ST/80-512

ChM®

5,0 ChM Locked Plating ChLP system

5.0ChLP calcaneal plate
3.7200; 3.7201
3.4057; 3.4058
3.4059; 3.4060
3.4093; 3.4094

- *SURGICAL TECHNIQUE*
- *IMPLANTS*
- *INSTRUMENT SET*

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SYMBOLS DESCRIPTION

Ti	Titanium or titanium alloy	H	H length [mm]
Co	Cobalt		Angle
L	Left	88 - 340	available lengths
R	Right	4-22	Available number of holes
L R	Available versions: left/right	1.8	Thickness [mm]
Len	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		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 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

1. INTRODUCTION

This surgical technique applies to 5.0ChLP locked plating system used for calcaneal bone osteosynthesis. 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 standard series.

The system for the calcaneal bone treatment includes:
- implants *(plates and screws)*,
- instrument set used in the surgery,
- surgical technique.

Indications

The plates are used to treat:
- comminuted fractures of calcaneus,
- articular and extra-articular fractures,
- mal-unions and non-unions.

Contraindications

- infections,
- growing children.

Plate selection and shaping

The plates are available in different sizes, separately for right and left calcaneus side. This allows for optimal selection of the implant to the fracture type. Shaping of the plates is not allowed.

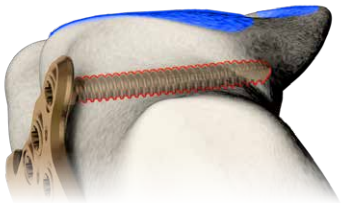
Before using the product, carefully read the Instructions for Use. It contains, among others, indications, contraindications, side effects, recommendations and warnings related to the use of the product.

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

2. IMPLANT FEATURES

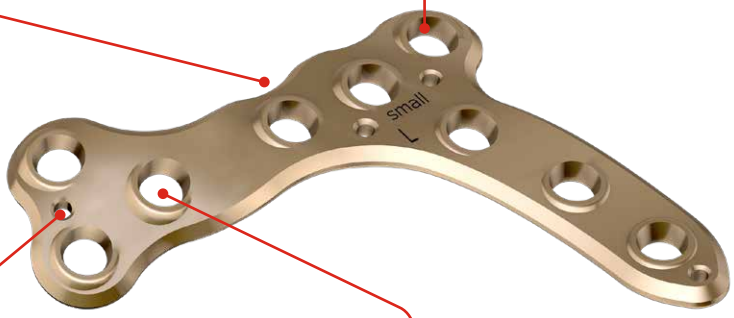
Calcaneal plates are a part of 5.0ChLP system. This system includes also compatible locking screws. To facilitate their identification, both titanium plate and screws are brown anodized.

5.0ChLP calcaneal plate *(pre-contoured - anatomical match)*



2 notches in the plate:
- independent screws supporting the talocalcaneal joint outside the plate can be introduced.

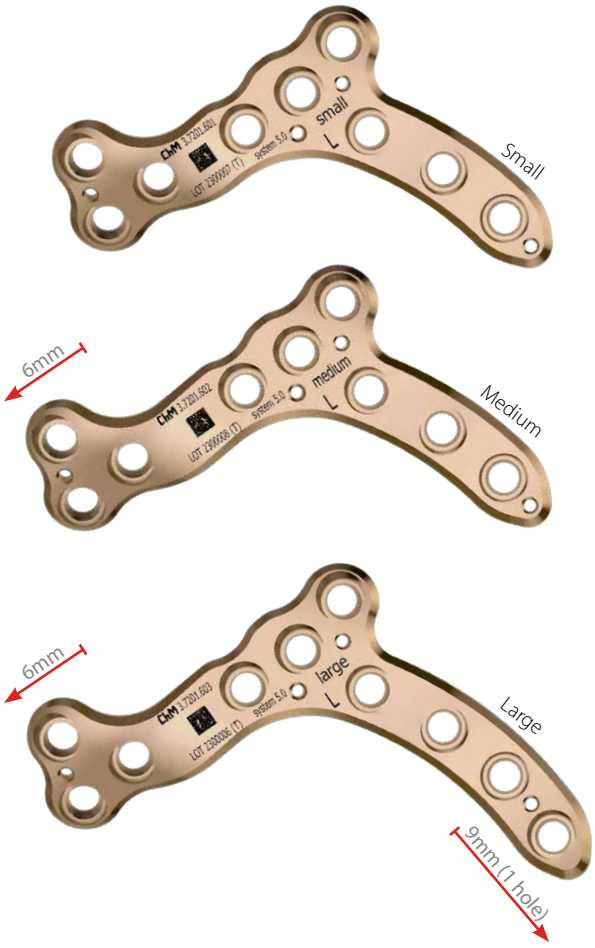
Anatomical position of screws:
- support of the surface of the talocalcaneal joint.

