therapy

1,600+
Users Worldwide



Scalable to meet the needs of any clinic or network, SunCHECK helps reduce risks, control costs, and improve treatment quality.

Platform
- One Database for Radiation Therapy QA
- Speed and Efficiency through Automation
- Access from Anywhere
- Seamless Clinical Integration

Patient
- Physics and Dosimetric Plan Checks
- Secondary Checks
- Phantomless and Array-Based Pre-Treatment QA
- In-Vivo Monitoring

Machine
- Daily, Monthly, Annual QA
- Measurement Device Connectivity
- Imaging, VMAT, MLC QA

Implementation Made Easy

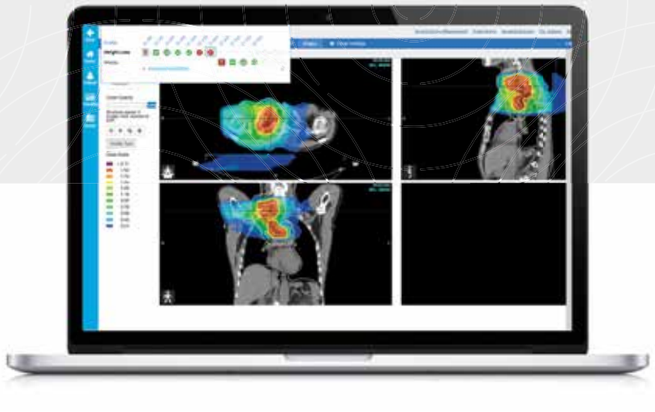
The SunCHECK Platform can be implemented via an on-premise server or **Cloud-hosted SaaS option***, based on your unique setup and maintenance requirements. The SaaS model is **ISO/IEC 27001:2013 certified** — assuring Radiation Therapy departments and their IT teams that SunCHECK is a robust and secure solution, with built-in backup and data redundancy.

SunDEPLOYS™ implementation services ensure your team achieves true workflow enhancements, and your staff is confident in bringing SunCHECK into routine use.

** Ask your Sun Nuclear representative or distributor about availability.*

Sun**CHECK**® Patient

Independent Patient QA in a Single Workflow



Purposefully Automated, yet Customizable

- Streamlines data transfer and time-consuming Patient QA tasks
- Flexible, automated analysis options, compatible with your planning and delivery technologies

Common, Browser-Based Analysis Software

- One database across all Patient QA phases
- Ability to support Single Sign-On (SSO)/Active Directory
- Worklist-oriented dashboard
  - Overview of Patient (and Machine) QA status
  - Quick access to results, reviews, to-do's, and approvals
  - Verify successful completion of QA
- On-premise server or Cloud-hosted SaaS implementation options

Efficient, Independent Patient QA Oversight

- Review and approve Patient QA and plans
- Physician review of results, with QA information on anatomy
- Consistent, interactive event display shows point dose, 2D analysis, 3D analysis, structure-based gammas, overall

Specifications

Browser Support	Google Chrome (Recommended), IE11
Meets Reimbursement/Reporting Requirements	Yes
Supported Treatment Modalities	3D CRT, IMRT, VMAT, SRS and SBRT
Certification	ISO/IEC 27001:2013 for information security management, including SaaS deployment of SunCHECK

"Our Physicians regularly ask us to 'SunCHECK' a patient when they see something they'd like to investigate. The automated, immediate feedback on patient delivery improves our workflow..."

Mark Young, Ph.D.,
Chief Physicist, Providence Queen of the Valley Medical Center, U.S.

Plan**CHECK**™

Plan Quality Checks

Automated Treatment Plan Validation

- Assess performance versus intent
- Automate time-consuming tasks to ease burden on medical physics staff

Software Highlights

- Automatically loads data from Varian Medical Systems® Eclipse™ and other DICOM-compliant TPSs
- Dosimetric checks compare dose/volume metrics to user-defined constraints
- Physics Checks verify treatment and non-treatment beams, and validate image and contour data

Specifications

Treatment Planning Systems Supported	Varian Medical Systems® Eclipse™ via Scripting, others via DICOM
Physics Checks	Rules-based checks: Treatment and non-treatment beam verifications, plan parameters, structures and deliverability
Dosimetric Checks	Structure-based checks: Dose/volume metrics with user-definable constraints; complex dosimetry metrics such as Conformality Index, Conformation Number, Gradient Index and Gradient Measure for multiple structures, plus Homogeneity Index, Inhomogeneity Index and more

Dose**CHECK**™

Secondary Checks

Automated, Independent 3D Secondary Dose Calculations

- Treatment plan support for 3D, IMRT, VMAT, SRS, SBRT, Varian Medical Systems® Halcyon™ System, Accuray's TomoTherapy® and Radixact Systems, and HDR Brachytherapy
- Efficiently investigate point doses, calculated vs. planned MUs, and 3D dose displays

Specifications

Supported Systems	• Elekta and Varian Medical Systems® Linacs, including Varian Medical Systems® Halcyon™ System • Accuray TomoTherapy Hi-Art®, H-Series™ and Radixact® Systems, including Precision Treatment Planning System • Varian Medical Systems® and Elekta HDR Brachytherapy Systems
Dose Calculation Algorithms	• Conventional Linacs Collapsed Cone Convolution Superposition • TomoTherapy Systems Monte Carlo • HDR Brachytherapy TG-43 compliant algorithm
Available Analysis & Pass/Fail Criteria	• Photon Composite & Beam Point doses, MUs*, 3D Dosimetric Analysis • Electron Beam Point doses • HDR Composite Point doses, Source Information, 3D Dosimetric Analysis

**Varian Medical Systems® and Elekta linac plans only.*

PerFRACTION®

Phantomless & Array-Based Pre-Treatment QA

In-Vivo Monitoring

Flexible Pre-Treatment QA Analysis

- 3D measurement analysis using EPID and/or Log File data*
- Independent Absolute Dose Analysis using EPID*

ArcCHECK® Direct Device Integration

- Direct device connectivity to **ArcCHECK** array for enhanced root-cause analysis of delivery issues

Compliance

- Meets AAPM Task Group 218 requirements for pre-treatment QA**

Specifications

Data Sources	EPID and/or Log Files (dependent on Linac and imaging type used in delivery), and/or ArcCHECK array
Available Analysis & Pass/Fail Criteria	• Composite and Beam Point Doses, 2D Relative Dose Analysis, 3D Dosimetric Analysis • 2D Absolute Dose Analysis (Transit Dosimetry Option*)

Automatically Track & Verify Dose

- Validate patient setup against the treatment plan
- Verify first fraction dose delivery vs. plan
- Review ongoing fractions

Catch Common Errors

- Anatomy issues
- Setup-related issues

Result Analysis Options

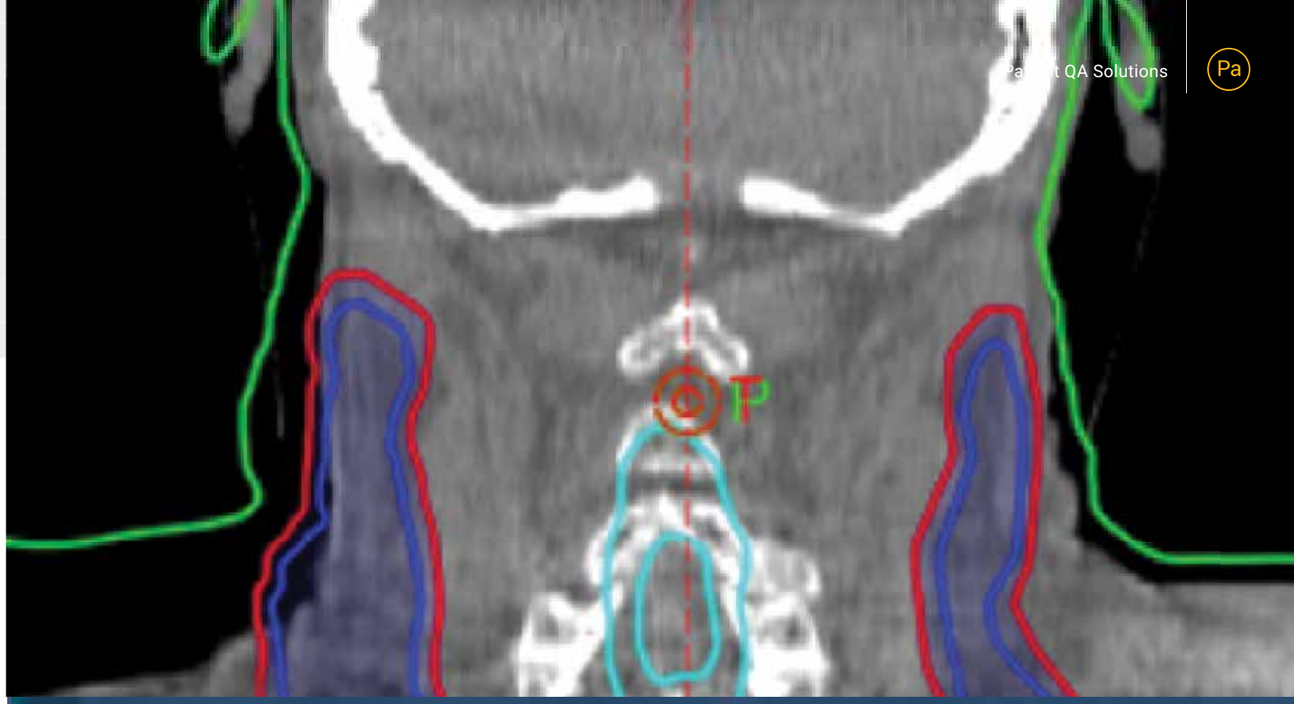
- 3D using EPID and/or Log File data, or
- 2D through the Transit Dosimetry* feature

Specifications

Data Sources	EPID and/or Log Files (dependent on Linac and imaging type used in delivery)
Dose Calculation Image Set	Planning CT, Cone Beam CT
Available Analysis & Pass/Fail Criteria	• Composite and Beam Point Doses, 2D Relative Dose Analysis, 3D Dosimetric Analysis • 2D Absolute Dose Analysis (Transit Dosimetry Option*)

** PerFRACTION Dosimetry*

*** For Varian Medical Systems® non-SRS/SBRT and FFF plans*



"With PerFRACTION, we've shown that **large-scale clinical implementation of in vivo transit dosimetry is feasible**, even for complex techniques."

Evy Bossuyt, M.Sc.,
Iridium Netwerk

**Published findings: Evaluation of automated pre-treatment and transit in-vivo dosimetry in radiotherapy using empirically determined parameters, E. Bossuyt, et al, Physics and Imaging in Radiation Oncology 16 (2020) 113–129.*

An Evolving In-Vivo Program

In 2018, the Iridium Netwerk begin an in-vivo dosimetry program. In its first two years, errors were detected in 7% of fractions analyzed. The data drove immediate corrective actions and new departmental protocols.*

Now, from insights uncovered over four years of their in-vivo program with SunCHECK, they have developed a process to address failed treatment fractions — leading to year-over-year decreases in failed fractions.

