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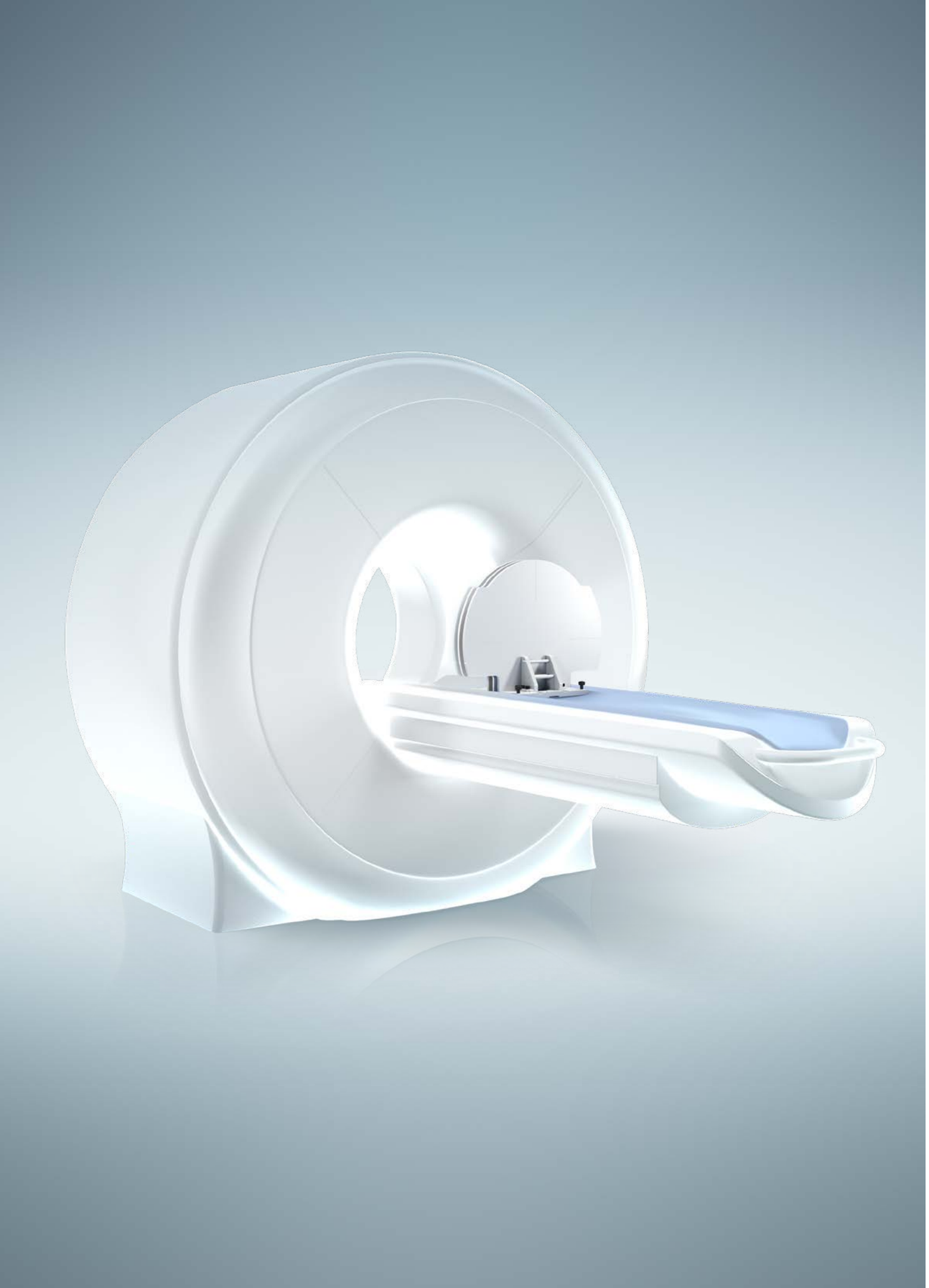
THETIS MR
Distortion Phantom

Detect distortions in MR imaging easily and reliably

Simply
Precise



A good image is the basis for better treatment

Image distortion is a common phenomena in the MR imaging process due to inhomogeneities in the magnetic field, gradient non-linearities, or ferromagnetic materials in the vicinity of the MR. But there is a solution for your quality assurance process in RT as well as diagnostics. THETIS MR Distortion Phantom enables you to easily detect image distortions. The phantom helps to register where the distortion affects the image and can be utilized for both 2D and 3D. Precision is the key at any step in radiation therapy. The more precisely the initial tasks are handled, the better the treatment will be as the final result.