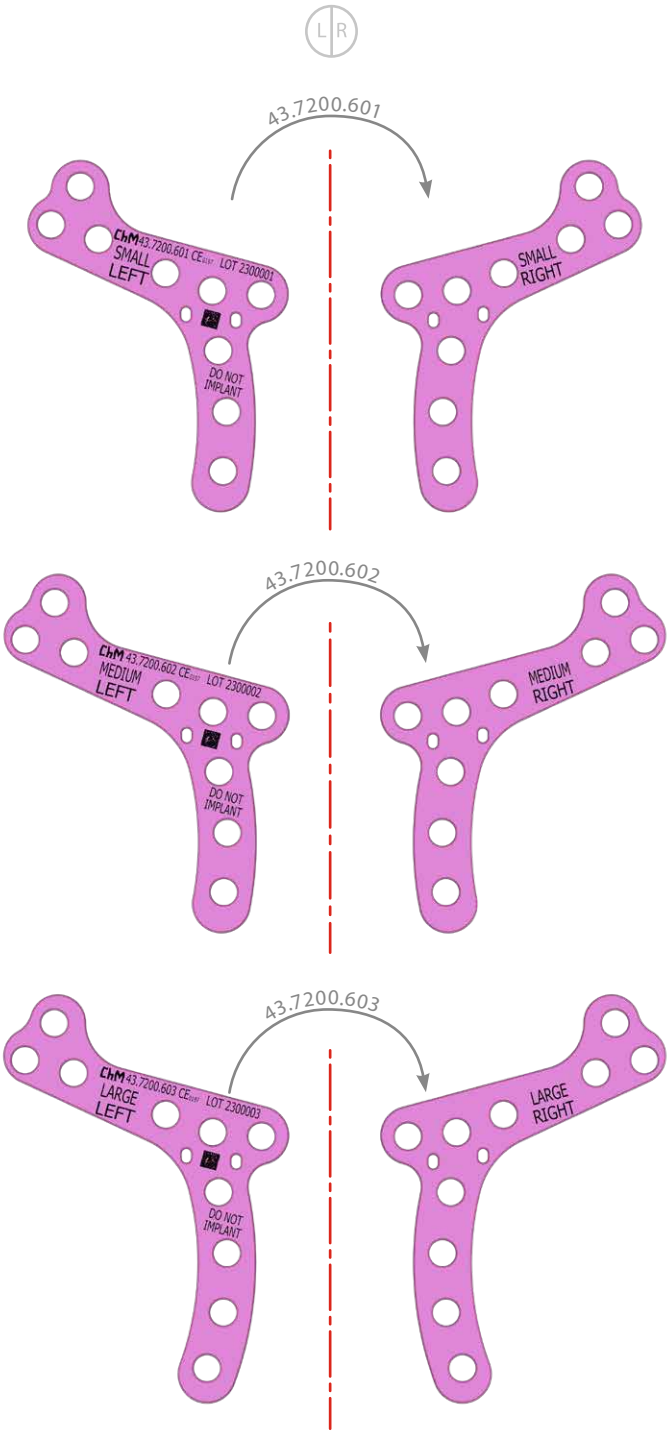


Holes for Kirschner wires:
- facilitated plate positioning,
- temporary plate stabilization.

New locking hole design:
- the screws heads do not protrude above the surface of the plate what significantly reduces the irritation of periimplant tissues,
- increased strength of the screw-to-plate threaded connection,
- bottom extrusion reduces surface area of the contact with the bone.

Calcaneal plates are offered in 3 variants **[small, medium, large]**. The size of the implant that corresponds to the size and anatomy of the bone affects significantly proper course of treatment. The use of trials **[43.7200.601, 43.7200.602, 43.7200.603]** facilitates the selection of the proper implant size. A single trial is used for both, the left and right calcaneal plate

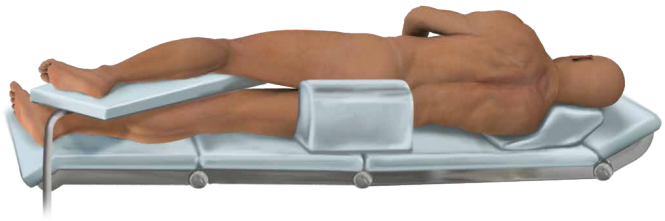




3. SURGICAL TECHNIQUE

3.1. PATIENT'S POSITIONING

It is recommended to position a patient on the side so that the treated foot is at the top. Bend the leg in the knee to allow X-Ray images in the lateral and A-P planes to be taken.

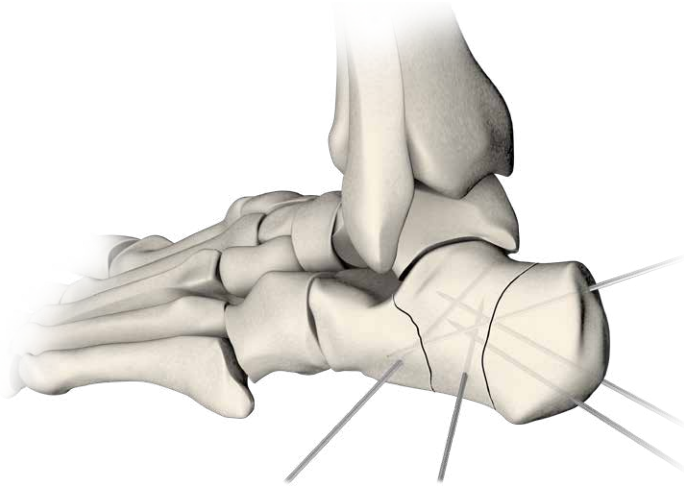


3.2. SURGICAL APPROACH

For a minimally-invasive approach, start the incision inferior to the fibular head, across the anterior process of the calcaneus and superior to the peroneal tendons, to the calcaneocuboid joint. Secure the sural nerve and peroneal tendon sheath.
Use a raspator to prepare a place for the posterior part of the plate, elevating the soft tissues from the calcaneus.

