

# TARIC<sup>®</sup>

total ankle system



## Surgical Technique

ic  
implantcast



# TARIC®

## total ankle system

The TARIC® ankle system was developed in collaboration with Prof. Dr. Stefan Rehart, Frankfurt, Prof. Dr. Bernd Fink, Markgröningen and Dr. Stephan Schill, Bad Aibling.



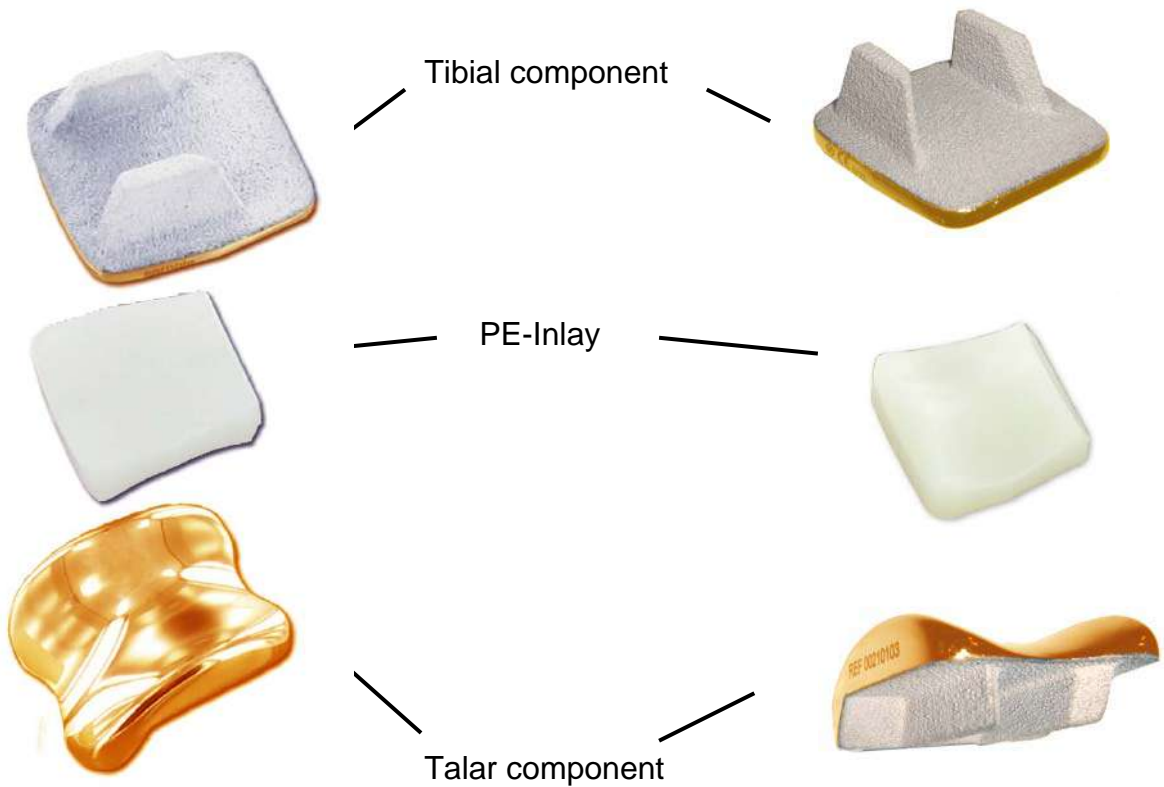
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**Nota Bene:** The described surgical technique is the suggested treatment for the uncomplicated procedure. In the final analysis the preferred treatment is that which addresses the needs of the individual patient.

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## DESIGN CHARACTERISTICS



The TARIC<sup>®</sup> ankle system is designed as a cementless „Mobile Bearing“ system. Two Fins are configured for the primary fixation of the tibial and talar component. These fins clamp into the bone. The additional applied cpTi- and HA-coating allows a solid secondary fixation of the metal components to the bone.

The system includes 5 sizes of tibial implants and 4 sizes of talar components. The highly congruent PE-inlays are made of highly molecular polyethylene. The size of the PE-inlay that has to be used depends on the chosen respective size of the talar component. The sophisticated instruments enable an accurate extramedullary alignment of the tibial and talar resection.



