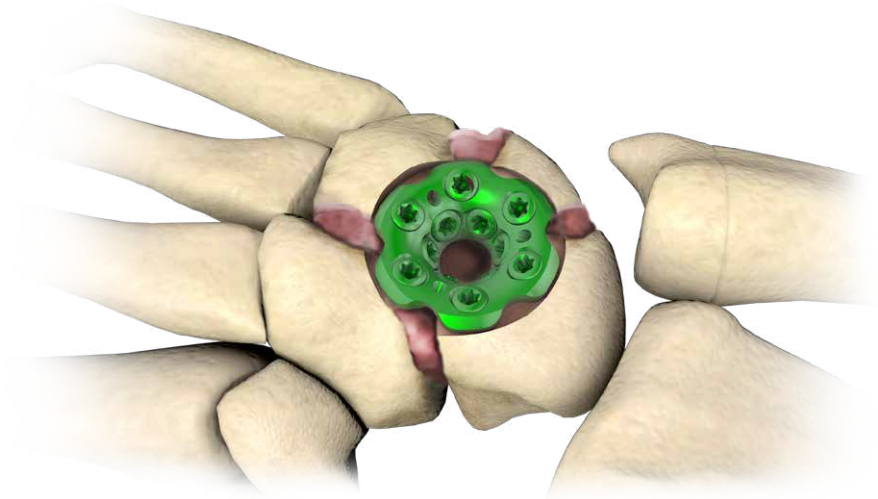
ST/80-404

ChM®

4,0 ChM Locked Plating ChLPsystem

# 4.0ChLP wrist arthrodesis plate
# 3.7206

- *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 | C | 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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|---|---|
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| Date of issue | 27.06.2019 |
| Review date | P-002-07.12.2020 |


*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 4.0ChLP locked plating system used for wrist 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

The plates are used for:
- post-traumatic or degenerative arthritis in the wrist,
- instability of the wrist,
- rheumatoid arthritis in the wrist,
- fractures in the wrist area.

## Plate selection and shaping

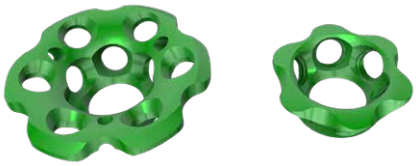
The plates are available in different variants. This allows for optimal selection of the implant to the fracture type. Shaping of the plates is not allowed.

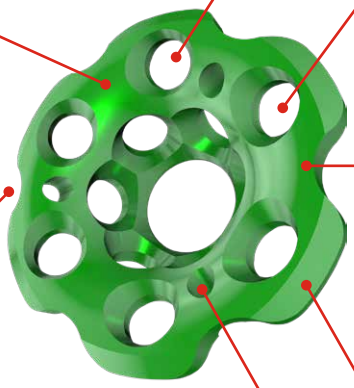
Before using the product, carefully read the Instructions for Use. It contains, among others, indications, contraindications, side effects, recommendations and warnings related to the use of the product.

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

## 2. IMPLANT DESCRIPTION

Wrist arthrodesis plates are offered in two variants. They are intended for arthrodesis of 3 or 4 bones of the wrist. The plates are a part of 4.0ChLP system. This system includes also compatible locking screws. To facilitate the identification, both titanium plate and screws are green anodized.





**2 sizes:**
- 6-hole plate with a diameter of 14mm,
- 12-hole plate with a diameter of 21mm,
- accommodated to patient's anatomy and planned arthrodesis.

**Variable angle screws:**
- facilitated stabilization of immobilized bones,
- 15° angulation from the predefined axis of the locking hole.

**Locking holes:**
- locking holes for 4.0ChLP screws,
- angular stabilization of immobilized bones.

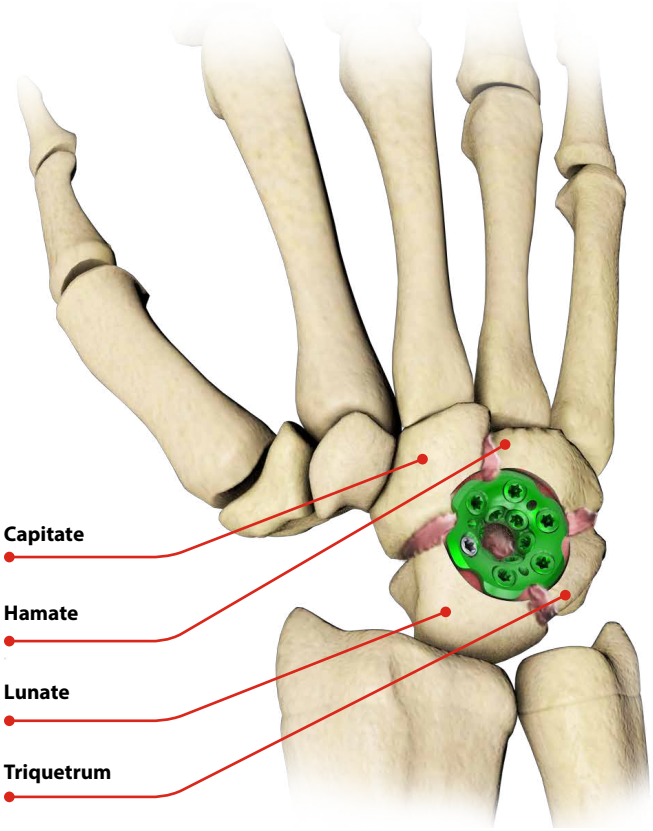
**Dedicated cutters for plate size:**
- deepening performed matches the plate profile,
- reduced amount of removed bone.

