

ChM[®]

4.0^{ChM} Locked Plating
ChLP system

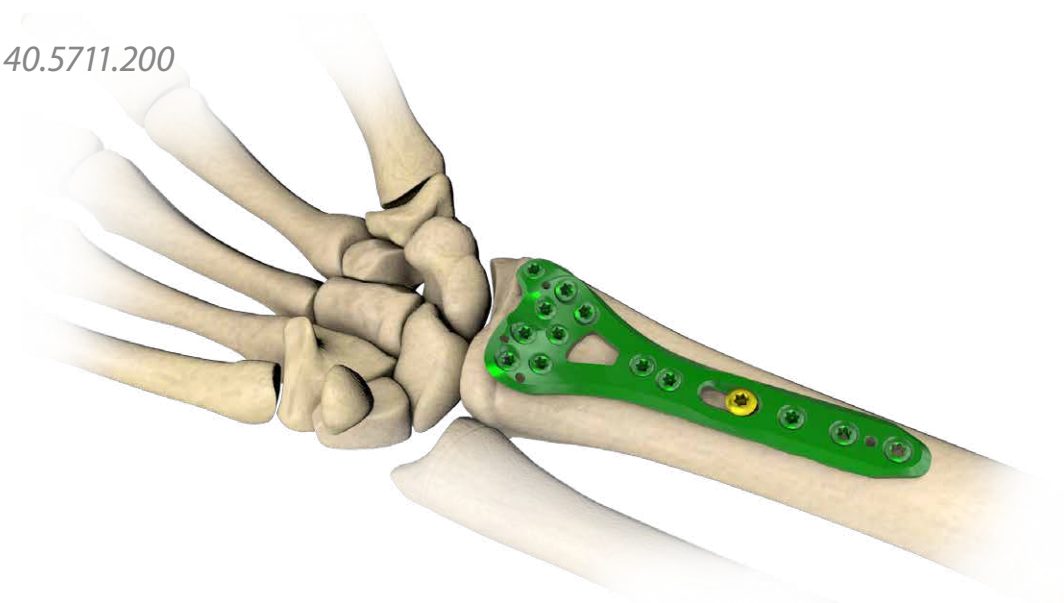
4.0ChLP radius volar plates

3.7226÷3.7231





4.0ChLP expanded radius volar plates








3.7232÷3.7237

- *SURGICAL TECHNIQUE*
- *IMPLANTS*
- *INSTRUMENT SET 40.5711.200*



SYMBOLS DESCRIPTION

	Titanium or titanium alloy		H length [mm]
	Cobalt		Angle
	Left		available lengths
	Right		Available number of holes
	Available versions: left/right		Thickness [mm]
	Length		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		Variable angle
	Hexagonal drive cannulated		Cortical
	Cannulated		Cancellous
	Locking		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

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1. INTRODUCTION

This surgical technique applies to 4.0ChLP locked plating system used for fractures fixation of distal radius. 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. Compliance with the requirements of quality management systems and the requirements of Directive 93/42/EEC concerning medical devices guarantee high quality of the offered implants.

The system includes:

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

Indications

The plates are used for:

- comminuted fractures of the distal radius and fractures extended to the radial shaft,
- mal-, and non-unions.

Plate selection and shaping

The plates are available in various lengths and widths, for left and right extremity, separately. This allows for optimal selection of the implant to the fracture type. Shaping of the plates in their epiphyseal part is not allowed.



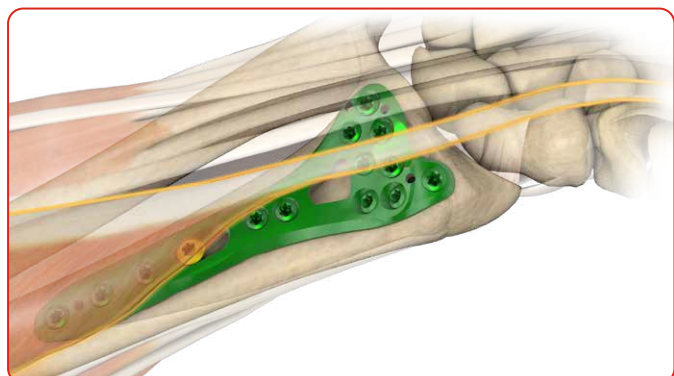
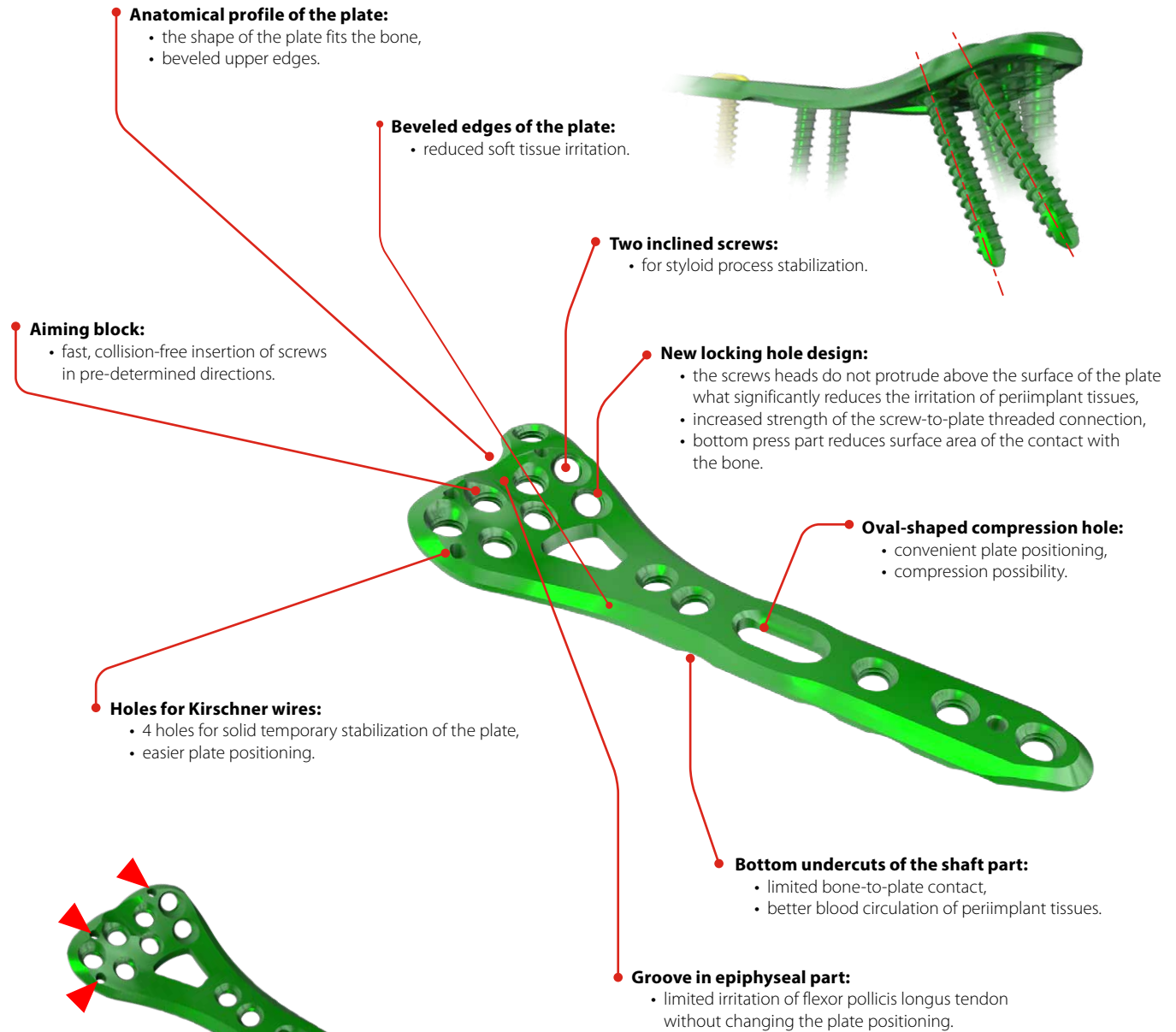
Before using the product, carefully read the Instructions for Use. It contains, among others, indications, contraindications, side effects, recommendations and warnings related to the use of the product.



