ST/80-705

ChM®



Ankle joint arthrodesis plates 3.7253; 3.7254 3.7255; 3.7256 3.7257; 3.7258 3.7259; 3.7260 3.7261; 3.7262 3.7263

- SURGICAL TECHNIQUE
- IMPLANTS
- INSTRUMENT SET

www.chm.eu

SYMBOLS DESCRIPTION

Titanium or titanium alloy	H	H length [mm]
Cobalt	\bigcirc	Angle
Left	88	available lengths
Right	4-22	Available number of holes
Available versions: left/right	1.8	Thickness [mm]
Length	1:1	Scale 1:1
Torx drive		Number of threaded holes in the shaft part of the plate
Torx drive cannulated		Number of locking holes in the plate
Hexagonal drive	VA	Variable angle
Hexagonal drive cannulated	\bigcirc	Cortical
Cannulated		Cancellous
Locking	Ster Non Ster	Available in sterile/ non- sterile condition
Diameter [mm]		Refer to surgical technique
Caution - pay attention to a special procedure.		
Perform the activity under X-Ray control.		

Information about the next stages of a procedure. Proceed to the next stage. Return to the specified stage and repeat the activity. Before using the product, carefully read the Instructions for Use. It contains, among others, indications, contraindications, side effects, recommendations and warnings i related to the use of the product.

The above description is not a detailed instruction of conduct. The surgeon decides about choosing the operating procedure.

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The manufacturer reserves the right to introduce design changes. Updated INSTRUCTIONS FOR USE are available at the following website: ifu.chm.eu

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1. INTRODUCTION

This surgical technique applies to 7,0ChLP locked plating system used for ankle joint arthrodesis. The plates are a part of the ChLP locked plating system developed by **ChM**. The presented range of implants is made of materials in accordance with ISO 5832 standards.

The system includes:

- implants (plates and screws),
- instrument set used in the surgery,
- surgical technique.

Indications

Ankle arthrodesis including tibiotalar or tibiotalocalcaneal arthrodesis, with possibility of osteotomy or fractures fixation of distal tibia, talus and calcaneus.

Plate selection and shaping

Various available options ensure the possibility of choosing an implant appropriate for clinical case and surgeon's preference. Implants were designed in order to ensure proper alignment with skeletal anatomy and reduce implant profiling in the operating room. Profiling of the shaft region of the plate in accordance with intructions given in the IFU is allowed. Profiling of the plates is not allowed when used with targeter.



Before using the product, carefully read the Instructions for Use supplied with the product. It contains, among others, indications, contraindications, side effects, recommendations and warnings related to the use of the product.

The above description is not a detailed instruction of conduct. The surgeon decides about choosing the operating procedure.

2. IMPLANT DESCRIPTION

Ankle joint arthrodesis plates are a part of 7.0ChLP system. This system includes also compatible locking and non-locking screws.



Compression hole

- oblong hole for plate positioning
- compression in two directions possible

3. STABILIZATION METHOD SELECTION

ChM's portfolio includes 6 types of locking plates for ankle joint arthrodesis, designed for use in three approaches: anterior, lateral and posterior:

- lateral TT-Tibiotalar and TTC-Tibiotalocalcaneal plates
- anterolateral TT plates
- posterior TT and TTC plates
- minimally invasive anterior TT plates

Taking into consideration factors such as bone quality, concomitant bone and periarticular damage, patient's anatomical conditions and surgeon's preference, the most beneficial treatment method should be chosen.

All implants mentioned above allow screw insertion into all of the fused bones.



4. SURGICAL TECHNIQUE (ANTEROLATERAL TT PLATE - PERCUTANEOUS METHOD)

4.1. PATIENT POSITIONING

Place the patient supine. Support the leg to ensure proper X-Ray imaging in the lateral and AP position.

4.2. SURGICAL APPROACH

Begin a cut parallel to tibia around 10cm proximally from the ankle and 1cm laterally from anterior tibial crest. Pay attention to superficial peroneal nerve and its visibility. The cut should end over the talonavicular joint. Ensure the correct cut size to avoid extensive soft tissue irritation.





