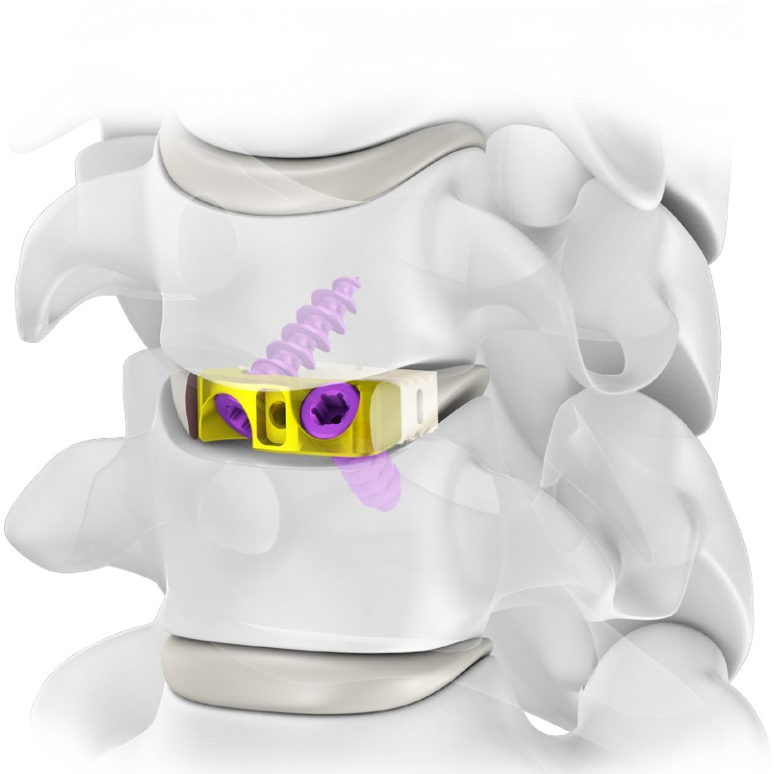
ST/107A

ChM®

# INTERVERTEBRAL CERVICAL LOCKING CAGE

- *IMPLANTS*
- *INSTRUMENT SET 15.0917.102*
- *SURGICAL TECHNIQUE*



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SYMBOLS DESCRIPTION

| | |
|---|---|
|  | 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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Document No ST/107A

Date of issue 25.08.2022

Review date P-006-12.08.2024


*The manufacturer reserves the right to introduce design changes.*

*Updated INSTRUCTIONS FOR USE are available at the following website: ifu.chm.eu*

# I. SYSTEM DESCRIPTION

## I.1. INDICATION

Cervical intervertebral cage, together with instrument set, is designed for the surgical treatment of the cervical spine diseases at the levels from C3 to C7, where spinal arthrodesis is advisable. Cervical spine diseases include:

- hernias,
- Degenerative Disc Diseases *(DDD)*,
- vertebrae instability,
- re-operations,
- degenerative scoliosis.

*(The above list is not exhaustive.)*

It is not recommended to use the system in case of:

- spine tumors,
- bad physical and mental state of the patient,
- osteoporosis,
- allergy or intolerance to polyetheretherketone *(PEEK Optima)*, titanium alloy or tantalum,
- spine infections,
- vertebral fractures.

*(The above list is not exhaustive)*.

# II. IMPLANTS

**ChM** implants have been designed for best fit to the anatomical shapes of the cervical bodies, to maximize their safe use.

The arc-shaped anterior wall of the implant imitates the curvature of the anterior part of the vertebral body maximizing the contact surface of the implant with the endplates and eliminating the risk of protruding the cage beyond the line of the bodies.

The posterior concavity also ensures the maximum contact surface of the implant with the endplates, minimizing the danger of the pressure being exerted by the cage on the spinal cord.

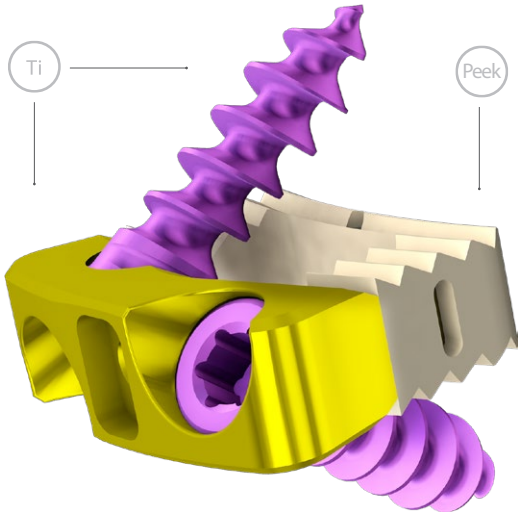
The concave arches of the side walls prevent the vertebral bodies from resting only on the side edges of the cage.

Dedicated locking screws are used with the intervertebral cage to immobilize the implant and eliminate the need for additional stabilization.

Cervical intervertebral cages are made of highly biocompatible materials: PEEK, titanium and tantalum alloys.
Locking screws are made of titanium alloy.

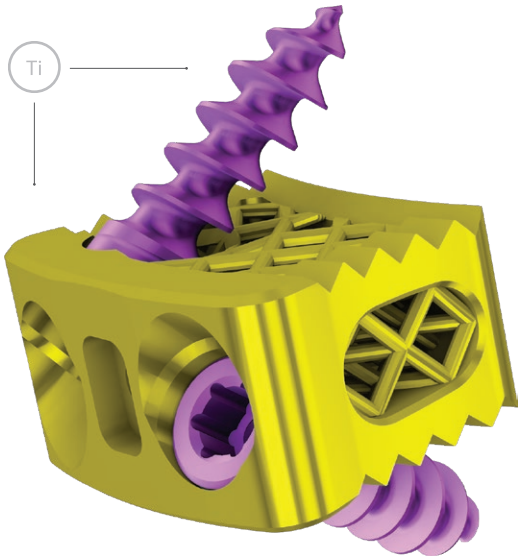
**PEEK**

- Stiffness approximates the host bone, which provides ideal load sharing attributes.
- Radiolucency of PEEK polymer offers an accurate visualization and assessment of the fusion.
- Radioopaque tantalum markers facilitate intraoperative X-Ray visualization of inserted implant.
- Open design to maximize the volume of bone tissue.




**Titanium alloy**

- Facilitated X-Ray imaging for precise determination of the implant position.
- High osseointegration with bone structures.
- High strength enables the use of bone locking screws compatible with the cage.




**3D-Ti**

- Made entirely of biocompatible titanium for high osseointegration with bone structures.
- Made in 3D printing technology.
- With a spatial trabecular structure, for optimal conditions for bone tissue ingrowth.

For quick identification, each implant is marked with the size and shape.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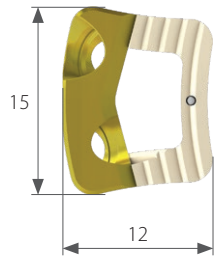
## II.1. AVAILABLE SIZES AND VARIANTS OF PEEK CAGES

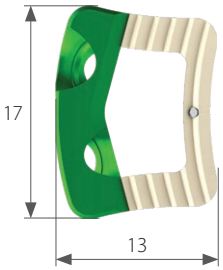
PEEK-OPTIMA®

**Overall dimensions** [mm]

15x12

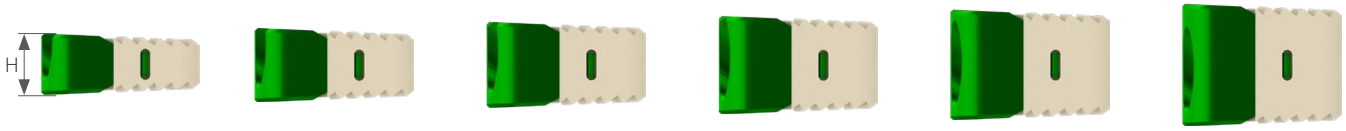



17x13




**Height sizes H** [mm]

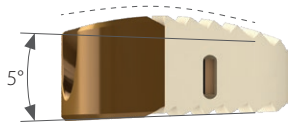
5 6 7 8 9 10




**Variants**

**Angular cervical intervertebral cage**


**Convex cervical intervertebral cage**




Ster Non Ster

**Angular cervical intervertebral cage**

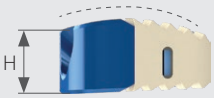

**Size 15x12** [mm]


**Size 17x13** [mm]

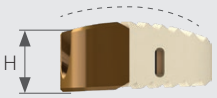
| Catalogue no. | Height H [mm] | Catalogue no. | Height H [mm] |
|---|---|---|---|
| 8.6970.505 | 5 | 8.6971.505 | 5 |
| 8.6970.506 | 6 | 8.6971.506 | 6 |
| 8.6970.507 | 7 | 8.6971.507 | 7 |
| 8.6970.508 | 8 | 8.6971.508 | 8 |
| 8.6970.509 | 9 | 8.6971.509 | 9 |
| 8.6970.510 | 10 | 8.6971.510 | 10 |

Ster Non Ster

**Convex cervical intervertebral cage**




**Size 15x12** [mm]




**Size 17x13** [mm]

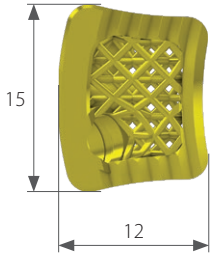
| Catalogue no. | Height H [mm] | Catalogue no. | Height H [mm] |
|---|---|---|---|
| 8.6972.005 | 5 | 8.6973.005 | 5 |
| 8.6972.006 | 6 | 8.6973.006 | 6 |
| 8.6972.007 | 7 | 8.6973.007 | 7 |
| 8.6972.008 | 8 | 8.6973.008 | 8 |
| 8.6972.009 | 9 | 8.6973.009 | 9 |
| 8.6972.010 | 10 | 8.6973.010 | 10 |

## II.2. AVAILABLE SIZES AND VARIANTS OF 3D-TI CAGES

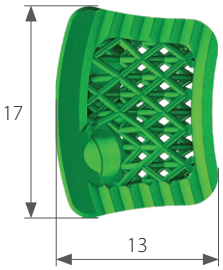
CHARSPINE system 3D-Ti
3D Titanium Trabecular Cage System

**Overall dimensions** [mm]

15x12




17x13



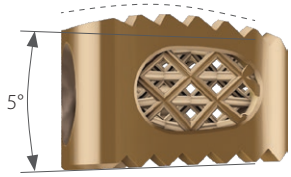

**Height sizes H** [mm]

5 6 7 8 9 10


**Variants**

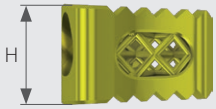
**Angular cervical intervertebral cage**


**Convex cervical intervertebral cage**




Ster

**Angular cervical intervertebral cage**



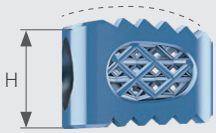

**Size 15x12** [mm]


**Size 17x13** [mm]

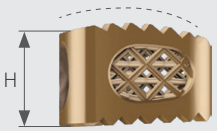
| Catalogue no. | Height H [mm] | Catalogue no. | Height H [mm] |
|---|---|---|---|
| 3.6986.005S | 5 | 3.6987.005S | 5 |
| 3.6986.006S | 6 | 3.6987.006S | 6 |
| 3.6986.007S | 7 | 3.6987.007S | 7 |
| 3.6986.008S | 8 | 3.6987.008S | 8 |
| 3.6986.009S | 9 | 3.6987.009S | 9 |
| 3.6986.010S | 10 | 3.6987.010S | 10 |

Ster

**Convex cervical intervertebral cage**




**Size 15x12** [mm]




**Size 17x13** [mm]

| Catalogue no. | Height H [mm] | Catalogue no. | Height H [mm] |
|---|---|---|---|
| 3.6988.005S | 5 | 3.6989.005S | 5 |
| 3.6988.006S | 6 | 3.6989.006S | 6 |
| 3.6988.007S | 7 | 3.6989.007S | 7 |
| 3.6988.008S | 8 | 3.6989.008S | 8 |
| 3.6988.009S | 9 | 3.6989.009S | 9 |
| 3.6988.010S | 10 | 3.6989.010S | 10 |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Ster Non Ster

**Cervical locking screw 3.5** *(self-drilling)*

| Diameter | Length [mm] | Colour | Catalogue no. |
|---|---|---|---|
| 3.5 | 10 | | 3.6974.010 |
| 3.5 | 12 | | 3.6974.012 |
| 3.5 | 14 | | 3.6974.014 |
| 3.5 | 16 | | 3.6974.016 |

Ster Non Ster

**Cervical locking screw 4.0** *(self-drilling - emergency)*

| Diameter | Length [mm] | Colour | Catalogue no. |
|---|---|---|---|
| 4 | 10 | | 3.6975.010 |
| 4 | 12 | | 3.6975.012 |
| 4 | 14 | | 3.6975.014 |
| 4 | 16 | | 3.6975.016 |

Material: Ti

| Stand for implants - set | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Container lid 4x4 | 14.0917.103 | 1 |
|  | Stand for implants - Cervical intervertebral cages 4x2 ½H | 14.0917.401 | 1 |
|  | Stand for implants - Cervical intervertebral cages 4x2 ½H | 14.0917.501 | 1 |
|  | Container 4x4H | 14.0000.003 | 1 |

| **Sterilization container** *(for the stand for implants - set)* | **Name** | **Catalogue No.** | **Pcs** |
|---|---|---|---|
|  | Perforated aluminum lid ½ 306x272x15mm Gray | **12.0751.200** | 1 |
|  | Container with solid bottom ½ 306x272x85mm | **12.0751.100** | 1 |



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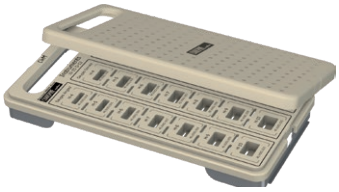
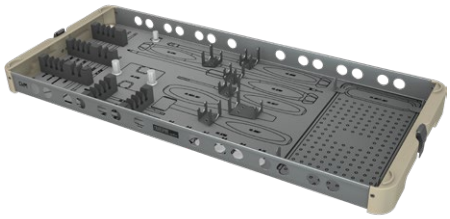
# III. INSTRUMENT SET

Features:

- high ergonomics,
- instruments provided with slender silicone handles,
- color-coded implant trials,
- instruments made of highest quality *(stainless)* steel,
- easy to clean,
- modern, small pallets system for storage, usage and sterilization of instruments and implants.

| Instrument set for cervical intervertebral locking cages 15.0917.102 | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Container lid 9x4 | 14.0917.105 | 1 |
|  | Applicator | 40.8784.000 | 1 |
|  | Persuader | 40.6080.000 | 1 |
|  | Compactor | 40.6077.000 | 1 |
|  | Hammer 200g | 40.6087.000 | 1 |
|  | Working stand | 40.8786.100 | 1 |
|  | Position retainer | 40.6079.100 | 1 |
|  | Aiming block H-5 | 40.8785.105 | 1 |
| | Aiming block H-6 | 40.8785.106 | 1 |
| | Aiming block H-7 | 40.8785.107 | 1 |
| | Aiming block H-8 | 40.8785.108 | 1 |
| | Aiming block H-9 | 40.8785.109 | 1 |
| | Aiming block H-10 | 40.8785.110 | 1 |
|  | Trocar | 40.8780.100 | 1 |
|  | Trocar | 40.8781.100 | 1 |
|  | Screwdriver tip T10 | 40.8783.100 | 1 |
|  | Screwdriver tip T10 with joint | 40.8782.100 | 1 |
|  | Handle ratchet device | 40.6654.001 | 1 |
|  | Extractor | 40.8789.000 | 1 |

| | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Stand 9x4 | 14.0917.201 | 1 |
|  | Angular trial5x15x12 | 40.6083.005 | 1 |
| | Angular trial6x15x12 | 40.6083.006 | 1 |
| | Angular trial7x15x12 | 40.6083.007 | 1 |
| | Angular trial8x15x12 | 40.6083.008 | 1 |
| | Angular trial9x15x12 | 40.6083.009 | 1 |
| | Angular trial10x15x12 | 40.6083.010 | 1 |
|  | Convex trial5x15x12 | 40.6082.005 | 1 |
| | Convex trial6x15x12 | 40.6082.006 | 1 |
| | Convex trial7x15x12 | 40.6082.007 | 1 |
| | Convex trial8x15x12 | 40.6082.008 | 1 |
| | Convex trial9x15x12 | 40.6082.009 | 1 |
| | Convex trial10x15x12 | 40.6082.010 | 1 |
|  | Angular trial5x17x13 | 40.6093.005 | 1 |
| | Angular trial6x17x13 | 40.6093.006 | 1 |
| | Angular trial7x17x13 | 40.6093.007 | 1 |
| | Angular trial8x17x13 | 40.6093.008 | 1 |
| | Angular trial9x17x13 | 40.6093.009 | 1 |
| | Angular trial10x17x13 | 40.6093.010 | 1 |
|  | Convex trial5x17x13 | 40.6092.005 | 1 |
| | Convex trial6x17x13 | 40.6092.006 | 1 |
| | Convex trial7x17x13 | 40.6092.007 | 1 |
| | Convex trial8x17x13 | 40.6092.008 | 1 |
| | Convex trial9x17x13 | 40.6092.009 | 1 |
| | Convex trial10x17x13 | 40.6092.010 | 1 |
|  | | 14.0917.104 | 1 |

| **Sterilization container**<br>*(for the Instrument set for cervical intervertebral locking cages)* | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Perforated aluminum lid ⅓ 595x275x15mm Gray | 12.0750.200 | 1 |
|  | Container with solid bottom ⅓ 595x275x86mm | 12.0750.100 | 1 |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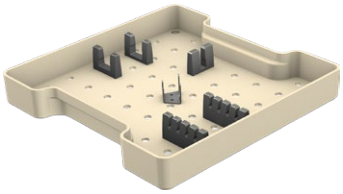
Instruments mentioned below are not included in the standard instrument set.
In order to include them to the ordered instruments, please contact your local representative or ChM Sales Department.

