

# aMP™

The ACL-PCL Substituting Knee

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## BioFoam® Tibial Bases



Surgical Technique For Cementless Tibial Fixation

**Surgical techniques and instrument  
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**aMP™ BioFoam®**

**Tibial Bases**

Surgical Technique

Proper surgical procedures and techniques are the responsibility of the medical professional. The following guidelines are furnished for information purposes only. Each surgeon must evaluate the appropriateness of the procedures based on his or her personal medical training and experience. Prior to use of the system, the surgeon should refer to the product package insert for complete warnings, precautions, indications, contraindications and adverse effects. Package inserts are also available by contacting MicroPort Orthopedics.

**Note: This technique works in conjunction with the ODYSSEY® Distal Cut First (008016) or Anterior Rough Cut (010672) surgical techniques. Please refer to these techniques for preparation of the femur, patella, and remaining portions of the tibia.**

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# Tibial Resection

*NOTE: Care should be taken to ensure the tibial plateau is completely flat after the resection is made. A tibial base trial can be used to check the flatness of the surface.*

*NOTE: The ODYSSEY® tibial resection guides are designed for use with a 1.3mm (.050") thick saw blade.*

## Extramedullary Tibial Resection

Position the ankle clamp of the extramedullary (EM) tibial resection guide against the lower leg just proximal to the malleoli (**Figure 1**). Attach the appropriate left or right tibial resection guide onto the guide and adjust the guide until the resection slot is located a few millimeters below the lowest articular surface (**Figure 2**). When the vertical axis of the guide is parallel to the tibial axis, it is positioned for a 3° posterior sloped resection. Attach the external alignment guide and slide the alignment rod through the appropriate TL or TR (Tibia Left or Tibia Right) hole. If the rod is parallel to the tibia, 3° slope is confirmed (**Figure 2**).

For an anatomically sloped resection, place the dual reference gauge or a saw blade in the cutting slot and adjust the long axis of the EM guide by loosening the ankle screw and pulling the distal end of the guide away from the ankle. Adjust the guide until the cutting slot angle matches the anatomic slope of the tibia (**Figure 3**).