4.3. JOINT PREPARATION

Perform distraction to ensure access to the upper ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

4.4. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wire 2.0/210 **[40.4815.210]** may be used.

4.5. IMPLANT SELECTION

Due to elongated shaft area, for percutaneous method the use of 7-hole plate **[3.7253.607/3.7254.607]** inserted using plate targeter **[40.8270.000/40.8271.000]** is advised.



4.6. TARGETER ASSEMBLY

Attach targeter foot to dedicated holes on the plate. Tighten up the setting screw using Screwdriver tip T 25-1/4 **[40.5684.000]**.

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40.5684.000





4.7. PLATE INSERTION

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Use the attached Plate targeter **[40.8270.000/40.8271.000]** as an arm for percutaneous plate insertion.



Beveled tip facilitate percutaneous insertion.

During insertion pay attention to correct positioning of the implant in the talonavicular joint area. Distal end of the plate cannot reduce mobility of that area.

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40.5705.740

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4.8. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.

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Placing wires in elongated holes will allow for later compression without losing implant position.

Dedicated instrument set includes Setting-compressing screw 2.0/75 **[40.8209.075]** ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

40.8209.075



Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).





4.10. JOINT COMPRESSING SCREW INSERTION

Inserting conical cancellous 5.4 screw [3.5242] into the anatomical compression hole.

insert guide sleeve 7.0/3.2 [40.5705.732] into anatomical compression hole



Using predefined directions ensures non-colliding screw insertion.







Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus.



40.5650.212

- remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression
- insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole



Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct.

• perform joint compression by tightening the screw







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4.11. LOCKING SCREWS INSERTION IN DISTAL PART

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into tibia (acc. to procedure 11c).



4.12. SCREW INSERTION IN THE SHAFT OF THE PLATE

Aligning targeter with the plate.

- insert protective guide 9.0/7.0 [40.5693.770] with a trocar 7.0
 [40.5695.770] into the last hole of the targeter corresponding to the last locking hole of the plate
- make the cut and push the trocar with the protective guide close to the plate, then lock the protective guide in the targeter
- remove trocar 7.0 [40.5695.770] and insert guide sleeve 7.0/4.0
 [40.5690.740]. Lock the guide sleeve in the locking hole, achieving a rigid plate-targeter construct









Cortical self-tapping 4.5 screw [3.1471] insertion into compression hole in the shaft area using percutaneous method.

- insert protective guide 10.0/8.0 [40.5694.780] with a trocar 8.0 [40.5696.780] into targeter hole
- make the cut and push trocar with protective guide close to the plate, then lock the protective guide in the targeter



- 08 0
- remove the trocar and insert guide sleeve 8.0/3.2 [40.5691.732]
- drill using a drill with scale 3.2/300 [40.5650.302], determine necessary



Insertion of locking 5.0 screws [3.5210] into locking holes in the shaft area using percutaneous method.

• insert protective guide 9.0/7.0 [40.5693.770] with a trocar 7.0 [40.5695.770] into chosen targeter hole • make the cut and push trocat with the protective guide close to the plate, then lock the protective guide in the targeter G 40.5693.770 40.5695.770 -6 • remove the trocar and insert guide sleeve 7,0/4,0 [40.5690.740] • drill using a drill with scale 4.0/300 [40.5651.302], determine necessary screw lenght based on drill scale 40.5690.740 40.5651.302 • insert self-tapping 5.0 screw [3.5210] of appropriate lenght through protective guide 9.0/7.0 [40.5693.770] using torque limiting ratchet handle T 4Nm [40.6660.000] and screwdriver tip T25-1/4 [40.5684.000]. 40.6660.000 11 40.5684.000 -0 Insert cortical screws before locking screws. The doctor decides about the order and number of locking and cortical screws to be inserted.

4.13. TARGETER DISASSEMBLY

Disassembly the targeter by loosening the targeter securing screw using screwdriver tip T 25-1/4 [40.5684.000].

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In the hole where the targeter was attached, insert the screw acc. to procedure 11c.



