GMK® Efficiency

SINGLE USE INSTRUMENTS
IN KNEE REPLACEMENT

INNOVATION THAT DELIVERS

CO_2neutral
Swiss Climate

Surgical Technique

Joint | Spine | Sports Med

GMK SPHERE CONVENTIONAL

Medacta International

INDEX

1. INTRODUCTION

This document describes the surgical technique for implanting the GMK Sphere total knee system using GMK Efficiency Single Use Instruments.

PLEASE NOTE
In the surgical technique described hereafter, the resections are performed as follows:

A. Tibial resection
B. Distal femoral resection
C. A/P femoral resections and chamfers

However, the surgeon can change the order of the resections by choosing between the following sequences:

B. Distal femoral resection
A. Tibial resection
C. A/P femoral resection and chamfers

or

B. Distal femoral resection
C. A/P femoral resection and chamfers
A. Tibial resection

It is compulsory to perform the distal femoral resection before the A/P resections and chamfers.

1.1 INDICATIONS

GMK Efficiency Instruments are intended to be used as surgical instruments to assist in the positioning of the GMK knee replacement components intra-operatively. GMK Efficiency Instruments are intended for single use only.

During the surgery:

- Visually inspect the instruments after use to identify any mechanical damage; damage to the instruments may cause the release of particles into the human body.
- Check that the instrumentation set is complete prior to disposal to verify that no pieces have been accidentally left in the human body.

The surgical technique requires the use of some reusable metal instruments. Refer to the section concerning instrumentation nomenclature, including the list of instruments required to complete the surgical procedure.

CAUTION
Certain specific instruments are fixed to the bone with dedicated pins. Before using the pins, ensure that they are intact and fully functional. BENT OR DEFECTIVE PINS CANNOT BE USED AND MUST BE REPLACED BY NEW PINS. When extracting pins it is important to avoid bending as this results in axial misalignment between the pin and the dedicated extractor. It is strongly recommended not to impact or hammer on any instruments unless otherwise specified in the surgical technique. For detailed instructions contact your local Medacta sales representative.

CAUTION
A full Efficiency set, including the general tray, the conventional tray and all sizes of femur and tibia, must be available as backup. Alternatively, a full conventional metal instrument set must be available and ready for the surgery as backup.

1.2 CONTRAINDICATIONS

Contraindications in using GMK Efficiency instrumentation are the same as the situations when a total knee replacement is contraindicated.

1.3 PREOPERATIVE PLANNING

Radiological planning
This is performed from the scanogram, anterior-posterior, lateral and sunrise knee radiographs. The goals are to determine the angle formed by the anatomical axis and the mechanical axis, the tibial slope, to trace and measure bone resections, to establish the intramedullary guide introduction points, to assess the sizes of the femoral and tibial components, the height of the tibial insert, the thickness of patella to be resected, to study the topography of the operative site (localization of osteophytes and particularly posterior osteophytes).

Clinical planning
The goal is to assess the range of motion of the joint and patellar centring and to assess whether deformities and ligamentous instability exist or not.

1.4 SURGICAL APPROACH

The most common surgical approach is the vertical midline skin incision and a medial parapatellar approach. Other approaches may be used depending on the surgeon's preferences. After exposing the joint via elevation of the medial retinaculum, flex the knee. Prior to any bone resection define the normal bony architecture by removing the osteophytes (including those at the intercondylar notch) as collectively these contribute to the maintenance of any malalignment and conceal the true bone size.

Additionally both cruciate ligaments are resected which also aids exposure by permitting easier subluxation of the tibia for its subsequent osteotomy.

CAUTION
If a cruciate retaining insert (CR Insert) is used, the posterior cruciate ligament must be preserved.

During all procedures, the intention is to replace the bone and cartilage, that has been lost secondary to the arthritic process and resected as part of the arthroplasty, with a similar thickness of polyethylene and metal provided by the prosthetic components.

2. TIBIAL RESECTION

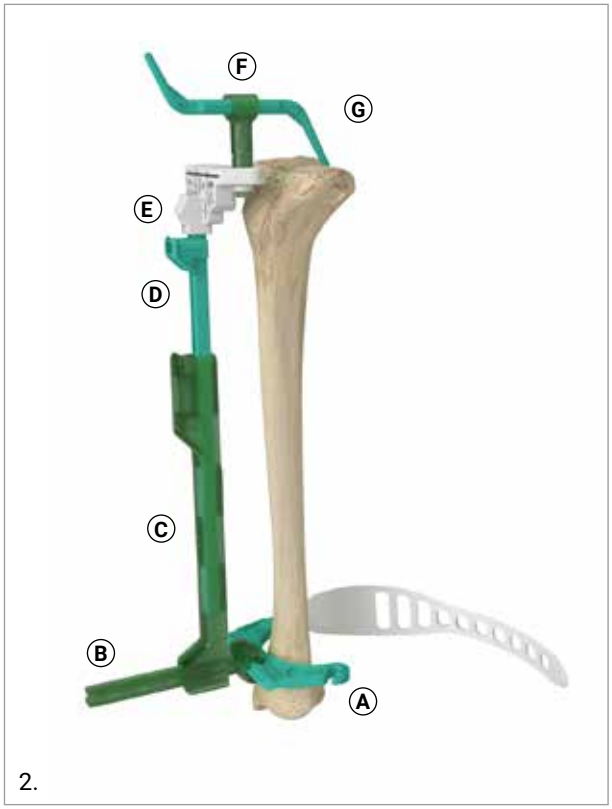
The proximal tibial resection can be performed using the extramedullary alignment guide or the intramedullary guide.

2.1 EXTRAMEDULLARY ALIGNMENT GUIDE

The extramedullary guide consists of:

- Malleolar clamp (A)
- Extramedullary guide malleolar clamp support (B)
- Extramedullary guide distal rod (C)
- Extramedullary guide proximal rod (D)
- Distal/tibial cutting block (E)
- Support for tibial stylus (F)
- Tibial stylus 2/10 mm (G)

1.



2.

Slide the distal/tibial cutting block (E) onto the extramedullary guide proximal rod (D).

MIS: when MIS distal/tibial cutting blocks are used, make sure to use the block corresponding to the side to be operated, as marked on the block.

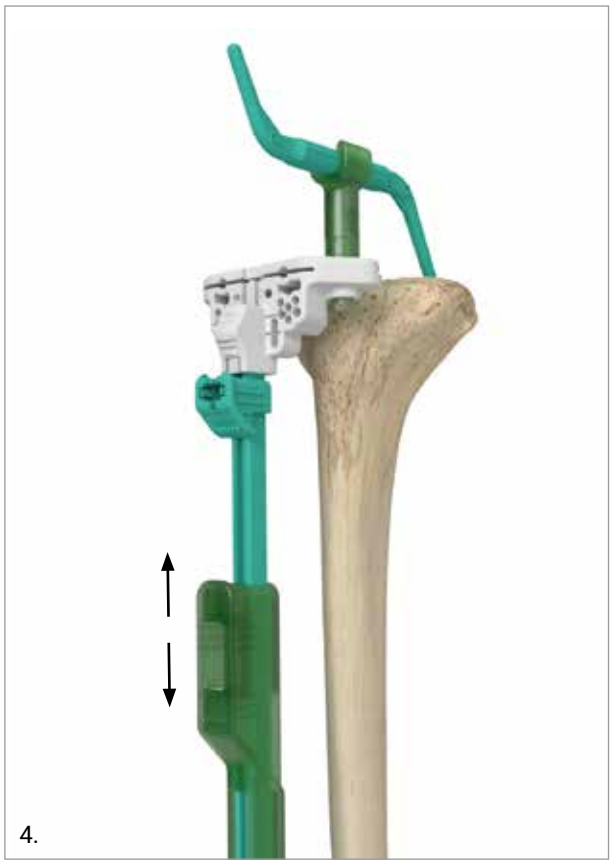
Please note that the block used for the left tibia is used also for the right femur, and viceversa. The correct side for the tibia is indicated by the letter “T”.

3.

Insert the malleolar clamp (A) into the malleolar clamp support (B), slide the extramedullary guide distal rod (C) into the malleolar clamp support. Slide the extramedullary guide proximal rod (D) into the distal rod (C).

Position the assembly on the tibia. Secure the malleolar clamp around the ankle and make sure that the malleolar clamp support points towards the second toe. Adjust the distance of the rods to the length of the patient's tibia and centre the tibial resection block.
A stylus (G) is provided to check the tibial resection level.

Fix the tibial stylus into the dedicated hole of the cutting block. Be careful to completely insert the stylus support into the cutting block. One side of the stylus is used to make a standard cut, 10 mm from the less worn tibia plateau, and the other side to make a conservative cut, 2 mm under the most worn plateau.
Control the tibial resection level by sliding the extramedullary guide proximal rod into the distal rod.



4.

OPTION

If more stability is required, a spike rod is available.
Before assembling the extramedullary guide, the spike rod must slide onto the track of the extramedullary guide's proximal rod and the cutting guide must slide from the bottom to the top of the proximal rod until it reaches its end position. After all the positioning adjustments have been made using the extramedullary guide, stabilize the spike rod with a short headed pin.

5.

6.

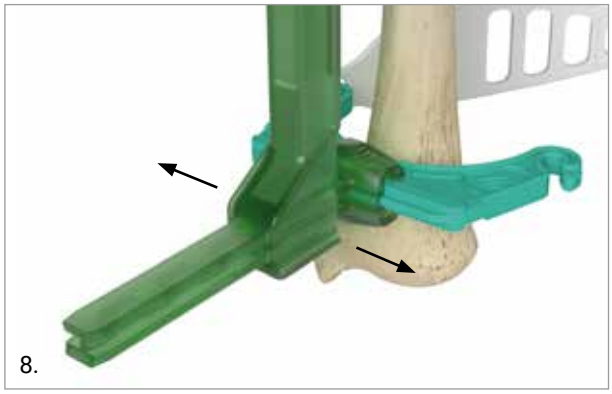
When the spike rod option is used, to control the tibial resection level the cutting block must be slid onto the extramedullary guide proximal rod.

7.

Before performing the tibial proximal resection, check the position of the cutting block using the angel wing.

Setting the tibial varus/valgus
To ensure neutral tibial rotation, the centre of the tibial cutting block must be exactly opposite the medial third of the tibial tubercle. The flat anterior border of the cutting block should be parallel to the transverse mediolateral plane of the tibia.

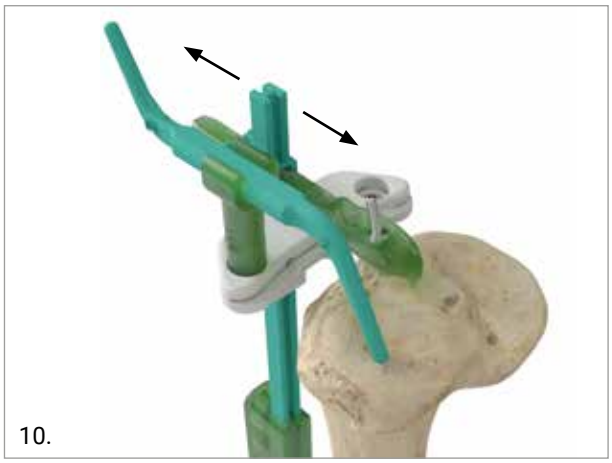
In order to make the tibia cut perpendicular to the mechanical axis, the malleolar clamp support must be on the centre of the ankle. The varus/valgus of the tibial resection can be adjusted by sliding the malleolar support on the malleolar clamp.


8.

Setting the tibial slope
It is recommended to avoid any excessive posterior slope. Whatever the surgeon's preference, it is important that no anterior slope is introduced. When the extramedullary rods are aligned with the tibial axis in the sagittal plane, the system provides a slope of 0°.
The posterior slope can be adjusted by sliding the distal rod of the extramedullary guide along the malleolar clamp support. Moving the distal rod away from the ankle will increase the posterior slope. When changing the slope, ensure that the malleolar clamp support still points to the second toe.


9.

OPTION
With the spike rod in place, the distance between cutting block and patient's tibia can be adjusted by sliding the proximal rod of the extramedullary guide onto the spike rod. Be sure that this adjustment does not alter the setting for posterior slope.

