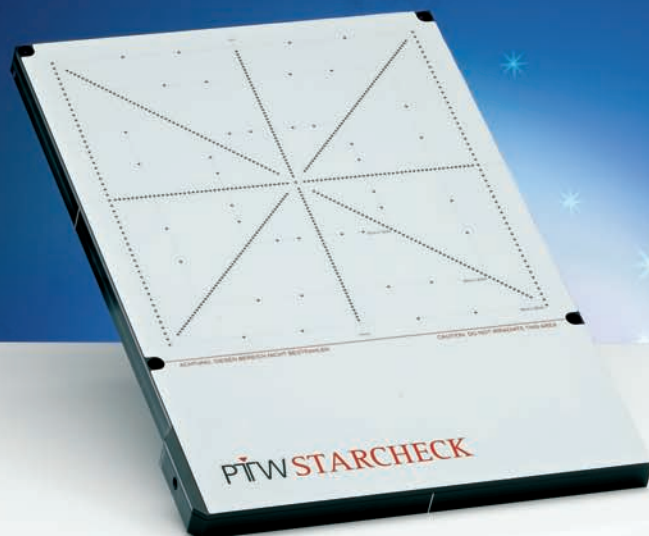


Process Optimization in LINAC QA



STARCHECK®

The high-resolution
3 mm ionization chamber matrix
for precise profile measurement

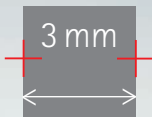
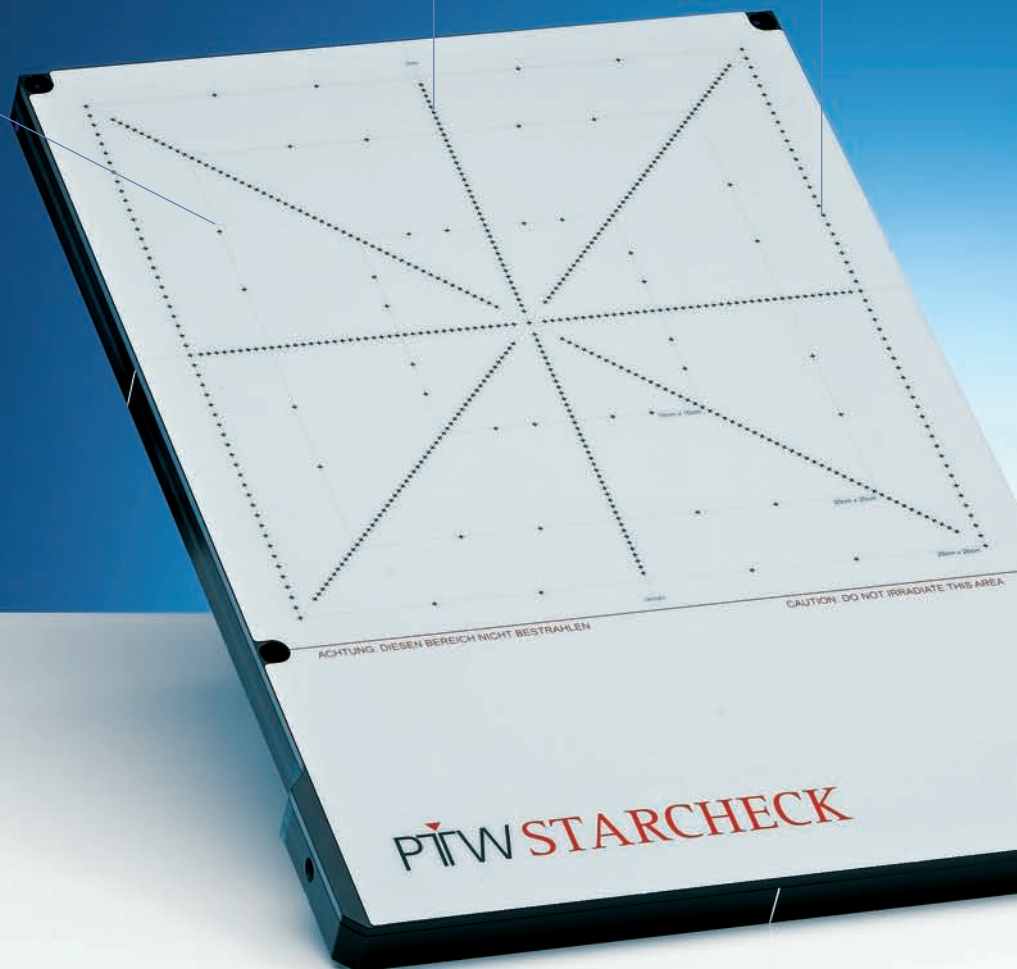
PTW