Learn more about this department's experience here >

SunCHECK® Machine

Complete Machine QA in One Streamlined Application

Standardize Daily, Monthly, Annual QA

- Standardize shared tolerances among clinics, machines and staff
- Leverage ready-to-use, and customizable, QA templates

Common, Browser-Based Analysis Software

- One database for all Machine QA
- Quickly review completed QA and drill-down into results
- Task scheduling offers quick insight on tasks coming due or overdue
- On-premise server or Cloud-hosted SaaS implementation options

Automated Data Collection and Imaging

- **Daily QA™ 3, IC PROFILER™** and **IC PROFILER™-MR** direct device connectivity automates data collection
- Automatic capture of QA beam delivery captures, processes and analyzes images or log files

Easily Meet Compliance

- Complete AAPM Task-Group 142 tasks, with pre-set templates
- Meet DIN and other daily, monthly and annual QA protocols

Specifications

Browser Support	Google Chrome (recommended), IE11
Meets Reimbursement/Reporting Requirements	Yes
Certification	ISO/IEC 27001:2013 for information security management, including SaaS deployment of SunCHECK

New Features!

- **Asset management**
- **External data import**
- **Automated Varian Medical Systems® Machine Performance Check support**

"Our IT group was overjoyed that we could uninstall 5 or 6 software applications and instead have only a web-based application they needed to support. They have been able to take a reduced, hands-off approach to managing the system."

Mark Geurts, M.S., Chief Physicist, Aspirus Health System, U.S.

SunCHECK® Machine

Daily, Monthly, Annual QA

Standardized, Efficient Machine QA

- Share tolerances among clinics, machines and staff
- Gain efficiencies with ready-to-use, but customizable, templates
- Complete all TG-142 and DIN QA easily within SunCHECK Platform

Automated Data Capture

- Automate beam measurement with direct integration to **Daily QA™ 3, IC PROFILER™** and **IC PROFILER™-MR** devices.
- Eliminate additional software needed for data transfer

Specifications

Protocol support	• TG-142 (all 127 tests in tables 1-6) • TG-51 • DIN • Daily QA Support TG-66, TG-148, TG-135 and 10CFR 35 • Custom templates
Direct Device Connection	Daily QA™ 3, IC PROFILER™ and Quad Wedges (Optional) and IC PROFILER™-MR devices

SNC Machine™

Imaging, VMAT, MLC QA

Automated QA Beam Capture

- SunCHECK Machine automatically captures, processes and analyzes images or log files
- Results are stored within SunCHECK Machine for easy review/audit
- Notifications may be turned on for pass/fail status

Imaging Phantom Support

- Supports most QA/QC Phantoms, including CT ACR 464 Phantom
- Works with Sun Nuclear **MV-QA, kV-QA, FS-QA,** and **WL-QA Phantoms** (see next page for details)

Specifications

Imaging Test Support	• Image Quality CBCT, kV, MV • MLC • VMAT
MLC/ Mechanical	• MLC Picket Fence, Positioning, Leaf Speed, Hancock • Winston Lutz Radiation & Machine Isocenter, Hancock • Starshot Gantry, Couch, Collimator • Light/Radiation Field Congruence
VMAT	• Dose Rate vs. Gantry Speed • Leaf Speed • Arc Point Dose • DMLC Point Dose

SunCHECK® Machine Phantoms

MV-QA

Applications

- Image scaling, positioning offset, spatial resolution, contrast, uniformity and noise
- Easy setup, alignment clearly marked on overlay and image

MV Line Pairs (mm)	0.1, 0.2, 0.5, 1.0 ± 0.025
MV ROI	9 (4 spatial, 4 contrast, 1 center)
MV Dimensions (cm)	12.7 L x 10.2 W x 2.5 D

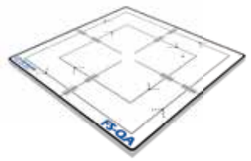
kV-QA

Applications

- Image scaling, positioning offset, spatial resolution, contrast, uniformity and noise
- Easy setup, alignment clearly marked on overlay and image

kV Line Pairs (mm)	0.6, 1.2, 1.8, 2.4 ± 0.01
kV ROI	28 (4 spatial, 23 contrast, 1 center)
kV Dimensions (cm)	12.7 L x 12.7 W x 1.6 D

FS-QA



Applications

- Symmetric and asymmetric light field/radiation field coincidence and jaw positioning
- Flatness and symmetry for photon and electron beam profile constancy

Field Sizes (cm)	10 x 10; 15 x 15
Markers (±0.1 mm)	56 - Field size (7 per field edge)
Dimensions (cm)	17.8 L x 17.8 W x 0.6 D

WL-QA

Applications

- Winston-Lutz measurements
- Imaging and radiation field isocenter coincidence
- Cone-beam CT positioning/repositioning
- End-to-end IGRT positioning tests
- 3D isocenter offset results

Dimensions (cm)	6.0 x 6.0 x 6.0
Sphere Size (mm)	7.0
Sphere Center Accuracy (mm)	0.2

SunCHECK Device Integration

ArcCHECK®, Daily QA™ 3 & IC PROFILER™

The SunCHECK Platform allows full control of essential Sun Nuclear Patient and Machine QA devices, without having to launch or maintain a separate application. Automated data collection and beam measurements help streamline manual workflows.

Efficient & meaningful **Patient QA**

ArcCHECK®

The Benchmark for 3D Pre-Treatment QA

DIRECT SunCHECK™ INTEGRATION

Powerful Patient-Specific QA

- Recommended by AAPM Task Group 218 for 3D measurement
- Measures and correlates gantry angle, leaf-end position, absolute dose, and time
- For all modalities - IMRT, VMAT, SBRT, Tomo, Halcyon and MRgRT QA
- Works with Enhanced Dynamic Platform (as MotionCHECK™ 3D solution) for QA of systems that perform tumor tracking and dynamic delivery such as the Accuray Radixact® System with Synchrony® and breath-hold gating such as the Radixact System with VitalHold™

Clinically Relevant Dose & DVH QA

- Identify TPS and beam delivery errors
- 1,386 SunPoint® Diode Detectors for increased BEV data density
- Angular corrections accurate to ±0.5° using the Virtual Inclinometer™
- Consistent BEV for all gantry angles measuring entrance and exit dose at multiple depths
- Real-time electrometer measures every pulse

Software Highlights

- SNC Patient™ software compares measured dose points to planned dose points
- 3DVH® Software for full 3D QA to support beam model adjustments
- Direct connectivity with **SunCHECK™ Platform** for expanded pre-treatment QA

MLC Pattern Machine QA

- Evaluate discrepancies between planned and delivered MLC patterns

MR MR-compatible version available

Device Specifications

Detector Type	SunPoint® Diode Detectors
Detector Quantity	1386
Detector Spacing (cm)	1.0, 0.7 cm Beams Eye View, 0.5 cm with Merge feature
Array Diameter (cm)	21.0
Water Equivalent Inherent Buildup (g/cm^2)	3.3
Detector Physical Depth (cm)	2.9
Array Geometry	Helical Grid (HeliGrid) 1 cm offset
Phantom Material	PMMA (Acrylic)
Active Detector Area (mm^2)	0.64
Detector Sensitivity (nC/Gy)	32.0
Max Dose/Pulse (Gy)	0.003
Detector Stability	0.5%/kGy at 6 MV
Dose Rate Dependence	± 1%
Update Frequency (ms)	50
Number of Connection Cables	Single power/data cable
Dimensions (cm^2)	27.0 x 43.0
Weight (kg)	15.4
Transport Option	18-inch wide trolley, designed to slide away after positioning on couch; not MR-compatible

MotionCHECK 3D system combines ArcCHECK with Enhanced Dynamic Platform for QA of motion management systems. Learn more on p. 32.

Cavity**Plug**™ & Multi**Plug**™

Tissue Equivalent Inserts for ArcCHECK®

Flexible Interior Dose Measurements

- Support heterogeneity tests
- Tissue equivalent inserts
- Brain, breast, bone, liver, lung, muscle, adipose, titanium, and water/air

MultiPlug

- Accepts ion chambers, stereotactic detectors and film
- Interior point measurement in 25 unique locations

CavityPlug

- Simplified isocenter dose measurement, without the film and tissue-equivalent insert features of MultiPlug

Map**CHECK**® 3

The Benchmark for 2D IMRT QA

Built for Pre-Treatment IMRT QA

- Most detectors (SunPoint® 2 Diode Detectors) of any 2D array
- Proven stability in large active field size (26 cm x 32 cm)

SNC Patient™ Software Highlights

- Compares dose distribution from plan file to actual measured values
- Highlights points outside acceptance criteria

Address Rotational Beams

- Use with **MapPHAN™,** a water equivalent phantom, for helical and arc-based delivery systems

Device Specifications

Detector Type	SunPoint® 2 Diode Detectors
Detector Quantity	1527
Field Size (cm)	26 x 32
Detector Spacing (mm)	7.07
Active Detector Area (mm x mm)	0.48 x 0.48
Active Detector Volume (mm³)	0.007
Detector Sensitivity (nC/Gy)	15
Sampling Frequency (ms)	50
Detector Stability	1%/kGy at 6 MV
Dose Rate Dependence	±1.5% over the range of 100 cGy/min to 1400 cGy/min
Inherent Buildup (g/cm²)	1.5
Inherent Backscatter (g/cm²)	2.3
Radiation Measured	Photons Co-60 to 25 MV
Number of Connection Cables	Single power/data cable
Dimensions (L/W/H)	56.0 cm x 29.2 cm x 3 cm
Weight (kg)	5.6

3,390
Total Publications
featuring MapCHECK®
& SRS MapCHECK® arrays

1,220
Total Publications
featuring ArcCHECK® array

Review key findings:
sunnuclear.com/publications

Plan**IQ**™

Rx Feasibility & Plan QA

Strengthen Treatment Plan Quality

- Analyze patient-specific feasibility of clinical goals
- Gain insights on areas of improvement

Plan Quality Scoring

- Quality scores for every target and OAR
- Plan Quality Metric (PQM) score and Adjust PQM scores rate patient-specific treatment plan feasibility

Protocols

- Choose from 70+ site-specific protocol libraries
- Leverage PQM for protocol best practices

Compliance

- Treatment plan reports satisfy accreditation audit requirements
- Simplified peer review with shareable, interactive files
- Supports AAPM Task-Group 53 compliance

IVD™ 2 with **ISORAD**™ & **QED**™

Easy-to-Use In-Vivo Dose Monitoring

Uncomplicated In-Vivo Monitoring

- Wired or wireless versions
- Automatic patient temperature compensation
- QED or ISORAD detector options, with SunPoint® Diode Detectors