FIGURE 1



FIGURE 2

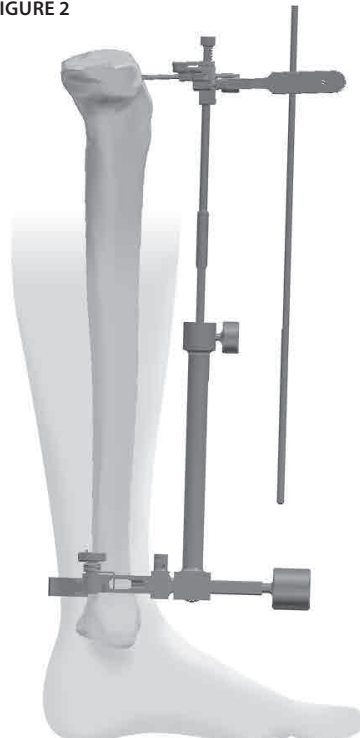


FIGURE 3

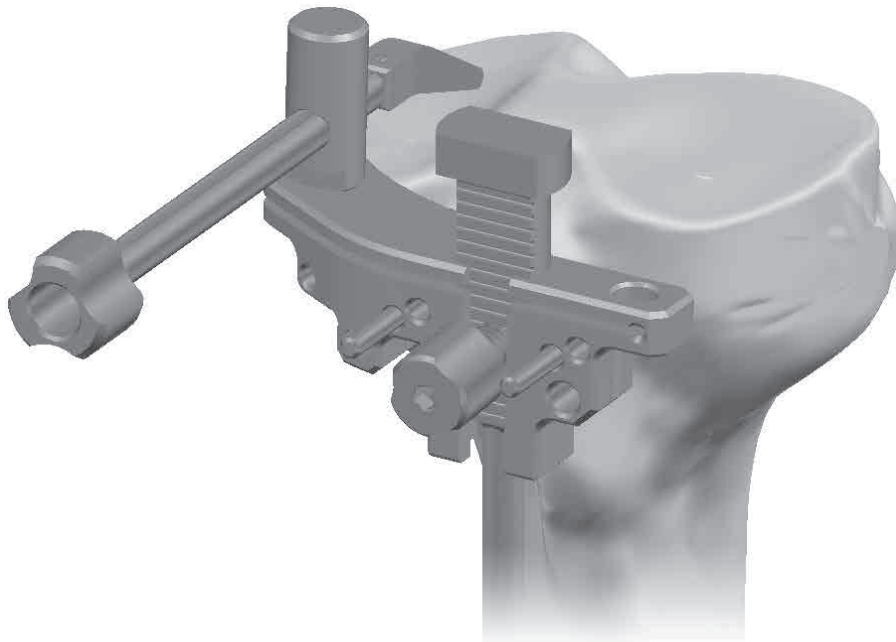


Drop the 2mm/10mm stylus into one of the holes on the top surface of the resection guide and turn the resection guide adjustment knob until the proper resection is found (**Figure 4**). Generally, the stylus is set to resect 2mm from the most deficient side and/or 10mm from the most prominent. Pin the resection guide to the proximal tibia through the +0mm holes. The alignment guide and rod can be used to check alignment to the ankle. If the resection guide is detached, it can be moved distally 2mm if headless pins are used. Divergent pin holes are available for additional stability and are highly recommended.

*NOTE: The top surface of the resection guide can be used to resect the tibia and is 4mm proximal to the distal surface of the captured slot.*

*NOTE: Care should be taken to ensure the tibial plateau is completely flat after the resection is made. A tibial base trial can be used to check the flatness of the surface.*

**FIGURE 4**



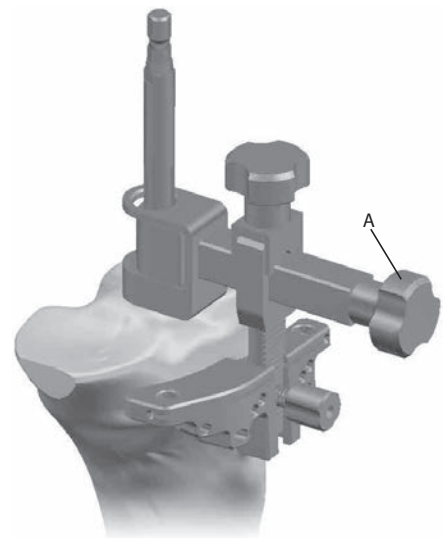
### Intramedullary Tibial Resection

The 3/8" (9.5mm) drill bit is used to penetrate the proximal tibia just posterior to the tibial ACL attachment. Insert the fluted IM reamer/rod into the tibial canal; constantly turning the T-handle (**Figure 5**). Irrigate and aspirate several times to reduce the chance of a fat embolus. The reamer/rod should be inserted to at least the mid isthmus. Slide the tibial alignment guide onto the IM reamer/rod (**Figure 6**). Turn the locking screw to lock the guide to the IM reamer/rod ("**A**" in **Figure 6**).

FIGURE 5



FIGURE 6



Drop the 2mm/10mm stylus into one of the holes on the top surface of the resection guide to set the desired level of tibial resection (**"A" in Figure 7**). Generally, the stylus is set to resect 2mm from the most deficient side and/or 10mm from the most prominent. Pin the resection guide to the proximal tibia through the 0mm holes. Before inserting a divergent pin, loosen the A/P adjustment knob and move the resection guide as close as possible to the tibia (**"B" in Figure 7**). To detach the guide, loosen the resection guide knob (**"C" in Figure 7**) and extract the IM reamer/rod and alignment guide together. When the resection guide is detached from the guide, the block can be moved 2mm distally if headless pins are used. Varus/valgus angulation can be checked to the ankle using the external alignment guide and rod (**Figure 8**).

