PEEKPower™ HTO Plate

2nd Generation | Surgical Technique

Arthrex®

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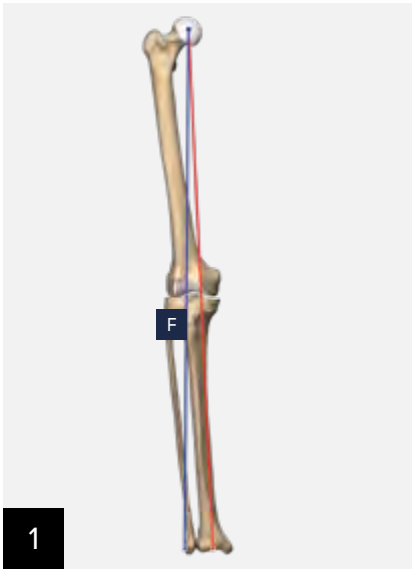
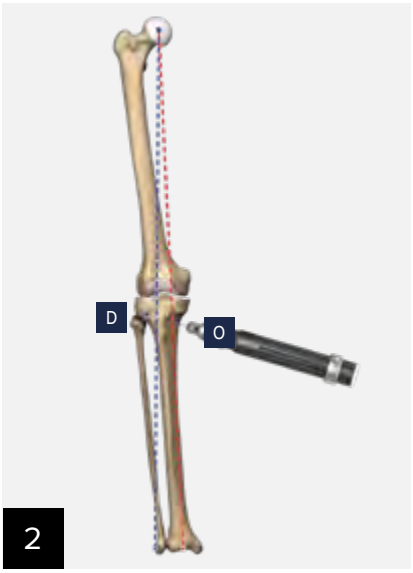
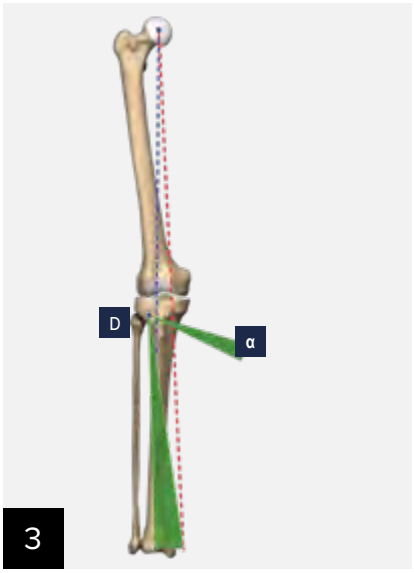
Body weight < 100kg, non-smoker. For preoperative planning, be aware of potential femoral malalignments.



Using the full-length, standing A/P radiograph, draw a line from the center of the femoral head to the center of the tibiotalar joint. This demonstrates the patient's mechanical axis (red line). To determine the desired mechanical axis, define the Fujisawa point.* Connect the center of the femoral head with the Fujisawa point linearly down to the tibiotalar joint (blue line).



Determine the center of rotation for the osteotomy 1 cm medial of the lateral cortex at the level of the fibula tip (**D**). Define the osteotomy plane by linking the medial entrance spot at the proximal rim of the pes anserinus (**O**) with the center of rotation.



Determination of the degree of correction (**α**): Trace the distal contour of the tibia on a transparent sheet. Rotate sheet with the distal part of the tibia around the center of rotation until the center of the tibiotalar joint matches with the desired mechanical axis. The angle of rotation corresponds to the degree of correction. Prior to final fixation, the alignment will be verified by external examination and fluoroscopy.

* The Fujisawa point (**F**) is located at 62.5 % of the width of the proximal tibia (i.e., 80 mm [width of proximal tibia] x 0.625 = 50 mm)

Reference:
Cotic M, Vogt S, Feucht MJ, Saier T, Minzlaff P, Hinterwimmer S, Imhoff AB. Prospective evaluation of a new plate fixator for valgus-producing medial open-wedge high tibial osteotomy. Knee Surg Sports Traumatol Arthrosc. 2015; 23(12):3707-16