Software Highlights

- Use with control module or PC software
- Networkable Microsoft SQL patient database with robust Protected Health Information (PHI) security
- Correction factor tools
- Direct export to Varian Medical Systems® ARIA® Oncology Information System

Detectors

- Flat design for easy placement (QED); Cylindrical design for isotropic response (ISORAD)
- 3 Photon Energy Ranges, 1 Electron Range, and Skin (QED)

Detector Module Specifications

Channels	Standard (rf-IVD 2/IVD 2) 8/4 Standard 4 Maximum 52
Repeatability	± 0.2% or ± 0.1cGy
Polarity	Bipolar (negative or positive polarity detectors)
Leakage	Automatic compensation
Calibration	User calibrated
Warm-up time (sec)	< 30
Wireless frequency (MHz)	USA 916.5; EU 433.92
Power	Rechargeable NiMH battery (12 hr) Power supply
Dimension L/W/H (cm)	7.0 x 12.0 x 3.0
Weight (kg)	0.34

SRS Map**CHECK**®

SRS & SBRT QA, No Film

Moving Beyond Film

- Film equivalent SRS/SBRT Patient QA for use with the **StereoPHAN™** end-to-end phantom
- Streamline your workflow from ~300 minutes to ~10 minutes

Irradiate From Any Angle

- Accounts and corrects for angular dependence, field size, and pulse rate
- Ensures accurate dose measurement form any angle, including vertex fields

Flexibility, Speed, & Accuracy

- Detects for output factor, MLC, and grid size errors
- Prevents more common sources of SRS/SBRT treatment errors

Unmatched Detector Resolution

- Detector spacing and resolution specifically designed for SRS/SBRT
- Measures field sizes down to 5 mm (5 diodes in 5 mm cone)
- Supports AAPM TG-101 requirement -- SRS measurements performed with <1 mm detector

SNC Patient™ Software

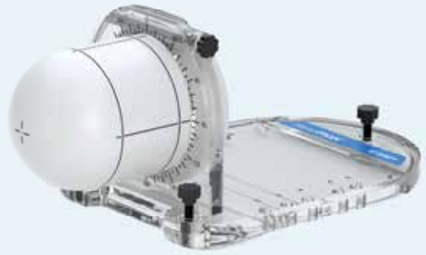
- Robust angular corrections detect and adjust for translational offset between compared datasets with precision of 0.1 mm (in line with film)
- Guidance for ideal setup of Single-Isocenter Multiple-Target (SIMT) plans (QA Setup tool)
- Offers simplified shifts for occasional larger fields
- Couch kick compatible
- Includes CyberKnife® Machine QA capabilities

Specifications

Detector Type	SunPoint® 2 Diode Detectors
Detector Quantity	1,013
Detector Spacing (mm)	2.47
Active Detector Area (mm x mm)	77 x 77
Detector Sensitivity (nC/Gy)	15
Sampling Frequency (ms)	50
Dose Rate Dependence	+/- 1.0% (100 MU/min to 2400 MU/min)
Inherent Buildup (g/cm²)	2.75
Inherent Backscatter (g/cm²)	2.75
Modalities Supported	Static, rotational, coplanar and noncoplanar (including vertex), CyberKnife® system (including VSI and M6 models with Cones or Incise and MLC Collimators), FFF, cone and MLC fields
Radiation Measured	Photons 6 MV, 10 MV, 6 FFF, 10 FFF
Number of Connection Cables	Single power/data cable
Dimensions (L/W/H)	320 x 105 x 45 (mm)
Weight (kg)	1.9

"This [array] gives us high-quality patient QA in minutes rather than hours and significantly enhanced patient throughput."

Brett Miller, M.S., DABR, Lead Medical Physicist, University of Tennessee Medical Center, U.S.
Stereotactic QA saving time, delivering outcomes, Physics World, July 2019



Stereotactic QA

Meet the stringent demands of stereotactic treatments, with our suite of SRS/SBRT solutions. **Learn more: sunnuclear.com/srsqa**

Improving by measuring **Machine QA**

StereoPHAN™

Comprehensive End-to-End Stereotactic QA

Confident Program Commissioning

- Test all aspects of stereotactic planning and delivery
- MRI/CT image fusion, CT to linac patient alignment, and treatment planning QA
- Rotate phantom up to 360° and combine with inserts for sagittal, coronal and transverse plane measurements within 0.1 mm accuracy

Versatile End-to-End Stereotactic QA

- Use with **SRS MapCHECK®** array for film-less, patient-specific QA for challenging small field and MLC-based SRS cases
- Use with **MultiMet-WL Cube** for multi-met single isocenter off-axis verification

Multi-Modality Compatibility

- Supports conventional linacs, CyberKnife® devices, Varian Medical Systems® HyperArc™ Systems, vertex delivery beams, and MRgRT
- SRS headframe compatibility: Brainlab® , Fraxion®, and Leksell Gamma Knife® systems

Specifications

Material	Polymethyl methacrylate (PMMA)
Weight (cylinder, stand, slide)	6.6 kg (15 lbs)
Measurement cubes (mm)	85 x 85 x 85
Dimensions - L/W/H (mm)	522 x 276 x 229

MultiMet-WL Cube

Targeting Accuracy Check for MultiMet SRS

Single-Isocenter Multiple-Met SRS QA

- Efficiently measures targets up to 7 cm off-axis within 0.1 mm accuracy
- Compatibility with Cone, MLC or Jaw deliveries

User-Friendly Software

- Ssoftware identifies off-axis and rotational sources of error — Gantry, Couch or Collimator — in 6 degrees of freedom
- Optimized RT plan enables fast and clinically useful analysis of combined Winston-Lutz results

Versatile Small-Field Tool

- Use with **StereoPHAN** and **SRS MapCHECK** solutions, or as a standalone phantom

Specifications

Dimensions (mm)	85 x 85 x 195
Targets	6 (5 mm diameter) tungsten targets in specified locations
Target to Cross-Hair Tolerance	± 0.1 mm
Target Material	Tungsten Carbide
Quantifiable Off-Axis Accuracy Range	Up to 7 cm

StereoPHAN™ Inserts

Film | Ion chamber | CT/MRI | MRI Signal Generator | Universal Spacer | Multi-film

See more inserts available on sunnuclear.com.

STEEV™ Phantom

Stereotactic End-to-End Verification

SRS Commissioning & Treatment Verification

- Meet TG-101 requirements for end-to-end SRS commissioning and QA
- Anthropomorphic, tissue-equivalent design accounts for challenging effects of tissue heterogeneity

Accurate Patient Simulation

- Compatible with most positioning and fixation devices
- Internal details (e.g., cortical/trabecular bone, brain, spinal cord, teeth, sinuses, trachea) provide realistic clinical simulation
- Geometric and organic target inserts provide means for comprehensive image QA, geometric machine QA and TPS QA for increased confidence in system performance

Multi-Modality Imaging & (Off) Isocenter Dose Measurements

- MRI/PET/CT inserts include: spherical target, organic targets for deformable image registration, spatial 3D distortion, ISO center
- Inserts include: TLD dosimetry, OSL dosimetry, film dosimetry, film stack dosimetry, film with fiducial, electron density, Winston-Lutz

Specifications

Includes:
Stereotactic Radiosurgery Head
MRI/CT ISO Center rectangular insert
Brain Equivalent Spacer (63.4 x 63.4 x 10 mm)
Brain Equivalent Spacer (63.4 x 63.4 x 20 mm)
Brain Equivalent Spacer (63.4 x 63.4 x 63.4 mm)
Solid Ø 12.7 mm (posterior chamber access plug)
Solid Ø 12.7 mm anterior chamber access plug with MRI/CT fiducial
Neck Alignment Plate & Rubber Clamp

SRS MR Distortion Phantom

Assess MR Image Distortion in SRS Planning

Characterize Geometric Accuracy for MR use in Treatment Planning

- Assess MR image distortion in SRS planning
- Realistic anthropomorphic scenario for CT and MR imaging
- Presents simulated bony anatomy as rigid landmarks for image fusion
- Special pads compatible with all fixation frames
- CT/MR markers facilitate positioning and image registration

Optimizing SRS QA

- Verify image fusion and deformable image registration algorithms used in various treatment planning systems
- Tissue equivalent, anthropomorphic phantom

Distortion Check Software

- Detects physical control points (859) throughout the 3D image volume
- Cloud-based solution designed to quickly and automatically quantify distortion in MR images

Specifications

Dimensions	32 cm x 24 cm x 18 cm
Weight	12 lbs (5.5 kg)
Materials	Skull: Plastic-based bone substitute; Interstitial/ Soft tissues: Water-base polymer; Grid: Reinforced nylon
Software	Distortion Check software
Model 603-GS Includes	
1	MR Distortion & Image Fusion Head Phantom
1	ABS Cradle
Unlimited	Unlimited scans using MRI Distortion Check Software for initial 2 year period
1	Custom Carry Case

IC **PROFILER**™

Real-Time, Tankless Beam Scanning

DIRECT SunCHECK™ INTEGRATION

Monthly & Annual QA in Minutes

- A single measurement provides real-time beam performance data, including:
  - Constancy checks for output and beam quality
  - Flatness, symmetry, field size and penumbra width

The Water Tank Alternative

- Accurate within 0.5% to a water tank
- Sets up in minutes, with no warm-up or pre-irradiation needed
- Linac acceptance, routine QA, and more

SunCHECK Integration

- Direct connectivity with **SunCHECK™ Platform** for efficient Monthly and Annual QA

MR MR-compatible version available

Device Specifications

Detector Type	Parallel plate Ion Chamber
Detector Quantity	251 total; X Axis: 63; Y Axis: 65; -Diagonal: 63; +Diagonal: 63
Detector Spacing (mm)	5.0
Array Size (cm)	32.0 x 32.0
Detector Volume (cm³)	0.046
Detector Sensitivity (pC/cGy)	14.4
Inherent Buildup (g/cm²)	0.94
Inherent Backscatter (g/cm²)	2.3
Phantom Material	PMMA (Acrylic) / PC
Weight (kg)	8.8

Quad Wedge Plates

Simplified Beam Energy Verification

Accelerate Beam Scanning

- Use with **IC PROFILER™** array for fast, precise energy measurements
  - Quad Wedges Plates are not suitable for use with IC PROFILER™-MR array
- Easy, reproducible setup
- Maximum efficiency compared to Solid Water (~15 minutes for 5 beams vs. ~60 minutes)

Photon & Electron Measurement

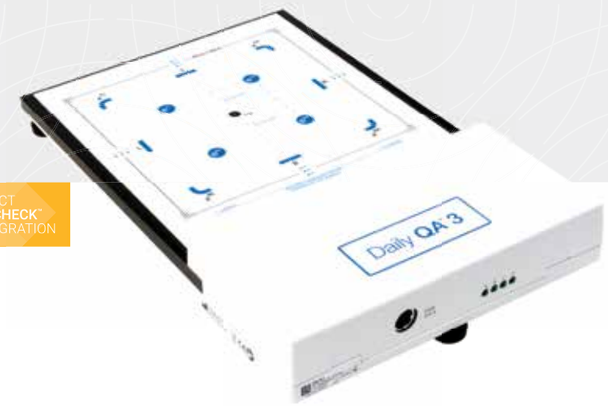
- Supports a wide range of energies for photons and electrons