4.14. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.

5. SURGICAL TECHNIQUE (ANTEROLATERAL TT PLATE)

5.1. PATIENT POSITIONING

Place the patient supine. Support the leg to ensure proper X-Ray imaging in the lateral and AP position.



5.2. SURGICAL APPROACH

Begin a cut parallel to tibia around 10cm proximally from the ankle and 1cm laterally from anterior tibial crest. Pay attention to superficial peroneal nerve and its visibility. The cut should end over the talonavicular joint. Ensure the correct cut size to avoid extensive soft tissue irritation.



5.3. JOINT PREPARATION

Perform distraction to ensure access to the upper ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

5.4. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wire 2.0/210 **[40.4815.210]** may be used.



5.5. IMPLANT SELECTION

Choose implant size appropriate for fracture type, size and anatomy of the bone.

5.6. PLATE INSERTION

For plate insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. Insert them into distal holes for tibia (*see point 3*).



Beveled tip facilitate percutaneous insertion.

During insertion pay attention to correct positioning of the implant in the talonavicular joint area. Distal end of the plate cannot reduce mobility of that area.



5.7. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.

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Placing wires in elongated holes will allow for later compression without losing implant position.

Dedicated instrument set includes setting-compressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

40.8209.075

5.8. LOCKING SCREWS INSERTION INTO THE TALUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).



ChM **5.9.** JOINT COMPRESSING SCREW INSERTION Inserting conical cancellous 5.4 screw [3.5242] into the anatomical compression hole. • insert guide sleeve 7.0/3.2 [40.5705.732] into anatomical compression hole Using predefined directions ensures non-colliding screw insertion. -40.5705.732 • drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus. • read drilling depth from the drill scale 40.5650.212 • remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression • insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole Always measure the screw before inserting and make sure

• perform joint compression by tightening the screw

on X-Ray that its position and lenght are correct.

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5.10. LOCKING SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into tibial holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.

The doctor decides about the order and number of locking and cortical screws to be inserted.



5.11. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.

6. SURGICAL TECHNIQUE (ANTERIOR TT PLATE)

6.1. PATIENT POSITIONING

Place the patient supine. Support the leg to ensure proper X-Ray imaging in the lateral and AP position.



6.2. SURGICAL APPROACH

Anterior approach

Begin a short cut parallel to tibia proximally from the ankle about 1cm laterally from anterior tibial crest. Pay attention to superficial peroneal nerve and its visibility. The cut should end over the talonavicular joint. Ensure the correct cut size to avoid extensive soft tissue irritation.



6.3. JOINT PREPARATION

Perform distraction to ensure access to the upper ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

6.4. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wire 2.0/210 **[40.4815.210]** may be used.



6.5. IMPLANT SELECTION

Choose implant size appropriate for fracture type, size and anatomy of the bone. Plate **[3.7262.6xx]** was designed as an assisting option, increasing fixation rigidity in arthrodesis procedure used compression screws. Due to this, ankle arthrodesis using only anterior TT plate is not allowed.

6.6. PLATE INSERTION

For tip insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. They shall be inserted into distal tibial holes (*see point 3*). During insertion pay attention to correct positioning of the implant in the talonavicular joint area. Distal end of the plate cannot reduce mobility of that area.



Beveled tip facilitate percutaneous insertion.

6.7. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.



Placing wires in elongated holes will allow for later compression without losing implant position.

Dedicated instrument set includes setting-compressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

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6.8. SCREW INSERTION INTO THE TALUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).



6.9. JOINT COMPRESSING SCREW INSERTION

Inserting conical cancellous 5.4 screw **[3.5242]** into the anatomical compression hole.

• insert guide sleeve 7.0/3.2 **[40.5705.732]** into anatomical compression hole (*using predefined directions ensures non-colliding screw insertion*)

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 drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth



Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus.

• read drilling depth from the drill scale

40.5650.212



- remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression
- insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole



Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct.

• perform joint compression by tightening the screw



6.10. SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into anterior holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.