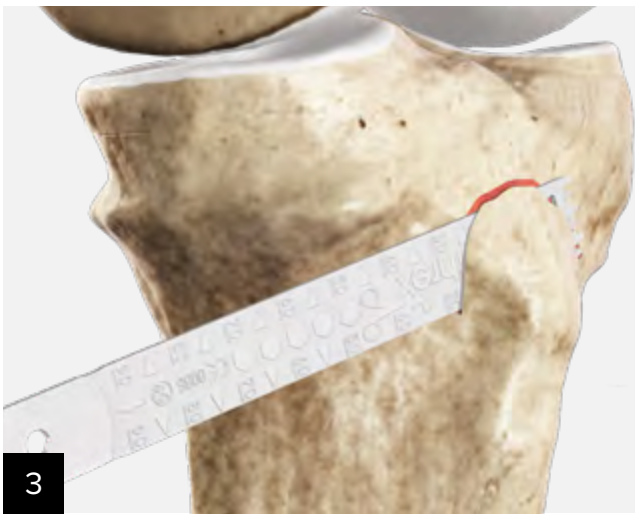
For a more reproducible osteotomy cut, the PEEKPower HTO plate can be combined with the HTO hinge pin system (LT2-0133-EN).

1

After reflecting back the superficial portion of the medial collateral ligament, place the trial HTO plate on the medial cortex and control position under fluoroscopy. Mark the desired osteotomy start point slightly distal of the trial handle at the anteroproximal rim of the pes anserinus. Remove the trial implant. Drill the first breakaway guide pin from the starting point angled towards the fibular head up to 1 cm of the lateral cortex. Remove the trial implant and drill the first breakaway guide pin along the marked osteotomy into the tibia. Again control under fluoroscopic guidance.


2

Utilize the cutting guide to determine the appropriate slope plane of the osteotomy. Place the second osteotomy guide pin under X-ray through the cutting guide anterior to the first pin. Surgical tip: Drill two K-wires parallel in the sagittal plane of the proximal tibia to isualize the alteration of the A/P tibia slope and rotation when opening the osteotomy.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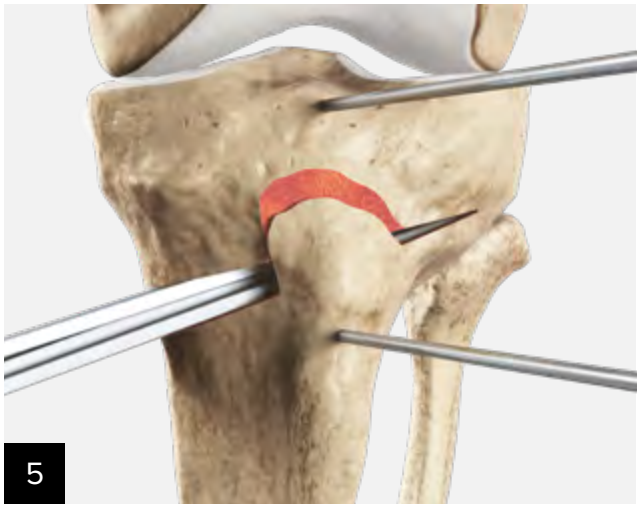
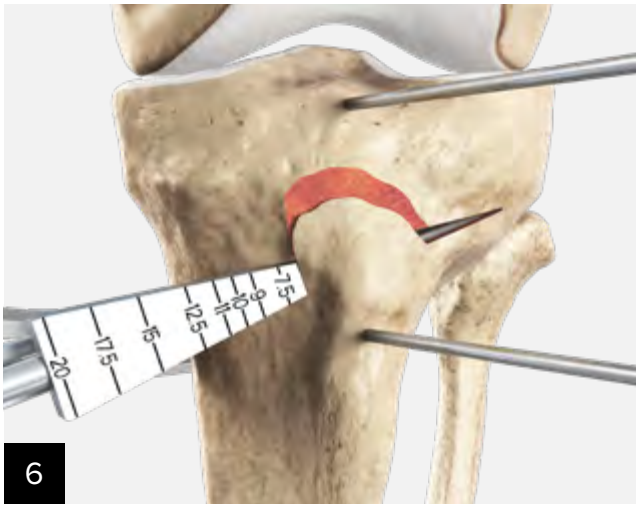
4

An oscillating saw is used to create a biplanar osteotomy cut for higher stability and faster healing. To protect the patellar tendon a radiolucent retractor can be used. After cutting the tuberositas tibiae (distal or proximal cut of the tuberositas is possible), insert a soft tissue retractor into the posterior part of the proximal tibia. Position the oscillating saw against the inferior surface of the guide pins to cut the tibial cortex medially, anteriorly and posteriorly. A single osteotome may be used to complete the osteotomy.