**Beveled upper edge of the plate:**
- reduced soft tissue irritation.

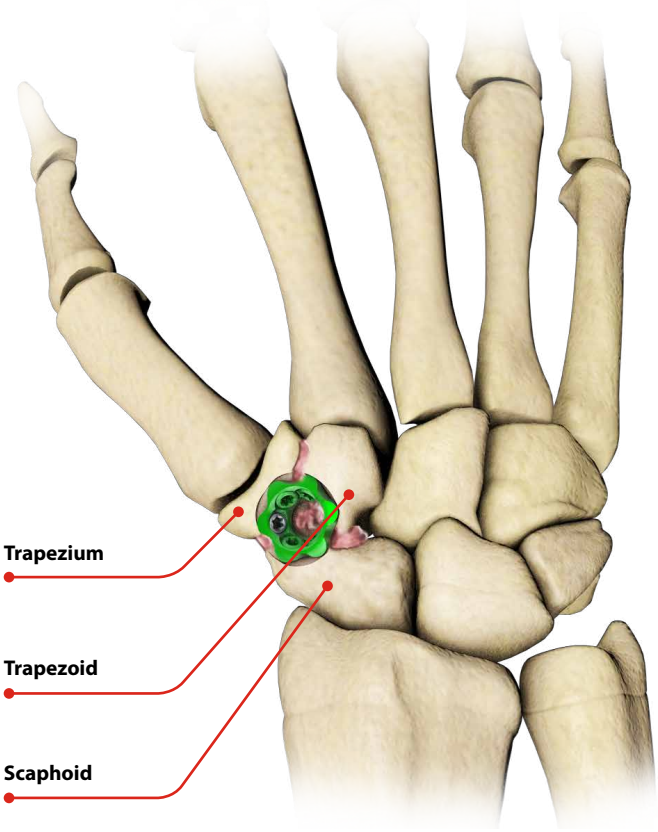
**Concave profile:**
- reduced amount of removed bone,
- facilitated plate positioning in the deepening.

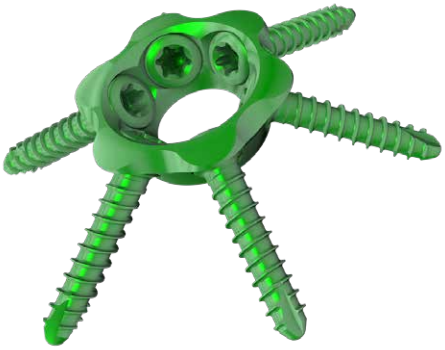
**Holes for Kirschner wires:**
- easier plate positioning,
- temporary plate stabilization.

## Arthrodesis of four bones 4CF *(Four Corner Fusion)*:



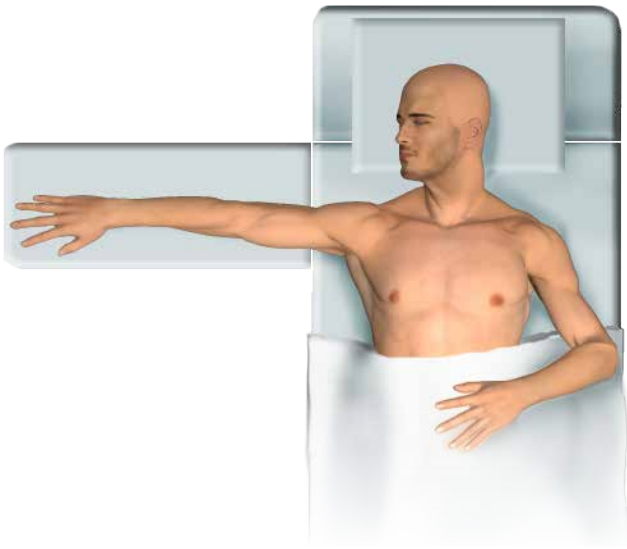

## Arthrodesis of three bones STT *(ScaphoTrapezioTrapezoidal Fusion)*:



# 3. SURGICAL TECHNIQUE

## 3.1. FOUR CORNER FUSION



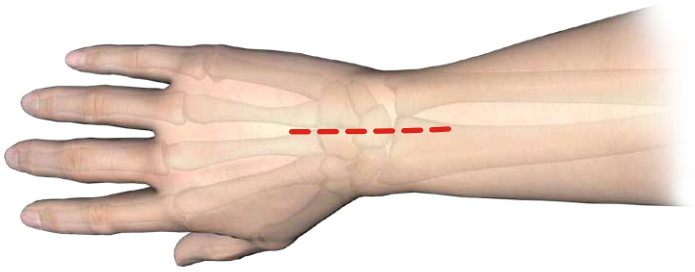
### 3.1.1. PATIENT'S POSITIONING

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

### 3.1.2. SURGICAL APPROACH

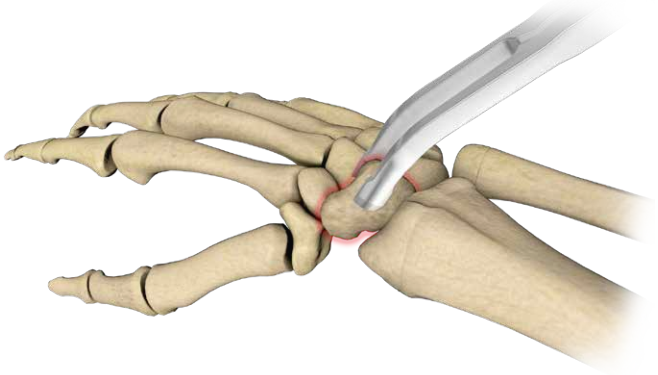
Perform a dorsal longitudinal skin incision.