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

2. IMPLANT DESCRIPTION

Radius volar plates are a part of 4.0ChLP system. This system includes also compatible locking screws. To facilitate their identification, both titanium plate and screws are green anodized.



Watershed line' profile:

- facilitated anatomical plate positioning in the distal part of the bone
- anatomical fit.

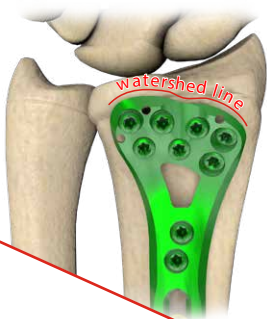


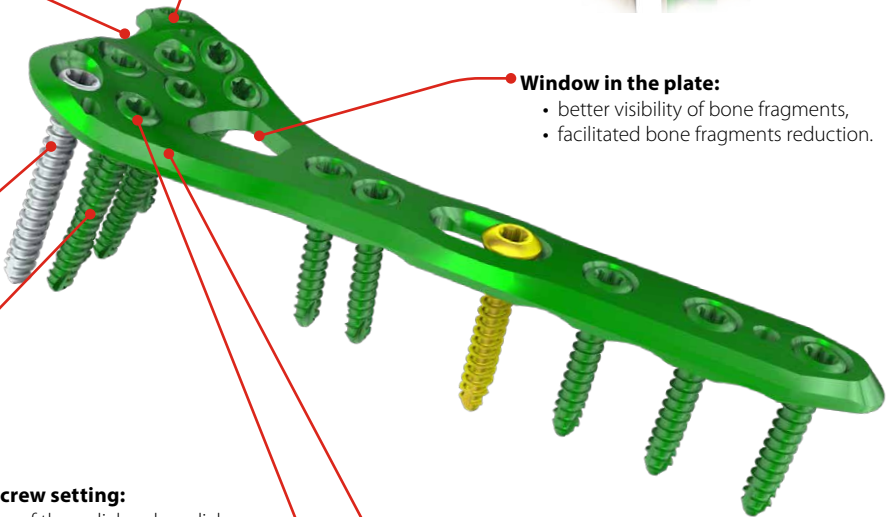
Plate with extension:

- facilitated anatomical alignment of styloid process fragments,
- reduced thickness of the extension to limit the soft tissue irritation,
- extra screw in the extended part.



Window in the plate:

- better visibility of bone fragments,
- facilitated bone fragments reduction.



Anatomical screw setting:

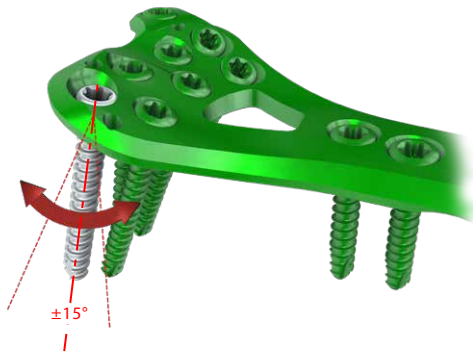
- stabilization of the radial and medial column.

Plate design:

- 3 widths and 3 lengths for optimal match.

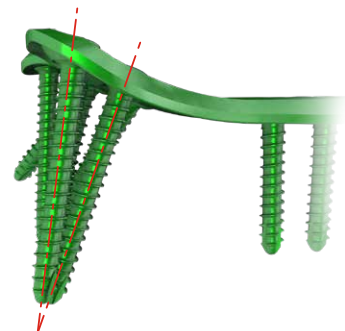
Locking holes adapted to variable angle screws:

- possible screw deflection in the range of $\pm 15^\circ$ from the predefined axis of locking hole.



Two rows of distal screws:

- convergent screws forming a 3-dimensional structure stabilizing the bone fractures,
- solid fracture fragments stabilization with support of the articular surface.