3.3. FRACTURE REDUCTION

Reduce the fracture. Temporarily stabilize the bone fragments with Kirschner wires and/or reduction pliers, if required. Make sure the wires positioning does not interfere with plate positioning.



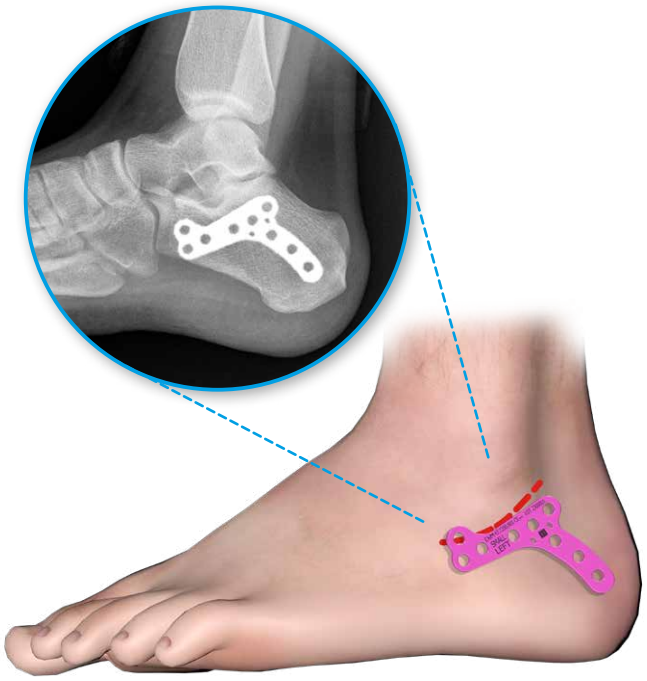
3.4. IMPLANT SELECTION

Use plate trials to determine the plate size *(appropriate for the calcaneus and fracture pattern)* by placing the trial on top of the skin over the fracture, and obtain a fluoroscopic image. Repeat the step using another trial size, if required.

43. 7200.601

43. 7200.602

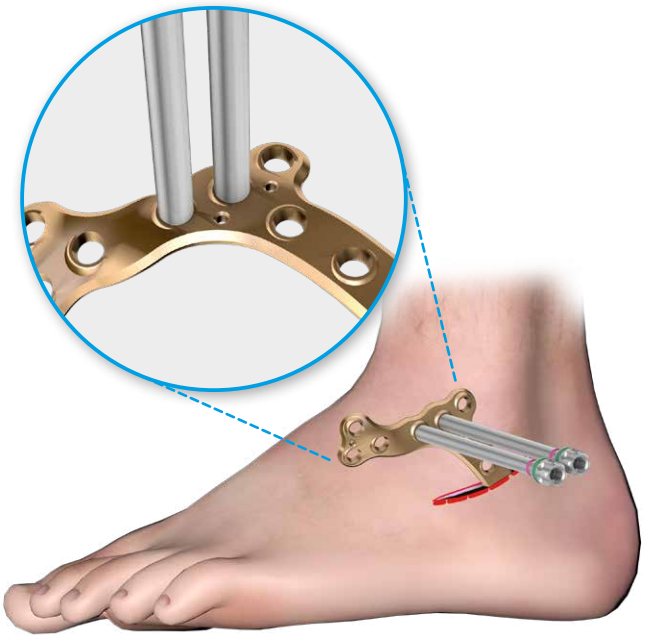
43. 7200.603



3.5. PLATE INSERTION

Install the guide sleeves in the indicated holes in the plate.
Holding the sleeves, continue inserting the distal end of the plate into the incision until the plate is positioned on the calcaneus as desired.
Take an X-Ray image to confirm the position of the implant.

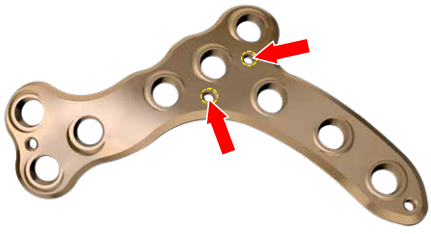
40.5673.728



3.6. TEMPORARY PLATE STABILIZATION

Stabilize the position of the implant using 2 Kirschner wires and dedicated holes.