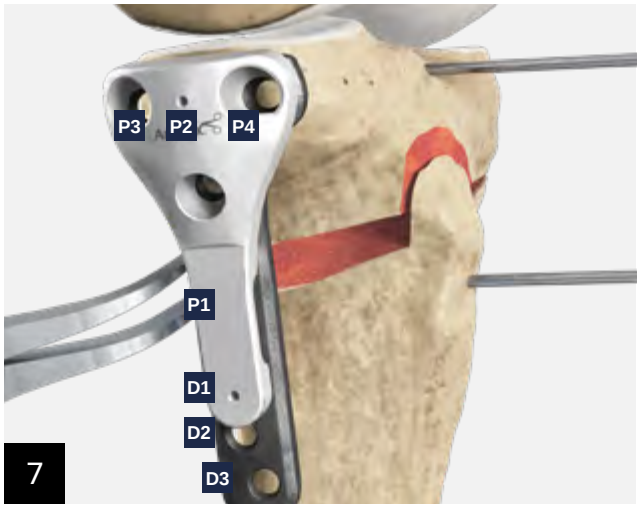
Note: To prevent the saw blade from blocking and to minimize damage to the retractor, please avoid hitting the retractor fully, and only for short periods of time, if necessary.



After performing the osteotomy, remove the cutting guide pins. To open and adjust to the desired correction, use additional osteotomes. Fluoroscopic confirmation should be used repeatedly throughout this procedure. Be sure to maintain the lateral tibial cortex hinge.



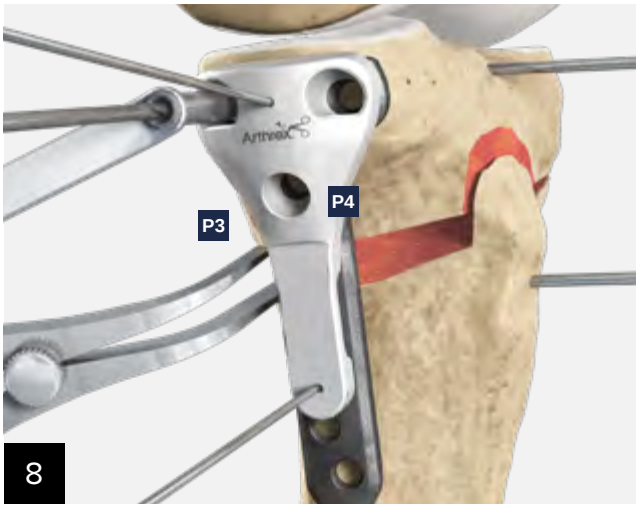
Insert the wedge trial into the osteotomy gap to verify the amount of correction. The amount of opening wedge correction may be read off of the millimeter markings. When the desired correction has been achieved, insert the adjustable bone spreader posteriorly to maintain the correction and remove all wedge trials.



The PEEKPower HTO plate is attached to the aiming adapter and placed over the osteotomy with the 4 proximal holes (**P1** - **P4**) positioned proximal to the osteotomy gap. The plate is positioned onto the pes anserinus and temporarily fixed with 1.57 mm guide wires. Using the aiming adapter with a corresponding drill sleeve prevents drilling into the tibial plateau. A shortened aiming adapter can be used if a smaller skin incision is desired.