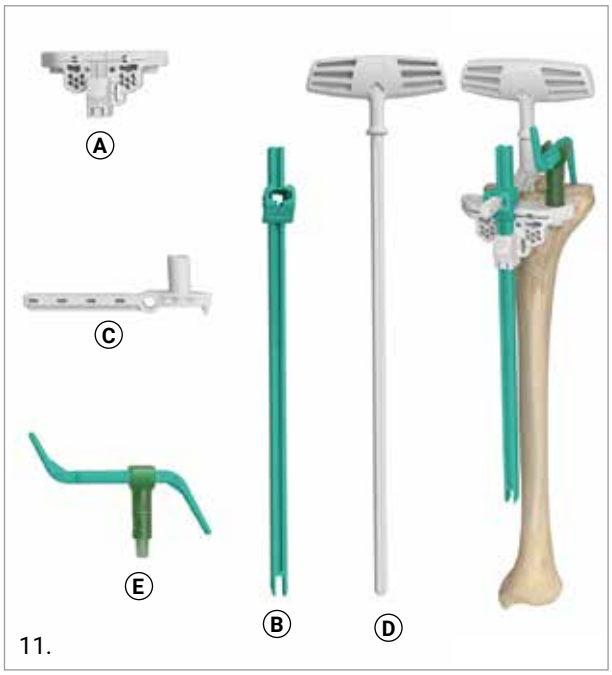

10.

2.2 INTRAMEDULLARY ALIGNMENT GUIDE

Open the intramedullary canal using the 9 mm drill. It is recommended to wiggle the drill tip to allow venting of the intramedullary canal.
Slide the distal/tibial cutting block (A) onto the extramedullary guide proximal rod (B).

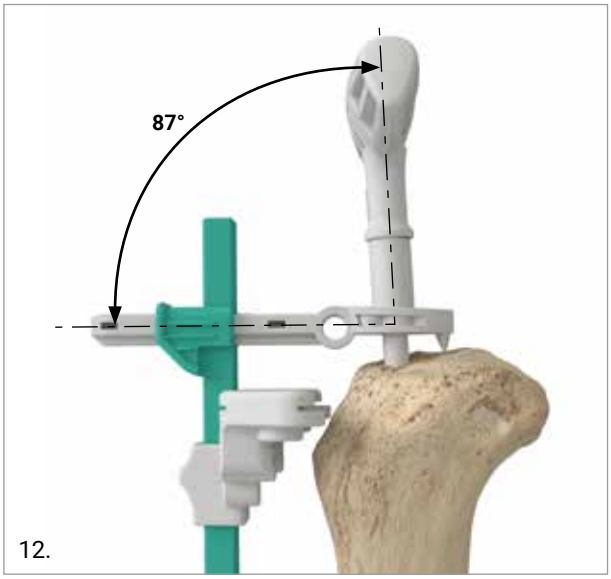
MIS: When MIS distal/tibial cutting blocks are used, make sure to use the block corresponding to the side to be operated on, as marked on the block.
Please note that the block used for the left tibia is used also for the right femur, and viceversa. The correct side for the tibia is indicated by the letter "T".

Insert the IM adapter (C) into the proximal rod. Finally insert the IM rod (D) into the IM adapter and slide the assembly into the canal.
A stylus (E) is provided to check the tibial resection level.



11.

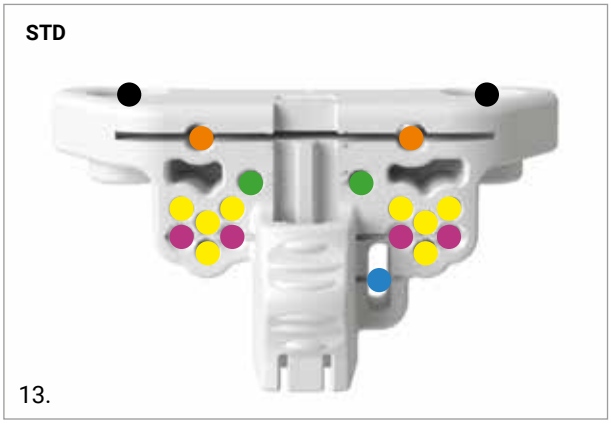
CAUTION
The IM adapter has a 3° built-in slope.



12.

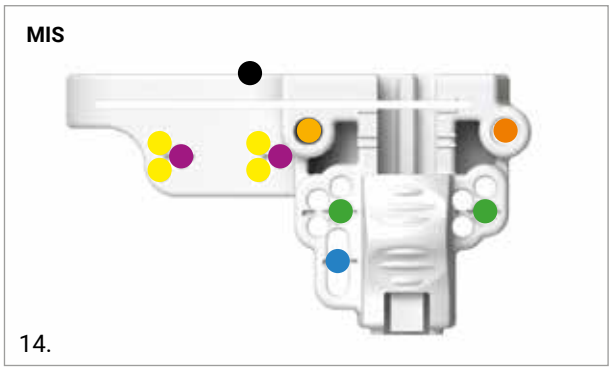
CAUTION
Using the IM reference, slope and varus/valgus cannot be adjusted. If adjustments are needed, use the specific recut guides. Be sure to position the recut guides on the same pin holes used to position the distal/tibial cutting guide.

2.3 TIBIAL CUTTING BLOCK FIXATION AND GUIDE REMOVAL



13.

Tibial cutting block holes
- Parallel positioning holes
- Additional positioning holes
- Oblique fixation holes
- Medial slot
- Telescopic alignment rod holes
- Stylus holes



14.

MIS tibial cutting block holes
- Parallel positioning holes
- Additional positioning holes
- Oblique fixation holes
- Medial slot
- Telescopic alignment rod holes
- Stylus holes

CAUTION
When the Efficiency pin adapter is used to insert/remove a threaded pin, be sure to clip the pin head in the pin adapter before starting the drill. The pin adapter works properly if a good alignment with the pin is maintained at all times during insertion/removal. For good alignment, please consider approximately an angle of <15° between the holder and pin axes.

CAUTION
The Efficiency pin extractor should be used with smooth pins. Threaded pins should be removed using the pin adapter. When using the pin extractor, be sure to grab a smooth pin at the section of full-diameter to ensure the best grip.

Extramedullary alignment guide removal
Once the distal/tibial cutting block is positioned on the tibia, insert a pin through the medial slot (holes marked with blue circle) of the cutting block to stabilize it.
Adjustments can still be made to the tibial slope after this pin has been inserted.
Remove the stylus by pulling it upwards. After pre-drilling the pin holes, insert two parallel pins in the parallel positioning holes, marked with the engraved line, on the cutting block. When using a standard tibial cutting block, choose the two most lateral holes or the two most medial holes. If required, the tibial cut can be increased at a later stage by 2 or 4 mm using the additional pin holes.
If the MIS cutting block is used, incremental adjustments of only 2 mm is possible.
To remove the extramedullary guide, open the malleolar clamp and disassemble the distal rod of the extramedullary guide from the proximal rod. Pull the proximal rod downwards and leave the cutting guide mounted on the tibia.

OPTION
In order to further stabilize the tibial cutting block during resection, the extramedullary alignment guide can be left in place.

OPTION
If the spike rod has been used, after having fixed the cutting guide with two parallel pins, open the malleolar clamp and remove (if used) the pin from the spike rod.
Continue to disassemble the distal rod from the proximal rod of the extramedullary guide. Hold the cutting guide on the bone with one hand and remove the proximal rod by pulling it upwards, leaving the cutting guide secured to the tibia.

Intramedullary alignment guide removal
Remove the stylus by pulling it upwards. After pre-drilling the pin holes, insert two parallel pins in the parallel positioning holes marked with the engraved line on the cutting block. When using a standard tibial cutting block, choose the two most lateral holes or the two most medial holes. If required, the tibial cut can be increased at a later stage by 2 or 4 mm using the additional pin holes.
If the MIS cutting block is used, incremental adjustments of only 2 mm is possible.
To remove the assembly from the bone, pull out the IM rod from the intramedullary canal, while holding the cutting guide on the tibia with one hand, pull the proximal rod and the connected adapter upwards.

2.4 TIBIAL RESECTION

To check the frontal alignment of the cutting block, it is possible to assemble the telescopic alignment rod onto the distal/tibial cutting block.


15.

Remove the telescopic rod.

Bring the tibial cutting guide into contact with the tibia by sliding it along the pins. Insert a third oblique pin into one of the oblique holes of the tibial cutting block to stabilize the guide.

CAUTION
Before performing the resection, ensure that the resection parameters have not changed while disassembling the guides.

Finally, perform the tibial proximal resection by cutting through the slot built into the guide. Remove the oblique pin, slide the tibial cutting block over the two parallel pins and remove it. The parallel pins should remain in position in case a tibial recut is required.

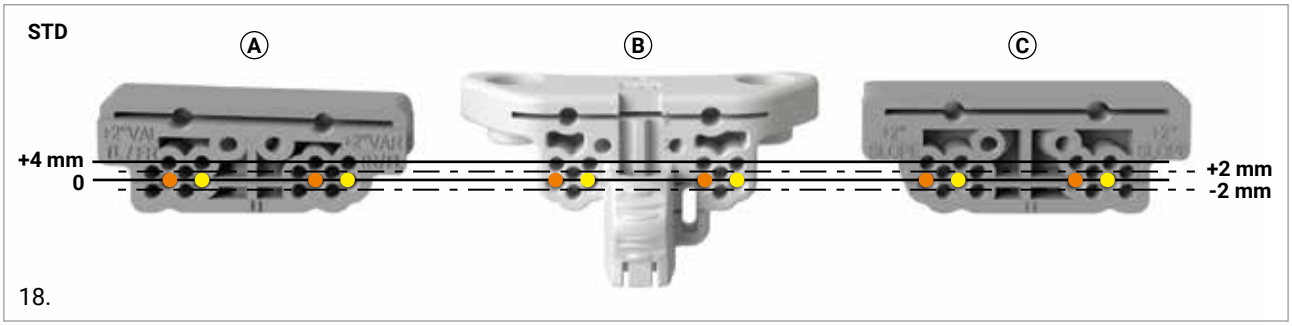

16.

CAUTION
Engage the saw blade into the cutting slot before activating the saw. Use physiological solution to cool the cutting block during resection. After resection, rinse the joint before positioning both the trial and final implant.

Should a recut be necessary, reposition the tibial cutting block on a different row of pin holes to modify the tibial resection level.

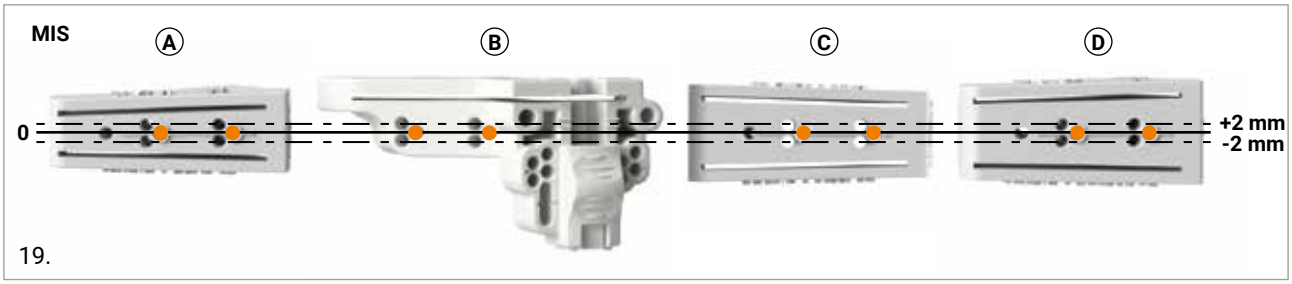
If necessary, two correction blocks are available, in order to correct the alignment (+/-2° varus/valgus) and the posterior slope (+2°) of the performed tibial resection.


17.



18.

(A) ± 2° varus/valgus tibial/distal correction cutting block
(B) tibial/distal cutting block
(C) +2° slope tibial correction cutting block



19.

MIS: If the tibial resection was performed using an MIS cutting block, use the dedicated MIS correction cutting block of the corresponding side (L or R).

(A) +2° varus tibial MIS correction cutting block
(B) tibial/distal MIS cutting block
(C) +2° valgus tibial MIS correction cutting block
(D) +2° slope tibial MIS correction cutting block

CAUTION
Ensure that the correction cutting blocks are positioned on the same row of holes used to perform the last tibial resection.

20.

In case a slight recut is needed, the 1mm recut guide is available in the GMK Efficiency General Sphere set.