40.4592.210

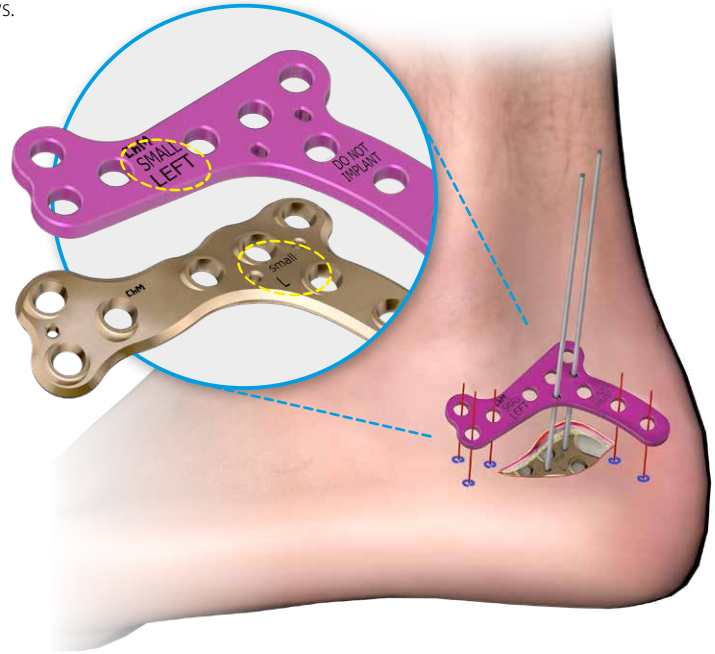


3.7. DEFINING MINIMALLY INVASIVE APPPROACH

Use the installed K-wires to position a plate trial of appropriate size tight on the skin.

A single plate trial is used for both left and right calcaneal plate.

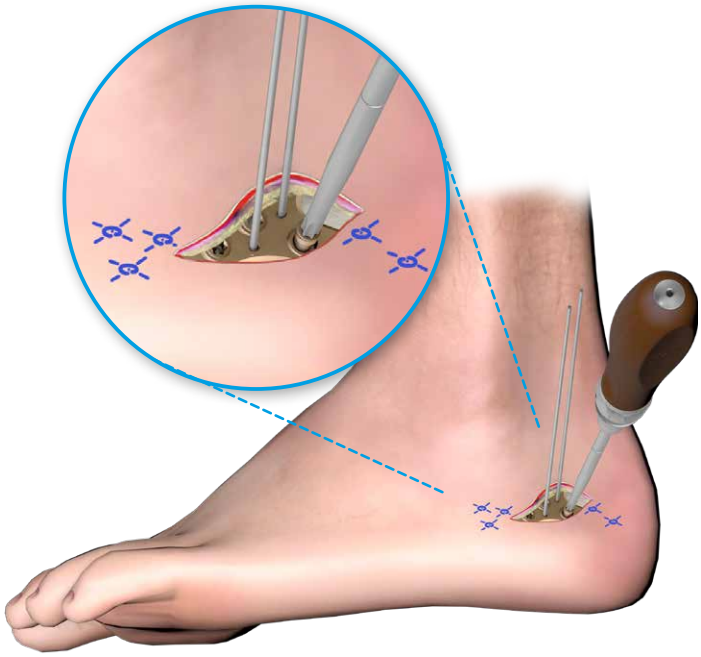
Use the trial holes to mark the plate insertion points for locking screws.



3.8. LOCKING SCREWS INSERTION

Perform incisions in the marked places for minimally invasive screw insertion.

Insert 5.0ChLP self-tapping screw 3.5 **[3.5200]** or 5.0ChLP screw VA 3.5 **[4.5236]** of a suitable length into the locking holes of the plate *(acc. to procedure 4c)*. The surgeon decides about the number and insertion order of the screws.

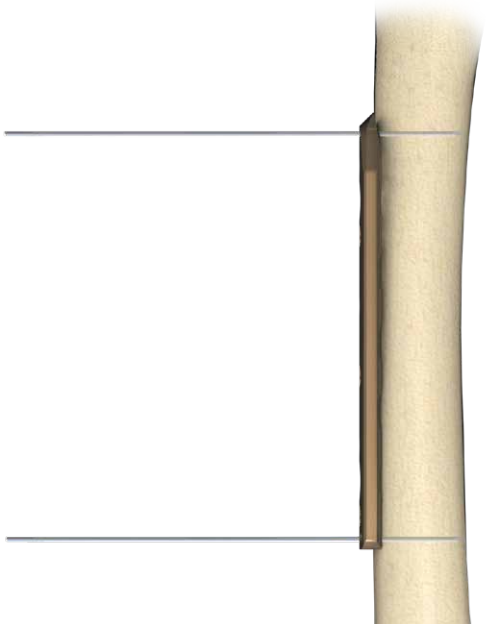


3.9. WOUND CLOSURE

Before closing the wound, take an X-Ray image in at least two projections to confirm implant position and fracture reduction. Make sure all the screws are properly tightened and do not penetrate the joint surface. Use appropriate surgical technique to close the wound.