Specifications

Electron Energy Quad Wedge Plate	Aluminum-based design; Suitable for analysis of energies from 4-22 MeV
Photon Energy Quad Wedge Plate	Copper-based design; Suitable for analysis of energies from 6-18 MV

Daily QA™ 3

Daily Beam Quality Analysis in One Measurement



DIRECT SunCHECK™ INTEGRATION

Fast Daily Checks of Energy Constancy, Beam Quality

- After daily test beam delivery see results for: dose output, beam flatness, beam symmetry, beam energy, light-radiation field coincidence, shape constancy, and field size shift for FFF

Efficient, Independent Beam Delivery Error Detection

- Daily test templates are easy for physicists to setup and handoff to therapists
- Fast and simple set up Rotational and FFF beams are supported, with no warm-up or pre-irradiation needed, and no additional trips to the vault
- Power Data Interface (PDI) managed through single-cable architecture
- Wireless option available – eliminates cable connections by using rf connections

SunCHECK Integration

- Direct connectivity with **SunCHECK™ Platform** for efficient Daily QA
- Pre-configured TG-142 tests, tolerances and categories
- Safety, MLC and imaging tests reside in same database
- Connect device and data is collected automatically (no manual entry)

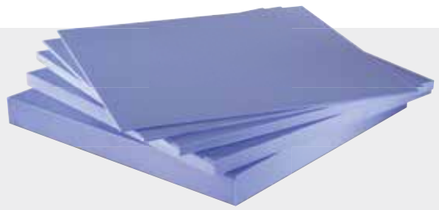
MR MR-compatible version available

Specifications

Detector Type	SunPoint® Diode Detectors Vented Ion Chambers
Detector Spacing (mm)	Diodes 5.0
Chamber Active Volume (cm^3)	Electron 0.6; Photon 0.3
Field Size (cm)	20 x 20
Inherent Buildup (g/cm^2)	Chambers 1.0 ± 0.1
Inherent Backscatter (cm)	2.3
Electron Energy Attenuation	Air, Cu, Al, Fe
Radiation Measured	Electrons, 4 MeV to 25 MeV; Photons, Co-60 to 25 MV
rf Frequency (rf-Daily QA 3) (GHz)	2.400 to 2.485
Dimensions L/W/H (cm)	25.6 x 40.8 x 4.6
Weight (kg)	5.7
Number of Connection Cables	Single power / data cable

Solid Water® HE

Reliable, Durable Water Equivalent Phantoms



Photon & Electron Energy Measurements

- Mimics true water within 0.5% for accurate calibration of radiotherapy beams
- Exceptional, verified slab uniformity
- 30 cm or 20 cm slab kits, designed to fit **MapCHECK® 3** and **IC PROFILER™** arrays, available for measuring output with a wide range of energies

MR MR-compatible

Specifications

Depth Ionization Relative-to-water	
Photons	1.000 +/- 0.005
Electrons	1.000 +/- 0.005
Density	
Mass Density (g/cm^3)	1.032 +/- 0.005
Electron Density (e^-/cm^3 N_A)	0.557 +/- 0.001
Solid Water HE / Water Electron Density Ratio	1.000 +/- 0.005

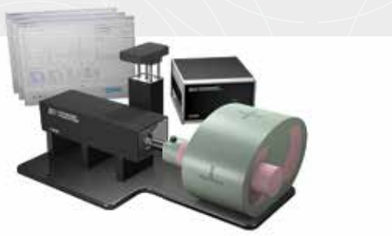
MR-Guided RT QA

Address the unique challenges magnetic fields present, with custom-designed QA solutions.

Learn more: sunnuclear.com/mrqa

Dynamic Thorax Phantom

Analyze Image Acquisition, Planning & Dose Delivery Verification



Motion IGRT & IMRT QA

- Comprehensive analysis of image acquisition, planning and dose delivery in IGRT
- Investigating and minimizing the impact of tumor motion inside the lung
- 3D tumor motion within tissue-equivalent phantom, representing lung
- Sub-millimeter accuracy and reproducibility
- Surrogate breathing platform accommodates numerous gating devices

Tissue-Equivalent Lung Phantom

- Tissue equivalent from 50 keV to 125 MeV
- Compatible with TLD, MOSFET, nanodot™, microchamber, PET/CT targets and film

XSight® Lung Tracking Phantom Kit

- Utilizes a specialized phantom body verified and validated by Accuray for use with CyberKnife® systems
- Designed to work in conjunction with the Synchrony® motion synchronization technology

Motion Control Software

- Enables different cycles, amplitudes and waveforms
- Graphical, intuitive user interface

Specifications

Dimensions	67 cm x 32 cm x 28 cm (26" x 13" x 11")
Weight	17.2 kg (38 lb)
Amplitude, IS	± 25 mm
Amplitude, AP/LR	± 5 mm
Amplitude, Surrogate	± 25 mm
Motion Accuracy	± 0.1 mm
Cycle Time	1 - ∞ (adjusted based on amplitude)
Waveforms	sin (t), 1-2cos4(t), 1-2cos6(t), sawtooth, sharkfin

Enhanced Dynamic Platform

Programmable Motion for Tracking & Positioning

Highlights

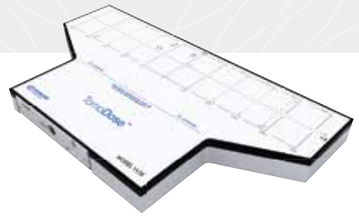
- Works with ArcCHECK® (as MotionCHECK™ 3D solution) for QA of systems that perform tumor tracking and dynamic delivery such as the Accuray Radixact® System with Synchrony® and breath-hold gating such as the Radixact System with VitalHold™
- Builds upon the Dynamic Platform, with sub-millimeter accuracy for 3D Motion QA of systems that perform tumor tracking and gating
- Easily set up for 1D, 2D or 3D motion QA
- Inferior-superior motion up to +/- 25mm (50 mm total) for applicable phantoms up to 70 lb.
- An 11.3° inclined plane provides +/- 5.0 mm (10 mm total) of motion in posterior-anterior direction (for applicable phantoms up to 50 lb).
- 30° rotation about the linac couch provides +/- 12.5 mm (25 mm total) of lateral motion
- Surrogate platform simulates posterior-anterior chest wall motion of +/-25mm (50mm total)
- Includes Motion Control Software

General Specifications

Dimensions (cm)	92.8(L) x 37.5(W) x 27.5(H) (for all motions at home position)
Weight (kg)	18.4
Position Accuracy (mm)	Position Accuracy (-/+0.25 mm)
Maximum Amplitude Inf/Sup (mm)	+/- 25.0 (50 total)
Maximum Amplitude Lateral (mm)	+/- 12.5 (25 total)
Maximum Amplitude Pos/Ant (mm)	+/- 5.0 (10 total)
Maximum Amplitude Surrogate (mm)	+/- 25.0 (50 total)
Editable Built-In Waveforms	sin(t), 1-2cos4(t), 1-2cos6(t), sawtooth, sharkfin
Power	110-250 VAC, 50/60 Hz

TomoDOSE™

Diode Detector Array for TomoTherapy® Systems



TomoTherapy System QA

- Supports routine QA, daily QA, and post-component replacement QA
- Measures entire Hi-Art beam in a single measurement, including 1 X-axis and 9 Y-axis

Accessible Data

- Access to raw data and import water tank data for comparison with TomoDose files

General Specifications

Detector Type	SunPoint® Diode Detectors
Detector Quantity	223 total on X and Y
Detector Spacing (mm)	X 5.0, Y 4.0, Y Off-axis 8.0
Field Size (cm)	53.0 x 9.8
Array Length (cm)	X 53.0 Y 9.8 (8.0 at ±19.0)
Y Axes Offset (cm)	±5.0, ±10.0, ±15.0, ±19.0 cm
Inherent Backscatter (g/cm²)	2.3
Active Detector Area (mm²)	0.64
Detector Volume (cm³)	0.000019
Detector Sensitivity (nC/Gy)	32.0
Detector Stability	0.5%/kGy at 6 MV
Maximum Dose Rate Limit (Gy/min)	56.0
Operating System	Windows 2000, XP 32-bit, or Vista 32-bit
Dimensions L/W/H (cm)	25.6 x 52.0 x 6.0
Weight (kg)	5.0
Number of Connection Cables	Single power/data cable

Daily ISO Phantom

Daily Isocenter Checks Made Easy

Efficient Daily Alignment Verification

- Ensure isocenters match for imaging modalities, lasers, and surface-guided alignment systems
- Machined concentric circle targets to objectively assess setup errors, including rotations, to easily align to true isocenter
- Unique fiducials produce sharp clear images in EPID, kV and CBCT imaging

Easy, Precise Shifting

- Available 6DOF ISO Base provides known phantom translations and rotations to check corrections made by 6DOF couches
- Manufactured with machining tolerance of ± 0.02 mm and target positioning accuracy of ± 0.1 m

Analysis Software

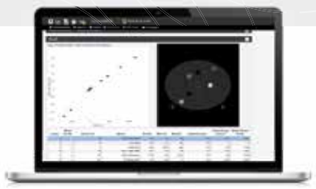
- Enables user-friendly quality control of linac isocenters by analyzing DICOM images acquired with the EPID, kV and CBCT

Specifications

Alignment System	Engraved markings, concentric alignment circles and internal radiographic markers/targets compatible with CBCT, MV-EPID, kV imaging, 6D couches and more
Isocenter Marker	6.35 mm diameter low-Z ceramic bead
Offset Marker	6.35 mm diameter low-Z ceramic bead at a fixed offset from isocenter, for registration and repositioning
Light Field Test	Verified using integrated radiographic markers and external scribe lines corresponding to a 10 cm x 10 cm light field
Bases	6DOF ISO Base™ designed for positioning, leveling and quick calculation of complex 3D shifts of systems with integrated 6DOF robotic couch. ISO Base™ positions and levels Phantom on 3DOF (conventional) systems. Both contain integrated pixel calibration targets recognized by ISO Analyze™ software.
Dimensions	12 cm x 12 cm x 12 cm
Weight	1.7 kg

RapidCHECK™

Automated CT-to-Density Calibration & CT Image Quality Analysis



Automate QA Workflows

- Use with **Advanced Electron Density Phantom** for faster, less-tedious calibration of CT-to-electron density tables
- Use with **CT ACR 464 Phantom** to automate image quality analysis faster analysis, trending reports, and an easily searchable permanent record
- Use with **IQphan Phantom** to quickly process CT data into results and reports