STARCHECK® – Excellent Resolution, Unprecedented

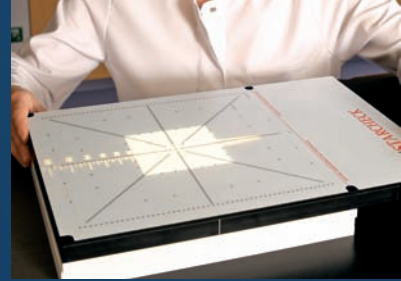
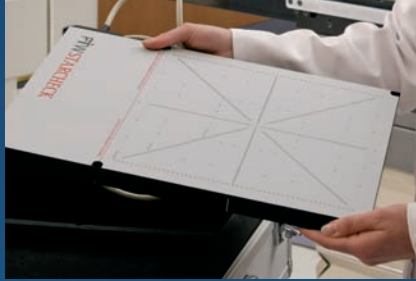
The profiles are measured along the main axes and diagonals with a distance of 3 mm from chamber center to chamber center.

Two additional chamber rows with a distance of 5 mm enable monitoring MLCs with 5 or 10 mm leaf width.

The ionization chambers along the field borders check the congruency of light and radiation fields in field sizes 10 x 10 cm², 20 x 20 cm² and 26 x 26 cm².

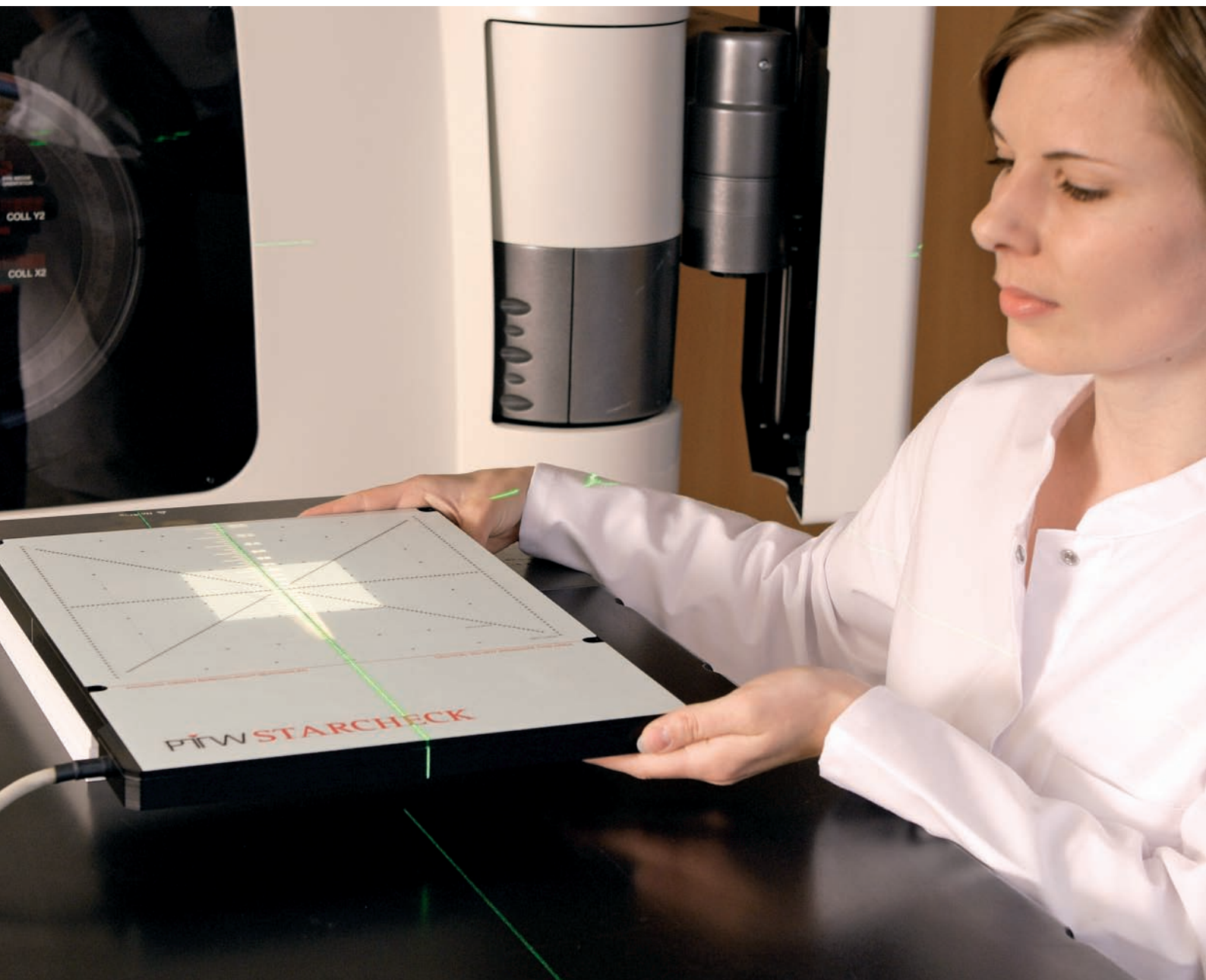


ted Convenience



- * **Fast installation**
Handy flat format, slight weight and easy setup
- * **Simple use**
Flexible use, intuitive user-prompting and multifaceted online evaluation
- * **Precise measurement**
Accurate analysis and **precise profiles with 3 mm resolution**
- * **Continual precision**
Calibrated vented ionization chambers, constant response behavior and no radiation damage as with semi-conductors

