# QUART

QUAR

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# Quart

QUART X-Ray QA Solutions is a German-based provider of quality assurance technologies for diagnostic imaging and radiological applications. Their offerings encompass QA phantoms, dosimetry tools, measurement systems, and analysis software, supporting medical professionals in maintaining high standards of patient safety and imaging accuracy.

**View all products from Quart**

**Partner website**

In clinical environments, QUART's QA phantoms are utilized to assess and verify the performance of imaging equipment, ensuring consistent image quality and compliance with regulatory standards. Their dosimetry instruments facilitate precise measurement of radiation doses, aiding in the optimization of imaging protocols and minimizing patient exposure. The measurement systems and software solutions provided by QUART enable efficient data analysis and documentation, streamlining quality assurance processes within healthcare facilities.

By integrating advanced engineering with user-friendly design, QUART X-Ray QA Solutions empowers medical institutions to uphold rigorous quality control measures, enhancing diagnostic confidence and patient care.

Elevate your imaging quality assurance practices with QUART's reliable and innovative solutions!

# QA MEASUREMENT SYSTEMS


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Diagnostic Imaging

# Darkscan duo ref

## Calibrated Reference Sensitometer and Scanning Densitometer

The darkscan duo ref is a high-precision combination of reference sensitometer and scanning densitometer in one unit.

It is designed for acceptance testing as well as daily routine testing of x-ray film-screen equipment according to IEC 61223-2-1, DIN V 6868-55, and DIN 6868-2 standards.

The device combination provides functional and technical advantages such as one power supply (batteries or rechargeable batteries), less maintenance cost, and less room for operation or storage.

The sensitometer section is suitable for blue and green x-ray films. The exposition for blue and green films is manually adjustable in 5 steps. The step wedge with 21 steps has an optical step wedge constant of 0.15. The exposition homogeneity of each step is almost constant. The maximum tolerance is ± 0.01 log (H).

Diagnostic Imaging

# Darklight duo

## Routine Test Sensitometer and Densitometer

The darklight duo devices fulfil all requirements of the IEC 61223-2-1 and DIN 6868-2 standards for daily constancy or routine tests.
The combination of both sensitometer and densitometer into one device provides ease of use, lower acquisition cost and handling advantage

Diagnostic Imaging

# MaVo_lux C Base

## Ambient Light Meter

The MaVo_lux C Base light meter is a single-purpose device primarily for ambient light measurement.
It features illumination only measurement for indoor or outdoor environments. Light measurement is performed in Class C mode.

Diagnostic Imaging

# MaVo_lux 5032B

## Medical Light and Luminance Meter

The MaVo_lux 5032B light and luminance meter was developed specifically for medical application.
It features luminance and illumination measurement in a single device. Light measurement is performed in Class B mode.

Diagnostic Imaging

# MaVo_spot

## Precision Light and Luminance Meter

The MaVo_spot USB is a precision instrument for specific requirements of medical light measurement applications.
It features a measuring angle of 1° (strict Class B requirement) and provides luminance measurements for distances between 1m to 1°.
The MaVo_spot is equipped with a high-quality SLR optical system having a viewing field of 15° and marked measuring angle of 1° in the center. An external focusing ring is also provided.
Two close-up lenses (optional ) allow for measuring distances down to 34 cm.
Contact measurements of the luminance directly on the screen of the monitor can be performed with a photometric measuring probe (optional accessory for this purpose).

Diagnostic Imaging

# QUART MONI_lux

## QUART MONI_lux

The QUART MONI_lux is designed for real-time monitoring of light and ambient light conditions.

The device evaluates and signals if present light conditions are suitable for critical assessment of x-ray images and if ergonomic working conditions are present.

The MONI_lux can be applied in digital or conventional X-ray imaging environments (e.g. on top of monitors or view boxes)
The QUART MONI_lux automatically checks if the ambient light is not too bright to ensure proper viewing conditions. For this purpose, it has been factory-calibrated to signal the appropriate (green) range between 20 – 50 lux.
The device also signals when the room light is too dark for critical image assessment (yellow). The reason for this is that in environments that are too dark, light areas in an X-ray image tend to glare when viewed on a view box or on a digital monitor.
Its power supply can be established from an available USB port at any workstation.
The QUART MONI_lux complies with IEC 61223-2-5 and DIN 6856-1.

