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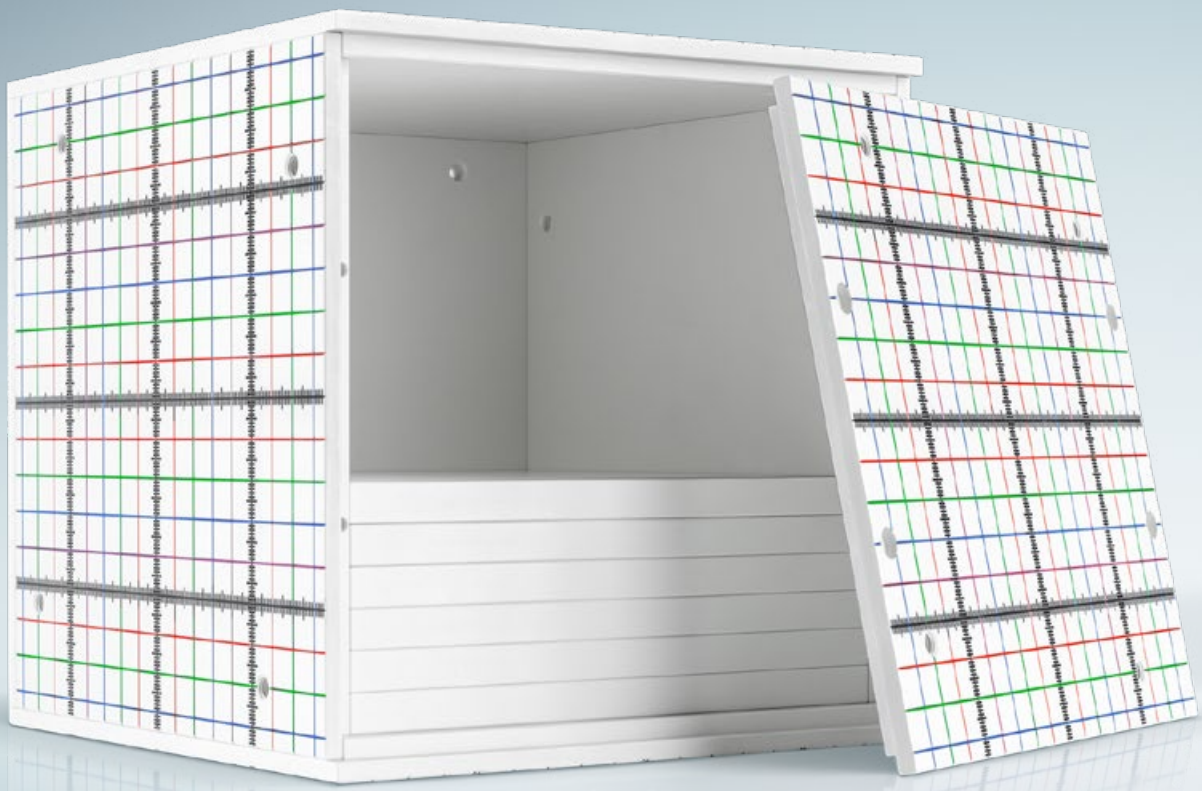
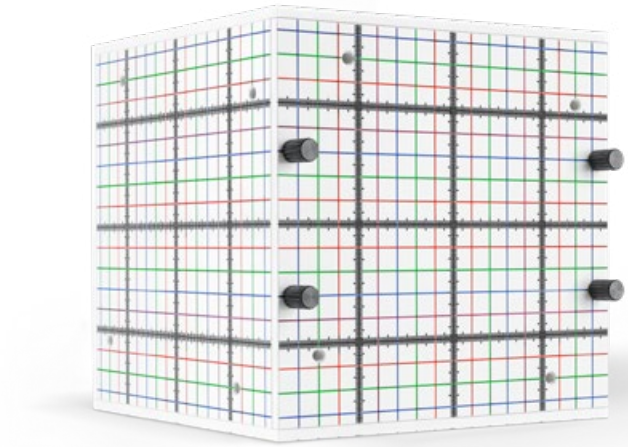


# EASY CUBE

Water equivalent phantom for
quality assurance in radiation therapy

Simply
Precise



Your routine is our practice

# Quality assurance in radiotherapy

Water-based and water-equivalent phantoms are qualified to measure dose distribution since the human body consists mainly of water.

Water tank phantoms are used for acceptance, commissioning and annual QA tests. For frequently recurring tasks in quality assurance, water-equivalent RW3 material is an integral and time-efficient tool for every medical physicist.

Our EASY WATER phantoms are made of RW3 and, therefore, perfectly suited for these requirements.