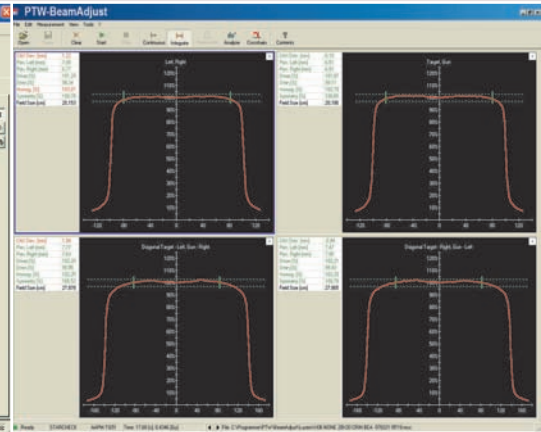
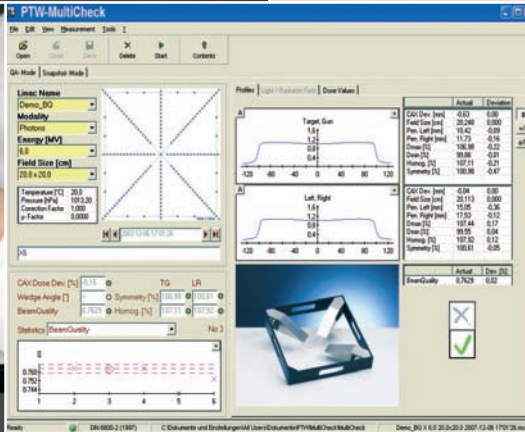
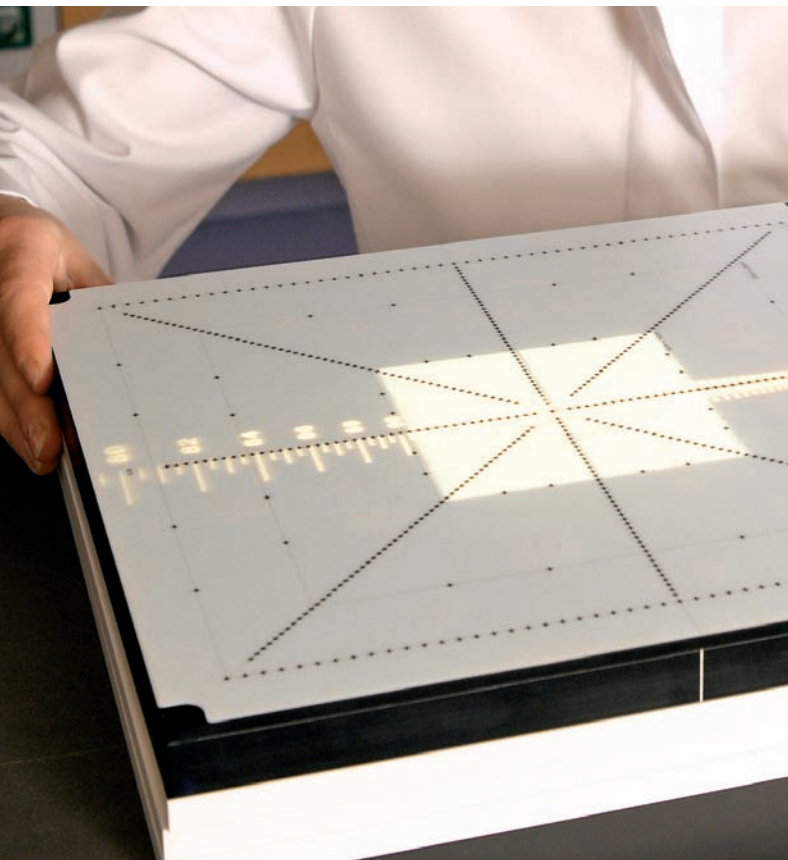
Multifaceted Application, Individual Options



STARCHECK is the high-resolution 3 mm ionization chamber matrix for fast and reliable quality assurance in radiotherapy. The vented ionization chambers are embedded in a solid body phantom; they detect the dose along the main axes and diagonals with a distance of 3 mm from chamber center to chamber center. The result is the exact depiction of the profile in a resolution, which enables analyzing the beam without data interpolation – even in the penumbra area.

In combination with the multifaceted software and phantoms for checking energy constancy and for checking the congruence of light field and radiation field STARCHECK is a multifunctional complete system and covers all processes required in quality assurance from online alignment to constancy checks and all the way to precise setting of the accelerator after a repair.

Thanks to its flat design and slight weight of only 5.5 kg, STARCHECK is also great for use with standard mounting plates. The array is calibrated in PTW's own laboratory; timeconsuming recalibrations are not necessary.



Applications

* Accelerator setting with BeamAdjust software

- ▶ Displays the profiles along the main axes and diagonals in real time
- ▶ Provides color-coded radiation parameter display with adjustable threshold values
- ▶ Creates a comprehensive data analysis according to selectable dosimetry protocols and protocols of the accelerator manufacturer
- ▶ Eliminates the need to set up a water phantom in many case, e.g., after maintenance or repair

* LINAC QA with MultiCheck software

- ▶ Checks homogeneity, symmetry, dose deviation in the central axis, wedge filter angle of dynamic, virtual or fixed wedges as well as the correspondence of light and radiation fields
- ▶ Compares all parameters with a reference data record and displays deviations