3. SURGICAL TECHNIQUE

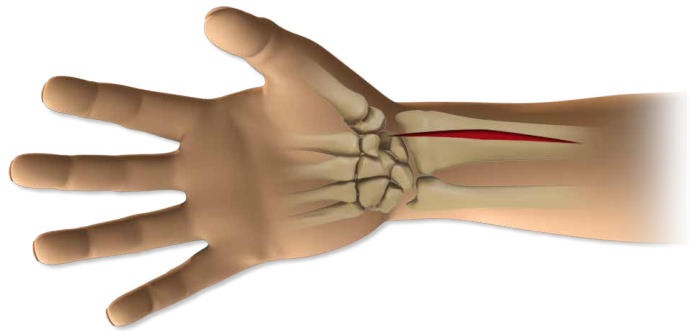
3.1. PATIENT'S POSITIONING

It is recommended to position a patient supine, with the forearm and hand positioned on a hand table.



3.2. SURGICAL APPROACH

For volar approach make a longitudinal incision between flexor carpi radialis tendon and radial artery.



3.3. FRACTURE REDUCTION

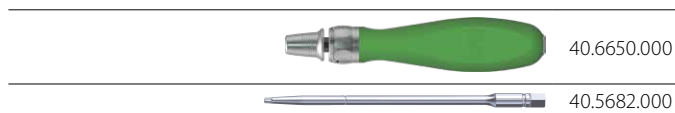
Perform fracture reduction. If need be, temporarily stabilize the bone fragments with Kirschner wires and/or reduction pliers.

3.4. IMPLANT SELECTION

Select the right size of the implant to the type of fracture, bone size and structure.

3.5. USE OF AIMING BLOCK

Attach appropriate aiming block to the plate by tightening the fixing screw of the block using screwdriver tip T8 **[40.5682.000]**.



Most ChLP locking plates are available with aiming blocks as additional supplementary instruments. The use of aiming blocks ensures proper guide sleeves locking in the plates epiphyseal locking holes. Aiming blocks facilitate also the surgery procedure, shorten its time and ensure drilling in the axis of the locking hole.

Not using aiming blocks may lead to improper device implantation. Incorrectly locked screws can cause complications when removing the plates.

3.6. PLATE INSERTION

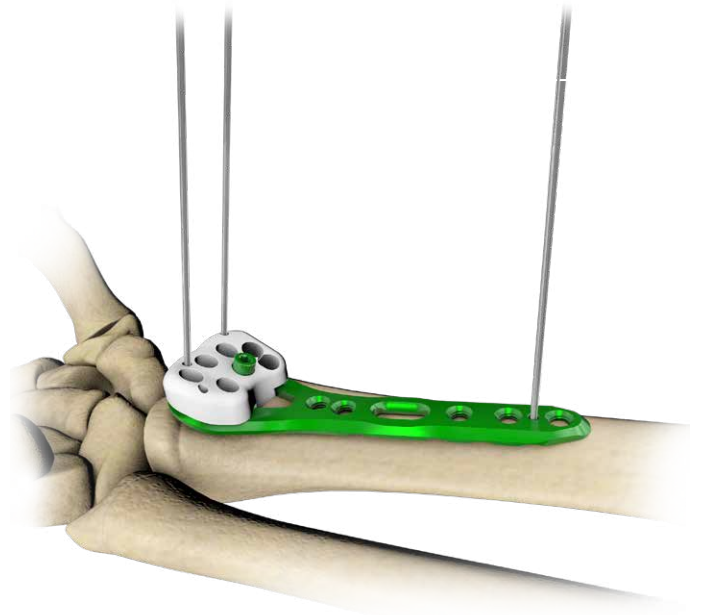
Position the implant correctly on the bone.

3.7. TEMPORARY PLATE STABILIZATION

Stabilize the position of the implant inserting Kirschner wires into appropriate holes or using setting-compressing screw (acc. to procedure 4a).



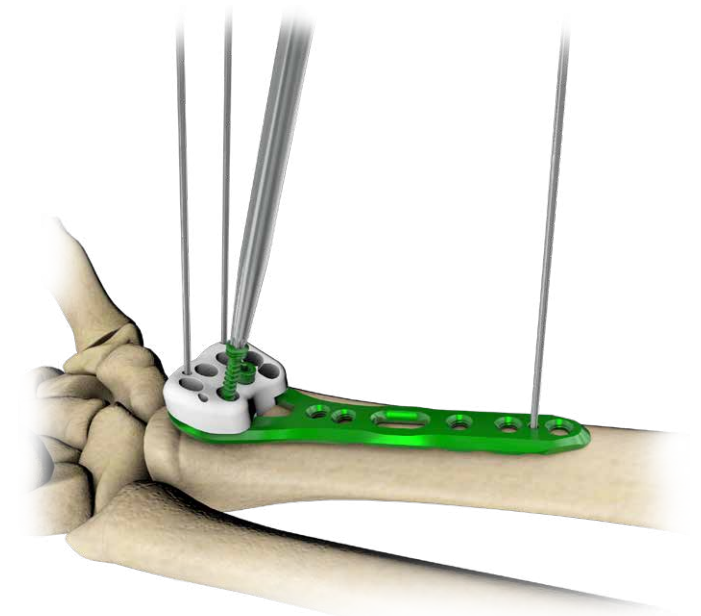
Confirm the correct position of the implant by taking X-Ray image.



3.8. LOCKING SCREWS INSERTION IN THE EPIPHYSEAL PART OF THE PLATE

Insert locking screw of a suitable length into the locking holes of the epiphyseal part of the plate.

- 4.0ChLP screw 2.4 [3.5164] acc. to procedure 4c
- 4.0ChLP screw VA 2.4 [4.5235] acc. to procedure 4d



3.9. AIMING BLOCK REMOVAL

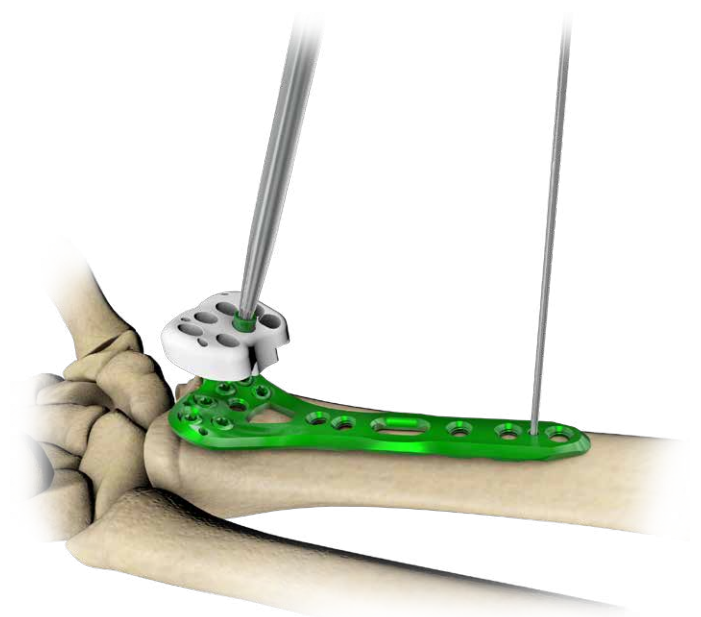
Use screwdriver tip T8 [40.5682.000] to remove the aiming block from the plate.