Do not damage the dorsal branch of ulnar nerve.



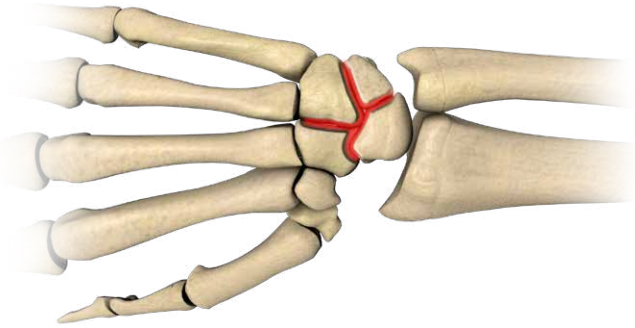
### 3.1.3. EXCISION OF THE SCAPHOID

Completely excise scaphoid.



### 3.1.4. PREPARE THE BONE FOR IMPLANTATION

Remove joint cartilage *(as presented in the figure)*.

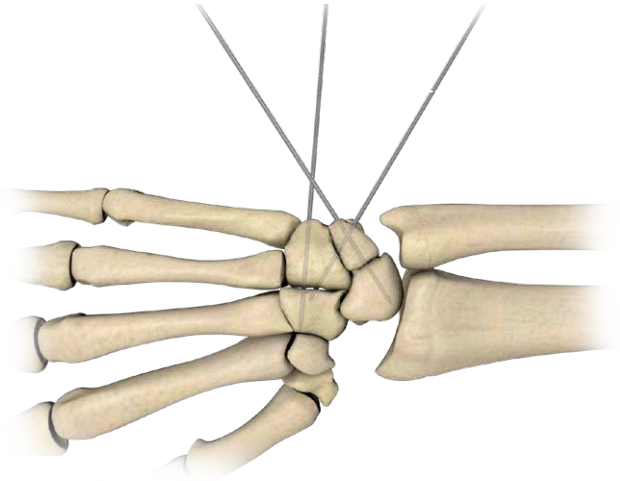


## 3.1.5. TEMPORARY STABILIZATION OF BONES

Use Kirschner wires 1.5/180 **[40.4592.180]** to temporary fix wrist bones in the correct position. Insert Kirschner wires so that they will not interfere with the instruments used in the subsequent steps.


40.4592.180

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

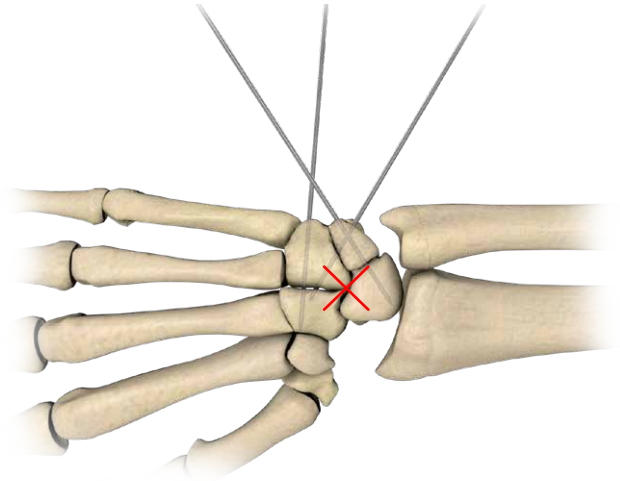


## 3.1.6. REAMING OF THE WRIST BONES

**a.** Enter the Kirschner wire 1.5/180 **[40.4592.180]** in the place the bones contact.


40.4592.180

Insert Kirschner wire perpendicular to the surface of the bones to be fixed. The position of the wire determines the correct setting of the cutter.