- ▶ Enables tracking parameters via a statistics function

- ▶ Creates a comprehensive data analysis according to selectable dosimetry protocols and protocols of the accelerator manufacturer
- ▶ Provides snapshot mode for fast checking of a beam

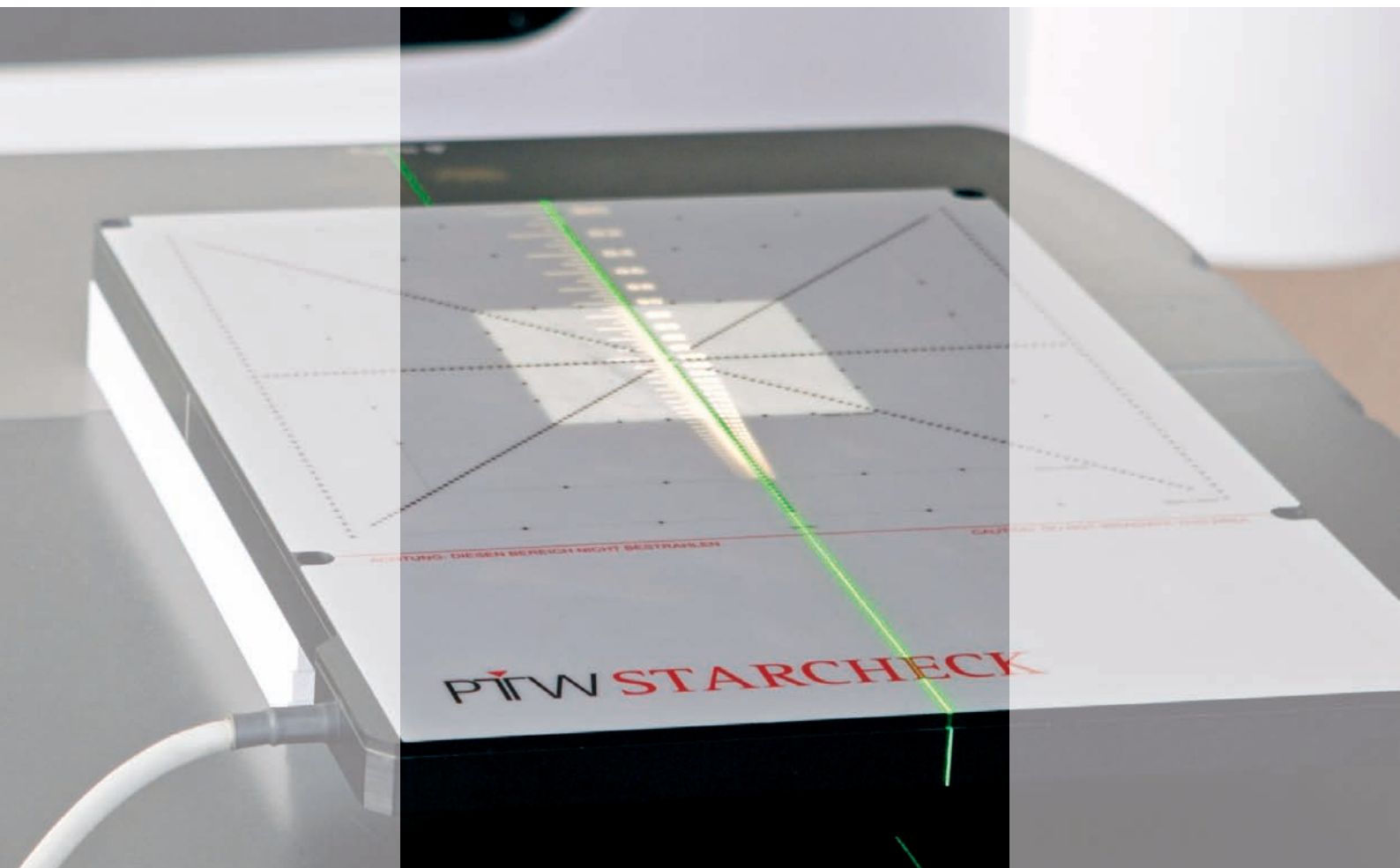
* Testphantoms BQ-CHECK and FIELDCHECK

- ▶ BQ-CHECK for constancy check of photon and electron beam quality
- ▶ FIELDCHECK for checking the congruence of light field and radiation field
- ▶ Comprehensive data analysis with the MultiCheck software