TARIC<sup>®</sup> on a lateral X-Ray



TARIC<sup>®</sup> on a frontal X-Ray

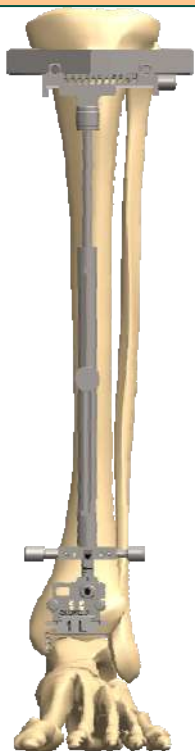


figure 1

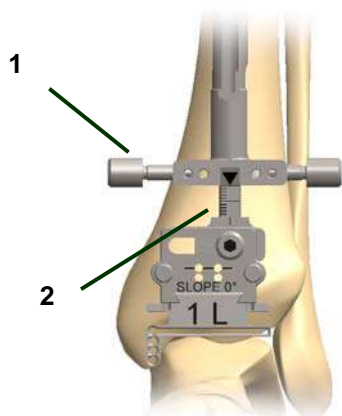


figure 2

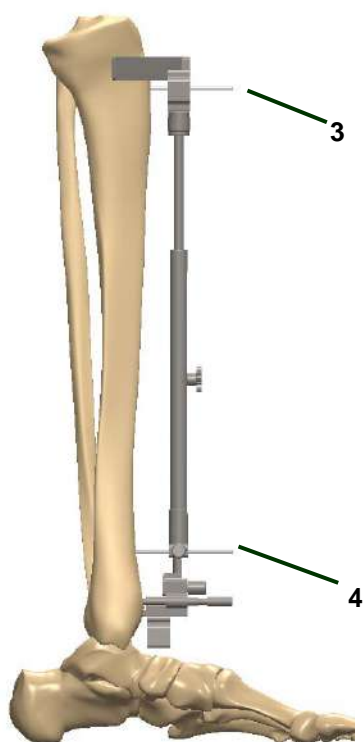


figure 3

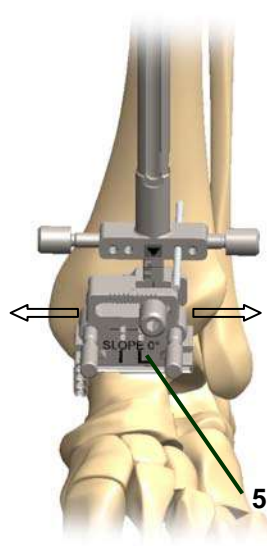


figure 4

## Surgical Technique

### Patient Positioning

Place the patient in the dorsal position with a tourniquet around the thigh. The malleoles should protrude six inches over the distal end of the table to have the possibility to x-ray.

### Surgical access

The cutaneous cut runs ventral, lengthwise between the extensor-hallucis-longus- and the tibialis-anterior-tendon, about 12 cm length. Considering and protecting the lateral running bunch of vessels and nerves the preparation is carried out up to the capsule incision. The distal ventral tibia surface must be completely exposed and released of osteophytes. The talofibular and the talotibial joint space have to be illustrated properly. To preserve the soft tissue use Langenbeck retractors.

Mount the slope block 0° (respectively 5°) on the tibial alignment guide. It is advised to use the 5° slope block (fig. 2). The slope block has to be adjusted, until the scale (2) advises 10mm and the tibial joint line is app. 1cm. Fix the adjustment screw (1) on the opposite side of the fixation pin. Choose the tibial resection guide of the preoperatively determined size and insert it into the slope block. The mark 1L for example must be readable if the left ankle with size 1 is operated (fig 2 and fig. 4).

Adjust the extramedullary alignment guide on the Tuberositas tibiae (fig. 1) and fix the alignment guide proximal (3) and distal (4) with 2,5mm fixation pins (fig. 3). The screw (5) remains unlocked to have the opportunity to adjust the slope block mediolaterally (fig. 4).

**Notice:** It is recommended to predrill all pin holes with the 2,5mm bone drill.

## TIBIAL ALIGNMENT

First of all adjust the slope block mediolateral and fix the screw (1) afterwards (fig. 5).

Push two fixation pins in the marked level (2) of the slope block but do not fasten these pins into the bone yet (fig. 6). Attach the talar alignment guide (3) on the fixation pins (fig. 7). Control the alignment with the help of the attached talar alignment guide. It should be aligned on the second metatarsale (fig. 8) to meet the center of the talar. If necessary adjust the rotation by releasing the screw (4) and readjusting on the adjustment screws (5).

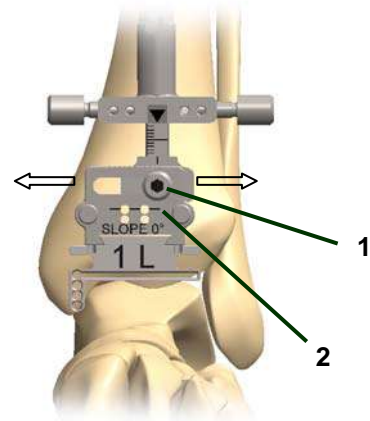


figure 5

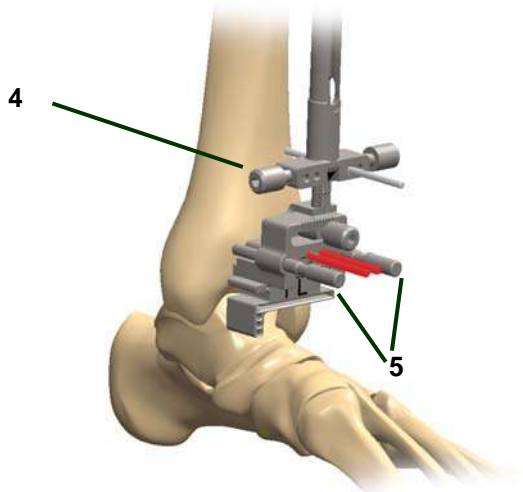


figure 6

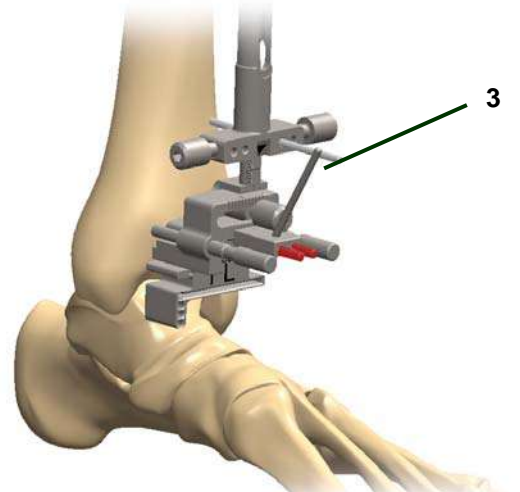


figure 7

After finishing the adjustment remove the talar alignment guide and the two fixation pins.

