medartis

PRECISION IN FIXATION

SURGICAL TECHNIQUE

Foot System 2.0 – 3.5

APTUS Foot

Contents

For further information regarding the APTUS product line visit www.medartis.com

Introduction

Product Materials

Product	Material
Plates	Pure titanium, titanium alloy
Washers	Titanium alloy
Screws	Titanium alloy
K-wires	Stainless steel
Instruments	Stainless steel, PEEK, aluminum, Nitinol, silicone or titanium
Containers	Stainless steel, aluminum, PEEK, polyphenylsulfone, polyurethane, silicone.

Indications

APTUS Foot System
The APTUS Foot System is intended for use in small bones, in particular in fractures, osteotomies and arthrodesis of the tarsals, metatarsals and phalanges.

APTUS Foot 3.5 System
The APTUS Foot 3.5 System is indicated for fractures and osteotomies of the calcaneus.

Contraindications

- Preexisting or suspected infection at or near the implantation site
- Known allergies and/or hypersensitivity to foreign bodies
- Inferior or insufficient bone quality to securely anchor the implant
- Patients who are incapacitated and/or uncooperative during the treatment phase
- The treatment of at-risk groups is inadvisable

Color Coding

System Size	Color Code
2.0	Blue
2.3	Brown
2.8	Orange
3.5	Green

Plates and Screws
Special implant plates and screws have their own color:

Implant plates blue	TriLock plates (locking)
Implant screws gold	Cortical screws (fixation)
Implant screws blue	TriLock screws (locking)
Implant screws silver	TriLock Express screws (locking) and transfixation screws
Implant screws green	SpeedTip screws (self-drilling)

Possible Combination of Plates and Screws

Plates and screws can be combined within one system size:

2.0/2.3 TriLock Plates
2.0 TriLock Screws, HexaDrive 6
2.3 Cortical Screws, HexaDrive 6

2.8 TriLock Plates
2.8 TriLock Screws, HexaDrive 7
2.8 Cortical Screws, HexaDrive 7

2.8 TriLock TMT-1 Fusion Plates
2.8 TriLock Screws, HexaDrive 7
2.8 Cortical Screws, HexaDrive 7
4.0 Transfixation Screw, HexaDrive 7

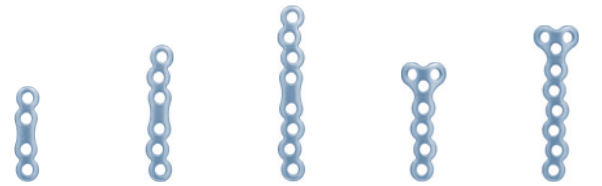
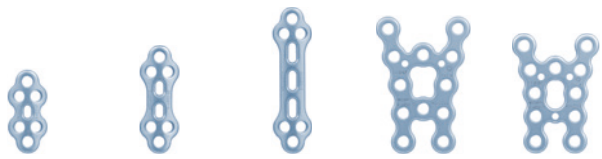
3.5 TriLock Plates
3.5 TriLock Screws, HexaDrive 15
3.5 Cortical Screws, HexaDrive 15

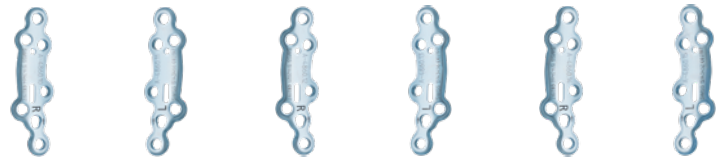
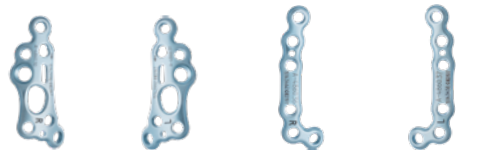
Symbols

HexaDrive

System Overview

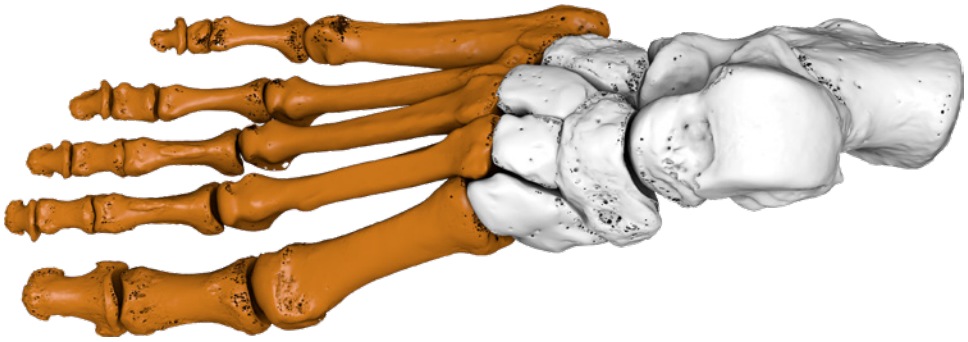
The APTUS Foot System 2.0–3.5

System	System Size		Plate Thickness
Fore- and Midfoot System 2.0/2.3, 2.8	2.0/2.3	TriLock Plates  A-4655.01 Straight, 4 Holes A-4655.03 Straight, 6 Holes A-4655.08 Straight, 8 Holes A-4655.12 T, 7 Holes A-4655.13 T, 9 Holes TriLock Grid Plates  A-4655.67 Grid, 6 Holes A-4655.68 Grid, 6 Holes A-4655.69 Grid, 6 Holes	1.3 mm
	2.8	TriLock Plates  A-4850.01 Straight, 4 Holes A-4850.03 Straight, 6 Holes A-4850.08 Straight, 8 Holes A-4850.12 T, 7 Holes A-4850.13 T, 9 Holes TriLock Grid/Wing Plates  A-4850.67 Grid, 6 Holes A-4850.68 Grid, 6 Holes A-4850.69 Grid, 6 Holes A-4850.70 Wing, large, 12 Holes A-4850.71 Wing, small, 11 Holes	1.6 mm

<table>
<tr><th>System</th><th>System Size</th><th></th><th>Plate Thickness</th></tr>
<tr><td rowspan="6">Hallux System 2.8</td><td rowspan="6">2.8</td><td>TriLock MTP Fusion Plates</td><td rowspan="2">1.6 mm</td></tr>
<tr><td> 
A-4860.10 0° dorsiflexion, right
A-4860.11 0° dorsiflexion, left
A-4860.12 5° dorsiflexion, right
A-4860.13 5° dorsiflexion, left
A-4860.14 10° dorsiflexion, right
A-4860.15 10° dorsiflexion, left</td></tr>
<tr><td>TriLock MTP Revision Plates</td><td rowspan="2">2.0 mm</td></tr>
<tr><td> 
A-4860.16 5° dorsiflexion, right
A-4860.17 5° dorsiflexion, left
A-4860.18 10° dorsiflexion, right
A-4860.19 10° dorsiflexion, left</td></tr>
<tr><td>TriLock TMT-1 Fusion Plates</td><td rowspan="2">1.6 mm</td></tr>
<tr><td> 
A-4860.30 medial, right
A-4860.31 medial, left
A-4860.36 plantar, right
A-4860.37 plantar, left</td></tr>
<tr><td rowspan="2">SpeedTip® C 2.0, 2.8 System</td><td>2.0</td><td>C Screws
 
A-5411.xx 10–13 mm</td><td>C-Snap Screws
 
A-5417.xx 10–13 mm</td></tr>
<tr><td>2.8</td><td colspan="2">C Screws
 
A-5811.xx 16–24 mm</td></tr>
<tr><td>Calcaneus System 3.5</td><td>3.5</td><td colspan="2">TriLock Calcaneus Plates
 
A-4950.71 left, small
A-4950.72 right, small
A-4950.73 left, medium
A-4950.74 right, medium
A-4950.75 left, large
A-4950.76 right, large</td><td>2.0 mm</td></tr>
</table>

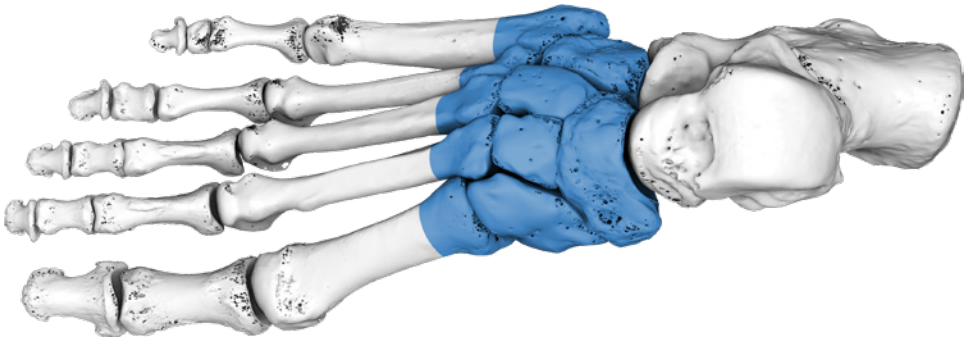
Treatment Concept

The table below lists typical clinical findings which can be treated with the implants of the APTUS Foot System 2.0–3.5.



Forefoot	SpeedTip C 2.0 A-5417.xx and A-5411.xx	SpeedTip C 2.8 A-5811.xx	Straight Plate 2.0/2.3 A-4655.01/03/08	T Plate 2.0/2.3 A-4655.12/13	Grid Plate 2.0/2.3 A-4655.67–69	Straight Plate 2.8 A-4850.01/03/08	T Plate 2.8 A-4850.12/13	Grid Plate 2.8 A-4850.67–69	MTP Fusion Plate 2.8 A-4860.10–15	MTP Revision Plate 2.8 A-4860.16–19
Fracture MT1						■	■	■		
Fracture MT2–5			■	■	■					
Osteotomy MT1		■								
MTP Fusion								■	■	
MTP Revision with Bone Graft								■		■
Closing Wedge Osteotomy						■	■			
Metatarsal Shortening (Weil) Osteotomy	■	■								
Opening Wedge Osteotomy							■			

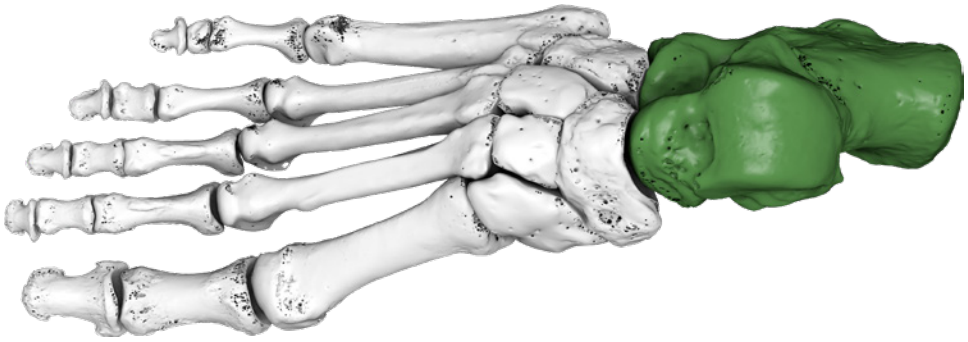
The above-mentioned information is a recommendation only. The operating surgeon is solely responsible for selecting the appropriate implant for the specific case.



Midfoot

	T Plate 2.0/2.3 A-4655.12/13	Grid Plate 2.0/2.3 A-4655.67–69	Straight Plate 2.8 A-4850.01/03/08	T Plate 2.8 A-4850.12/13	Grid Plate 2.8 A-4850.67–69	Wing Plate 2.8 A-4850.70/71	TMT-1 Medial Fusion Plate 2.8 A-4860.30/31	TMT-1 Plantar Fusion Plate 2.8 A-4860.36/37	Wing Plate 3.5 A-4950.91/92
Cuboid Fracture		■			■	■			
Calcaneo-cuboid Arthrodesis					■	■			
First Tarsometatarsal Joint Arthrodesis (Lapidus)				■	■		■	■	
Lisfranc			■	■	■	■			■
Navicular Fracture	■			■	■				

The above-mentioned information is a recommendation only. The operating surgeon is solely responsible for selecting the appropriate implant for the specific case.



Hindfoot	Straight Plate 2.8 A-4850.01/03/08	T Plate 2.8 A-4850.12/13	Grid Plate 2.8 A-4850.67–69	Wing Plate 2.8 A-4850.70/71	Calcaneus Plate 3.5 A-4950.71–76
Calcaneal Fracture					
Calcaneo-cuboid Arthrodesis					
Talus Fracture					

The above-mentioned information is a recommendation only. The operating surgeon is solely responsible for selecting the appropriate implant for the specific case.

Instrument Application

General Instrument Application

Plate Pick-Up

The plates can be manually removed from the implant container or with the help of the plate holding forceps (A-2050). These forceps have a crossed end and will open when pressure is applied. The plates are kept force-free in the holding channel of the forceps tip.

A-2050
2.0–3.5 Plate Holding Forceps

Bending

If required, the plates can be bent with the plate bending pliers.
Depending on the associated system size of the plate there are two different plate bending pliers.

Type 1 for 2.0–2.8 TriLock plates
Plate bending pliers with pins (A-2047)

A-2047
2.0–2.8 Plate Bending Pliers, with Pins

Type 2 for 3.5 TriLock plates
Plate bending pliers (A-2940)

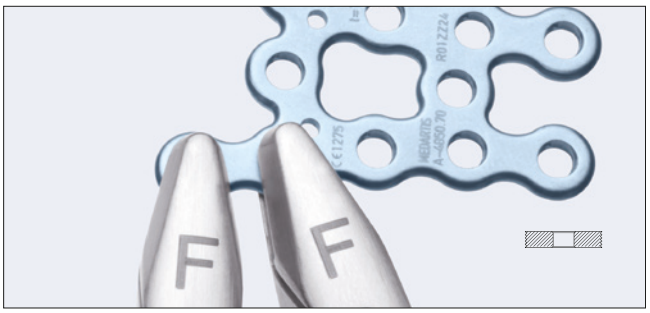
A-2940
3.5/4.0 Plate Bending Pliers

Warning
Wrong bending of the plate may lead to impaired functionality and postoperative construct failure.

The plate bending pliers are always used in pairs.

Plate bending pliers for 2.0–2.8 TriLock plates
The labeled side of the plate must always face upwards when inserting the plate into the bending pliers (A-2047).

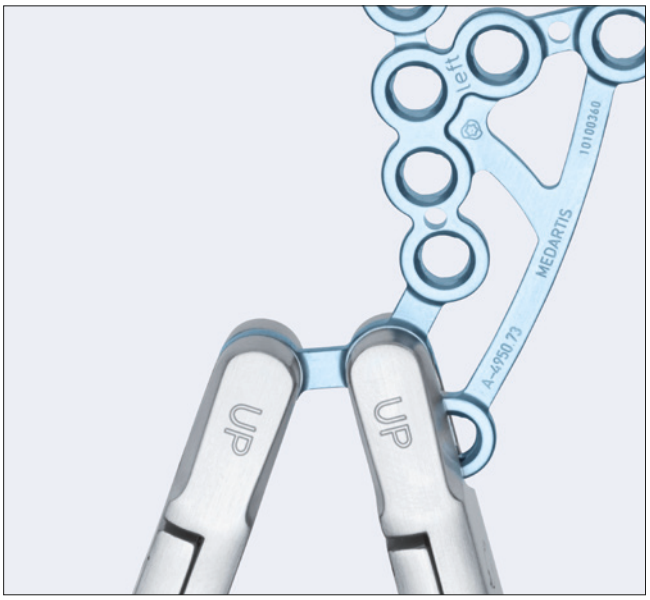
When bending flat plates (wing plates), the plate bending pliers must be held so that the letters “F – FLAT PLATE THIS SIDE UP” are legible from above. This ensures that the plate holes are not damaged.