40.6650.000

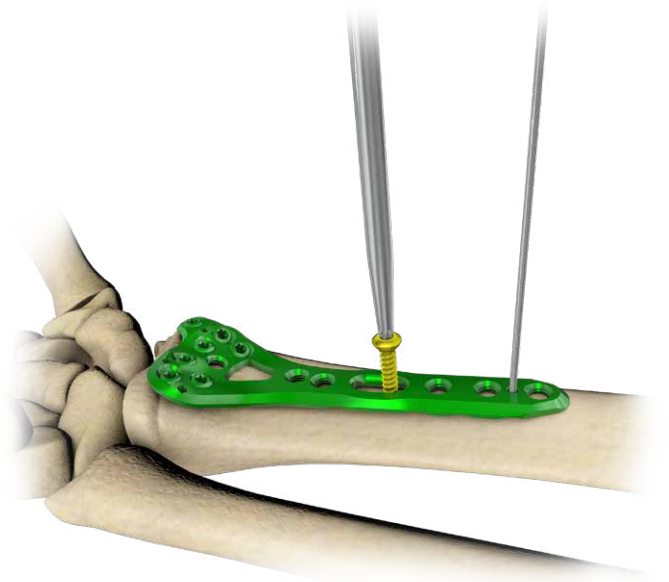


40.5682.000



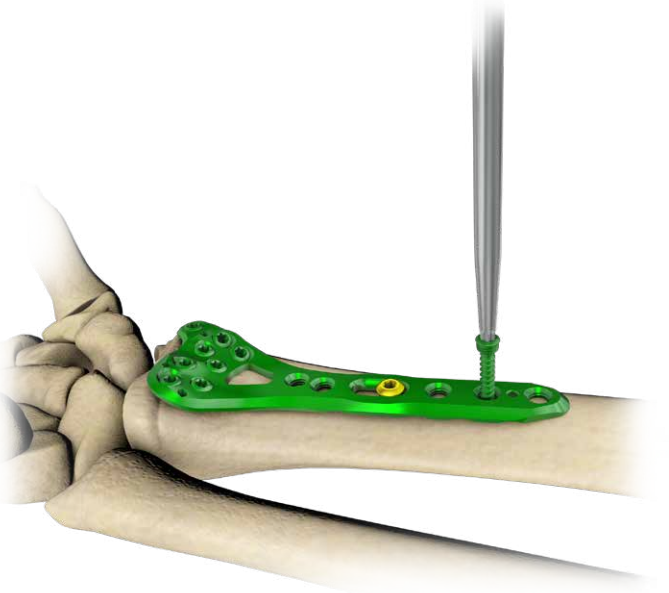
3.10. INSERTION OF CORTICAL SCREW IN THE SHAFT PART OF THE PLATE

Insert cortical self-tapping screw 2.7 **[3.1220]** into the oval-shaped hole of the plate. If necessary, perform compression (*acc. to procedure 4b*).



3.11. INSERTION OF LOCKING SCREW IN THE SHAFT PART OF THE PLATE

Insert 4.0ChLP screw 2.4 **[3.5164]** of a proper length in the locking hole of the shaft part of the plate (*acc. to procedure 4c*).



Insert the cortical screws 2.7 into the fracture before inserting the locking screws.

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

3.12. WOUND CLOSURE

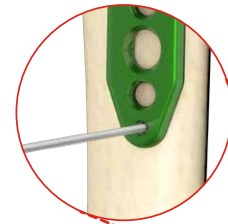
Before closing the wound, take an X-Ray image in at least two projections to confirm implant position and fracture reduction. Make sure all the screws are properly tightened and do not penetrate the joint surface. Use appropriate surgical technique to close the wound.

4. SURGICAL PROCEDURES

4a. PROCEDURE OF TEMPORARY IMPLANT STABILIZATION

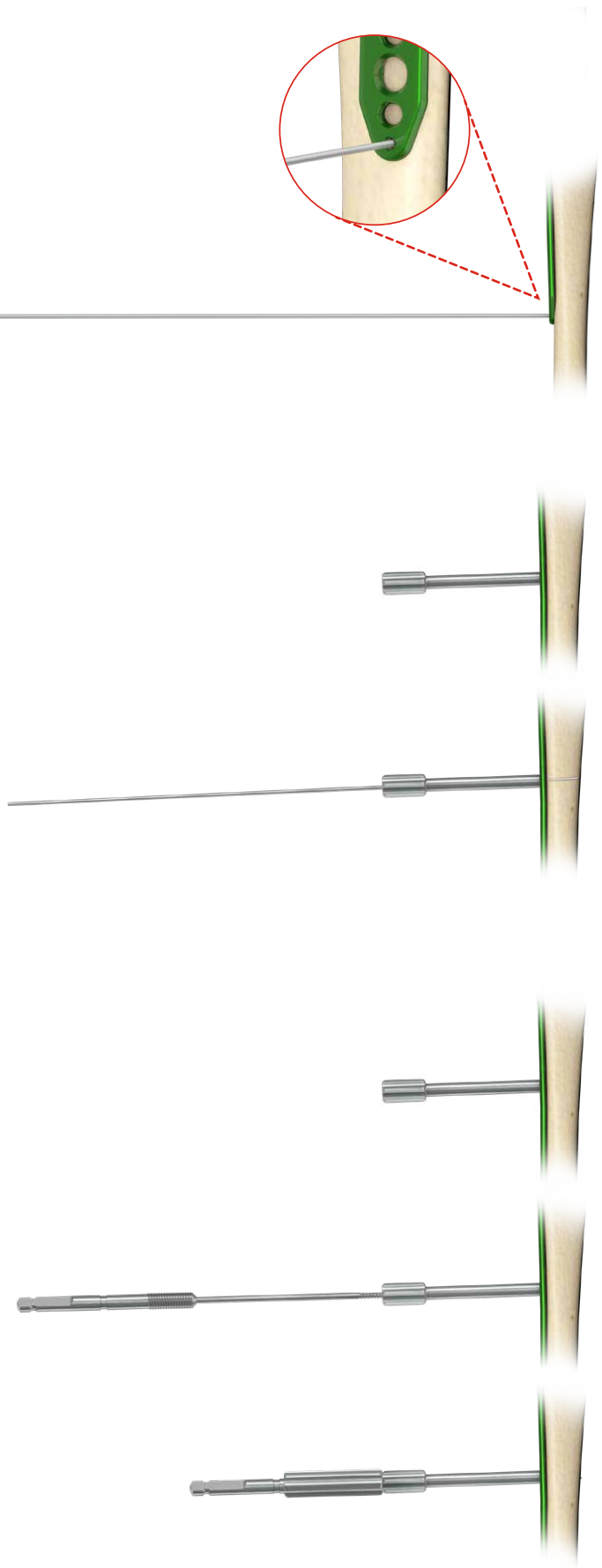
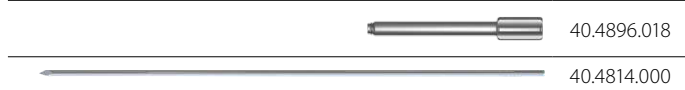
Stabilization using Kirschner wire