**Notice:** For better understanding all fixation pins placed for the adjustment but not fixed in the bone at that moment, are presented in **RED** colour (for example fig. 6).

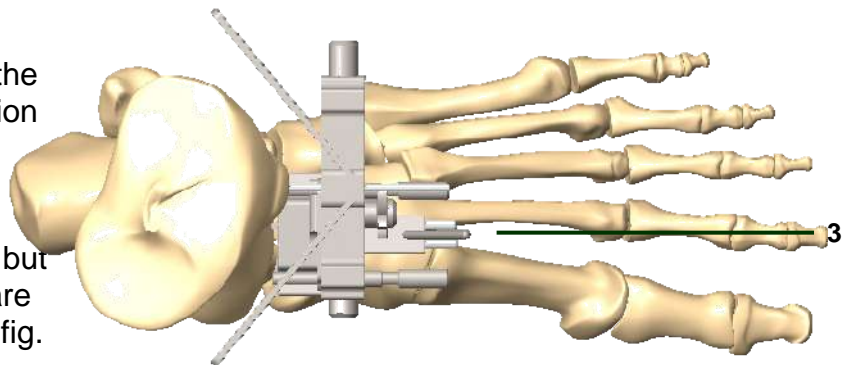


figure 8

## ADJUSTMENT OF THE TIBIAL RESECTION HEIGHT

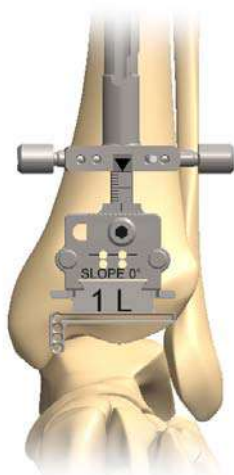


figure 9

The scale on the alignment guide has to be put at least to 10mm (fig.9). Choose the tibial resection guide of the preoperatively determined size and insert it into the slope block. The mark **1L** for example must be readable if the left ankle with size 1 is operated (fig. 9).

Insert the alignment pin into the most cranial hole of the alignment guide (fig. 10a), but do not fasten it into the bone at this time. The resection guide has to be adjusted vertical and horizontal until the pin is positioned on the medial joint edge (fig. 10a and 10b).

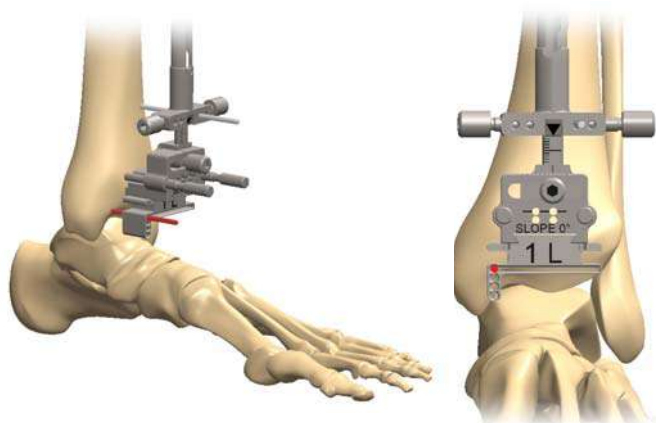


figure 10a and 10b

Take care that the correct mediolateral alignment is chosen as an accurate position is necessary to avoid a damage of the medial malleolus. To have an orientation of the convergence of the joint in dorsal direction it is recommended to place a Lambott chisel in the talofibular joint space and another one in the talotibial joint space.

Now the height of the resection guide corresponds to the leading edge of the tibial joint line.

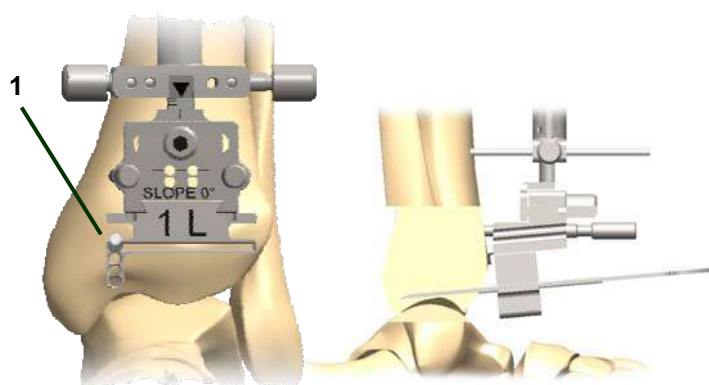
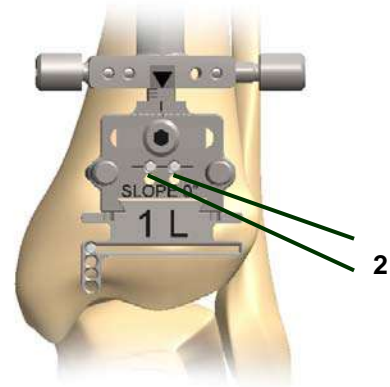


figure 11a and 11b

To resect adequate bone from the distal tibia, the resection guide has to be adjusted 3mm at a plain tibial dome (fig. 11a) respectively 7mm at a high tibial dome (fig. 11b) in proximal direction. Please fix the block with a fixation pin inserted through the highest hole (**1**) (fig. 11a).

## TIBIAL BONE RESECTION

After the height adjustment fix the resection block with two 2,5mm fixation pins on the marked (2) level (fig. 12).



