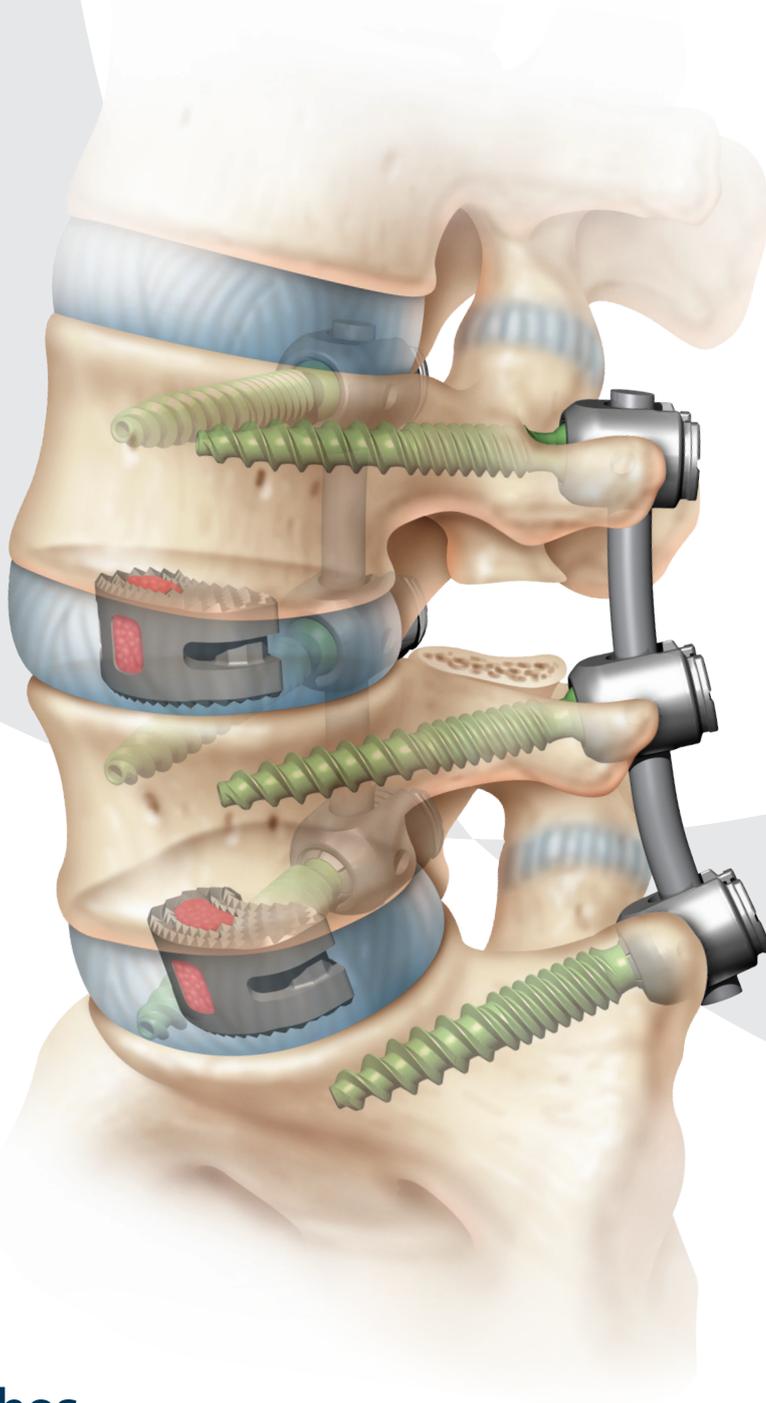


Transforaminal Posterior Atraumatic Lumbar Cage System  
Available in PEEK, Titanium and ProTi 360™ Titanium Integrated Technology

# T-PAL™ Interbody System

Surgical Technique



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 Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

**Processing, Reprocessing, Care and Maintenance**

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuyshes.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE\_023827) or refer to:

<http://emea.depuyshes.com/hcp/reprocessing-care-maintenance>

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\* For Product Catalog contact your local  
DePuy Synthes representative.