Precise imaging

The main goal of imaging is to obtain an image with all important information and without any deviations. THETIS is designed to detect distortions reliably.

Easy handling

THETIS is easy to handle and quick to set up.

Affordable price

Choose from four different kits and additional extensions.

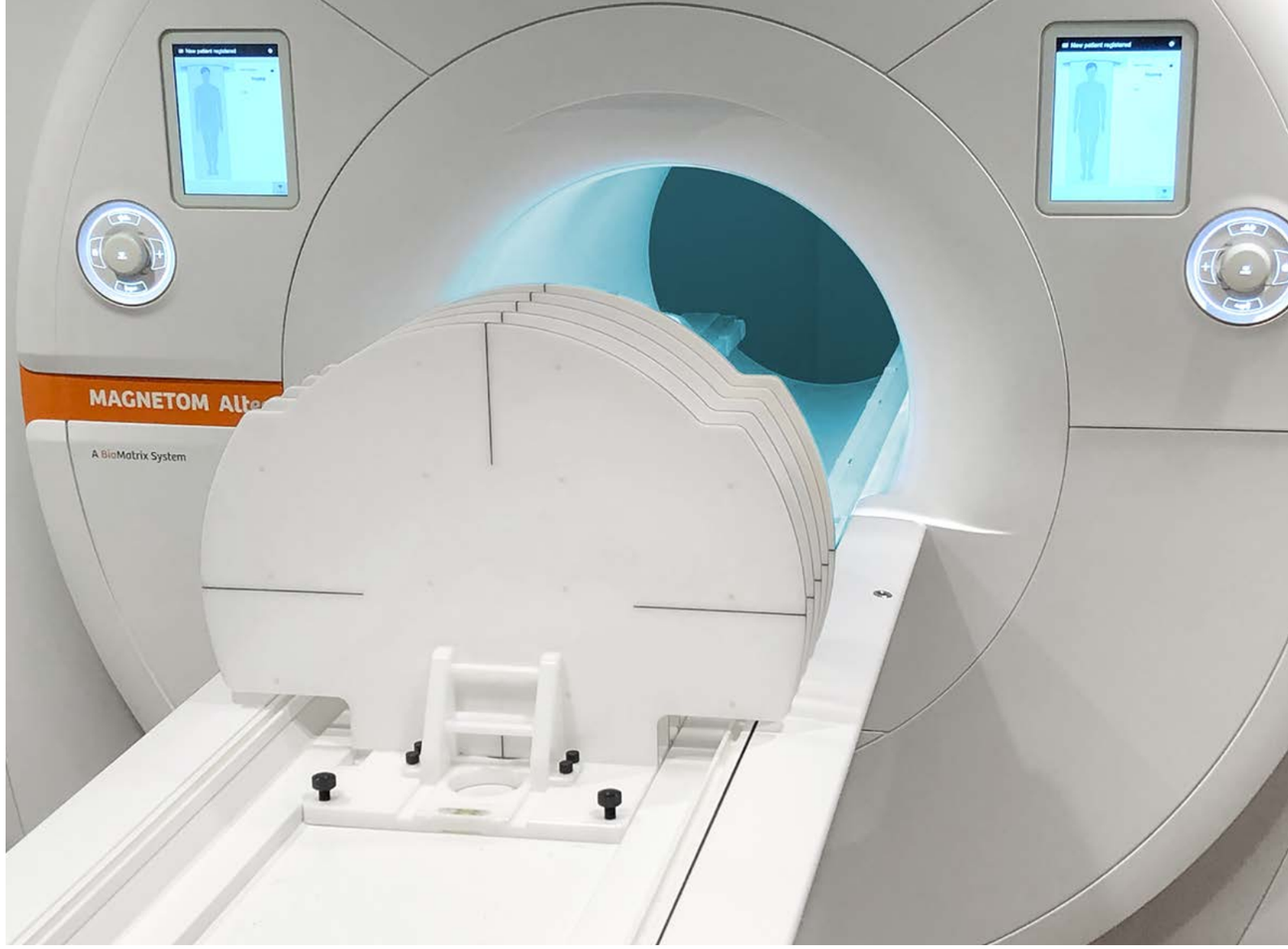
Suitable for any MRI purposes

Whether you use the MRI device for RT or diagnostics, the image quality as a result of the process should be precise and reliable for the steps that follow.