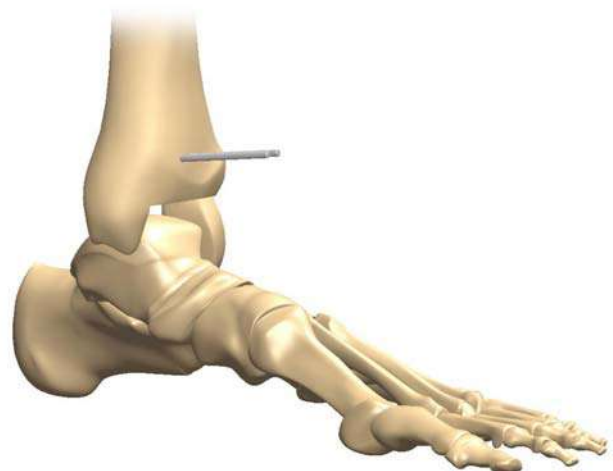
**figure 12**

Use a 1,37mm thick, narrow saw blade for the horizontal resection of the tibia. The fixation pin inserted before avoids a damage of the medial malleolus during the horizontal cut (fig. 12 and fig. 13).



**figure 13**

Remove all instruments except the two fixation pins inserted through the slope block. These two pins are needed for the final tibial preparation (fig. 14).



**figure 14**



## CHECKING OF THE JOINT STABILITY



figure 15

Combine the modular handle with the spacer base plate and insert these instruments together with the thinnest full Spacer (5mm) into the joint space (fig. 15).

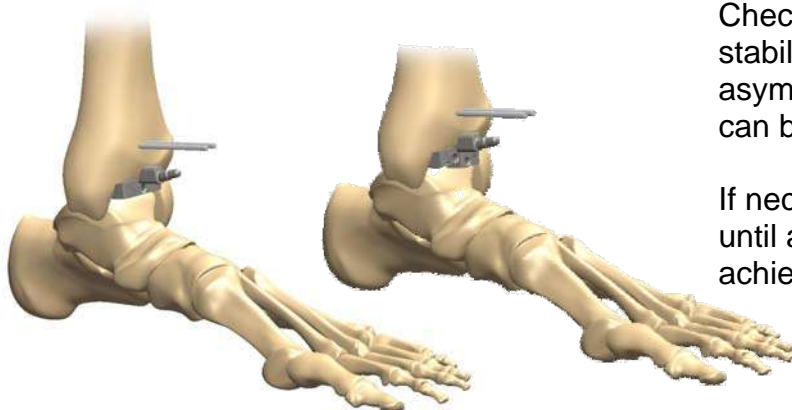


figure 16a and 16b

Check the ligament tension and the stability of the joint. In case of an asymmetric joint space, two half spacers can be inserted (fig. 16b).

If necessary insert the proximate spacer until a satisfying ligament tension is achieved.



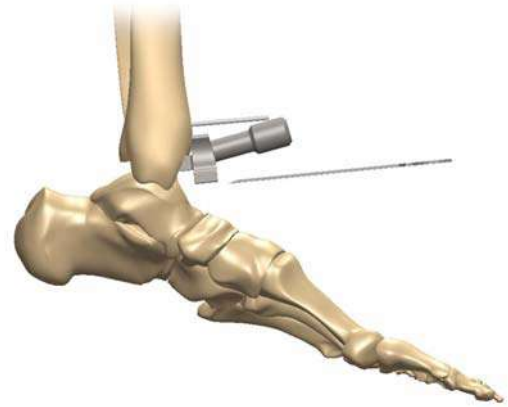
figure 17

Leave the spacer base plate as well as the spacer in the joint space (fig. 16a & 16b) and screw the talar resection block of **size 5mm** on the spacer base plate which corresponds to the PE height (fig. 17).

**Only in case of a higher dome shape consider to use the talar resection block 6mm to 8mm.**

## TALAR RESECTION

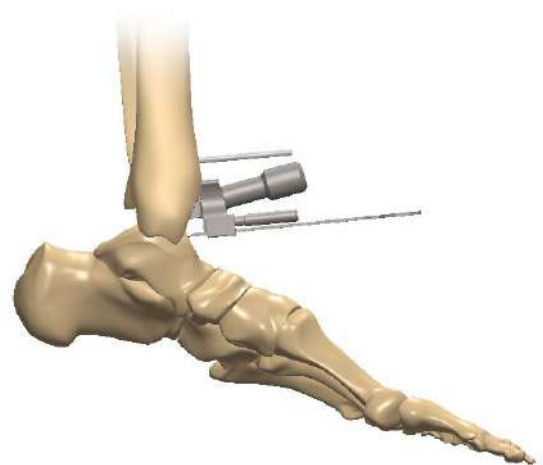
Resect the talus with the help of a narrow saw blade along the bottom rim of the resection block (fig. 18a). If you want to cut through a slot, please add the modular saw capture (fig. 18b) and perform the slotted cut of the talus (fig. 18c). The foot should be held in circa 10° plantar flexion (fig. 19).