*NOTE: Care should be taken to ensure the tibial plateau is completely flat after the resection is made. A tibial base trial can be used to check the flatness of the surface.*

FIGURE 7

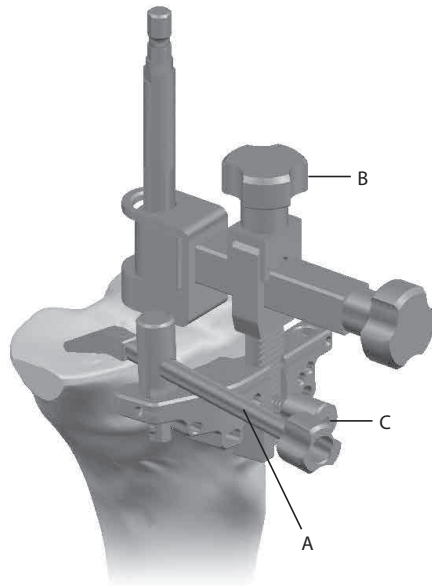
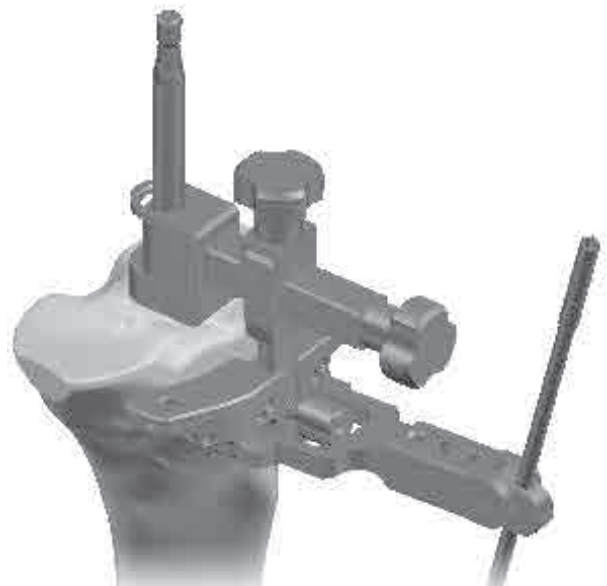


FIGURE 8



## Flexion/Extension Blocks

The flexion/extension gaps can be measured following the tibial and femoral resections. With the knee flexed at 90°, insert the 10mm spacer block into the space between the posterior femoral condyle and tibial bone surfaces (**Figure 9**). If the 10mm spacer block does not fit in flexion, additional posterior slope or a smaller femoral size may be needed. Use progressively thicker spacer blocks until the appropriate tension is obtained in flexion. Slide the external alignment rod through the hole in the handle to check the accuracy of the tibial cut to the center of the ankle. After the flexion gap has been determined, place the leg in extension (**Figure 10**) and check the extension gap.

*NOTE: The spacer blocks indicate the thickness of the appropriate tibial insert. The thickness of the femoral condyles, tibial base, and tibial insert are built into the spacer block thickness.*

FIGURE 9



FIGURE 10





# Tibial Sizing

Based on the femoral size used, choose the tibial base trial that provides the most coverage of the tibial bone without any overhang of the base.

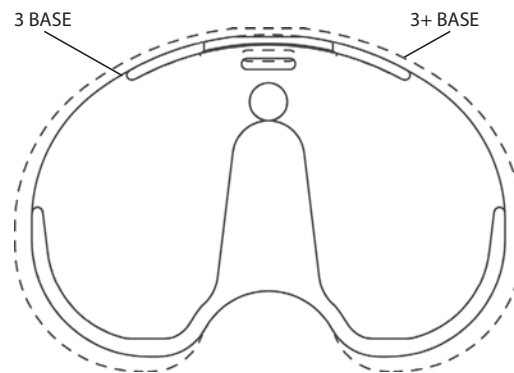
*NOTE: In all aMP™ Total Knee Inserts, with the exception of the aMP™ Double-High Knee, the tibial insert size must match the femoral implant size (Table 1). There are two tibial base sizes that can be used with any one size femoral component. For example a size 3 femoral implant can be used with either a size 3 or 3+ tibial base (Figure 11). When using the aMP™ Double-High Insert, a femoral component one size greater than the tibial insert may be utilized. For example, a size 3 aMP™ Double-High Insert may be used with a size 3 or 4 femur and a size 3 or 3+ tibial base (Table 2).*