Diagnostic Imaging

# K2

## Basic kVp and Timer Meter

The meter enables non-invasive measurement of tube current and exposure time. Two Device Options are available: K2 for the normal range / K2L for the sensitive range. Exposure Time is measured in Milliseconds.
The meter automatically detects AC or DC and auto-resets after each measurement.

Diagnostic Imaging

# MAS1

## Basic mA/mAs and Timer Meter

The meter measures the tube current of x-ray generators and calculates the product of exposure time and mA for mAs. An improved circuitry increases accuracy and reliability. The meter features automatic detection of AC / DC.
A self-setting procedure eliminates the need to reset. The display provides all information at once eliminating the need for multiple exposures.

# MAK1

## Basic mAs/kVp/Timer Meter

The meter combines two instruments into one unit: kVp and mAs in one package. The mAs section is self-resetting, and the kVp measurement is non-invasive. The meter can be used on AC or DC x-rays. It measures kVp, mA, mAS, and exposure time.
The instrument case is durable ABS plastic housing.

Diagnostic Imaging

# QUART didoMAS

## Real-Time mA/mAs Meter

The QUART didoMAS meters automatically set the range of measurement. No pre-setting is required for direct reading of mA, mAs, and time parameters.
The meters can be used throughout the complete range of radiographic equipment including fluoroscopic or mammography exposures.
The meter is powered by a rechargeable battery. One charge is sufficient to last approximately 80 hours of continuous use. Recharging the meter until full takes only between 3–4 hours. A warning will appear on the display when the battery is running low.
The QUART didoMAS features an extra-long cable between the base and the detector unit. A customized cable for the connection between the detector head and circuit is included in the delivery.

The connection between circuit and the detector unit is polarity independent. The mA is refreshed and displayed every second.

Diagnostic Imaging

# ED 150

## Electronic Personal Dose Meter w/ Dose Rate Indicator and Alarm Function

The ED150 is a dose rate meter for the measurement of gamma radiation and X-rays for dose equivalent p(10).
It features an energy-compensated Geiger-Müller-tube detector in a compact casing with a large specially shaped LC display.
The meter provides dose rate indication upon keystroke, reliable and safe measurement of radiation in front of the user‘s body ( solid detection at an angle of 180°). Upon request, the alarm thresholds can be configured to customer requirements. In addition, the meter has a switchable acoustic single-pulse indication, menu-driven user navigation storage of dose value, and set parameters also during battery change. IP67 protection class.

Diagnostic Imaging

# Gamma Twin

## Compact Dose Rate Meter

The Gamma Twin is a PTB-approved dose rate meter for the measurement of gamma radiation and X-rays for ambient dose rate equivalent p*(10) and ambient dose equivalent H*(10) (local dose).
It features an energy-compensated Geiger-Müller-tube detector in a compact casing with a large backlit LC display.
The meter provides selectable simultaneous or separate indications of dose and dose rate together with an analog dose rate logarithmic bar graph. Four preset dose and dose rate alarm thresholds are available. Upon request, the alarm thresholds can be configured to customer requirements. In addition, the meter has a switchable acoustic single-pulse indication, automatic and continuous storage of the dose into a non-volatile memory, storage of the dose, and set parameters even at battery change. IP54 protection class (splash proof)

Diagnostic Imaging

# X-Ray Ruler

## Cross Shaped Radiopaque X-Ray Ruler

Set of 440 mm “0” center cross-shaped rulers on a center aluminum pin.
The center is designed to easily read all 20 graduations in all directions from the center, with no graduation overlap.
The set swings open for use and closes for storage in the case. The base ruler has a built-in stabilizer with clear rubber feet to keep its position on the image receptor.
A set of lines on the base helps the user quickly align the rulers at 90° to each other.
Felt bumpers keep the rulers from scratching each other.