The doctor decides about the order and number of locking and cortical screws to be inserted.





6.11. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.

7. SURGICAL TECHNIQUE (LATERAL TTC PLATE)

7.1. PATIENT POSITIONING

Place the patient support the leg to ensure proper X-Ray imaging in the lateral and AP position.

7.2. SURGICAL APPROACH

Lateral approach

Begin a cut parallel to tibia around 10cm proximally from fibula in posterior area. The cut shall reach bottom part of the calcaneus. Pay attention to sural nerve and its visibility. Ensure the correct cut size to avoid extensive soft tissue irritation.





7.3. LATERAL ANKLE RESECTION

In lateral approach, resection of the distal fibula is necessary. Cut about 8-10 cm above the end of the bone, depending of the plate size. To avoid sharp bone ending above the plate, make sloped cut in A-P view.

7.4. JOINT PREPARATION

Perform distraction to ensure access to the upper ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

7.5. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wire 2.0/210 **[40.4815.210]** may be used.



7.6. IMPLANT SELECTION

Choose implant size appropriate for fracture type, size and anatomy of the bone. Plates **[3.7255.6xx]/[3.7256.6xx]**, inserted from lateral approach requires resection of the lateral ankle, which significantly reduces the possibility of later ankle joint replacement.

7.7. PLATE INSERTION

Beveled tip facilitate percutaneous insertion. For tip insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. They shall be inserted into distal tibial holes *(see point 3)*. For correct fitting of the implant, protruding talus parts and fibular notch resection may be necessary.





7.8. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.



Placing wires in elongated holes will allow for later compression without losing implant position.

Dedicated instrument set includes wires settingcompressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

40.8209.075

7.9. SCREW INSERTION INTO THE TALUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).



7.10. CORTICAL SCREW INSERTION INTO THE CALCANEUS

Insert cortical 5.0 screw **[3.1471]** of appropriate lenght into tibia (*acc. to procedure 11b*). While inserting the screw distally into the hole, perform lower ankle joint compression.

7.11. LOCKING SCREWS INSERTION INTOTHE CALCANEUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into the calcaneus *(acc. to procedure 11c).*

7.12. JOINT COMPRESSING SCREW INSERTION

- Inserting conical cancellous 5.4 screw $\left[\textbf{3.5242} \right]$ into the anatomical compression hole.
 - insert guide sleeve 7.0/3.2 **[40.5705.732]** into anatomical compression hole (using predefined directions ensures non-colliding screw insertion).

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 drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth



Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus.

• read drilling depth from the drill scale

40.5650.212

- remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression
- insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole



Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct.

• perform joint compression by tightening the screw

7.13. LOCKING SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into tibial holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.



7.14. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.



8. SURGICAL TECHNIQUE (LATERAL TT PLATE)

8.1. PATIENT POSITIONING

Place the patient supine. Support the leg to ensure proper X-Ray imaging in the lateral and AP position.

8.2. SURGICAL APPROACH

Lateral approach

Begin a cut parallel to tibia around 10cm proximally from fibula in posterior area. The cut shall end archwise frontward on fibular head tip. Pay attention to sural nerve and its visibility. Ensure the correct cut size to avoid extensive soft tissue irritation.





8.3. LATERAL ANKLE RESECTION

In lateral approach, resection of the distal fibula is necessary. Cut about 8-10 cm above the end of the bone, depending of the plate size. To avoid sharp bone ending above the plate, make sloped cut in A-P view.

8.4. JOINT PREPARATION

Perform distraction to ensure access to the upper ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.



8.5. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wire 2.0/210 **[40.4815.210]** may be used.

8.6. IMPLANT SELECTION

Choose implant size appropriate for fracture type, size and anatomy of the bone. Plates **[3.7255.6xx]/[3.7256.6xx]**, inserted from lateral approach requires resection of the lateral ankle, which significantly reduces the possibility of later ankle joint replacement.

8.7. PLATE INSERTION

For tip insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. They shall be inserted into distal tibial holes *(see point 3)*. For correct fitting of the implant, protruding talus parts and fibular notch resection may be necessary.