By its modular design and various extensions, the EASY CUBE phantom can also be used for end-to-end QA tests to verify the whole treatment chain.

# EASY CUBE

## Multi-modular phantom for dosimetry and beyond

The unique multi-colored grid eases positioning during set up and orientation during QA tasks and therefore reduces misalignment risks.

The EASY CUBE supports QA measurements in dosimetry and beyond in the field of radiation oncology. The phantom can be used in combination with irradiation detectors like ionization chambers, radiosensitive films and TLDs. The detectors are positioned inside the phantom with appropriate adapters, which consist of the same material as the phantom.

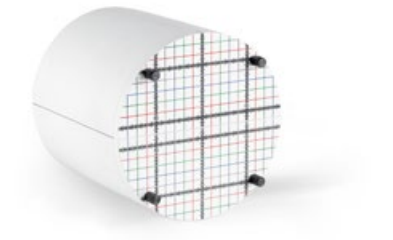
By means of various extension modules, the EASY CUBE can be shaped into different phantoms for different applications.

### Easy

The cube phantom's universal application possibilities simplify quality assurance. No additional tools are required. The multi-colored grid on the cube surface allows precise alignment at CT or LINAC.

### Variable

Adapters for your ionization chambers are available for dose measurement. Inhomogeneous inserts, stereotactic localizer plates and other elements allow high adaptation to the specific QA task.



### Modular

In addition to the basic body, three designs are available. Different regions of the body, such as head, neck, and torso, can thus be optimally simulated. The extensions are modular to ensure an efficient workflow.

## QA of high-energy photons and electrons on LINACs

The following applications are possible:

- Measurements with a homogeneous, standardized phantom with properties equivalent to water
- Measurements with irradiation detectors from well-known vendors by use of optional adapters
- Measurement of general dose distributions computed on the EASY CUBE phantom
- Measurement of dose distributions from intensity-modulated fields, computed on the EASY CUBE phantom
- Measurement of dose distributions from stereotactic irradiation, computed on the EASY CUBE phantom

## Measurements on computer tomographs (CT)

The following measurements are possible:

- Cross-checking of Hounsfield values measured by a CT scanner
- Cross-checking of CT scans for geometric distortion
- Cross-checking of table coordinates displayed by a CT scanner
- Cross-checking of coordinate system of a CT scanner

# End-to-end tests

## Why are they useful?

End-to-end testing is a methodology used to test whether the treatment chain is performing as designed from start to finish. With the increasing complexity of external beam therapy, end-to-end tests are intended to cover all steps from therapy planning to follow-up to fulfill the high demands on quality assurance. End-to-end tests are used to measure the overall accuracy of the radiation therapy chain, excluding patient-specific factors. An end-to-end test is a prerequisite to the overall success of any IGRT to analyze potential errors accumulated by individual devices and processes in the treatment chain.

→ *With the EASY CUBE we offer efficient QA from imaging to beam delivery which is cost-effective and fast.*

# End-to-end tests need to be developed and coordinated closely to your individual clinical processes – here are some examples for QA with the EASY CUBE:

### QA of CT parameter

- Starting with the alignment as preparation of the treatment planning CT, the EASY CUBE phantom can be specifically configured for your patient case, e. g. using extension modules and accessories like inhomogeneous inserts.
- Measurements of CT parameters like HU values and phantom dimensions can be processed.

### QA of Data transfer

- As target volumes and OARs often are contoured at special contouring stations, the CT objects have to be sent to these contouring stations via a specified transfer protocol.
- A correct data transfer is mandatory for further use and can be checked with generated EASY CUBE data.