Diagnostic Imaging

# QUART nonius

## Direct Electronic X-Ray Ruler for Field and Fan-Beam Measurement

The QUART nonius is an easy-to-use and very sophisticated measuring instrument to verify the size and geometrical properties of **X-ray fields**. It can also be used to analyze characteristics of **fanned X-ray beams** as used in **CT** or dental panoramic X-rays (**OPG**).
The QUART nonius is incredibly flexible: it is suitable for digital as well as conventional X-ray modalities. In any case, its precision is an absolute strong point – as it achieves a resolution in the so-called nonius range of **0.1 mm**.
The nonius software, to operate the device, is available as a single or multi-user **on-premise installation**.
Digitization in X-ray technology makes traditional screen films less available. Originally, they were used for checks on X-ray beam properties. Today, the QUART nonius performs the same task. And it provides even more substantial features.
The QUART nonius can be used to verify if the light visor matches the actual X-ray field. In addition, the nonius provides the option to assess the position and width as well as the dose profile of fanned X-ray beams. For that purpose, it features markings to line up the light field or positioning lasers.
Recent studies have proven that QUART nonius can also be used for field measurement in radiation therapy applications.*

Diagnostic Imaging

# QUART dido/time M

## Routine Test Dosemeter for Mammography QA/QC 25-35 kV

The QUART dido/time meters are designed for straightforward dose/dose reference measurements as required in x-ray routine QA/QC. Routine tests are usually carried out in regular intervals to ensure the adequate performance of X-ray equipment. The QUART dido/time meters are perfect tools for that application.
The meter is ready for use immediately after activation. No presetting procedure is required. Simply position the detector and expose it to acquire the routine check parameters. The QUART dido/time M is calibrated to Mo/Mo radiation quality.
In x-ray quality control the meters are used with an image quality control phantom.

Diagnostic Imaging

# QUART dido/time RF

## Routine Test Dosemeter for X-Ray and Fluoro QA/QC 50-150 kV

The QUART dido/time meters are designed for simple and straightforward dose/dose reference measurements as required in x-ray routine QA/QC. Routine tests are usually carried out in regular intervals to ensure the adequate performance of x-ray equipment. The QUART dido/time meters are perfect tools for that application.

The meters are ready for use immediately after activation. No presetting procedures are required. Simply position the detector expose to acquire the routine check parameters. The QUART dido/time RF features a detector embedded in a 25.0 mm Al patient equivalent filter. Such a set-up had been introduced in German QA regulations to simulate x-ray imaging reality in quality control processes.

In x-ray quality control the meters are used together with an image quality control phantom.

Diagnostic Imaging

# QUART dido/time R

## Routine Test Dosemeter for X-Ray QA/QC 50-150 kV

The QUART dido/time meters are designed for simple and straight-forward dose/dose reference measurements as required in x-ray routine QA/QC. Routine tests are usually carried out in regular intervals to ensure the adequate performance of x-ray equipment. The QUART dido/time meters are perfect tools for that application. The meters are ready for use immediately after activation. No presetting procedures are required. Simply position the detector and expose it to acquire the routine check parameters. In x-ray quality control the meters are used together with an image quality control phantom.

Diagnostic Imaging

# didoEASY M / didoEASY+ M / didoEASY++ M

## Dosemeter Series for X-Ray Service and QA in Mammography

- QUART didoEASY M, Art. 11116, Basic Configuration
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The QUART didoEASY meters are designed for users who emphasize high precision in dosimetric applications but do not require the performance of a full-range dosemeter package. QUART didoEASY meters can be used to measure parameters that are essential for service and quality assurance operations at x-ray equipment such as dose, dose rate, and time. Of course, as with all QUART meters – with maximum precision.

- kVp and PPV measurements are available in the QUART didoEASY**+** M version.
- Direct-HVL **and** kVp / PPV measurements are available in the QUART didoEASY**++** M version.

