PLAN VERIFICATION

peo MEDICAL

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Sun Nuclear Corporation **3**

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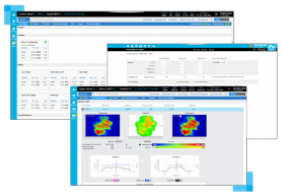
Partner Sun Nuclear Corporation

Sun Nuclear is a leading provider of comprehensive Quality Management solutions for radiation therapy and diagnostic imaging. Their portfolio encompasses positioning systems, dosimetry tools, QA phantoms, detectors, dose rate monitoring devices, analysis software, and training phantoms. These solutions are designed to support medical professionals in ensuring accurate, safe, and efficient patient care.

Product offering

PlanCHECK™ – Sun Nuclear Corporation

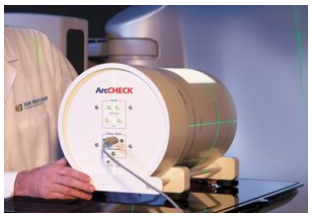


MapCHECK®3 – Sun Nuclear

SRS MapCHECK – SunNuclear

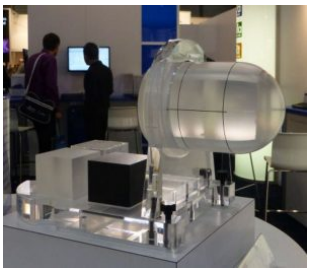
SunCHECK™ Patient

ArcCHECK 4D – Sun Nuclear



Model 038 STEEV Steriotactic End-to-end Verification Phantom Patient

StereoPHAN Phantom – Sun Nuclear



PlanCHECK™ – Sun Nuclear Corporation

Automate Plan Quality Verification with PlanCHECK:

- Physics Checks
- Dosimetric Checks
- Seamless, integrated Patient QA workflow

PLANCHECK™

Plan checks are a time-consuming task that requires significant experience and expertise to ensure treatment plans are created as intended. An independent and automated solution for physics and dosimetric checks, PlanCHECK™ eases this burden.

Part of the powerful SunCHECK™ Platform, PlanCHECK automatically loads loads patients' plan files into the Treatment Planning System and performs the plan checks – reducing the time required for this intensive process.

- Dose/Volume Results: automatically verified against a selected customizable clinical protocol
- Comprehensive Rules-Based Physics Plan Checks: automatically apply pass, warn, and fail criteria
- Compatible: works with multiple Treatment Planning Systems, via scripting or DICOM transfer

PlanCHECK fits seamlessly within the SunCHECK Patient workflow – providing an all-in-one solution for plan checks, secondary calculations, pre-treatment QA and in-vivo monitoring.

Physics Checks

Validate the treatment plan against your department's requirements, and easily identify deviations with user-defined pass/fail results. Rules -based checks include:

- Plan Parameter Checks
- Structure Checks
- Deliverability Checks

Dosimetric

Checks Automatically assess performance of a treatment plan versus treatment. Verify a variety of comprehensive, structure-based checks, including: • Various Dose and Volume Metrics, compared to pre-loaded, editable protocols • Complex dosimetry metrics such as: Conformality Index, Conformation Number, Gradient Index and Gradient Measure for multiple structures, plus Homogeneity Index, Inhomogeneity Index and more.

If you want to read more about PlanCHECK and SunCHECK, take a look at our partner's website!

MapCHECK®3 – Sun Nuclear

The Benchmark for 2D IMRT QA

MapCHECK®3 is the gold standard for IMRT QA requiring large field measurements.