(A) +1mm recut block
(B) tibial/distal cutting block

2.5 TIBIAL RESECTION CHECK

In order to verify the accuracy of the tibial resection and assess the size, lay the tibial sizer on the resected surface of the tibia. Each tibial sizer has two sides, corresponding with two tibial sizes (1-2, 3-4, 5-6).

21.

Insert the tibial spacer into the knee joint in flexion and in extension in order to check the performed tibial resection.

22.

23.

The tibial spacer has two sides, simulating a 10 mm inlay and a 12 mm inlay. If the 10 mm spacer cannot be inserted into the joint, a tibial recut may be necessary (see § 2.4).

Different inlay thicknesses (11, 13 or 14 mm) can be simulated by attaching the corresponding spacers to the 10 mm side of the femoral spacer.

Only in the case when a Flex insert is willing to be used, thicker spacers (17 and 20 mm) are available in the Efficiency extension set.

In order to verify the varus/valgus and slope of the tibial resection, the telescopic rod can be disassembled from the alignment rod and inserted into the dedicated hole of the tibial spacer.

24.

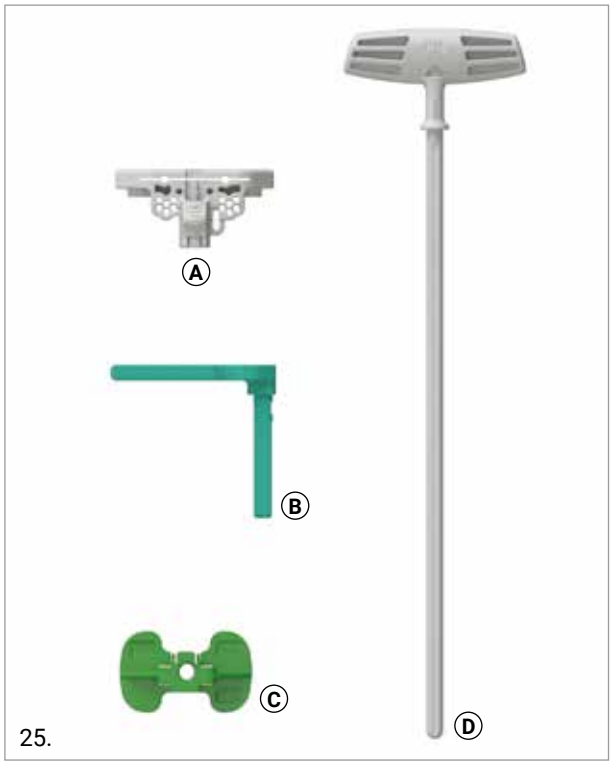
3. DISTAL FEMORAL RESECTION

3.1 DISTAL CUTTING BLOCK POSITIONING

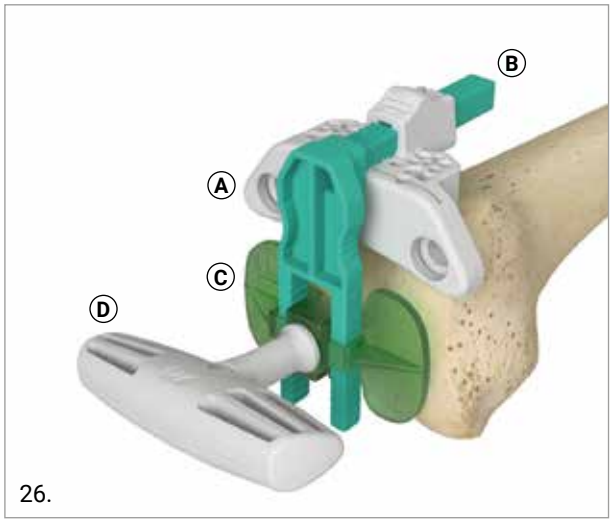
Open the intramedullary canal using the 9 mm drill. It is recommended to wiggle the drill tip to allow venting of the intramedullary canal.

Distal resection guide components:

- Distal/tibial cutting block (A)
- Distal cut positioner (B)
- 6° block for distal cut positioner (C)
- IM rod (D)

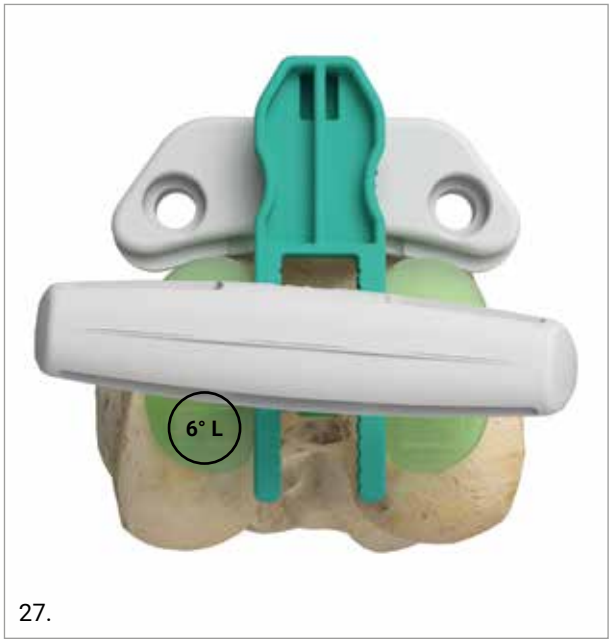


25.



26.

Assemble the 6° block for distal cut positioner (C) on the intramedullary rod (D) and insert the rod into the canal. The 6° block for the distal cut positioner has a 6° correction from the anatomical axis and therefore it must be rotated until the correct operative side can be identified on the block. The right side is indicated by "R" and the left side is indicated by "L".



27.

When the 6° block for the distal cut positioner is in place and secured in place by the IM rod, it may be in contact with only one of the distal condyles.

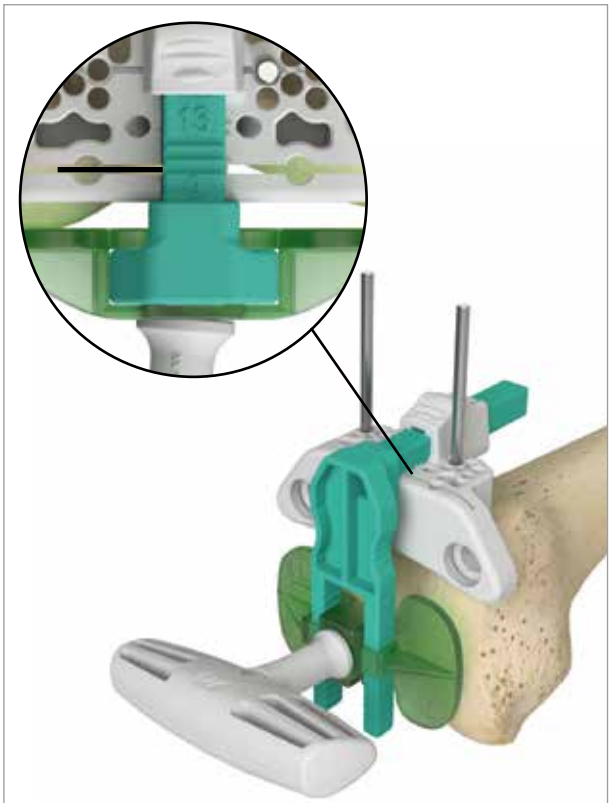
OPTION

A 5° reference block is also available in the Efficiency conventional set.

Assemble the distal/tibial cutting block (A) onto the distal cut positioner (B). Then connect the assembly to the 6° block by sliding the distal cut positioner onto the specific tracks.

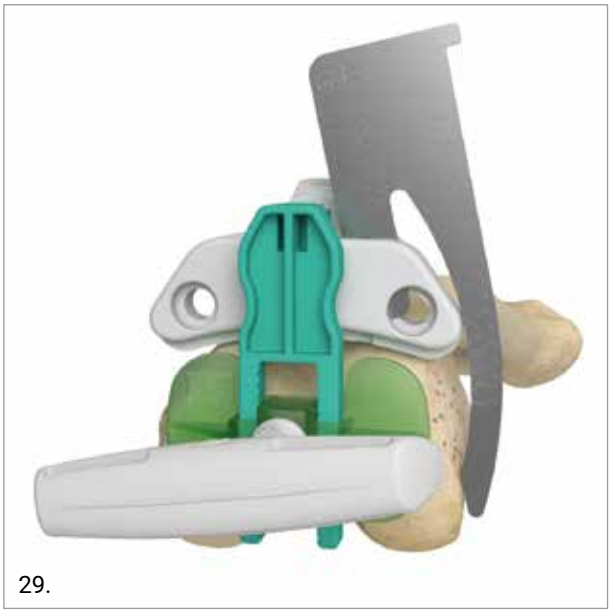
MIS: If the MIS distal/tibial cutting blocks are used, make sure to use the block that corresponds to the side to be operated, as marked on the block.
Please note that the block used for the left tibia is used also for the right femur, and viceversa. The correct side for the femur is indicated by the letter "F".

The femoral distal resection can be adjusted by sliding the distal/tibial cutting block on the distal cut positioner. The standard 9 mm resection can be set by sliding the distal cutting guide to its end position. The adjustment range is 9 to 13 mm, with 2 mm increments.
Set the desired resection level by aligning the graduation mark on the distal cut positioner with the slot of the distal cutting guide.



28.

Before performing the resection, check the distal/tibial cutting block position with the angel wing.



29.

CAUTION

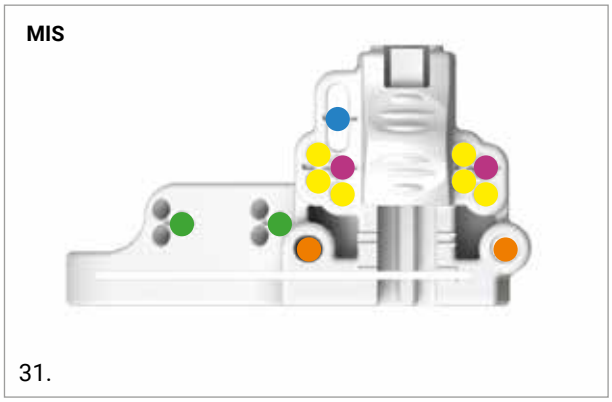
When the IM rod is inserted in the intramedullary canal, do not use the IM rod to lift the femur up during knee flexion to avoid any possible deformation of the shaft.

3.2 DISTAL CUTTING BLOCK FIXATION

30.

Distal cutting block holes

- Parallel positioning holes
- Additional positioning holes
- Oblique fixation holes
- Medial slot
- Telescopic alignment rod holes



31.

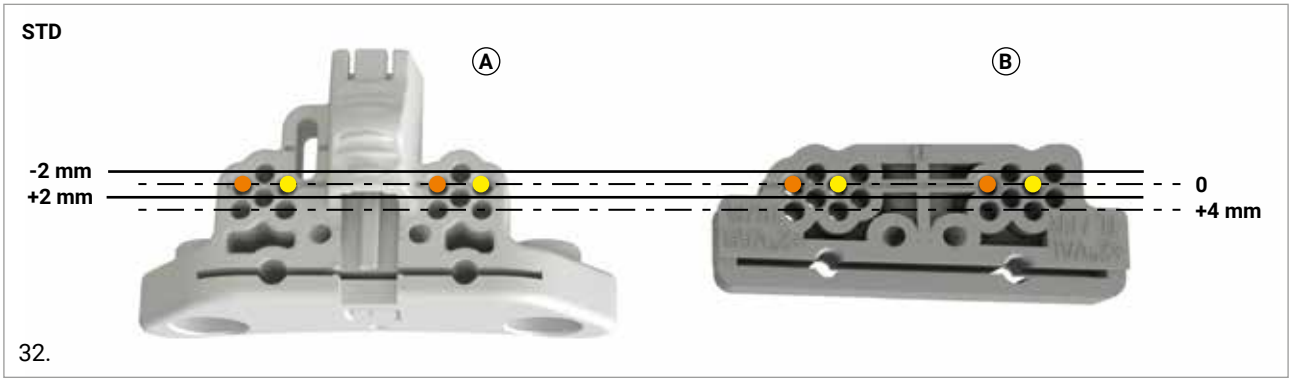
MIS distal cutting block holes

- Parallel positioning holes
- Additional positioning holes
- Oblique fixation holes
- Medial slot
- Telescopic alignment rod holes

Secure the block by introducing 2 pins in the holes corresponding to the engraved reference line (the holes marked with purple circles), then remove the distal cut positioner and the IM rod. If necessary the distal/tibial

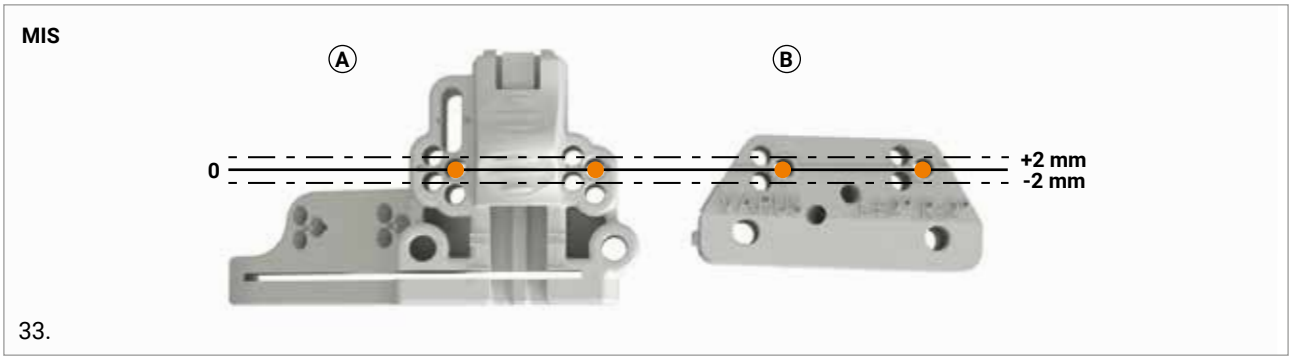
cutting block can be repositioned (the holes marked with yellow circles) to adjust the cutting height distally or proximally in 2 mm increments.

