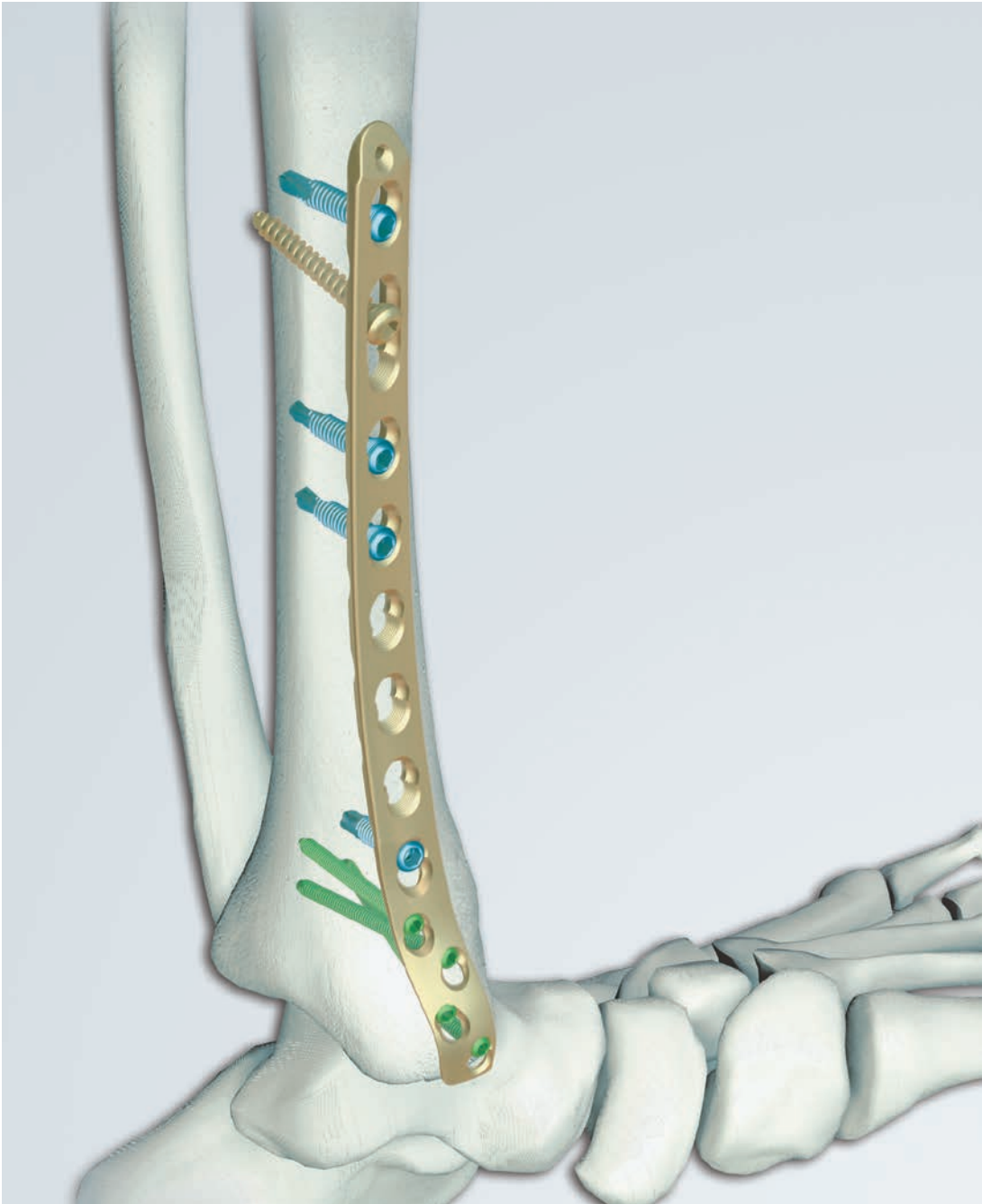


# LCP Metaphyseal Plate for distal medial tibia. Anatomically precontoured metaphyseal plate.

## Surgical Technique



This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.

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 Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

**Processing, Reprocessing, Care and Maintenance**

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE\_023827) or refer to:

<http://emea.depuyshnthes.com/hcp/reprocessing-care-maintenance>

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# LCP Metaphyseal Plate for distal medial tibia. Anatomically precontoured metaphyseal plate.

## Features and benefits

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### Anatomically precontoured plate

The anatomical shape of the plate is especially designed to fit the complex shape of the distal part of the bone. A twist of the plate optimizes the fit on the tibia.