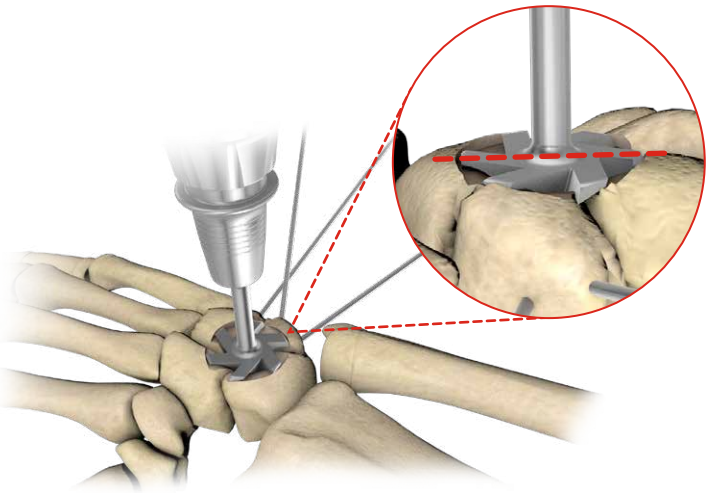


**b.** Ream the bones using a cutter 22 **[40.8262.022]**.


40.8262.022

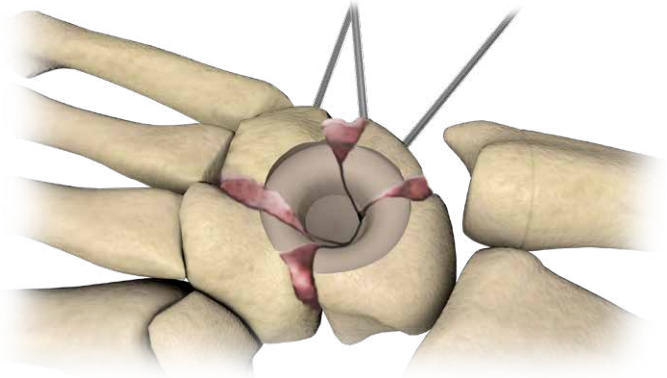
A properly performed deepening should ensure complete insertion of the plate in relation to the bones.

The upper edge of the cutter determines the correct reaming depth and should be level with the surface of the bones.



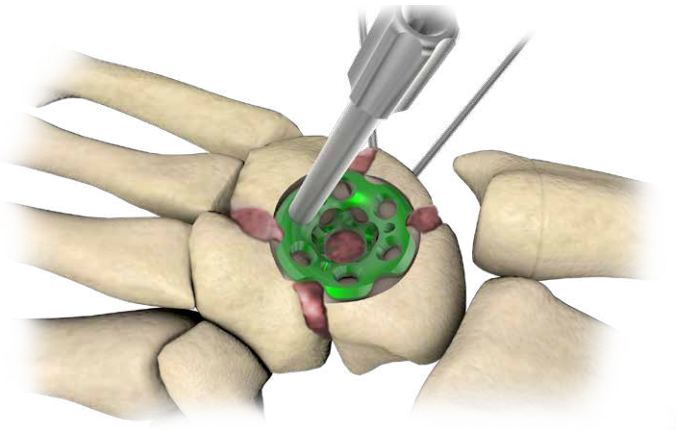
## 3.1.7. BONE GRAFTING

Fill the space between the bones to be fixed with autogenous bone grafts taken e.g. from the iliac crest or dorsal tubercle of radius.



## 3.1.8. PLATE INSERTION

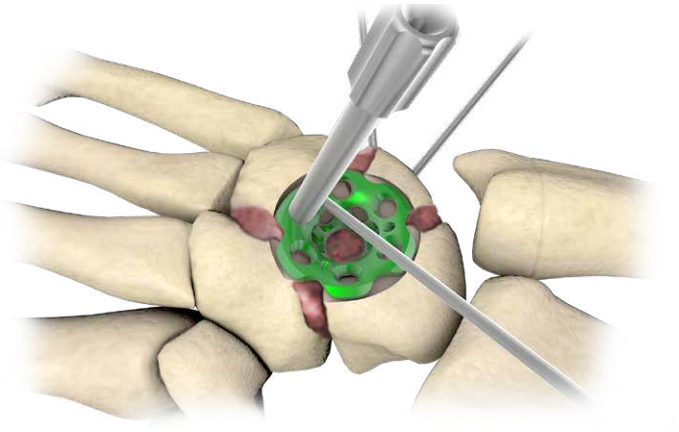
Position the plate in the prepared hole so that the insertion of at least two screws in each of the fixed bones will be possible.



 40.4896.018

As an auxiliary element, a threaded guide M3.5/1.8 - 4.0 **[40.4896.018]** inserted into the plate locking hole can be used.

Insert Kirschnet wire 1.5/180 **[40.4592.180]** into a dedicated hole in the plate and lock its position.

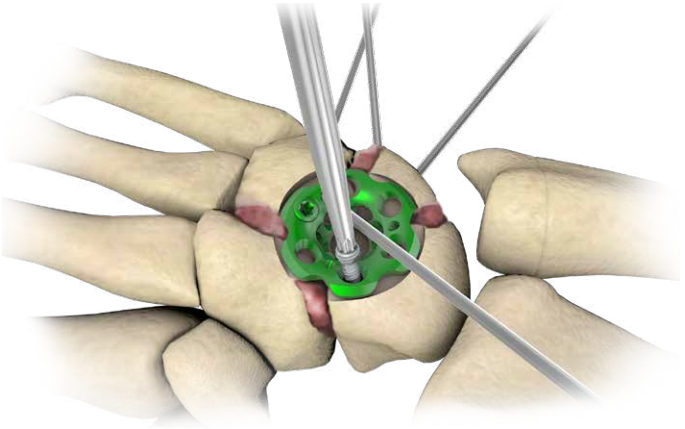


 40.4592.180

## 3.1.9. SCREWS INSERTION

Insert a locking screw of a proper length in the locking holes of the plate.

- Insert 4.0ChLP screw 2.4 **[3.5164]** acc. to 4a procedure,
- Insert 4.0ChLP screw VA 2.4 **[4.5235]** acc. to 4b procedure.