Diagnostic Imaging

# didoEASY R / didoEASY+ R / didoEASY++ R

## Dosemeter Series for X-Ray Service and QA in R&F and Dental

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# DIAGNOSTIC IMAGING

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Diagnostic Imaging

# QUART DVTap DIN 6868-161

**QUART DVTap DIN 6868-161**

Developed over a period of 2 years in a project involving major dental manufacturers, and released by QUART already in 2007, the DVTap has become a national and international standard solution for CBCT – based on our company's innovative approach.

The QUART DVTap phantom is designed to be used as a universal tool for 3D imaging equipment including CT applications. The phantom fully complies with DIN 6868-161 for acceptance tests in DVT/CBCT.

In conjunction with a specially developed software (QUART DVTtec), quick and comprehensive CBCT IQ tests can be performed.

Only one exposure is necessary to create a 3D data set containing all required parameters to evaluate CBCT image quality. Automated evaluation is performed with the unique QUART DVTtec software.

The phantom can be used for field sizes from 4x4cm to large fields-of-view (FOV). A universal holder or customized phantom holders are available for easy and reproducible positioning.

**Technical specifications**

- Spatial resolution: Line spread function
- Resolution: Z-Resolution
- Standard test objects: PMMA / Air / PVC
- Material equivalents : Free Air / Soft tissue / Bone
- Positioning tools: Linear (top side) / Selective markers
- Size: Ø 16 cm, height: 15 cm
- Scatter Radiation modules: 1x 6 cm / 1x 5 cm

**Parameters**

- Nyquist Frequency (NF)
- Contrast-to-Noise Ratio (CNR)
- Homogeneity / Image Uniformity
- Z-Resolution
- Modulation Transfer Function (MTF)
- Artefacts, Image Flaws
- Figure of Merit / Acceptance Indicator

https://peomedical.com/webinar/quality-control-in-cone-beam-computed-tomography-cbct-efomp-estro-iaea-protocol/attachment/quart-dvt-kp/

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Diagnostic Imaging

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The instrument case is durable ABS plastic housing.

Diagnostic Imaging

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The QUART didoMAS features an extra-long cable between the base and the detector unit. A customized cable for the connection between the detector head and circuit is included in the delivery.

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The meter provides dose rate indication upon keystroke, reliable and safe measurement of radiation in front of the user‘s body ( solid detection at an angle of 180°). Upon request, the alarm thresholds can be configured to customer requirements. In addition, the meter has a switchable acoustic single-pulse indication, menu-driven user navigation storage of dose value, and set parameters also during battery change. IP67 protection class.

Diagnostic Imaging

# Gamma Twin

## Compact Dose Rate Meter

The Gamma Twin is a PTB-approved dose rate meter for the measurement of gamma radiation and X-rays for ambient dose rate equivalent p*(10) and ambient dose equivalent H*(10) (local dose).
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The meter provides selectable simultaneous or separate indications of dose and dose rate together with an analog dose rate logarithmic bar graph. Four preset dose and dose rate alarm thresholds are available. Upon request, the alarm thresholds can be configured to customer requirements. In addition, the meter has a switchable acoustic single-pulse indication, automatic and continuous storage of the dose into a non-volatile memory, storage of the dose, and set parameters even at battery change. IP54 protection class (splash proof)

Diagnostic Imaging

# X-Ray Ruler

## Cross Shaped Radiopaque X-Ray Ruler

Set of 440 mm “0” center cross-shaped rulers on a center aluminum pin.
The center is designed to easily read all 20 graduations in all directions from the center, with no graduation overlap.
The set swings open for use and closes for storage in the case. The base ruler has a built-in stabilizer with clear rubber feet to keep its position on the image receptor.
A set of lines on the base helps the user quickly align the rulers at 90° to each other.
Felt bumpers keep the rulers from scratching each other.