To check the frontal alignment of the distal/tibial cutting block, insert the telescopic alignment rod into the dedicated holes of the distal/tibial cutting block (the holes marked with orange circles above).



32.

(A) distal/tibial cutting block
(B) ± 2° varus/valgus distal/tibial correction cutting block



33.

(A) distal/tibial MIS cutting block
(B) ± 2° varus/valgus MIS distal correction cutting block

34.

In case a slight recut is needed, the 1mm recut guide is available in the GMK Efficiency General Sphere set.

(A)+1mm recut block
(B) tibial/distal cutting block

When satisfied with the position of the distal/tibial cutting block, it is recommended to add an additional pin in the medial or in the lateral oblique fixation hole.

CAUTION
When the Efficiency pin adapter is used to insert/remove a threaded pin, be sure to clip the pin head in the pin adapter before starting the drill. The pin adapter works properly if a good alignment with the pin is maintained at all times during insertion/removal. For good alignment, please consider approximately an angle of <15° between the holder and pin axes.

CAUTION
The Efficiency pin extractor should be used with smooth pins. Threaded pins should be removed using the pin adapter. When using the pin extractor, be sure to grab a smooth pin at the section of full-diameter to ensure the best grip.

3.3 DISTAL RESECTION

Perform the distal resection using the distal resection slot.

CAUTION
Engage the saw blade into the cutting slot before activating the saw. Use physiological solution to cool the distal/tibial cutting block during resection. After resection, rinse the joint before positioning both the trial and final implant.

Once the resection has been performed, remove the oblique pin and the distal/tibial cutting block by sliding it off the parallel pins. It is advisable to leave the parallel pins in place should a recut be necessary.

An additional cutting block allows the correction of the valgus of the distal resection (+/- 2° varus/valgus). Ensure that the correction cutting block is positioned on the same row of holes used to perform the distal cut.

MIS: If the distal resection was performed using a MIS cutting block, the dedicated MIS distal correction block must be used should a recut be necessary.

4. EXTENSION GAP CONTROL

To check the extension gap, the gap spacer has to be used by inserting the side where "EXT" is engraved between femur and tibia. The "EXT" side of the gap spacer simulates the final implant thickness (femur + tibia) with a 10 mm inlay in extension.

In order to verify the alignment, the telescopic rod can be disassembled from the alignment rod and inserted into the dedicated hole of the femoral spacer.


35.

Different inlay thicknesses (11, 12, 13 or 14 mm) can be simulated by attaching the corresponding shim to the gap spacer.
Only in the case when a Flex insert is willing to be used, thicker spacers (17 and 20 mm) are available in the Efficiency extension set.


36.

If the introduction of the reference spacer into the joint is impossible, the tibial resection can be increased by 2 or 4 mm. Reposition the tibial cutting block distally through the row of holes will allow a 2 mm recut or a 4 mm recut. If tests indicate incomplete extension, despite a posterior release, an additional 2 mm resection of the distal femur could be performed. In these cases, reposition the distal cutting block on the two pins left in place through the row of pin holes which allows 2 mm recuts.

5. ANTERIOR CUT, POSTERIOR CUT AND CHAMFERS

Once the distal end of the femur has been cut, the size and orientation of the femoral component will be determined by the position of the anterior, posterior condylar and chamfer cuts. The anterior femoral cut is limited in antero-posterior placement by the need to avoid notching the anterior cortex and creating too large a gap between flange and anterior cortex. The anterior cortex is most prominent laterally, so by increasing the external rotation this will progressively increase the minimum AP internal dimension required to avoid notching. Therefore it may happen that, for instance, increasing external rotation may require a size 4 where a size 3 had initially been measured. The goal is to obtain a flush fit between the anterior flange of the component and the anterior cortex on the lateral side without notching the femur.

The medial posterior condylar cut should allow the prosthetic condylar surface to be at roughly the same level as in the non-arthritic knee. In the GMK Sphere the internal anteroposterior dimension varies by 2 mm as the size increases or decreases.

If no external rotation of the femoral component is planned, the same amount of bone will be resected from both posterior condyles. If external rotation is desired, it can be set using this surgical technique.

It should be remembered that in the normal knee there is laxity in the lateral compartment after approximately 20 degrees flexion, which allows the medial pivot action seen in normal knees. Externally rotating the femoral component, while possibly helping with patellar tracking, makes the lateral posterior condyle more prominent than normal and may impede the medial pivot tracking motion seen in the normal knee. A reasonable compromise between these two conflicting requirements is to place the component at about 3 degrees of external rotation. The surgeon has discretion in this matter.

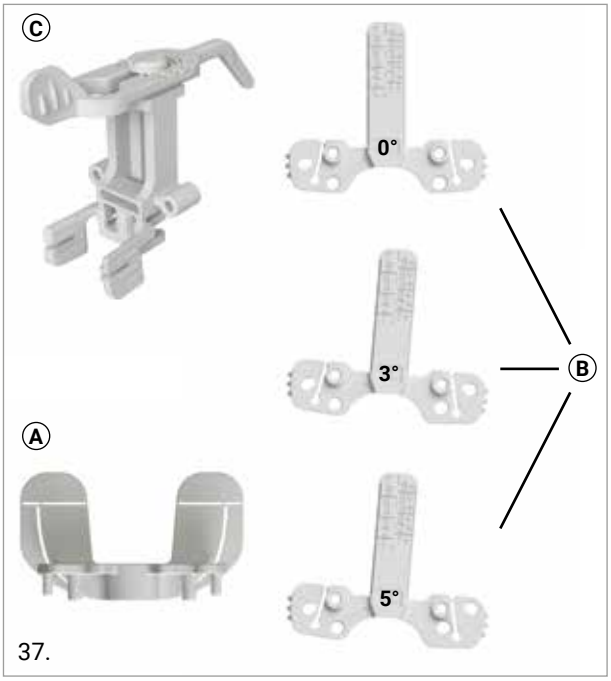
The next step is to place the pins through the appropriate holes in the sizer, perpendicular to the cut surface of the distal condyles. After the pins have been placed, the sizer can be removed and the 4in1 cutting block can be placed over the pins. The surgeon must determine if the position of the 4in1 block appropriately positions the next cuts. The guide can be displaced anteriorly or posteriorly by 2 mm using the different sets of holes in the guide.

Use the 4in1 femoral cutting block to perform the anterior, posterior and chamfer femoral resections.

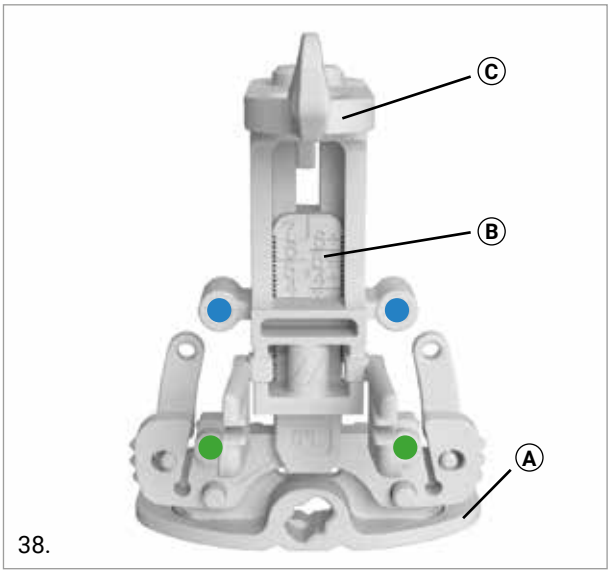
5.1 FEMORAL SIZING

Femoral sizer components:

- Condyle support (A)
- Posterior reference guides (B)
- Anterior mobile body and stylus (C)



37.



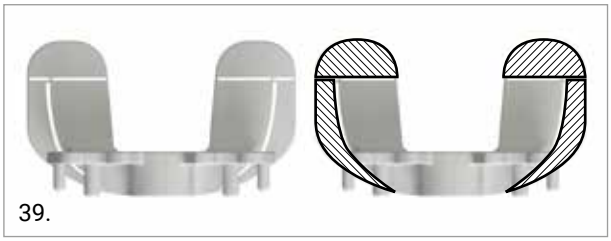
38.

Femoral sizer referencing holes:

- Anterior referencing holes
- Posterior referencing holes

The posterior reference guide can be adapted to different femoral sizes and surgical techniques by removing some or all of the detachable parts with a clamp or the back part of the pin-extractor handle.

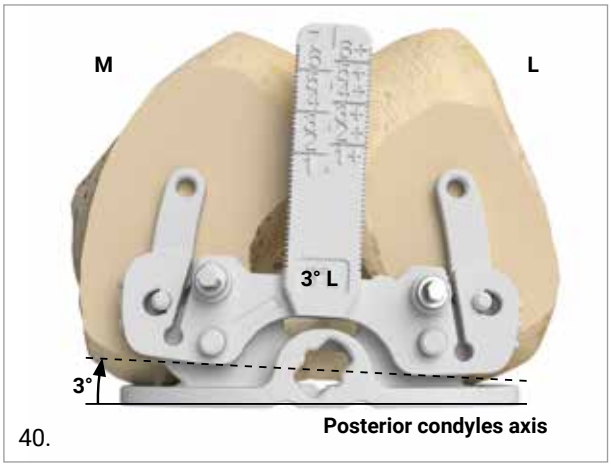
CAUTION
After use, ensure that all detachable parts left in place are still attached to the main body of the posterior reference guide.



39.

Assemble the posterior reference guide (B) on the condyle support (A). Three different guides are provided, corresponding to an external rotation of 0°, 3° and 5° from the posterior condyles axis respectively.

Position the chosen posterior reference guide according to the side to be operated, as indicated on the block by “R” or “L”. The side with the letter corresponding to the side to be operated must be positioned facing outwards.

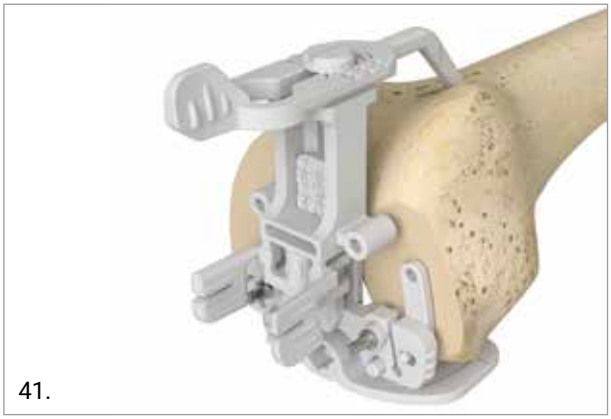


40.