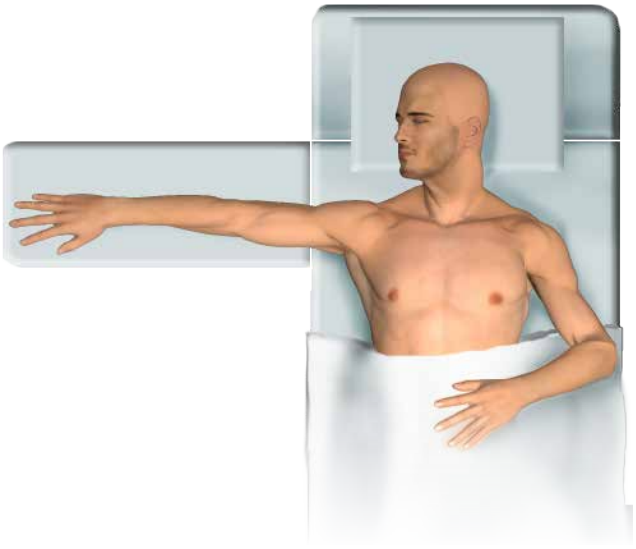


The doctor decides about the order and number of screws to be inserted.

## 3.1.10. 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.

## 3.2. SCAPHOTRAPEZIOTRAPEZOIDAL FUSION

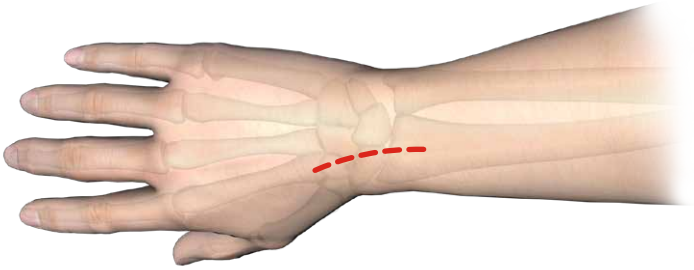


### 3.2.1. PATIENT'S POSITIONING

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

### 3.2.2. SURGICAL APPROACH

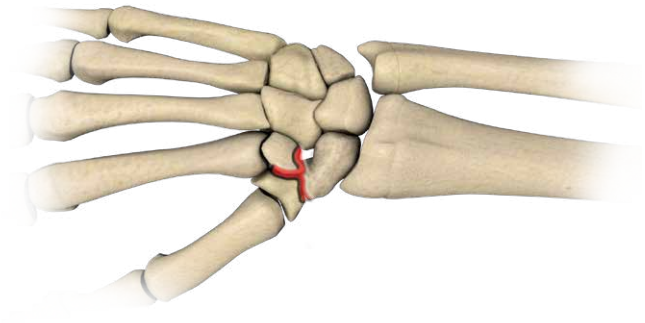
Perform a dorsal longitudinal curved skin incision below dorsal tubercle of radius.



**Do not damage the dorsal branch of ulnar nerve.**

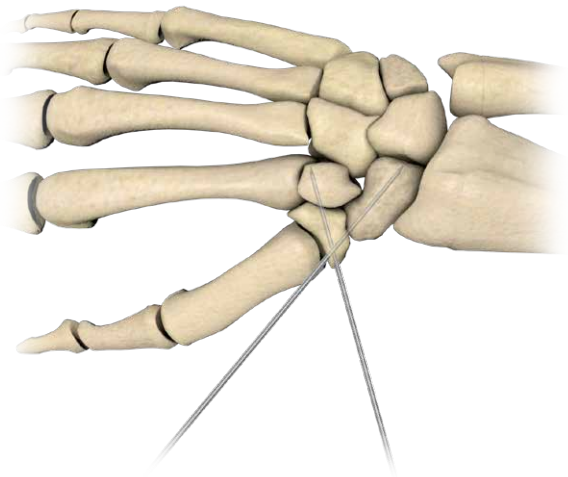
### 3.2.3. PREPARE THE BONE FOR IMPLANTATION

Remove joint cartilage *(as presented in the figure)*.



### 3.2.4. TEMPORARY STABILIZATION OF BONES

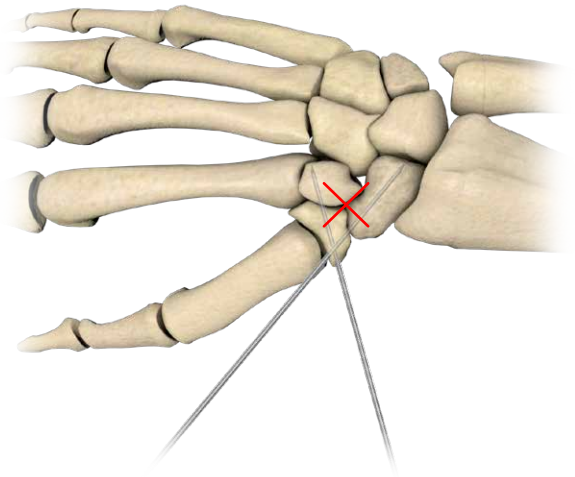
Use Kirschner wires 1.5/180 **[40.4592.180]** to temporary fix wrist bones in the correct position. Insert Kirschner wires so that they will not interfere with the instruments used in the subsequent steps.