When merging CT and MR images, no geometric differences should occur. For MR-only workflows, the treatment relies even more on the image quality and therefore needs to be exact.

When to use THETIS MR Distortion Phantom?

- After commissioning of a new machine
- For QA after major updates to the machine
- For MR-only: monthly and daily before use



Distinctive design

The MR signal is delivered by small silicon markers arranged in a grid pattern. The dimensions of THETIS are suitable for the purpose of detecting distortions.

Perfect fit

Magnetic field gradients do not behave linearly in the MR. The outer area of the field of view is mainly affected by MR-non-linearity. The dimensions of THETIS were chosen on this basis.

Modularity

Whether for 2D or 3D (volume) checks, you can adapt THETIS to your specific needs. Choose a kit and add accessories if needed.

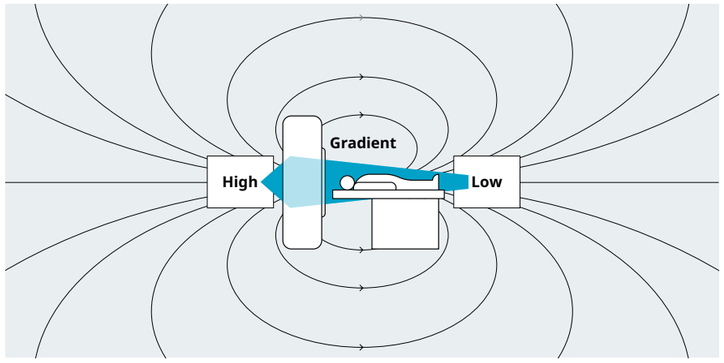
Lightweight

Despite the size, THETIS is light and easy to carry, which makes a difference in daily clinical life.

“The use of MRI and MR-Linac in radiation therapy has grown massively. To cover the needs of generating MR images of the highest geometrical accuracy, we released THETIS. THETIS makes it easy to determine where distortions are affecting the image and whether the magnetic field or distortion correction has changed over a period of time.”

Torsten Hartmann

Director Product Management Healthcare
LAP GmbH Laser Applikation



Example of a gradient in the Z-direction of the MRI

Distortions and their sources

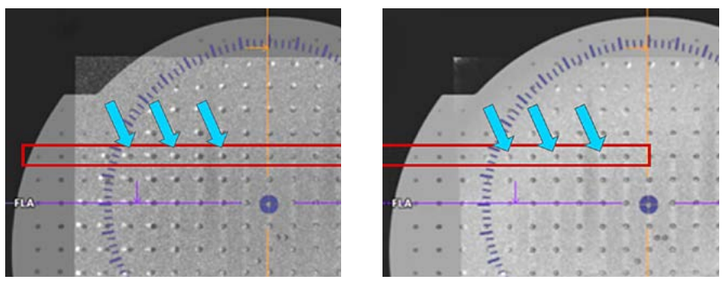
There are different reasons for distortions in MR imaging. The most important ones are distortions due to gradient non-linearities, B0 inhomogeneities and susceptibility artefacts caused by the imaged patient or phantom. All MRI manufacturers provide methods and algorithms for distortion correction to minimise these effects.

In clinical practice, residual image distortion needs to be below acceptable limits. A large field phantom such as THETIS is able to detect residual distortions from gradient non-linearities or B0 main magnet inhomogeneties. Its embedded silicon markers arranged in a grid help to visualise the limited geometry away from the magnet isocentre and prevent a potential inaccurate view of organs at the outer area of MRI image.