### QA of dose

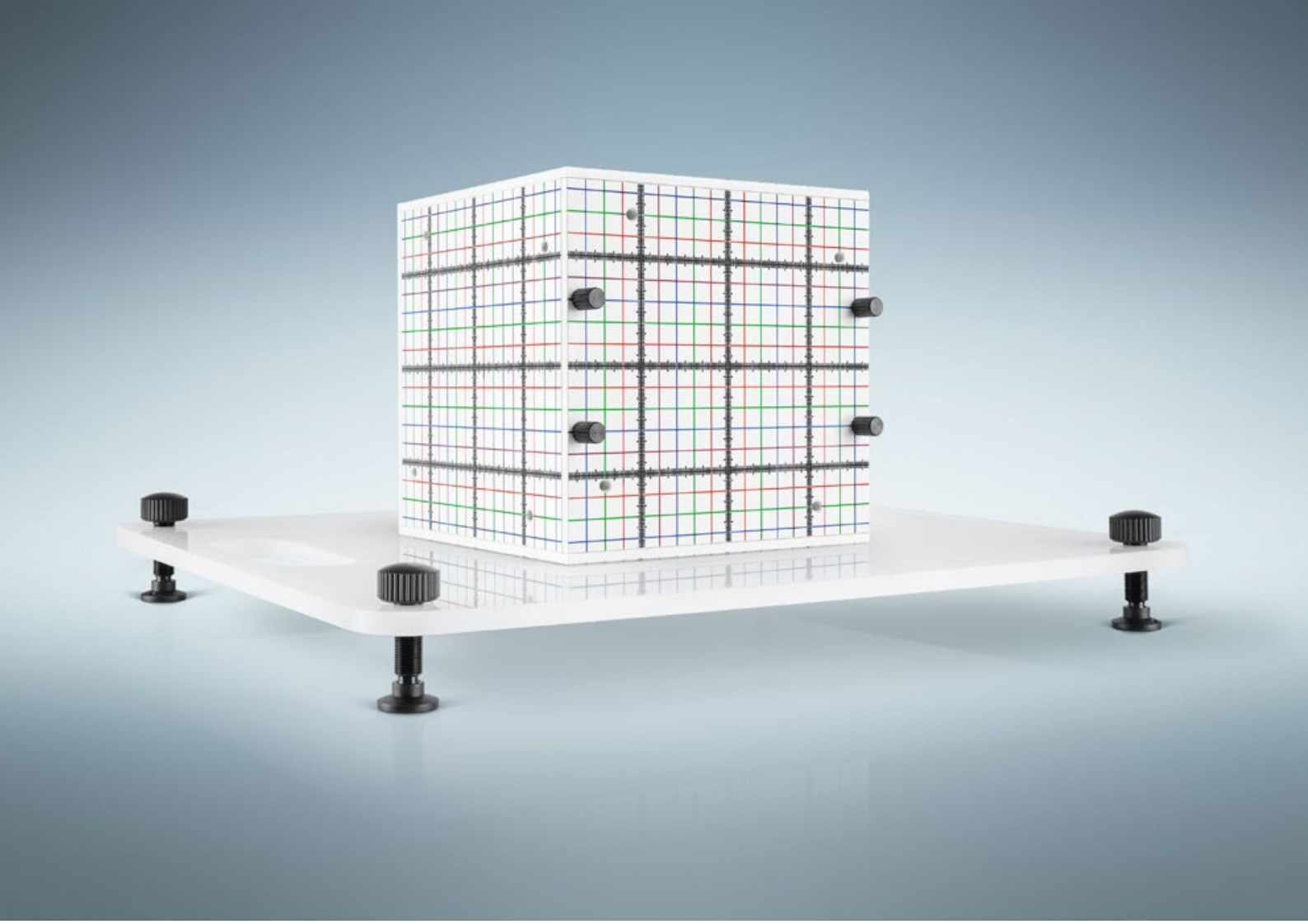
- Dose in the phantom can be measured in one or multiple measurement points with appropriate detectors.
- Planned irradiation can be checked by precise positioning of various detectors.

### QA of TPS

- In case of contouring and treatment planning are processed at different systems, the transferred data including the structure set can be checked again and errors can be evaluated.
- An individual patient treatment plan can be calculated at the TPS under consideration of the invidual configured setup of the EASY CUBE.

### QA of treatment positioning

- The EASY CUBE phantom can be aligned by use of imaging devices (e. g. EPID) of the treatment unit.
- Produced images can be checked regarding mentioned image parameters and registered to the treatment planning CT.
- Evaluated shifts can be checked to the realized table and gantry movements.



# The core

## EASY CUBE is the base for most setup variants

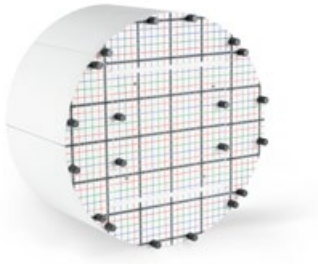
**Basic scope of delivery:**

- EASY CUBE
- EASY CUBE set of plates
- 1 EASY CUBE IC adapter bar*
- Set of distance bars and spacers
- Leveling plate small
- Transport and storage case

* EASY CUBE adapter bar for ionization chamber has to be specified by customer, depending on IC of choice

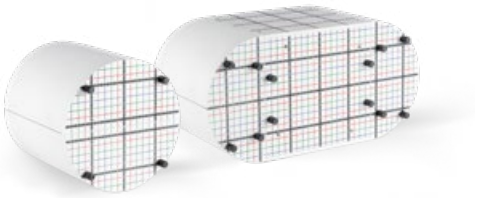
# Extension modules

## Different shapes – different possibilities



### EASY CUBE with Cylinder module F or S

The combination of the EASY CUBE with the Cylinder module **F** or Cylinder module **S** forms a cylinder phantom.