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

## 3.2.5. REAMING OF THE WRIST BONES

**a.** Enter the Kirschner wire 1.5/180 **[40.4592.180]** in the place the bones contact.



 40.4592.180

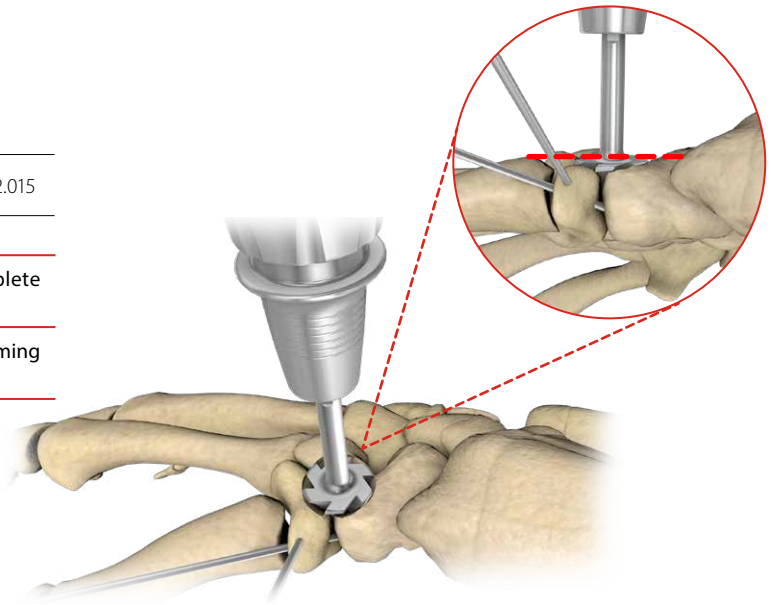
Insert Kirschner wire perpendicular to the surface of the bones to be fixed. The position of the wire determines the correct setting of the cutter.

**b.** Ream the bones using a cutter15 **[40.8262.015]**.

 40.8262.015

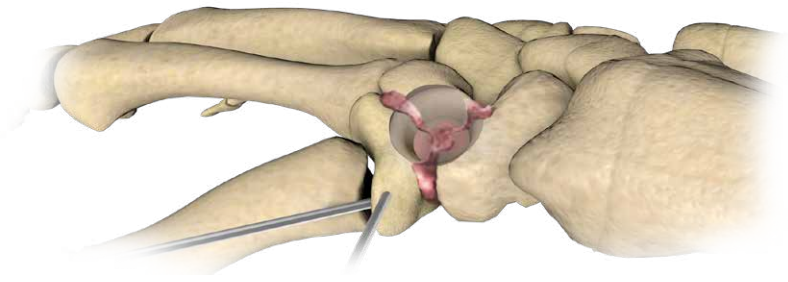
A properly performed deepening should ensure complete insertion of the plate in relation to the bones.

The upper edge of the cutter determines the correct reaming depth and should be level with the surface of the bones.



## 3.2.6. BONE GRAFTING

Fill the space between the bones to be fixed with autogenous bone grafts taken e.g. from the iliac crest or dorsal tubercle of radius.

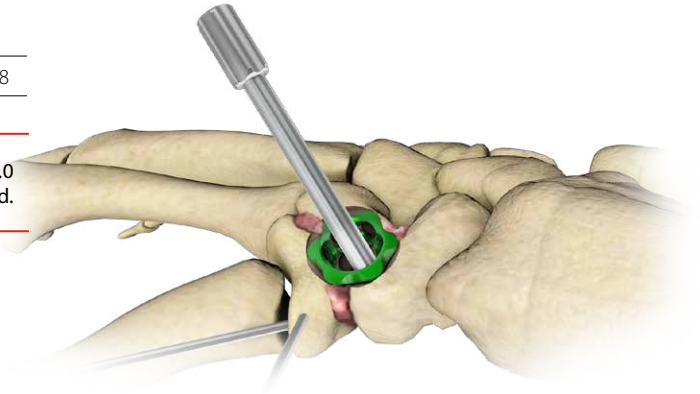


## 3.2.7. PLATE INSERTION

Position the plate in the prepared hole so that the insertion of screws in the bones to be fixed will be possible.


40.4896.018

As an auxiliary element, a threaded guide M3.5/1.8 - 4.0 **[40.4896.018]** inserted into the plate locking hole can be used.

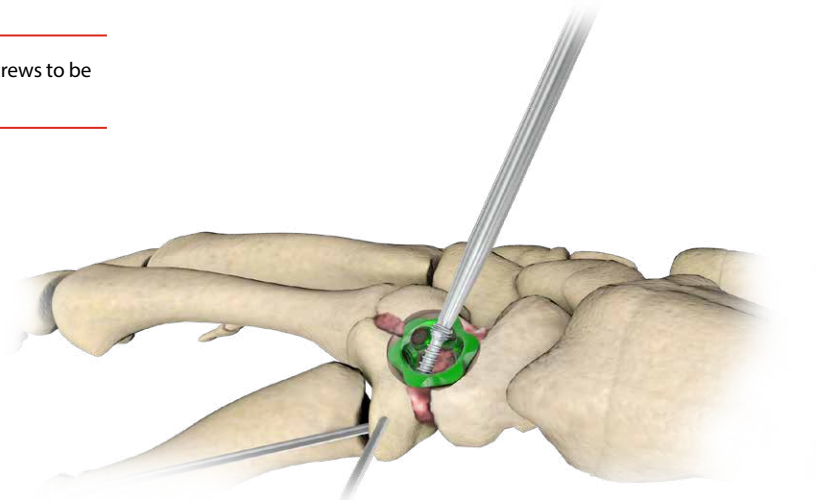


## 3.2.8. SCREWS INSERTION

Insert a locking screw of a proper length in the locking holes of the plate.

- Insert 4.0ChLP screw 2.4 **[3.5164]** acc. to 4a procedure,
- Insert 4.0ChLP screw VA 2.4 **[4.5235]** acc. to 4b procedure.