The posterior reference guide must be positioned in contact with the distal cut surface. The condyle support should be in contact with both posterior condyles.

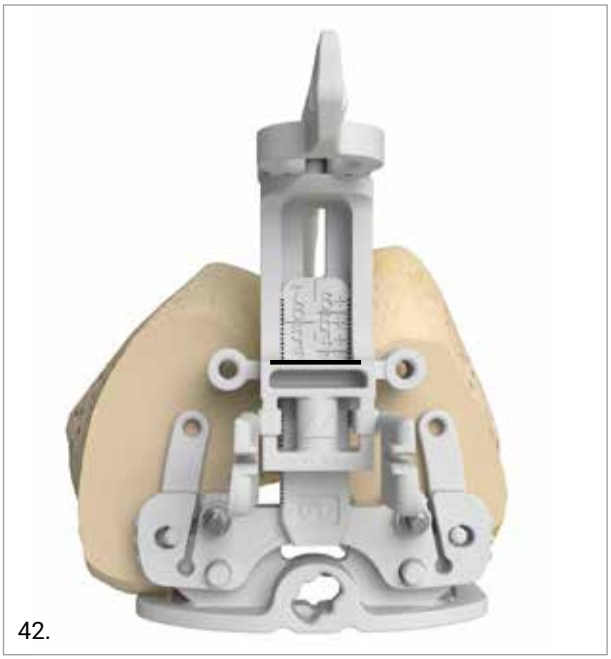
To increase the stability of the femoral sizer, insert two pins into the posterior referencing holes (the holes marked with green circles).

Assemble the anterior reference mobile body and the stylus (C). Then, assemble them to the posterior reference guide.



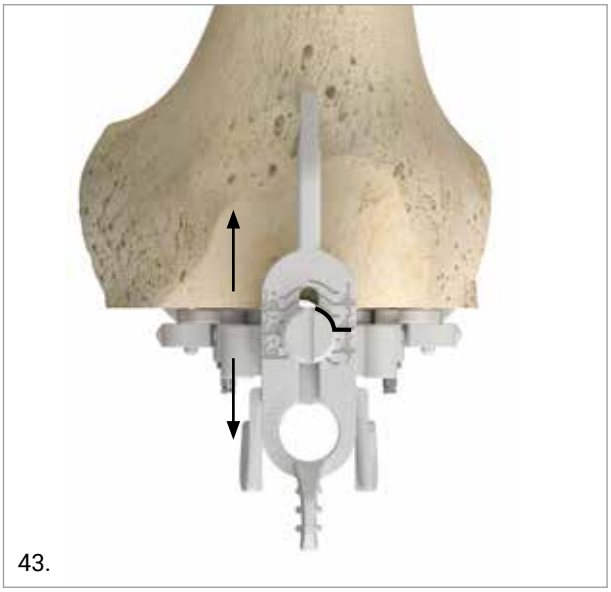
41.

Close the sizer until the stylus touches the anterior cortex. The correct femur size can be read on the posterior reference guide, through the mobile part of the sizer (as showed below).



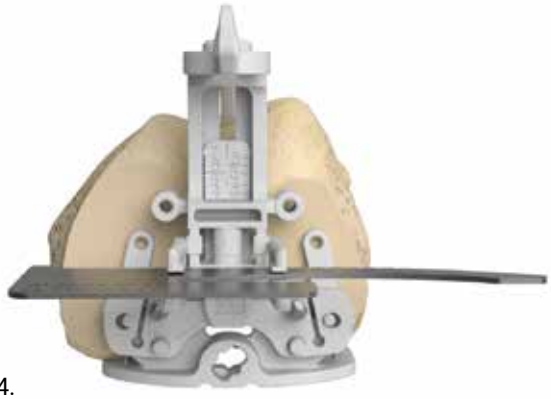
42.

The femur size can be double checked by adjusting the position of the stylus. Slide the stylus onto the head of the anterior reference body until its circular profile matches the circular line engraved on the stylus, corresponding to the femur size displayed on the sizer.



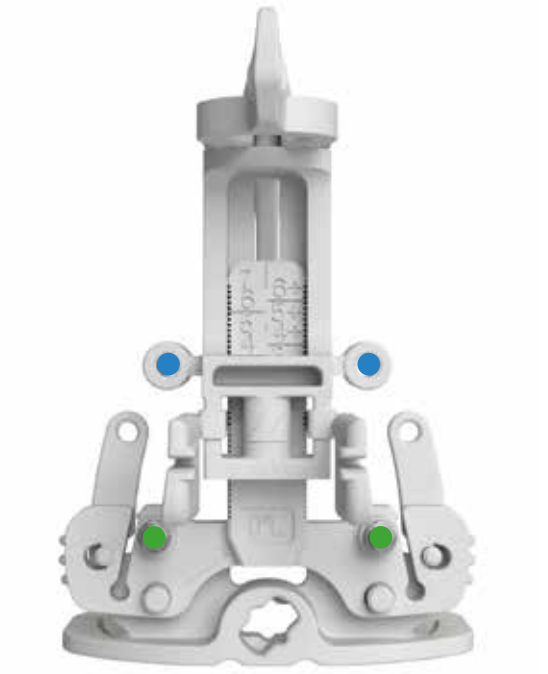
43.

The external rotation, with respect to the epicondylar axis, can be checked by inserting the angel wing into the slot on the wings of the anterior mobile body.



44.

Once the size of the femur has been chosen, prepare the holes for the 4in1 cutting block fixation using the dedicated drills. Two alternative options are available: anterior referencing holes and posterior referencing holes.



45.

- Anterior referencing holes
- Posterior referencing holes

CAUTION

While drilling, ensure continuous contact between the femoral sizer and the distal resection.

Remove the femoral sizer. This can be done by using the end of the trial base handle.

CAUTION

After removal of the femoral sizer, ensure that all detachable parts of the posterior reference guide left in place are still attached to the main body.

46.

5.2 4IN1 CUTTING BLOCK POSITIONING - ANTERIOR REFERENCE

Open the GMK Efficiency femur set of the chosen femoral size and then take out the 4in1 cutting block. Insert the pins into the anterior reference parallel holes of the 4in1 cutting block of the chosen size. Make sure to use the holes that correspond to the zero reference line (the holes marked with blue circles).

Hold the assembly while positioning the pins in the previously drilled holes. Slide the 4in1 cutting block onto the pins until it is completely flush with the distal resection plane.

47.

To correct the position of the 4in1 cutting block, move the block onto a different row of parallel pins. To move the 4in1 cutting block 2 mm anteriorly, position the cutting block on the row of pin holes marked “UP”. To move the cutting block 2 mm posteriorly, position the 4in1 cutting block on the row of pin holes row marked “DOWN”.

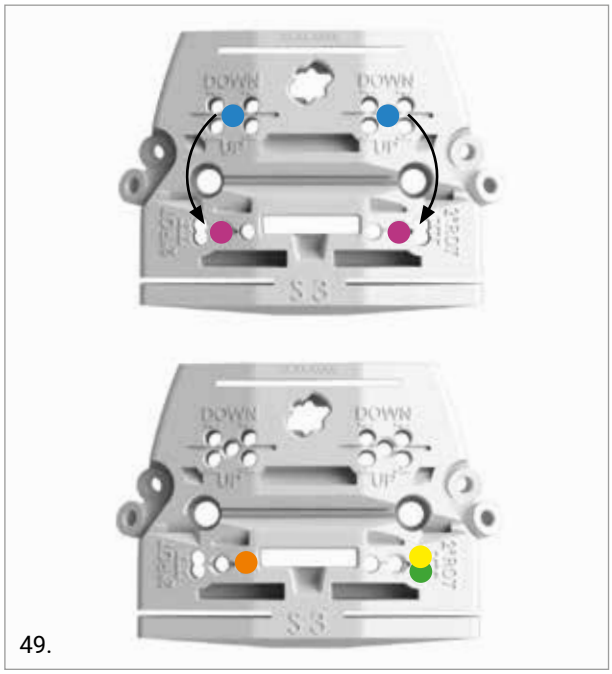
Once the 4in1 cutting block has been properly positioned on the femur, visually check the cut height with the angel wing before cutting.

Check the correct femoral external rotation of the 4in1 cutting block inserting the rotation guide (horse-shoe) in the dedicated hole (green in figure above). The rotation guide simulates the thickness of the final implant (tibia + inlay + femur). It has two sides, simulating a 10 mm inlay and a 12 mm inlay.

Different inlay thicknesses (11, 13 or 14 mm) can be simulated by attaching the corresponding spacers to the 10 mm side of the rotation guide. Only in the case when a Flex insert is willing to be used, thicker spacers (17 and 20 mm) are available in the Efficiency extension set.

48.

External rotation modification - Anterior reference
To correct femoral external rotation, drill the posterior referencing holes and insert two pins (the holes marked with purple circles in the figure below). Then, remove the anterior referencing pins and reposition the 4in1 cutting block on the medial pin hole and on one of the two lateral rotation pins.



49.

M Medial pin hole
M–L +2 external rotation
M–L -2 external rotation

5.3 4IN1 CUTTING BLOCK POSITIONING - POSTERIOR REFERENCE

Insert the pins into the posterior referencing parallel holes of the 4in1 cutting block of the chosen size (the holes marked with purple circles).

Hold the assembly while positioning the pins in the previously drilled holes. Slide the 4in1 cutting block onto the pins until it is completely in contact with the distal resection.

50.

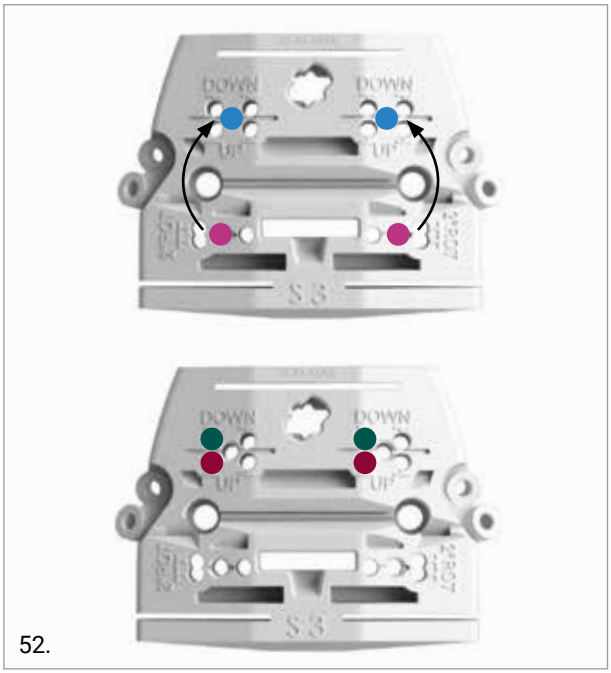
To correct femoral rotation, reposition the 4in1 cutting block on the medial pin hole and on one of the two lateral rotation pins.

51.

M Medial pin hole
M–L +2 external rotation
M–L -2 external rotation

Once the 4in1 cutting block has been properly positioned on the femur, visually check the cut height using the standard angel wing before cutting.

4in1 cutting block position modification - Posterior reference
To correct femoral position, drill the anterior referencing holes and insert two pins. Then, remove the posterior referencing pins and reposition the 4in1 cutting block onto a different row of parallel pins. To move the 4in1 cutting block 2 mm anteriorly, position the cutting block on the row of pin holes marked “UP”. To move the cutting block 2 mm posteriorly, position the 4in1 cutting block on the row of pin holes marked “DOWN”.



52.

- +2 mm anteriorly
- +2 mm posteriorly

5.4 4IN1 FEMORAL RESECTIONS

Once the 4in1 cutting block position has been properly adjusted, stabilize the block using the options indicated below.

53.

- Oblique fixation holes
- Cancellous bone screw holes

When the 4in1 cutting block has been stabilized, perform the femoral resections:

1. Anterior femoral resection
2. Posterior femoral resection
3. Posterior chamfer
4. Anterior chamfer

CAUTION

Engage the saw blade into the cutting slot before activating the saw. Use physiological solution to cool the cutting block during resection. After resection, rinse the joint before positioning both trial and final implant.

Remove the screws and/or the oblique pins.
The removal of the 4in1 cutting block can be performed using the end of the trial base handle.

54.

5.5 FEMORAL UPSIZING/DOWNSIZING

The difference between two consecutive femoral sizes is 2 mm in both antero-posterior and mediolateral planes.