**figure 18a**

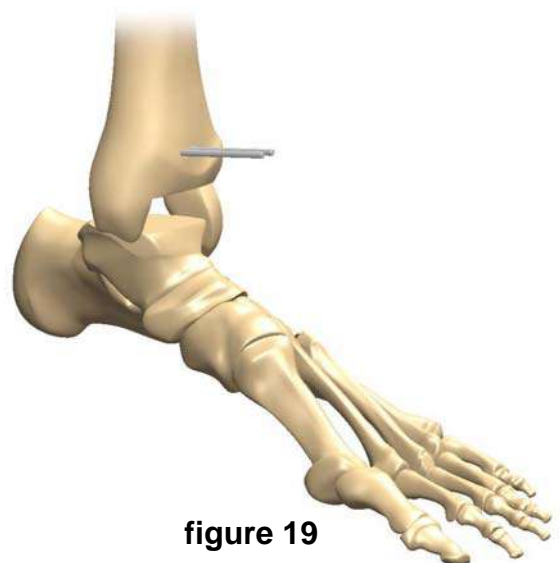


**figure 18b**



**figure 18c**

Remove the talar resection block and the spacer base plate. Leave the two fixation pins still in the bone (fig. 19).



**figure 19**

## TALAR BONE PREPARATION



figure 20

Insert the talar reamer guide in the joint space and determine the size of the talar implant (fig. 20a).

**Notice:** A complete coverage of the talar without overlapping of the prosthesis should be achieved.

After determining the correct size, the reamer guide has to be fixed at the talus with two fixation pins. (fig. 20b)



figure 21

Use the reamer and ream up to the stop of the reamer guide. Direct the reamer sideways to complete the reaming of the anterior surface (fig. 21).

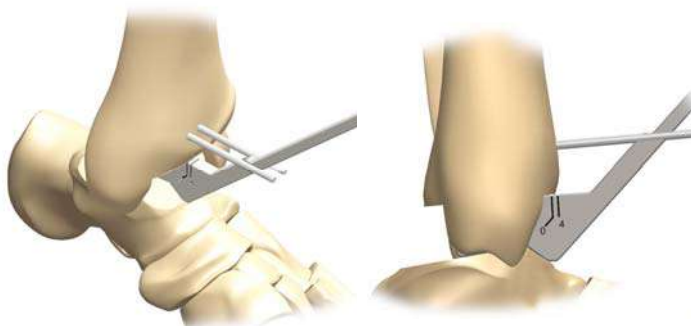


figure 22

Use the template for the talar size of the designated PE-height to check the joint space and the position of the anterior resection (fig. 22). To assure, that the talar and the tibial component are aligned properly, the tibial leading edge must be positioned between the marks 0 and 4 of the template for the talar size (fig. 23a).



In case the position is not between these marks (fig. 23b), it has to be reamed again. Fix the reamer guide again with two fixation pins and ream with the revision reamer +1mm to relocate the position of the talar implant to posterior.

Right                      False  
figure 23a and 23b

## FINAL TALAR PREPARATION

Position the talar fin template of the designated size on the talus. Fix the template with two anterior fixation pins (fig. 24).

**Notice:** In case of hard bone it is recommended to prepare the slots with a jigsaw.



figure 24

Insert the chisel for talar fins into the talar fin template and prepare the talar bone carefully until the stop (fig. 25a).

**Notice:** Make sure that the talar fin template lies flush on the talar bone during the preparation to ensure the right positioning of the talar implant.

Remove the talar fin template, the chisel for talar fins and the two talar fixation pins (fig. 25b).

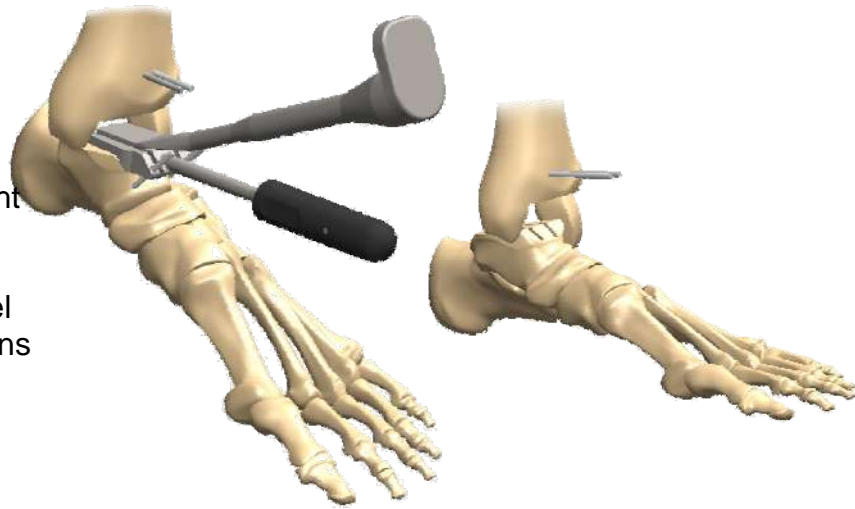
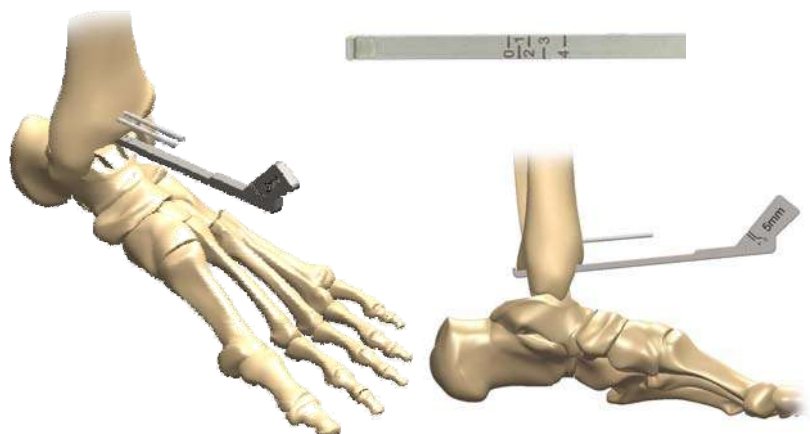


figure 25a and 25b

Control the A/P measurement of the designated tibia size. Therefore insert the template for the talar size into the joint space and touch the trailing edge (fig. 26a).