4. SURGICAL PROCEDURES

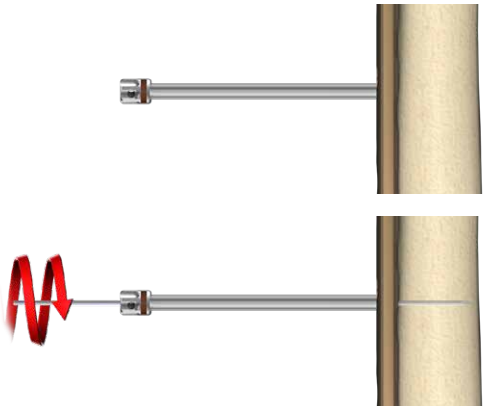
4a. PROCEDURE OF TEMPORARY IMPLANT STABILIZATION



Stabilization using Kirschner wires

- Stabilize temporary the implant inserting Kirschner wires 1.5/210 **[40.4592.210]** into dedicated holes in the plate.

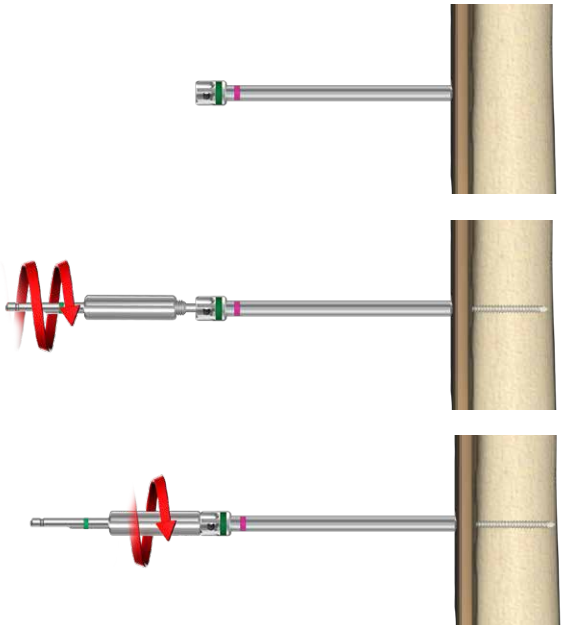
	40.4592.210



Stabilization in locking holes using Kirschner wires

- Insert guide sleeve 5.0/1.8 **[40.5673.718]** into the locking hole of the plate.
- Insert Kirschner wire **[40.4592.210]** through the guide sleeve 5.0/1.8 **[40.5673.718]**.

	40.5673.718
	40.4592.210



Stabilization using setting-compressing screw

- Insert guide sleeve 5.0/2.8 **[40.5673.728]** into the locking hole of the plate.
- Insert setting-compressing screw 2.8/180 **[40.5674.728]** through the guide sleeve 5.0/2.8 **[40.5673.728]**.
- Tighten the nut of the setting-compressing screw **[40.5674.728]** and push the plate to the bone.

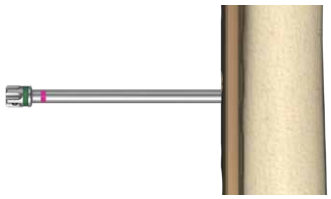
	**40.5673.728**
	**40.5674.728**

4b. PROCEDURE OF 5.0ChLP SELF-TAPPING SCREW 3.5 [3.5200] INSERTION

Guide sleeve insertion

- Insert guide sleeve 5.0/2.8 **[40.5673.728]** into a locking hole of the plate.

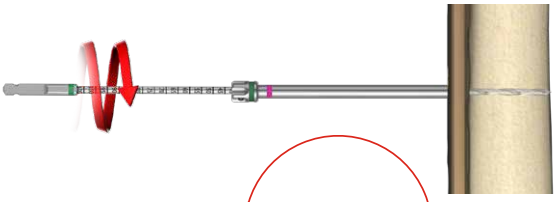

40.5673.728



Hole drilling

Drill using drill with scale 2.8/210**[40.5653.212]** until desired depth is reached.

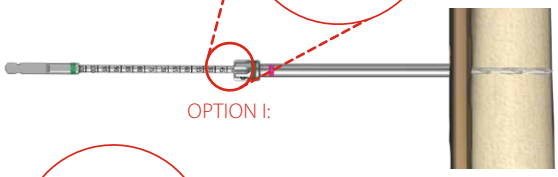
40.5653.212



Measurement of hole depth

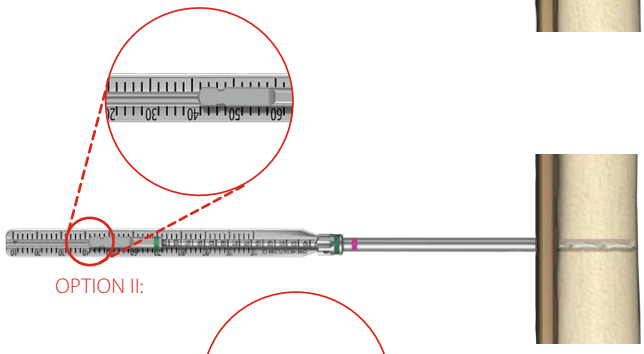
OPTION I: Read the length of the screw from the drill measure **[40.5653.212]**

40.5653.212



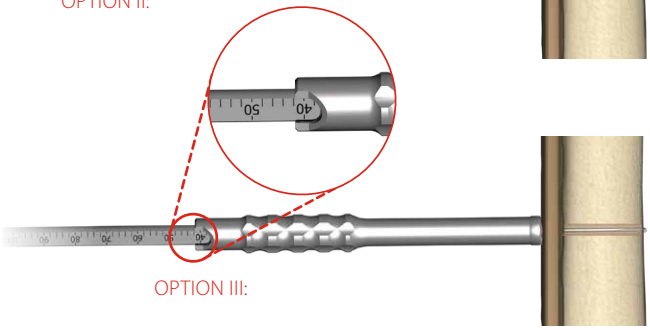
OPTION II: or use screw length measure **[40.5675.500]**.