# T-PAL™ Interbody System

## Articulating Implant

- Rails on top of the implant are designed to turn the cage into the desired position by guiding the cage along the pathway created in the vertebral endplates by the rails on the trial
- Three x-ray markers help to visualize the implant under radiographic control
- Cages available in three material types PEEK, Titanium & ProTi 360°™ Titanium Integrated Technology

### Pyramidal teeth

Designed to provide resistance to implant migration

### Rails on the surface

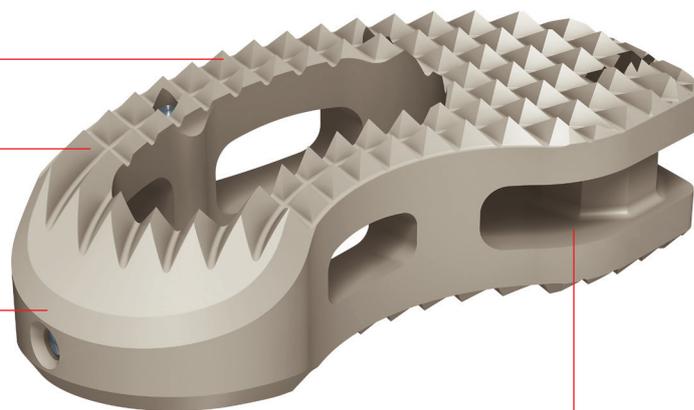
Designed to guide and turn the cage into the desired position by following the path created in the vertebral endplates by the rails on the trial

### Self-distracting nose

Self-distracting bullet nose facilitates insertion

### Connection cylinder

Permits the pivoting action with the applicator



### Two anterior radiographic marker pins

Enable visualization of the anterior implant position during imaging  
The PEEK Cages 1.4 mm diameter pins and ProTi 360° 1mm diameter pins are approximately 2 mm from the anterior edge of the implant.

### Axial window

Accommodates autogenous bone graft or bone graft substitute

### Implant materials

- PEEK (Titanium alloy marker pins (TAN - Ti-6Al-7Nb)
- Titanium alloy (TAN - Ti6Al-7Nb)
- ProTi 360° PEEK Titanium Integrated (Tantalum pins)

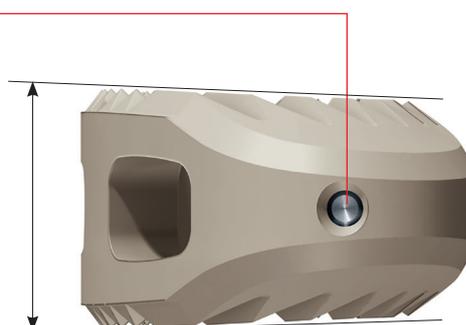
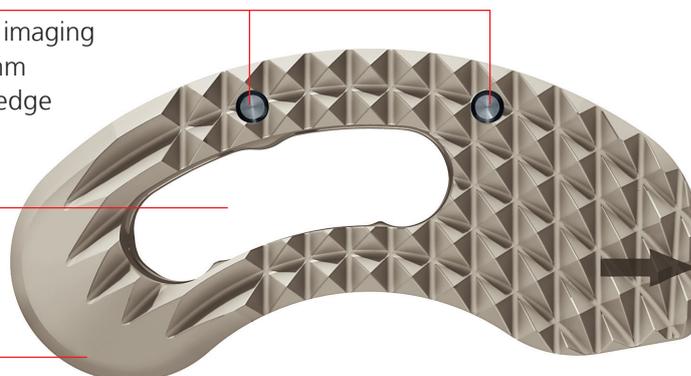
### Radiographic marker pin

Enable visualization of implant tip position during insertion

The 1.4 mm diameter, 5mm long pin is located in the middle of the cage and stops at the bullet nose tip of the cage. A 1 mm diameter, 3 mm long pin is represented in T-PAL ProTi 360° cage.