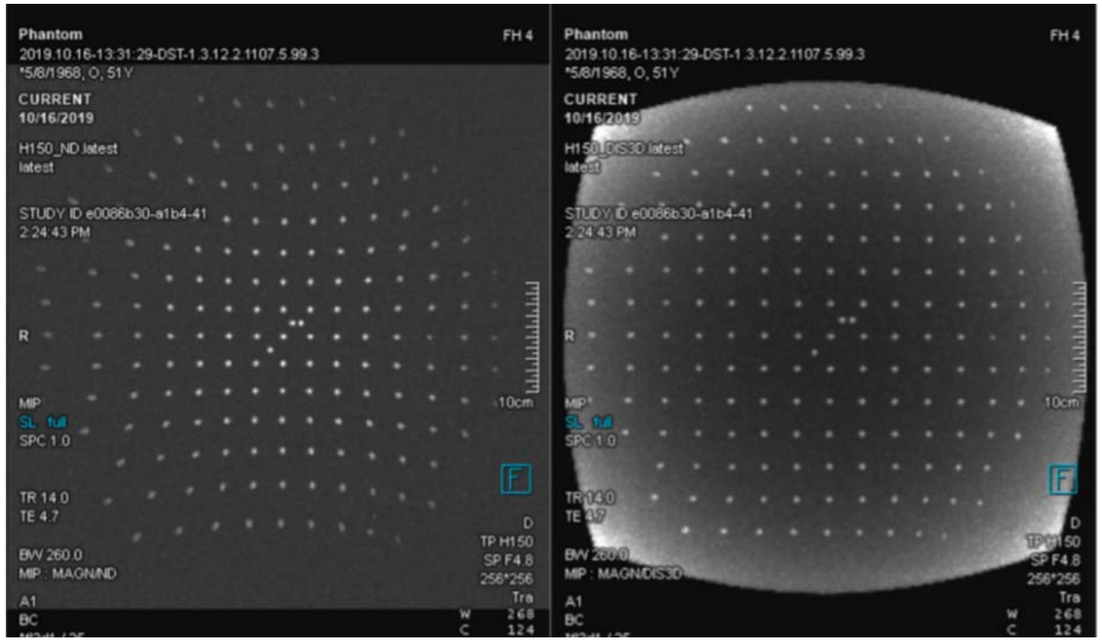
Having a tool on hand that conveniently detects distortions contributes to making clinical life safer and easier. The result leads to better patient treatment, which is the goal in RT.

Without distortion correction

With distortion correction



Visual comparison of residual distortion, visualized on rigidly fused CT and MR, without and with distortion correction switched on, in *syngo*.via RT Image Suite (Courtesy of Siemens Healthineers)



Sample MR images, acquired with a 2D MR Distortion Phantom, without (left), and with (right) distortion correction (Courtesy of Siemens Healthineers)

Not only good, but recommended

Do you use a particular phantom to check for MR distortions? This is recommended by the leading manufacturers of MR devices. Even a newly installed magnet does not have ideal specification levels. External influences in the near environment of the magnet (such as wires, metals in pipes etc.) cause small impacts that result in inaccurate spatial mapping and therefore cause geometric distortions. Various group of experts (APPM, TG 284) recommend distortion checks not only after installation, but also as part of the regular QA routine. This is because the distortion corrections may have changed over a certain period of time.

Visit website for links to sources

Flexible and scalable

Kits and accesories

THETIS 3D MR
Distortion Phantom

The gold standard. Suitable for a broad variety of cases. Consists of three phantom plates and delivers MR FoV depth information.

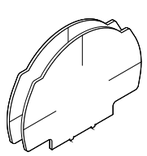
THETIS 2D MR
Distortion Phantom

Consists of one phantom plate and is suitable for 2D measurements. Delivers no depth information.

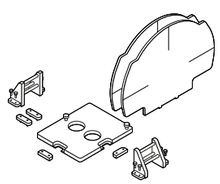
THETIS 3D
Distortion Phantom max

Provides the maximum of flexibility and covers the most MR FoV depth information. Consists of five phantom plates and two levelling plates.

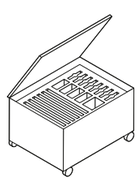
Make it yours



Extension Kit 1
Add phantom plates



Extension Kit 2
Add levelling plate and phantom plates



Storage Case
Conveniently store all your THETIS materials

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

8
Locations

Quality

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

All locations around the world use a quality management system 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 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 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.

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Contact us!
info@lap-laser.com

Contact us!

P +49 4131 95 11-95
E info@lap-laser.com
LAP Laser
laplaser

LAP GmbH Laser Applikationen
Zeppelinstr. 23
21337 Lüneburg
Germany

LAP GmbH Laser Applikationen, Germany / LAP Measurement Technology GmbH, Germany / LAP Sued GmbH, Germany / LAP FRANCE SAS, France / LAP GmbH Laser Applikationen c/o representative office DMAN, Russian Federation / LAP Laser Applications Asia Pacific Pte. Ltd., Singapore / LAP Laser Applications China Co. Ltd., China / LAP of America Laser Applications, L.L.C., USA / LifeLine Software, Inc., USA
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