40.5675.500



OPTION III: Having removed the guide sleeve 5.0/2.8 **[40.5673.728]**, use depth measure **[40.4639.550]** to determine the length of a screw.


40.4639.550

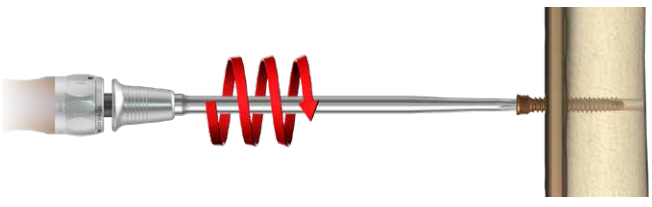


Screw insertion

Remove the guide sleeve 5.0/2.8 **[40.5673.728]**. Use torque limiting ratchet handle 2Nm **[40.6652.000]** and screwdriver tip T15 **[40.5677.000]** to insert the locking screw.


40.6652.000

40.5677.000



The final tightening of the locking screw, especially when a drive is used, should always be performed with the use of torque limiting handle. Failure to use the torque limiting handle may lead to intraoperative and postoperative complications *(during later removal of the plate and locking screws)*.

4c. PROCEDURE OF 5.0ChLP VA SCREW 3.5 [3.5236] INSERTION

When using variable angle *(VA)* screws, there is a risk of collision of screws or a drill with already implanted screws.
Well-thought-out trajectory of inserted screws and intraoperative X-Ray control of drilling reduces the risk of the collision.

Guide VA positioning

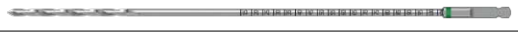
- Insert the guide VA 2.8 **[40.8206.028]** into the locking hole co-axially.
- Set the desired inclination of the guide in relation to the locking hole axis. The guide enables the inclination of 15° in each direction with respect to the axis of the locking hole.

40.8206.028

Exceeding the inclination angle of more than 15° may prevent proper locking of the VA screw in the plate hole.

Hole drilling

- Drill using drill with scale 2.8/210 **[40.5653.212]** until desired depth is reached.

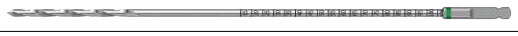


40.5653.212

Drill under X-Ray control to avoid a collision of the drill with already implanted screws.

Measurement of hole depth

OPTION I: Read the length of the screw from the drill measure **[40.5653.212]**.