- Stabilize temporary the implant inserting Kirschner wire 1.0/180 [40.4814.000] into dedicated hole in the plate.



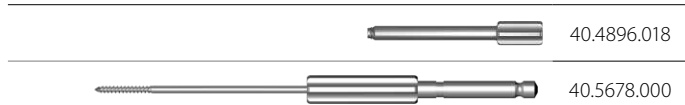
Stabilization in locking holes using Kirschner wires

- Insert threaded guide M3.5/1.8-4.0 [40.4896.018] into locking hole of the plate.
- Insert Kirschner wire 1.0/180 [40.4814.000] through the threaded guide M3.5/1.8-4.0 [40.4896.018].



Stabilization using setting-compressing screw

- Insert threaded guide M3.5/1.8-4.0 [40.4896.018] into the locking hole of the plate.
- Insert setting-compressing screw 1.8/120 [40.5678.000] through the threaded guide [40.4896.018].
- Tighten the nut of the setting-compressing screw [40.5678.000] and push the plate to the bone.



4b. PROCEDURE OF CORTICAL SELF-TAPPING SCREW 2.7 [3.1220] INSERTION

Compression guide positioning

Position the compression guide 1.8 [40.4897.018] in a desired position:



NEUTRAL POSITION: Push the guide to the plate. It will position itself so that neutral insertion of the screw is allowed.

COMPRESSION POSITION: Do not push the guide and move it to the edge of the compression hole. The hole drilled in this position allows compressive insertion of the screw.

ANGULAR POSITION: Angular position of the guide may also be applied.

Hole drilling

Perform a hole through both cortices for a cortical screw 2.7 insertion. For drilling, use drill 1.8/180 [40.2063.181] and compression guide in a desired position.



Measurement of hole depth

Insert depth measure [40.4640.000] 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 handle 1Nm [40.6650.000] and screwdriver tip T8 [40.5682.000].

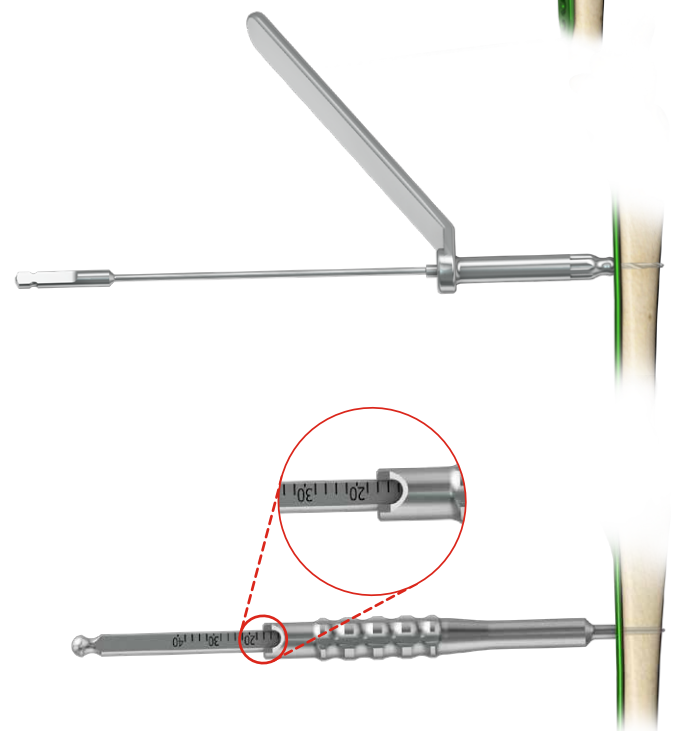


NEUTRAL POSITION:



COMPRESSION POSITION:

ANGULAR POSITION:



4c. PROCEDURE OF 4.0ChLP SCREW 2.4 [3.5164] INSERTION

Threaded guide insertion

Insert threaded guide M3.5/1.8-4.0 [40.4896.018] into the threaded hole of the plate.



Hole drilling

Drill using drill 1.8/180 [40.2063.181] until a desired depth is reached.



Measurement of hole depth

OPTION I: Determine the length of the screw to be used using locking screw length measure [40.4818.100].