Beveled tip facilitate percutaneous insertion.

8.8. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.

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Placing wires in elongated holes will allow for later compression without losing implant position.



Dedicated instrument set includes setting-compressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

40.8209.075

8.9. SCREW INSERTION INTO THE TALUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (*acc. to procedure 11c*).



8.10. JOINT COMPRESSING SCREW INSERTION Inserting conical cancellous 5.4 screw [3.5242] into the anatomical compression hole. • insert guide sleeve 7.0/3.2 [40.5705.732] into anatomical compression hole (using predefined directions ensures non-colliding screw insertion). -40.5705.732 • drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus. • read drilling depth from the drill scale 40.5650.212 • remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression • insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct. • perform joint compression by tightening the screw

8.11. LOCKING SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into tibial holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.

The doctor decides about the order and number of locking and cortical screws to be inserted.



8.12. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.

9. SURGICAL TECHNIQUE (POSTERIOR TTC PLATE)



9.1. PATIENT POSITIONING

Place the patient in prone position, with feet and ankles overhanging the table, to achieve neutral foot position.

9.2. SURGICAL APPROACH

Posterior approach

Begin a cut parallel to tibia around 10cm proximally from ankle joint. The cut shall reach upper part of the calcaneus. In posterior approach the Achilles tendon may be divided lenghtwise in the middle. Pay attention to flexor hallucis longus muscle, which should be moved medially. Ensure the correct cut size to avoid extensive soft tissue irritation.



9.3. JOINT PREPARATION

Perform distraction to ensure access to the upper and lower ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

9.4. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wires 2.0/210 **[40.4815.210]** may be used.



Choose implant size appropriate for fracture type, size and bone anatomy.

9.6. PLATE INSERTION

SBeveled tip facilitate percutaneous insertion. For tip insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. They shall be inserted into distal tibial holes (*see point 3*).







9.7. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.



Placing wires in elongated holes will allow for later compression without losing implant position.

Dedicated instrument set includes setting-compressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

 40.8209.075

 40.4815.210



Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).

9.9. LOWER ANKLE JOINT COMPRESSION

- insert guide sleeve 7.0/4.0 [40.5705.740] into one of locking holes for calcaneus (see point 3)
- insert setting-compressing screw 4.0/180 [40.5706.740] into guide sleeve
- perform joint compression by tightening setting-compressive screw cap





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9.10. SCREW INSERTION INTO THE CALCANEUS

Insert self-tapping locking 5.0 screw [3.5210] of appropriate lenght, into free hole (acc. to procedure 11c). After locking the screw, remove the setting-compressing screw and threaded guide sleeve. Insert self-tapping locking 5,0 screw into free hole (acc. to procedure 10d).



9.11. JOINT COMPRESSING SCREW INSERTION

Inserting conical cancellous 5.4 screw [3.5242] into the anatomical compression hole.

• insert guide sleeve 7.0/3.2 [40.5705.732] into anatomical compression hole (using predefined directions ensures non-colliding screw insertion)





• drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth



Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus.

• read drilling depth from the drill scale

40.5650.212





- remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression
- insert conical cancellous 5.4 screw [3.5242] of appropriate lenght into prepared hole



Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct.

• perform joint compression by tightening the screw



9.12. SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into shaft holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.

The doctor decides about the order and number of locking and cortical screws to be inserted.



9.13. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.

10. SURGICAL TECHNIQUE (POSTERIOR TT PLATE)



10.1. PATIENT POSITIONING

Place the patient in prone position, with feet and ankles overhanging the table, to achieve neutral foot position.

10.2. SURGICAL APPROACH

Posterior approach

Begin a cut parallel to tibia around 10cm proximally from ankle joint. The cut shall reach upper part of the calcaneus. In posterior approach the Achilles tendon may be divided lenghtwise in the middle. Pay attention to flexor hallucis longus muscle, which should be moved medially. Ensure the correct cut size to avoid extensive soft tissue irritation.