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



## 3.2.9. 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.

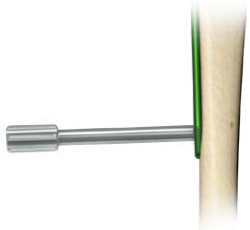
# 4. PROCEDURY OPERACYJNE

## 4a. 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.

40.4896.018

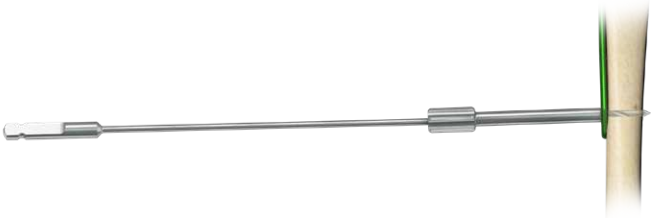


### Hole drilling

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



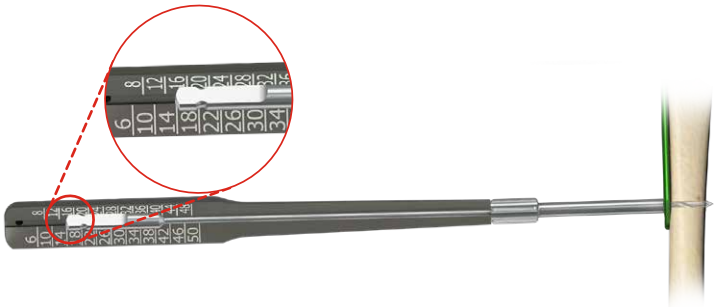
40.2063.181



### Measurement of hole depth

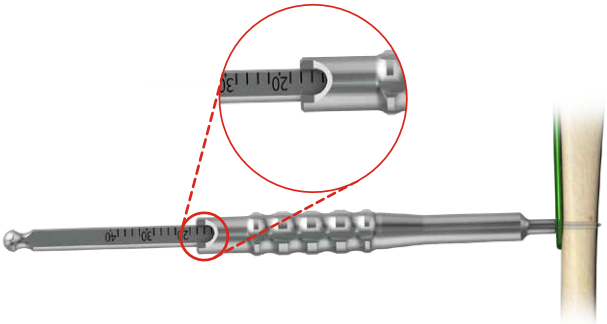
OPTION I: Determine the length of the screw to be used using locking screw length measure **[40.4818.100]**.

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.

40.4640.000



### 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]**.

40.6650.000

40.5682.000

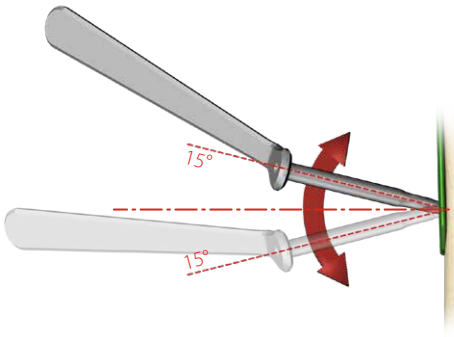
# 4b. PROCEDURE OF 4.0ChLP SCREW VA 2.4 [4.5235] INSERTION

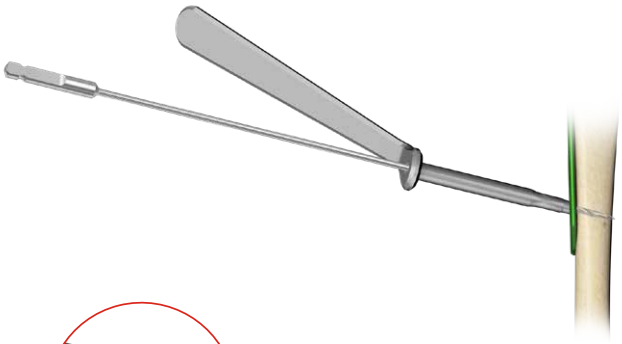
## Guide VA positioning

- 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.

40.5928.018



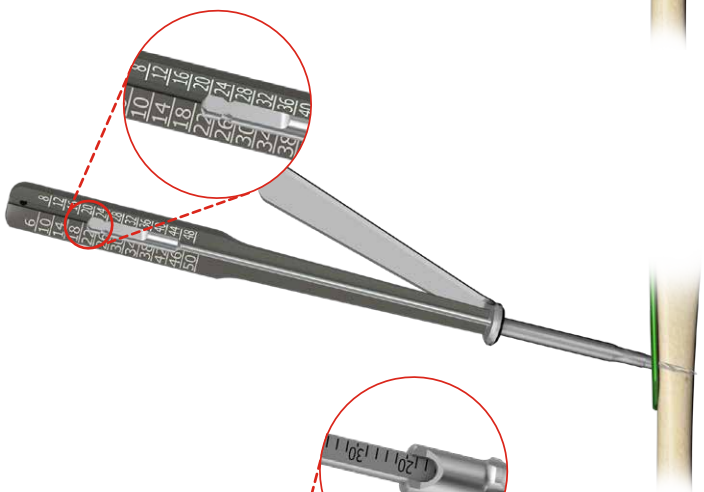



## Hole drilling

- 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.