Browser-Based Software

- Use RapidCHECK software from any browser in your clinical network
- Get results immediately, load data, and see analysis

Specifications

Operating System	Windows 10 (Pro, Enterprise, and Educational) or Windows 11 (Pro, Education, Enterprise, Pro Education) with either Microsoft Edge or Google Chrome browsers, with at least an i3 processor, 8 GB RAM, and 10 GB of drive space
Regional Settings	US or International
Minimum Computer Specifications	Intel i3 processor; total RAM 4 GB (8 GB recommended); 10 GB of drive space; Display resolution 1280 x 1024; Color depth 32-bit

Advanced Electron Density Phantom

Tissue-Equivalent CT-to-Electron Density Calibration

Automated CT-to-Electron Density Analysis

- Patented rod markers* uniquely identify each material in a CT scan
- CT-to-density tables are automatically generated in the **RapidCHECK™** software

Sized for Wide-Beam Applications

- Larger phantom body diameter supports evaluation of cone-beam CT and wide-beam CT scanners
- Removable section for head and small body protocols

Superior Tissue Equivalence & Chamber Compatibility

- Meets medical standards ICRU-44 and ICRP for human tissue densities
- Compatible with any ion chamber

Specifications

In-plane Dimensions	40.0 cm (15.7 in) x 30.0 cm (11.8 in)
Depth	16.5 cm (6.3 in), up to 26.5 cm (10.2 in) with optional extension plates
Removable Head Section Diameter	20.0 cm (7.87 in)
Material	HE Energy-matched CT Solid Water® phantom material
Interchangeable Inserts	14 solid inserts plus two true water containers
Optional Inserts	Aluminum, Stainless Steel, Titanium
Available Upon Request	Extension plates, Ion Chamber conversion rod
Weight	15.5 kg (34.1 lbs)
Wheeled Case	Included
Stand	Included
Weight	5 years

**U.S. Patent No. 10,939,891*

Varian Medical Systems®
Halcyon™ System & Ethos™ Therapy QA

We offer a range of independent QA solutions for these well-adopted platforms.

Learn more: sunnuclear.com/halcyonqa

Maximize accuracy,
minimize subjectivity
Dosimetry

SunSCAN™ 3D

Next-Generation Cylindrical Water Scanning System

User-Centered Design

- Faster, easier commissioning and beam scanning, with SRS-class accuracy
- Unique cylindrical shape removes need for tank shifts, which take time and compromise scanning setup
- Single Setup

  65 cm scan range allows 40 x 40 cm field scans, even at 100 cm SSD and 40 cm depth
- Consistent Detector Orientation

  Smallest part of the detector always measures the beam edge, minimizing stem and cable effects and water movement
- Virtual Reference Detector using Pulse Normalization permitting accurate scanning of small fields without the need of a physical reference detector

7-Minute AutoSetup™

- Automatic setup in a third of the time of other tanks
- Tank is leveled and aligned, with detector positioned at water surface, in minutes
- True, physical leveling enables the most accurate scans and is achieved through a proven guided workflow

Intuitive Software

- New SunDOSE™ software reduces clicks to complete commissioning, and features favorite and enhanced workflow features
- AutoSetup routine guides users through tank setup

"With SunSCAN 3D, in form and function, it's clear Sun Nuclear put thought into every detail to help medical physics teams work smartly. It's easy to set up, fill and drain. Plus, it's light and compact for moving and storing. Above all, it offers high accuracy for confidence in your commissioning and annuals."

Kayhan Mohajeri, M.S., DABR,
Medical Physicist

General Specifications

Vertical (mm)	400
Diameter (mm)	650
Ring (Degrees)	360
Motors	Encoded stepper/servo
Scanning Modes	Continuous and step
Scanning Speed Range (mm/sec)	Variable up to 20
Scanning Accuracy (mm)	0.1 throughout the 3D volume
Repeatability (mm)	0.05
Position Resolution (mm)	0.02
Water Tank	
Thickness Wall/Bottom (mm)	13/19
Height (mm)	916
Width (mm)	736
Diameter Inner (mm)	676
Water Capacity (L)	172
Weight Empty/Full (kg)	59/194
Linac Pulse Count	Included with threshold detection
Software	
Tank Centering	Automatic
Leveling	Automatic
Surface Detection	Automatic
TPS Export	Included

Control Center with Integrated Electrometer

Highlights

- Improved Signal to Noise Ratio for superior small signal measurements
- Dual bias control, compatible with most detectors
- Enhanced Dynamic Mode automatically adjusts to signal - no need to set gain

Digital Pendant

Highlights

- Two interchangeable pendants on tank and reservoir
- Easy-to-read backlit display
- Intuitive controls for tank, lift and reservoir
- Interlock prevents accidental irradiation

SunDOSE™ Software

Highlights

- Easily move between tasks with intuitive interface
- With visualization of all layers, users can see processing applied on each scan, and batch process similar scan types with one click

Reservoir

Highlights

- Redesigned with half the footprint
- Dripless tank connector and self-enclosed hose avoid spills
- Water filter included

SunSCAN™ TPR

Highlights

- Supports Varian Medical Systems®, Elekta, Siemens and CyberKnife® delivery systems
- Less than 5-minute installation with no additional tools
- 20 cm TPR drain measurement in 2.5 minutes
- 20 cm TPR fill measurement in 3.5 minutes

Mini-Lift Table (MLT)

Highlights

- Integrated Automatic Leveling Platform
  - Leveling to within <0.02 degrees
  - Centering to within <0.1mm
- Straddles linac couch ring for stability
- Fits through standard doorways; legs fold for storage
- Quick and easy disassembly for transport

Reference Detector

Interference-Free Dosimetry Scanning

Small Field Annuals & Commissioning

- Linac head leakage allows the Reference Detector to obtain a reference signal during water tank scanning of photon energies
- Use with Sun Nuclear water tank for commissioning measurements of any field size
- Fully out-of-field detector is ideal for small fields

Easy & Efficient

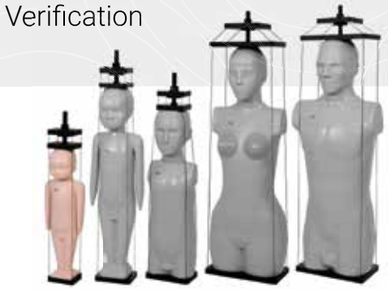
- Mounts to top surface of a supported linac gantry using a non-invasive dual-lock fastener
- Includes 2-meter cable with triax connector

Specifications

Volume (cc)	39
L x W x H (mm)	125 x 105 x 15
Reference Point (mm)	2-meter cable with triaxial connector
Placement	Top surface of linac head, via dual-lock fastener

ATOM® Phantom Family

Versatile Dosimetry Investigation & Verification



Highlights

- Full line of anthropomorphic, cross-sectional dosimetry phantoms, consisting of five clinically relevant ages
- Uniquely designed for investigation of organ doses and whole body effective doses, as well as the verification of therapeutic radiation doses
- Produced with average soft tissue, average bone tissue, cartilage, spinal cord, spinal disks, lung, brain, and sinus tissues

Linear Attenuation of Simulated Tissues

- Within 1% of actual attenuation for soft tissue and bone
- Within 3% for lung, from 50 keV to 15 MeV
- Lung tissue is a low-density inhale formulation equivalent to 0.2 g/cc

Homogenous Bone

- Uses age-specific, averaged mineral density of cortical and trabecular bone ratios to create a homogenous bone, with no distinction in the anatomy
- Eases comparative Monte-Carlo calculations for dose verification
- Makes red-marrow measurements in electron equilibrium easier to obtain

1D **SCANNER™**

Accurate Point Dose & PDD Dosimetry Water Tank

Simple, Efficient Water Scanning

- Perform dosimetry measurements in water, including output factors, dose calibrations, annual, and routine QA
- Collect PDD curves with optional SunDOSE™ or SNC Dosimetry™ software and **PC Electrometer™**

Easy, Reproducible Setup

- Single power and data cable connection
- Water surface detection feature automatically sets the dosimetry detector at the water surface

Software

- Organize and execute groups of scans
- 1-click quantitative analysis across data sets
- Easy, searchable access to data

Specifications

Inner Dimensions L/W/H (cm)	35.0 x 39.0 x 36.2
Exterior Dimensions L/W/H (cm)	37.6 x 40.6 x 36.8
Interior Volume	50 liters at 35 cm depth
Weight empty with arm (kg)	10.4
Arm positioning increments (cm)	0.01, 0.1, 1.0 & 10.0
Arm positioning accuracy (cm)	± 0.01; ± 0.02 for movements of 10 cm
Scan depth maximum (cm)	30.0
Operating system	Windows 10 Pro 64-bit
Number of connection cables	Single power/data cable

PC **Electrometer™**

Portable, Reference-Class Electrometer

Accurate & Convenient

- Dual channel reference class electrometer for absolute dose calibration
- Available in BNC or TNC triax connectors

Simple & Portable

- Small and lightweight for easy transport
- Simple setup with single USB and < 1-minute warm-up time

Software

- Organize and execute groups of scans
- 1-click quantitative analysis across data sets
- Easy, searchable access to data

Specifications

Warm Up Time	< 1.0 min
Charge Range	2 pC – 10 mC, 15 fC resolution
Current Range (Continuous)	Low 2 pA – 50 nA
Current Range (Pulsed)	0 -105 pC/pulse
Leakage Drift	±0.001 pA
Display Update Frequency(s)	500 ms
Bias Voltage	Adjustable, 0 to ±400 V
Non-linearity	± 0.1% of full scale
Long-Term Stability	< ± 0.5%
Measurement Repeatability	± 0.25% of full scale
A/C Converter	16-bit
Operating System	Windows 10 Pro 64-bit
Dimensions	10.6 x 14.8 x 4.5 cm
Weight	0.46 kg
Compatibility	SunDOSE or SNC Dosimetry software
Conformity	Reference class according to IEC 60731

EDGE **Detector™**

Ultimate Small Field Detector for Precision 3D Dosimetry

Well-Suited for Small Fields

- SunPoint® Diode Detector is 842 times smaller, and has 100 times more signal, than micro ionization chambers
- Small size ideal for accurate penumbra characterization
- Also ideal for steep gradients for fields ≤10 cm

Compliance

- Supports compliance with TRS483 and precision dosimetry

Specifications

Active Detection Area (mm)	0.8 x 0.80.3 from top, 4.72 from end
Diode Die Location (mm)	2.7 from side; location is indicated by cross hairs on top of the housing
Water Depth Equivalent (mm)	0.5
Housing Wall Thickness (mm)	0.13 brass
External Dimensions (mm)	3.8 x 5.5 x 38
Nominal Sensitivity (nC/Gy)	32.0
Impedance (Mohm)	>200 at 10 mV reverse bias
Output Polarity	Negative
Cable	3.4 mm dia. x 1.8 m long, triax
Cable Connector	BNC or TNC triax, or adapters upon request