### LCP combination holes

The LCP combination hole allows an internal fixation using standard screws, angle-stable locking head screws, or a combination of both. This takes into account the most diverse intraoperative requirements.



### Thinned plate profile

The distal part of the plate is tapered to preserve the thin soft tissue envelope of the distal tibia.

### Optimal distal application of the locking head screws

The specific orientation of the four distal screws allows optimal fixation in the epiphyseal area without penetrating the articulation.

### Increased hole density provides improved anchorage

In the distal part of the plate a tight network of 3.5 LCP combination holes allows inserting the screws closer to each other.

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### Guiding blocks

The guiding block allows an easy and correct insertion of the drill sleeves in the distal area of the plate. The guiding block can be removed or placed back onto the plate even with drill sleeves in place. If desired, standard screws can be inserted before placing the guiding block.

### Additional design features

- Bullet nose tip for easier application of a minimally invasive surgical technique.
- The Kirschner wire hole in the bullet nose can be used conveniently for temporary fixation.
- The longer hole in the shaft area of the plate facilitates fine tuning of the reduction in the longitudinal axis.
- Improved vascularisation of the bone due to plate undercuts that reduce the plate-to-bone contact.

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**Note:** For information on fixation principles using conventional and locked plating techniques, please refer to the LCP Locking Compression Plate Surgical Technique (DSEM/TRM/0115/0278).

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# AO Principles

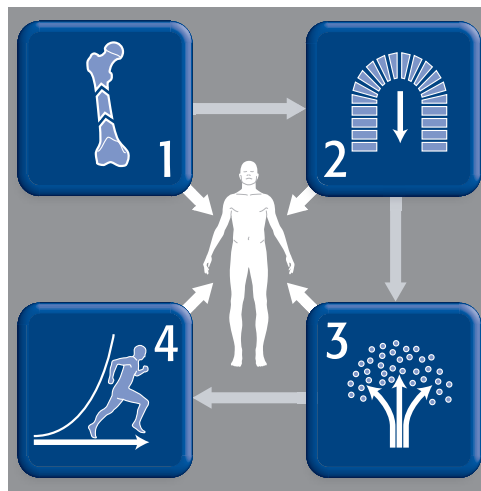
In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation<sup>1,2</sup>.

## Anatomic reduction

Fracture reduction and fixation to restore anatomical relationships.

## Early, active mobilization

Early and safe mobilization and rehabilitation of the injured part and the patient as a whole.



## Stable fixation

Fracture fixation providing absolute or relative stability, as required by the patient, the injury, and the personality of the fracture.

## Preservation of blood supply

Preservation of the blood supply to soft tissues and bone by gentle reduction techniques and careful handling.

<sup>1</sup> Müller ME, Allgöwer M, Schneider R, Willenegger H. Manual of Internal Fixation. 3<sup>rd</sup> ed. Berlin, Heidelberg, New York: Springer. 1991.

<sup>2</sup> Rüedi TP, Buckley RE, Moran CG. AO Principles of Fracture Management. 2<sup>nd</sup> ed. Stuttgart, New York: Thieme. 2007.

# Indications

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The LCP Metaphyseal Plate for distal medial tibia is a pre-shaped plate that allows optimal treatment of juxta-articular fractures of the distal tibia extending into the shaft area. This plate takes the following characteristics of the distal tibia into account:

- Thin, soft tissue coverage
- Complex anatomic shape of the bone

# Surgical Steps

## Implant preparation

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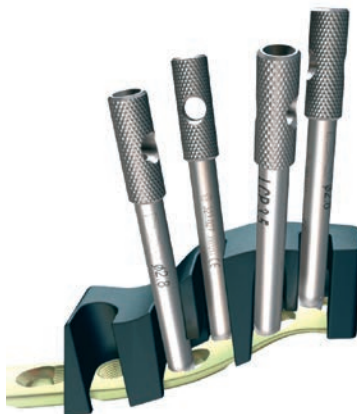
**1**

Place the guiding block onto the plate. Thread the LCP Drill Sleeve (323.027) through the guiding block into the plate. If desired, the guiding block can then be removed.



**2**

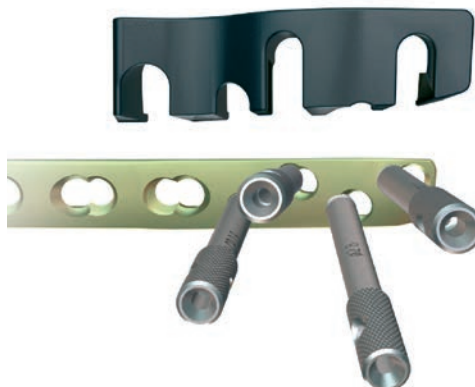
Precise contouring of the plate is unnecessary. Take the screw direction into consideration when plate bending is required.