**TABLE 1 | aMP™ Medial-Pivot, Traditional, PS component sizing**

Femur	Insert	Tibia
1	1	1 or 1+
2	2	2 or 2+
3	3	3 or 3+
4	4	4 or 4+
5	5	5 or 5+
6	6	6

**TABLE 2 | aMP™ Double-High component sizing**

Femur	Insert	Tibia
1 or 2	1	1 or 1+
2 or 3	2	2 or 2+
3 or 4	3	3 or 3+
4 or 5	4	4 or 4+
5 or 6	5	5 or 5+



**FIGURE 11**

# Tibial Preparation

*NOTE: Care should be taken to ensure the tibial plateau is completely flat after the resection is made. A tibial base trial can be used to check the flatness of the surface.*

*NOTE: The aMP™ BioFoam® Tibial base is approximately .5mm thicker than a porous-coated base with beads. The trial tibial bases take into account this increased thickness.*

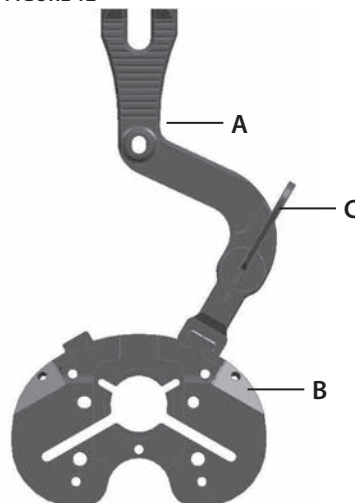
After the proximal tibial resection has been made, the proper tibial base trials, keel punch guide, reamer, and keel punch should be chosen. **Table 3** should be used to determine the sizing compatibility of the instrumentation.

**Table 3 | Instrument Sizing Matrix**

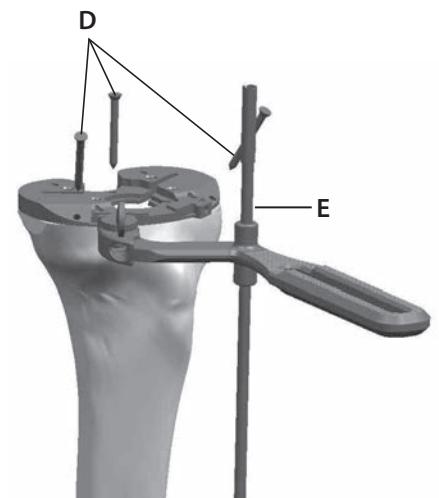
Implant Size	Base Trial	Reamer	Keel Punches
Size 1	Size 1	Line 1	Size 1/1+/2
Size 1+ Size 2	Size 1+/2	Line 1	Size 1/1+/2
Size 2+ Size 3	Size 2+/3	Line 2	Size 2+/3/3+/4
Size 3+ Size 4	Size 3+/4	Line 2	Size 2+/3/3+/4
Size 4+ Size 5	Size 4+/5	Line 3	Size 4+/5/5+/6
Size 5+	Size 5+/6	Line 3	Size 4+/5/5+/6

The tibial base trial handle (“**A**” in **Figure 12**) is assembled to the appropriate size tibial base trial (“**B**” in **Figure 12**) by aligning the tabs on each. The lever on the handle (“**C**” in **Figure 12**) is then rotated 90° to the “LOCKED” position. The trial base is then placed onto the resected surface of the tibia and properly aligned (generally to the medial one-third of the tibial tubercle) to check the overall coverage. If the tibial trial base size is too small, a “plus size” will provide additional tibial coverage. The trial base is then pinned to the tibia using short headed anchoring pins (“**D**” in **Figure 13**) through the anteromedial, anterolateral and posterior holes. The holes may be pre-drilled using a 3.2mm (1/8”) drill bit if required. The alignment rod can be inserted through the handle to check alignment to the ankle (“**E**” in **Figure 13**).

**FIGURE 12**



**FIGURE 13**



As shown in **Figure 14**, align the four spikes on the keel punch guide with the corresponding holes on the trial base and impact the guide with a mallet until flush with the surface of the trial base (**Figure 15**).