10.3. JOINT PREPARATION

Perform distraction to ensure access to the upper and lower ankle. Remove cartilage and subchondral tissue from joint surface using rasps and scrapers to reveal cancellous bone.



After articular cartilage removal bone fenestration is advised to increase blood flow and accelerate healing.

10.4. FOOT POSITIONING

Immobilize the joint in neutral position. The sole should create a 90° angle with tibia, with external foot rotation of $5\div10^{\circ}$ and hindfoot valgus of about 5°. For temporary fixation Kirschner wires 2.0/210 **[40.4815.210]** may be used.

10.5. IMPLANT SELECTION

Choose implant size appropriate for fracture type, size and bone anatomy.

10.6. PLATE INSERTION

Slanted tip mitigates percutaneous insertion. For tip insertion use guide sleeve 7.0/4.0 **[40.5705.740]**. They shall be inserted into distal tibial holes (*see point 3*).







10.7. TEMPORARY PLATE STABILIZATION

Stabilize implant placement using a method of choice acc. to procedure 11a. For optimal bone stabilization use at least one wire for tibia and talus.

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Placing wires in elongated holes will allow for later compression without losing implant position.

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Dedicated instrument set includes setting-compressing screw 2.0/75 [40.8209.075] ensuring initial stabilization through screw holes. Using threaded wires with stops allows for bone-plate compression.

40.8209.075

10.8. SCREW INSERTION INTO THE TALUS

Insert self-tapping 5.0 screws **[3.5210]** of appropriate lenght into talus head (acc. to procedure 11c).

10.9. JOINT COMPRESSING SCREW INSERTION

Inserting conical cancellous 5.4 screw [3.5242] into the anatomical compression hole.

• insert guide sleeve 7.0/3.2 **[40.5705.732]** into anatomical compression hole (using predefined directions ensures non-colliding screw insertion).

40.5705.732



 drill using drill with scale 3.2/210 [40.5650.212] through tibia and talus until reaching proper depth



Perform drilling under X-Ray control to prevent penetration of the inferior joint surface. Screw lenght should be properly selected, so that the screw ends just above the inferior surface of the talus.

• read drilling depth from the drill scale

40.5650.212

- remove stabilizing wires from the tibia, except for wires in the elongated holes which ensure compression
- insert conical cancellous 5.4 screw **[3.5242]** of appropriate lenght into prepared hole



Always measure the screw before inserting and make sure on X-Ray that its position and lenght are correct.

• perform joint compression by tightening the screw

10.10. SCREW INSERTION INTO THE TIBIA

Insert locking and/or cortical screws of appropriate lenght into shaft holes (acc. to procedure 11b or 11c).



Insert cortical screws before locking screws.



The doctor decides about the order and number of locking and cortical screws to be inserted.

10.11. WOUND CLOSURE

Before closing the wound, take X-Rays in at least two positions for implant position and fracture fixation confirmation. Make sure that the screws are properly tightened and do not collide with articular surface. Use appropriate surgical technique to close the wound.



11. SURGICAL PROCEDURES

11a. TEMPORARY IMPLANT STABILIZATION PROCEDURE

Stabilization using Kirschner wires

• Stabilize temporary the implant inserting Kirschner wires 2.0/210 **[40.4815.210]** into dedicated holes in the plate.

40.4815.210



- Insert guide sleeve 7.0/4.0 [40.5705.740] into the locking hole of the plate.
- Insert Kirschner wire **[40.4815.210]** through the guide sleeve 7.0/4.0 **[40.5705.740]**.

40.5705.740
 40.4815.210



Stabilization using setting-compressing screw

- Insert guide sleeve 7.0/4.0 [40.5705.740] into the locking hole of the plate.
- Insert setting-compressing screw 4.0/180 [40.5706.740] through the guide sleeve 7.0/4.0 [40.5705.740].
- Tighten the nut of the setting-compressing screw 4.0/180 **[40.5706.740]** and push the plate to the bone.