## Supplementary instruments

| **Instrument set for Caspar cervical distractor** 15.0918.220 | Name | Catalogue no. | Pcs |
|---|---|---|---|
|  | Caspar cervical distractor | 40.6075.000 | 1 |
|  | Screwdriver for Caspar pins | 40.6086.000 | 1 |
|  | Caspar pin 3.0x14 | 40.6076.014 | 2 |
|  | Caspar pin 3.0x16 | 40.6076.016 | 2 |
|  | Tray 4x4 ½H | 14.0918.220 | 1 |

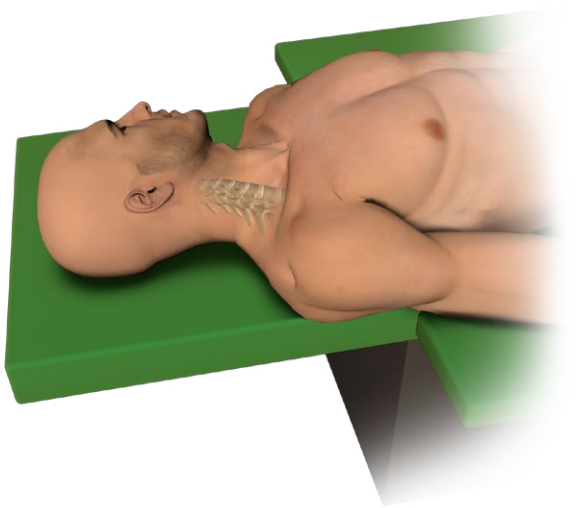
| **Container with lid** *(for the distraction set)* | Name | Catalogue no. | Pcs |
|---|---|---|---|
|  | Container lid 4x4 | 14.0000.102 | 1 |
|  | Container 4x4 ½H | 14.0000.004 | 1 |

| **Sterilization container** *(for the distraction set)* | Name | Catalogue No. | Pcs |
|---|---|---|---|
|  | Perforated aluminum lid ½ 306x272x15mm Gray | 12.0751.200 | 1 |
|  | Container with solid bottom ½ 306x272x85mm | 12.0751.100 | 1 |

# IV. SURGICAL TECHNIQUE *(WITHOUT USE OF CASPAR CERVICAL DISTRACTOR)*

## IV.1. PATIENT POSITIONING AND SURGICAL APPROACH

The patient shall be in supine position with his head in a neutral position or rotated about 30° from the neutral position to the left or right, opposite to the surgical approach.



## IV.2. DISCECTOMY

Remove the intervertebral disc using standard procedure and instruments to perform such an operation.

The instruments used in the discectomy are not included in the instrument set for Cervical Intervertebral Cage.

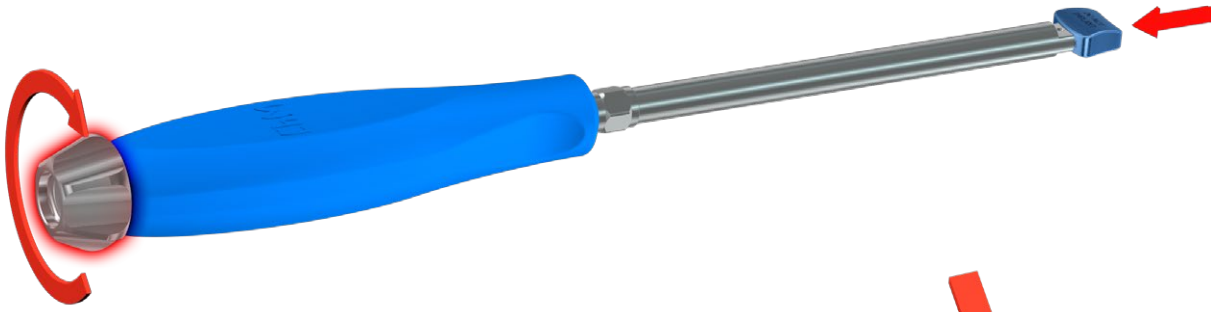
## IV.3. IMPLANT SELECTION

Implant size is selected on the basis of trials [40.6082.0xx], [40.6083.0xx], [40.6092.0xx], [40.6093.0xx] whose shapes and dimensions correspond to the available implants.

| | |
|---|---|
|  | 40.6082.0xx,<br>40.6083.0xx<br>40.6092.0xx<br>40.6093.0xx |
|  | 40.6080.000 |
|  | 40.6079.100 |

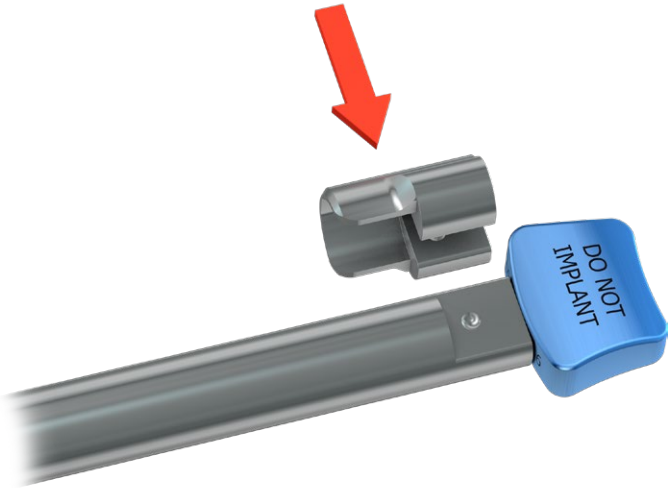
Choose intraoperatively, on the basis of X-Ray image, one of the trials **[40.6082.0xx]**, **[40.6083.0xx]**, **[40.6092.0xx]**, **[40.6093.0xx]** whose shape and height corresponds best to the intervertebral space.

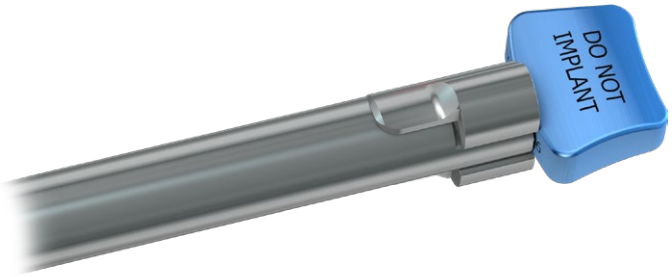
Mount the selected trial to the persuader **[40.6080.000]** - insert the trial on the persuader tip and by rotating the persuader knob clockwise, tighten the locking pin in the socket of the trial.



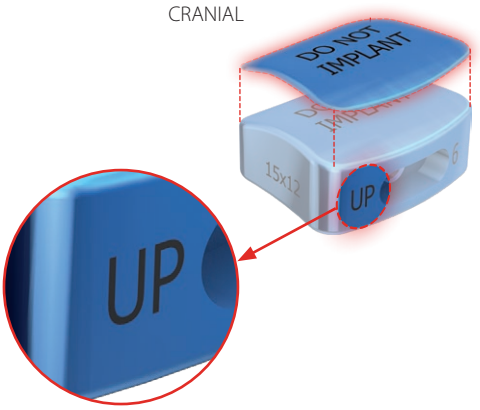
Attach the position retainer **[40.6079.100]** to the persuader.

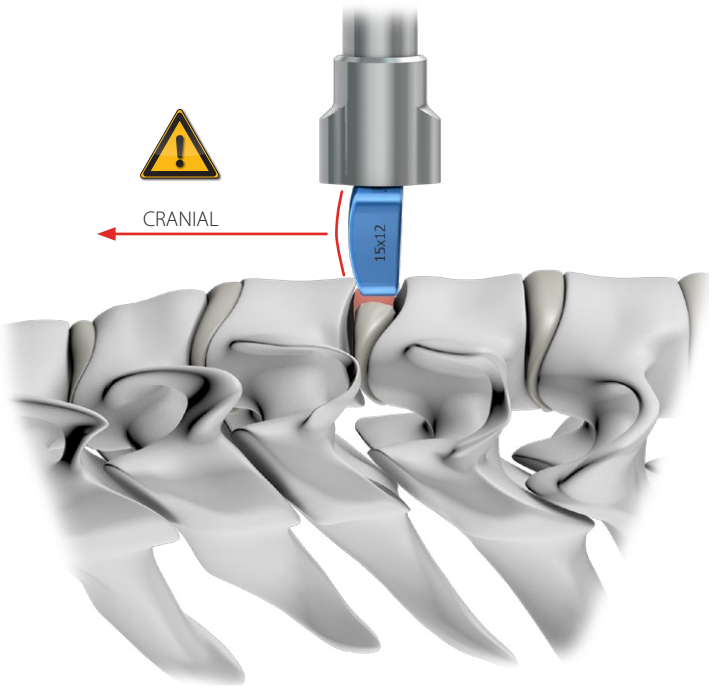
The position retainer serves as a protection against excessive penetration of the trials, bone rasps and implants in the intervertebral space and thereby reduces the risk of damage to the spinal cord.



Convex trials [40.6082.0xx], [40.6092.0xx] should be inserted with the convex surface facing the head *(cranial direction)*.
The convex part of the trial is above the word *"UP"*.

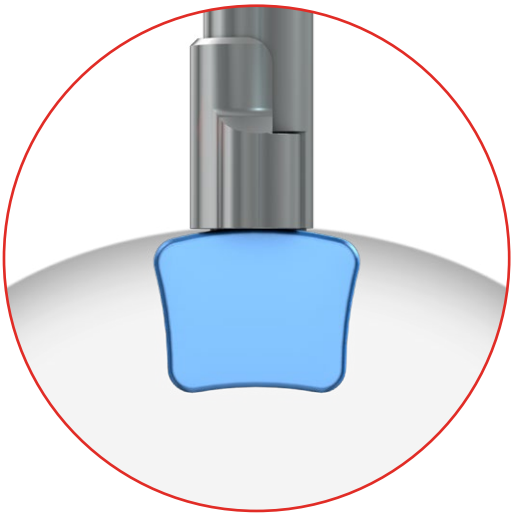



40.6087.000

Insert the selected trial into the intervertebral space.
Use hammer **[40.6087.000]** when necessary, gently tapping on the persuader's knob.

Insert the trial until the position retainer leans on the vertebra's surface.



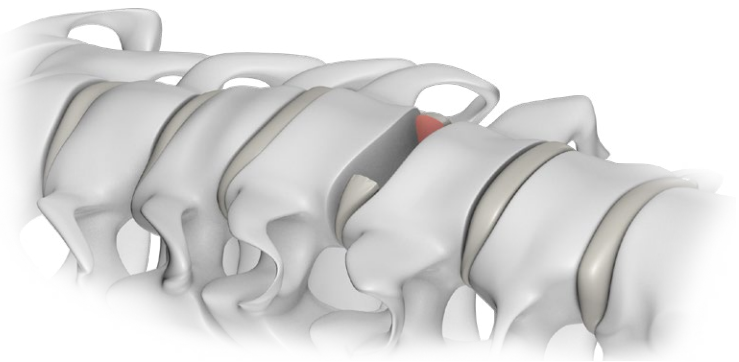
Verify the position of the trial using X-Ray imaging.

In the anterior projection, the lateral edges of the trial should be symmetrical to the vertical axis of the vertebrae.

Remove the trial.

Should the trial be incorrectly placed, repeat the procedure using a trial better fitting the intervertebral space.

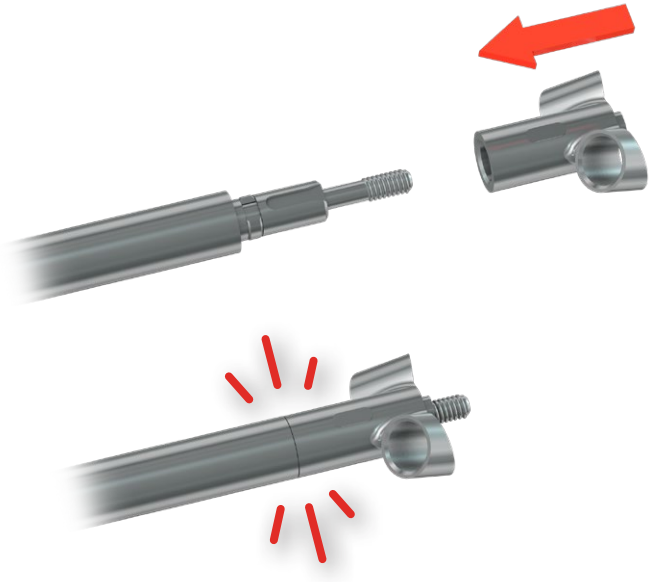
**Based on the selected trial, choose an implant of the same size and shape. The implant will be used later in the procedure.**



## IV.4. IMPLANT PREPARATION

Before implantation, the space in the PEEK intervertebral cervical cage should be filled with autologous bone graft *(bone chips)* which allows for spinal fusion.

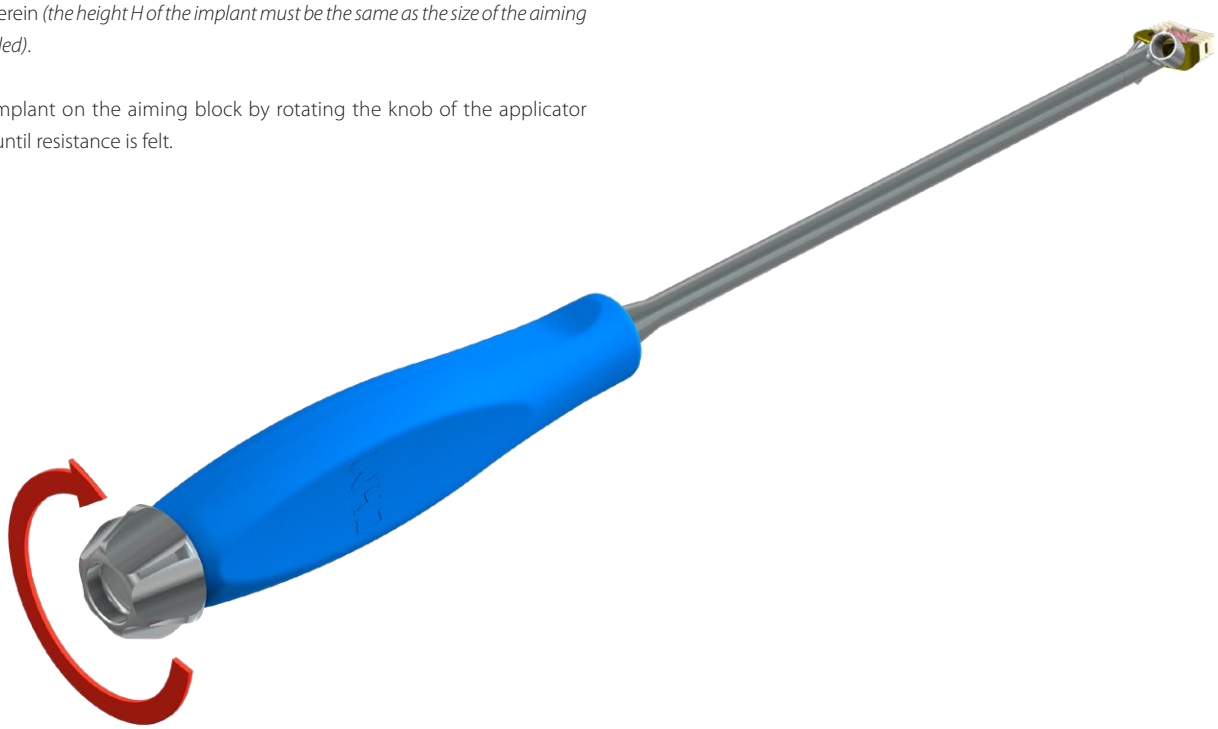
| | |
|---|---|
|  | 40.8784.000 |
|  | 40.8785.105<br>40.8785.106<br>40.8785.107<br>40.8785.108<br>40.8785.109<br>40.8785.110 |



Install the selected aiming block **[40.8785.1xx]** *(the height H of which must be the same as for the height of the final trial used)* to the applicator **[40.8784.000]** - the click sound must be heard.