Diagnostic Imaging

# QUART nonius

## Direct Electronic X-Ray Ruler for Field and Fan-Beam Measurement

The QUART nonius is an easy-to-use and very sophisticated measuring instrument to verify the size and geometrical properties of **X-ray fields**. It can also be used to analyze characteristics of **fanned X-ray beams** as used in **CT** or dental panoramic X-rays (**OPG**).
The QUART nonius is incredibly flexible: it is suitable for digital as well as conventional X-ray modalities. In any case, its precision is an absolute strong point – as it achieves a resolution in the so-called nonius range of **0.1 mm**.
The nonius software, to operate the device, is available as a single or multi-user **on-premise installation**.
Digitization in X-ray technology makes traditional screen films less available. Originally, they were used for checks on X-ray beam properties. Today, the QUART nonius performs the same task. And it provides even more substantial features.
The QUART nonius can be used to verify if the light visor matches the actual X-ray field. In addition, the nonius provides the option to assess the position and width as well as the dose profile of fanned X-ray beams. For that purpose, it features markings to line up the light field or positioning lasers.
Recent studies have proven that QUART nonius can also be used for field measurement in radiation therapy applications.*

Diagnostic Imaging

# QUART dido/time M

## Routine Test Dosemeter for Mammography QA/QC 25-35 kV

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The meter is ready for use immediately after activation. No presetting procedure is required. Simply position the detector and expose it to acquire the routine check parameters. The QUART dido/time M is calibrated to Mo/Mo radiation quality.
In x-ray quality control the meters are used with an image quality control phantom.

Diagnostic Imaging

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In x-ray quality control the meters are used together with an image quality control phantom.

Diagnostic Imaging

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Diagnostic Imaging

# didoEASY M / didoEASY+ M / didoEASY++ M

## Dosemeter Series for X-Ray Service and QA in Mammography

- QUART didoEASY M, Art. 11116, Basic Configuration
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- kVp and PPV measurements are available in the QUART didoEASY**+** M version.
- Direct-HVL **and** kVp / PPV measurements are available in the QUART didoEASY**++** M version.

Diagnostic Imaging

# didoEASY R / didoEASY+ R / didoEASY++ R

## Dosemeter Series for X-Ray Service and QA in R&F and Dental

- QUART didoEASY R, Art. 11115, Basic Configuration
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# NUCLEAR MEDICINE

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Diagnostic Imaging

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Diagnostic Imaging

# QUART dido/time M

## Routine Test Dosemeter for Mammography QA/QC 25-35 kV

The QUART dido/time meters are designed for straightforward dose/dose reference measurements as required in x-ray routine QA/QC. Routine tests are usually carried out in regular intervals to ensure the adequate performance of X-ray equipment. The QUART dido/time meters are perfect tools for that application.
The meter is ready for use immediately after activation. No presetting procedure is required. Simply position the detector and expose it to acquire the routine check parameters. The QUART dido/time M is calibrated to Mo/Mo radiation quality.
In x-ray quality control the meters are used with an image quality control phantom.

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Nuclear Medicine

# didoEASY MR / didoEASY+ MR / didoEASY++ MR

## X-Ray Multi-Meter Series for Service and QA in R&F, Dental and Mammograph

- QUART didoEASY MR, Art. 11117, Basic Configuration
- QUART didoEASY+ MR, Art. 11117+, Added kV Measurement
- QUART didoEASY++ MR, Art. 11117++, Added kV and Direct-HVL Measurement

The QUART didoEASY meters are designed for users who emphasize high precision in dosimetric applications but do not require the performance of a full-range dosemeter package.
In basic configuration QUART didoEASY meters can be used to measure parameters that are essential for service and quality assurance operations at x-ray equipment such as dose, dose rate, and time. Of course, as with all QUART meters – with maximum precision.

- kVp and PPV measurements are available in the QUART didoEASY**+** MR version.
- Direct-HVL **and** kVp / PPV measurements are additionally available in the QUART didoEASY**++** MR version.

Nuclear Medicine

# QUART didoNEO R

## X-Ray Multi-Meter for Service and QA in R&F and Dental

The QUART didoNEO line of meters introduce a new approach to the market of diagnostic x-ray measurement:

- The system features the lightest multi-functional base unit ever designed in our industry.
- didoNEO sports the smallest and thinnest multi-parameter detector available.
- The user can access a waveform preview on the unit’s display in the field – without the need to access a PC or laptop.
- Up to 10.000 exposures are stored in the memory for future reference or reporting.