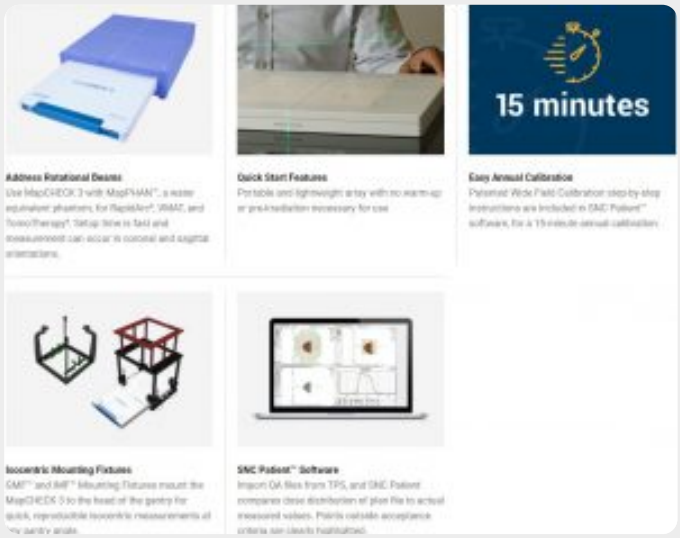
It offers the highest detector density, highest sensitivity, and largest field size of 2D arrays. Plus, it’s uniquely TG 218-compliant.

Built for Pre-Treatment IMRT QA

SunPoint® 2 Diode Detectors placed uniformly throughout the array offer high sensitivity and proven stability in a large active field size (26 cm x 32 cm). A real-time electrometer measures every pulse with 50-millisecond updates.

Easy Comparison Features

Simply import the QA files from your TPS, and let SNC Patient™ software compare dose distribution from the plan file to actual measured values. Measured points outside of acceptance criteria are highlighted for high and low dose.



SRS MapCHECK – SunNuclear

SRS PATIENT QA, NO FILM

SRS MapCHECK removes film and subjectivity from stereotactic QA, and offers efficient, electronic Patient QA and end-to-end testing.

It supports conventional linacs, CyberKnife® Systems, Varian HyperArc™ Systems, and vertex delivery beams to help prevent treatment errors.

But, most importantly, SRS MapCHECK's main objective is accuracy. Because of this product, patients will receive safe and accurate stereotactic radiotherapy. The treatments will also be more efficient and simple. MapCHECK can be used as a stand-alone 2D array, but it can also be used in combination with StereoPHAN.

MOVING BEYOND FILM

SRS MapCHECK takes the place of film and makes the workflow for time-sensitive patient QA more efficient. MapCHECK is a consistent and easy to maintain method for high-density, absolute dose measurements.

IRRADIATE FROM ANY ANGLE

In combination with the StereoPHAN, SRS MapCHECK uses a patented technique to account for angular dependence and correct when necessary. It also pairs this technique with field size and puls rate corrections to ensure accuracy from any angle, including vertex fields.

FLEXIBILITY, SPEED AND ACCURACY

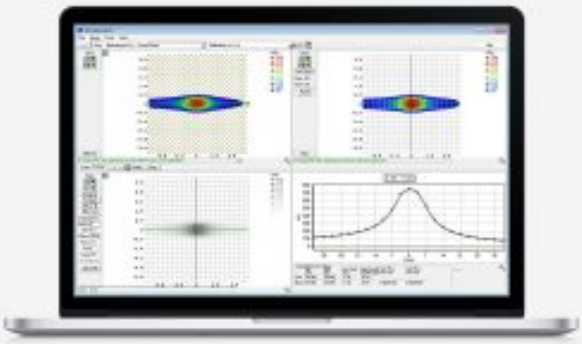
MapCHECK is proven to efficiently detect output factor, MLC, and grid size errors. SRS MapCHECK prevents the most common sources of SRS treatment errors.

NEW IN SNC PATIENT V8.4

The latest software update introduces the QA Setup Tool. This tool provides guidance for ideal setup of Single-Isocenter Multiple-Target (SIMT) plans, and simplified shifts for occasional larger fields.

SRS MAPCHECK FEATURES

- 2D array for SRS applications
- High resolution because of two diodes
- Relpaces film and standalone detector for efficiency
- Provides absolute and relative dose in a single measurement
- The QA setup tool in SNC Patient provides guidance for ideal setup
- Work with static, rotational and non-coplanar, CyberKnife®, FFF, cone and MLC fields
- In combination with the StereoPHAN, it supports irradiation at any angle



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

- Brett Miller, University of Tennessee Medical Center
- Stereotactic QA: saving time, delivering outcomes, Physics World, July 2019

CLINICAL NOTE

Smaller, High Density Arrays vs. Larger, Lower Density Arrays for Stereotactic QA

Performing patient-specific stereotactic QA on plans with multiple targets and a single isocenter can be complex. Radiation therapy teams rely on arrays to ensure treatments will be delivered as expected. This clinical note explores the importance of detector density in arrays for measuring stereotactic patient QA.