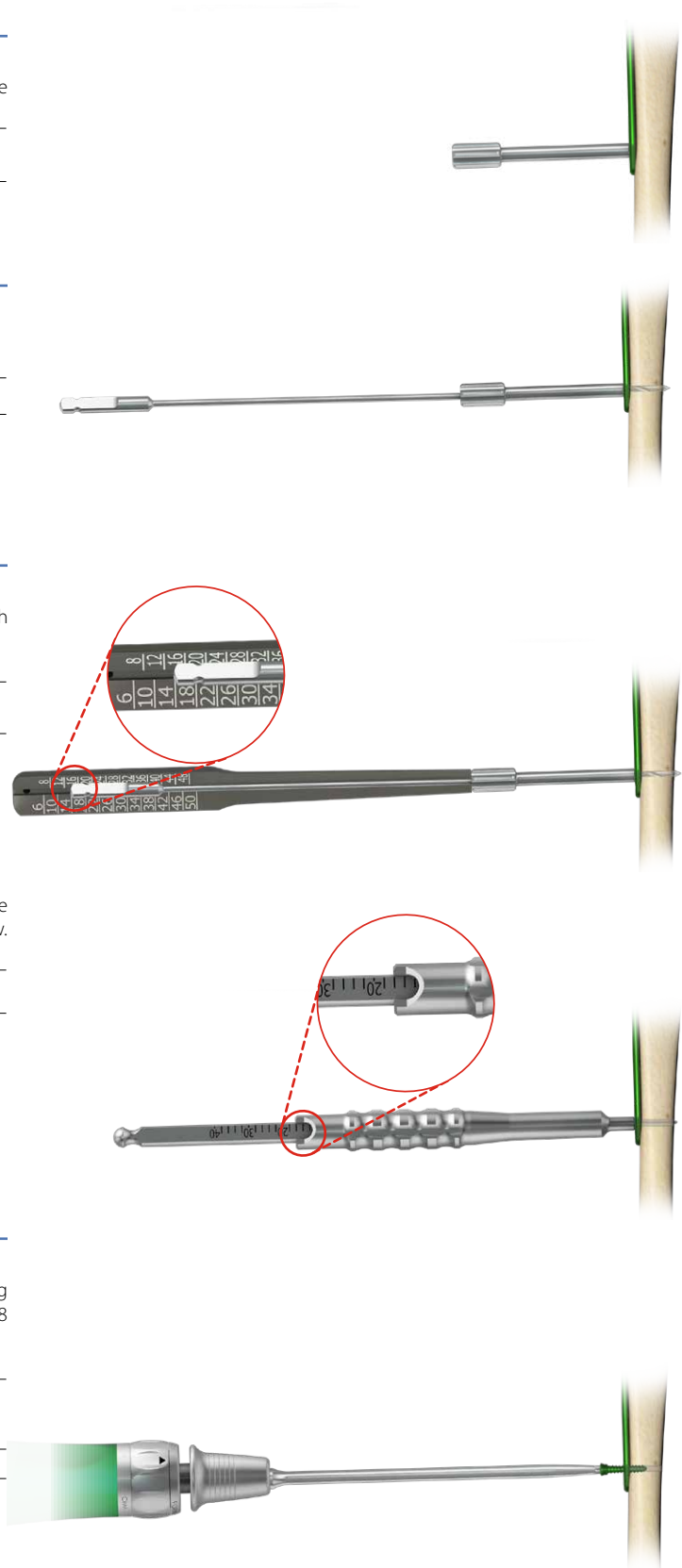


OPTION II: or having removed the threaded guide M3.5/1.8-4.0 [40.4896.018], use depth measure [40.4640.000] to determine the length of the screw.



Screw insertion

Remove threaded guide M3.5/1.8-4.0 [40.4896.018]. Insert locking screw using torque limiting ratchet handle 1Nm [40.6650.000] and screwdriver tip T8 [40.5682.000].



4d. PROCEDURE OF 4.0ChLP SCREW VA 2.4 [4.5235] 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 1.8 [40.5928.018] 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.



IMPORTANT: 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 1.8/180 [40.2063.181] until desired depth is reached.



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



Measurement of hole depth

OPTION I: Determine the length of the screw to be used using locking screw length measure [40.4818.100].

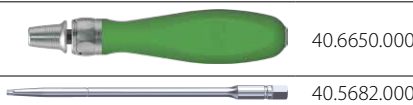


OPTION II: or having removed the guide VA, use depth measure [40.4640.000] to determine the length of the screw.



Screw insertion

Insert VA screw using torque limiting ratchet handle 1Nm [40.6650.000] and screwdriver tip T8 [40.5682.000].