### Lordotic angle

5° (except for the 7 mm height)



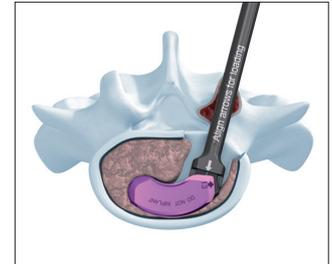
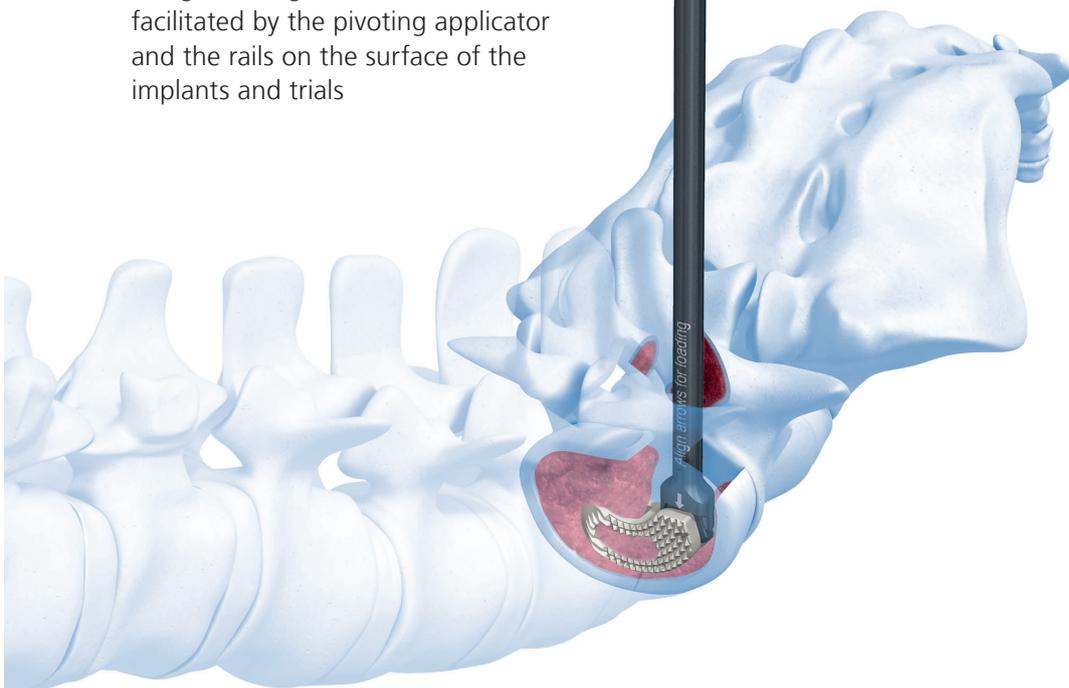
## Applicator

- One instrument for insertion of trials and implants
- Applicator allows for pivoting action of both trials and implants
- Security button designed to prevent implant disengagement
- Applicator is designed for placement of the cage through an open or MIS approach.

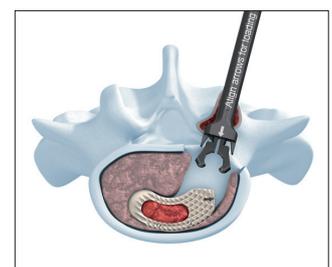
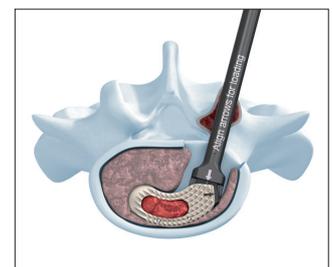
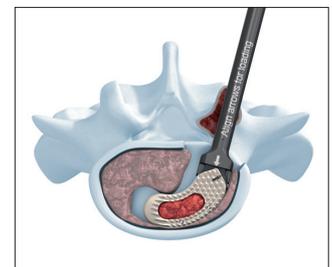
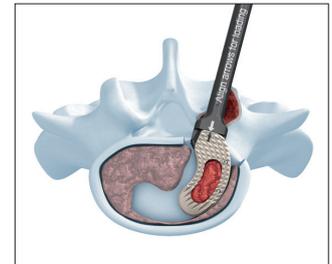