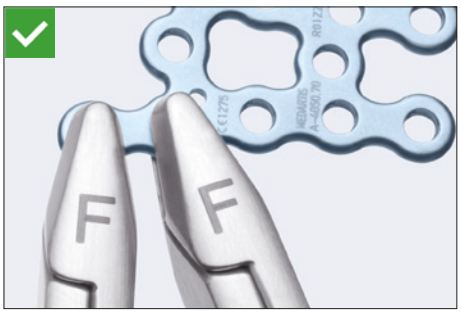
When bending a curved plate, the plate bending pliers must be held so that the letters “C – CURVED PLATE THIS SIDE UP” are legible from above. This ensures that the plate holes are not damaged.

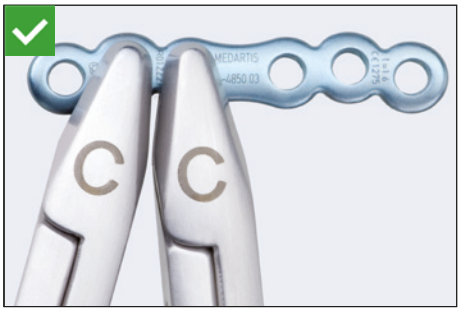
Plate bending pliers for 3.5 TriLock plates
The labeled side of the plate must always face upward when inserting the plate into the bending pliers (A-2940).

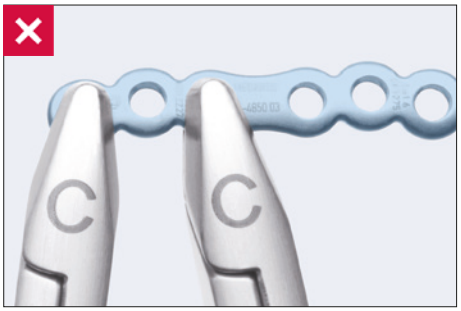
When bending 3.5 TriLock plates, the plate bending pliers must be held so that the letters “UP” are legible from above. This ensures that the plate holes are not damaged.

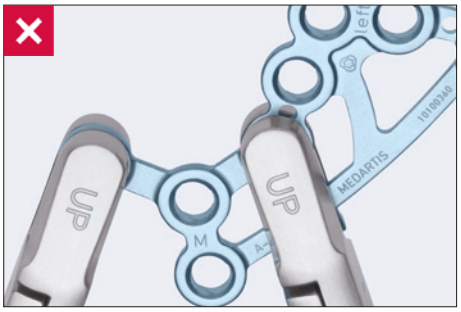


Notice
While bending, the plate must always be held at two adjacent holes to prevent contour deformation of the intermediate plate hole.







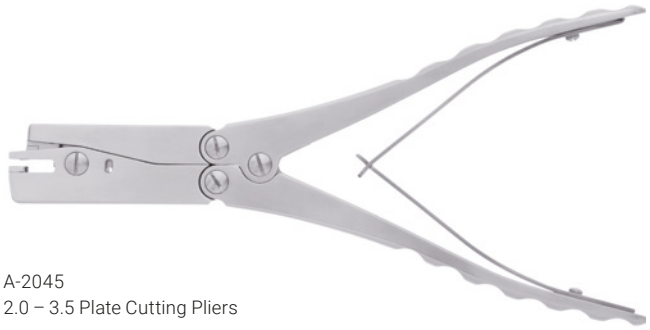


Warning
Do not bend the plate by more than 30°. Bending the plate further may deform the plate holes and may cause the plate to break postoperatively.

Warning
Repeatedly bending the plate in opposite directions may cause the plate to break postoperatively.
Always use the provided plate bending pliers to avoid damaging the plate holes. Damaged plate holes prevent correct and secure seating of the screw in the plate and increase the risk of system failure.

Cutting

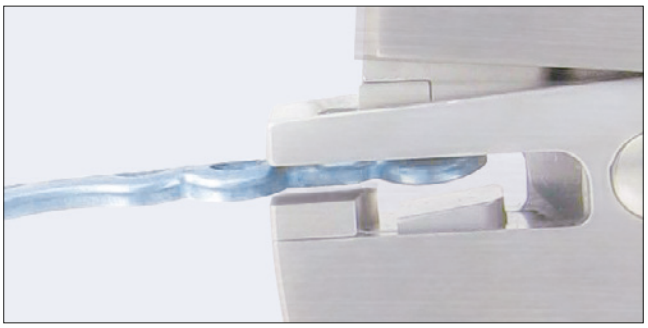
If required, the plate cutting pliers (A-2045) can be used to cut all plates (except 2.0/2.3 and 2.8 TriLock Grid plates and TriLock TMT-1 fusion plates) as well as K-wires up to a diameter of 2.0 mm.



A-2045
2.0 – 3.5 Plate Cutting Pliers

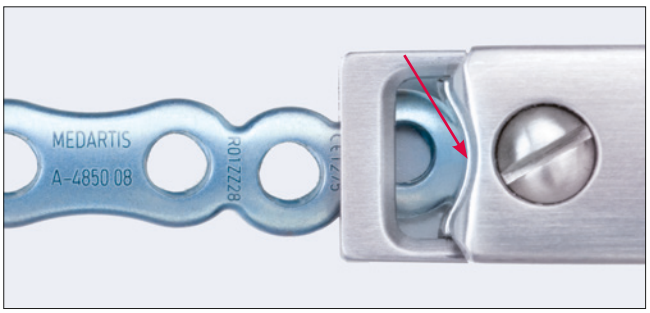
Ensure that there are no remaining plate segments in the cutting pliers (visual check). Insert the plate from the front into the open cutting pliers. Always ensure that the labeled side of the plate is facing upwards. Hold the implantable plate segment with your hand during and after cutting.

Recommendation
To facilitate the insertion of the plate, support the cutting pliers slightly with your middle finger.



You can visually check the desired cutting line through the cutting window in the head of the pliers. Always leave enough material on the rest of the plate to keep the adjacent hole intact.

Always cut the plate holes individually. If two plate holes need to be cut off, two cutting procedures are necessary.



Warning
Wrong cutting of the plate may result in sharp edges and lead to injuries of the surrounding tissues.

Shorten the K-wires by inserting the wire through the opening located on the side of the plate cutting pliers. Cut the wire by pressing the pliers.

Drilling

Color-coded twist drills are available for every APTUS system size. All twist drills are color coded with a ring system.

System Size	Color Code
2.0	Blue
2.3	Brown
2.8	Orange
3.5	Green

There are two different types of twist drills for every system size: The core hole drills are characterized by one colored ring. The gliding hole drills (for lag screw technique) are characterized by two colored rings.

Screw Size	Screw Type	Color Code on Instrument	Twist Drill for Core Hole (one colored ring)	Twist Drill for Gliding Hole (two colored rings)	Drill Guide
2.0	TriLock	Blue	 A-3414, A-3424, A-3434 Twist Drills Ø 1.6 mm		 A-2021 2.0/2.3, 2.8 Drill Guide
2.3	Cortical	Brown	 A-3510, A-3512, A-3520, A-3530 Twist Drills Ø 1.9 mm	 A-3513, A-3521, A-3531 Twist Drills Ø 2.35 mm (for Gliding Hole)	 A-2022 2.0/2.3, 2.8 Drill Guide for Lag Screws
2.8	Cortical + TriLock	Orange	 A-3832 Twist Drill Ø 2.35 mm	 A-3834 Twist Drill Ø 2.9 mm (for Gliding Hole)	 A-2026 2.5/2.8 Drill Guide TriLock^{PLUS}  A-2820 2.8 Drill Guide
3.5	Cortical + TriLock	Green	 A-3931 Twist Drill Ø 3.0 mm	 A-3933 Twist Drill Ø 3.6 mm (for Gliding Hole)	 A-2920 3.5 Drill Guide

The self-holding drill sleeve (A-2826, A-2921) can be locked with a clockwise turn in the TriLock holes of the plate (no more than ± 15°). It thus performs all of the functions of a drill guide without the need to be held.

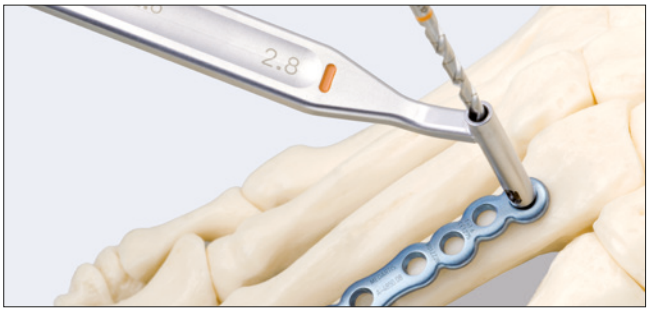
A-2826
2.5 / 2.8 Drill Sleeve, Self-Holding

A-2921
3.5 Drill Sleeve, Self-Holding

Warning
The twist drill must always be guided by the drill guide (A-2021, A-2022, A-2026, A-2820, A-2920) or the self-holding drill sleeve (A-2826, A-2921). This prevents damage to the screw hole and protects the surrounding tissue from direct contact with the drill. The drill guide also serves to limit the pivoting angle.

The double-ended drill guide (A-2022) can be used for all screw holes and for the insertion of independent screws (e.g. fragment fixation with screws alone).

After positioning the plate, insert the drill guide and the twist drill into the screw hole.



Warning
For TriLock plates ensure that the screw holes are predrilled with a pivoting angle of no more than ± 15°. For this purpose, the drill guides show a limit stop of ± 15°. A predrilled pivoting angle of > 15° no longer allows the TriLock screws to correctly lock in the plate.

Assigning the Screw Length

The depth gauges (A-2031, A-2837) are used to assign the ideal screw length for use in monocortical or bicortical screw fixation.

System	Corresponding Depth Gauge
Fore- and Midfoot System 2.0/2.3, 2.8	A-2031
Hallux System 2.8	A-2837
Calcaneus System 3.5	A-2930

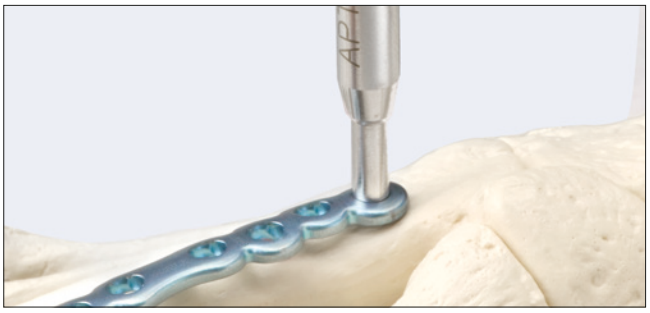
A-2031
2.0 – 2.8 Depth Gauge

A-2837
2.8 Depth Gauge

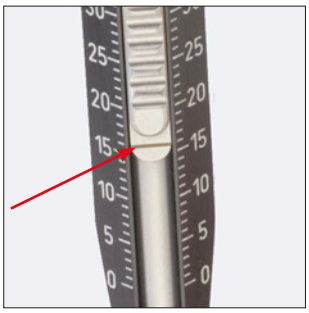
A-2930
3.5 / 4.0 Depth Gauge

Retract the slider of the depth gauge.
The depth gauge caliper has a hooked tip that is either inserted to the bottom of the hole or is used to catch the far cortex of the bone. When using the depth gauge, the caliper stays static, only the slider is adjusted.

To assign the screw length, place the distal end of the slider onto the implant plate or directly onto the bone (e.g. for fracture fixation with lag screws).



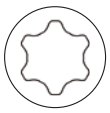
The ideal screw length for the assigned drill hole can be read on the scale of the depth gauge.



Screw Pick-Up

The screwdrivers (A-2610 and A-2810) and the screwdriver blades (A-2611, A-2013 and A-2911) feature the patented HexaDrive self-holding system.

A-2610
2.0/2.3 Screwdriver, HD6, Self-Holding



A-2810
2.8 Screwdriver, HD7, Self-Holding

A-2611
2.0/2.3 Screwdriver Blade, HD6, AO

A-2013
2.5/2.8 Screwdriver Blade, HD7, AO

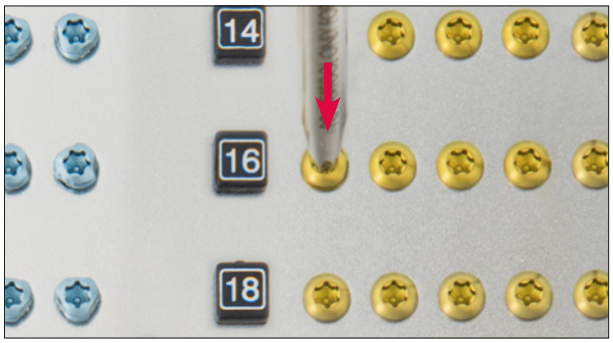
A-2073
Handle with Quick Connector, AO

A-2911
3.5/4.0 Screwdriver Blade, HD15, AO

A-2074
Handle with Quick Connector, AO

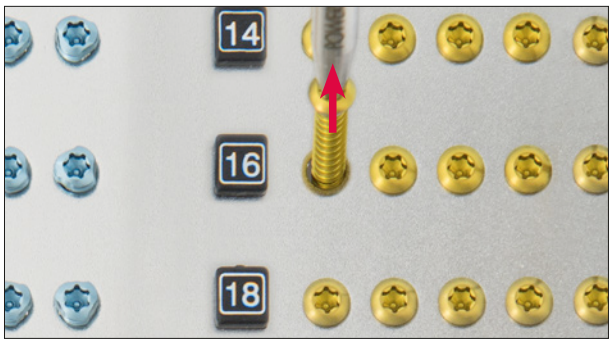
Caution
Do not use the 2.0/2.3 screwdriver blade (A-2611) and the 2.5/2.8 screwdriver blade (A-2013) with the large handle (A-2074), as the high forces generated can damage the locking of the screw head in the plate hole.

To remove the screws from the implant container, insert the appropriately color-coded screwdriver blade perpendicularly into the screw head of the desired screw and pick up the screw with axial pressure.



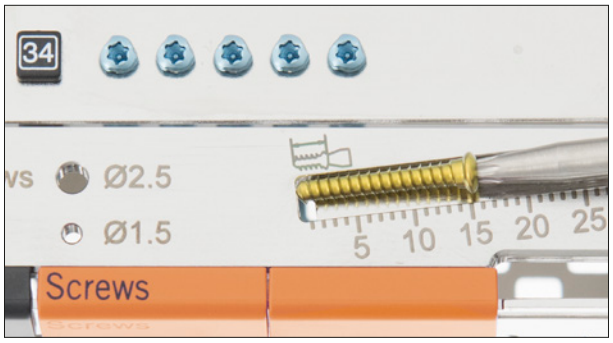
Notice
The screw will not hold without axial pressure.

Caution
Vertically extract the screw from the compartment. Picking up the screw repeatedly may lead to permanent deformation of the self-retaining area of the HexaDrive inside the screw head. Therefore, the screw may no longer be able to be picked up correctly. In this case, a new screw has to be used.



SpeedTip C-Snap screws feature a snap-off pin for connecting to a 1.8 mm K-wire driver as well as the HexaDrive self-holding technology. The HexaDrive self-holding technology is only accessible after the pin has snapped off (see chapter Specific Instrument Application – SpeedTip C-Snap Screws).

Notice
Check the screw length and diameter at the scale of the measuring module. The screw length is determined at the end of the screw head.