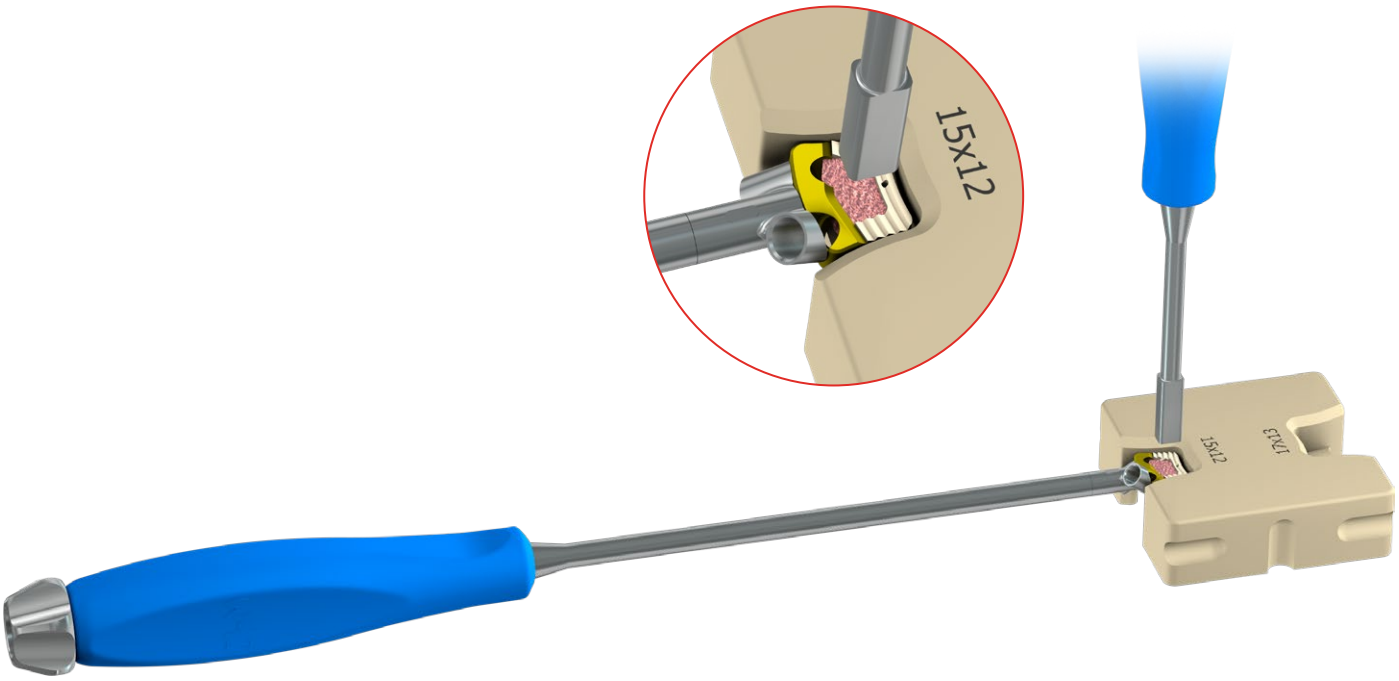
Then connect the intervertebral cage with the applicator and the aiming block installed therein *(the height H of the implant must be the same as the size of the aiming block installed)*.

Lock the implant on the aiming block by rotating the knob of the applicator clockwise until resistance is felt.



| | |
|---|---|
|  | 40.8786.100 |
|  | 40.6077.000 |

Place the implant in an appropriate socket of the working stand **[40.8786.100]** and fill with bone chips. Compress them with compactor **[40.6077.000]**.




Bone graft should only be used with PEEK Optima cervical locking cages equipped with a titanium insert. 3D-Ti printed implants are not designed to be used with grafts.

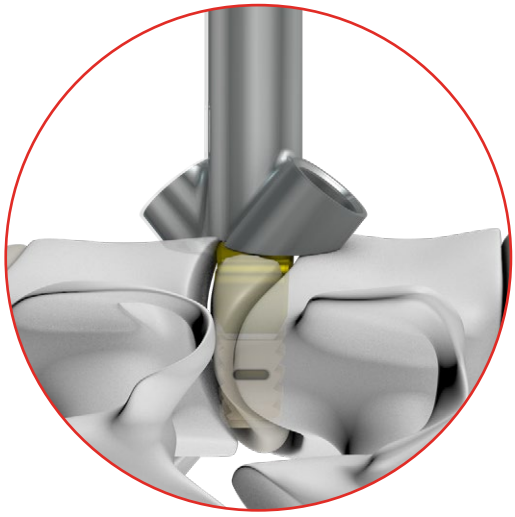
## IV.5. IMPLANT INSERTION

Insert implant, filled with bone graft, into the intervertebral space.

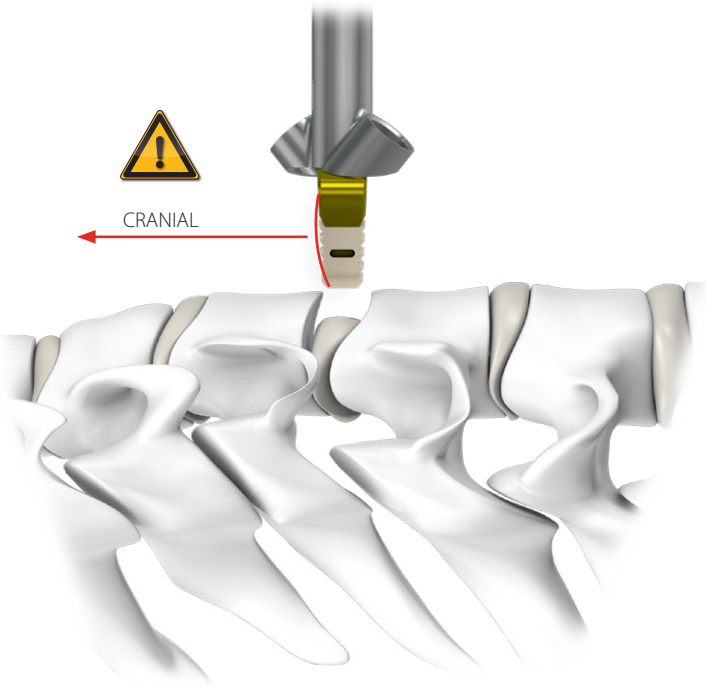
40.6087.000

Use hammer **[40.6087.000]** when necessary, gently tapping on the applicator's knob.

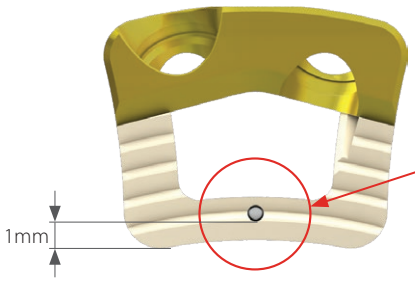
Continue inserting the implant until the aiming block leans against the vertebral surface.



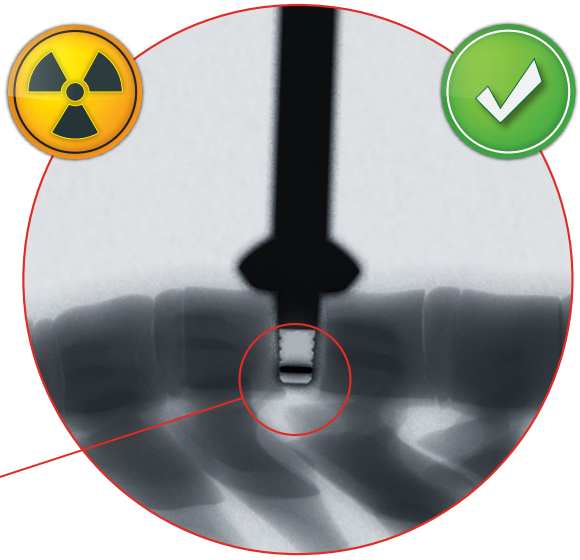
**Convex cervical intervertebral cages [8.6972.xxx], [8.6973.000] should be inserted with the convex surface facing the head** *(cranial direction)*.



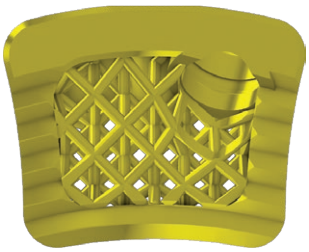
The embedded tantalum marker is used to navigate the position of the posterior wall of the intervertebral cage *(the marker is located 1mm from the edge of the cage)*. The marker is also used to determine whether the endplates of the vertebral bodies adhere properly to the cage.



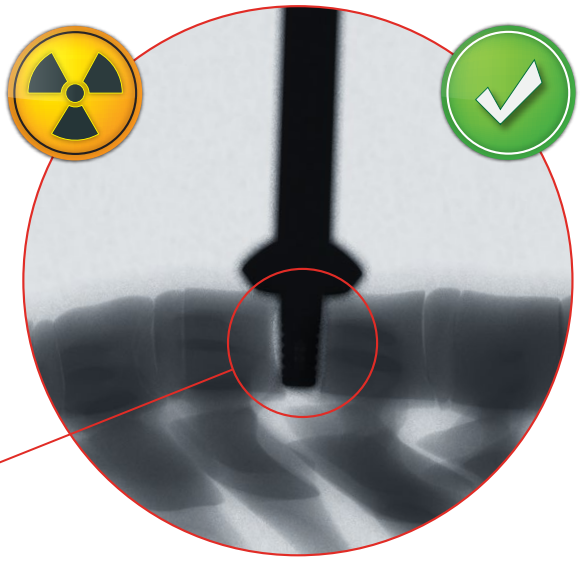

PEEK-OPTIMA®



**PEEK-Ti implant in X-Ray imaging**



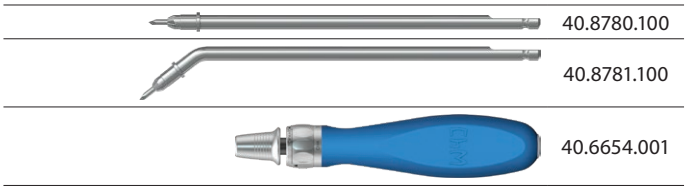
CHARSPINE system 3D-Ti
3D Titanium Trabecular Cage System

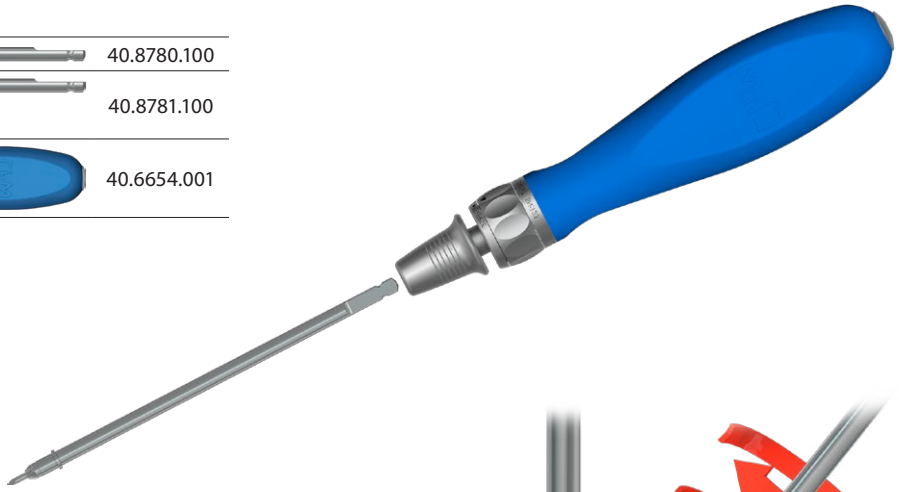


**3D-Ti implant in X-Ray imaging**

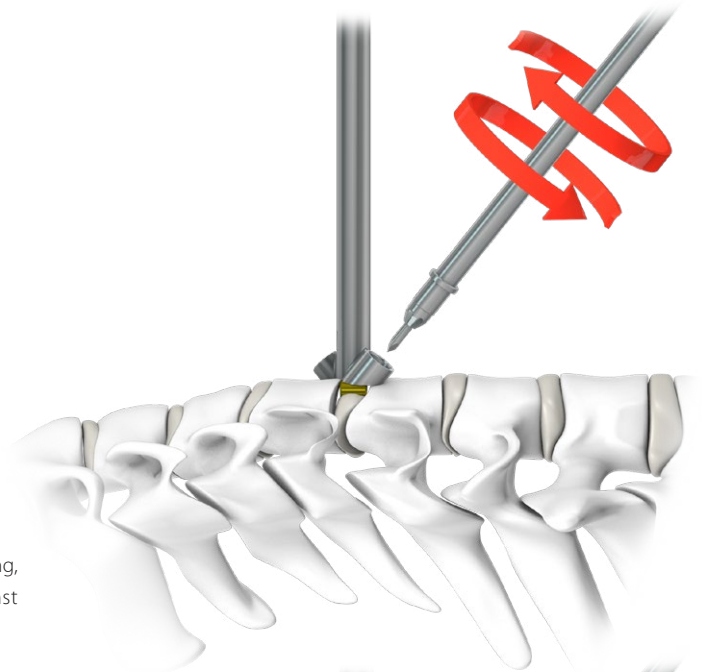
## IV.6. HOLES DRILLING AND SCREWS INSERTION

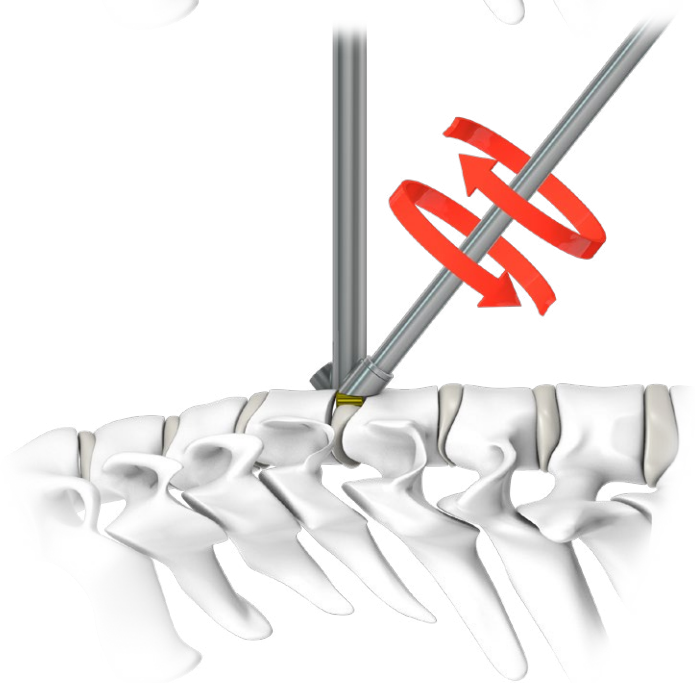
Connect the trocar *(straight)* **[40.8780.100]** or *(angled)* **[40.8781.100]** to the handle ratchet device **[40.6654.001]**.



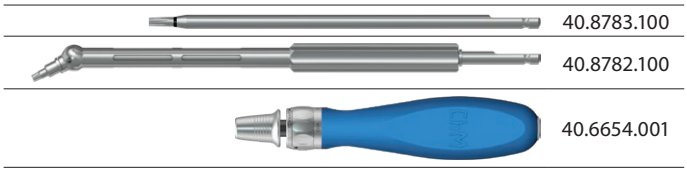
Place the trocar in the hole of the aiming block **[40.8785.100]** and, by rotating, continue inserting the trocar until the limiter of the trocar rests against the aiming block.





## IV.7. SCREWS INSERTION

Connect the handle ratchet device **[40.6654.001]** with screwdriver tip T10 with joint **[40.8782.100]** or screwdriver tip T10 **[40.8783.100]**.

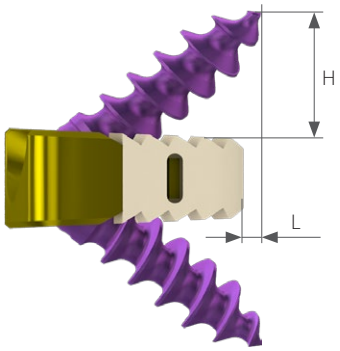



Install the determined screw.

3.5mm diameter screws should be used first.

4.0mm screws should only be used in emergency situations when the use of 3.5mm screw does not ensure secure anchoring of the intervertebral cage.

CAUTION:
For optimal stabilization, it is recommended to use the longest screws.
When selecting the screws, consider the information on the protrusion of screws outside the intervertebral cage of the table *(Tab.1)*.