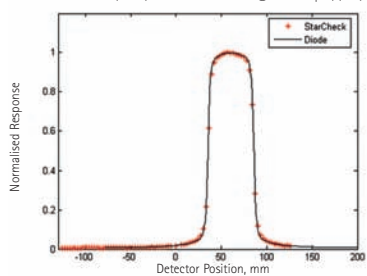
* SC Gantry Mount

- ▶ Enables mounting the chamber matrix on the accelerator head
- ▶ Suitable for use with standard setup material

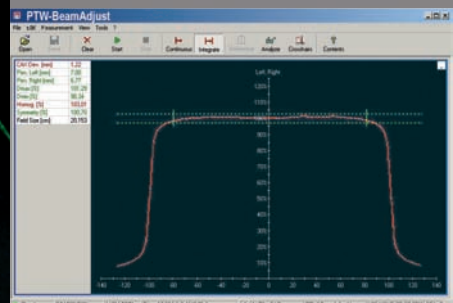
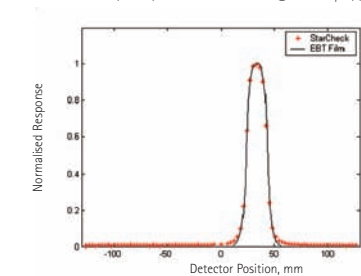
Excellent Technology, Extremely Precise Profile Mea



Cross-Plane Profiles (6 MV): Starcheck Vs Diode @ 5 cm Depth, (5x5) cm² Field



Cross-Plane Profiles (15 MV): Starcheck Vs EBT Film @ 5 cm Depth, (2x2) cm² Field



STARCHECK is the first system worldwide, which measures profiles with a 2D-detector in the isocenter in the desired, high resolution. Compared to single ionization chambers, films and diodes, the 3 mm ionization chamber matrix provides convincing concordance of measurement results. It has outstanding technology, which demonstrates its advantages regularly in actual practice. It increases precision and safety, simplifies processes and saves valuable time: perceptible progress and a milestone in function and design. Typical PTW: decades of experience and intensive research stand for outstanding quality.

STARCHECK^{maxi}

STARCHECK's big brother STARCHECK^{maxi} is designed for quality assurance at a maximum field size of 40 cm x 40 cm.

STARCHECK^{maxi} features the same performance as STARCHECK.

The maximum field size is 40 cm x 40 cm.

709 ionisation chambers are arranged in a star shape.

STARCHECK^{maxi} weighs 13 kg.

With a separate adapter plate the BQ-CHECK and the FIELDCHECK phantom can be used together with STARCHECK^{maxi}.

Important Questions? The Right Answers!

▶ How does the chamber matrix STARCHECK differ from OCTAVIUS Detector 729

The OCTAVIUS Detector 729 is specially designed for IMRT plan verification, in which a large area must be checked. STARCHECK is optimized for the LINAC QA; the profiles should primarily be measured with maximum resolution here.

▶ Does STARCHECK replace QUICKCHECK, or is a combination recommended?

STARCHECK covers several applications. It is suitable for daily quality assurance and it enables online display as well as analysis of a beam, e.g., for setting the accelerator after maintenance work.

▶ In which cases does STARCHECK provide a practical alternative to use of a water phantom?