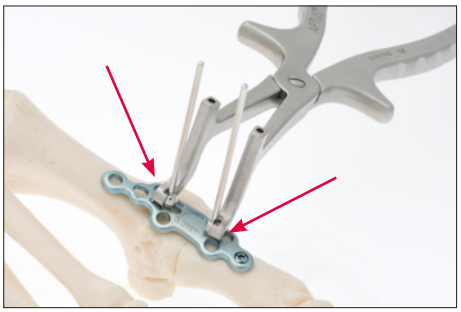


Specific Instrument Application

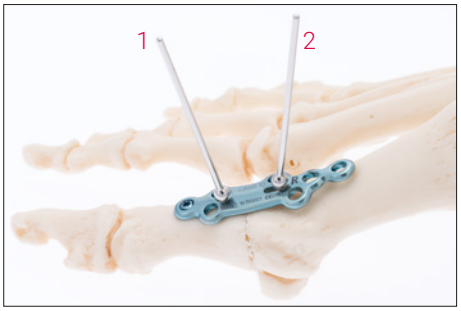
Compression and Distraction Forceps with 1.6 mm Olive K-Wires

APTUS Hallux MTP plates, MTP revision plates and TMT medial plates feature a K-wire hole and a K-wire slot for compression with 1.6 mm olive K-wires or standard 1.6 mm K-wires.

1. Using the compression and distraction forceps
When using olive K-wires (A-5045.xx), always have the curved ends of the instrument (A-2049) pointing towards the plate.



2. Inserting the olive K-wires
Align the plate and fix it on one side with a TriLock screw. Choose two olive K-wires with adequate length for bicortical fixation. Insert the first olive K-wire through the K-wire hole until the olive gets in contact with the plate surface.

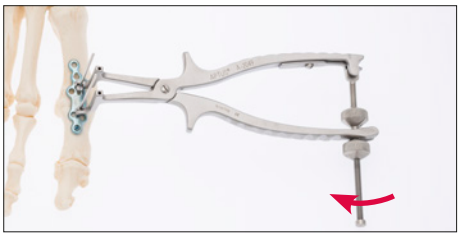


Warning
Do not overtighten the olive K-wire as this would lead to stripping of the thread inside of the bone.

Insert the second olive K-wire through the far end of the K-wire slot until the olive is in contact with the plate.

3. Applying compression
Place the curved end with the cupped mouth pieces of the compression and distraction forceps over the olives and apply a gentle compression. Slide the knurled nut into the slot of the handle. Turn the nut clockwise to gradually apply additional compression and to sustain the interfragmentary compression.

Warning
Overcompression or overdistraction could damage the bone and/or the K-wires. If the forceps are placed too high away from the bone, the K-wires may possibly bend.

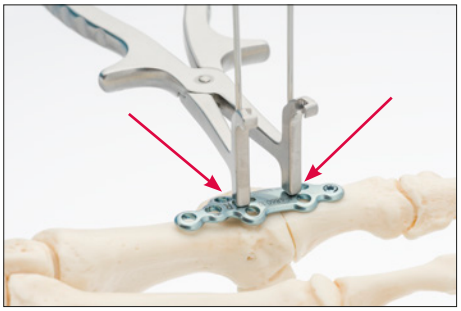


Compression and Distraction Forceps with 1.6 mm Standard K-Wires

The compression and distraction forceps (A-2049) can also be used for compression or distraction in combination with standard 1.6 mm K-wires (A-5042.41 or A-5040.41) through the holes in its jaws.

Caution
Distraction can only be carried out with standard 1.6 mm K-wires. The olive K-wires are not suitable for distraction.

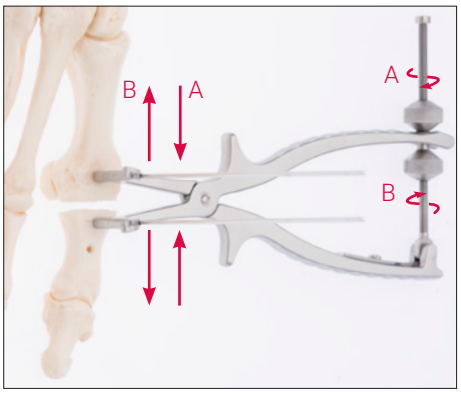
1. Using the compression and distraction forceps
Always use the compression and distraction forceps (A-2049) with the flat or straight ends towards the bone or plate. The curved ends have to point up.



2. Inserting the K-wires
Place a K-wire (A-5042.41 or A-5040.41) through the K-wire hole more or less perpendicularly to the bone surface. Slide the forceps over the wire and insert the second K-wire through the K-wire slot. The instrument should be in direct contact with the bone or the plate surface.

Alternatively: Insert both K-wires through the compression and distraction forceps using the K-wire hole and the K-wire slot as K-wire guide.

3. Applying compression or distraction
For compression (A), close the forceps until the bone fragments get into contact with each other. Slide the knurled nut into the slot of the handle and turn the nut clockwise to apply the desired compression.



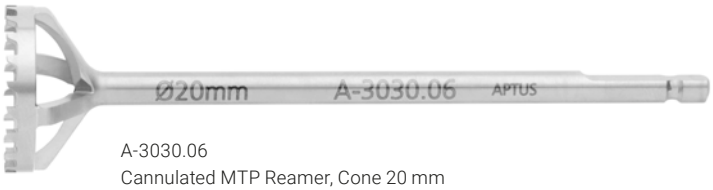
For distraction (B), pull the handles apart. Slide the knurled nut into the slot of the handle and turn the nut counterclockwise until the desired distraction is reached.

Warning
Overcompression or overdistraction could damage the bone and/or the K-wires. If the forceps is placed at a too high distance from the bone, the K-wires may possibly bend.

MTP Reamers

Cup and cone shaped reamers to prepare the MTP joint surface are available in five pairs.

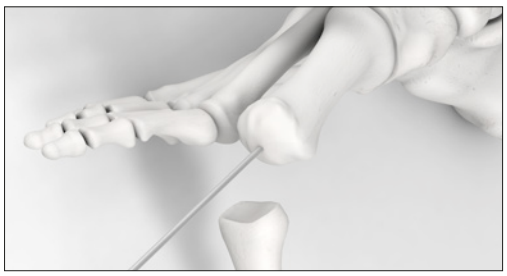
Paired sizes are:
16 mm, 18 mm, 20 mm, 22 mm und 24 mm
cannulation for 1.6 mm K-wire



A-3030.06
Cannulated MTP Reamer, Cone 20 mm

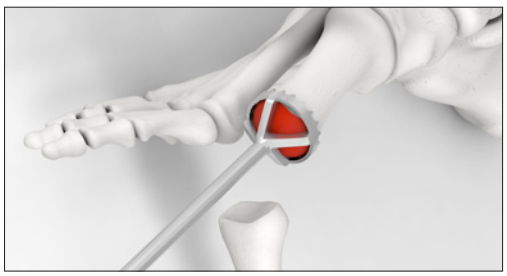
A-3030.05
Cannulated MTP Reamer, Cup 20 mm

1. Inserting the first K-wire
Insert the 1.6 mm K-wire into the first metatarsal head. Ensure the wire is coaxial to the central canal and inserted up to the diaphysis.

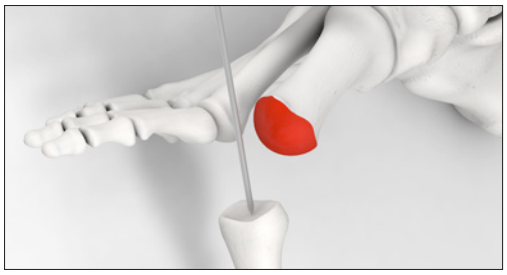


2. Proximal reaming (Cone)
Select the appropriate proximal reamer. Slide the reamer over the K-wire. Always start with a larger size and work down to a smaller size until the desired reaming is reached.

After reaming, remove the K-wire from the first metatarsal.



3. Inserting the second K-wire
Insert a K-wire into the center of the proximal phalange. Ensure the K-wire is coaxial to the central canal and inserted further than the desired reaming depth.



4. Distal reaming (Cup)
Slide the appropriate distal reamer (same diameter as MTP reamer Cone) over the K-wire and ream until the cartilage is removed from the joint.

Caution
Do not ream too deep in order to avoid length loss. Ream, however, deep enough to remove the cartilage.

Surgical Techniques

General Surgical Techniques

Lag Screw Techniques

Two lag screw techniques can be used, depending on the implant.

Warning
Incorrect application of the lag screw techniques may result in postoperative loss of reduction.

Lag Screw Technique Using Cortical Screws

The drill guides for lag screws are used to perform the classic lag screw technique according to AO/ASIF.

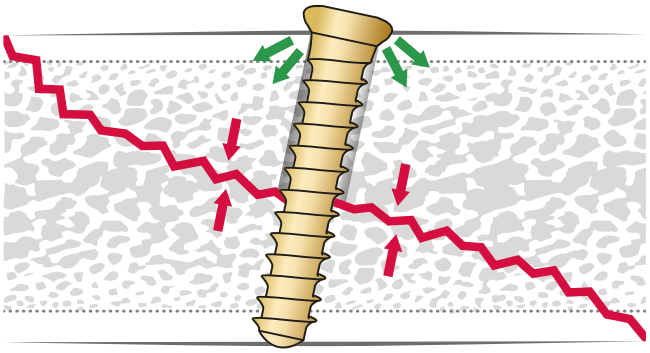
System	Screw Size	Drill Guide for Lag Screw
Fore- and Midfoot System 2.0/2.3, 2.8	2.0/2.3, 2.8	 A-2022
Hallux System 2.8	2.8	 A-2820
Calcaneus System 3.5	3.5	 A-2920

1. Drilling the gliding hole
The Fore- and Midfoot System has a special drill guide for drilling gliding holes (A-2022; labeled with “LAG”). With the Hallux System 2.8, use the end of the drill guide A-2820 labeled with “LAG”. With the Calcaneus System 3.5, use the end of the drill guide A-2920 with two green bars (also labeled with “LAG”). Use the twist drill for gliding holes (two colored rings) of the required system size to drill perpendicular to the fracture line.

Do not drill further than to the fracture line.

2. Drilling the core hole
After fracture reduction, insert the other end of the drill guide (A-2021, A-2820 or A-2920) onto the drilled gliding hole and use the twist drill for core holes with one ring (A-3510, A-3512, A-3520, A-3530, ∅ 1.9 mm, A-3832, ∅ 2.35 mm, A-3934, ∅ 2.6 mm) to drill the core hole.

3. Compressing the fracture / osteotomy
Compress the fracture with the corresponding cortical screw.



4. Optional steps before compression
If required, use the corresponding countersink (A-3835 or A-3930) to create a recess in the bone for the screw head.

Caution
Use the handle (A-2073 or A-2074) instead of a power tool to reduce the risk of countersinking too far through the near cortex.

Warning
If the cortical bone is soft, a washer (A-4700.70/1) can be used in order to distribute the lag forces over a larger surface of the bone around the screw hole.

Lag Screw Technique Using Lag Screws

4.0 transfixation screws (A-5936.xx) can be used as independent lag screws.

1. Drilling the core hole
Use the twist drill (A-3832) to drill the core hole in combination with the drill guide (A-2820). There is no need of an additional gliding hole drilling.

2. Compressing the fracture/arthrodesis
Insert the transfixation screw of the corresponding length until reaching the desired compression in the bone gap.

3. Optional steps before compression
If required, use the countersink (A-3930) to create a recess in the bone for the screw head.

A-3930

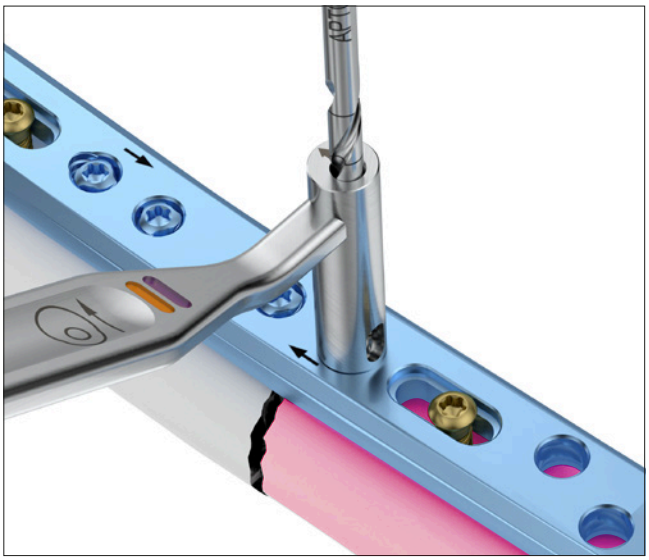
Caution
Use the handle (A-2073 or A-2074) instead of a power tool to reduce the risk of countersinking too far through the near cortex.

TriLock^{PLUS}

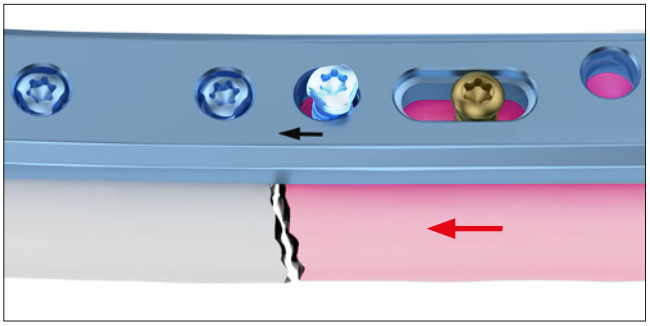
TriLock^{PLUS} holes are available on all MTP fusion plates (A-4860.10–19) and the medial TMT-1 fusion plates (A-4860.30–31).

TriLock^{PLUS} allows for 1 mm compression and angular stable locking in one step.

For this technique, a TriLock screw, the 2.5/2.8 drill guide TriLock^{PLUS} (A-2026) and a plate with a TriLock^{PLUS} hole are required. The TriLock^{PLUS} holes and the respective end of the drill guide are both marked with an arrow indicating the direction of the compression. Before using a TriLock^{PLUS} hole, ensure that there is no fixation on the TriLock^{PLUS} side, and fix the plate with at least one TriLock screw on the opposite side of the fracture or osteotomy line.

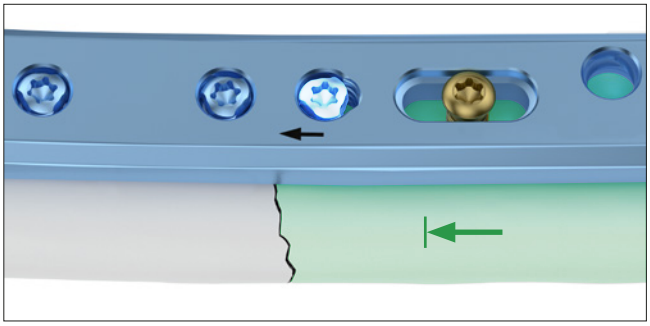


1. Positioning the drill guide in the plate
Following the direction of the compression, insert the 2.5/2.8 drill guide TriLock^{PLUS} perpendicular to the plate. The arrow on the drill guide and the plate both indicate the direction of the compression.



Warning
Correct compression is only achieved if the drill guide is inserted in a 90° angle into the plate.

2. Drilling through the drill guide TriLock^{PLUS}
Use the twist drill for core holes (A-3832) to completely drill through the bone (bicortically).



3. Inserting the screw and locking in final position
Insert a TriLock screw into the predrilled hole. Axial compression starts as soon as the screw head touches the plate. The final position is reached when the screw is locked into the TriLock screw hole.