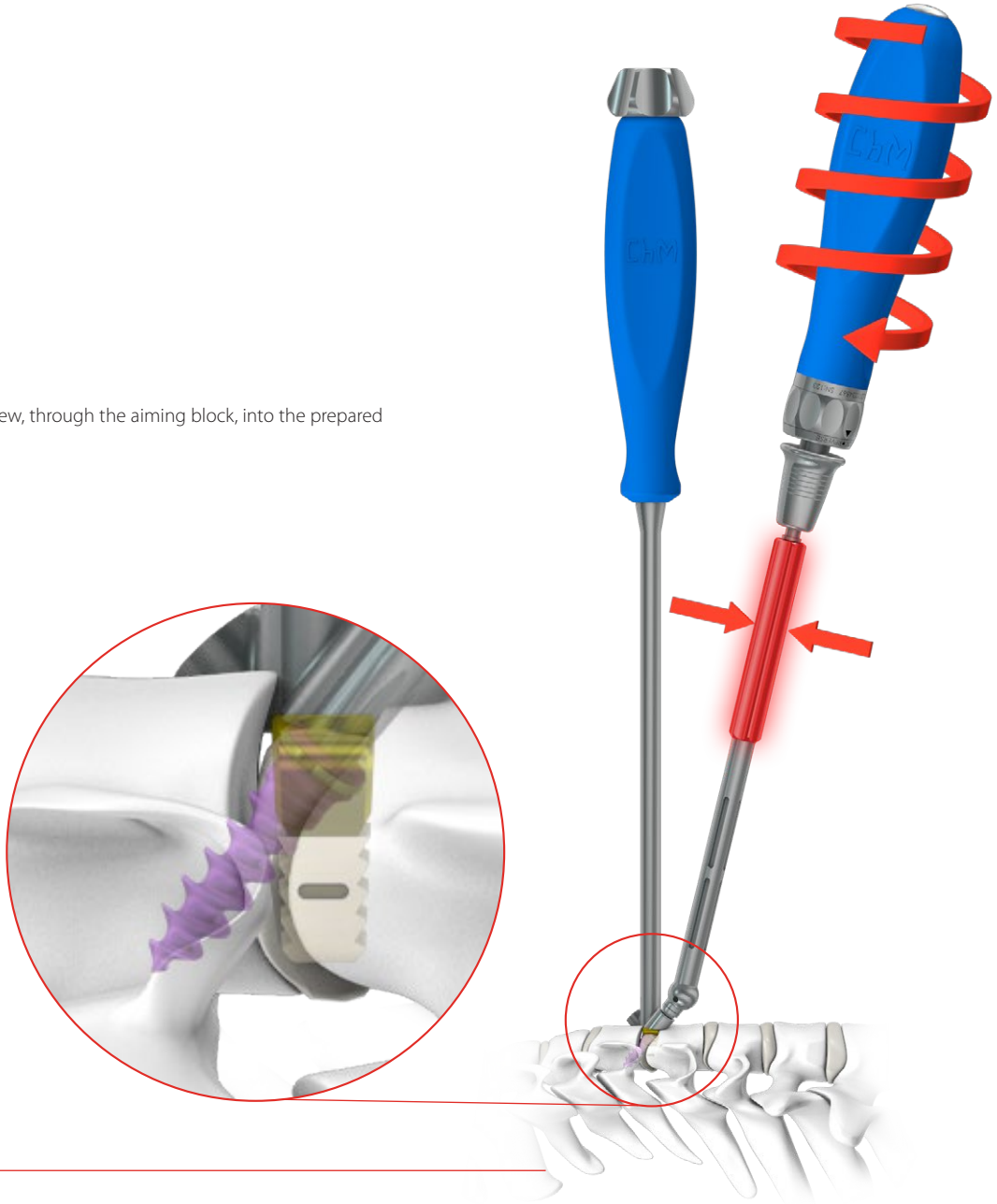



| Cage 15x12 | | |
|---|---|---|
| **Screw length** | **L** | **H** |
| 10 | Does not protrude | 3.6 |
| 12 | Does not protrude | 4.8 |
| 14 | 0.7 | 6 |
| 16 | 2.2 | 7.3 |

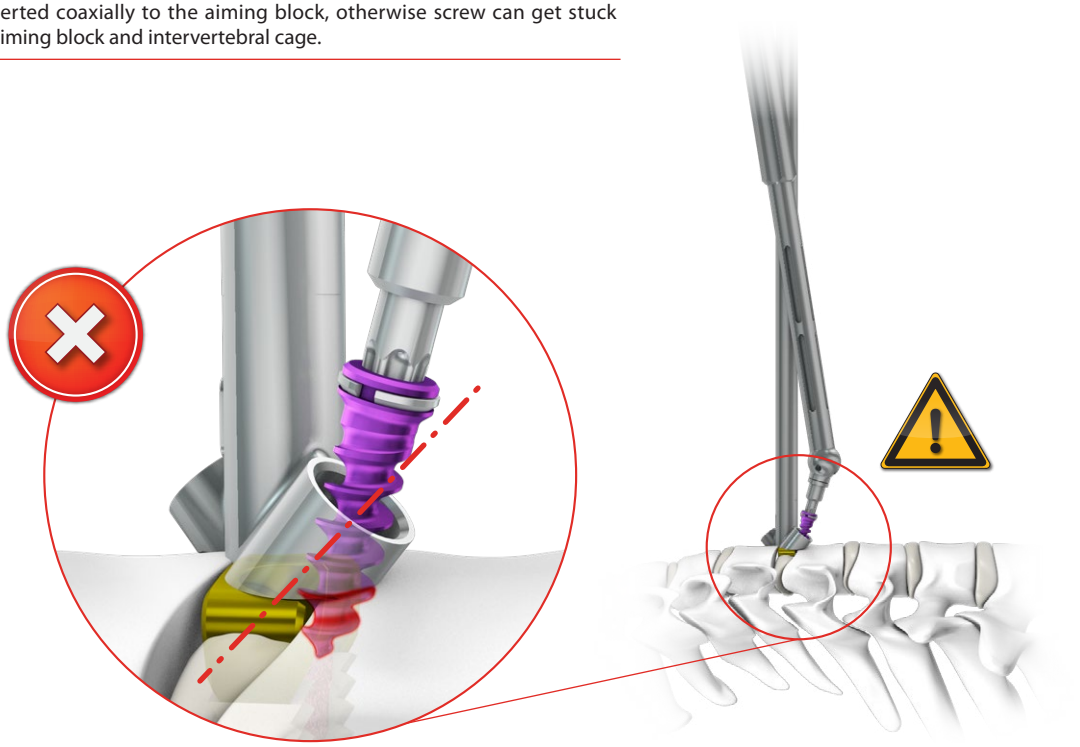
| Cage 17x13 | | |
|---|---|---|
| **Screw length** | **L** | **H** |
| 10 | Does not protrude | 3.7 |
| 12 | Does not protrude | 4.9 |
| 14 | Does not protrude | 6.1 |
| 16 | 1.2 | 7.3 |

Tab.1. Selection of screws

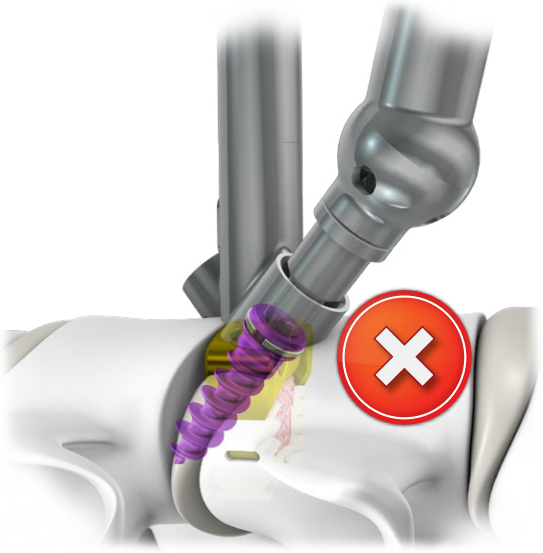
Carefully insert the attached screw, through the aiming block, into the prepared hole using clockwise rotation.



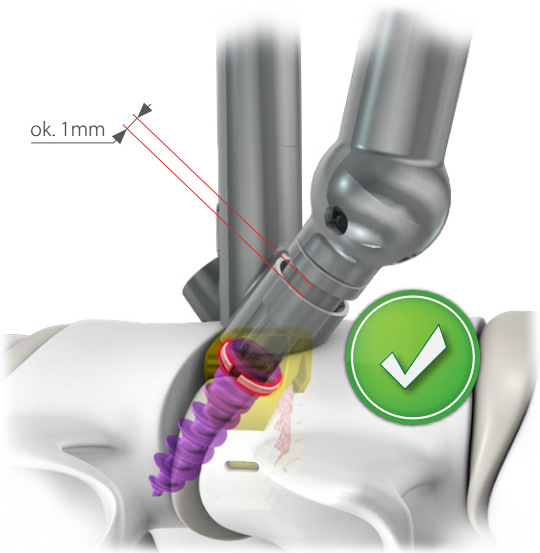
CAUTION!
When intervertebral cages with a height of H-5 or H-6 are used, make sure locking screws are inserted coaxially to the aiming block, otherwise screw can get stuck between the aiming block and intervertebral cage.



When the collar on the screwdriver tip is about 1mm from the edge of the aiming block, the screw has been screwed in completely and the locking ring has been positioned as intended in the recess in the intervertebral cage.



Not locked screw

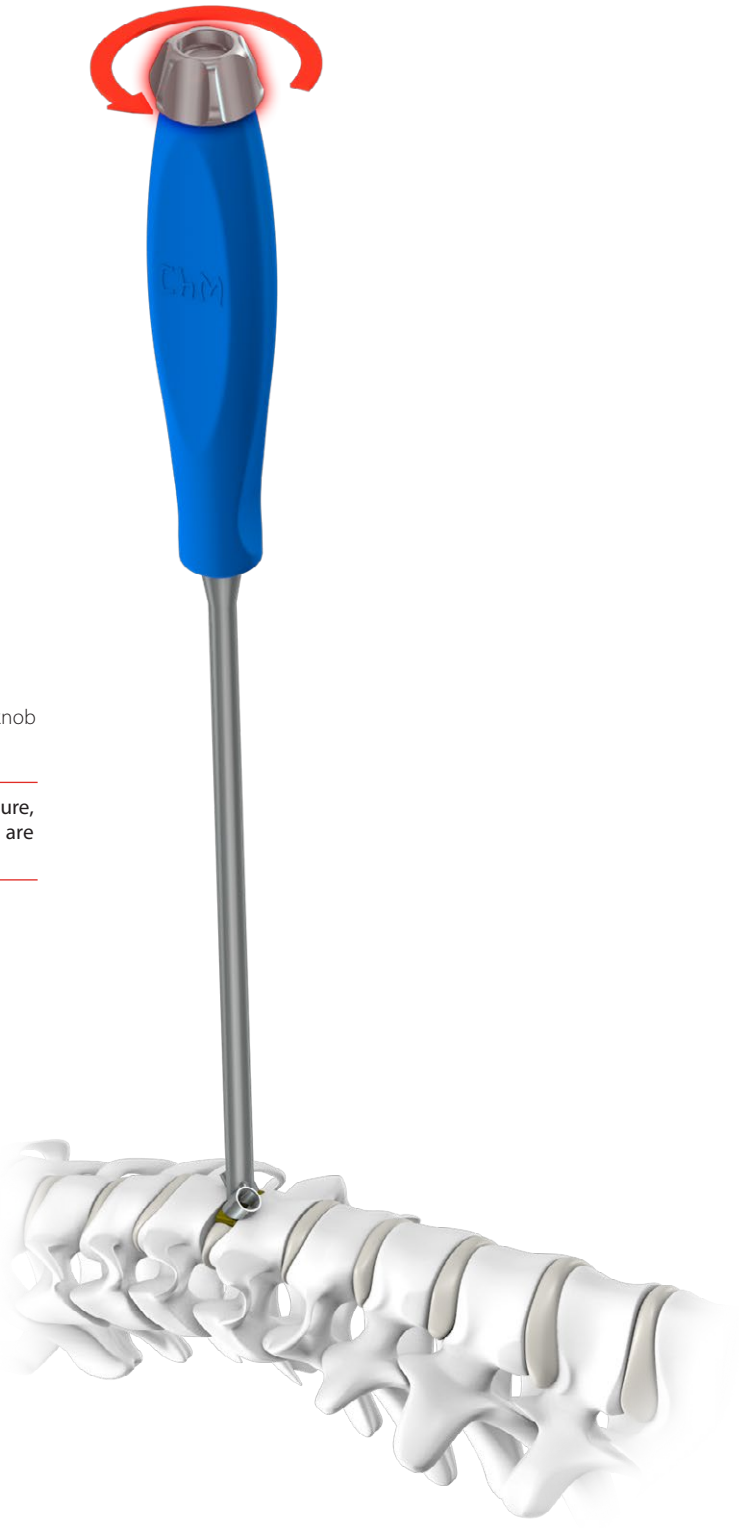



Locked screw

For the intervertebral cage to be properly locked, repeat the procedure for the other hole.

After locking the cage, remove the applicator **[40.8784.000]** by rotating the knob counter-clockwise.

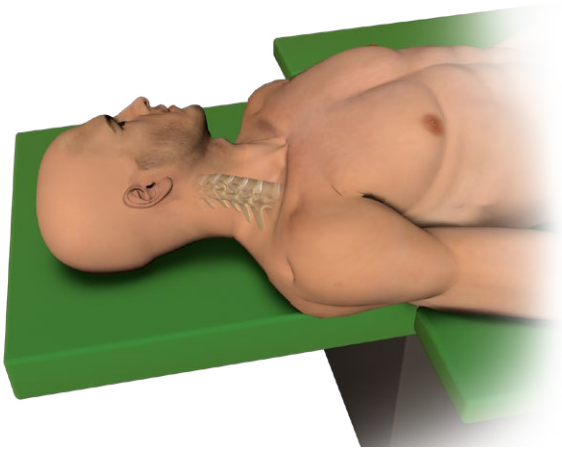
To make sure that the screws have been properly locked, ensure, after removing the applicator, that the rings on the screws are hidden in the cage.



# V. SURGICAL TECHNIQUE *(WITH USE OF CASPAR CERVICAL DISTRACTOR)*

## V.1. PATIENT POSITIONING AND SURGICAL APPROACH

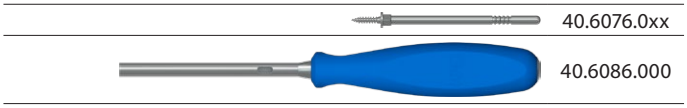
The patient shall be in supine position with his head in a neutral position or rotated about 30° from the neutral position to the left or right, opposite to the surgical approach.



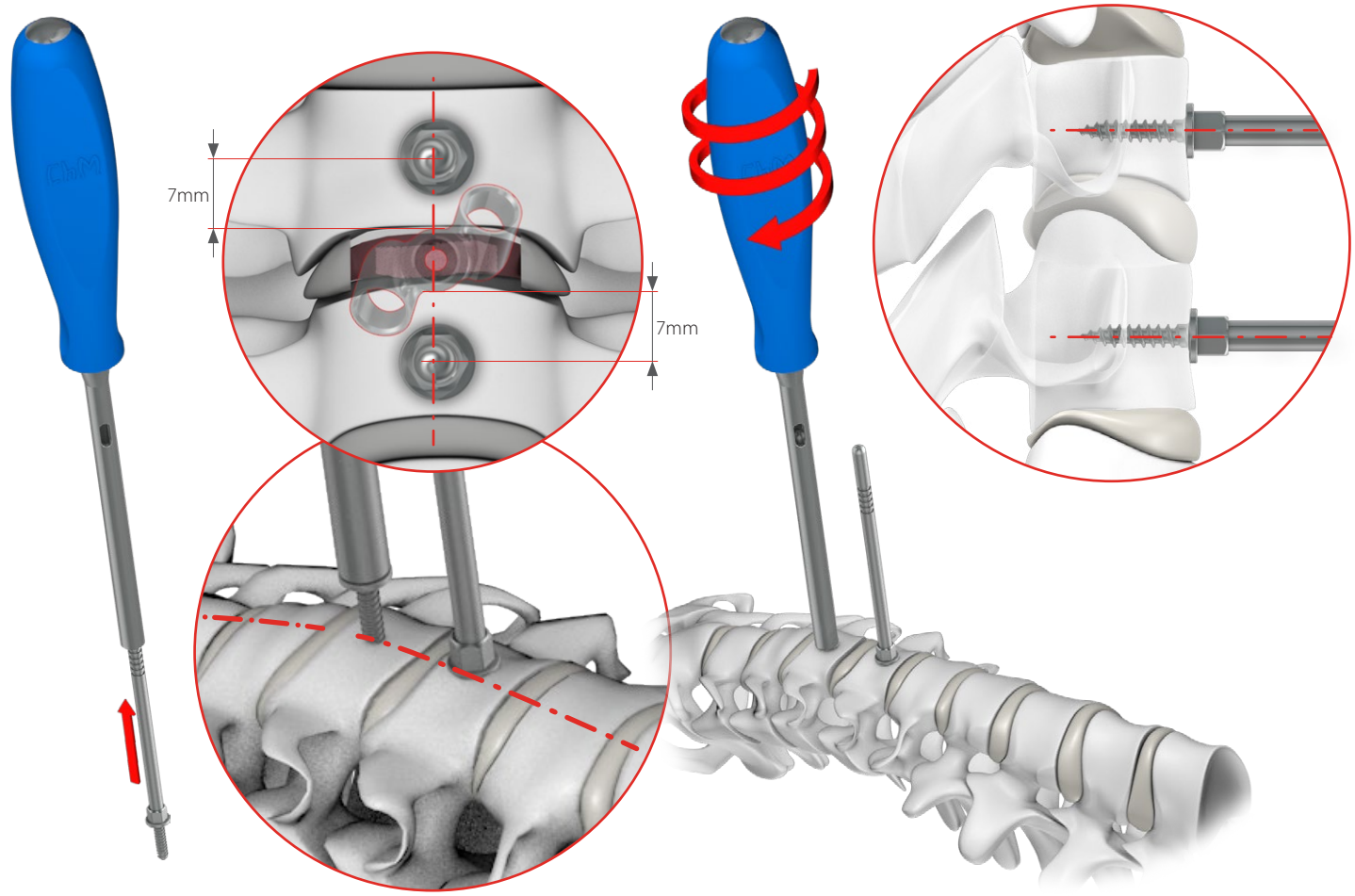
## V.2. INSTALLATION OF CASPAR CERVICAL DISTRACTOR

Caspar cervical distractor [40.6075.000], Caspar pins [40.6076.0xx], and screwdriver for Caspar pins [40.6086.000] are not included in the standard set.
In order to include them to the ordered instrument set for cervical locking cages, please contact your local representative or ChM Sales Department.