## Guided insertion technique

- Designed for guided insertion, which is facilitated by the pivoting applicator and the rails on the surface of the implants and trials



AP trial window Lateral trial window



# AO Spine Principles

The four principles to be considered as the foundation for proper spine patient management underpin the design and delivery of the Curriculum: Stability – Alignment – Biology – Function.<sup>1,2</sup>

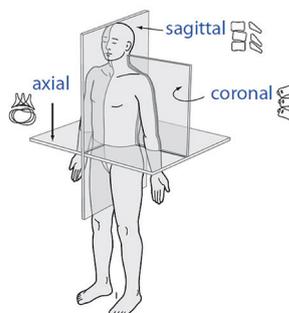
## Stability

Stabilization to achieve a specific therapeutic outcome



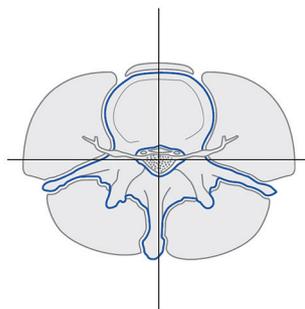
## Alignment

Balancing the spine in three dimensions



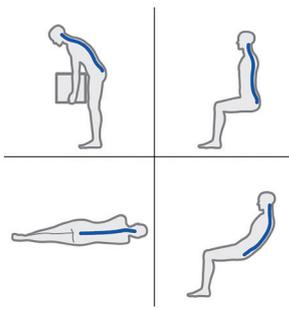
## Biology

Etiology, pathogenesis, neural protection, and tissue healing



## Function

Preservations and restoration of function to prevent disability



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# Preoperative Planning and Preparation

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## Preparation

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### Set

---

01.812.001 Set T-PAL

---

### Optional sets

---

01.809.011 Dilation Instrument Set

---

01.615.004 Insight Tubes Set  
or

01.615.002 Insight Retractor Set,  
Standard Configuration

---

01.612.110 Set for MIS Support System

---

01.605.903 Set for Minimally Invasive Posterior  
Instruments

---

Have all necessary imaging studies readily available to plan implant placement and visualize individual patient anatomy.

Have all sets readily available prior to surgery.

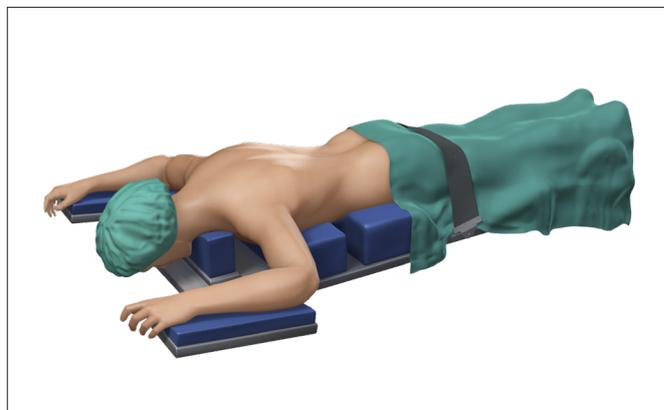
**Warning:** Please see the **Surgical Technique Guide Addendum for information specific to the T-PAL Advanced Applicator, including precautions, warnings, and other important information.**

# Patient Positioning

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## Position the patient

Position the patient in a restored physiological lordosis, avoiding abdominal restriction to reduce venous stasis.