For more information about SRS MapCHECK, take a look at this page from our partner.

Would you like to know more?

Contact PEO!

SunCHECK™ Patient

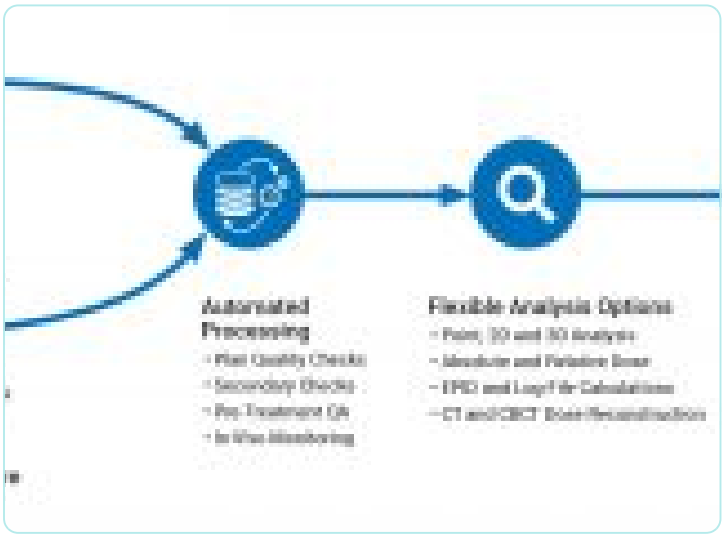
Independent Patient QA in a Single Workflow

SunCHECK™ Patient brings Plan Checks, Secondary Calculations, Pre-Treatment QA and In-Vivo Monitoring into a single workflow, on the same platform as your Machine QA.

Purposefully Automated
SunCHECK Patient streamlines data transfer and time-consuming tasks, enabling greater focus on improved treatment quality.

Common Analysis Tools & Centralized Storage of Results
In support of standardization, SunCHECK Patient provides common analyses across each Patient QA phase — and stores all results for easy retrieval and review.

Custom-Fit for Your Clinic
We optimize SunCHECK Patient for the planning and delivery technologies you use — and provide flexible, automated analysis options for every step. As updates occur and your needs evolve, SunCHECK Patient adapts.

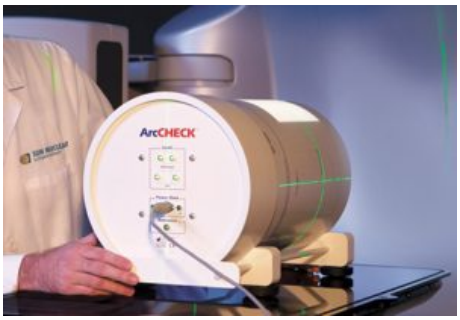


“Because this system is fully automated so that no physicist time is required for data acquisition and evaluation, daily patient treatment QA is feasible.”

- Zhuang AH, Olch AJ.,
- *J Appl Clin Med Phys (2018)*

ArcCHECK 4D – Sun Nuclear

ArcCHECK is the only true 4D array specifically designed for QA of today's modern rotational deliveries. At its heart are over 1300 SunPoint Diode Detectors providing consistent and highly sensitive measurements for all gantry angles, with no additional hardware required. Independent absolute dose measurements enable the gold standard for stringent and efficient patient plan and machine QA testing.



ArcCHECK 4D features:

- smallest available detectors for accurate measurements
- BEV is consistent regardless of gantry angle
- 3D and DVH Analysis
- Flattening Filter Free (FFF)
- easy setup and lightweight (16kg)
- measure both composite and per control point
- real-time updates (50ms)

ArcCHECK 4D compatibility:

- rotational therapy: RapidArc, VMAT, TomoHelical
- static gantry: IMRT, TomoDirect
- treatment planning systems: Pinnacle, Eclipse, Monaco, iPlan, and any TPS system that can export DICOM data
- FFF and non-FFF deliveries

Contact our product specialist or download the datasheet below.