### Head/Oval module F without and with EASY CUBE

As with the EASY CUBE, the Head/Oval module **F** is hollow and can be filled with detectors and compensation elements.

This arrangement is especially suitable if radiation is to entering phantom from different angles. It serves to prevent artefacts from the edges of the phantom.

The Head/Oval module **F** can be used to simulate a human head by fixing the two half cylinders to one another with assembly plates.

### EASY CUBE with Body module S

For simulation of the entire human torso (trunk) the Body module **S** can be combined with the EASY CUBE.

The Body module **S** is comprised of two solid half cylinders and 16 body shaped distance plates with needles for film alignment:

- 15 plates each 10 mm thick, numbered from 1 to 15
- one plate 5 mm thick

**F:** fillable **S:** solid

| Dimensions [L × W × H] | |
|---|---|
| **EASY CUBE** | 180 × 180 × 180 mm |
| **Cylinder module** | ø 320 × 180 mm |
| **Head module** | ø 180 × 180 mm |
| **Oval module** | 360 × 180 × 180 mm |
| **Body module** | 360 × 335 × 180 mm |

# Accessories

## A modular equipment solution

**Inhomogeneous inserts**
Various inhomogeneous inserts similar to fat, muscle, lung and bone fabrics are available to calibrate Hounsfield values. Artificial inhomogeneities like metal prostheses can be simulated as well. Using the compensation elements, the inhomogeneous inserts can be freely positioned inside the EASY CUBE.

**Detector adapters for different ionization chambers**
One or more detector adapters corresponding to your configuration, e. g. for detectors already in your possession allow positioning at the desired measurement position.



**Detector adapter plates for radiochromic films**
Radiochromic films can be placed inside the EASY CUBE using compensation plates with a milled cavity.



**Detector adapter plates for TLDs**
Different adapter plates are available for measurements with thermoluminescent dosimeters (TLD). The square adapter plates (160 mm edge length) are 10 mm thick. Depending on the TLD type, the adapter plates are equipped with boreholes, rods, or circular pits, so called “chips”.

**Stereotatic localizer plates**
Stereotactic localizer plates with integrated metal wires are available for the measurement of stereotactic coordinates. The stereotactic localizer plates are fastened with screws to the surface of the EASY CUBE.

**Compensation elements**
Several compensation plates of different thicknesses are available, and compensation bars and spacers in different dimensions.

**Leveling plates**
Using the leveling plates, available in two different sizes, the EASY CUBE and its extension modules can be fixed and precisely positioned within the application environment.

**Transport and storage case**
The EASY CUBE together with the different modules of choice will be delivered with a dedicated transport and storage case.

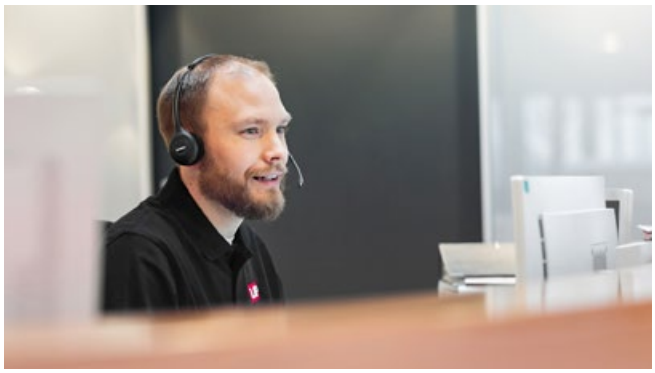
# About us

LAP is one of the world's leading suppliers of systems that increase quality and efficiency through laser projection, laser measurement, and other processes. Every year, LAP supplies 15,000 units to customers in industries as diverse as radiation therapy, steel production, and composite processing. LAP employs 300 people at locations in Europe, America, and Asia.

**90+**
**Partners**

**300**
**Employees**

**7**
**Locations**



## Quality

We work to uniform standards and with certified processes. For us, "Made in Germany" means the highest precision in manufacturing and quality inspection of each device. For our customers, this means planning and process certainty.

All our worldwide locations use a quality management system according to EN ISO 13485 or EN ISO 9001. Our products have all the necessary approvals and registrations almost everywhere in the world.

## Service

We ensure the maximum availability of your equipment so you can concentrate on your core process. Wherever you need us, our certified service technicians are quickly on site in any time zone. We support you from installation and commissioning, through user training, up to maintenance, repair, or unit replacement.

Our efficient logistics ensure the fast availability of spare parts worldwide. For technical questions and support, our helpdesk is at your disposal by telephone, via e-mail, or remote diagnosis.

**More about our global QM system**

**made in Germany**

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