SNC**125c™**

Reference Class Dosimetry

Reliable & Accurate Reference Dosimetry

- Vented, waterproof and fully guarded
- White chamber body makes visualization easy
- Reduces the convolution of high-dose gradient regions during profile and depth measurements

Ion Chamber Highlights

- Meets IEC 60731 standards
- kq factors available for TG-51, TRS398 and DIN 6800-2 calibrations
- Enhanced penumbra without loss of signal strength
- Optimized to work with Sun Nuclear's unique cylindrical water scanning systems
- Maintains ideal orientation during scans
- Sensitivity of a 0.125 cm^3 chamber and penumbra closer to a micro-chamber

Specifications

Active Volume (cm^3)	0.108
Active Length (mm)	7.05
Active Diameter (mm)	4.75
Sensitivity (nC/Gy)	3.4
Wall Material	Paint 0.05 mm PMMA 0.30 mm Graphite 0.25 mm
Electrode	0.8 mm diameter aluminum
Vented	To atmosphere through waterproof tubing
Waterproofing	Viton tubing
Polarizing Voltage	±400 V Max
Cable Length (m)	1.5
Cable Connector	TNC or BNC

SNC**350p**™

Electron Reference Dosimetry

Reliable & Accurate Reference Dosimetry

- Vented, waterproof and fully guarded
- White chamber body makes visualization easy
- Parallel-plate ion chamber is well-guarded to minimize perturbation effects for reference, field, and scanning dosimetry of therapeutic electron beams, TDD/TPS commissioning and QA

Ion Chamber Highlights & Compliance

- Supports absolute or relative dose point measurements and PDD measurements
- Conforms to the design principles as stated by Dr. M. Roos et al. (IAEA TRS-381)
- Meets AAPM TG-51 and IAEA TRS-398 requirements for low-energy beams (<10 MeV)

Specifications

Sensitive Volume (cm³)	0.388
Entrance Window (mm)	0.05 Paint; 1.00 PMMA; 0.02 Carbon
Reference Point (mm)	1.0 Below Window Surface
Collection Volume Height (mm)	2.0
Collector Diameter (mm)	15.6
Guard Ring Width (mm)	4.1
Polarity Effect	Within 1.000 (±) 0.01
Waterproofing	Viton tubing
Max Dose Rate for (Gy/s)	
≥ 99.5 % Saturation	5.2
≥ 99.0 % Saturation	10.4
Max Dose Per Pulse for (mGy)	
≥ 99.5 % Saturation	0.46
≥ 99.0 % Saturation	0.92
Radiation Quality	Photons Co-60 to 25 MV Electrons 5 MeV to 25 MeV
Field Size (mm)	Minimum 40 x 40 Maximum 400 x 400
Sensitive Volume (cm³)	0.388
Entrance Window (mm)	0.05 Paint

SNC**600c**™

Photon & Electron Reference Dosimetry

Reliable & Accurate Reference Dosimetry

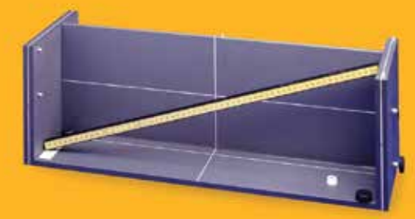
- Vented, waterproof and fully guarded
- White chamber body makes visualization easy

Ion Chamber Highlights

- Based on the classic Farmer Chamber design
- kq factors available for TG-51, TRS398 and DIN 6800-2 calibrations
- Design allows use in most slab phantoms
- Reference class performance (IEC 60731) allows for use in X-ray and electron reference dosimetry protocols - TG-51 and TRS-398

Specifications

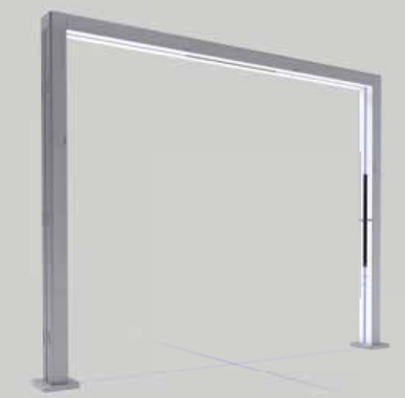
Active Volume (cm³)	0.6
Active Length (mm)	22.7
Active Diameter (mm)	6.1
Sensitivity (nC/Gy)	20
Wall Material (mm)	Paint 0.05, Graphite 0.43
Energy Range	Co-60 - 25 M; V9 MeV - 25 MeV
Electrode (mm)	1.1 diameter aluminum
Vented	To atmosphere through waterproof tubing
Waterproofing	Viton tubing
Buildup Cap (mm)	4.5
Polarizing Voltage	±400 V Max
Length (m)	1.5
Cable Connector	TNC or BNC



CT Simulation QA

Our solutions provide confidence in alignment, electron density calibration, image quality, and imaging doses, when performing CT simulation.

Learn more: sunnuclear.com/lasers



Simplified workflows for
Laser Alignment

MICRO+™

Fixed Lasers System

Precise Patient Alignment for Radiation Therapy & Diagnostic Imaging

- ±0.5 mm accuracy, at 3 m
- Line widths of ≤0.5 mm, at 4 m, for all colors
- Industry-leading line length of ≥4 m, at 3 m

Remote Controlled, Workflow Optimized

- Easy adjustments via included remote control
- Backlit for visibility in darkly lit rooms
- Easily synchronizes and controls multiple lasers with Bluetooth® technology (no line of sight needed)

Tool-Free Access

- Quick-release cover enables tool-free entry for service and alignment adjustments

Customized to Your Needs

- Three color options – red, green, or blue
- 3-laser system (3 crosshairs) or 4-laser system (3 crosshairs and 1 sagittal) configurations available

MR-compatible version available, including custom post-mount option for Elekta Unity MR Linac* (field strengths of 3T or less)

Specifications

Adjustment Type	Handheld remote control
Degrees of Movement/Freedom	6
Left - Right	≥ ± 15 mm
Up - Down	≥ ± 15 mm
Rotation	≥ ± 5°
Horizontal Tilt (yaw)	≥ ± 5°
Vertical Tilt (pitch)	≥ ± 5°
Focus Range	1.5 m - 4 m
Adjustment Accuracy	0.15 mm
Adjustments Speed	Slow – Ultra accurate steps (0.15 mm) for each touch of the control Medium – Hold the control for continuous motion Fast – Continue to hold the control for faster speeds and larger movements
Remote Technology	Bluetooth technology and infrared
Remote Receiver	Integrated
Remote Operational Range	>10 m
Remote Locator	"Find remote" option on each laser
Number of Lasers per Remote	6
Laser Selection	OneTouch automatic laser and remote pairing
Line Width (All Colors)	≤ 0.5 mm for all colors @ 4 m
Line Length	≥ 4 meter @ 3 m
Laser Type	Diode
Laser Output	< 1 mW
Power Supply	100 – 240 V (auto select)
Dimensions	216 mm × 134 mm × 80 mm (H×W×D)
Weight	< 1 kg
Available Colors	Wavelength 635 nm Red Wavelength 515 nm Green Wavelength 450 nm Blue
Installation Options	Wall mount ± 45° (with optional tilt and adapter bracket) Post mount
Certifications	ISO13485 certified. Complies with Center for Devices and Radiological Health regulations for Class II lasers and all CE requirements. (21 CFR 1040) (IEC 60601) (IEC 60825-1) (MDD 93/42/EEC)

**Elekta Unity is a trade name by Elekta AB.. Sun Nuclear Corporation is not affiliated with or sponsored by Elekta AB.*

CT **SIM+™ & SIM+™** Pro* with RapidSIM™ Software

Moveable Lasers Systems

Simplified Positioning & Marking for PET/CT Simulation

- ±0.5 mm accuracy, at 3 m
- Line widths of ≤0.5 mm, at 4 m, for all colors
- Industry-leading line length of ≥4 m at 3 m
- All laser axes remote adjustable (SIM+ Pro):
  - Coronal, sagittal, transverse planes
  - Pitch yaw and roll
  - Focus

Tool-Free Access (CT SIM+)

- Quick-release cover enables tool-free entry for service and alignment adjustments

Customized to Your Needs

- Three color options – red, green, or blue
- 3-arm or 5-arm configurations are available for wall/ ceiling, posts, and bridge (or custom configurations can be accommodated)

RapidSIM™ Software

- Seamless laser connectivity to the CT simulation package or Treatment Planning System
- Compatible with all major third-party systems
- Reads coordinates and directs lasers for accurate identification of patient marking and treatment location
- Flexible levels of automation

  IsoDRIVE™ mode retrieves TPS coordinates and automatically moves the lasers into position. The IsoLOCK™ feature provides visual confirmation the lasers are at the requested position within 0.5 mm

  DICOM mode allows single point selection, driven by the user.

  Manual mode allows the user to manually enter coordinate information.