Anterior Referencing: Upsizing/Downsizing
Replace the 4in1 cutting block with one of a more suitable size using the same row of holes.
In case of downsizing, the posterior resection level is moving 2 mm anteriorly. If necessary, the guide can be moved onto the other rows of holes (2 mm modifications).

Posterior Referencing: Upsizing/Downsizing
Replace the 4in1 cutting block with one of a more suitable size using the same row of holes.

CAUTION

When downsizing, the anterior resection level is moving 2 mm posteriorly. Make sure that there is no anterior notching and, if necessary, move the guide on to the lower pin holes.

Anterior Referencing: Downsizing after the femoral resections
If it is necessary to downsize the femoral component after having performed the femoral resections, insert a saw blade in the slot of the anterior resection, apply the 4in1 cutting block on the distal cut, ensuring that the saw blade is perfectly flush with the anterior resected surface, and insert two pins in the row of holes belonging to the anterior holes group and marked with a line.

Replace the cutting guide with one of a more suitable size. Fix the cutting block following the procedure described at § 5.2 (4in1 cutting block positioning - Anterior reference).

Posterior Referencing: Downsizing after the femoral resections

If it is necessary to downsize the femoral component after having performed the femoral resections, insert a saw blade into the slot of the anterior resection, apply the 4in1 cutting block on the distal cut, ensure that the saw blade is perfectly in contact with the anterior resected surface, and insert two pins in the row of holes belonging to the posterior holes group and marked with a line.

Replace the cutting guide with one of the inferior size. Fix the cutting block following the procedure described at § 5.3 (4in1 cutting block positioning - Posterior reference). Perform the femoral resections.

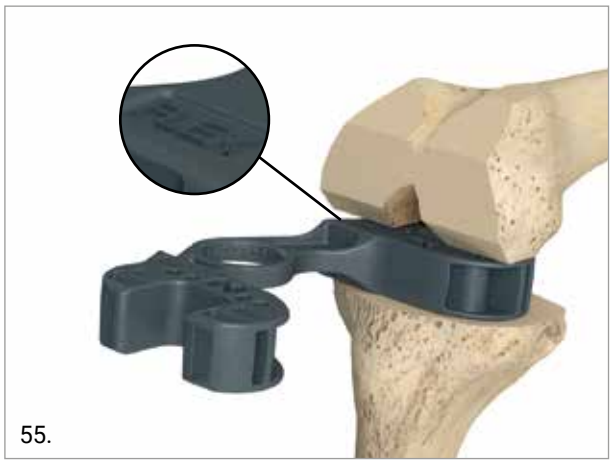
CAUTION

The anterior resection level is moving 2 mm posteriorly. Make sure that there is no anterior notching.

5.6 FLEXION/EXTENSION GAP FINAL CHECK

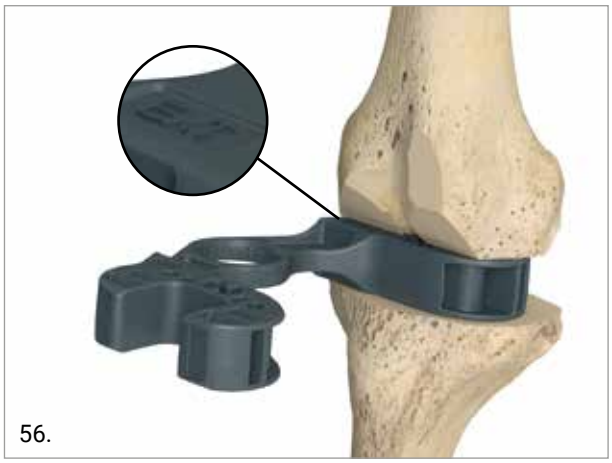
The gap spacer has two sides, simulating a final implant thickness (femur + tibia) with a 10 mm inlay respectively in flexion and extension. On the spacer side that must be used to check the flexion gap, "FLEX" is engraved.

If the gap spacer cannot be inserted into the joint, a tibial recut may be necessary. In case of laxity, different inlay thicknesses (11, 12, 13 or 14 mm) can be simulated by attaching the corresponding shim to the gap spacer. Only in the case when a Flex insert is willing to be used, thicker spacers (17 and 20 mm) are available in the GMK Efficiency extension set.



55.

To finally check the extension gap, the gap spacer can be used by inserting the side where "EXT" is engraved between femur and tibia. The "EXT" side of the gap spacer simulates the final implant thickness (femur + tibia) with a 10 mm inlay in extension. If the gap spacer cannot be inserted into the joint, a tibial recut may be necessary. Different inlay thicknesses (11, 12, 13 or 14 mm) can be simulated by attaching the corresponding shim to the gap spacer. Only in the case when a Flex insert is willing to be used, thicker spacers (17 and 20 mm) are available in the GMK Efficiency extension set.



56.

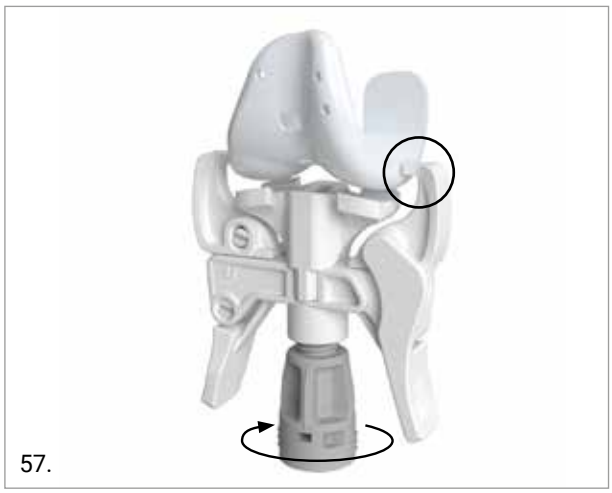
CAUTION

If the 11, 12, 13, 14, 17 or 20 mm shim has been used during the flexion gap check, the same shim has to be attached to the gap spacer on the "EXT" side for the extension gap check.

6. TRIALING

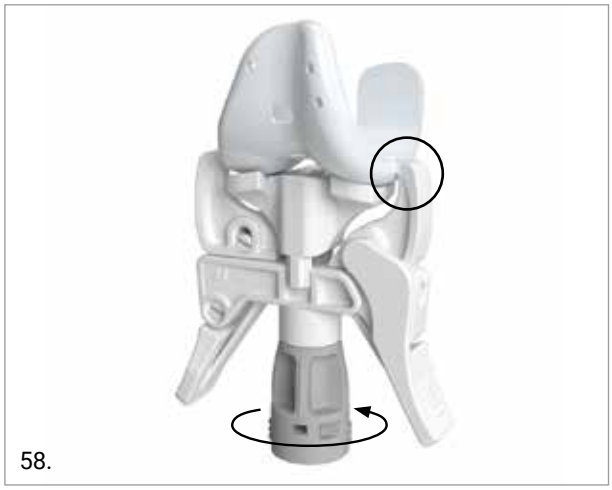
Assemble the femoral clamp with the multifunctional handle. Take out from the GMK Efficiency femur set the correct side trial femoral component.

Mount the trial femoral component onto the femoral clamp by unscrewing the mobile part of the clamp and securing the trial femur between the claws of the clamp.



57.

Tighten the clamp to further secure the trial femur by screwing the clamp mobile part.



58.

Position the trial femoral component on the resected femur, centring it medio-laterally.

CAUTION

DO NOT USE the femoral clamp to impact the femoral component onto the femur.

59.

Once the trial femoral component has been positioned, disassemble the femoral clamp from the multifunctional handle.

Assemble the femoral impactor to the mutifunctional handle and impact the trial femoral component.

60.

Fix the trial femoral component with one or more pins using the anterior holes. Drill the holes for the femoral pegs using the femoral drill bit, assembled with the dedicated reduction and power equipment.

61.

Open the GMK Efficiency tibial set of the selected tibial size.

CAUTION

When using a size 3 or 4 tibia, open the insert tray “i3 - t3/4” if the femoral size ranges from 1 to 3+, and the insert tray “i4 - t3/4” if the femoral size ranges from 4 to 7.

Assemble the trial tibial baseplate, of the appropriate size, with the trial base handle. Clip the trial insert, of appropriate thickness, onto the trial baseplate. Reduce the patella and test the knee throughout its range of motion.

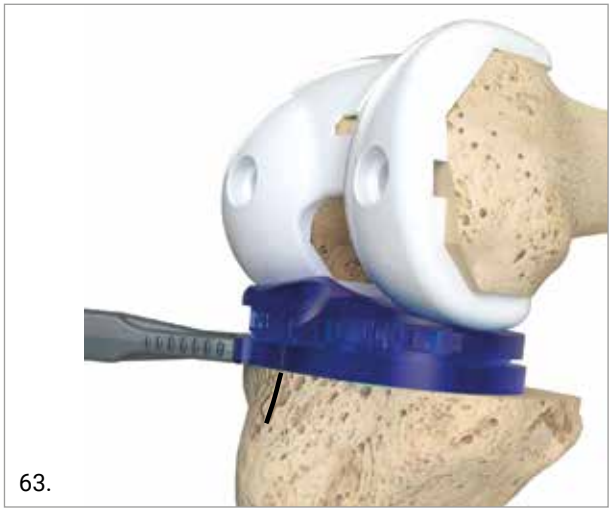
NOTE: The trial base handle has an offset to allow trialing with the patella left in place.

62.

OPTION

In the Efficiency tibia set there are 10 mm, 11 mm, 12 mm, 13 mm and 14 mm trial inserts. Should a thicker insert be needed, 17 mm and 20 mm spacers included in the Efficiency extension set can be clipped between the trial baseplate and the 10 mm trial insert.

In order to adjust the rotation of the tibial baseplate, mark the position of the trial baseplate on the bone.



63.

7. FEMORAL FINISHING

CAUTION
In the case that a GMK SpheriKA femoral implant is to be implanted, the femoral box preparation is not to be performed.

Assemble the femoral clamp with the multifunctional handle and remove the trial femur. Then, position the femoral box cutting guide on the peg holes. Fix the guide with two pins.

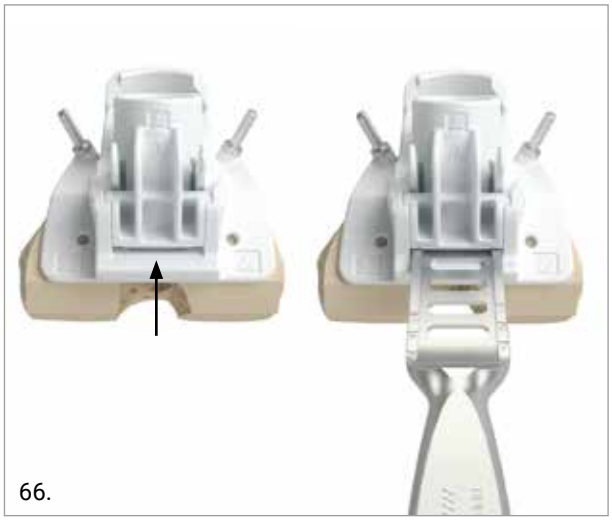
Perform the femoral box resection using the trochlea reamer.

64.

CAUTION
In order to accurately prepare the femoral box, it is advisable to ream from the anterior part of the femur to the posterior part.

65.

OPTION
The femoral box preparation can be carried out also using the osteotome (Ref. 02.07.10.1017). Assemble the PS reamer guide with the femoral finishing guide. Next, the osteotome can be inserted in the dedicated slot of this assembly in order to create the femoral box.



66.

Remove the femoral box cutting guide and check the performed femoral box cut by superimposing the box cut verifier on the trochlea.

The femoral box cut is correct if the medial and lateral flanges of the box cut verifier are flush with the femoral bone. If a correction is needed, refine the cut using the manual rasp.

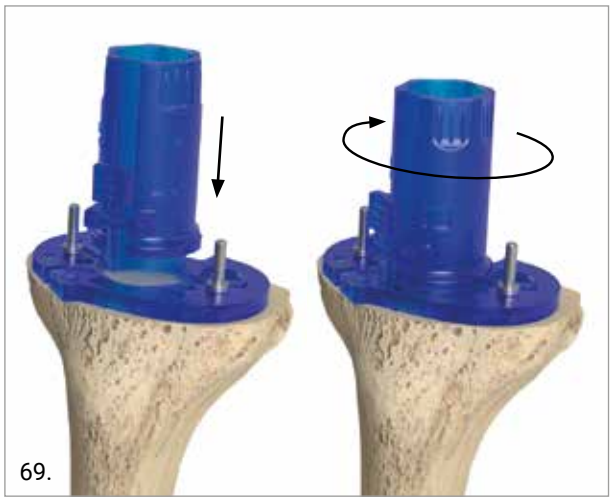
67.