**3**

Use the Guide Sleeve for Kirschner Wires (324.081) and insert the Kirschner wires to determine the direction of the screws or simply to temporarily fix the plate to the bone.

For temporary fixation, a Kirschner wire can also be placed through the hole in the bullet nose.





## Plate fixation

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### 1

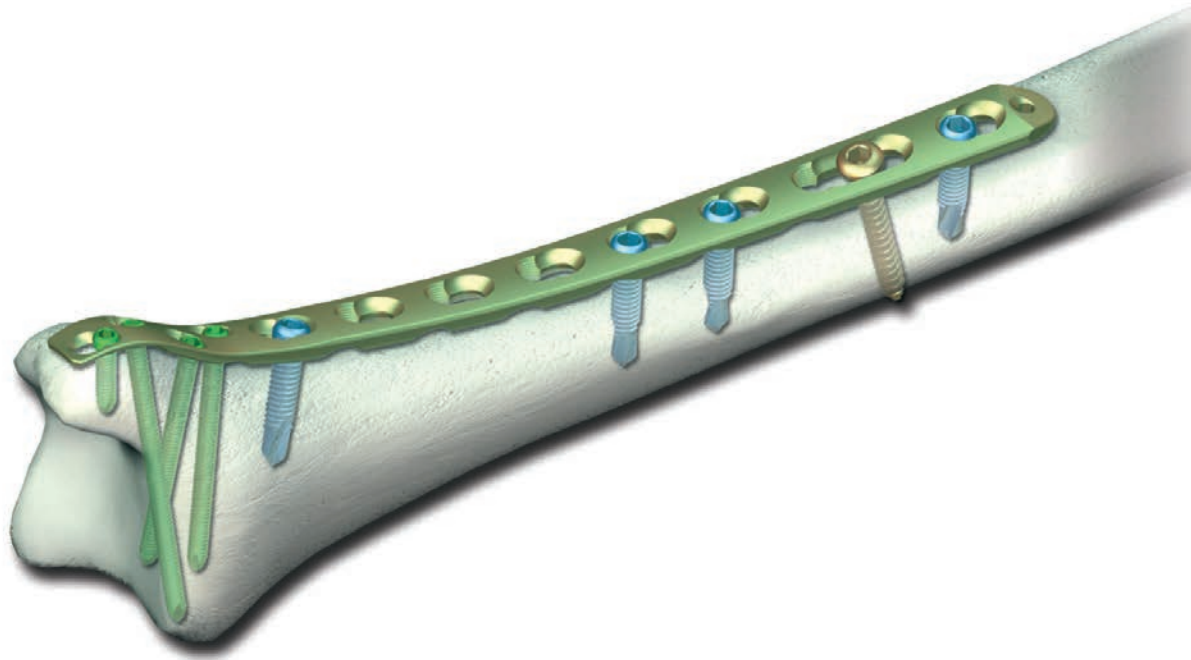
Use the LCP Metaphyseal Plate for distal medial tibia according to the LCP Principles; see LCP Application notes (DSEM/TRM/0115/0278).

### 2

For improved anchorage in the bone, the direction of the threaded screw holes in the distal part of the plate has been optimized. To insure correct insertion and locking of the locking head screws in this distal part of the plate, use the appropriate guiding block and LCP drill sleeves. For the distal part of the plate, use 3.5 mm locking head screws, 3.5 mm cortex screws, 4.0 mm cancellous bone screws, or a combination of all three.

### 3

For the shaft of the plate, use 5.0 mm locking head screws, 4.5 mm cortex screws or a combination of both.



## Implant Removal

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Unlock all screws from the plate, then remove the screws completely from the bone. This prevents simultaneous rotation of the plate when unlocking the last locking screw.

If a screw cannot be removed with the screwdriver (e.g. if the hexagonal or Stardrive recess of the locking screw is damaged or if the screw is stuck in the plate), use the T-Handle with Quick-Coupling (311.440) to insert the conical Extraction Screw (309.520 or 309.521) into the screw head, and unscrew the screw in a counter-clockwise direction.