**SIM+ Pro is not available for sale in all markets. CE mark pending.*

Laser Alignment Solutions

Specifications

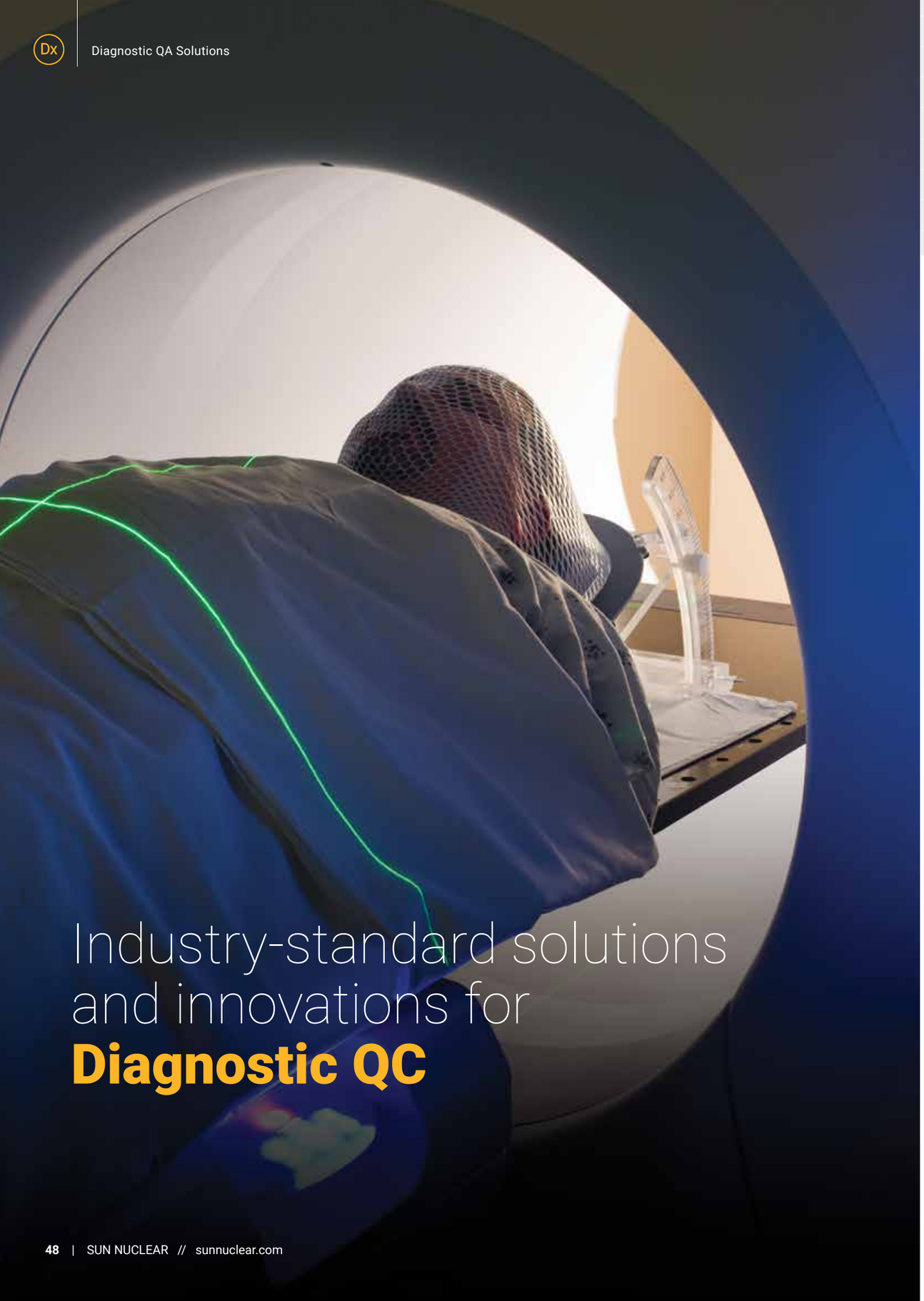
Laser Output			
Power (mW)	<1.0		
Range	Up to 6 m		
Line Width	≤0.5 mm for all colors @ 4 m		
Line Length	≥4 m @ 3 m		
Available Colors	Wavelength 635 nm Red Wavelength 515 nm Green Wavelength 450 nm Blue		
Mechanical			
Length of Travel	700 mm		
Positional Accuracy	<0.1mm		
Projected Laser Accuracy at the Patient	±0.5 mm at 3.0 m		
Dimensions	**Wall**	**Post**	**Bridge**
Length (mm)	1191	1770	Varies
Width (mm)	201	201	Varies
Depth (mm)	119	119	Varies
Wireless Connectivity			
Wi-Fi	802.11 b/g/n		
Remote Communication (SIM+ Pro):	Bluetooth BLE		
Power Requirements			
Voltage	110/240 VAC (auto-select)		

Workflow-Compatible Software

A touchscreen monitor and handheld tablet create redundancy and ease of workflow when moving in and out of the room.

“CT SIM+ lasers allowed us to achieve our vision, thanks to high precision and perfect connectivity with our image management and CT systems.”

Ricardo Ruggeri, M.Sc., Chief of Medical Physics, Centro Oncológico Integral, Argentina



Industry-standard solutions and innovations for **Diagnostic QC**

Doppler Ultrasound Phantoms

Reproducible System Velocity Testing

Comprehensive QA & Testing

- Determine maximum signal penetration, channel isolation, and flow rate readout accuracy
- Doppler flow and B-Mode QA test systems
- Meet ACR, ECR, and AIUM QA requirements
- **Doppler 403™ Flow Phantom** ideal for abdominal flow measurements
- **Mini-Doppler 1430™ Flow Phantom** ideal for cardiology and musculoskeletal applications

Unparalleled Tissue Mimicking

- Blood-mimicking fluid ultrasonically similar to human tissue, with an electronic flow of 1550 m/s
- Patented High Equivalency Gel* (HE Gel™) offers tissue mimicking for evaluating image uniformity, detecting dead transducer elements, and assessing maximum penetration depth

Specifications

HE Gel™ Multi-Frequency Tissue-Mimicking Material	Included
Composite Film Scanning Surface	Included
Vessels (2)	5 mm inner diameter; 1 horizontal at 2 cm depth, 1 diagonal at 40° from 2 to 16 cm deep (403) 4 mm inner diameter; 1 horizontal at 2 cm depth, 1 diagonal at 35° from 2 to 9 cm deep (1430)
Flow Rates	Customizable, constant and pulsatile
Blood Mimicking Fluid	Speed of Sound 1550 +/- 10 m/s
Targets	Strings, cysts, greyscale, resolution groups
Dimensions (Case)	28 H x 30.5 W x 22 cm (403) 20 H x 23 W x 15.2 cm (1430)
Weight	8.34 kg (403) 4.6 kg (1430)

**U.S. Patent No. 6,352,860*

B-Mode Ultrasound Phantoms

Training & Compliance Ultrasound Testing

Comprehensive Offerings

- Comprehensive Ultrasound QA solutions from Sun Nuclear for training through compliance and more
- Sun Nuclear patented* HE Gel™ and Zerdine® Hydrogel provide multi-frequency, high quality, reproducible images

Comprehensive QA Test Coverage

- Meet ACR, AIUM, AAPM and IEC TS 62736:2016 requirements
- Test across the entire frequency range (2 - 18 MHz)
- **Model 40GSE** Multi-purpose, multi-tissue phantom with elastography and dual attenuation zones
- **Sono403™**: Multi-purpose phantom ensures accurate screening, diagnosis and monitoring
- **Model ATS 539**: Multi-purpose phantom of durable urethan rubber construction
- **Model ATS 570:** Multi-purpose, endoscopic phantom with curved scan surface and endocavity well for enhanced testing of curved probes and endo probe

Basic QA Test Coverage

- Provide support for ACR-required tests; limited ability to support other QA tests
- Test across the entire frequency range (2 - 18 MHz)
- **Model ATS 539:** General purpose, low-cost QA solution for ACR requirements
- Dedicated Ultrasound image uniformity phantoms

See sunnuclear.com for a full listing of Ultrasound QA solutions, including Small Parts and Special Purpose phantoms, as well as specifications.

CT ACR 464 Phantom

Multi-Modality CT Accreditation

Comprehensive CT Testing

- Test positioning and alignment accuracy, CT number accuracy, slice thickness, low contrast detectability, image resolution and uniformity, spatial resolution, and inter- and intra-plane distance measurement accuracy
- Meet AAPM TG-66 requirements

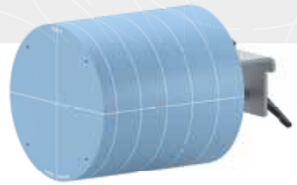
Proven & Versatile Design

- Made of the original Solid Water® Zero HU formulation
- Works with **RapidCHECK™** software to automate CT image quality testing or analysis with the SunCHECK(R) Platform
- Optional Phantom Body Ring and Extensions available

See sunnuclear.com for specifications.

IQphan™

Comprehensive CT Image Quality Phantom



Comprehensive CT QA — All in One Phantom

- Perform QA across CT imaging systems, from sophisticated diagnostic scanners to cone beam to on-board radiotherapy systems
- Use with **RapidCHECK™** Image Quality Analysis software for exacting CT imaging quality testing, with quick, consistent analysis

Modular Testing Support

- High-Contrast Resolution Module features high-resolution line pairs, large 3D patterns that are easy to visualize, and robust data analysis in **RapidCHECK** software
- Slice Thickness & Geometric Evaluation Module with multiple wire-ramp materials and diameters enable analysis of slice thickness on range of scanners -- from diagnostic CT to CBCT and MVCT
- Low-Contrast Detectability Module provides a low-contrast test covering radiation therapy systems and diagnostic CT
- Uniformity Module supports assessment of noise and uniformity in HE CT Solid Water
- HU Module tests the consistency of known HU materials and measures the effective energy of the scan

See sunnuclear.com for specifications.

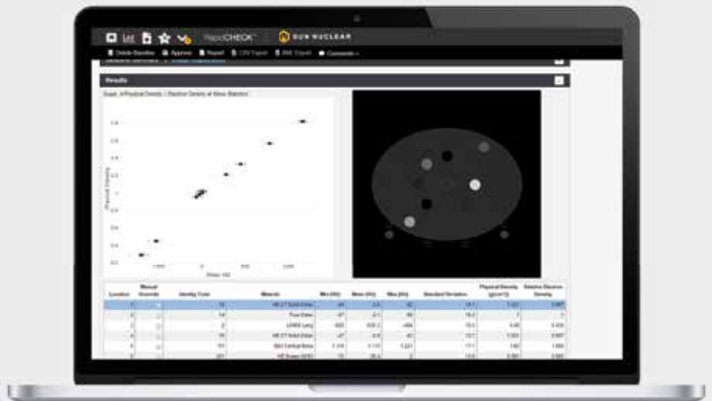
RapidCHECK™ Software

Automated CT-to-Density Calibration & CT Image Quality Analysis

Automate QA Workflows

- Use with **IQphan Phantom** to quickly process CT data into results and reports
- Use with **Advanced Electron Density Phantom** for faster, less-tedious calibration of CT-to-electron density tables
- Use with **CT ACR 464 Phantom** for automation of image quality analysis, trending reports, and an easily searchable permanent record

See p.34 to learn more.