Model 038 STEEV Steriotactic End-to-end Verification Phantom Patient

STEEV™ Phantom

The STEEV Phantom provides the most realistic clinical simulation to perform end-to-end testing of SRS QA systems in the most challenging anatomical regions.

The Model 038 STEEV Steriotactic End-to-end Verification Phantom Patient is used for comprehensive testing of stereotactic radiosurgery systems. The Phantom provides a means to check every step the patient will undergo in the treatment process from diagnostic imaging with MR, CT, and PET to treatment plan verification.

Model 038 STEEV Steriotactic End-to-end Verification Phantom Patient features:

- Performs IGRT QA procedure for X-ray and onboard kV and MV imagers including CBCT
- TPS Deformable Image registration algorithm accuracy QA
- Performs end-to-end testing for commissioning as directed by AAPM TG-101
- Verifies patient treatment plan in critical regions
- performs geometric machine QA Winston-Lutz isocenter verification tests and localization/repositioning with couch shift
- Verifies patient positioning using frame/frameless systems, head and shoulder masks or other positioning fixation devices
- Assesses image transfer QA, image fusion, accuracy verification and TPS testing with Multi-modality imaging capabilities (CT, MRI and PET)

Workflow step:

- Treatment planning
- Pre-Treatment delivery
- Commissioning & acceptance
- Monthly QA
- Annual QA
- Dosimetry
- End-to-End QA

Modality:

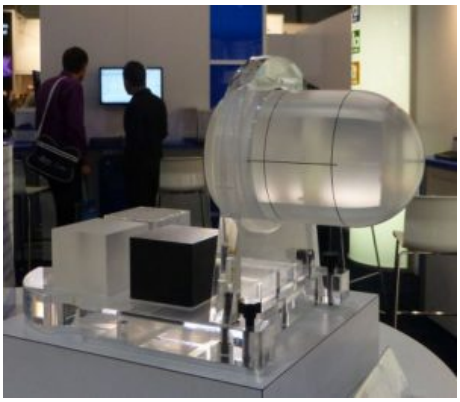
- Linac
- SRS/SBRT
- Bore-based Linacs
- Cyberknife
- TomoTheraphy
- Imaging

The standard model 038 includes:

- Phantom head and neck with external fiducials and markings
- Three brain equivalent spacers to fill rectangular intercranial cavity
- Two tissue-equivalent rods to fill cylindrical channels (one includes MRI/CT fiducial)
- MRI/CT/PET ISO Center Insert
- Neck alignment plate
- Foam-lined carry case
- User guide and warranty

Read more about the Model 038 STEEV Steriotactic End-to-end Verification Phantom Patient on the Sun Nuclear website

StereoPHAN Phantom – Sun Nuclear



StereoPHAN is designed for end-to-end commissioning and quality assurance testing on all parts of the SRS process. StereoPHAN inserts and configurations are quickly exchanged with no tools or change in setup. It's that simple, and that powerful.

StereoPHAN Phantom features:

- easy setup and assembly; no tools required for assembly, stand base can be mounted to a couch that uses the prevalent Lok-Bar system, phantom stand holds the inser ts, making them easily accessible during testing
- single cube insert tests CT and MRI imaging, including slice position, thickness and alignment
- target volumes in CT/MRI cube eliminate need for CT/MRI markers
- flat surface of ion chamber insert enables easier cross-calibration to water than the curved surface of a spherical geometry
- all components fit into a durable rolling case suitable for storage and air travel
- stereotactic (SRS/SRT/SBRT) end-to-end testing and patient-specific QA
- adapters for Head-Frames and CyberKnife
- quality assurance of image fusion algorithms for CT and MRI imaging modalities
- absolute, relative and point dose dosimetry QA measurements at isocenter with ion chambers; relative dose distribution using film
- dosimetry detector cabling remains outside of beam for interference-free dose measurement regardless of measurement setup
- geometric accuracy; optical and geometric isocenter, laser alignment, indexed table positioning alignment and positioning coordinates, CBCT and MV/kV isocenter alignmenent

Read more about the StereoPHAN Phantom on the Sun Nuclear website