With the scale the A/P measurement of the tibia sizes can be read (fig. 26b). A posterior overlap of the tibial component should be avoided. If necessary, change the size of the tibial component.



figures 26a and 26b



figure 27

## FINAL TIBIAL PREPARATION

Insert the talus trial implant. In order not to compromise the final pressfit locking the trial implants simply have two smaller fins.



Insert the trial inlay of the size corresponding to the size of the talar trial implant into the joint space (fig. 27).



figure 28

Mount the tibia trial implant of the previous checked size onto the two tibial 2,5mm fixation pins (fig. 28) and check the tape tension of the joint.

Remove the two modular handles (fig. 28) and perform a stability check. If necessary increase the height of the trial inlay to achieve satisfying stability.

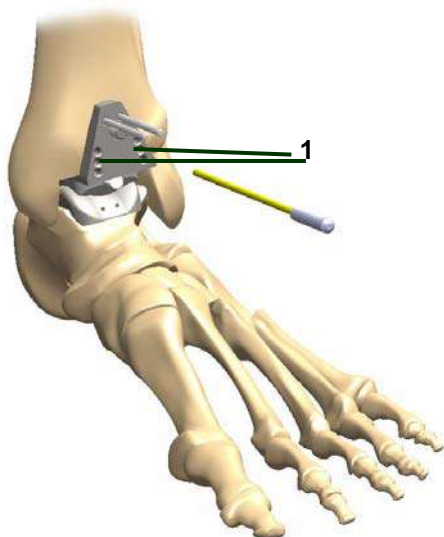
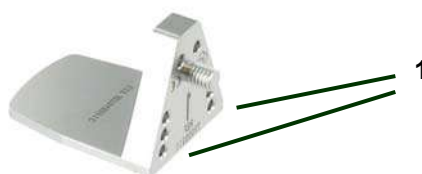


figure 29

After successful stability check drill through the 6 drilling holes (1) of the tibia trial inlay with the tibial drill 2,5mm to prepare the bone slots for the anchoring fins (fig. 29).



## INSERTION OF THE IMPLANTS

Remove the two tibial fixation pins and use a small osteotome to complete the preparation of the slots (fig. 30a).

The tibial and talar bone preparation are finished now (fig. 30b). Continue with the insertion of the implants.

Begin with the implantation of the talar component. Use the talar impactor carefully until the implant is seated completely (fig. 31).

**Notice:** Make sure that the talar implant slides into the slots of the talar bone and a complete bone contact is achieved.

If necessary use a talar implant setting instrument (fig. 32a) to ensure the secured anchoring of the talar component (fig. 32b).

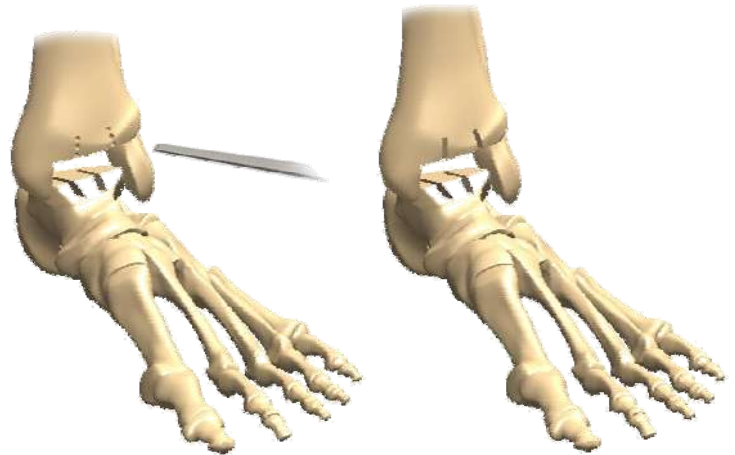


figure 30a and 30b



figure 31

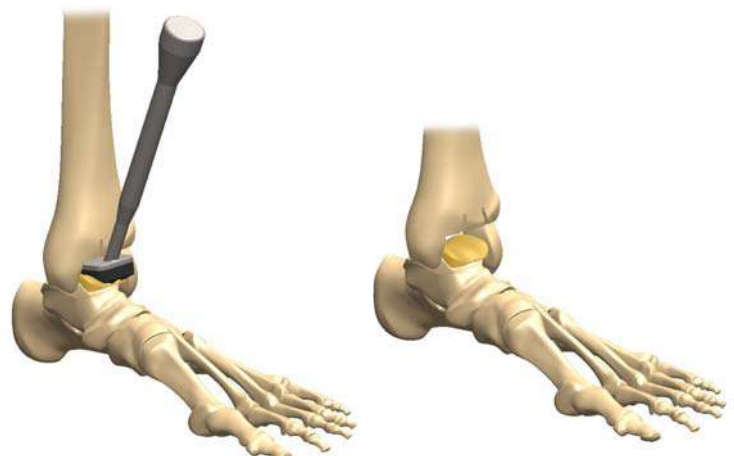
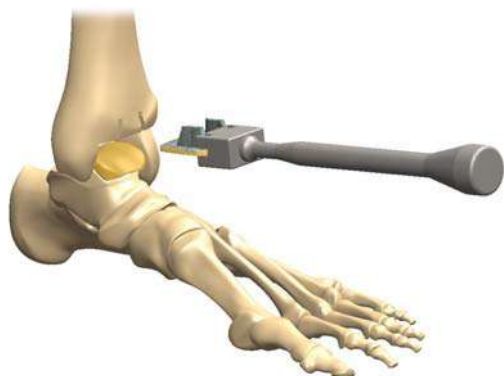


figure 32a and 32b

## INSERTION OF THE IMPLANTS



**figure 33a**

Avoid any contact between the two metallic components during the implantation of the joint partners. If necessary insert the trial inlay to prevent any damage of the high polished surfaces of the implants.