The Caspar cervical distractor is used to prevent the closure of the intervertebral space during discectomy and further surgical procedure.

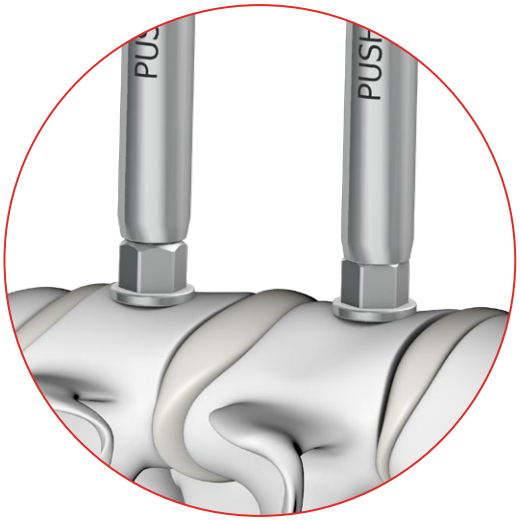


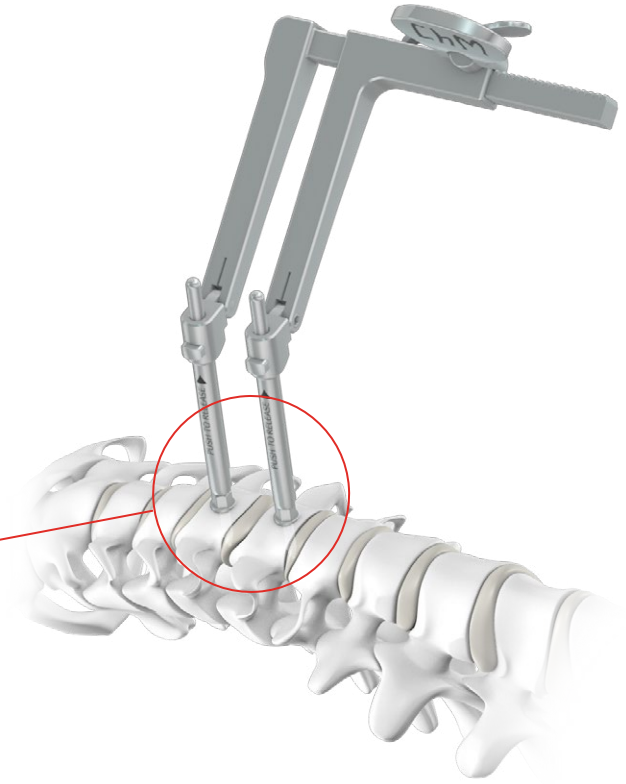

Choose intraoperatively, on the basis of X-Ray image, the length of the Caspar pin **[40.6076.0xx]** *(14mm or 16mm)*.
Insert the selected pins using screwdriver **[40.6086.000]** in a vertebra located above and below the operated intervertebral disc. The inserted pins should be parallel to each other and perpendicular to the front surface of the vertebral bodies, as presented below.



40.6075.000

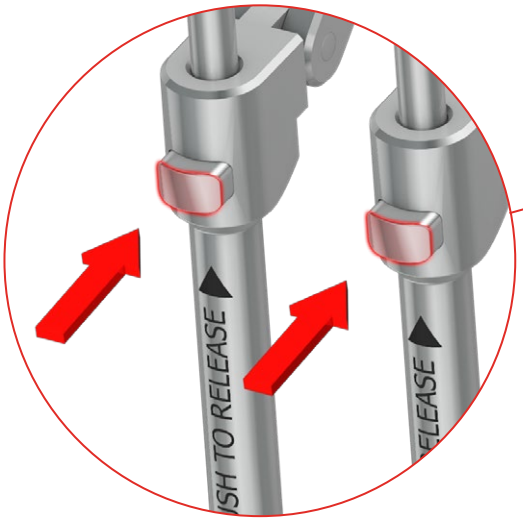
Insert Caspar cervical distractor **[40.6075.000]** sleeves onto the Caspar pins until the sleeves meet the collars of the pins.

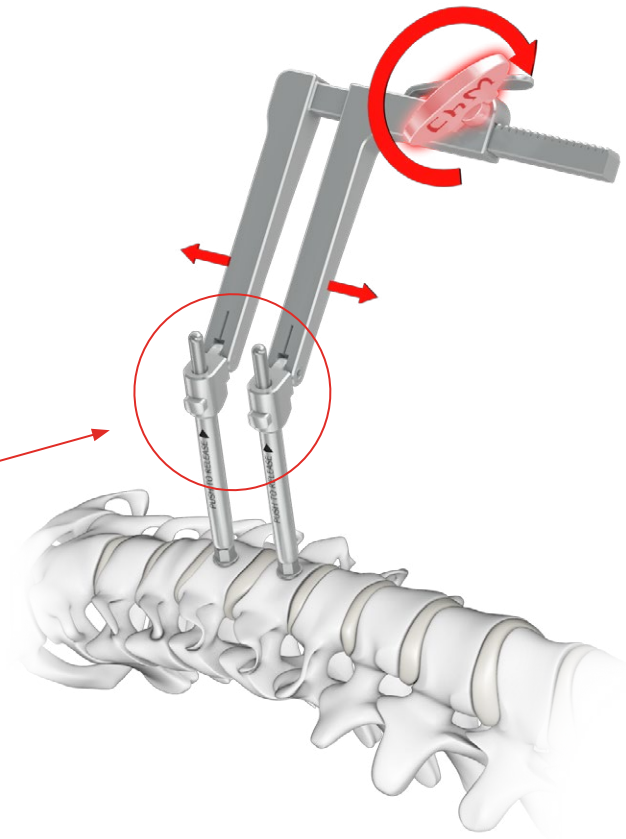




Perform gentle distraction by rotating the knob clockwise.

Pins are secured in the distractor from unintentional disconnection. To remove the distractor, press and hold simultaneously both buttons located at the upper part of the sleeves, then remove the distractor.

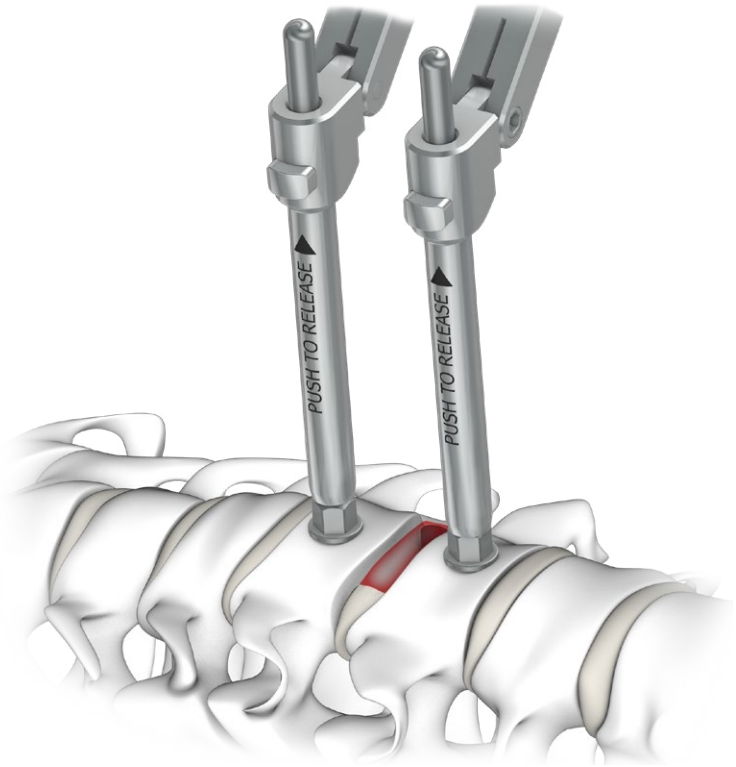


## V.3. DISCECTOMY

Remove the intervertebral disc using standard procedure and instruments to perform such an operation.

The instruments used in the discectomy are not included in the instrument set for Cervical Intervertebral Cage.



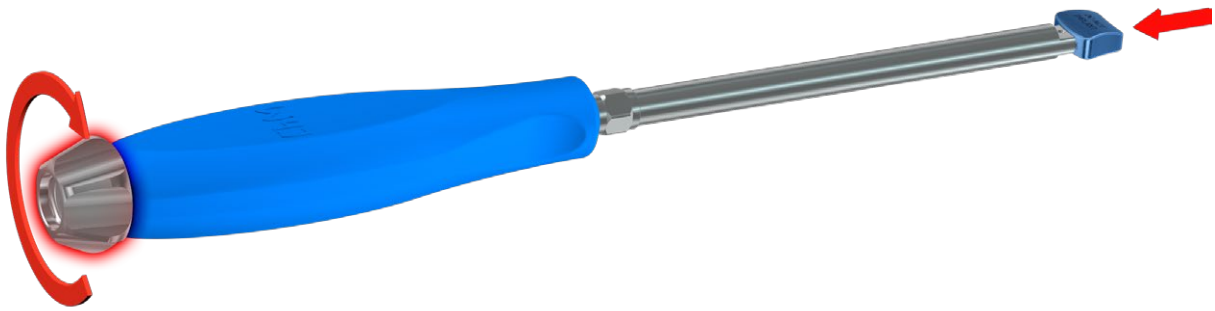
## V.4. IMPLANT SELECTION

Implant size is selected on the basis of trials [40.6082.0xx], [40.6083.0xx], [40.6092.0xx], [40.6093.0xx] whose shapes and dimensions correspond to the available implants.

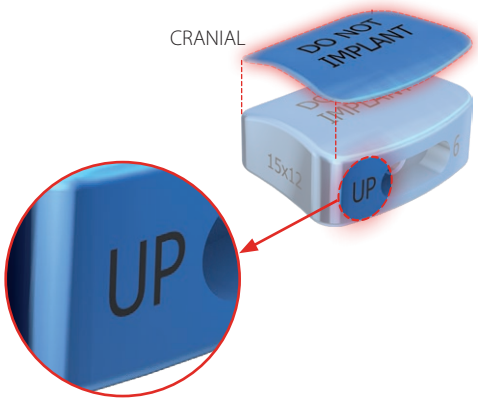
| | |
|---|---|
|  | 40.6082.0xx,<br>40.6083.0xx<br>40.6092.0xx<br>40.6093.0xx |
|  | 40.6080.000 |

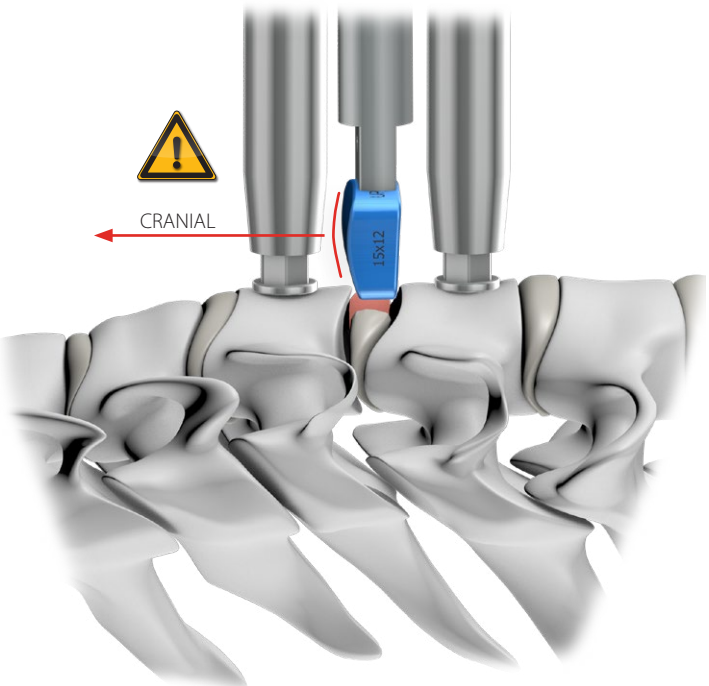
Choose intraoperatively, on the basis of X-Ray image, one of the trials **[40.6082.0xx]**, **[40.6083.0xx]**, **[40.6092.0xx]**, **[40.6093.0xx]** whose shape and height corresponds best to the intervertebral space.

Mount the selected trial to the persuader **[40.6080.000]** - insert the trial on the persuader tip and by rotating the persuader knob clockwise, tighten the locking pin in the socket of the trial.

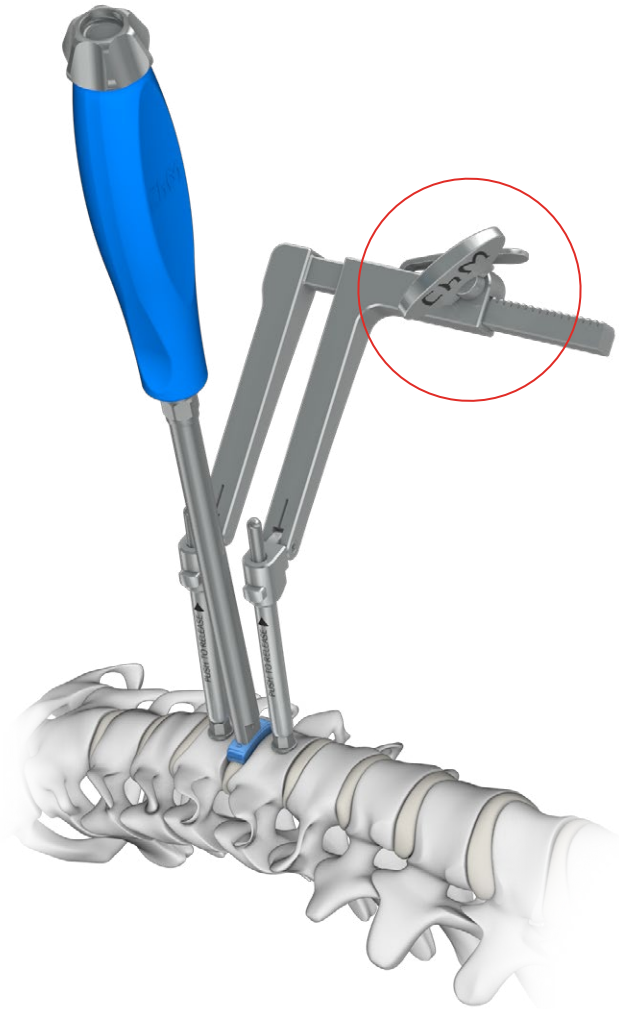


Convex trials [40.6082.0xx], [40.6092.0xx] should be inserted with the convex surface facing the head *(cranial direction)*.
The convex part of the trial is above the word *"UP"*.

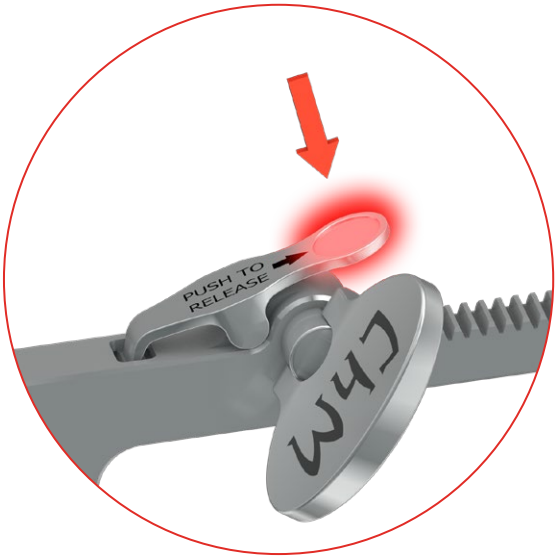


Insert the selected trial into the intervertebral space so that the top surface of the trial is located approximately 2mm below the top surface of the vertebral body.