11b. PROCEDURE OF CORTICAL SELF-TAPPING SCREW 4,5 **[3.1471]** INSERTION

Compression guide positioning

Position the compression guide VA 4.0 [40.8207.040] in a desired position:





Hole drilling

Perform a hole through both cortices for a cortical screw 4,5 insertion. For drilling, use drill with scale 3.2/210 **[40.5650.212]** and compression guide in a desired position.

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Measurement of hole depth

Insert depth measure **[40.4639.550]**] into drilled hole until the hook of the measure rests against the outer surface of the second cortex.



Screw insertion

Insert cortical screw using torque limiting ratchet T handle 4Nm **[40.6660.000]** and screwdriver tip T25 **[40.5684.200]**.





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11c. PROCEDURE OF 7.0ChLP SELF-TAPPING SCREW 5,0 [3.5210] INSERTION







40/54

12. POSTOPERATIVE PROCEDURE

Introduce appropriate postoperative treatment that is determined by the physician. In order to avoid patient's movement limitations, introduce exercises as soon after surgery as possible. However, make sure that the limb is not fully loaded before fragments osteosynthesis is complete.

13. IMPLANT REMOVAL

The physician decides about implant removal. In order to remove the implants from the body, unlock all the locking screws first and then remove them from the bone. This will prevent any rotation of the plate when removing the last locking screw.

14. CATALOGUE PAGES

14a. INSTRUMENT SET

Instrument set for 7.0ChLP 4x4 1/2H

15.0207.207

	Name	Catalogue no.	Pcs.
	Tray for 7.0ChLP instrument set 4x4 1/2H	14.0207.207	1
	Kirschner wire 2.0/210	40.4815.210	4
	Drill with scale 3.2/210	40.5650.212	2
	Drill with scale 4.0/210	40.5651.212	2
	Setting-compressing screw 4.0/180	40.5706.740	1
and a second a	Guide VA 4.0	40.8207.040	1
	Guide sleeve 7.0/3.2	40.5705.732	1
	Guide sleeve 7.0/4.0	40.5705.740	2
	Torque limiting ratchet handle T 4Nm	40.6660.000	1
1 <u>1</u>	Screwdriver tip T25-1/4	40.5684.200	1
	Depth measure	40.4639.550	1
	Setting-compressing screw 2.0/75	40.8209.075	4
	Torque connector 4Nm	40.5927.040	1

Instrument set for 7.0ChLP 9x4 1/2H

15.0207.110

		10.010	
	Name	Catalogue No.	Pcs
	7.0ChLP container 9x4 1/2H	14.0207.110	1
r BICHT	Plate 3.7254 targeter	40.8270.000	1
K RANA	Plate 3.7253 targeter	40.8271.000	1
7	Protective guide 9.0/7.0	40.5693.770	2
	Trocar 7.0	40.5695.770	1
	Guide sleeve 7.0/4.0	40.5690.740	2
8	Protective guide 10.0/8.0	40.5694.780	1
	Trocar 8.0	40.5696.780	1
	Guide sleeve 8.0/3.2	40.5691.732	1
	Drill with scale 3.2/300	40.5650.302	1
 () 「副園園図場路部路路路路路路路路路路路路路路路路路路路路路路路路路路路路路路路路路路	Drill with scale 4.0/300	40.5651.302	1
T25 CHEWSHOUD	Screwdriver tip T 25-1/4	40.5684.000	1
	Setting-compressing screw 4.0	40.5698.740	1



7.0ChLP anterolateral arthrodesis plate TT







		Ti	\bigcirc		\bigcirc	\bigcirc	
	3.5210.xxx	\checkmark	\checkmark	\checkmark	\checkmark		5.0
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3.1471.xxx	$\checkmark$	$\checkmark$		$\checkmark$		4.5
	3.5242.xxx	$\checkmark$	$\checkmark$		$\checkmark$		5.4