The reamer can be used to prepare the medullary canal if needed. Referring to **Figure 16** and **Table 3**, ream through the keel punch guide to the appropriate line indicated on the reamer. A 3.2mm drill bit may be used to prepare for the spikes on the implant as well (**Figure 17**).

FIGURE 14



FIGURE 15



FIGURE 16

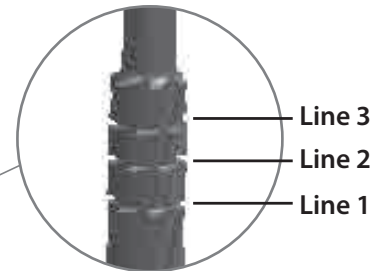


FIGURE 17



Drill for Spikes

Assemble the appropriate size keel punch to the keel punch handle by pulling back on the trigger mechanism on the handle (**"A" in Figure 18**) and inserting it into the opening on the punch. The keel punch handle is impacted with a mallet until fully seated and the bottom edge of the handle aligns with the top of the punch guide (**"B" in Figure 19**). The handle is disassembled from the punch by pulling back on the trigger mechanism and the punch guide is removed with a slaphammer and hook (**Figure 20**). A trial reduction can then be performed with the femoral, tibial, and insert trial components (**Figure 21**). If desired, the lines on the anterior portion of the trial bases (**"C" in Figure 21**) can be marked to aid with alignment of the tibial base component during implantation. After trialing, the punch handle is used to remove the punch and the headed pins are removed with the slaphammer.

FIGURE 18



FIGURE 19

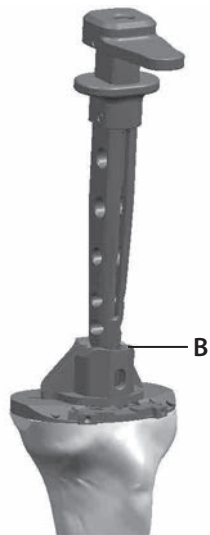
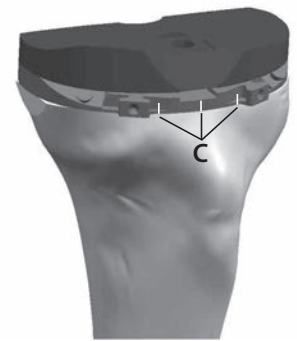


FIGURE 20



FIGURE 21



# Tibial Base Implantation

*NOTE: The recommended order for implantation is left to the discretion of the orthopaedic surgeon.*

*NOTE: Care should be taken when handling the tibial bases. The locking mechanism on proximal surface of the tibial base may contain sharp edges that could puncture surgical gloves.*

The proper size tibial base and keel is chosen and assembled by placing the stem onto the Morse taper of the base. Care should be taken to align the anterior tab and key. The stem is impacted with three or four strong blows from a mallet, ensuring the base is placed on a rigid surface during assembly.

*IMPORTANT NOTE: To assemble, do not cushion the mallet or base with any materials. The base should be placed directly on a firm surface, while the end of the stem is directly struck with the head of the mallet.*

The inserter/extractor is utilized to implant the base (**Figure 22**) by engaging the insert locking dovetail and impacting with a mallet until fully seated on the bone. The monolithic tibial impactor (**Figure 23**) can also be used to seat the tibial base.

To prepare for the bone screws, each hole is drilled using the fixed-angle drill guide ("**A**" in **Figure 24**) and a 3.2mm (1/8") drill bit ("**B**" in **Figure 24**). The recommended angulation of the screws is shown in **Figure 25**. The posterolateral screw is angled toward the midline of the tibial to avoid the peroneal nerve. If the screws are to be angled outward, care should be taken when drilling through the cortical bone.

To avoid damage to surrounding soft tissue, do not plunge the drill bit through the cortex. The screw depth gauge is utilized to approximate the screw lengths to be used. For bi-cortical screw fixation, the inside "hook" is used to grasp the cortical bone. Additionally, trans-cortical screws can be measured by placing the end of the gauge into the bottom of the hole. The screw length is determined by reading the increments off the end of the gauge and the appropriate length screw is chosen. A 3.5mm hex screwdriver is used to advance and fully seat the cancellous screws into the base.