# Implants

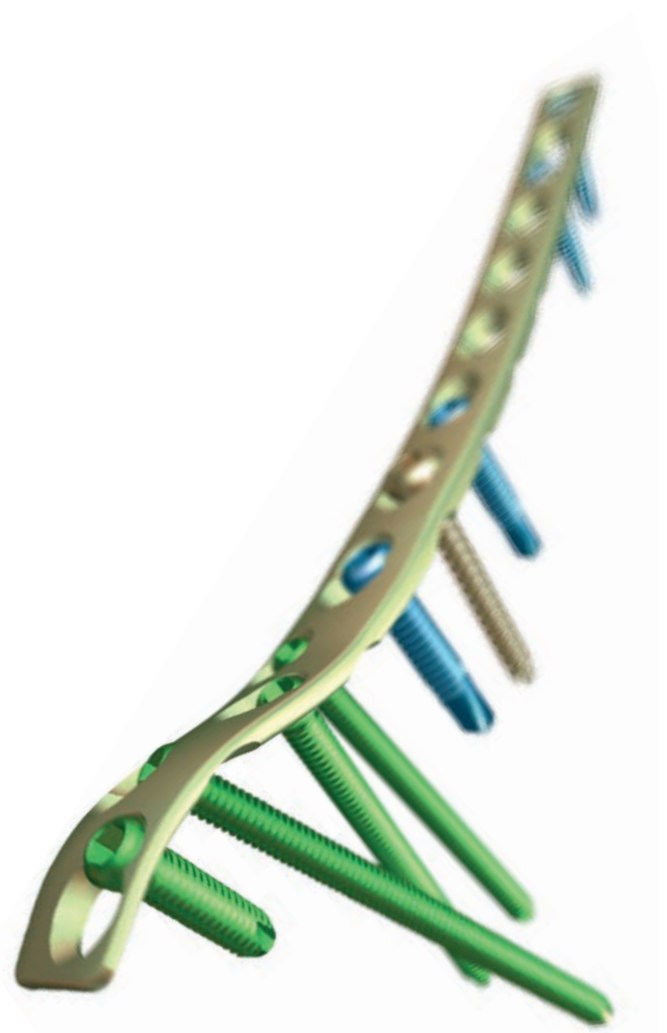
## Plates

### LCP Metaphyseal Plate for distal medial tibia, right

St. Steel	Titanium	Holes	Length
224.768	424.768	4+4 holes	123 mm
224.769	424.769	4+5 holes	141 mm
224.770	424.770	4+6 holes	159 mm
224.771	424.771	4+7 holes	177 mm
224.772	424.772	4+8 holes	195 mm
224.773	424.773	4+9 holes	213 mm
224.774	424.774	4+10 holes	231 mm
224.776	424.776	4+12 holes	267 mm
224.778	424.778	4+14 holes	303 mm
224.780	424.780	4+16 holes	339 mm
224.782	424.782	4+18 holes	375 mm
224.784	424.784	4+20 holes	411 mm

### LCP Metaphyseal Plate for distal medial tibia, left

St. Steel	Titanium	Holes	Length
224.808	424.808	4+4 holes	123 mm
224.809	424.809	4+5 holes	141 mm
224.810	424.810	4+6 holes	159 mm
224.811	424.811	4+7 holes	177 mm
224.812	424.812	4+8 holes	195 mm
224.813	424.813	4+9 holes	213 mm
224.814	424.814	4+10 holes	231 mm
224.816	424.816	4+12 holes	267 mm
224.818	424.818	4+14 holes	303 mm
224.820	424.820	4+16 holes	339 mm
224.822	424.822	4+18 holes	375 mm
224.824	424.824	4+20 holes	411 mm



### LCP Metaphyseal Plate for distal medial tibia Set

171.250	<b>LCP Metaphyseal Plate for distal medial tibia Set with contents, stainless steel</b>
171.255	<b>LCP Metaphyseal Plate for distal medial tibia Set with contents, titanium</b>
671.205	SYNCASE for LCP Metaphyseal Plate for distal medial tibia Set, consisting of:
671.206	Case for LCP Metaphyseal Plate for distal medial tibia Plates
671.207	Lid to SYNCASE for LCP Metaphyseal Plate for distal medial tibia

### Implants contained in the LCP Metaphyseal Plate for distal medial tibia Set 171.250

St Steel	Designation	Units
224.768– 224.784	LCP Metaphyseal Plate for distal medial tibia, right	1 each
224.808– 224.824	LCP Metaphyseal Plate for distal medial tibia, left	1 each

### Implants contained in the LCP Metaphyseal Plate for distal medial tibia Set 171.255

Titanium	Designation	Units
424.768– 424.784	LCP Metaphyseal Plate for distal medial tibia, right	1 each
424.808– 424.824	LCP Metaphyseal Plate for distal medial tibia, left	1 each

### Instruments contained in the LCP Metaphyseal Plate for distal medial tibia Set

Item no.	Designation	Units
312.936	Aiming Block for LCP Metaphyseal Plate, for distal tibia, right	1
312.937	Aiming Block for LCP Metaphyseal Plate, for distal tibia, left	1



All plates are available sterile packed. For sterile implants add suffix "S" to article number.