#### 7.0ChLP lateral arthrodesis plate TTC







#### 7.0ChLP lateral arthrodesis plate TT







#### 7.0ChLP posterior arthrodesis plate TTC







#### 7.0ChLP posterior arthrodesis plate TT







#### 7.0ChLP anterior arthrodesis plate TT





#### 14c. SCREWS



Ti

# 7, Och Locked Plating

#### 7.0ChLP self-tapping screw 5.0

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18	3.5210.018
20	3.5210.020
22	3.5210.022
24	3.5210.024
26	3.5210.026
28	3.5210.028
30	3.5210.030
32	3.5210.032
34	3.5210.034
36	3.5210.036
38	3.5210.038
40	3.5210.040
42	3.5210.042
44	3.5210.044
46	3.5210.046
48	3.5210.048
50	3.5210.050
52	3.5210.052
54	3.5210.054
56	3.5210.056
58	3.5210.058
60	3.5210.060
65	3.5210.065
70	3.5210.070
75	3.5210.075
80	3.5210.080
85	3.5210.085
90	3.5210.090
95	3.5210.095
100	3.5210.100
105	3.5210.105
110	3.5210.110

#### Cortical self-tapping screw 4.5

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16	3.1471.016
18	3.1471.018
20	3.1471.020
22	3.1471.022
24	3.1471.024
26	3.1471.026
28	3.1471.028
30	3.1471.030
32	3.1471.032
34	3.1471.034
36	3.1471.036
38	3.1471.038
40	3.1471.040
42	3.1471.042
44	3.1471.044
46	3.1471.046
48	3.1471.048
50	3.1471.050
52	3.1471.052
54	3.1471.054
56	3.1471.056
58	3.1471.058
60	3.1471.060
65	3.1471.065
70	3.1471.070
75	3.1471.075
80	3.1471.080
85	3.1471.085
90	3.1471.090
95	3.1471.095
100	3.1471.100
105	3.1471.105
110	3.1471.110

#### 7,0 ChLP Conical cancellous screw Ø5.4





#### 14.0207.506

7.0ChLP self-tapping screw 5.0 . 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 **L** [mm] 4 Pcs 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 58 60 65 70 **L** [mm] Pcs 4 4 4 4

* Stand does not include implants

Stand for 7.0ChLP screws 4x2 H

#### Stand for 7.0ChLP screws 4x2 H

	Cortical scr	ew Ø	ð4.5											<ul> <li></li> </ul>				_			<b> </b> →	
	<b>L</b> [mm]	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56
	Pcs	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	<b>L</b> [mm]	58	60	65	70																	
•	Pcs	2	2	2	2																	
	Conical cancellous screw Ø5.4																					
	<b>L</b> [mm]	30	35	40	45	50	55	60	65	70	75	80	85	90	95							
	Pcs	2	2	2	2	2	2	2	2	2	2	2	2	2	2							

* Stand does not include implants

#### 14.0207.507



#### Example of 7.0ChLP set for ankle arthrodesis

	Name	Catalogue no.	Name		Catalogue no.
1	7.0ChLP container lid 9x4H	14.0207.102	1 7.0ChLP container lid 9x4H		14.0207.102
2	7.0ChLP container 9x4H	14.0207.101	2	7.0ChLP container 9x4H	14.0207.101
3	Tray for 7.0ChLP plates 5x4 1/2H	14.0207.413	3	Tray for 7.0ChLP plates 5x4 1/2H	14.0207.413
4	Tray for 7.0ChLP plates 5x4 1/2H	14.0207.412	4	Tray for 7.0ChLP plates 5x4 1/2H	14.0207.412
5	Stand for 7.0ChLP screws 4x2H	14.0207.506	5	Stand for 7.0ChLP screws 4x2H	14.0207.506
6	Stand for 7.0ChLP screws 4x2H	14.0207.507	6	Stand for 7.0ChLP screws 4x2H	14.0207.507
7	Instrument set for 7.0ChLP 9x4 1/2H	15.0207.110			
8	Instrument set for 7.0ChLP 4x4 1/2H	15.0207.207	1	7.0ChLP container lid 9x4H	14.0207.102
			7	Instrument set for 7.0ChLP 9x4 1/2H	15.0207.110
			8	Instrument set for 7.0ChLP 4x4 1/2H	15.0207.207

# ChM sp. z o.o.

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