Multi-Energy CT Phantom

Comprehensive Testing, Tissue Equivalence

Comprehensive Testing of Scanner Performance

- Test efficacy of clinical protocols over an expanded range of material concentrations for multi-energy analysis
- Compare consistency and stability across scanners
- Expanded range of testing to exceed draft AAPM Task Group 299 requirements

Automated Material Discrimination

- Solid rods represent iodine, calcium, blood, adipose, and more
- Patent-pending rod markers enable automated analysis

Specifications

In-Plane Dimensions	40.0 cm (15.7 in) x 30.0 cm (11.8 in)
Depth	16.5 cm (6.3 in), up to 26.5 cm (10.2 in) with extension plates
Removable Head Section Diameter	20.0 cm (7.87 in)
Material	HE CT Solid Water® phantom material
Interchangeable Inserts	27 solid inserts plus 1 true water container, each tagged with a CT-visible rod identification code
8 HE Iodine Inserts with Variable Concentrations	Concentrations of 0.2, 0.5, 1.0, 2.0, 5.0, 10.0, 15.0, and 20.0 mg/mL
3 Iodine Inserts with Variable Diameters	5.0 mg/mL concentration at diameters of 2.0, 5.0, and 10.0 mm
8 HE Calcium Inserts	Concentrations of 0, 5, 10, 20, 50, 100, 200, and 300 mg/mL
3 Blood [iron] Inserts	Blood-mimicking material at relative electron densities of 1.03, 1.07, and 1.10
2 Blood [iron] with Iodine Inserts	Blood-mimicking material plus iodine at 2.0 and 4.0 mg/mL
3 Tissue-Mimicking Inserts	High-Equivalency Brain, High-Equivalency Adipose, High-Equivalency CT Solid Water
Weight	15.5 kg (34.1 lbs)
Wheeled Case	Included
Stand	Included

Mercury 4.0 Phantom

Advanced CT Performance Assessment

Characterize Advanced CT Features

- Address performance and effectiveness of Automatic Exposure Control/Tube Current Modulation
- Evaluate image quality for Iterative Reconstruction
- Meet AAPM TG-233 requirements

CT Protocol Optimization

- 5-tiered sections reflect range of patient sizes, and enable size-dependent image quality evaluation
- Software analysis, featuring imQuest software available from Duke University

Specifications

Material	Polyethylene
Diameter	16.0, 21.0, 26.0, 31.0, and 36.0 cm
Length	52.0 cm
Contrast Materials	HE CT Solid Water®, Bone Mimicking Material, Polystyrene, 10 mg/mL Iodine, and Air
Resolution Wedge	HE CT Solid Water® phantom material
Software Analysis	Works with imQuest software, available from Duke University
Included	Wheeled Case and Stand

CTDI Phantoms

Computed Tomography Dose Index Phantom

Compliance Maintenance

- Measure absorbed dose and monitor scanner output for Dose Index QA
- Address specifications outlined by the FDA (FDA 21CFR 1020.33) and IEC (IEC 60601-2-44, IEC 61223-2-6 and IEC 61223-3-5IEC 60601-2-44)
- Meet AAPM TG-66 requirements

Configurable

- 2-piece configuration supports adult body and adult head/ pediatric body sizes
- 3-piece configuration offers an additional pediatric head size
- Nested modules adapt the phantom to the size required by user protocol

Specifications

Material	Polymethyl-Methacrylate (PMMA/Acrylic)
Density	1.19 g/cm³
Alignment Markings	Etched lines centered at the transverse, coronal and sagittal planes
Module	Dimensions (OD x Length)
Adult Body	32 cm x 14.5 cm
Adult Head/Pediatric Body	16 cm x 14.5 cm
Pediatric Head (Model 468-BHP only)	10 cm x 14.5 cm
Weight	19.9 kg (30.5 lbs)
Chamber Ports Diameter	1.31 cm

CT Perfusion Phantom

Optimize Imaging & Perfusion Protocols

Consistent, Optimized CT Perfusion Programs

- Ensure your CT scanner and perfusion software are providing consistent results
- Benchmark perfusion rates and time-attenuation curves for each system
- Meet ACR CT Perfusion and FDA recommendations

Image Gently

- Use the dose port to optimize imaging and perfusion protocols
- Gain insights to image at the lowest possible dose

Specifications

Covers and housings	PVC, Acrylic
Dosimetry Port	Standard CT Pencil Chambers up to 12.7 mm (0.5 in) diameter
Central Scan Disk	High Equivalency (HE) Brain Mimicking Material
Artery Rod	16 discrete sections of blood and contrast simulating materials to mimic arterial flow rates following a contrast bolus injection
Vein Rod	16 discrete sections of blood and contrast simulating materials to mimic venous flow rates following a contrast bolus injection
Tissue Rods (Qty 2)	HE Brain Mimicking Material of 16 discrete sections of brain tissue to mimic tissue uptake rates following a contrast bolus injection
Velocity settings (mm/second)	1.31, 1.50, 1.75, 2.10, 2.63 +/- 2%
Rod Travel Distance	10.5 cm (4.1 in)
Dimensions (L/W/H)	55.5 x 25.4 x 30.5 cm (22 x 10 x 12 in)
Power	8 AA batteries (included)
Weight	13.6 kg (29.9 lbs)

Stereotactic Needle Biopsy Phantom

Enabling Critical Testing & Training

Highlights

- For use in localization accuracy test per ACR's stereotactic breast biopsy accreditation program
- Use upon system installation or repair, to ensure accurate needle placement
- Anthropomorphic shape allows accurate simulation of breast compression
- Re-usable - will not dry out, or leak when punctured; Masses can be biopsied multiple times
- 11 dense masses in three sizes; Two microcalcification clusters
- Compatible with standalone and add-on stereotactic biopsy systems

Specifications

Dimensions	10 cm x 16.6 cm x 5 cm (6.5" x 2.5" x 4")
Phantom Weight	1.0 lb. (0.4 kg)
Phantom Volume	530 cc
Material	Polyurethane

Multi-Modality Breast Biopsy and Sonographic Trainer

A Versatile Tool for Shaping Best Practices

Highlights

- Designed to train users in aspects of breast imaging and image-guided interventional procedures - X-ray, Ultrasound, MRI
- Includes cystic and dense lesions embedded within breast background
  - Half of dense lesions spherical with embedded 100-300 micron microcalcification, half with spiculated shape
  - Calcifications serve as useful markers for image registration between modalities
- Features patent-pending Z-Skin™ membrane to simulate skin, providing protection from desiccation even after multiple sessions

Specifications

Tray Dimensions	26 cm x 23 cm x 7.5 cm (10" x 9" x 3")
Breast Size	500 cc (14 cm x 11 cm at base, 8 cm high)
Total Weight	1 lb. (0.4 kg)
Membrane Material	Z-Skin™ elastomer
Background Material	Zerdine®, white
Cystic Masses	Qty: 5-10
Dense Masses	Material: Zerdine®

Image-Guided Abdominal Biopsy Phantom

Image-Guided Training and Demonstration

Highlights

- Minimal needle tracking-- Z-skin™ fat layer and softer gel provide better self-healing properties
- Re-usable
  - Will not dry out, or leak when punctured
  - Masses can be biopsied multiple times
- Improve performance of freehand abdominal biopsies
- Validate automated biopsy systems

See sunnuclear.com for specifications.

DBT QC Phantom

Thorough Tomosynthesis System Performance Testing

Comprehensive Digital Testing

- Acceptance testing, daily and routine QC
- Tests image quality and stability of DBT systems
- Consistent, repeatable targets in homogeneous background
- Optional complex background provides clinically relevant challenge for target detection
- Slab configurations provide range of thicknesses with or without targets
- Developed to meet developing requirements of EUREF and AAPM TG-245

Specifications

Overall Dimensions	127 mm x 80 mm x 100 mm
Individual Slab Dimensions	6 Slabs: 110 mm x 180 mm x 10 mm; 1 Slab: 115 mm x 180 mm x 10 mm (support slab); 1 Slab: 110 mm x 180 mm x 5 mm, semicircular shape
Phantom Weight	1.62 kg (3.55 lbs)
Materials	BR50/50, BRSW5050
Set Includes	4 Solid Homogeneous Slabs 1 cm thick; 1 Solid Homogeneous Slabs 0.5 cm thick; 3 Target Homogeneous Slabs 1 cm thick; 1 Positioning Holder with Magnetic Fixation

Mammo **FFDM**™ Phantom

Full Field Digital Mammography

Ensure Optimal FFDM Performance

- Evaluate artifacts over the entire detector with a single image
- Meet ACR, MSQA and EUREF requirements
- Test objects designed and located per ACR specifications, and reduced backscatter and equalized attenuation
- Meets ACR 2018 Digital Mammography Quality Control Manual requirements

Specifications

Materials	Wax and acrylic equivalent to 4.2 cm thick compressed breast tissue
Nylon Fibers	6
Specks	6 Groups, Glass Spheres
Masses	6
Dimensions (L x W x H)	31.0 ± 0.1 x 19 ± 0.1 x 4.1 ± 0.03 cm
Dimensions: Wax Insert (L x W x H)	12.98 (+ 0, - 0.04) x 6.98 (+0, -0.04) x 0.7 ± 0.02 cm
CNR Cavity Depth	0.1 ± 0.005 cm
CNR Diameter	2.0 ± 0.05 cm
Compensator	9 mil Polyvinylidene Chloride
Case	Optional custom hard-sided case, with 1-year warranty

Mammo **156™ & 156D Stereo™** Phantoms

Digital Mammography System QC, Biopsy & Localization

Measure & Monitor Digital Mammography Systems

- Phantoms simulate the radiographic characteristics of compressed breast tissue
- Detect objects from 0.20 to 1.00 mm
- Monitor signal-to-noise, resolution and image quality
- Meet ACR and MSQA requirements
- Hang Mammo 156D on biopsy system detector during rotation

Specifications

Materials	Wax and acrylic equivalent to 4.2 cm thick compressed breast tissue. 50% adipose & 50% glandular Mammo 156D fibers, specks and masses follow ACR specifications.
Nylon Fibers (Fibrils)	6 (156)
Nylon Fibers (monofilament) DIA (mm)	0.40, 0.54, 0.74, 0.93 (156D)
Micro-calcifications	5 Groups (156)
Micro-calcifications (Aluminum Oxide) DIA (mm)	0.20, 0.24, 0.32, 0.54 (156D)
Masses	5 (156)
Masses DIA (mm)	0.25, 0.50, 0.75, 1.00 (156D)
Dimensions (L x W x H)	10.2 x 10.8 x 4.5 cm (156) 6.7 x 6.8 x 6.1 cm (156D)
Case	Optional soft-sided case with foam insert, with 1-year warranty

Mammo 3D™ Performance Kit

Digital Mammography System QC

Acceptance Testing for 3D Tomosynthesis Systems

- Includes PMMA plates, spacers, aluminum plates and foils, steel plates and customized test tools
- Meet IEC Protocol 601223-3-6, EUREF/EFOMP 1.03 (Tomosynthesis), & German DIN 6868-14 requirements

Specifications

Standard Test Plate	1 - 320 x 260 x 45 mm
10 mm PMMA Plate	7 - 320 x 260 x 10 mm
15 mm PMMA Plate	1 - 320 x 260 x 5 mm
2 mm PMMA Plates	7 - 40 x 20 x 2 mm
10 mm PMMA Spacers	2 - 180 x 15 x 10 mm
30 mm PMMA Spacers	2 - 180 x 30 x 30 mm
Geometric Distortion & Z-Resolution Phantom	1 - 320 x 260 x 5 mm
Custom Hard Case	Included
Aluminum Plates & Foils	
2 mm Aluminum Plate	1 - 100 x 100 x 2 mm
0.2 mm Aluminum Foil Sheet	1 - 10 x 10 x 0.2 mm
0.1 mm Aluminum Foil Sheets	8 - 100 x 100 x 0.1 mm
Steel Plates	
3 mm Stainless Steel Plate	1 - 320 x 260 x 3 mm
MTF Edge Tool	1 - 120 x 60 x 0.6 mm
Wire, Spacers, X-ray Rulers	
25 micron Tungsten Wire (cm)	100
Polystyrene Foam Spacers	5 - 240 x 180 x 20 mm
1 mm scale X-ray Rulers	4 - +2.5 to -5 cm

PATIENT MACHINE DOSIMETRY LASER DIAGNOSTIC

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