8. TIBIAL FINISHING

Position the trial baseplate onto the resected tibia, aligning it to the markings made on the bone during the trialing phase. Check the bone coverage and secure the baseplate with two sword pins.

68.

Assemble the reamer guide to the trial tibial baseplate and rotate it clockwise to lock it into place.



69.

Insert the dedicated reamer into the guide and prepare the keel hole parallel to the axis of the bone until the depth gauge stopper is reached. To excise the bone, ream clockwise.

70.

Once the keel hole has been performed, push the locking lever, turn the reamer guide counterclockwise and remove it.

CAUTION

In order to avoid damaging the tibia during impaction of the keel, prepare the slots for the keel fins using an oscillating saw.

Assemble the trial keel onto the multifunctional handle and impact it through the dedicated hole of the trial baseplate, finishing the keel preparation.

9. EXTENSION STEM

For additional tibial baseplate stability (if required), an extension stem can be added to the tibial keel.

CAUTION
In order to avoid the risk of cortical infraction, carefully plan preoperatively the positioning of the stem with the help of the X-ray template.

Remove the trial keel from the bone and re-position the reamer guide.

Open the intramedullary canal using the 9 mm drill bit then insert the 11 mm metal bush into the reamer guide.


71.

Ream the canal until the 30 mm mark on the 11 mm reamer is aligned with the top of the reduction bush.

72.

OPTION
For 65 mm stem option, ream until the 65 mm mark on the reamer. The trial extension stem 65 mm long is available only in the conventional metal version (§ 14).

Remove the 11 mm bush and insert the 15.5 mm bush into the reamer guide. Finish the extension stem hole preparation using the 15.5 mm reamer.


73.

Remove the reamer guide and open the dedicated GMK Efficiency extension set. Assemble the trial extension stem (30 mm long) onto the trial keel. Assemble the trial keel+trial extension stem to the multifunctional handle and impact it into the prepared hole.

10. PATELLA RESURFACING

Open the GMK Efficiency patella set and take out the patella clamp (A) and the resection jaws (B).

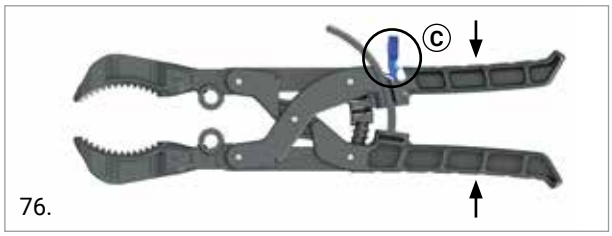
74.

Attach the two resection jaws to the patella clamp. Check that the resection jaws are correctly attached: the markings on the patella clamps and jaws should be aligned.

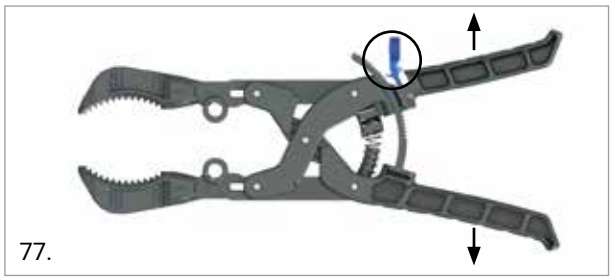

75.

The patella clamp has a locking mechanism that holds the position once the clamp has been closed.
To reset the clamp to the fully-open position, push the locking lever (C) in the "unlocking position" and release the two arms.

CAUTION
Before pushing the release-lever gently compress the clamp handles, then gently push the lever and release the handles to open the clamp.



76.


77.

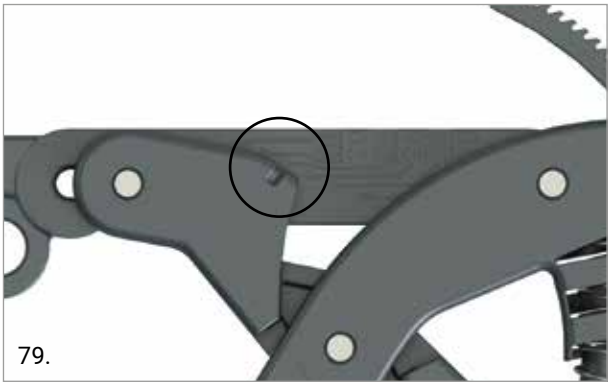
10.1 PATELLA THICKNESS MEASURING

The patella clamp assembled with the resection jaws can be used as a caliper to measure the thickness of the patella. Close the patella clamp until the two tips of the resection jaws touch the most protruding points of the patella.

CAUTION
Do not force the patella clamp during this phase as an excessive tightening could lead to incorrect measurement.


78.

The thickness is displayed on the scale engraved on the body of patella clamp (24 mm in the example below).

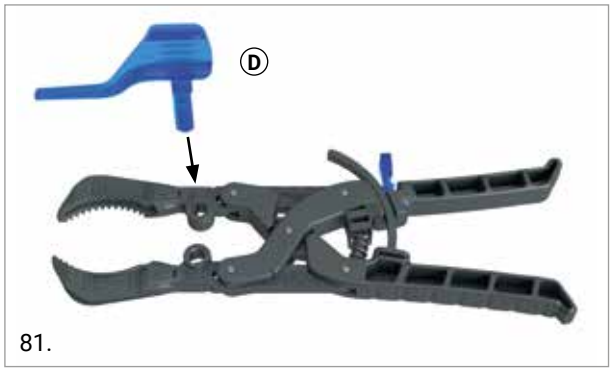

79.

The scale is shown in 2 mm increments, alternated on the two arms of the clamp.


80.

10.2 PATELLA CLAMP POSITIONING

The patella stylus (D) should be positioned in the dedicated slot of the patella clamp, making sure that the "UP" mark is facing upwards.

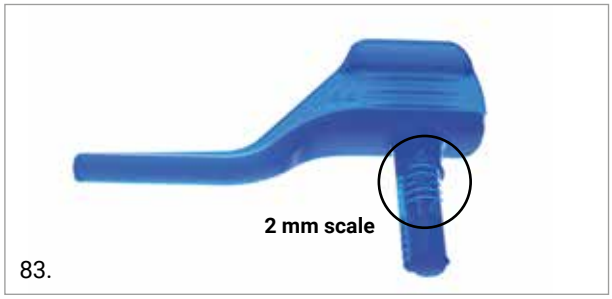


81.

Only one orientation allows the insertion of the stylus.


82.

A scale is engraved on the stylus, indicating the thickness of the bone to be resected. Set the resection level referring to this scale.



83.

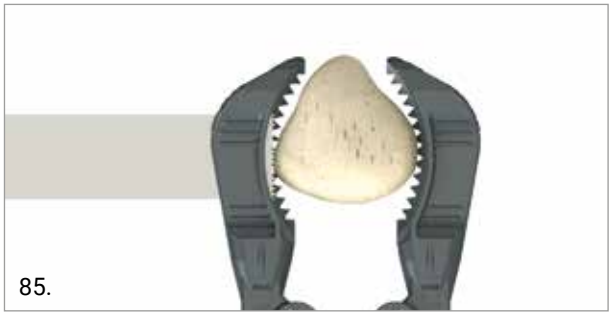
CAUTION
Make sure that at least 13 mm of bone remains after resection.

Lock the stylus by turning it towards the centre of the patella clamp.
Unlock and open the patella clamp, position the stylus in contact with the highest point of the patella dome and close the jaws to firmly lock the patella rim.


84.

Remove the stylus by turning it into the removal position, then perform the patella resection with an oscillating saw.

CAUTION
Engage the saw blade into the cutting slot before activating the saw. Use physiological solution to cool the patella cutting guide during resection. After resection, rinse the patella before positioning both the trial and final implant.


85.

Once the cut has been made, unlock the clamp and remove it from the bone.

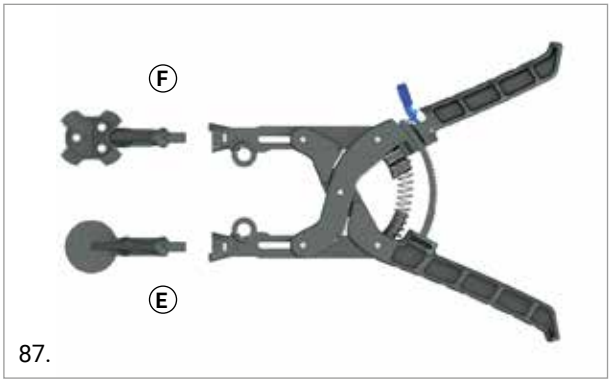
10.3 PEGS PREPARATION AND SIZING

The patella can be sized using the patellar sizers. There are two sizers in the patella set, each one simulating two consecutive sizes (S 1 & 2, S 3 & 4).


86.

Once the size has been selected, assemble the peg holes drilling guide (E) and the base insert (F) to the patella clamp.

CAUTION
The patella sizers and the base insert have spikes, HANDLE WITH CARE.



87.

Grab the patella making sure that the MED and LAT marking of the drilling guide are positioned respectively on the medial and lateral sides of patella (the 2 peg holes must be on the medial side of the patella).

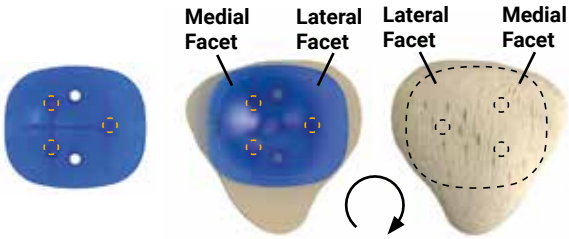

88.

The drilling guide has 4 contours in each corner, corresponding to the profiles of the 4 sizes of the patella implant.

Be sure that the selected countour match the patella profile on each one of the four angles.


89.

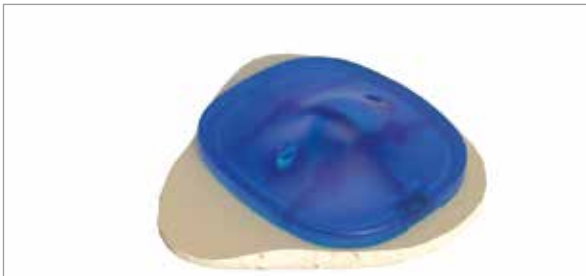
Drill the 3 peg holes using the specific drill bit.



90.

10.4 TRIALING

Unlock the clamp and remove it from the patella. Place the trial patella, of the chosen size, on the bone, centring it on the 3 holes.


91.

Assemble the cement cup (G) and the base insert on the patella clamp and pressurise the trial implant on the bone.

92.

Reduce the patella and test the knee throughout its range of motion.
When satisfied, remove the trial patella from the bone.

NOTE: After completing preparation of the femur, tibia and patella, it is advisable to perform trialing of the trial implant again, to verify the positioning of the implants. The trial base handle can be assembled to the trial insert, in order to simplify its insertion into the knee joint. The trial base handle is offset to allow trialing with the patella in place, without removing it.

11. SELECTION OF THE PROSTHETIC COMPONENTS - SIZE MATCHING

GMK Fixed Tibial Trays can be matched with GMK Sphere Flex/CR Tibial Inserts and GMK Sphere Femoral Components according to Table 1.

Tibia bone size	GMK Fixed Tibial Trays	GMK Sphere Femoral Components						
		Sizes 1/ 1+	Sizes 2/2+	Sizes 3/3+	Sizes 4/4+	Sizes 5/5+	Sizes 6/6+	Size 7
1	Size 1	Insert* size 1	Insert* size 1	Insert* size 1				
2	Size 2	Insert* size 2	Insert* size 2	Insert* size 2				
3	Size 3	Insert* size 3	Insert* size 3	Insert* size 3				
	Size t3-i4**				Insert* size 4	Insert* size 4	Insert* size 4	Insert* size 4
4	Size t4-i3***	Insert* size 3	Insert* size 3	Insert* size 3				
	Size 4				Insert* size 4	Insert* size 4	Insert* size 4	Insert* size 4
5	Size 5				Insert* size 5	Insert* size 5	Insert* size 5	Insert* size 5
6	Size 6				Insert* size 6	Insert* size 6	Insert* size 6	Insert* size 6

Table 1

All GMK Fixed Tibial Trays can be implanted with or without the extension stem. All GMK Resurfacing patellae can be implanted with all the sizes of GMK Sphere Femoral Components.