TriLock^{PLUS} holes can also be used as conventional TriLock holes allowing for multidirectional (±15°) and angular stable locking with TriLock screws or for the insertion of cortical screws. For conventional drilling, use the respective end of the drill guide (A-2026, A-2820), see also chapter Drilling.

2.0, 2.8 SpeedTip C Screws

SpeedTip is the patented technology of self-drilling screws. SpeedTip C screws feature a partially threaded shaft for compression. All SpeedTip C screws are available with standard HexaDrive interface.

A-5411.xx
2.0 SpeedTip C Screw, HD6

A-5811.xx
2.8 SpeedTip C Screw, HD7

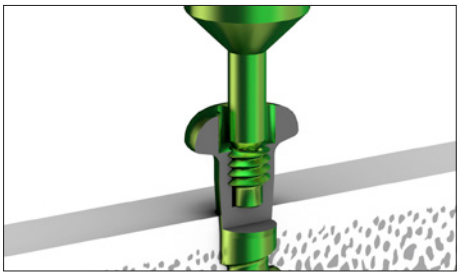
2.0 SpeedTip C-Snap Screws

A-5417.xx
2.0 SpeedTip C-Snap Screw, HD6

SpeedTip C-Snap screws feature a snap-off pin for insertion using a K-wire driver.

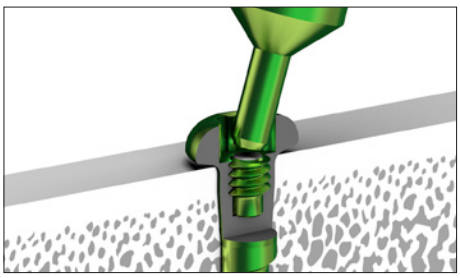
1. Picking up the SpeedTip C-Snap screw
After assigning the screw length, pick up the SpeedTip C-Snap screw using a K-wire driver (Ø 1.8 mm) or an appropriate three-jaw chuck.

2. Inserting the screw
Advance the SpeedTip C-Snap screw until the head is flush and the snap-off occurs.

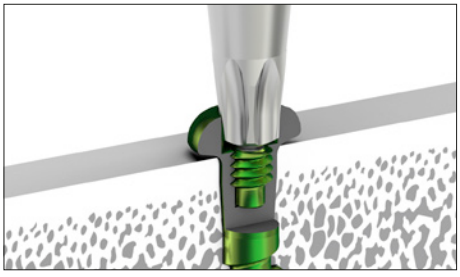


Caution
In the case of very hard bone, the snap-off can occur even before reaching the final position (see Step 4).

3. Manual snap-off (optionally)
In patients with soft or osteoporotic bone, it might be necessary to break off the pin manually from the screw by tilting off the snap-pin.



4. Final tightening (optionally)
After the pin is separated from the screw, final tightening can be done manually using the HexaDrive screwdriver HD6 (A-2610 or A-2611 with A-2073).



Use the power tool to insert SpeedTip C and SpeedTip C-Snap screws only.

Warning
Under no circumstances may it be used for inserting TriLock screws or cortical screws.

Specific Surgical Techniques

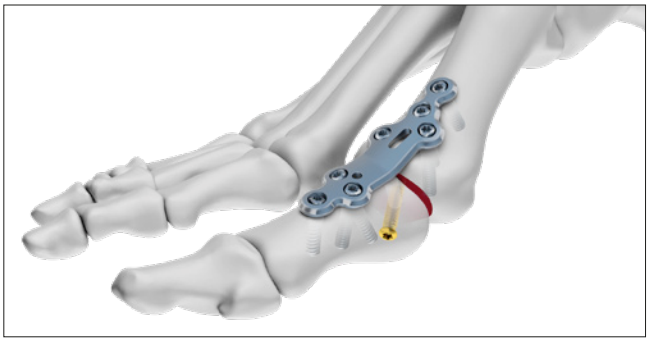
2.8 TriLock MTP Fusion Plates (A-4860.10–15) and MTP Revision Plates (A-4860.16–19)

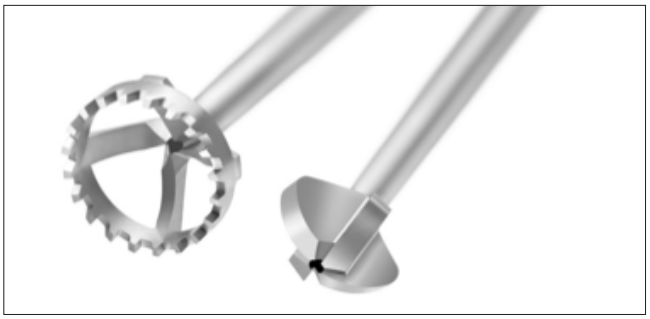
1. Preparing the joint

2.8 TriLock MTP Fusion Plates:
After making the required incisions and exposing the first metatarsal head and proximal phalanx base, bend the phalanx down and expose the joint.

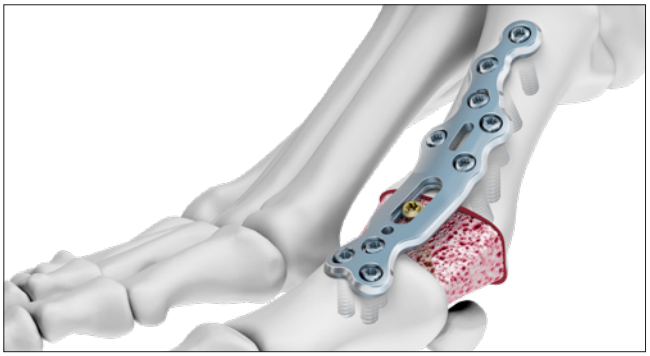
For the standard 2.8 TriLock MTP fusion plate, the joint can be prepared using cup and cone reamers. The cartilage can also be removed by hand or alternatively the bone can be prepared with the oscillating saw resulting in two parallel cuts.

For preparing the joint using the cup and cone shaped MTP reamers see chapter Specific Instrument Application– MTP Reamers.





2.8 TriLock MTP Revision Plates:
For the 2.8 TriLock MTP revision plate, prepare the revised joint and debride the cavity to healthy bone.
Insert a 1.6 mm K-wire (A-5040.41 or A-5042.41) to align the toe and establish the desired length of the toe after the arthrodesis. Varus/valgus and flexion positions can also be estimated.



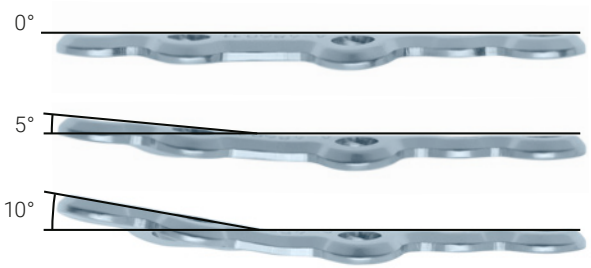
Determine the size of the bone graft to be placed in the cavity and sculpt the graft to the desired shape.
Be sure to account for the concavity of the excised bone in the metatarsal and phalanx.

Remove the K-wire and insert the bone graft into the cavity checking the varus/valgus and dorsiflexion positions.

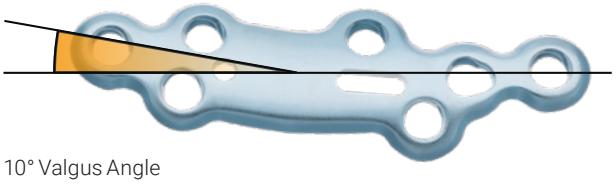
Insert a 1.6 mm K-wire to hold the toe and the graft in its optimal position.

2. Selecting and positioning the plates

2.8 TriLock MTP Fusion Plates:
Select the APTUS MTP fusion plate with the suitable dorsiflexion angle (0°, 5°, 10°) to allow for the desired level of correction.



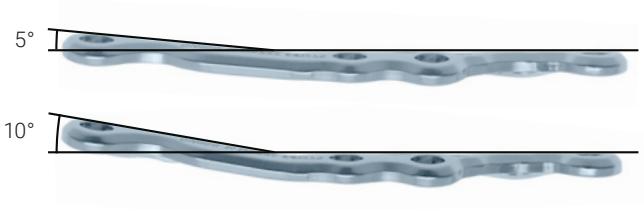
Three Defined Dorsiflexion Angles



10° Valgus Angle

Check the position of the arthrodesis (5° valgus, 5–10° dorsiflexion, neutral rotation) with simulated weight-bearing.

2.8 TriLock MTP Revision Plates:
Select the APTUS MTP revision plate with the suitable dorsiflexion angle (5° or 10°) to allow for the desired level of correction.



Two Defined Dorsiflexion Angles

3. Temporary fixation of the plate
The selected APTUS MTP fusion or MTP revision plate can be temporarily fixed in the desired position using 1.6 mm K-wires (A-5040.41 or A-5042.41) or 1.6 mm olive K-wires (A-5045.41/1–47/1).

4. Compressing the joint

Compression of the joint with compression forceps:
APTUS MTP fusion and MTP revision plates feature a K-wire hole and a K-wire slot for compression with 1.6 mm olive K-wires or standard 1.6 mm K-wires.

For applying compression using the compression and distraction forceps for olive K-wires, see chapter Specific Instrument Application – Compression and Distraction Forceps with 1.6 mm Olive K-Wires.

10° Valgus Angle

Compression of the joint with TriLock^{PLUS}:
TriLock^{PLUS} holes are available in the MTP fusion and MTP revision plates and allow for 1 mm compression and angular stable locking in one step.

For applying compression using the TriLock^{PLUS} hole in the MTP plate, see chapter General Surgical Techniques – TriLock^{PLUS}.

5. Fixing the plate and screw insertion

For 2.8 TriLock MTP Fusion Plates:
Before fixation of the plate an independent "home run" screw (oblique metatorso-phalangeal screw) can be inserted from proximal to distal and plantar to dorsal. It may also be inserted from distal to proximal, which, however, is technically more demanding.

For compression of the additional independent screw it is recommended to use the lag screw technique (see chapter General Surgical Techniques – Lag Screw Technique Using Cortical Screws).

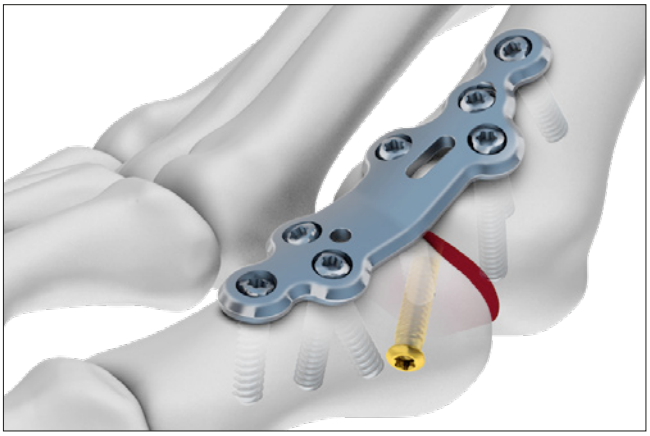
Start with screw fixation of the MTP fusion with 2.8 TriLock (A-5850.xx) or cortical (A-5800.xx) screws using the 2.8 drill guide (A-2820) or 2.8 self-holding drill sleeve (A-2826) with the twist drill ∅ 2.35 mm (A-3832).

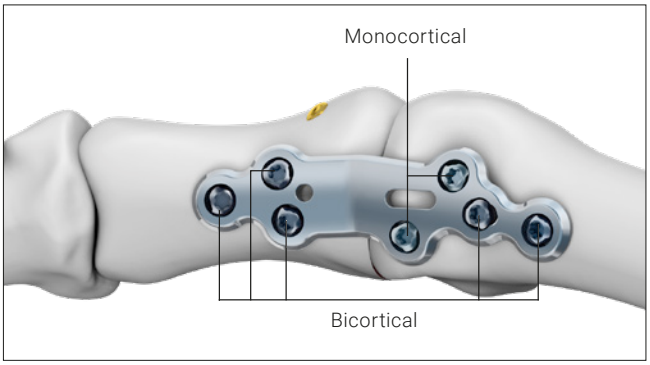
Assign the screw lengths using the 2.8 depth gauge (A-2837) and insert the screw.

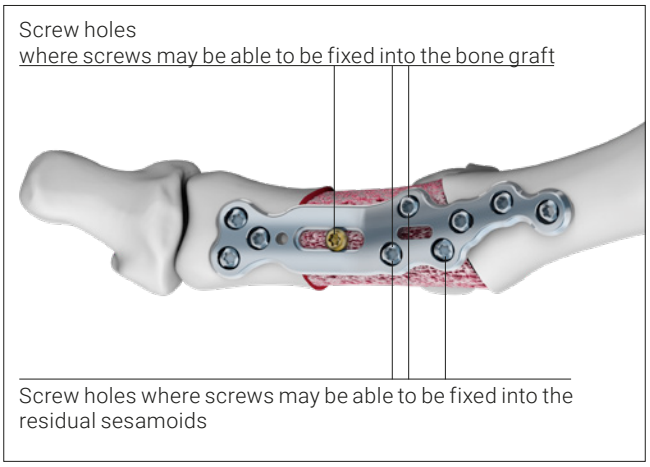
Notice
Avoid bicortical fixation of the two most distal screws in MT-1 to reduce the risk of sesamoid irritation.

For 2.8 TriLock MTP Revision Plates:
The MTP revision plate is fixed from distal to proximal with 2.8 TriLock screws (A-5850.xx).

Insert a 2.8 cortical screw (A-5800.xx) into the bone graft via the oblong hole.
The 1.6 mm K-wire can be left in position as the 2.8 TriLock screws can be angled around the K-wire.







6. Filling the remaining screw holes

Repeat the steps above to fill the remaining screw holes and remove the temporary fixation.

Warning

Insert at least three screws in each bone fragment.

2.8 TriLock Medial TMT-1 Fusion Plates

(A-4860.30–31)

1. Preparing the joint

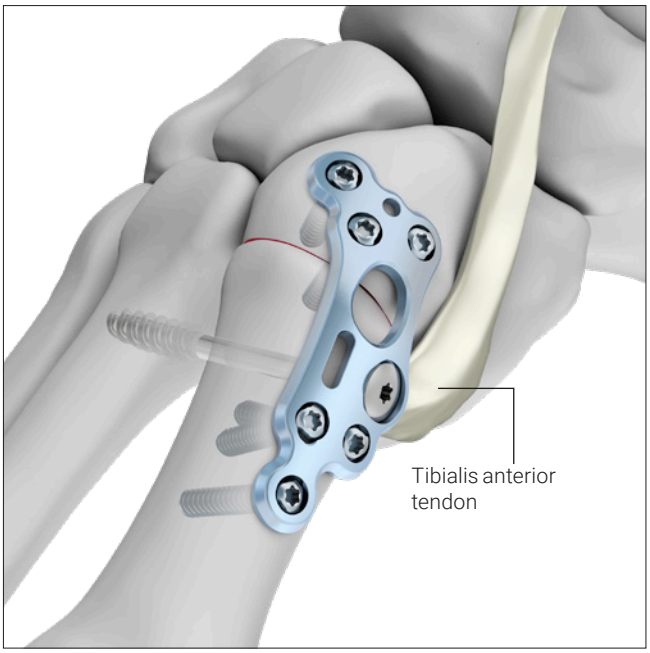
Make the required incisions and dissect down to the bone taking care not to harm the neurovascular bundle or the tibialis anterior tendon.