40.2063.181



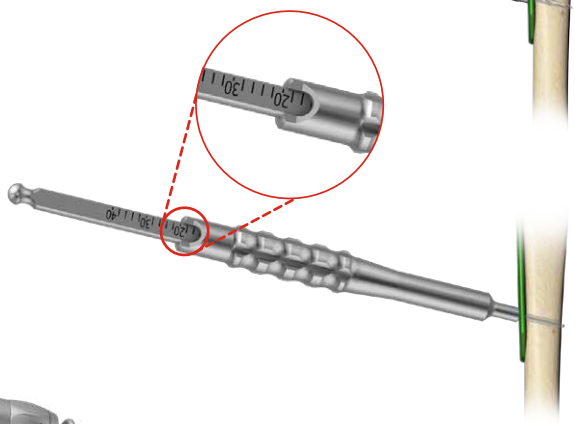
## Measurement of hole depth

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

40.4818.100

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

40.4640.000



## Screw insertion

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

40.6650.000



40.5682.000

## 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

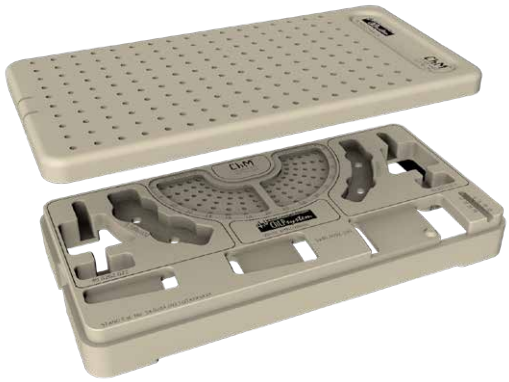
The physician decides about implant removal. In order to remove the implants from the body, use star screwdriver T8 **[40.0669.100]** and unlock all the locking screws first and then remove them from the bone. This will prevent any rotation of the plate when removing the last locking screw.

40.0669.100

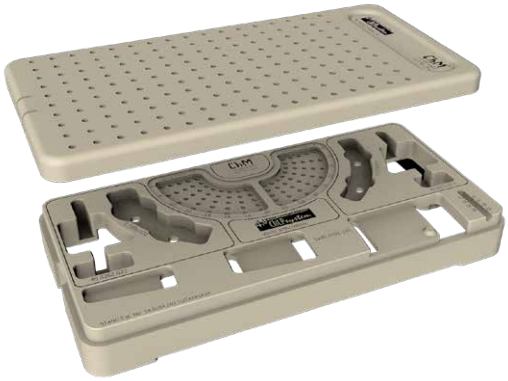
# 7. CATALOGUE PAGES

## 7a. INSTRUMENT SET

Stand for 4.0ChLP implants 3.7206 4x2 1/2H — 15.0204.602

| | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Cutter 15 | **40.8262.015** | 1 |
|  | Cutter 22 | **40.8262.022** | 1 |
|  | Kirschner wire 1.5/180 | **40.4592.180** | 5 |
|  | Stand for 4.0ChLP implants 3.7206 4x2 1/2H | **14.0204.602** | 1 |

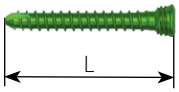
Stand for 4.0ChLP implants 3.7206 4x2 1/2H — 14.0204.602



4.0ChLP wrist arthrodesis plate

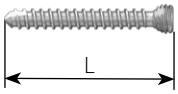
| | | |
|---|---|---|
| **Pcs** | 2 | 2 |

4.0ChLP Screw 2.4




| **L** [mm] | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|
| **Pcs** | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

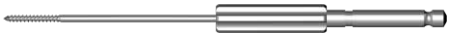
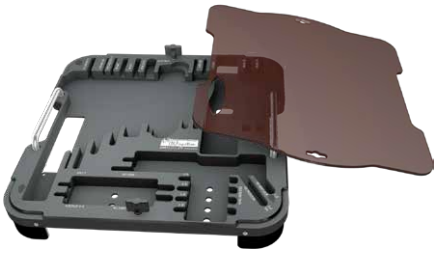
4.0ChLP Screw VA 2.4




| **L** [mm] | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|
| **Pcs** | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

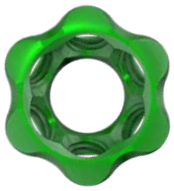
* Tray does not include implants

## Instrument set for 4.0ChLP

| | 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 handle1.0Nm | **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 | 40.5711.200 |
|  | Container with solid bottom 1/2 306x272x85mm | **12.0751.100** | 1 | 40.5711.300 |
| | Perforated aluminum lid 1/1 595x275x15mm Gray | **12.0751.200** | 1 | |

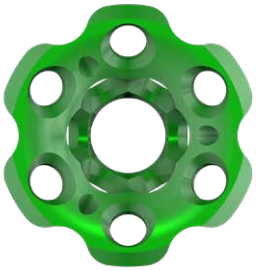
## 4.0ChLP wrist arthrodesis plate

1



| | | | Ti |
|---|---|---|---|
| 1 | 6 | 14 | 3.7206.014 |
| 2 | 12 | 21 | 3.7206.021 |

2



Ti

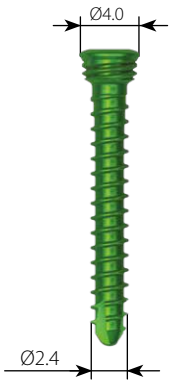
1.8

Ster
Non
Ster

| | Ti | Co | | | VA | | |
|---|---|---|---|---|---|---|---|
| 3.5164.xxx | ✓ | | ✓ | ✓ | | ✓ | 2.4 |
| 4.5235.xxx | | ✓ | ✓ | ✓ | ✓ | ✓ | 2.4 |

## 4.0ChLP screw 2.4

Ster Non Ster




| 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 |

## 4.0ChLP screw VA 2.4

Ster Non Ster


| 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 |

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