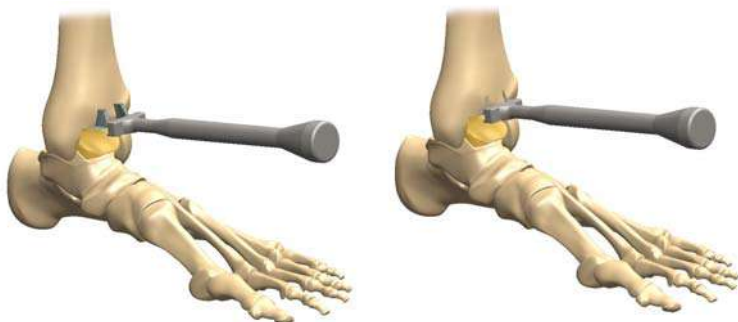
Insert the tibia implant into the tibial setting instrument.

Insert the tibia implant from anterior into the slots of the tibia bone (fig. 33a).



**figure 33b**

Insert the tibia implant with cautious beats from ventral into the prepared slots of the tibia until it stops at the tibial bone (fig. 33b). Consider the rotation during this act.



**figure 34a and 34b**

Complete the implantation with the help of the tibial impactor modular (fig. 34a and 34b).

**Notice:** Consider the correlation between the leading edge of the implant and the leading edge of the tibial bone (fig. 35).



**figure 35**

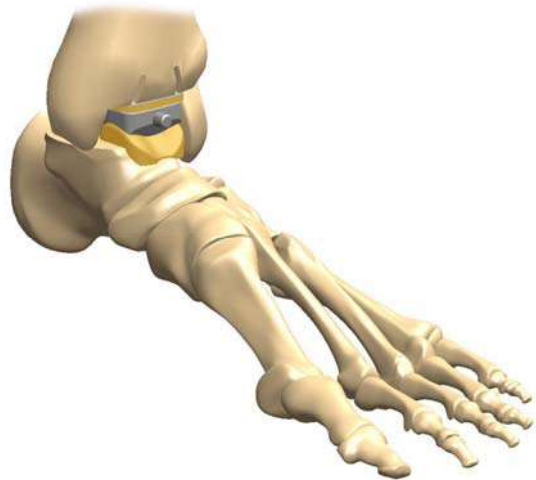
## TRIAL REPOSITIONING AND INSERTION OF THE PE-INLAY

Avoid any contact between the two metallic components during the following steps to prevent any damage of the high polished surfaces of the implants. (fig. 36).



**figure 36**

Optionally a terminal trial reposition can be performed. Therefore insert the trial inlay of the accurate size and PE-height (consider the colour coding; in this case GREY for the talar size 1) and check the joint stability (fig. 37).



**figure 37**

In case of satisfying joint stability the trial insert is removed and replaced by the final PE-inlay (fig. 38).

To indicate the size matching all packagings of the implants have a colour coding corresponding to the colour of the trial inlay.



**figure 38**



## POSTOPERATIVE CARE

After the terminal cleaning of the joint a redon drainage is inserted in the joint and the capsule is closed with suture.

Following the careful reconstruction of the retinaculum and the subcutane adaptation the skin can be closed with a stapler or conventional sutares.

The postoperative care may happen in Vacoped-shoe, which immediately can be released with an extension/flexion of 10-0-10°. For the first 3 weeks a partial weight bearing with 10-30 kg should take place. After 3 weeks the establishing of weight bearing can take place in a Vacoped-shoe. After radiological control the patient will be mobilised after 6 weeks without shoe under full weight bearing. Physiotherapy with active and passive exercises (e.g. CPM-splint) can take place from the first postoperative day for the whole process.



**IMPLANTS**

**TARIC<sup>®</sup> tibial implant**

*Mat.: implavit<sup>®</sup>; CoCrMo-casting alloy acc. to DIN ISO 5832/4 with CpTi and HA-coating*

| <b>TiN</b> | <b>w/o TiN</b> | <b>size</b> |
|------------|----------------|-------------|
| 0021-0040N | 0021-0040      | 0           |
| 0021-0041N | 0021-0041      | 1           |
| 0021-0042N | 0021-0042      | 2           |
| 0021-0043N | 0021-0043      | 3           |
| 0021-0044N | 0021-0044      | 4           |


**TARIC<sup>®</sup> PE-inlay**

*Mat.: UHMWPE acc. to DIN ISO 5834/2*

| <b>REF</b> | <b>size</b> | <b>height</b> |
|------------|-------------|---------------|
| 0021-0005  | 0           | 5mm           |
| 0021-0006  | 0           | 6mm           |
| 0021-0007  | 0           | 7mm           |
| 0021-0008  | 0           | 8mm           |
| 0021-4010  | 0           | 10mm          |
| 0021-0015  | 1           | 5mm           |
| 0021-0016  | 1           | 6mm           |
| 0021-0017  | 1           | 7mm           |
| 0021-0018  | 1           | 8mm           |
| 0021-4110  | 1           | 10mm          |
| 0021-0025  | 2           | 5mm           |
| 0021-0026  | 2           | 6mm           |
| 0021-0027  | 2           | 7mm           |
| 0021-0028  | 2           | 8mm           |
| 0021-4210  | 2           | 10mm          |
| 0021-0035  | 3           | 5mm           |
| 0021-0036  | 3           | 6mm           |
| 0021-0037  | 3           | 7mm           |
| 0021-0038  | 3           | 8mm           |
| 0021-4310  | 3           | 10mm          |
| 0021-4310  | 3           | 10mm          |

**Notice:** The size of the PE-inlay corresponds to the size of the talar implant. For revision cases PE-inlays in thicknesses of 12 and 14mm are available.