Notes:

- PEEKPower HTO plate cannot be bent
- PEEKPower HTO locking screws:
  Screw angle has to be changed if the screw is removed and inserted into the same plate hole



Proximal Fixation of PEEKPower™ HTO Plate

Insert the drill guide for locking screws (AR-1340DG) through the aiming adapter. Drill tunnels for screw holes (**P1**, **P3**, **P4**) with the 4.3 mm drill (AR-1340D). Read the screw length on the drill where it enters the drill sleeve tunnel or by using the depth gauge for the PEEKPower HTO plate (AR-1340G). Insert screws through the aiming adapter leaving 2 to 3 turns remaining. Remove the aiming adapter. **P2** is drilled without the aiming adapter. Complete final fixation of all proximal locking screws with a 3.5 mm hex screwdriver manually until screws are flush with the plate.

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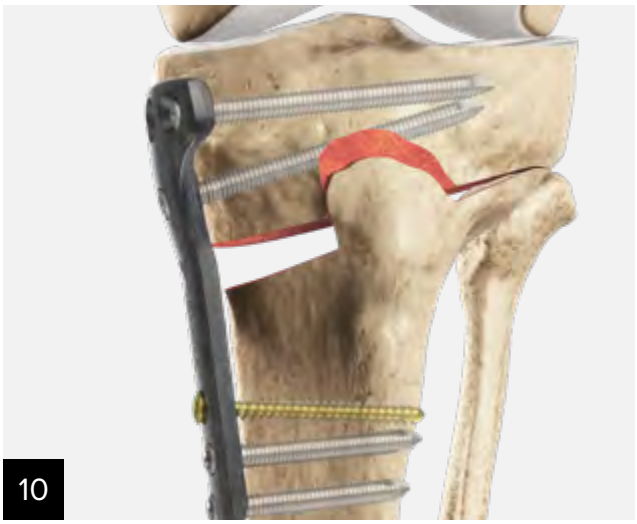
Distal Fixation of PEEKPower™ HTO Plate

Intact Hinge:
Screw holes **D1**, **D2** and **D3** are fixed with 5 mm locking screws using a 4.3 mm drill and drill guide for locking screws.

Broken Hinge:
A golden compression screw is used in **D1**: Bicortical fixation is achieved by using a 3.2 mm drill (AR-1343.2D) with drill guide (AR-1343DG) for compression screws. The drill and drill sleeve are angled as distal as possible (12°) to achieve the best intrafragmentary compression of the lateral hinge.

The compression screw is fixed manually with a 3.5 mm hex screwdriver under X-ray control of the lateral hinge.



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The plate is fixed in **D2** and **D3** with bicortically placed 5 mm locking screws. The same drill and drill sleeve are used as for proximal screw fixation. Finally, the golden compression screw in **D1** is replaced by a same-length 5 mm locking screw.

Plate Removal:
Screws are removed using the 3.5 hex screwdriver for PEEKPower HTO plate. In case of screw hex stripping, an easy-out for 3.5 mm hex screw, AO connect, has to be used.

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ACP-soaked INNOTERE 3D osteotomy wedges or INNOTERE Paste-CPC can be placed into the bone void.

Mechanical Properties and Histological Data

The high-performance polymer unites high mechanical stiffness and strength with excellent biocompatibility. The use of PEEK in combination with endless carbon and tantal fibers in a fiber composite leads to revolutionary mechanical properties with higher long-term stability compared to the best hardened titanium implants. The application of carbon-fiber-reinforced PEEK for medical technologies has been approved for years in spine surgery. The new material combination CF-PEEK needs compliance with the following surgical provisions:

- The angle-stable, multidirectional centering of head-threaded screws is ensured by screwing the threaded head into the PEEKPower plate material
- Ensure correct centering of the drill guide to avoid drilling the plate
- In fixation systems entirely based on metal combinations (e.g., titanium plate and titanium screws), material abrasion is always present; it is the same for the PEEKPower plates

PEEKPower plates have been tested according to EN ISO 10993-1 referring to biological evaluation and testing of potentially leachable chemical substances. The results of these tests demonstrate no evidence of cytotoxicity, systematic toxicity, irritation or any macroscopic reaction response. Moreover, no evidence was produced that leachable substances have negative impacts. Furthermore Cotic et. al. [1] presented two-year results from analyzing the revolutionary fiber composite at the ISAKOS congress: 25 patients were treated with the PEEKPower HTO plate. The results showed that 100 % were stabilized and had improved scores with regard to joint preservation. Within the histological tissue analysis, no negative findings such as severe or specific inflammation were found.