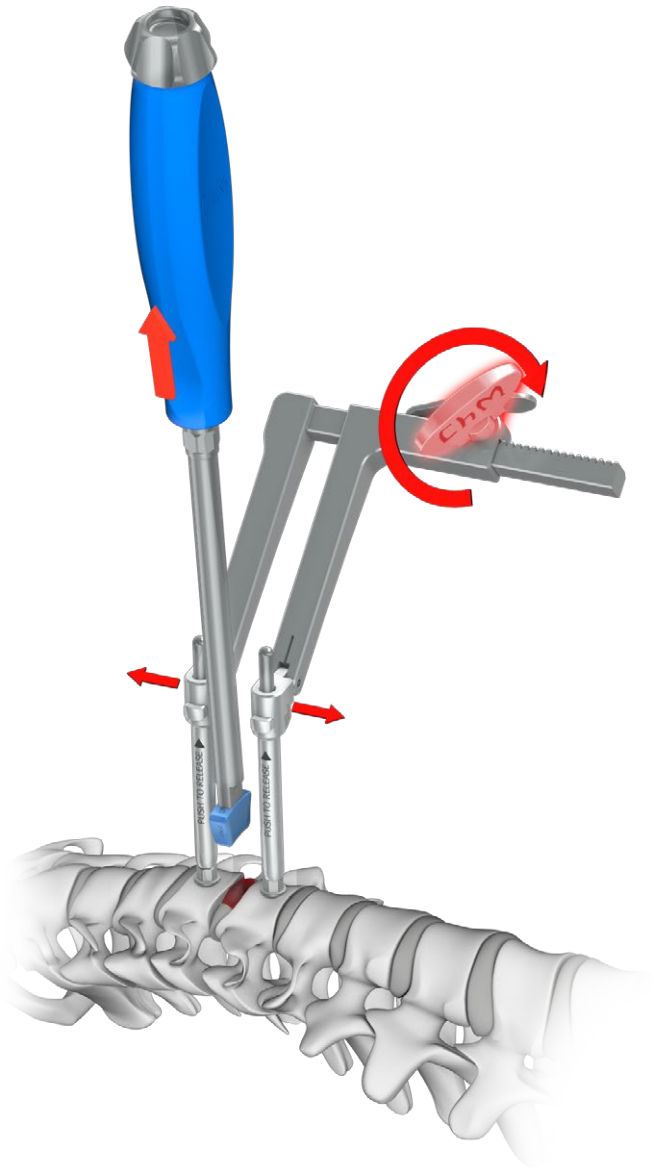


Release the distraction by pushing the locking lever of the Caspar cervical distractor.




Verify the position of the trial using X-Ray imaging.

In the anterior projection, the lateral edges of the trial should be symmetrical to the vertical axis of the vertebrae.



Distract the vertebrae again and remove the trial.

Should the trial be incorrectly positioned, repeat the procedure using a trial better fitting the intervertebral space.

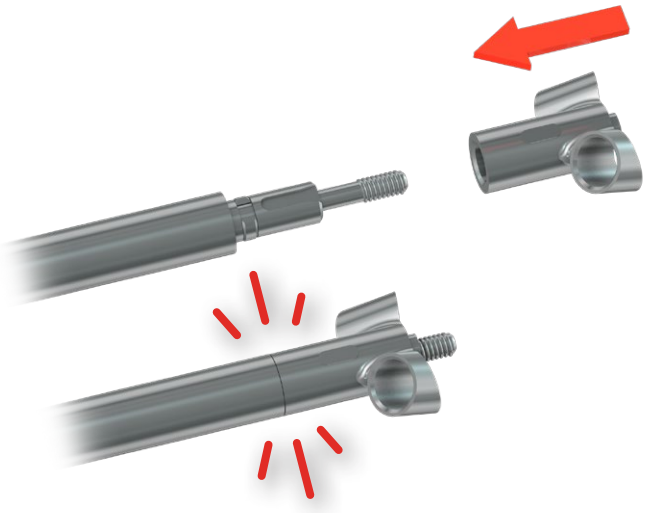
**Based on the selected trial, choose an implant of the same size and shape. The implant will be used later in the procedure.**

## V.5. IMPLANT PREPARATION

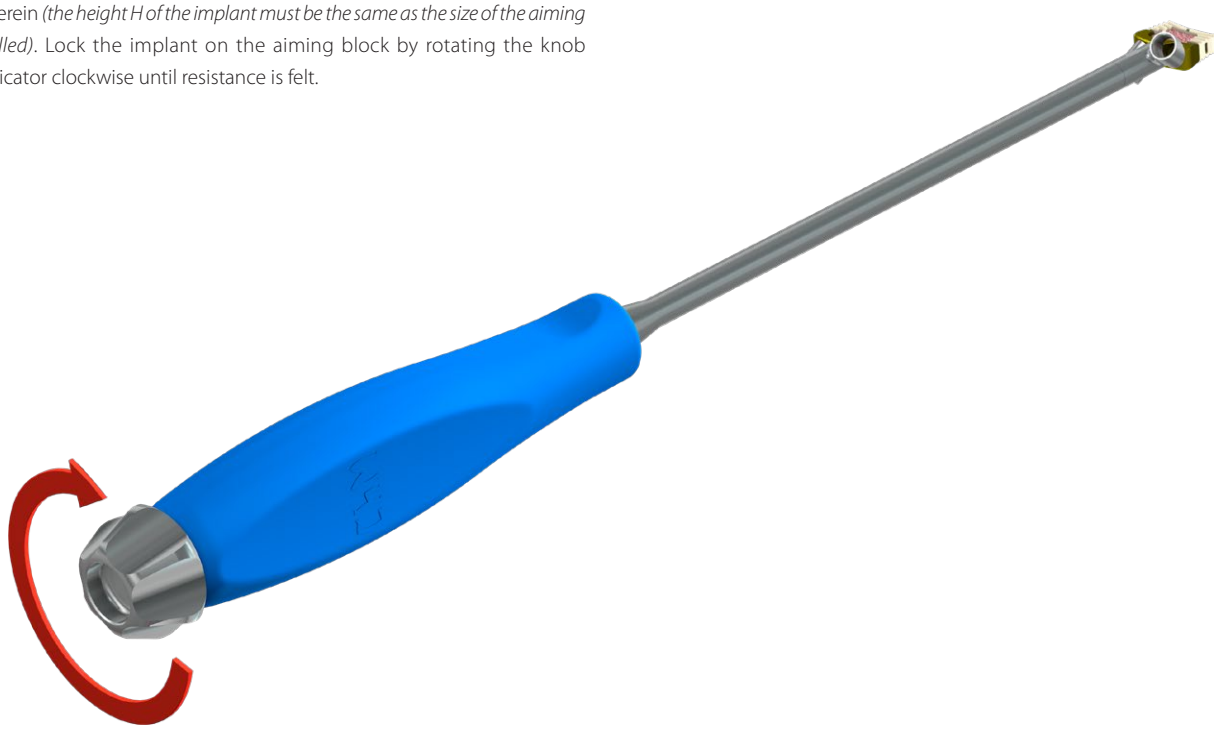
Before implantation, the space in the PEEK intervertebral cervical cage should be filled with autologous bone graft *(bone chips)* which allows for spinal fusion.

| | |
|---|---|
|  | 40.8784.000 |
|  | 40.8785.105<br>40.8785.106<br>40.8785.107<br>40.8785.108<br>40.8785.109<br>40.8785.110 |

Install the selected aiming block **[40.8785.1xx]** *(the height H of which must be the same as for the height of the final trial used)* to the applicator **[40.8784.000]** - the click sound must be heard.

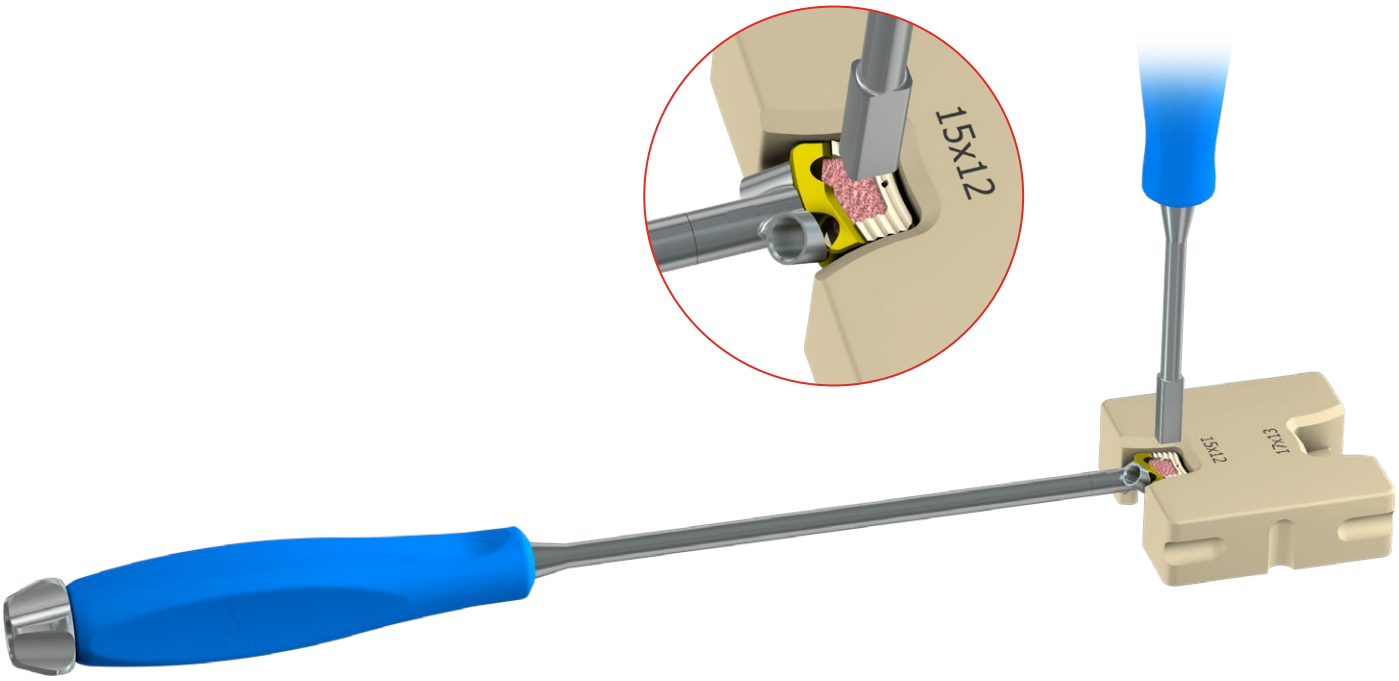


Then connect the intervertebral cage with the applicator and the aiming block installed therein *(the height H of the implant must be the same as the size of the aiming block installed)*. Lock the implant on the aiming block by rotating the knob of the applicator clockwise until resistance is felt.



| | |
|---|---|
|  | 40.8786.100 |
|  | 40.6077.000 |

Place the implant in an appropriate socket of the working stand **[40.8786.100]** and fill with bone chips. Compress them with compactor **[40.6077.000]**.

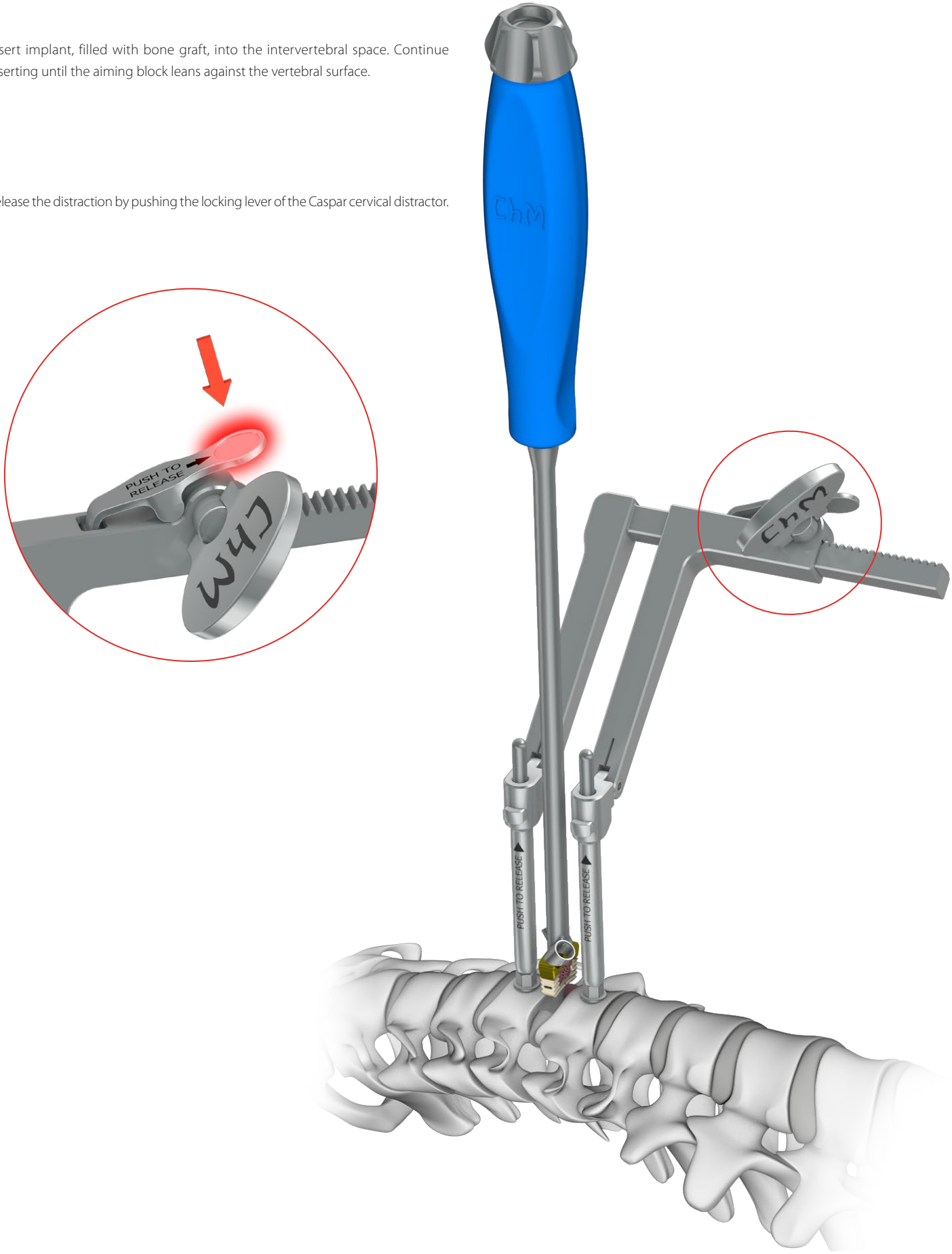



Bone graft should only be used with PEEK Optima cervical locking cages equipped with a titanium insert. 3D-Ti printed implants are not designed to be used with grafts.

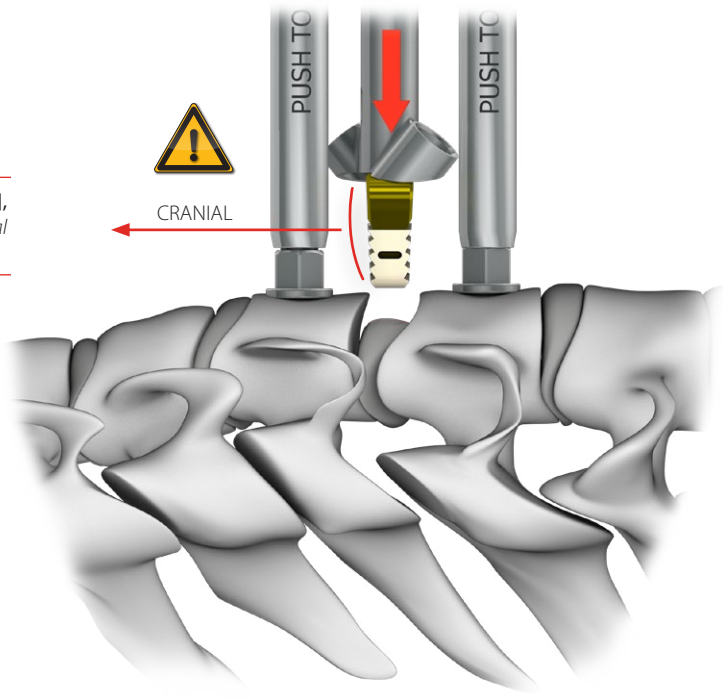
## V.6. IMPLANT INSERTION

Insert implant, filled with bone graft, into the intervertebral space. Continue inserting until the aiming block leans against the vertebral surface.

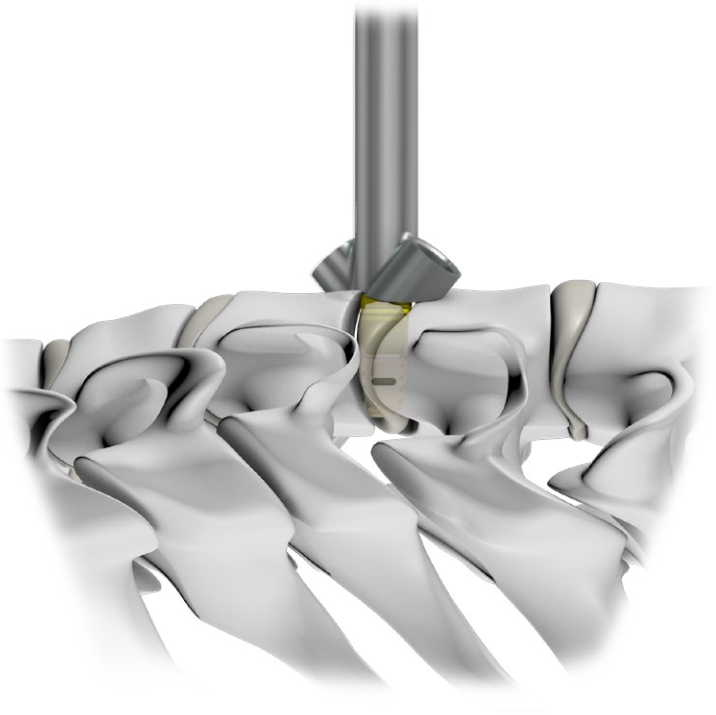
Release the distraction by pushing the locking lever of the Caspar cervical distractor.