The compact detector design enables measurements at locations with limited space, for instance behind scatter radiation grids to determine the equipment attenuation factor. The small size also has a very low influence on fluoroscopy AEC.

The detector can be easily and efficiently positioned at dental panoramic x-ray equipment*.

Direct-HVL and Total Filtration measurement are integrated and calibrated upon delivery and are not charged extra

# QA PHANTOMS


peo MEDICAL

Diagnostic Imaging

# QUART DVTap DIN 6868-161

## QUART DVTap DIN 6868-161

Developed over a period of 2 years in a project involving major dental manufacturers, and released by QUART already in 2007, the DVTap has become a national and international standard solution for CBCT – based on our company's innovative approach.

The QUART DVTap phantom is designed to be used as a universal tool for 3D imaging equipment including CT applications. The phantom fully complies with DIN 6868-161 for acceptance tests in DVT/CBCT.

In conjunction with a specially developed software (QUART DVTtec), quick and comprehensive CBCT IQ tests can be performed.

Only one exposure is necessary to create a 3D data set containing all required parameters to evaluate CBCT image quality. Automated evaluation is performed with the unique QUART DVTtec software.

The phantom can be used for field sizes from 4x4cm to large fields-of-view (FOV). A universal holder or customized phantom holders are available for easy and reproducible positioning.

### Technical specifications

- Spatial resolution: Line spread function
- Resolution: Z-Resolution
- Standard test objects: PMMA / Air / PVC
- Material equivalents : Free Air / Soft tissue / Bone
- Positioning tools: Linear (top side) / Selective markers
- Size: Ø 16 cm, height: 15 cm
- Scatter Radiation modules: 1x 6 cm / 1x 5 cm

### Parameters

- Nyquist Frequency (NF)
- Contrast-to-Noise Ratio (CNR)
- Homogeneity / Image Uniformity
- Z-Resolution
- Modulation Transfer Function (MTF)
- Artefacts, Image Flaws
- Figure of Merit / Acceptance Indicator

https://peomedical.com/webinar/quality-control-in-cone-beam-computed-tomography-cbct-efomp-estro-iaea-protocol/attachment/quart-dvt-kp/

# QUART IAEA-EFOMP-ESTRO Test Set

## QUART IAEA-EFOMP-ESTRO Test Set

The test set was compiled based on the recommendations of the three organizations, **IAEA, EFOMP, and ESTRO**, for a quick and time-efficient QA performance at CBCT imaging equipment.

These recommendations are principally based on DIN 6868-161 and 6868-15 for CBCT quality assurance.

These recommendations are principally based on DIN 6868-161 and 6868-15 for CBCT quality assurance.

Only one exposure is required to create 3D data set containing all required parameters to evaluate image quality. Automated image quality evaluation is performed through the unique QUART CTtec QA/QC software.

The DVTkp phantom can be applied for field sizes from 4x4cm to large fields-of-view (FOV). Customized holders for a variety of CBCT systems are available.

**Technical specifications:**

- Spatial resolution: Line spread function
- Standard test objects: PMMA / Air / PVC
- Material equivalents: Free Air / Soft tissue / Bone
- Positioning tools: Linear (top side) / Selective markers
- Size: Ø 16 cm, height: 15 cm

**Parameters:**

- Nyquist Frequency (NF)
- Contrast
- Noise
- Contrast-to-Noise Ratio (CNR)
- Homogeneity / Image Uniformity
- Spatial Resolution / Modulation Transfer Function (MTF) at 10% & 50% modulation
- Modulation Transfer Function (MTF) as per IEC 62220-1-2
- CT Numbers / Hounsfield Units
- Z-Axis Resolution / NF and MTF in Axial Direction
- Artefacts, Image Flaws, etc.
- System Indicator / Acceptance Indicator (Figure of Merit)
- Patient / Phantom Positioning Accuracy
- Additional QA/QC related tests such as geometry and distance measurements etc. to be conducted in an external DICOM viewer

https://www.sciencedirect.com/science/article/abs/pii/S1120179717301837