[1] Cotic M, Slotta-Huspenina J, Noël PB, Imhoff AB. Two-Year Results of Open-Wedge Tibial Osteotomy with Fixation by the PEEKPower™ HTO-Plate for Varus Malalignment with Unicompartmental Osteoarthritis of the Knee (ISAKOS 2011, paper # 69)

Ordering Information

Implants

Product Description	Item Number
PEEKPower™ HTO plate	AR-**13401L**
PEEKPower™ HTO locking screw, non-sterile, 5 mm × 16 - 90 mm Sizes: 16, 20, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55, 60, 65, 70, 75, 80, 85, 90 mm	AR-**13416T** to **-90T**
PEEKPower™ cortical non-locking screw, non-sterile, 4.5 mm × 24 - 52 mm Sizes: 24, 28, 32, 36, 40, 44, 48, 52 mm	AR-**13524T** to **-52T**
PEEKPower™ HTO locking screw, sterile, 5 mm × 16 - 90 mm Sizes: 16, 20, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 55, 60, 65, 70, 75, 80, 85, 90 mm	AR-**13416TS** to **-90TS**
PEEKPower™ cortical non-locking screw, sterile, 4.5 mm × 24 - 52 mm Sizes: 24, 28, 32, 36, 40, 44, 48, 52 mm	AR-**13524TS** to **-52TS**

Instrumentation Set for PEEKPower™ HTO Plate

Product Description	Item Number
Saw Blade for DrillSaw Max 600™	
Thickness 1.27 mm, length 105 mm, width 19 mm	AR-**600-012S**
Thickness 1.27 mm, length 90 mm, width 25.4 mm	AR-**600-005S**
Thickness 1.27 mm, length 90 mm, width 13 mm	AR-**600-001S**
Osteotome, 10 - 25 mm Sizes: 10, 15, 20, 25 mm	AR-**13421W-10** to **-25**
Trial for PEEKPower™ HTO, left	AR-**13401LT**
Positioning Handle	AR-**14024**
Bone spreader for HTO	AR-**1340T**
Aiming adapter tibial head	AR-**1340DGA**
Shortened aiming adapter tibial head	AR-**1341DGA**
Drill for PEEKPower™ HTO locking screws, Ø 4.3 mm	AR-**1340D**
Drill guide for PEEKPower™ HTO plate locking screws	AR-**1340DG**
Depth gauge for PEEKPower™ HTO plate	AR-**1340G**
Drill for cortical screws, Ø 3.2 mm	AR-**1343.2D**
Drill guide for 4.5 mm cortical screws	AR-**1343DG**
Screwdriver for PEEKPower™ HTO plate	AR-**13435D**
Driver handle, AO connection	AR-**13421AO**
Cutting guide for HTO	AR-**13315**
Wedge trial for HTO	AR-**13324**
AO adapter	AR-**4160AOC**
Osteotomy guide pin, 2.4 mm	AR-**13303-2.4**
Guide wire with trocar tip, 1.57 mm	AR-**8941K**
Instrument case for PEEKPower™ HTO plate instrument set	AR-**13421C**
Osteotomy retractor, radiolucent	AR-**13325**
Easy-out for 3.5 mm hex screw, AO connection	AR-**1994-35**

Bone Graft Substitute

Product Description	Item Number
INNOTERE osteotomy wedge, 7 mm × 30 mm	**721TS1**
INNOTERE osteotomy wedge, 10 mm × 30 mm	**721TS2**
INNOTERE osteotomy wedge, 12 mm × 35 mm	**721TS3**
INNOTERE osteotomy wedge, 15 mm × 35 mm	**721TS4**
INNOTERE Paste-CPC, 3 cc	**111VX2**
INNOTERE Paste-CPC, 0.5 cc	**211IP2**
INNOTERE Paste-CPC, 1 cc	**211IP1**
INNOTERE Paste-CPC, 3 × 1 cc	**231IP1**
INNOTERE Paste-CPC, 3 cc	**111VX2**
INNOTERE Paste-CPC, 6 cc	**311IP2**
INNOTERE Paste-CPC, 12 cc	**311IP1**

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