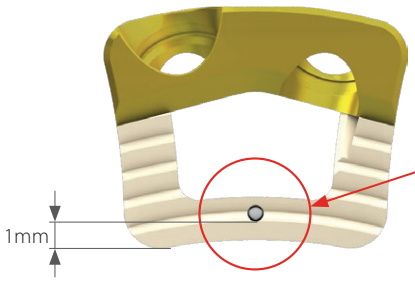
Convex cervical intervertebral cages [8.6973.xxx], [8.6972.xxx], should be inserted with the convex surface facing the head *(cranial direction)*.



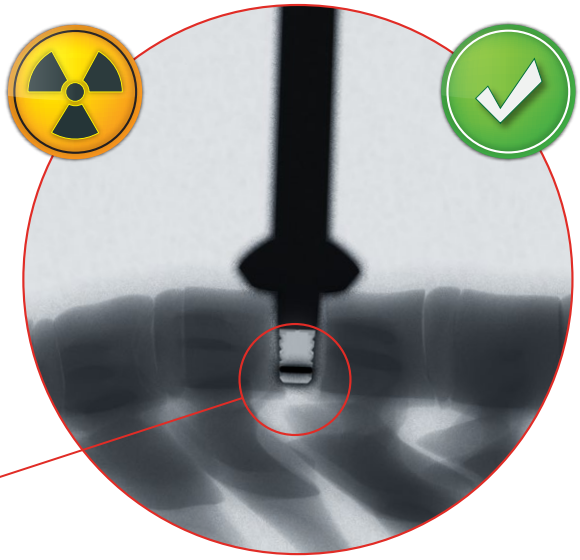

Having inserted the cage into the intervertebral space, remove the Caspar distractor and pins and leave the applicator in place.



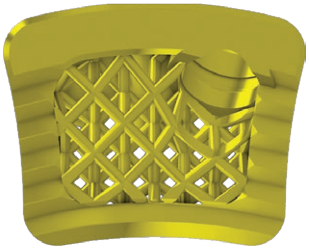
The embedded tantalum marker is used to navigate the position of the posterior wall of the intervertebral cage *(the marker is located 1mm from the edge of the cage)*. The marker is also used to determine whether the endplates of the vertebral bodies adhere properly to the cage.



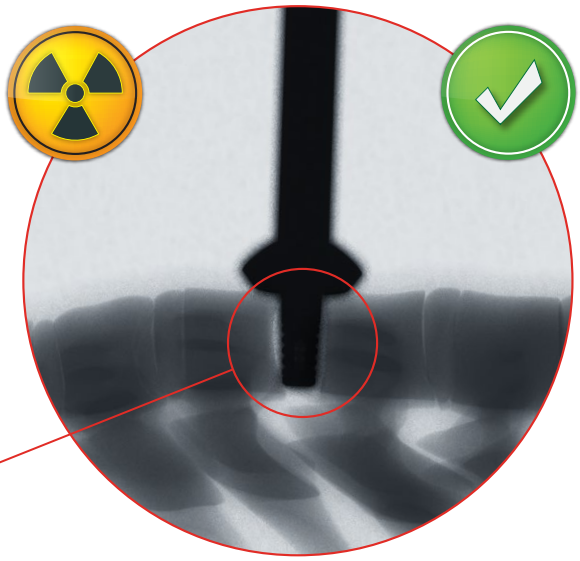

PEEK-OPTIMA®



**PEEK-Ti implant in X-Ray imaging**



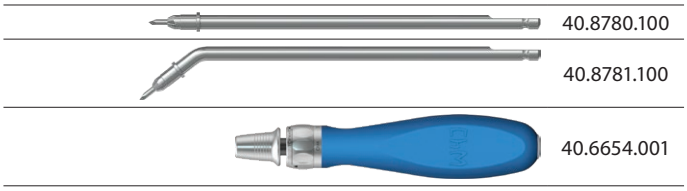
CHARSPINE system 3D-Ti
3D Titanium Trabecular Cage System

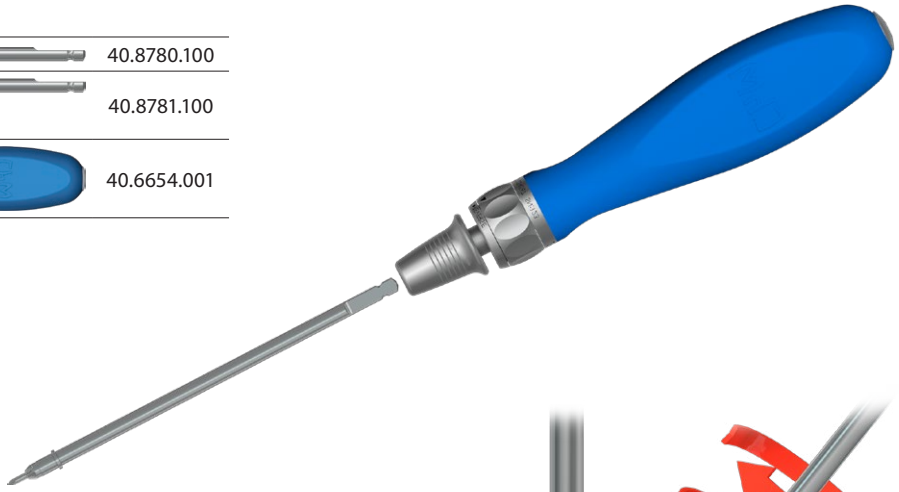


**3D-Ti implant in X-Ray imaging**

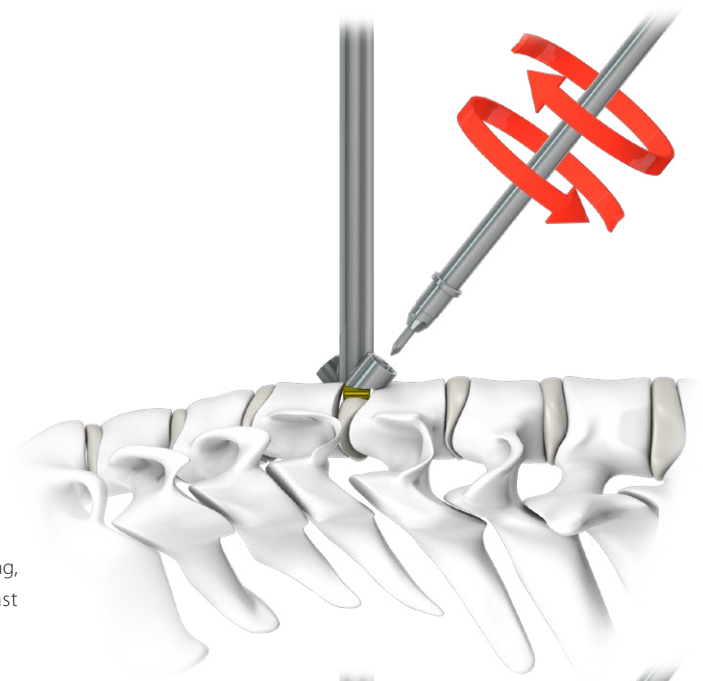
## V.7. HOLES DRILLING AND SCREWS INSERTION

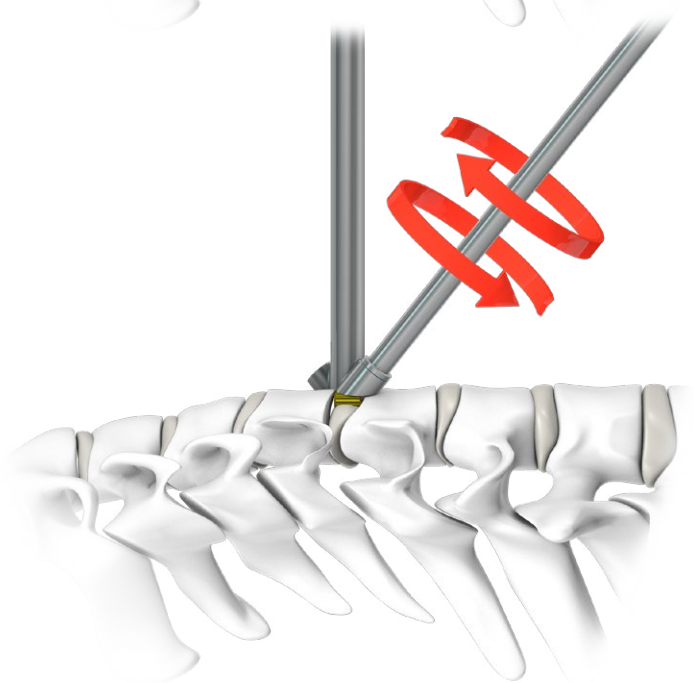
Connect the trocar *(straight)* **[40.8780.100]** or *(angled)* **[40.8781.100]** to the handle ratchet device **[40.6654.001]**.



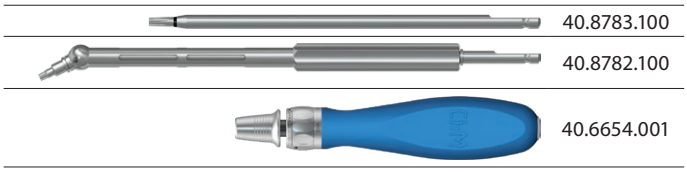
Place the trocar in the hole of the aiming block **[40.8785.1xx]** and, by rotating, continue inserting the trocar until the limiter of the trocar rests against the aiming block.





## V.8. SCREWS INSERTION

Connect the handle ratchet device **[40.6654.001]** with screwdriver tip T10 with joint **[40.8782.100]** or screwdriver tip T10 **[40.8783.100]**.

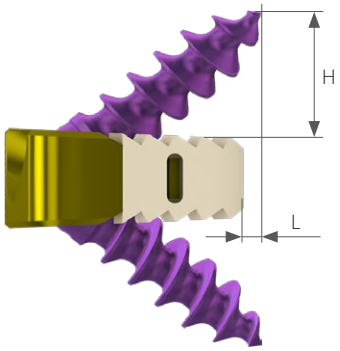



Install the determined screw.

3.5mm diameter screws should be used first.

4.0mm screws should only be used in emergency situations when the use of 3.5mm screw does not ensure secure anchoring of the intervertebral cage.

CAUTION:
For optimal stabilization, it is recommended to use the longest screws.
When selecting the screws, consider the information on the protrusion of screws outside the intervertebral cage of the table *(Tab.1)*.

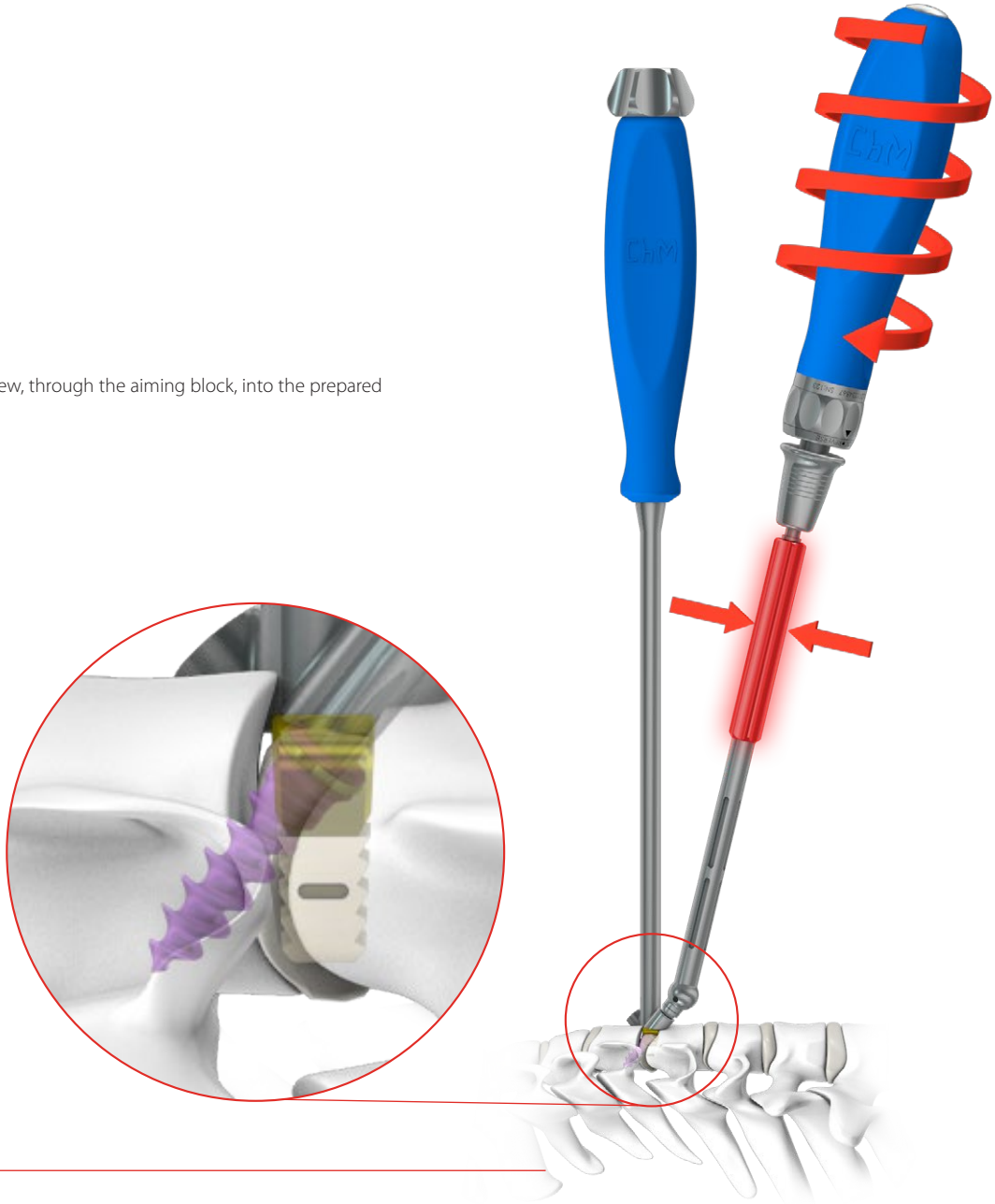



| Cage 15x12 | | |
|---|---|---|
| **Screw length** | **L** | **H** |
| 10 | Does not protrude | 3.6 |
| 12 | Does not protrude | 4.8 |
| 14 | 0.7 | 6 |
| 16 | 2.2 | 7.3 |

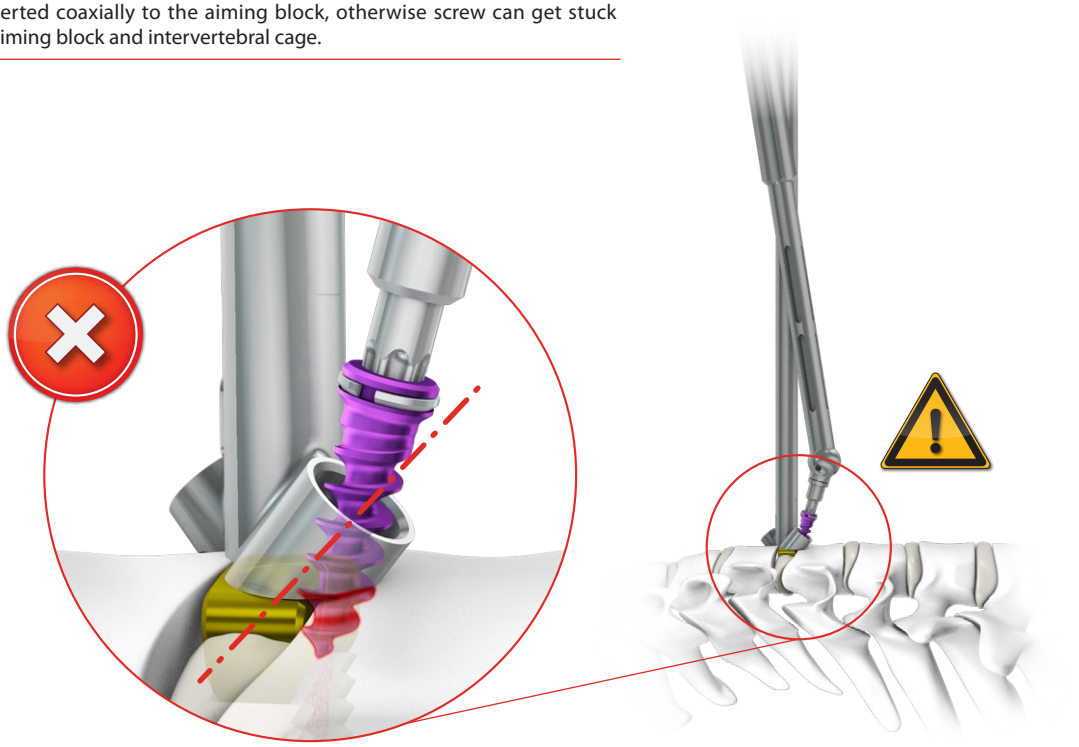
| Cage 17x13 | | |
|---|---|---|
| **Screw length** | **L** | **H** |
| 10 | Does not protrude | 3.7 |
| 12 | Does not protrude | 4.9 |
| 14 | Does not protrude | 6.1 |
| 16 | 1.2 | 7.3 |

Tab.1. Selection of screws

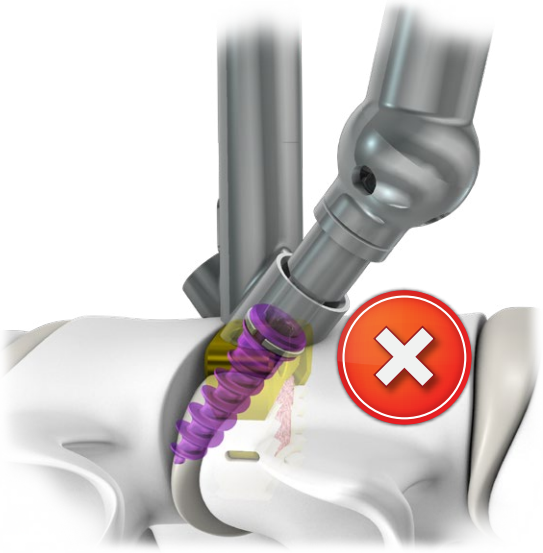
Carefully insert the attached screw, through the aiming block, into the prepared hole using clockwise rotation.