## Screws

### Locking Screw Stardrive® Ø 5.0 mm, self-tapping, Stainless Steel or Titanium

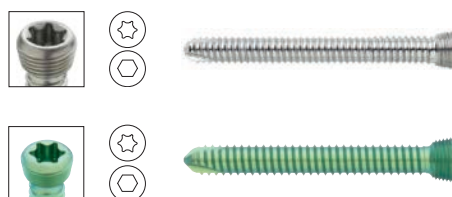
X12.201– Locking Screw Stardrive Ø 5.0 mm,  
X12.221 self-tapping, length 14–60 mm

### Locking Screw Stardrive® Ø 3.5 mm, self-tapping, Stainless Steel or Titanium

X12.101– Locking Screw Ø 3.5 mm, self-tapping,  
X12.125 length 10–65 mm

or

X13.010– Locking Screw Ø 3.5 mm, self-tapping,  
X13.060 length 10–60 mm

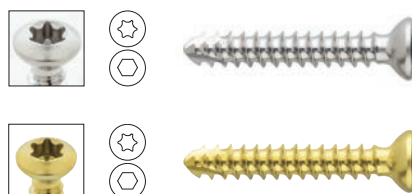


### Cortex Screw Ø 3.5 mm, self-tapping, Stainless Steel or Titanium

0X.200.010– Cortex Screw Stardrive Ø 3.5 mm,  
0X.200.060 self-tapping, length 10–60 mm

or

X04.810– Cortex Screw Ø 3.5 mm, self-tapping,  
X04.860 length 10–60 mm



### Cortex Screw Ø 4.5 mm, self-tapping, Stainless Steel or Titanium

X14.814 Cortex Screw Ø 4.5 mm, self-tapping,  
length 14 mm

X14.860 Cortex Screw Ø 4.5 mm, self-tapping,  
length 60 mm

X=2 Stainless Steel  
X=4 Titanium

All screws are available sterile packed. For sterile implants add suffix "S" to article number.

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**Cancellous Bone Screw Ø 4.0 mm, fully threaded,  
Stainless Steel or Titanium**

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X06.010–	Cancellous Bone Screw Ø 4.0 mm,
X06.060	fully threaded, length 10–60 mm

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**Cancellous Bone Screw Ø 4.0 mm,  
Stainless Steel or Titanium**

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X07.010–	Cancellous Bone Screw Ø 4.0 mm,
X07.060	length 10/5–60/16 mm

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X=2 Stainless Steel

X=4 Titanium

All screws are available sterile packed. For sterile implants add suffix "S" to article number.

**Implants: Kirschner Wires**

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X92.160	Kirschner Wire Ø 1.6 mm with trocar tip, length 150 mm, Stainless Steel or Titanium
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X92.200	Kirschner Wire Ø 2.0 mm with trocar tip, length 150 mm, Stainless Steel or Titanium
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492.710	Kirschner Wire Ø 1.6 mm with threaded tip, length 150/5 mm, Titanium Alloy (TAV)
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X=2 Stainless Steel

X=4 Titanium

All Kirschner wires are available sterile packed. For sterile implants add suffix "S" to article number.

**Instruments**

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**Aiming Block for LCP Metaphyseal Plate,  
for distal tibia**

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312.936	right
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312.937	left
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X=2 Stainless Steel

X=4 Titanium

All screws are available sterile packed. For sterile implants add suffix "S" to article number.

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## **Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-06e1 and ASTM F 2119-07**

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

## **Radio-Frequency-(RF-)induced heating according to ASTM F 2182-11a**

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils (whole body averaged specific absorption rate [SAR] of 2 W/kg for 6 minutes [1.5 T] and for 15 minutes [3 T]).

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**Precautions:** The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
  - Patients with impaired thermoregulation or temperature sensation should be excluded from MR scanning procedures.
  - Generally, it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
  - Using the ventilation system may further contribute to reduce temperature increase in the body.
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