Remove the cartilage and prepare the joint surface for fusion by performing a subchondral parallel cut to the joint surface on the MT-1 base and a cut at the medial cuneiform, perpendicular to the longitudinal axis of MT-2.
Use this cut to achieve slight plantar flexion.

Notice

Take care to start with the cut within the cartilage in order to reduce shortening of the first ray.

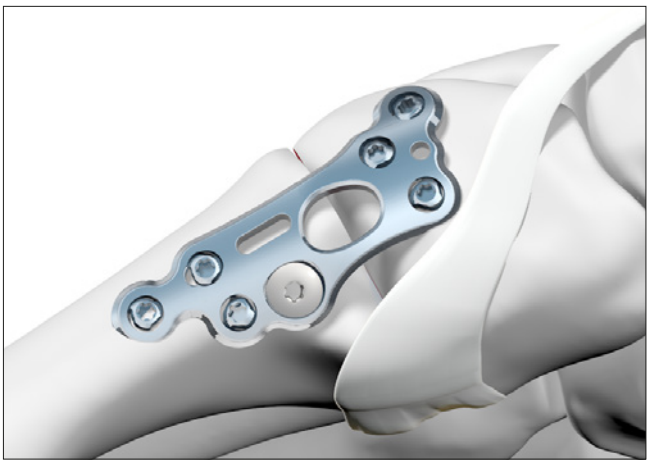
Prepare the lateral cortex of MT-1 and the medial cortex of MT-2 with an osteotome to allow for intermetatarsal bony fusion. Perform a lateral release at the MTP-1 joint.



2. Selecting and positioning the plate

Before placing the plate over the joint surface temporarily fix the arthrodesis with a 1.6 mm K-wire (A-5040.41 or A-5042.41) from the MT-1 base into the medial cuneiform.

Position the medial TMT-1 fusion plate across the joint respecting the position of the tibialis anterior tendon.



Ideal plate position

3. Temporary fixation of the plate
The medial TMT-1 fusion plate can be temporarily fixed in the desired position using 1.6 mm K-wires (A-5040.41 or A-5042.41) or 1.6 mm olive K-wires (A-5045.41/1- 47/1).

4. Compressing the joint

Compression of the joint with compression forceps:
The medial TMT-1 fusion plate features a K-wire hole and a K-wire slot for compression with 1.6 mm olive K-wires or standard 1.6 mm K-wires.

For applying compression using the compression and distraction forceps for olive K-wires see chapter Specific Instrument Application – Compression and Distraction Forceps with 1.6 mm Olive K-Wires.

Compression of the joint with TriLock^{PLUS}:
A TriLock^{PLUS} hole is available in the medial TMT-1 fusion plate and allows for 1 mm compression and angular stable locking in one step.

For applying compression using the TriLock^{PLUS} hole in the medial TMT-1 plate see chapter General Surgical Techniques –TriLock^{PLUS}.

5. Fixing the plate
Fix the plate with 2.8 TriLock or 2.8 cortical screws using the 2.8 drill guide (A-2820) or 2.8 self-holding drill sleeve (A-2826) with the twist drill ∅ 2.35 mm (A-3832).

Assign the screw lengths using the 2.8 depth gauge (A-2837).

Notice
Insert at least three screws in each bone fragment.

4.0 Transfixation Screws

Classic Lapidus arthrodesis
2.8 TriLock TMT-1 medial fusion plates (A-4860.30 and A-4860.31) have a specific hole to insert an optional transfixation screw (A-5936.xx) in the second metatarsal. This fixation from the first to the second metatarsal is also referred to as the classic Lapidus arthrodesis.

Decide if a classic Lapidus arthrodesis is indicated by applying tactile pressure with your thumb and your index/ middle finger in the space between the heads of MT-1 and MT-2.
If a gap opens under X-ray on the fusion site, a transfixation screw into MT-2 is indicated (classic Lapidus arthrodesis).

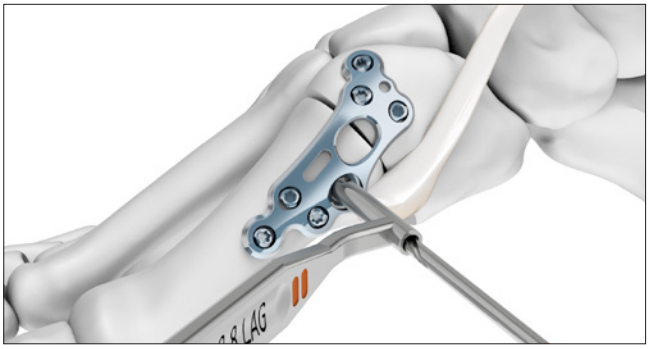
Fill the space between MT-1 or MT-2 base with either cancellous bone chips or bone material from other sites to achieve bony fusion.

1. Drilling the hole for the transfixation screw
Predrill the the hole for the transfixation screw with the twist drill (A-3832, single orange ring). Use the "LAG" end (serrated end) of the drill guide (A-2820) to center the twist drill in the transfixation hole and protect the surrounding tissue from direct contact with the drill. Drill over the entire length of MT-1 and MT-2.

Notice
Typically, an angle of 20° dorsally is needed for the ideal placement of the screw into the second metatarsal.

2. Assigning the screw length and screw insertion
Assign the screw length with the depth gauge (A-2837).

Insert transfixation screw of the determined screw length using the screwdriver blade (A-2013).



2.8 TriLock Medial TMT-1 Plantar Fusion Plates

(A-4860.36-37)

1. Preparing the joint

Perform a medial approach on the medial boarder reaching from the cuneiform to the center of the proximal phalanx of the great toe.
To estimate the height of the incision, palpate the bones of the medial column and place the incision in the lower third or alternatively orientate dorsal to the plantar foot skin.

Perform all soft tissue releases, dissections and resections according to standard surgical technique.

Remove the cartilage and prepare the joint surface for fusion by performing a subchondral parallel cut to the joint surface on the MT-1 base and a cut at the medial cuneiform, perpendicular to the longitudinal axis of MT-2.
Use this cut to achieve slight plantar flexion.

Notice

Take care to start with the cut within the cartilage in order to reduce shortening of the first ray.

2. Fixing the arthrodesis with an independent screw

Before placing the plate over the joint surface, temporarily fix the arthrodesis in the appropriate position with a 1.6 mm K-wire (A-5040.41 or A-5042.41) from distal-dorsal to proximal-plantar.

Insert a compression screw across the arthrodesis using the placed 1.6 mm K-wire as a guide for a 5.0 SpeedTip CCS. Follow the surgical procedure for CCS as described in the Surgical Technique for Cannulated Compression Screws and Headed Cannulated Compression Screws, available at www.medartis.com. .

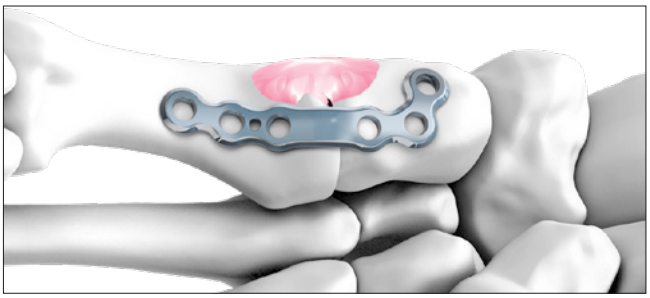
Fully insert the screw head to avoid soft tissue irritations.

Notice

A 4.0 transfixation screw (A-5936.xx) can be used alternatively as a lag screw. Countersink the screw head to avoid soft tissue irritations.

Verify the correct position of MT-1 clinically and under fluoroscopy.

3. Selecting and positioning the plate
The plate should be positioned strictly plantar. The position of the plate is determined by the tibialis anterior tendon insertion. Place the plate lateral to it. If subtle contouring of the plate is required, use the 2.0–2.8 plate bending pliers with pins (A-2047).



The self-holding drill guide (A-2826) can be used to position the plate. Additional soft tissue preparation may be necessary to correctly position the plate.

Intraoperative image

3. Temporary fixation of the plate
The TMT-1 plantar fusion plate can be temporarily fixed in the desired position using 1.6 mm olive K-wires (A-5045.41/1–47/1) in the screw holes.

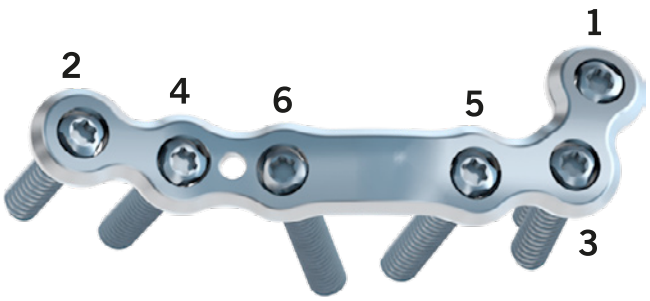
4. Fixing the plate
When fixing the plate, insert the most proximal screw first without locking to secure the position of the plate. Then insert the most distal screw, as this eases finding the position of the plate along the axis.

Fix the plate with 2.8 TriLock or 2.8 cortical screws using the 2.8 drill guide (A-2820) or 2.8 self-holding drill sleeve (A-2826) with the twist drill ∅ 2.35 mm (A-3832).

Assign the screw lengths using the 2.8 depth gauge (A-2837).

As a final step, lock the most proximal screw in the plate.

Notice
Insert at least three screws into each bone.

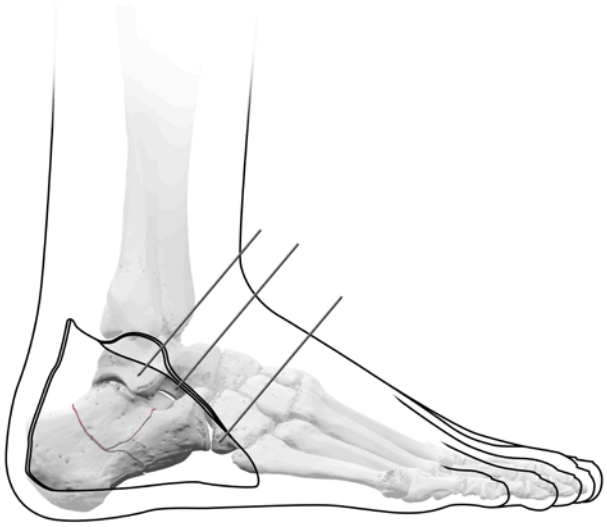


Overview of order of insertion

3.5 TriLock Calcaneus Plates

1. Surgical approach
Place the patient in lateral decubitus position with the operative extremity facing up.

Make an extensile, right-angled lateral incision with the posterior arm of the incision placed midway between the fibula and the Achilles tendon.
The horizontal arm is placed in line with the base of the fifth metatarsal.



The incision is carried straight down to the bone at its angle to allow a single, thick flap to be lifted from the periosteal surface.

The flap consists of skin and soft tissue which includes the peroneal tendons, sural nerve and the detached calcaneofibular ligament.

Notice
Meticulous handling of the soft tissue is critical.

A “no-touch” technique must be employed by retracting the flap with K-wires (A-5040/61 or A-5042.61) in the talus and in the cuboid, or by placing stay sutures to protect the soft tissues.

2. Reducing the fracture
Reduction of the fracture can be performed with the use of joysticks or Schanz screws placed into the posterior (or tuberosity) fragment. The joystick allows for traction and manipulation of the tubor out of its angulated and translated position.

All the components of the calcaneus fracture, both intraarticular and extraarticular, must be realigned and then held provisionally with multiple K-wires.

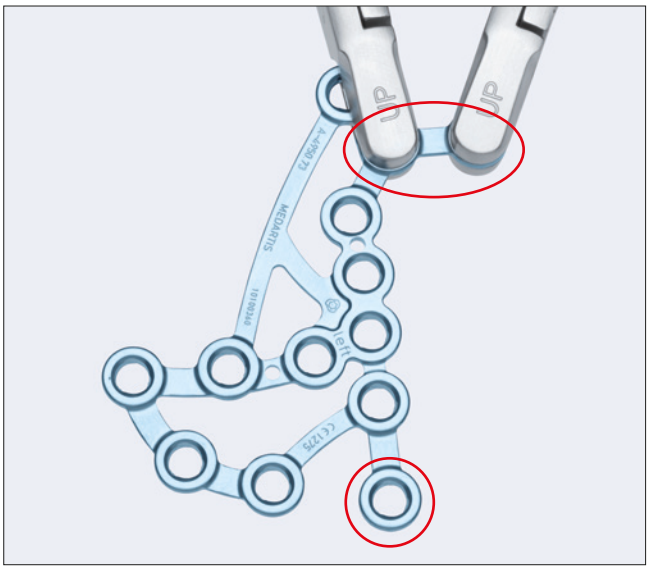
The K -wires must be placed to avoid interference with final plate placement. To accomplish this, lay a plate or template (A-4950.XXTP) on the calcaneus.

3. Selecting and positioning the plate
If fracture reduction is satisfactory, a suitable plate is selected and contoured to the calcaneus.

It is important not to bend the plate in its longitudinal axis, as the calcaneus is more or less flat.

Only the anterior or superior projections of the plate need to be bent (see chapter General Instrument Application – Bending).

If the plate needs to be cut see chapter General Instrument Application – Cutting.



4. Temporary fixation of the plate
The plate is positioned and fixed to the calcaneus using K-wires.

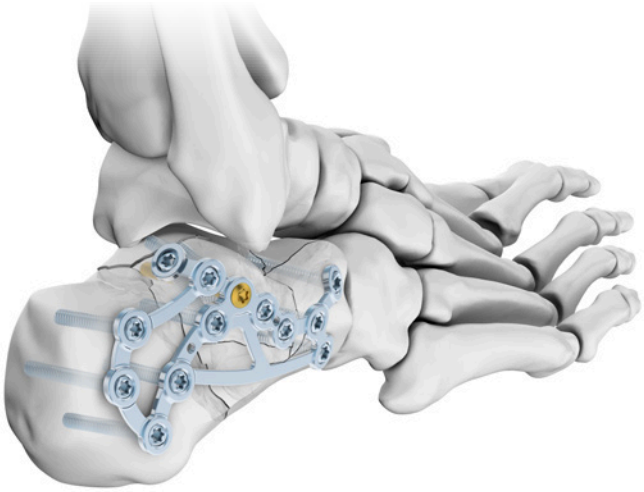
Use intraoperative X-ray control to verify the correct plate position.

5. Fixing the plate
The plate is first fixed to the tuber fragment and the anterior process.

Drill the screw holes for 3.5 TriLock (A-5950.xx) or 3.5 cortical screws (A-5900.xx) using the 3.5 drill guide (A-2920) or 3.5 self-holding drill sleeve (A-2921) with the twist drill ∅ 3.0 mm (A-3931).
Assign the screw lengths using the 3.5 depth gauge (A-2930).

A 3.5 cortical screw is inserted into the sustentaculum tali as a compression screw to pull the plate to the bone.

Fill the remaining screw holes.



Explantation

Explantation of Foot Plates

1. Removing the screws
Unlock all screws and remove them.

The order in which the screws are removed is not relevant.

In case the plate sticks to the bone, use a periosteal elevator to carefully lift and detach it from the bone.

Caution
When removing the screws, ensure that any bone ingrowth in the screw head has been removed, that the screwdriver/ screw head connection is aligned in axial direction, and that a sufficient axial force is used between blade and screw.