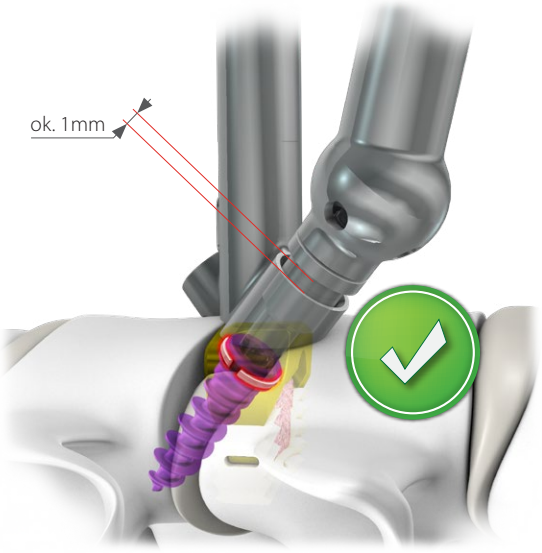


CAUTION!
When intervertebral cages with a height of H-5 or H-6 are used, make sure locking screws are inserted coaxially to the aiming block, otherwise screw can get stuck between the aiming block and intervertebral cage.



When the collar on the screwdriver tip is about 1mm from the edge of the aiming block, the screw has been screwed in completely and the locking ring has been positioned as intended in the recess in the intervertebral cage.






For the intervertebral cage to be properly locked, repeat the procedure for the other hole.

After locking the cage, remove the applicator **[40.8784.000]** by rotating the knob counter-clockwise.

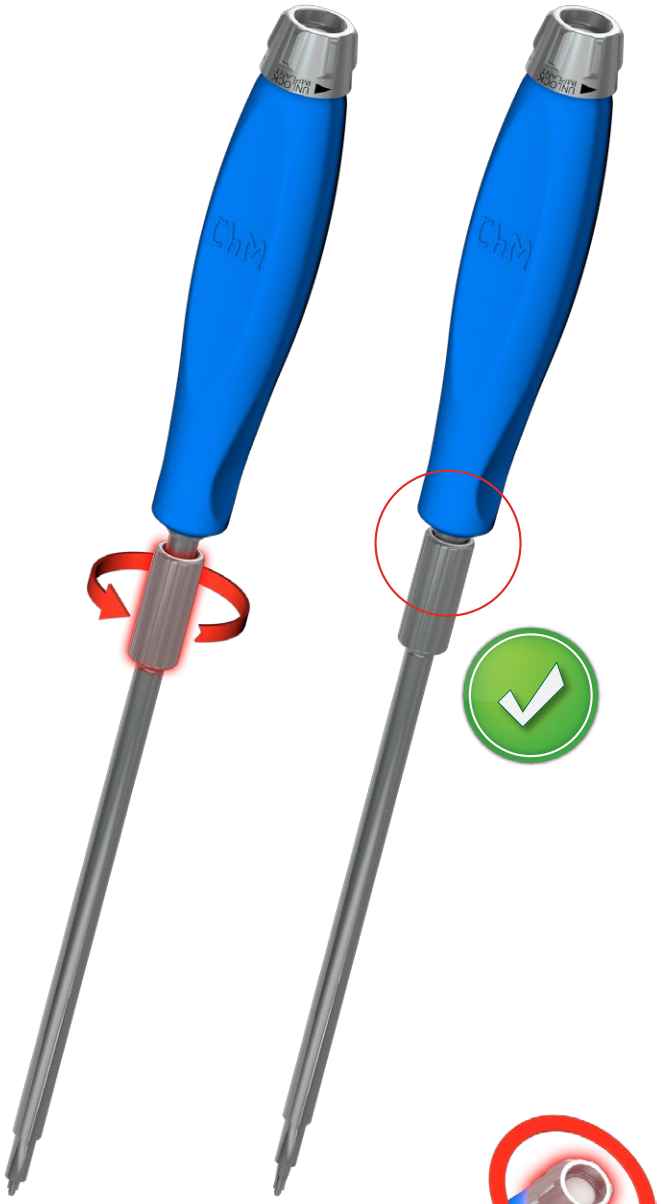
To make sure that the screws have been properly locked, ensure, after removing the applicator, that the rings on the screws are hidden in the cage.

# VI. IMPLANT REMOVAL

## VI.1. LOCKING SCREWS REMOVAL

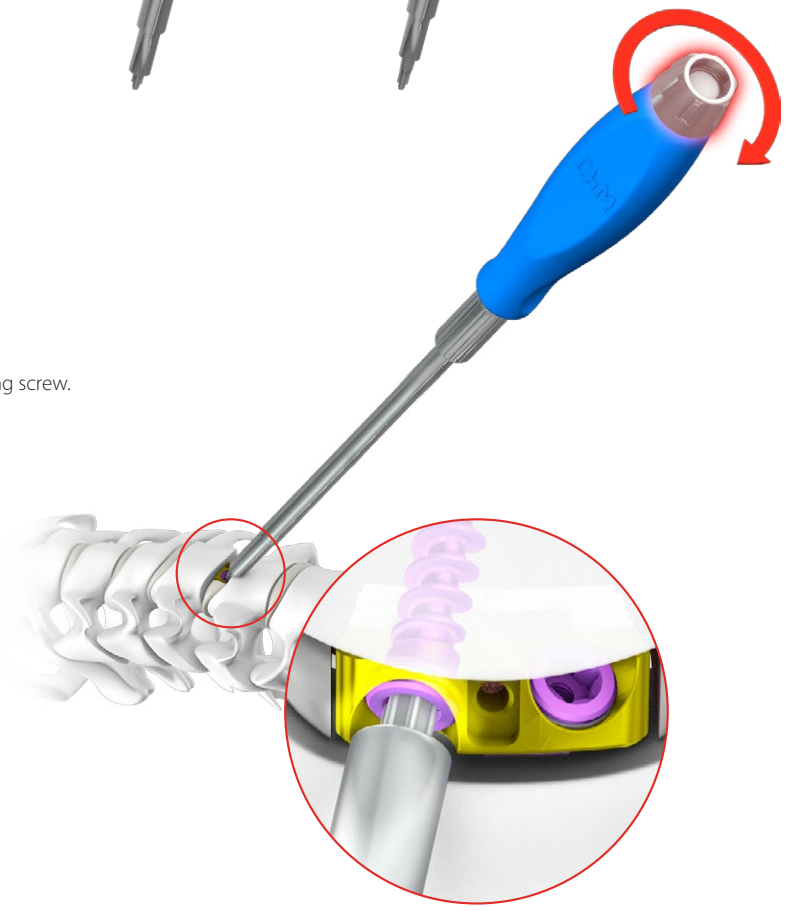
CAUTION!
Make sure the extractor sleeve is in the upper position before use. If not, rotate the sleeve counterclockwise to set the sleeve as intended.

40.8789.000

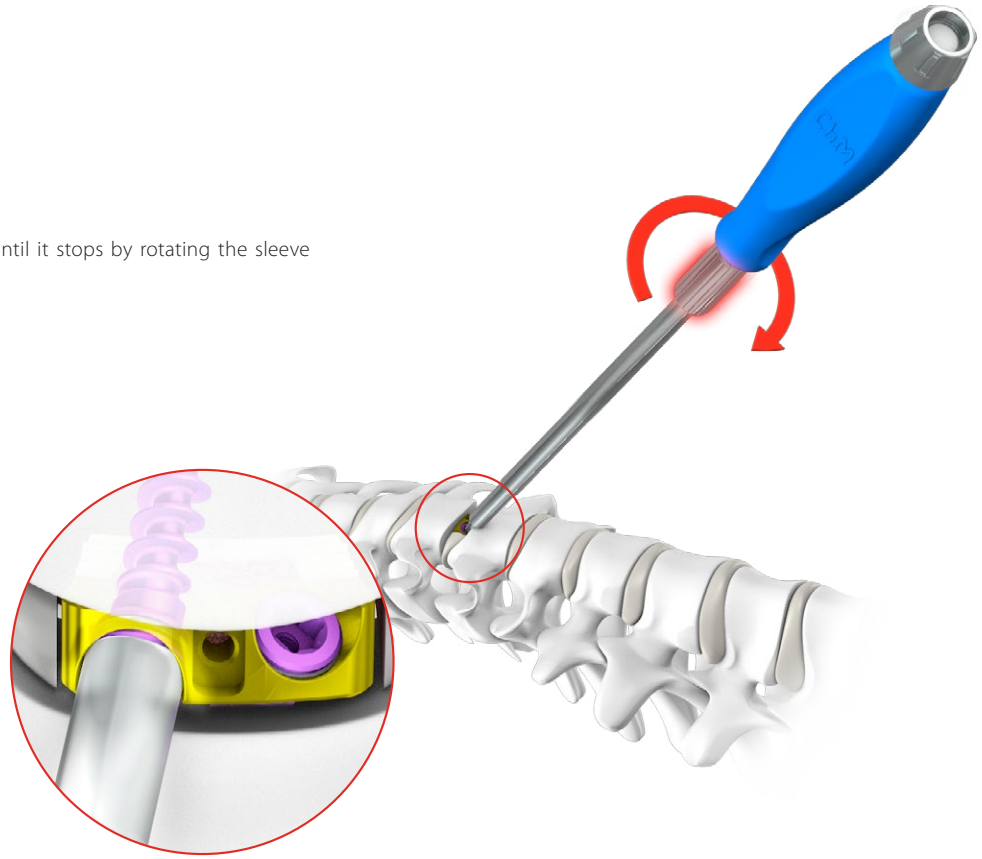


Insert the extractor tip in the socket of the locking screw.

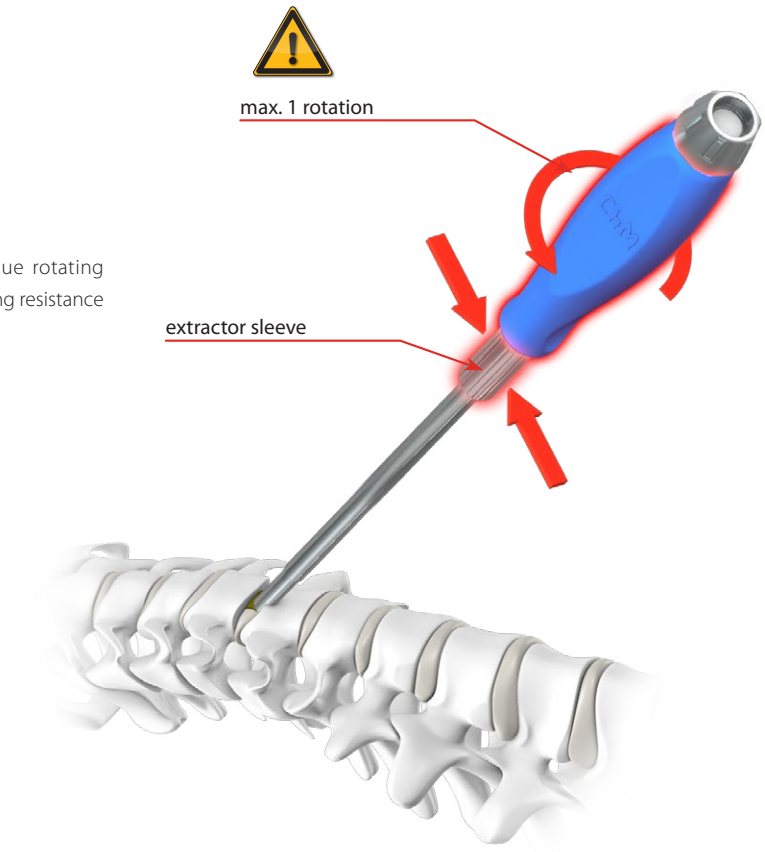
Rotate the knob of the pin clockwise to install the extractor in the locking screw.



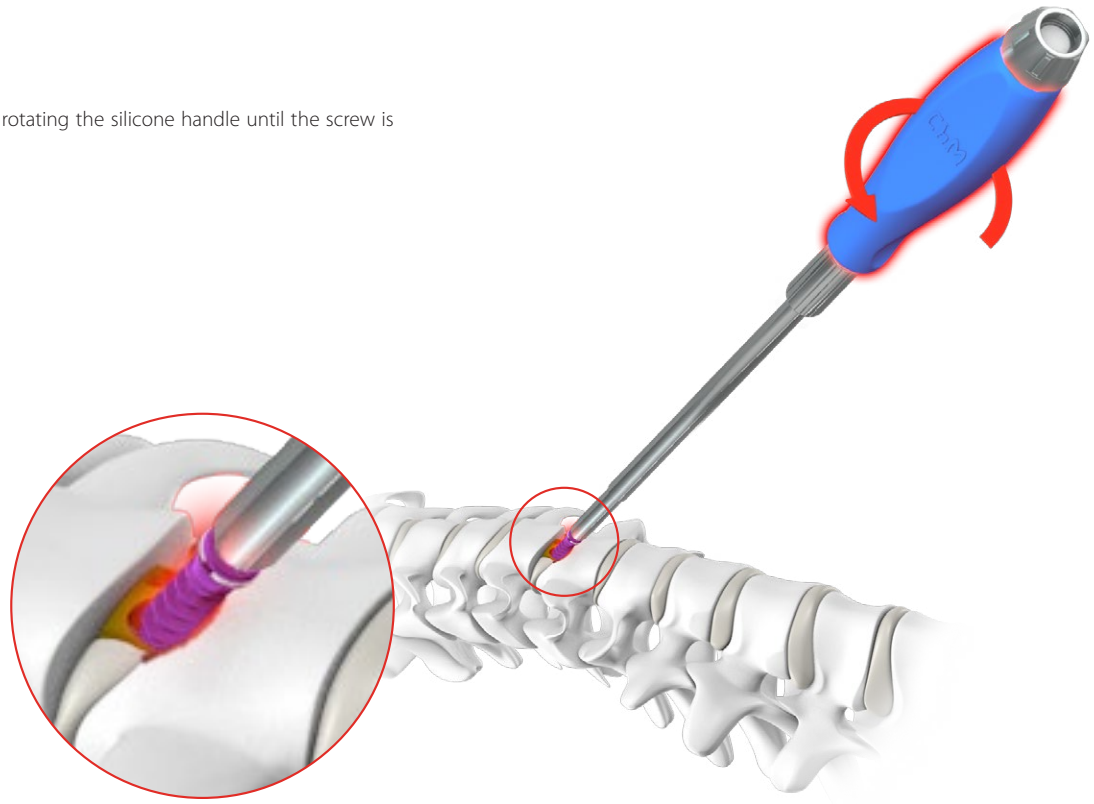
Continue lowering the extractor sleeve until it stops by rotating the sleeve knob clockwise.



While holding the extractor sleeve *(against its rotation)*, continue rotating the silicone handle counterclockwise *(about 1 full rotation)* until strong resistance on the sleeve is felt *(the screw is unlocked)*.



Release the sleeve and continue rotating the silicone handle until the screw is completely removed.



When removed, unlock the screw from the extractor by counter-clockwise rotation.

CAUTION:
Once the screw has been removed from the intervertebral cage, it cannot be used again.

## VI.2. INTERVERTEBRAL CAGE REMOVAL

When the screws are removed, connect the intervertebral cage with the applicator and the aiming block installed therein and gently pull out the implant.

If necessary, Caspar distractor should be used to distract the vertebral bodies.

For further information on:
• adverse effects,
• warnings,
• sterilization,
• pre- and post-operative recommendations,
please, refer to the Instructions for Use for the product.

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

CE 0197