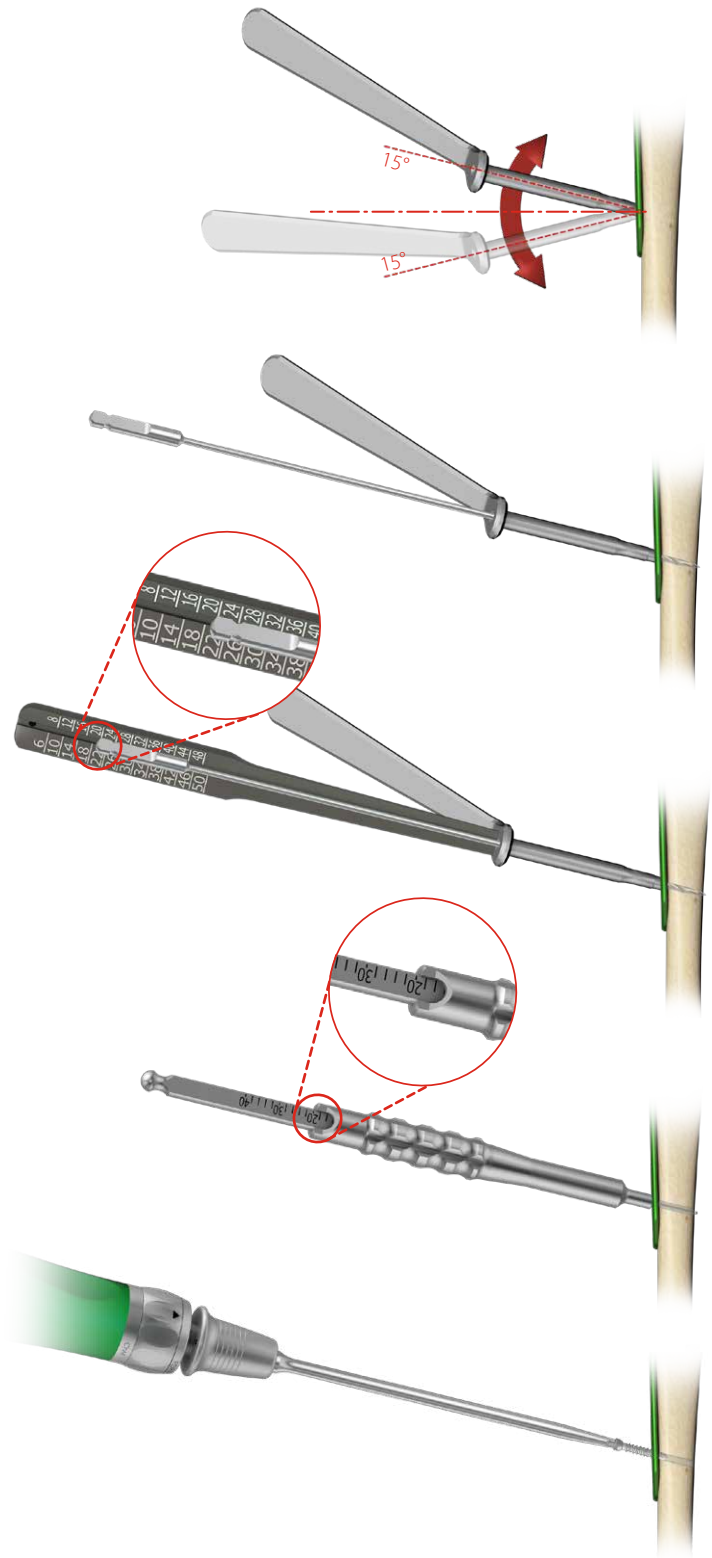


When using torque limiting handle to tighten the VA screw with large inclination in relation to the axis of the locking hole, the head of the screw may protrude above the plate. In this case, it may be necessary to use a handle ratchet device [40.6654] and screwdriver tip T15 [40.5677]. Use the instruments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



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.

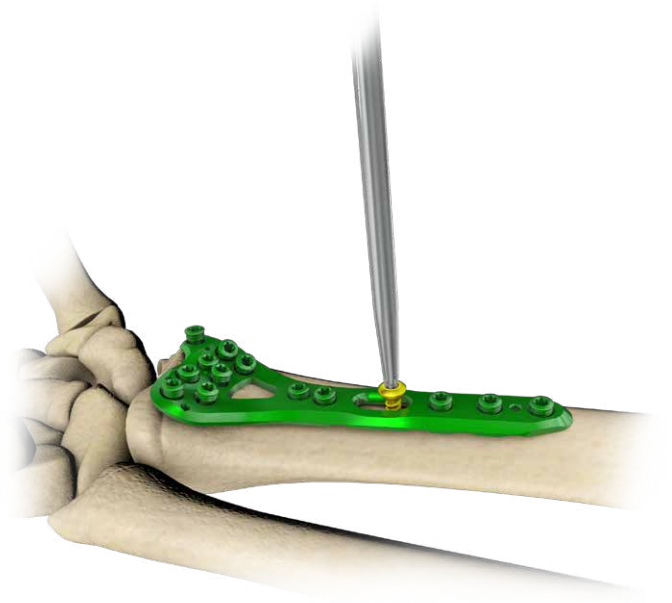
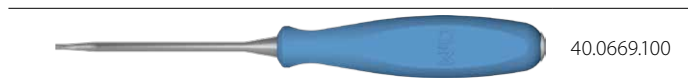


5. POSTOPERATIVE PROCEDURE

Introduce appropriate postoperative treatment 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.

6. IMPLANT REMOVAL

The physician decides about implant removal. In order to remove the implants from the body, use star screwdriver T8 **[40.0669.100]** and 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

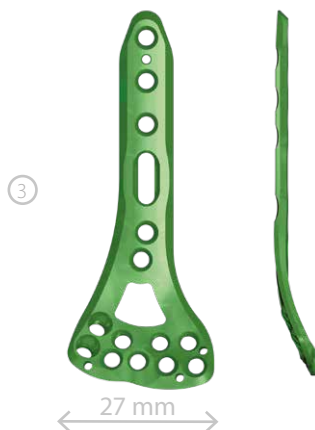
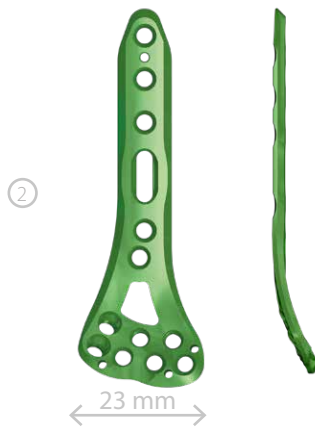
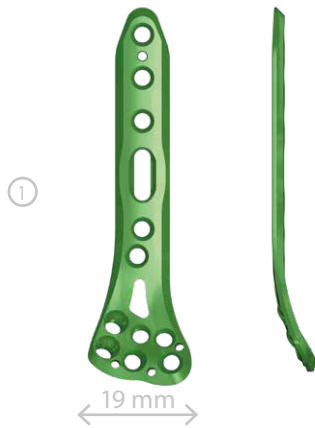
7a. INSTRUMENT SET

Instrument set for 4.0ChLP

40.5711.200

	Name	Catalogue No.	Pcs
	Threaded guide M3.5/1.8 -4,0	40.4896.018	4
	Compression guide 1.8	40.4897.018	1
	Guide VA 1.8	40.5928.018	1
	Kirschner wire 1.0/180	40.4814.000	5
	Drill 1.8/180	40.2063.181	2
	Length measure of locking screw	40.4818.100	1
	Depth measure	40.4640.000	1
	Screwdriver tip T8.0	40.5682.000	1
	T8 screwdriver tip with holder	40.5989.000	1
	Cortical tap HA 2.7	40.5988.000	1
	Tap 4.0ChLP -2.4	40.5987.024	1
	Setting-compressing screw 1.8/120	40.5678.000	2
	Torque limiting ratchet handle 1.0Nm	40.6650.000	1
	Star screwdriver T8	40.0669.100	1
	Plates bender 4.0	40.4643.000	2
	Dissecting forceps Standard 14.5cm	30.3303.000	1
	Palette for instruments 4.0ChLP	40.5712.100	1