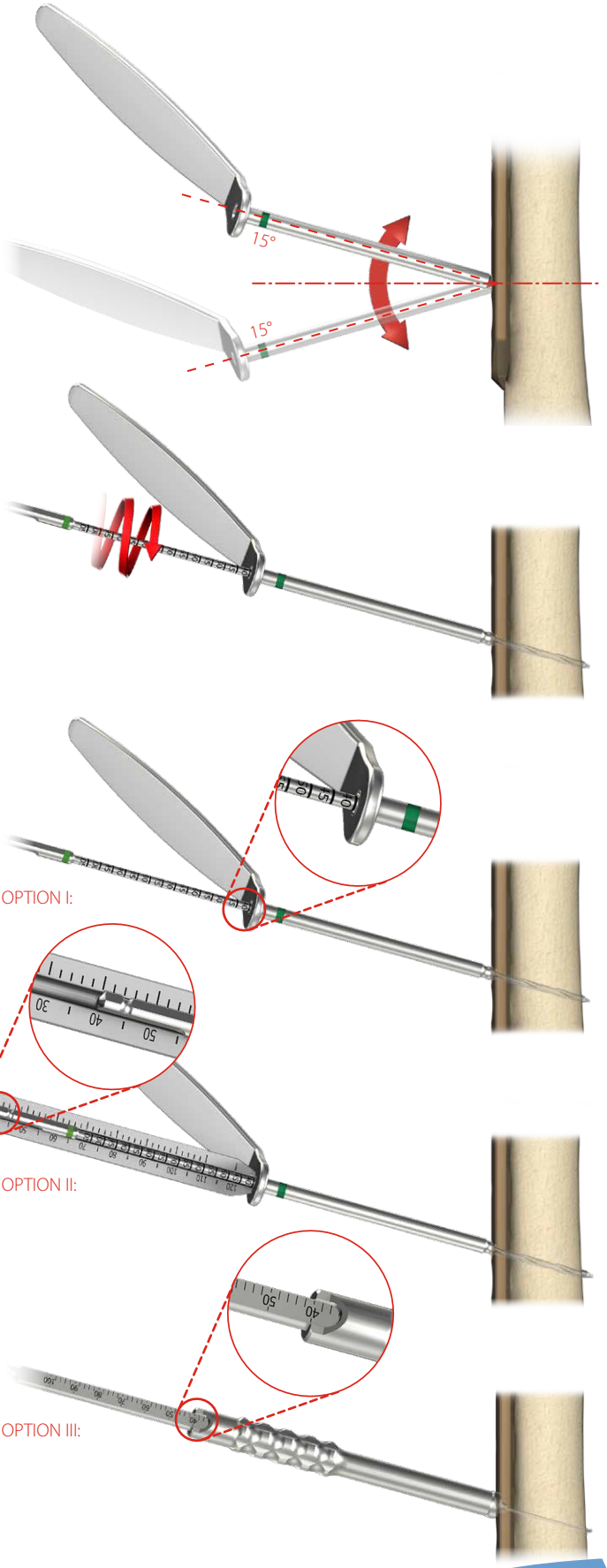
40.5653.212

OPTION II: or use screw length measure **[40.5675.500]**.

40.5675.500

OPTION III: Having removed the guide VA, use depth measure **[40.4639.550]** to determine the length of the screw.

40.4639.550

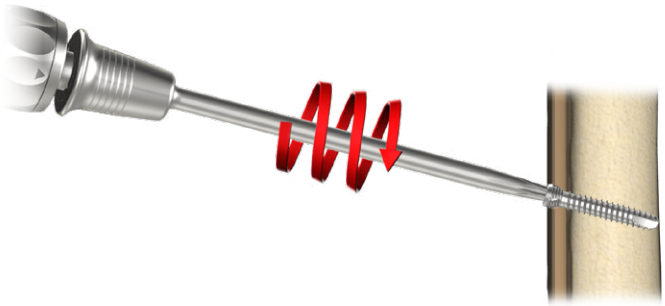


Screw insertion

Use torque limiting ratchet handle 2Nm **[40.6652.000]** and screwdriver tip T15 **[40.5677.000]** to insert the VA screw.

40.6652.000

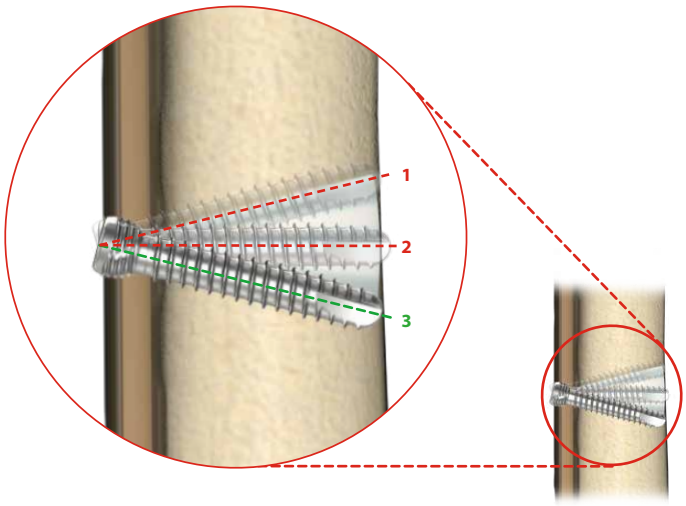
40.5677.000



When using torque limiting handle to tighten the VA screw with large inclination in relation to the axis of the locking hole, the head of the screw may protrude above the plate. In this cause, it may be necessary to use a handle ratchet device **[40.6654]** and screwdriver tip T15 **[40.5677]**. Use the instruments carefully to tighten the VA screw. Avoid damaging the screw socket or screwdriver tip. Do not insert the screw too deep into the plate.

40.6654.000

40.5677.000



Change of the VA screw positioning

It is possible to lock the VA screw three times in the threaded hole of the plate.
The hole in the plate in which the VA screw was locked cannot be used to insert a standard locking screw.

5. POSTOPERATIVE PROCEDURE

Introduce appropriate postoperative treatment. The physician decides on the post-operative treatment and its conduct. 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.

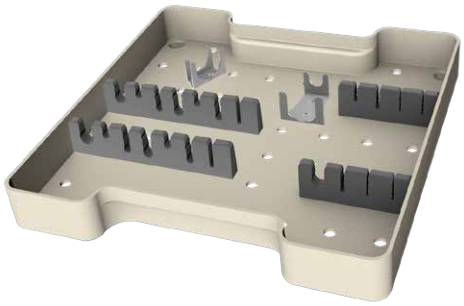
6. IMPLANT REMOVAL

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.