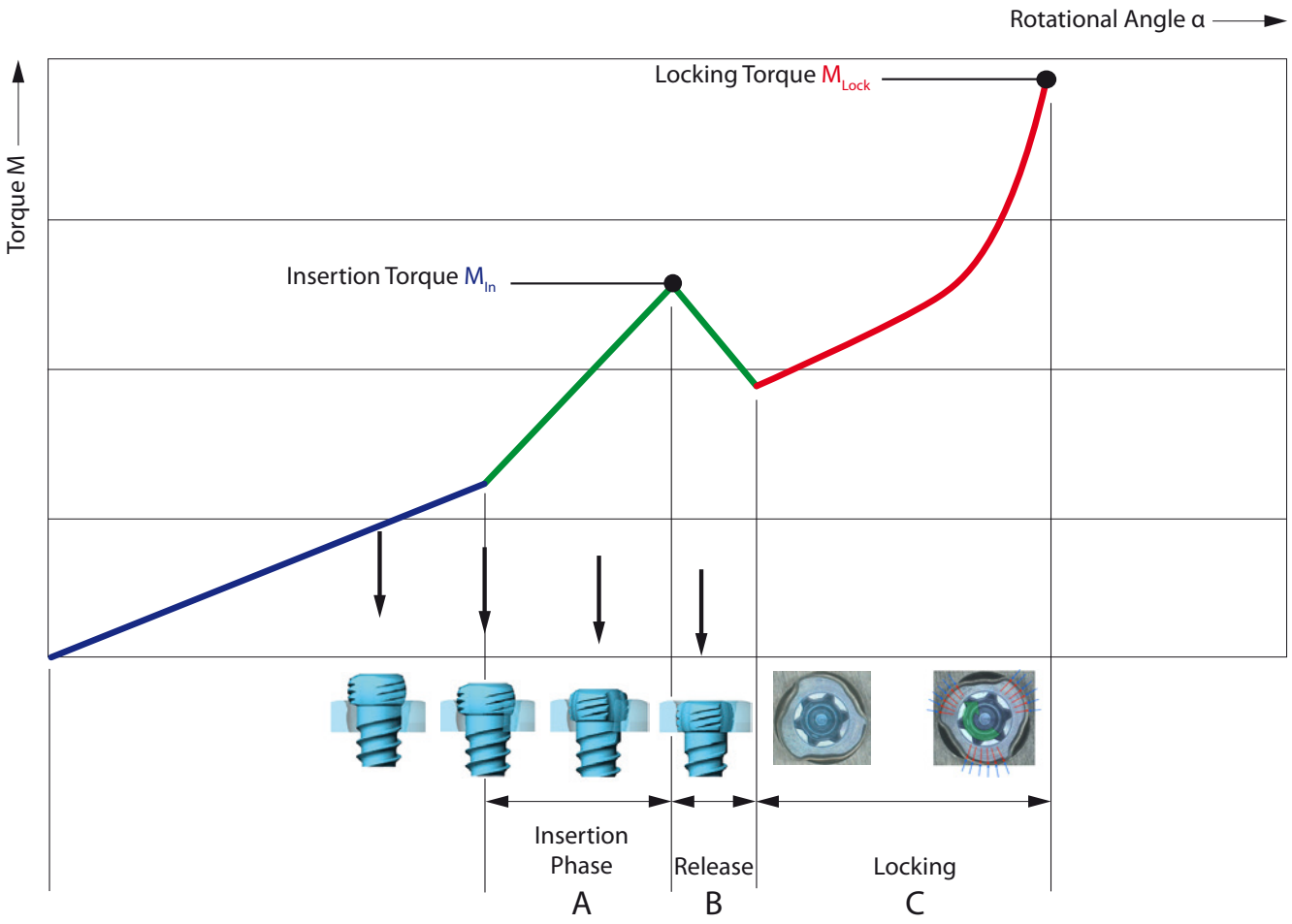
TriLock Locking Technology

Correct Application of the TriLock Locking Technology – 2.0, 2.3, 2.8 Screws

The screw is inserted through the plate hole into a predrilled canal in the bone. An increase of the tightening torque will be felt as soon as the screw head gets in contact with the plate surface.

This indicates the start of the "Insertion Phase" as the screw head starts entering the locking zone of the plate (section "A"in the diagram). Afterwards, a drop of the tightening torque occurs (section "B" in the diagram). Finally the actual locking is initiated (section "C" in the diagram) as a friction connection is established between screw and plate when tightening firmly.

The torque applied during fastening of the screw is decisive for the quality of the locking as described in section "C" of the diagram.



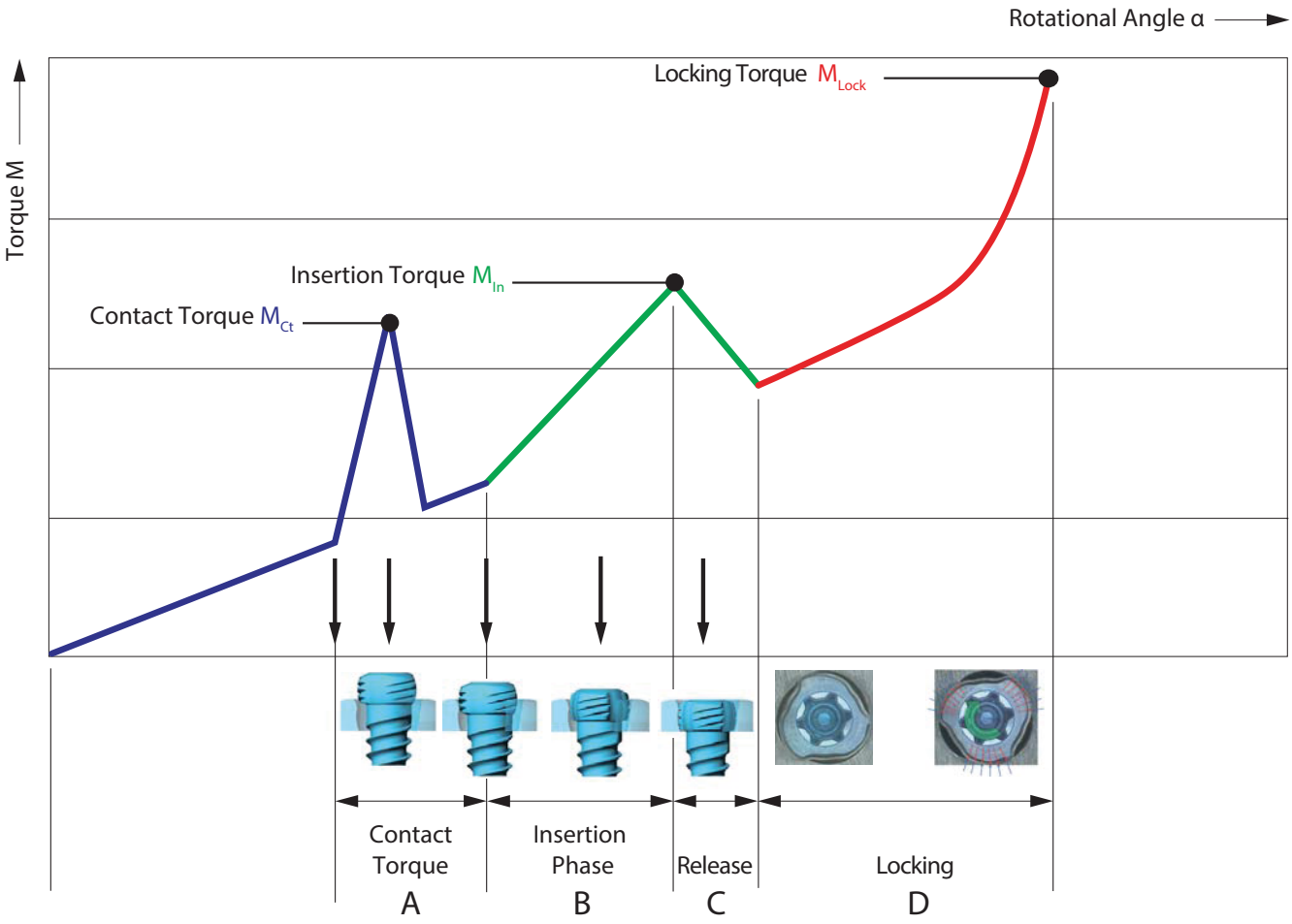
3.5 TriLock Locking Technology

Correct Application of the TriLock Locking Technology – 3.5 Screws

The screw is inserted through the plate hole into the pre-drilled bone. A “contact torque” will be felt once the screw head makes contact with the plate surface. This torque increase is easily perceived (section “A” in the diagram).

The torque then decreases before it starts increasing again during the “Insertion Phase”, as the screw head enters the locking hole (section “B” in the diagram).
Once the screw head has entered the locking hole, a second decrease of torque occurs (section “C” in the diagram). Finally, the actual locking is initiated (section “D” in the diagram) as a friction connection is established between screw and plate when tightening firmly. The torque applied in section “D” is decisive for the quality of the locking.

In summary, two intermediate torque maxima have to be overcome before the final locking of the screw.



Correct Locking (± 15°) of the TriLock Screws in the Foot System 2.0–3.5

The example below representatively depicts the correct locking position of a 2.5 screw in a straight 1.6 mm thick plate.
Correct locking occurs only when the screw head is locked flush with the locking contour (fig. 1 and 3).

However, if there is still a noticeable protrusion (fig. 2 and 4), the screw head has not completely reached the locking position. In this case, the screw has to be retightened to obtain full penetration and proper locking. In case of poor bone quality a slight axial pressure may be necessary to achieve proper locking.

After having reached the locking torque (MLock), do not further tighten the screw, otherwise the locking function cannot be guaranteed anymore.

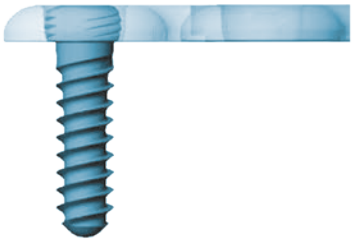


Figure 1

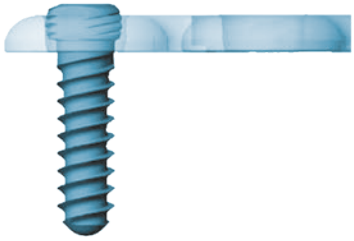


Figure 2

Figure 3

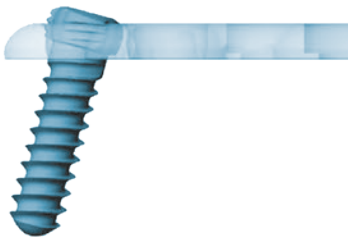


Figure 4

Implants and Instruments

2.0 SpeedTip C-Snap Screws, Self-Drilling, HexaDrive 6

Material: Titanium alloy (ASTM F136)

Length	Art. No.	Pieces / Pkg
10 mm	A-5417.10/1	1
11 mm	A-5417.11/1	1
12 mm	A-5417.12/1	1
13 mm	A-5417.13/1	1

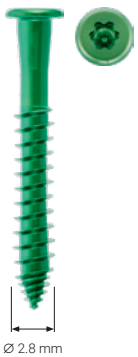
2.0 SpeedTip C Screws, Self-Drilling, HexaDrive 6

Material: Titanium alloy (ASTM F136)

Length	Art. No.	Pieces / Pkg
10 mm	A-5411.10/1	1
11 mm	A-5411.11/1	1
12 mm	A-5411.12/1	1
13 mm	A-5411.13/1	1

2.8 SpeedTip C Screws, Self-Drilling, HexaDrive 7

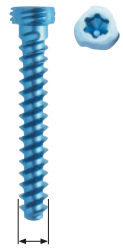
Material: Titanium alloy (ASTM F136)



Length	Art. No.	Pieces / Pkg
16 mm	A-5811.16/1	1
18 mm	A-5811.18/1	1
20 mm	A-5811.20/1	1
22 mm	A-5811.22/1	1
24 mm	A-5811.24/1	1

2.0 TriLock Screws, HexaDrive 6

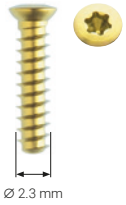
Material: Titanium alloy (ASTM F136)



Length	Art. No.	Pieces / Pkg	Art. No.	Pieces / Pkg
7 mm	A-5450.07/1	1	A-5450.07	5
8 mm	A-5450.08/1	1	A-5450.08	5
9 mm	A-5450.09/1	1	A-5450.09	5
10 mm	A-5450.10/1	1	A-5450.10	5
11 mm	A-5450.11/1	1	A-5450.11	5
12 mm	A-5450.12/1	1	A-5450.12	5
13 mm	A-5450.13/1	1	A-5450.13	5
14 mm	A-5450.14/1	1	A-5450.14	5
16 mm	A-5450.16/1	1	A-5450.16	5
18 mm	A-5450.18/1	1	A-5450.18	5
20 mm	A-5450.20/1	1	A-5450.20	5
22 mm	A-5450.22/1	1	A-5450.22	5
24 mm	A-5450.24/1	1	A-5450.24	5
26 mm	A-5450.26/1	1	A-5450.26	5
28 mm	A-5450.28/1	1	A-5450.28	5
30 mm	A-5450.30/1	1	A-5450.30	5

2.3 Cortical Screws, HexaDrive 6

Material: Titanium alloy (ASTM F136)



Length	Art. No.	Pieces / Pkg	Art. No.	Pieces / Pkg
6 mm	A-5500.06/1	1	A-5500.06	5
7 mm	A-5500.07/1	1	A-5500.07	5
8 mm	A-5500.08/1	1	A-5500.08	5
9 mm	A-5500.09/1	1	A-5500.09	5
10 mm	A-5500.10/1	1	A-5500.10	5
11 mm	A-5500.11/1	1	A-5500.11	5
12 mm	A-5500.12/1	1	A-5500.12	5
13 mm	A-5500.13/1	1	A-5500.13	5
14 mm	A-5500.14/1	1	A-5500.14	5
15 mm	A-5500.15/1	1	A-5500.15	5
16 mm	A-5500.16/1	1	A-5500.16	5
17 mm	A-5500.17/1	1	A-5500.17	5
18 mm	A-5500.18/1	1	A-5500.18	5
19 mm	A-5500.19/1	1	A-5500.19	5
20 mm	A-5500.20/1	1	A-5500.20	5
21 mm	A-5500.21/1	1	A-5500.21	5
22 mm	A-5500.22/1	1	A-5500.22	5
23 mm	A-5500.23/1	1	A-5500.23	5
24 mm	A-5500.24/1	1	A-5500.24	5
26 mm	A-5500.26/1	1	A-5500.26	5
28 mm	A-5500.28/1	1	A-5500.28	5
30 mm	A-5500.30/1	1	A-5500.30	5
32 mm	A-5500.32/1	1	A-5500.32	5
34 mm	A-5500.34/1	1	A-5500.34	5

2.8 Cortical Screws, HexaDrive 7

Material: Titanium alloy (ASTM F136)

Length	Art. No.	Pieces / Pkg	Art. No.	Pieces / Pkg
8 mm	A-5800.08/1	1	A-5800.08	5
10 mm	A-5800.10/1	1	A-5800.10	5
12 mm	A-5800.12/1	1	A-5800.12	5
14 mm	A-5800.14/1	1	A-5800.14	5
16 mm	A-5800.16/1	1	A-5800.16	5
18 mm	A-5800.18/1	1	A-5800.18	5
20 mm	A-5800.20/1	1	A-5800.20	5
22 mm	A-5800.22/1	1	A-5800.22	5
24 mm	A-5800.24/1	1	A-5800.24	5
26 mm	A-5800.26/1	1	A-5800.26	5
28 mm	A-5800.28/1	1	A-5800.28	5
30 mm	A-5800.30/1	1	A-5800.30	5
32 mm	A-5800.32/1	1	A-5800.32	5
34 mm	A-5800.34/1	1	A-5800.34	5
36 mm	A-5800.36/1	1	A-5800.36	5
38 mm	A-5800.38/1	1	A-5800.38	5
40 mm	A-5800.40/1	1	A-5800.40	5
45 mm	A-5800.45/1	1	A-5800.45	5