CAUTION
The tibial extension stem must not be coupled with TiNbN coated fixed tibial baseplates.

* GMK Sphere Flex/CR Tibial Insert

** Tibial Trays t3-i4 have the same coverage in AP and ML of a Tibial Tray Size 3 and must be used with a Tibial Insert size 4.

*** Tibial Trays t4-i3 have the same coverage in AP and ML of a Tibial Tray Size 4 and must be used with a Tibial Insert size 3.

12. FINAL IMPLANTS

Having completed all bone preparations and selected the definitive components, these are opened in an aseptic manner and implanted with bone cement. It is generally easier to implant the tibial component first.

12.1 TIBIAL IMPLANT

The tibial implant should be positioned manually, ensuring that there is no conflict between the posterior edge of the baseplate and the femur, which may result in femoral injury or tibial malrotation. The bone cement must be prepared according to the related instructions for use, provided by the cement manufacturer.
Once the cement reaches the right viscosity, it must be applied to the undersurface of the tibial implant into the corresponding cement pockets. If cement is applied directly to the bone please make sure it does not enter the keel hole.

The final impaction is performed using the baseplate impactor, assembled with the multifunctional handle. If a stem extension is used, pre-assemble it by removing the plastic plug of the tibial keel, impacting the stem on the keel and, finally, fixing it with a screw inserted through the tibial keel. Once the tibial implant has been fully inserted, impact it with the dedicated tibia impactor assembled on the multifunctional handle. The extruded cement must be cleared from the tibia, carefully checking that no cement remains in the joint.

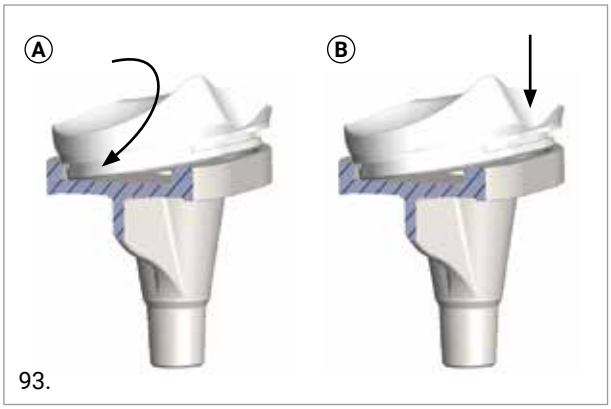
CAUTION
To avoid damaging the stem, protect it during impaction. A screwdriver can be inserted in the hexagonal hole of the stem and the impaction can be performed by hammering on the screwdriver.

CAUTION
The tibial extension stem must not be coupled with TiNbN coated fixed tibial baseplates.

12.2 INSERT

Place the insert on the tibial baseplate according to the following steps:

1. Make sure that the metallic upper surface of the tibial baseplate is perfectly clean and that no small debris can get interposed between tray and insert during assembly
2. Engage the posterior lips of the insert in the posterior part of the tibial baseplate (A)
3. Clip the anterior part of the insert, by exerting pressure on it manually (B)



93.

CAUTION
Once the posterior lips of the insert are fully engaged into the posterior part of the tibial baseplate, apply downward pressure to clip it firmly in position. If difficultly is experienced whilst trying to clip the insert in place, remove and reposition it. A 'click' will be heard or felt when the insert is correctly connected.

WARNING
When using a GMK Sphere Flex insert, it can be further secured through an optional screw packaged together with it. If the screw option is chosen, the torque limiter screwdriver 3.5 N·m (ref. 02.07.10.4557) must be used to guarantee that the optimal locking of the screw is achieved.

12.3 FEMORAL COMPONENT

Assemble the femoral clamp on the multifunctional handle. Open the femoral clamp jaws and attach them to the femoral component using the two lateral slots. Lock together by turning the handle screw mechanism firmly.
The bone cement must be prepared according to the cement manufacturer's instructions. Once the cement reaches the right viscosity, it must be applied to the internal surface of the femoral implant into the corresponding cement pockets. The resected bone surface should be thoroughly cleaned by pulse lavage and the intramedullary canal closed by cancellous bone. Position the femoral implant using the previously drilled peg holes for correct alignment, then assemble the femoral impactor on the multifuntional handle and impact the femoral component.

CAUTION
DO NOT USE the femoral clamp to impact the femoral component on the patient's femur bone.

Once the femoral implant has been fully inserted, the extruded cement must be cleared from the femur, ensuring that no cement remains on the articular surface, on the intercondylar notch and in the joint, in order to avoid excessive UHMWPE wear.

12.4 PATELLA RESURFACING

Assemble the spike jaw and the cement cup on the patella clamp.
The bone cement must be prepared as per the manufacturer's "instructions for use". Once the cement has the right viscosity, it should be applied to the internal surface of the patellar implant. Lock the patella implant to the patella resected surface by closing the patella clamp.
Hold the implant in the final position and clear the extruded cement from the patella, ensuring that no cement remains on the articular surface.

13. INSTRUMENTATION NOMENCLATURE

In the tables below are listed the GMK Efficiency sets. For a detailed list of the items contained in each GMK Efficiency set, please consult the "Instrumentation addendum", Ref: 99.26E.12INST.

GENERAL SETS

Reference (carton box)	Reference (no carton box)	Description
11.01001	11.11001	General Sphere Instrument Set
11.01002	11.11002	General MIS Sphere Instrument Set

CONVENTIONAL SET

Reference (carton box)	Reference (no carton box)	Description
11.00004	11.10004	Conventional instrument set

GMK SPHERE FEMUR SIZE-SPECIFIC SETS

Reference (carton box)	Reference (no carton box)	Size
11.01011	11.11011	1
11.01111	11.11111	1+
11.01012	11.11012	2
11.01112	11.11112	2+
11.01013	11.11013	3
11.01113	11.11113	3+
11.01014	11.11014	4
11.01114	11.11114	4+
11.01015	11.11015	5
11.01115	11.11115	5+
11.01016	11.11016	6
11.01116	11.11116	6+
11.01017	11.11017	7

GMK SPHERIKA FEMUR SIZE-SPECIFIC SETS

Reference (carton box)	Reference (no carton box)	Size
11.01061	11.11061	1
11.01071	11.11071	1+
11.01062	11.11062	2
11.01072	11.11072	2+
11.01063	11.11063	3
11.01073	11.11073	3+
11.01064	11.11064	4
11.01074	11.11074	4+
11.01065	11.11065	5
11.01075	11.11075	5+
11.01066	11.11066	6
11.01076	11.11076	6+
11.01067	11.11067	7

GMK SPHERE TIBIAL/FLEX INSERT SIDE LEFT SETS

Reference (carton box)	Reference (no carton box)	Size
11.01021	11.11021	1
11.01022	11.11022	2
11.01023	11.11023	3
11.01024	11.11024	4
11.01025	11.11025	5
11.01026	11.11026	6

GMK SPHERE TIBIAL/FLEX INSERT SIDE RIGHT SETS

Reference (carton box)	Reference (no carton box)	Size
11.01031	11.11031	1
11.01032	11.11032	2
11.01033	11.11033	3
11.01034	11.11034	4
11.01035	11.11035	5
11.01036	11.11036	6

GMK SPHERE TIBIAL/CR INSERT SIDE LEFT SETS

Reference (carton box)	Reference (no carton box)	Size
11.01041	11.11041	1
11.01042	11.11042	2
11.01043	11.11043	3
11.01044	11.11044	4
11.01045	11.11045	5
11.01046	11.11046	6

GMK SPHERE TIBIAL/CR INSERT SIDE RIGHT SETS

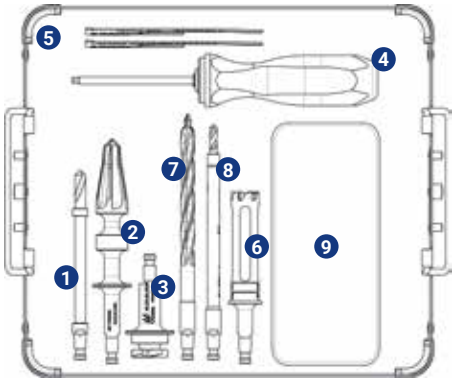
Reference (carton box)	Reference (no carton box)	Size
11.01051	11.11051	1
11.01052	11.11052	2
11.01053	11.11053	3
11.01054	11.11054	4
11.01055	11.11055	5
11.01056	11.11056	6

ON DEMAND SETS

Reference (carton box)	Reference (no carton box)	Description
11.00005	11.10005	Resurfacing patella instrument set
11.00102	11.10102	Extension instrument set
11.00103	N/A	MIS Correction guide Instrument Set
11.00006	11.10006	Sword pin pack
11.00007	11.10007	Short threaded pins pack
11.00008	11.10008	Smooth pins pack
11.00009	11.10009	Threaded pins pack
11.00010	11.10010	Screws pack
11.00027	11.10027	Drills and Reamers instrument set
11.00104	11.10104	Impactor handle set

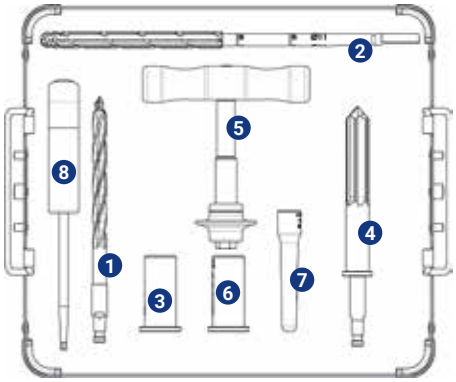
14. METAL COMPLEMENTS

REF. 02.07S.EFFMETAL



N.	Ref.	Description	Qty.
1	77.11.0106	Femur PEG drill	1
2	02.07.10.1071	Reamer for tibial keel - Hudson coupling	1
3	02.07.10.0046	Trochlea finishing reamer	1
4	02.07.10.4577	Torque limiter screwdriver 3.5 Nm	1
5	02.12.10.0142	Angel wing	1
6	02.07.10.9795	PS cam resection reamer	1
7	02.02.10.0128	Drill bit (¢ 9, L 162 mm) Hudson coupling	1
8	02.02.10.0404	Mobile patella pegs drill (¢4.5,L155) Hudson coupling	1
9	02.08.10.0120	UKM pin Ø 3.2 L=55	2
	02.02.10.0130	Drill Ø3.2 mm L130	1
	02.02.10.0145/A	Pins ¢ 3.2, L 70 mm	4
	02.02.10.0145/B	Pins ¢ 3.2, L 90 mm	2
	02.07.10.2294	Pin Ø3.2 L=40 ISO5835-Meche-Head-Triangle	4
	02.07.10.2194	Sword pin Ø3.2 L=22 mm	2
	02.07.10.4741	Threaded pin Ø3.2 L85 longer connection	4
	02.07.10.4650	Screw HA5 - Length 35 - reduced head	3

REF. 02.07S.EFFEXT



N.	Ref.	Description	Qty.
1	02.02.10.0128	Drill bit (¢ 9, L 162 mm) Hudson coupling	1
2	02.07.10.4590	Primary extension stem reamer D11	1
3	02.07.10.0019	Safe guide reamer reduction bush Ø11	1
4	02.07.10.1072	Drill bit Ø 15.5 mm - Hudson coupling	1
5	02.07.10.2020	Handle for safe guide reamer	1
6	02.07.10.1052	Primary stem Ø 15.5 mm drill but guide	1
7	02.07.10.1053	Primary cem. trial extension stem/Ø11 mm-L.65 mm	1
8	1.113	Screwdriver 3.5 mm	1

Part numbers subject to change.

NOTE FOR STERILISATION

GMK Efficiency is delivered sterile. Metal reusable instruments to be used in association with GMK Efficiency must be cleaned before use and sterilised in an autoclave respecting the regulation of the country, EU directives where applicable and following the instructions for use of the autoclave manufacturer.
For detailed instructions please refer to the document “Recommendations for cleaning decontamination and sterilization of Medacta International reusable orthopedic devices” available at www.medacta.com.

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