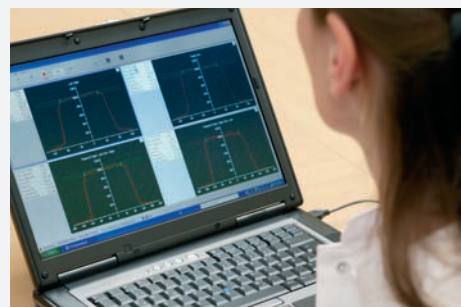
Time-consuming setup of a water phantom is not required when only beam profiles should be measured. A water phantom is still required for depth dose measurement, basic data recording and measurements according to specifications of various regional protocols.

▶ What advantages does ionization chamber technology provide compared to systems with semi-conductors?

Ionization chambers maintain a constant sensitivity and provide stable measurement values continually. Dose-dependent damage especially makes semi-conductors in a matrix unsuitable for use in the LINAC QA; areas, which are irradiated more intensively (e.g., the center), change their sensitivity more.

▶ Why does PTW only sell systems with ionization chambers for quality assurance?

PTW has decades of experience in technological development and empirical research in this area. Our chamber arrays have been on the market for more than 15 years and are convincing thanks to their unmatched measurement value precision and stability compared to products of other companies. It is not without reason that our competitors, who previously only used semiconductors for their products, now also work on 2D-arrays with ionization chambers.



Specifications

Product:	Two-dimensional chamber matrix with 527 ionization chambers
Application:	LINAC QA, consistency check and online alignment of the accelerator
Detector type:	Vented plane parallel ionization chambers
Chamber arrangement:	83 measurement points per main axis, 109 measurement points per diagonal axis, 2 x 53 measurement points for MLC check and 40 measurement points for checking the radiation field size
Detector intervals:	3 mm along the profile and diagonals (center to center)*; 5 mm for the MLC chambers
Scanning range:	25.2 cm along the main axes, 34.5 cm along the diagonals
Measurement range:	100 mGy...1000 Gy; 100 mGy/min...80 Gy/min
Detector size:	Volume 0.08 cm ³
Resolution:	1 mGy
Dead time:	0 ms
Display cycle:	200 ms

Chamber voltage:	1000 V
Reference point:	8.5 mm under the surface
Field sizes:	10 x 10 cm ² , 20 x 20 cm ² , 26 x 26 cm ²
Outer dimensions:	300 mm x 400 mm x 22 mm
Weight:	approx. 5.5 kg
Housing material:	GRP

Ordering Information

L981389	STARCHECK Measurement system with 527 ionization chambers, including interface cable and storage case, BeamAdjust software for online display and MultiCheck for consistency checks
Options:	
T41021	SC Gantry Mount for mounting on the STARCHECK accelerator head
T40049	Positioning phantom for precise alignment of STARCHECK
T42030	BQ-CHECK Energy test phantom
T40052	FIELDCHECK phantom

* The distance of the three center detectors is 6 mm along the main axes and 13 mm along the diagonals.

Africa Egypt Morocco South Africa **America** Argentina Brazil Canada Chile
 Colombia Costa Rica Ecuador Mexico Panama Uruguay USA Venezuela **Asia**
 Bahrain Bangladesh China Hong Kong India Indonesia Iran Israel Japan Jordan
 Korea Lebanon **The objective from the start was to be a trustworthy and** Malaysia Pakistan
 Philippines Saudi **competent partner for our customers throughout the world.** Arabia Singapore
 Syria Taiwan **This also includes maintaining quality standards and com-** Thailand Vietnam
Australia Australia **prehensive service and support. We will continue to do every-** and New Zealand
Europe Austria **thing possible in the future to manufacture high-quality** Belarus Belgium
 Bulgaria Cyprus Czech Republic Denmark Finland France Germany Greece
 Hungary Iceland Italy Malta Netherlands Norway Poland Portugal Romania
 Russia Slovakia Spain Sweden Switzerland Turkey Ukraine United Kingdom

We know what responsibility means.

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