2.8 TriLock Screws, HexaDrive 7

Material: Titanium alloy (ASTM F136)

Length	Art. No.	Pieces / Pkg	Art. No.	Pieces / Pkg
8 mm	A-5850.08/1	1	A-5850.08	5
10 mm	A-5850.10/1	1	A-5850.10	5
12 mm	A-5850.12/1	1	A-5850.12	5
14 mm	A-5850.14/1	1	A-5850.14	5
16 mm	A-5850.16/1	1	A-5850.16	5
18 mm	A-5850.18/1	1	A-5850.18	5
20 mm	A-5850.20/1	1	A-5850.20	5
22 mm	A-5850.22/1	1	A-5850.22	5
24 mm	A-5850.24/1	1	A-5850.24	5
26 mm	A-5850.26/1	1	A-5850.26	5
28 mm	A-5850.28/1	1	A-5850.28	5
30 mm	A-5850.30/1	1	A-5850.30	5
32 mm	A-5850.32/1	1	A-5850.32	5
34 mm	A-5850.34/1	1	A-5850.34	5
36 mm	A-5850.36/1	1	A-5850.36	5
38 mm	A-5850.38/1	1	A-5850.38	5
40 mm	A-5850.40/1	1	A-5850.40	5
45 mm	A-5850.45/1	1	A-5850.45	5

2.5 / 2.8 Washer

Material: Titanium alloy (ASTM F136)

Ø 6.0 mm

Description	Art. No.	Pieces / Pkg	Art. No.	Pieces / Pkg
Concave	A-4700.70/1	1	A-4700.70	5

3.5 Cortical Screws, HexaDrive 15

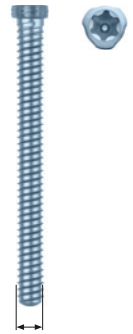
Material: Titanium alloy (ASTM F136)

Ø 3.5 mm

Length	Art. No.	Pieces / Pkg
16 mm	A-5900.16/1	1
18 mm	A-5900.18/1	1
20 mm	A-5900.20/1	1
22 mm	A-5900.22/1	1
24 mm	A-5900.24/1	1
26 mm	A-5900.26/1	1
28 mm	A-5900.28/1	1
30 mm	A-5900.30/1	1
32 mm	A-5900.32/1	1
34 mm	A-5900.34/1	1
36 mm	A-5900.36/1	1
38 mm	A-5900.38/1	1
40 mm	A-5900.40/1	1
45 mm	A-5900.45/1	1
50 mm	A-5900.50/1	1
55 mm	A-5900.55/1	1
60 mm	A-5900.60/1	1

3.5 TriLock Screws, HexaDrive 15

Material: Titanium alloy (ASTM F136)



Length	Art. No.	Pieces / Pkg
16 mm	A-5950.16/1	1
18 mm	A-5950.18/1	1
20 mm	A-5950.20/1	1
22 mm	A-5950.22/1	1
24 mm	A-5950.24/1	1
26 mm	A-5950.26/1	1
28 mm	A-5950.28/1	1
30 mm	A-5950.30/1	1
32 mm	A-5950.32/1	1
34 mm	A-5950.34/1	1
36 mm	A-5950.36/1	1
38 mm	A-5950.38/1	1
40 mm	A-5950.40/1	1
45 mm	A-5950.45/1	1
50 mm	A-5950.50/1	1
55 mm	A-5950.55/1	1
60 mm	A-5950.60/1	1

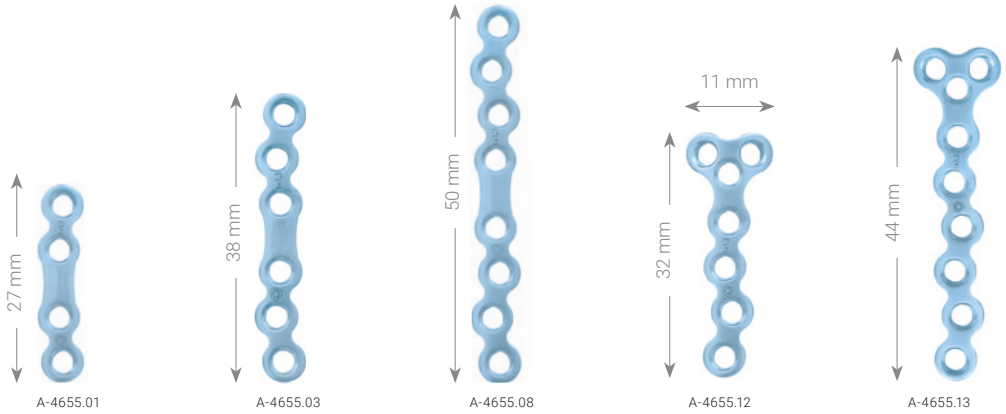
4.0 Transfixation Screws, HexaDrive 7

Material: Titanium alloy (ASTM F136)

Length	Art. No.	Pieces / Pkg
28 mm	A-5936.28/1	1
30 mm	A-5936.30/1	1
32 mm	A-5936.32/1	1
34 mm	A-5936.34/1	1
36 mm	A-5936.36/1	1
38 mm	A-5936.38/1	1
40 mm	A-5936.40/1	1
45 mm	A-5936.45/1	1

2.0 / 2.3 TriLock Plates

Material: Titanium (ASTM F67)
Plate thickness: 1.3 mm

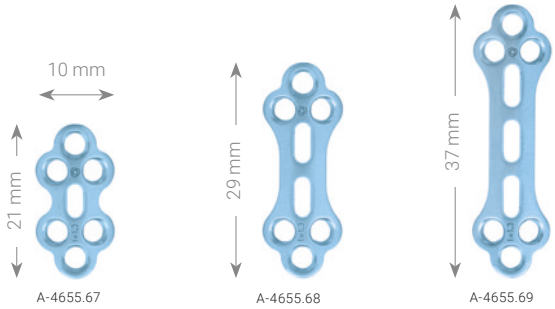


A-4655.01 A-4655.03 A-4655.08 A-4655.12 A-4655.13

Art. No.	Description	Holes	Pieces / Pkg
A-4655.01	straight	4	1
A-4655.03	straight	6	1
A-4655.08	straight	8	1
A-4655.12	T	7 (3 / 4)	1
A-4655.13	T	9 (3 / 6)	1

2.0 / 2.3 TriLock Grid Plates

Material: Titanium (ASTM F67)
Plate thickness: 1.3 mm

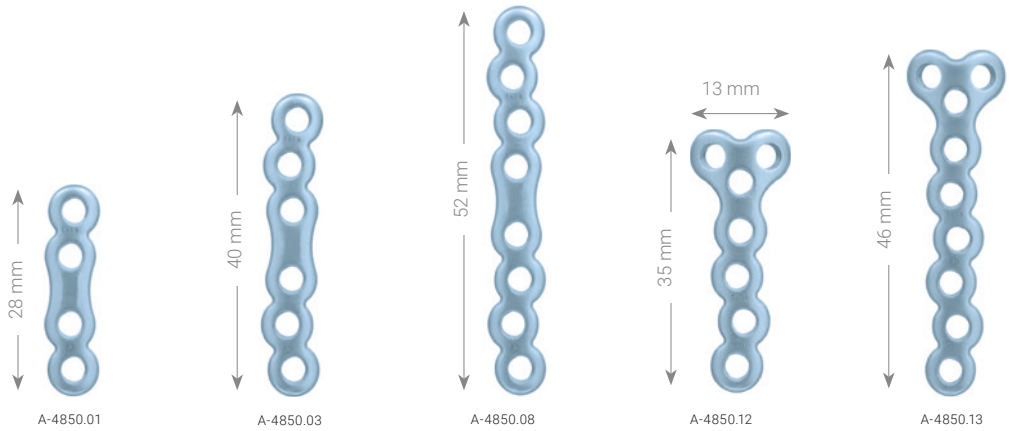


A-4655.67 A-4655.68 A-4655.69

Art. No.	Description	Holes	Pieces / Pkg
A-4655.67	Grid	6 (3 + 3)	1
A-4655.68	Grid	6 (3 + 3)	1
A-4655.69	Grid	6 (3 + 3)	1

2.8 TriLock Plates

Material: Titanium (ASTM F67)
Plate thickness: 1.6 mm

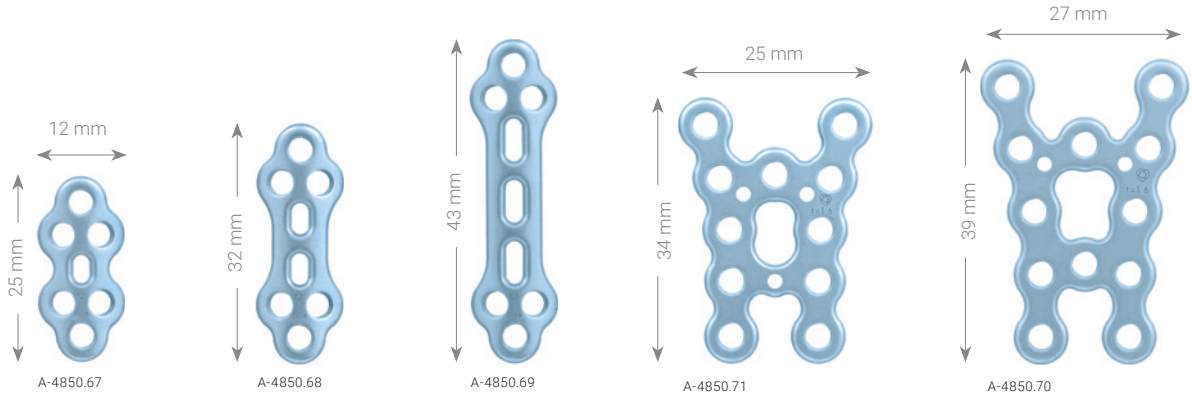


A-4850.01 A-4850.03 A-4850.08 A-4850.12 A-4850.13

Art. No.	Description	Holes	Pieces / Pkg
A-4850.01	straight	4	1
A-4850.03	straight	6	1
A-4850.08	straight	8	1
A-4850.12	T	7 (2 / 5)	1
A-4850.13	T	9 (2 / 7)	1

2.8 TriLock Grid / Wing Plates

Material: Titanium (ASTM F67)
Plate thickness: 1.6 mm

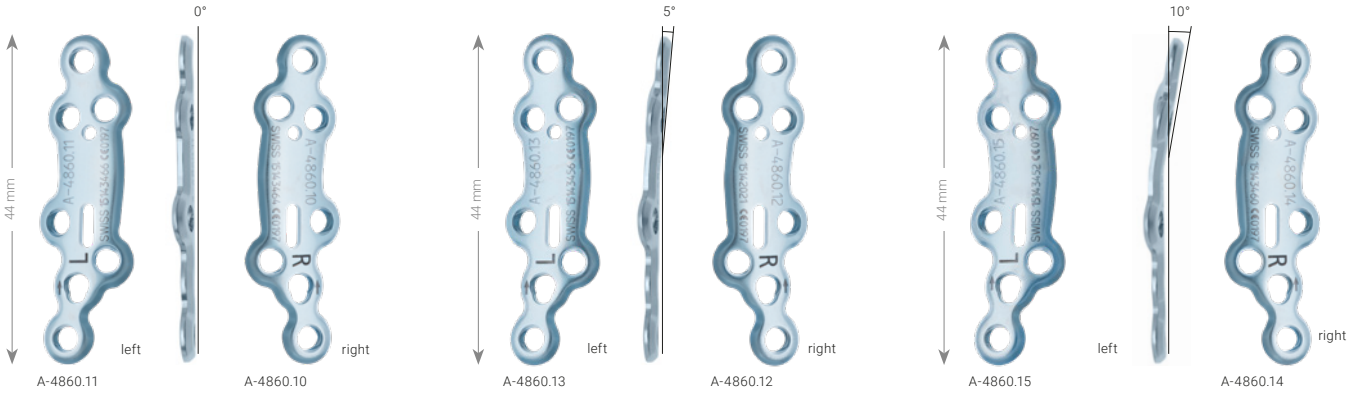


A-4850.67 A-4850.68 A-4850.69 A-4850.71 A-4850.70

Art. No.	Description	Holes	Pieces / Pkg
A-4850.67	Grid	6 (3 + 3)	1
A-4850.68	Grid	6 (3 + 3)	1
A-4850.69	Grid	6 (3 + 3)	1
A-4850.70	wing, large	12	1
A-4850.71	wing, small	11	1

2.8 TriLock MTP Fusion Plates

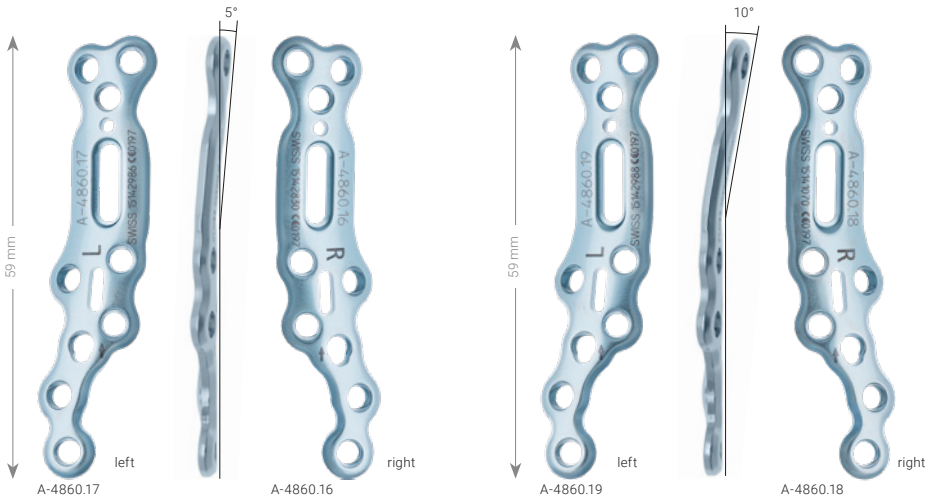
Material: Titanium (ASTM F67)
Plate thickness: 1.6 mm



Art. No.	Description	Holes	Pieces / Pkg
A-4860.10	0° dorsiflexion TriLock^{PLUS}, right	7	1
A-4860.11	0° dorsiflexion TriLock^{PLUS}, left	7	1
A-4860.12	5° dorsiflexion TriLock^{PLUS}, right	7	1
A-4860.13	5° dorsiflexion TriLock^{PLUS}, left	7	1
A-4860.14	10° dorsiflexionTriLock^{PLUS}, right	7	1
A-4860.15	10° dorsiflexion TriLock^{PLUS}, left	7	1

2.8 TriLock MTP Revision Plates

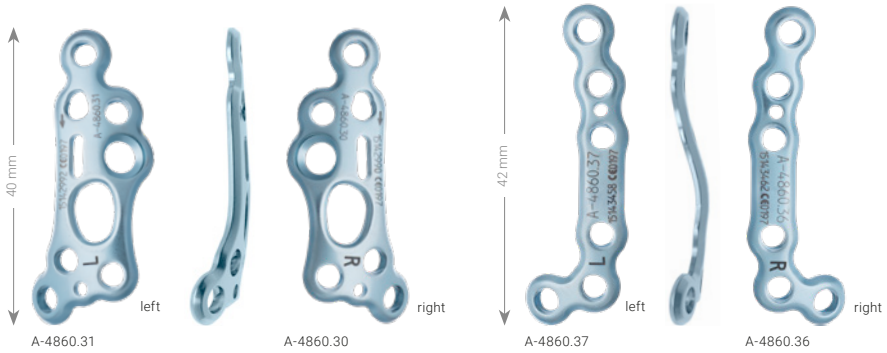
Material: Titanium (ASTM F67)
Plate thickness: 2.0 mm