FIGURE 22



FIGURE 23



FIGURE 24

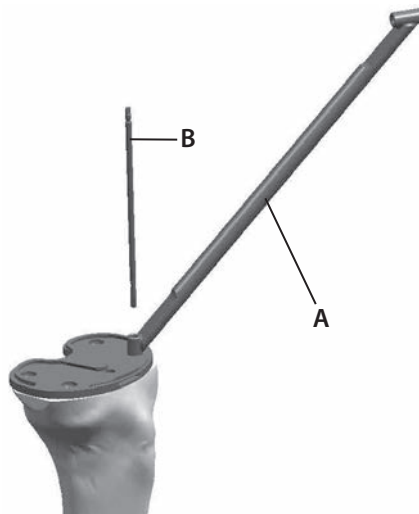
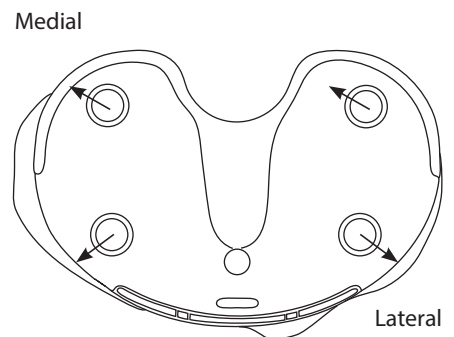


FIGURE 25

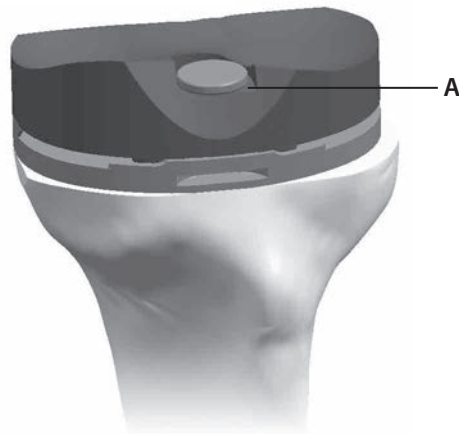


### Final Trial Reduction

After the base and femoral component have been implanted, the appropriate trial tibial insert can be used to recheck ligament and soft tissue balancing. A trial insert pin may be placed through the trial insert into tibial base implant to provide a more secure construct during final assessment of joint stability (**"A"** in **Figure 26**).

*NOTE: The trial insert only engages the central locking detail and a gap will be present along the anterior periphery of the insert.*

FIGURE 26



## Tibial Insert Seating

*NOTE: Care should be taken to remove all soft tissue, or other foreign bodies from the tibial locking mechanism and dovetail before attempting to seat the insert. Failure to do so could result in improper or incomplete seating of the tibial insert and require the use of a second insert.*

Once the tibial base is fully seated, the appropriate tibial insert may be locked into place. Initial seating is accomplished by pushing the insert as far posterior as possible with hand pressure, paying special attention to engage the central dovetail and posterior captures of the tibial base. For final seating of the insert, the 45° insert impactor is utilized by placing the impactor tip in the anterior slot of the tibial insert (**Figures 27 and 28**). The impactor handle should be at an angle slightly greater than 45°. Keeping the impactor tip in the slot, decrease the angle of the impactor handle until the tip is felt to impinge within the slot. This should be approximately 45°. While maintaining this 45° angle relative to the tibial base, apply several strong mallet blows directing the insert posteriorly. After the anterior edge of the insert has been pushed past the anterior capture of the tibial base, it will drop behind the anterior capture and the insert face will be flush against the surface of the tibial base (**Figure 29**).