4.0ChLP radius volar plate



4.0ChLP radius volar narrow plate

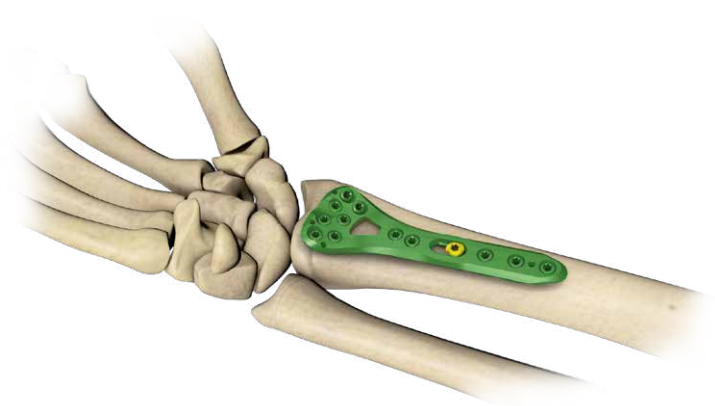
①	Len	L	R
3	44	3.7227.603	3.7226.603
4	54	3.7227.604	3.7226.604
6	70	3.7227.606	3.7226.606

4.0ChLP radius volar plate

②	Len	L	R
3	44	3.7229.603	3.7228.603
4	54	3.7229.604	3.7228.604
6	70	3.7229.606	3.7228.606

4.0ChLP radius volar wide plate

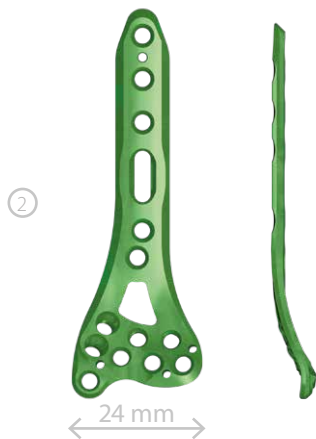
③	Len	L	R
3	44	3.7231.603	3.7230.603
4	54	3.7231.604	3.7230.604
6	70	3.7231.606	3.7230.606



- Ti
- 2.0
- Ster Non Ster
- L/R

	Ti	Co	Locking	VA	Locking	Locking
 3.5164.xxx	✓		✓		✓	2.4
 3.5165.xxx	✓		✓		✓	2.7
 3.1220.xxx	✓		✓		✓	2.7
 4.5235.xxx		✓	✓	✓	✓	2.4

4.0ChLP expanded radius volar plate



4.0ChLP expanded radius volar narrow plate

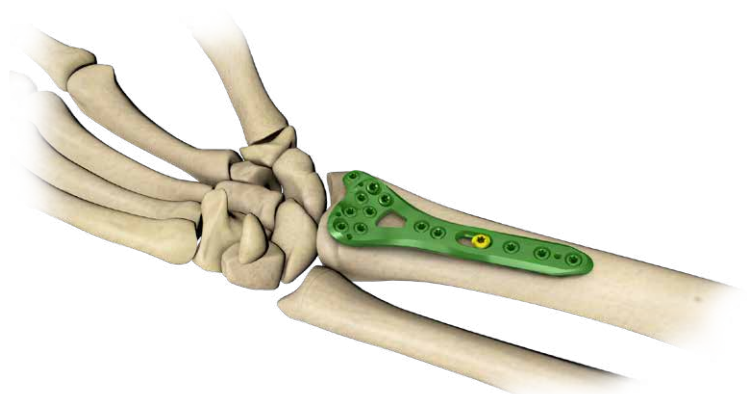
①	Len	L	R
3	46	3.7233.603	3.7232.603
4	56	3.7233.604	3.7232.604
6	72	3.7233.606	3.7232.606

4.0ChLP expanded radius volar plate

②	Len	L	R
3	46	3.7235.603	3.7234.603
4	56	3.7235.604	3.7234.604
6	72	3.7235.606	3.7234.606

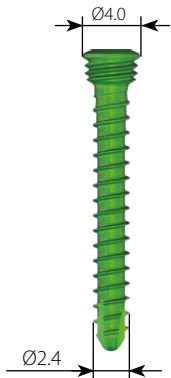
4.0ChLP expanded radius volar wide plate

③	Len	L	R
3	46	3.7237.603	3.7236.603
4	56	3.7237.604	3.7236.604
6	72	3.7237.606	3.7236.606



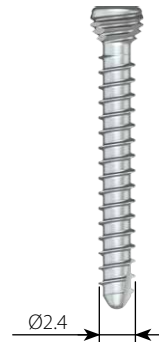
	Ti	Co	Lock	Lock	VA	Lock	Lock
	3.5164.xxx	✓	✓	✓		✓	2.4
	3.5165.xxx	✓	✓	✓		✓	2.7
	3.1220.xxx	✓	✓			✓	2.7
	4.5235.xxx		✓	✓	✓	✓	2.4

4.0ChLP screw 2.4



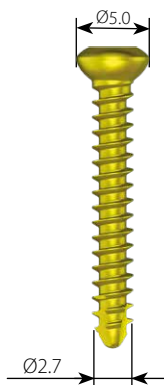
Len	Ti
6	3.5164.006
8	3.5164.008
10	3.5164.010
12	3.5164.012
14	3.5164.014
16	3.5164.016
18	3.5164.018
20	3.5164.020
22	3.5164.022
24	3.5164.024
26	3.5164.026
28	3.5164.028
30	3.5164.030
32	3.5164.032
34	3.5164.034
36	3.5164.036
38	3.5164.038
40	3.5164.040

4.0ChLP screw VA 2.4



Len	Co
6	4.5235.006
8	4.5235.008
10	4.5235.010
12	4.5235.012
14	4.5235.014
16	4.5235.016
18	4.5235.018
20	4.5235.020
22	4.5235.022
24	4.5235.024
26	4.5235.026
28	4.5235.028
30	4.5235.030
32	4.5235.032
34	4.5235.034
36	4.5235.036
38	4.5235.038
40	4.5235.040

Cortical self-tapping screw 2.7



Len	Ti
6	3.1220.006
8	3.1220.008
10	3.1220.010
12	3.1220.012
14	3.1220.014
16	3.1220.016
18	3.1220.018
20	3.1220.020
22	3.1220.022
24	3.1220.024
26	3.1220.026
28	3.1220.028
30	3.1220.030
32	3.1220.032
34	3.1220.034
36	3.1220.036
38	3.1220.038
40	3.1220.040

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