Art. No.	Description	Holes	Pieces / Pkg
A-4860.16	5° dorsiflexion TriLock^{PLUS}, right	9	1
A-4860.17	5° dorsiflexion TriLock^{PLUS}, left	9	1
A-4860.18	10° dorsiflexion TriLock^{PLUS}, right	9	1
A-4860.19	10° dorsiflexion TriLock^{PLUS}, left	9	1

2.8 TriLock TMT-1 Fusion Plates

Material: Titanium (ASTM F67)
Plate thickness: 1.6 mm

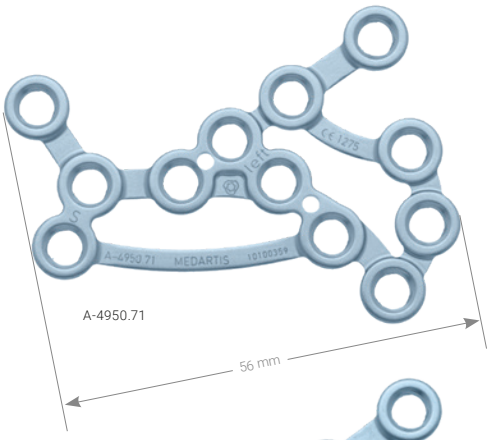


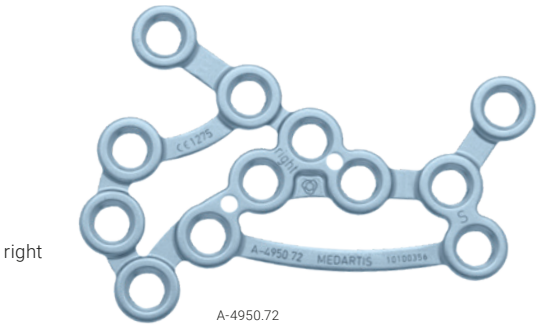
Art. No.	Description	Holes	Pieces / Pkg
A-4860.30	medial right, TriLock^{PLUS}	7	1
A-4860.31	medial left, TriLock^{PLUS}	7	1
A-4860.36	plantar right	6	1
A-4860.37	plantar left	6	1

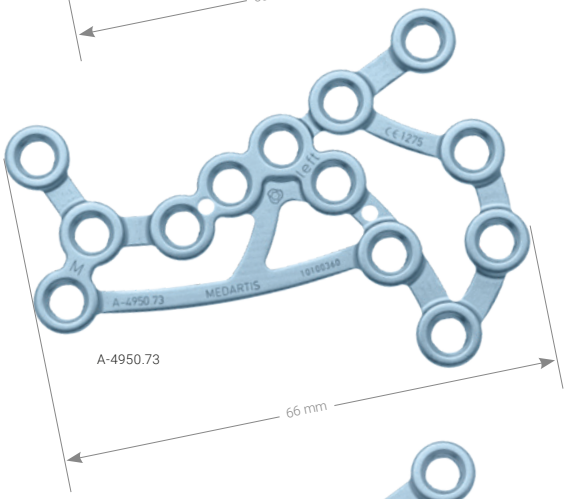
Scale 1 : 1

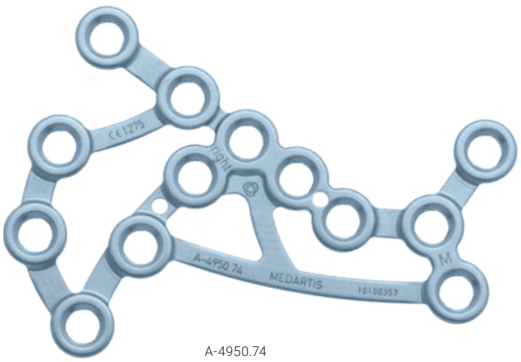
3.5 TriLock Calcaneus Plates

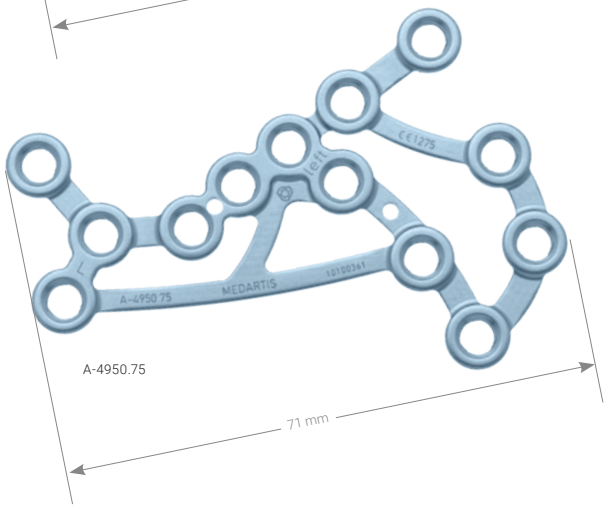
Material: Titanium (ASTM F67)
Plate thickness: 2 mm

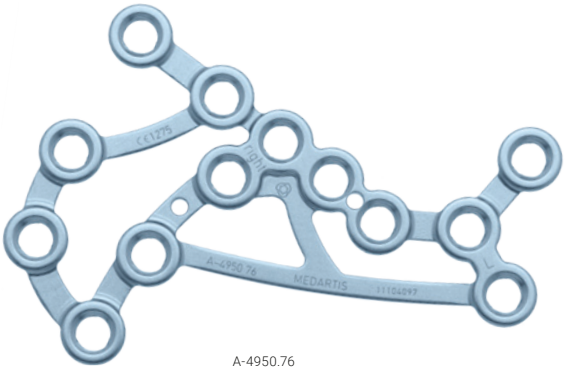












Art. No.	Description	Holes	Pieces / Pkg
A-4950.71	left, small	12	1
A-4950.72	right, small	12	1
A-4950.73	left, medium	13	1
A-4950.74	right, medium	13	1
A-4950.75	left, large	13	1
A-4950.76	right, large	13	1

Scale 1 : 1

Twist Drill ∅ 1.6 mm

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3434	2.0	30 mm	86 mm	AO Quick Coupling	1

Twist Drill ∅ 1.9 mm

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3530	2.3	35 mm	91 mm	AO Quick Coupling	1

Twist Drill ∅ 2.35 mm (for Gliding Hole)

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3531	2.3	10 mm	66 mm	AO Quick Coupling	1

Twist Drill ∅ 2.35 mm

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3832	2.8	50 mm	101 mm	AO Quick Coupling	1

Twist Drill ∅ 2.9 mm (for Gliding Hole)

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3834	2.8	10 mm	61 mm	AO Quick Coupling	1

Twist Drill ∅ 3.0 mm

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3931	3.5	70 mm	150 mm	AO Quick Coupling	1

Twist Drill ∅ 3.6 mm (for Gliding Hole)

Art. No.	System Size	Stop	Length	Shaft End	Pieces / Pkg
A-3933	3.5	30 mm	126 mm	AO Quick Coupling	1

Countersinks for Cortical Screws

A-3835

A-3930

Art. No.	Description	System Size	∅	Length	Shaft End	Pieces / Pkg
A-3835		2.8	3.7 mm	45 mm	AO Quick Coupling	1
A-3930	for 4.0 transfixation screws	3.5	6.0 mm	45 mm	AO Quick Coupling	1

MTP Reamers, Cannulated

A-3030.05

A-3030.06

Art. No.	Description	Ø	Shaft End	Pieces / Pkg
A-3030.01	Cup	16 mm	AO Quick Coupling	1
A-3030.02	Cone	16 mm	AO Quick Coupling	1
A-3030.03	Cup	18 mm	AO Quick Coupling	1
A-3030.04	Cone	18 mm	AO Quick Coupling	1
A-3030.05	Cup	20 mm	AO Quick Coupling	1
A-3030.06	Cone	20 mm	AO Quick Coupling	1
A-3030.07	Cup	22 mm	AO Quick Coupling	1
A-3030.08	Cone	22 mm	AO Quick Coupling	1
A-3030.09	Cup	24 mm	AO Quick Coupling	1
A-3030.10	Cone	24 mm	AO Quick Coupling	1

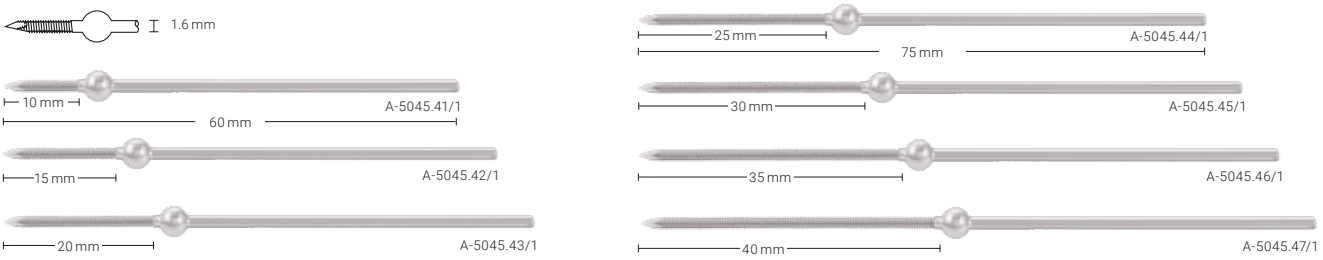
K-Wires, Trocar, Stainless Steel

Art. No.	STERILE	Ø	Length	Pieces / Pkg
A-5040.41		1.6 mm	150 mm	10
	A-5040.41/2S	1.6 mm	150 mm	2
A-5040.61		2.0 mm	150 mm	10
	A-5040.61/2S	2.0 mm	150 mm	2

K-Wires, Lancet, Stainless Steel

Art. No.	Ø	Length	Pieces / Pkg
A-5042.41	1.6 mm	150 mm	10
A-5042.61	2.0 mm	150 mm	10

Olive K-Wires, Stainless Steel



Art. No.	Ø	Thread Length	Length	Pieces / Pkg
A-5045.41/1	1.6 mm	10 mm	60 mm	1
A-5045.42/1	1.6 mm	15 mm	65 mm	1
A-5045.43/1	1.6 mm	20 mm	70 mm	1
A-5045.44/1	1.6 mm	25 mm	75 mm	1
A-5045.45/1	1.6 mm	30 mm	80 mm	1
A-5045.46/1	1.6 mm	35 mm	85 mm	1
A-5045.47/1	1.6 mm	40 mm	90 mm	1

Drill Guides

A-2021

A-2620

A-2022

A-2820

A-2026

A-2920

Art. No.	System Size	Description	Length	Pieces / Pkg
A-2021	2.0 / 2.3, 2.8		147 mm	1
A-2022	2.0 / 2.3, 2.8	for lag screws	150 mm	1
A-2026	2.5 / 2.8	TriLock PLUS	146 mm	1
A-2620	2.0 / 2.3	for cortical screws (core and gliding hole)	150 mm	1
A-2820	2.8	for cortical screws (core and gliding hole)	146 mm	1
A-2920	3.5	for cortical screws (core and gliding hole)	171 mm	1

Drill Sleeves

A-2826

A-2921

Art. No.	System Size	Description	Length	Pieces / Pkg
A-2826	2.5 / 2.8	self-holding	34 mm	1
A-2921	3.5	self-holding	50 mm	1

Depth Gauges

A-2031

A-2032

A-2837

A-2930

Art. No.	System Size	Length	Pieces / Pkg
A-2031	2.0 – 2.8	189 mm	1
A-2032	2.0 / 2.3	151 mm	1
A-2837	2.8	189 mm	1
A-2930	3.5 / 4.0	210 mm	1

Screwdrivers, Self-Holding

A-2610 HD6

A-2810 HD7

Art. No.	System Size	Interface	Length	Pieces / Pkg
A-2610	2.0 / 2.3	HD6	153 mm	1
A-2810	2.8	HD7	166 mm	1

Scale 1 : 2

Handles with Quick Connector

A-2070

A-2073

A-2074

Art. No.	Description	Length	for Shaft End	Pieces / Pkg
A-2070		119 mm	AO Quick Coupling	1
A-2073	with twist cap	125 mm	AO Quick Coupling	1
A-2074		145 mm	AO Quick Coupling	1

Screwdriver Blades, Self-Holding

A-2611 HD6 1 : 1

A-2013 HD7 1 : 1

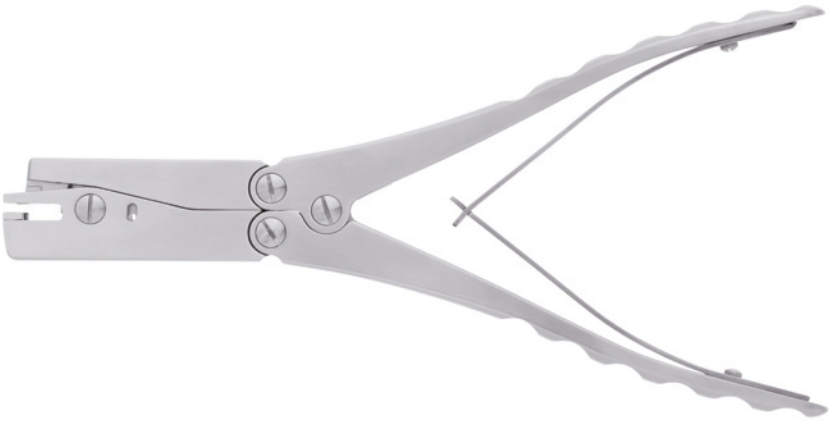
A-2911 HD15 1 : 1

Art. No.	System Size	Interface	Length	Shaft End	Pieces / Pkg
A-2013	2.5 / 2.8	HD7	75 mm	AO Quick Coupling	1
A-2611	2.0 / 2.3	HD6	75 mm	AO Quick Coupling	1
A-2911	3.5 / 4.0	HD15	80 mm	AO Quick Coupling	1

Plate Holding Forceps

Art. No.	System Size	Length	Pieces / Pkg
A-2050	2.0 – 3.5	122 mm	1

Plate Cutting Pliers



Art. No.	System Size	Length	Pieces / Pkg
A-2045	2.0 – 3.5	218 mm	1

Scale 1 : 2

Plate Bending Pliers

A-2047

A-2940

Art. No.	System Size	Description	Length	Pieces / Pkg
A-2047	2.0 – 2.8	with pins	158 mm	1
A-2940	3.5 / 4.0	with pin	158 mm	1

Compression and Distraction Forceps for K-Wires

Art. No.	Description	Length	Pieces / Pkg
A-2049	for 1.6 mm K-wires / olive K-wires	163 mm	1

Reduction Forceps

Art. No.	Description	Length	Pieces / Pkg
A-7001	«Apart»	130 mm	1

Bone Holding Forceps

Art. No.	Length	Pieces / Pkg
A-7012	140 mm	1

Bone Elevator Mini-Hohmann

Art. No.	Width	Length	Pieces / Pkg
A-7006	8 mm	160 mm	1

Periosteal Elevator

Art. No.	Width	Length	Pieces / Pkg
A-7007	6 mm	185 mm	1

Hook

Art. No.	Description	Length	Pieces / Pkg
A-7009	«Tönnis»	150 mm	1

Scale 1 : 2

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