FIGURE 27



FIGURE 28



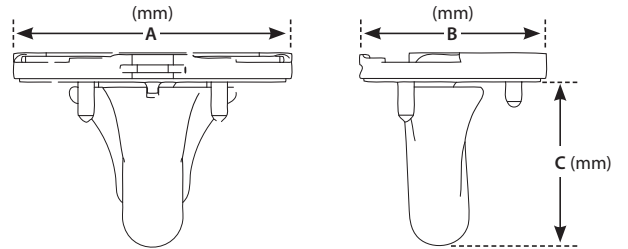
FIGURE 29



# Appendix

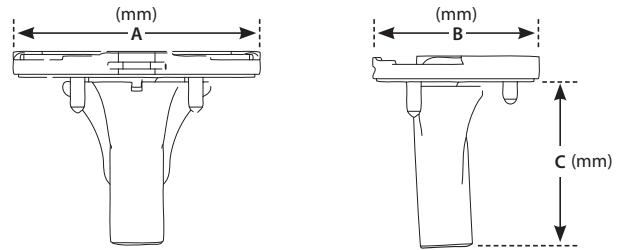
## Primary Pressfit Keels

SIZE	A	B	C
1	60	41	34
1+	65	44	34
2	65	44	34
2+	70	48	41
3	70	48	41
3+	75	51	41
4	75	51	41
4+	80	54	49
5	80	54	49
5+	85	58	49



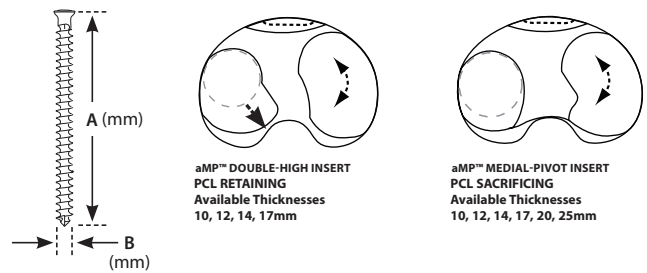
## Modular Pressfit Keels

SIZE	A	B	C
1	60	41	47
1+	65	44	47
2	65	44	47
2+	70	48	47
3	70	48	47
3+	75	51	47
4	75	51	47
4+	80	54	47
5	80	54	47
5+	85	58	47



## 6.5mm Cancellous Bone Screws

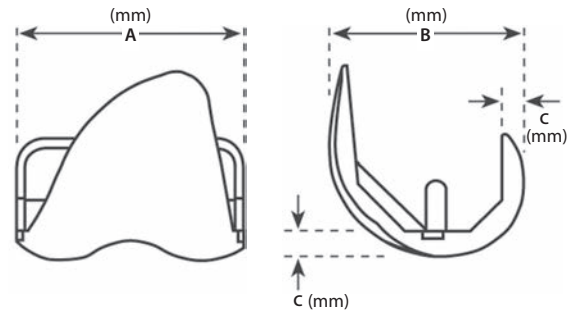
SIZE	A	Ø B
15mm	15	6.5
20mm	20	6.5
25mm	25	6.5
30mm	30	6.5
35mm	35	6.5
40mm	40	6.5
45mm	45	6.5
50mm	50	6.5
55mm	55	6.5





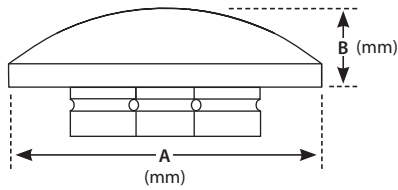
**Primary Femoral Components**

SIZE	A	B	C
1	60	52	8
2 – aMP™ STATURE™	60	57	8
2	65	57	8
3 – aMP™ STATURE™	65	62	8
3	70	62	8
4 – aMP™ STATURE™	70	66	8
4	75	66	8
5	80	71	8



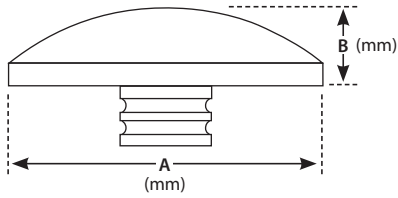
**Onlay All-poly Tri Peg**

A	B
26	8
29	8
32	8
35	8
38	10
41	11



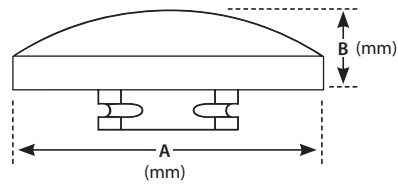
**Onlay All-poly Single Peg**

A	B
32	8
35	8
38	10
41	11



**Recessed All-poly**

A	B
25 Low	7
25 High	9
28 Low	7
28 High	9









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