7. CATALOGUE PAGES

7a. INSTRUMENT SET

15.0205.208

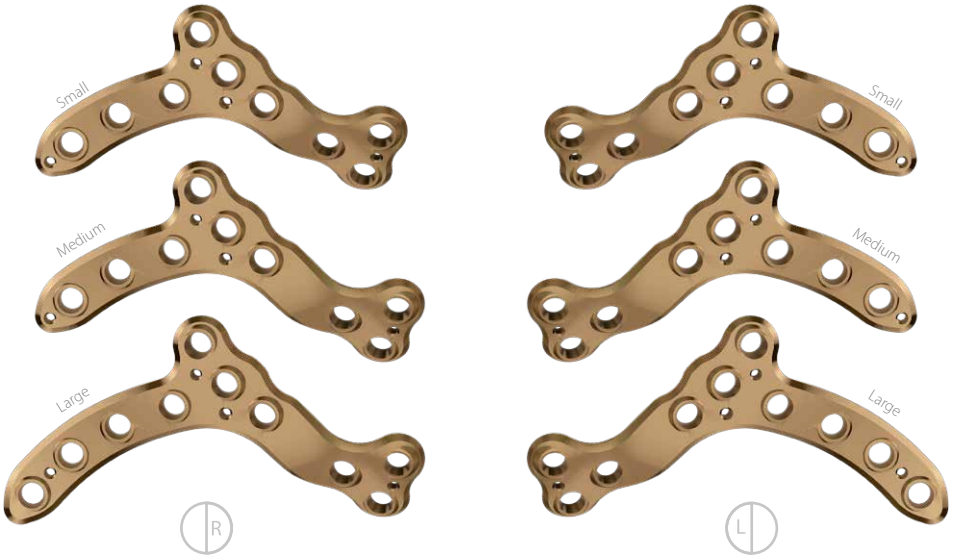
	Name	Catalogue no.	Pcs.
	Tray for 5.0ChLP instrument set 4x4 1/2H	14.0205.208	1
	Kirschner wire 1.5/210	40.4592.210	4
	Drill 1.8/210	40.2063.212	2
	Drill with scale 2.8/210	40.5653.212	2
	Setting-compressing screw 2.8/180	40.5674.728	1
	Torque limiting ratchet handle 2Nm	40.6652.000	1
	Guide VA 2.8	40.8206.028	1
	Guide sleeve 5.0/2.8	40.5673.728	3
	Guide sleeve 5.0/1.8	40.5673.718	2
	Protective guide 7/5	40.5672.000	2
	Screwdriver tip T15	40.5677.000	1
	Depth measure	40.4639.550	1
	Optional instrument		
	Torque connector 2Nm	**40.5927.020**	0

5.0ChLP calcaneal plate

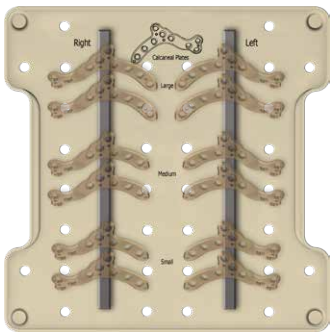
Ti | Ster / Non Ster

Size	Len	R	L
Small	59	3.7200.601	3.7201.601
Medium	63	3.7200.602	3.7201.602
Large	66	3.7200.603	3.7201.603

2.0 [mm] - thickness



	Len	TiA	Co			VA		
	3.5200.xxx	12÷95	✓		✓	✓		✓	3.5
	4.5236.xxx	12÷95		✓	✓	✓	✓	✓	3.5



Tray for plates 5.0ChLP 3.7200/3.7201 4x4 1/2H **14.0205.423**

Plate 3.7200.601/3.7201.601 trial **43. 7200.601**

Plate 3.7200.602/3.7201.602 trial **43.7200.602**

Plate 3.7200.603/3.7201.603 trial **43. 7200.603**

5.0ChLP self-tapping screw 3.5

Len	TiA
12	3.5200.012
14	3.5200.014
16	3.5200.016
18	3.5200.018
20	3.5200.020
22	3.5200.022
24	3.5200.024
26	3.5200.026
28	3.5200.028
30	3.5200.030
32	3.5200.032
34	3.5200.034
36	3.5200.036
38	3.5200.038
40	3.5200.040
42	3.5200.042
44	3.5200.044
46	3.5200.046
48	3.5200.048
50	3.5200.050
52	3.5200.052
54	3.5200.054
56	3.5200.056
58	3.5200.058
60	3.5200.060
65	3.5200.065
70	3.5200.070
75	3.5200.075
80	3.5200.080
85	3.5200.085

5.0ChLP screw VA 3.5

Len	Co
12	4.5236.012
14	4.5236.014
16	4.5236.016
18	4.5236.018
20	4.5236.020
22	4.5236.022
24	4.5236.024
26	4.5236.026
28	4.5236.028
30	4.5236.030
32	4.5236.032
34	4.5236.034
36	4.5236.036
38	4.5236.038
40	4.5236.040
42	4.5236.042
44	4.5236.044
46	4.5236.046
48	4.5236.048
50	4.5236.050
52	4.5236.052
54	4.5236.054
56	4.5236.056
58	4.5236.058
60	4.5236.060
65	4.5236.065
70	4.5236.070
75	4.5236.075
80	4.5236.080
85	4.5236.085

ChM sp. z o.o.
Lewickie 3b
16-061 Juchnowiec Kościelny
Polska
tel. +48 85 86 86 100
fax +48 85 86 86 101
chm@chm.eu
www.chm.eu

CE 0197