**TARIC<sup>®</sup> talar implant**

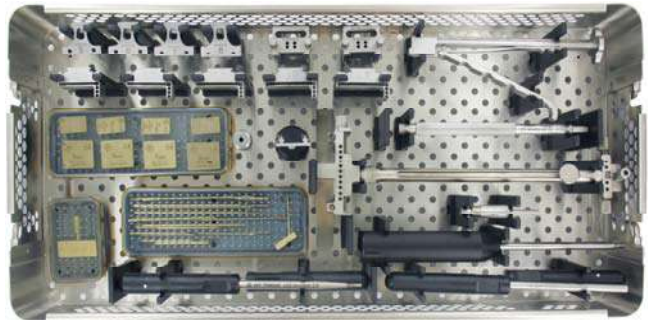
*Mat.: implavit<sup>®</sup>; CoCrMo-casting alloy acc. to DIN ISO 5832/4 with CpTi and HA-coating*

| <b>TiN</b> | <b>w/o TiN</b> | <b>size</b> |
|------------|----------------|-------------|
| 0021-0100N | 0021-0100      | 0           |
| 0021-0101N | 0021-0101      | 1           |
| 0021-0102N | 0021-0102      | 2           |
| 0021-0103N | 0021-0103      | 3           |

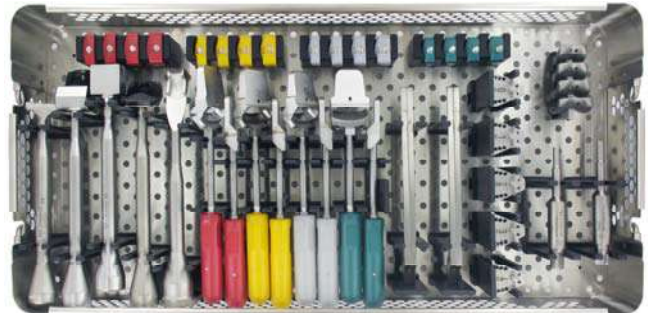


## INSTRUMENTS

**TARIC<sup>®</sup> container 1**  
7999-0023



**TARIC<sup>®</sup> container 2**  
7999-0024



**talar resection block**  
7700-0235 5 mm  
7700-0236 6 mm  
7700-0237 7 mm  
7700-0238 8 mm



**talar saw capture**  
7700-0203



**spacer base plate**  
7700-0200



**handle for spacer**  
7700-0245 2x

**talar orientation guide**  
7700-0107



**modular handle**  
7700-0201 2x



**pin-inserter**  
4223-0006 2,5 mm



**pin-extractor**  
7700-0109



**INSTRUMENTS**

**talar reamer**  
7700-0240

**talar revision reamer +1mm**  
7700-0239

**full spacer**  
7700-0215 5  
7700-0216 6  
7700-0217 7  
7700-0218 8

**half spacer**  
7700-0225 5  
7700-0226 6  
7700-0227 7  
7700-0228 8

**drill 2,5mm**  
7700-0112

**fixation pin 2,5 mm**  
7700-0110 50mm 10x  
7700-0118 70mm 10x  
7700-0111 100mm 8x

**hexagon screw driver short 3,5 mm**  
0280-1007

**slope block**  
7700-0106 0°  
7700-0105 5°

**tibial alignment guide**  
7700-0100

**A/O quick release chuck small**  
4224-0021



**INSTRUMENTS**

**tibial cutting guide**

- 7700-0101 1
- 7700-0102 2
- 7700-0103 3
- 7700-0104 4



**tibial trial implant**

- 7700-0310 0
- 7700-0311 1
- 7700-0312 2
- 7700-0313 3
- 7700-0314 4



**trial inlay**

| sz. | 5mm       | 6mm       | 7mm       | 8mm       |
|-----|-----------|-----------|-----------|-----------|
| 0   | 7700-0305 | 7700-0306 | 7700-0307 | 7700-0308 |
| 1   | 7700-0315 | 7700-0316 | 7700-0317 | 7700-0318 |
| 2   | 7700-0325 | 7700-0326 | 7700-0327 | 7700-0328 |
| 3   | 7700-0335 | 7700-0336 | 7700-0337 | 7700-0338 |



**talar trial implant**

- 7700-0300 0
- 7700-0301 1
- 7700-0302 2
- 7700-0303 3



**template for talar size**

- 7700-0251 5 mm
- 7700-0252 6 mm
- 7700-0253 7 mm
- 7700-0254 8 mm



**talar fin template**

- 7700-0117 0
- 7700-0261 1
- 7700-0262 2
- 7700-0263 3



**talar reamer guide**

- 7700-0116 0
- 7700-0241 1
- 7700-0242 2
- 7700-0243 3

## INSTRUMENTS



**chisel for talar fins**  
7700-0250



**tibial setting instrument**  
7700-0114



**tibial impactor modular**  
7700-0230



**talar impactor**  
7700-0260



**talar implant setting instrument**



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