# Access and Exposure

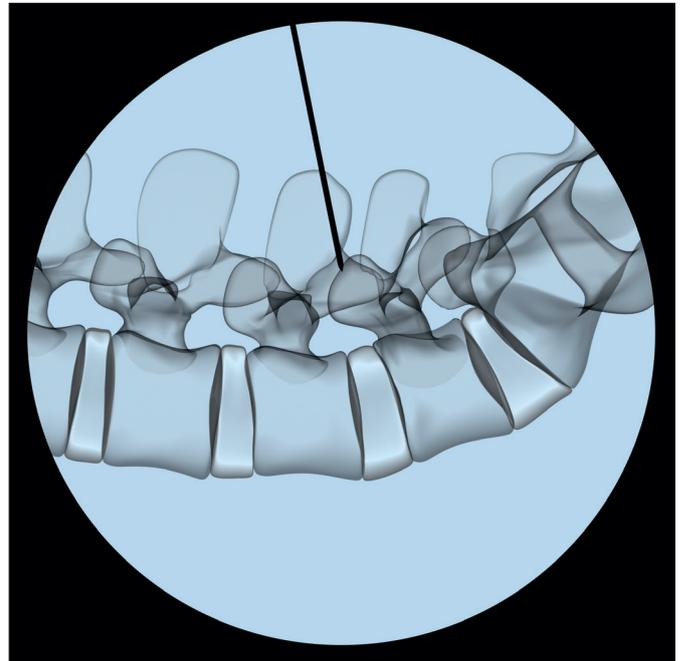
## Minimally invasive transforaminal approach

### 1. Approach

#### Optional sets

01.809.011	Dilation Instrument Set
01.615.004	Insight Tubes Set or
01.615.002	Insight Retractor Set, Standard Configuration
01.612.110	MIS Support System Set

1. Locate the correct operative level with fluoroscopic views. Push the Kirschner wire into the desired facet joint. Separate the posterior soft tissue by inserting the smallest diameter dilator over the Kirschner wire. Repeat with next larger diameter dilator until required dilation is achieved. Use fluoroscopy to determine the location of dilator.



### 2a. Retraction with Insight tubes

#### Instrument set

01.615.004	Insight Tubes Set
------------	-------------------

#### Optional sets

01.612.110	MIS Support System Set
01.809.011	Dilation Instrument Set

Determine the appropriate tube length from the depth indicators on the dilators.

Slide the tube over the dilators until it contacts the facet joint.

Use the Flex Arm to stabilize the tube to the OR table. Remove the dilators and the Kirschner wire.



## 2b. Retraction with Insight retractor

### Instrument set

01.615.002 Insight Retractor Set,  
Standard Configuration

### Optional Sets

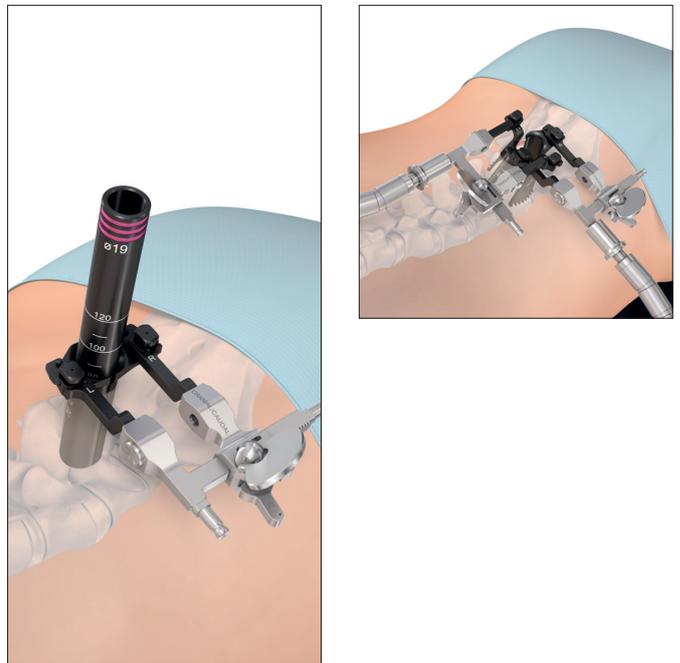
01.809.011 Dilation Instrument Set

01.612.110 MIS Support System Set

Determine the appropriate retractor lengths of the cranial/caudal and medial/lateral blades from the depth indicators on the dilators.

Slide the retractor with the cranial/caudal blades over the dilators until the blades contact the facet joints. Distract the blades and introduce the second retractor with the medial/lateral blades.

Use the Flex Arm to stabilize the retractor to the OR table. Remove the dilators and the Kirschner wire.



## 3. Cut transforaminal window

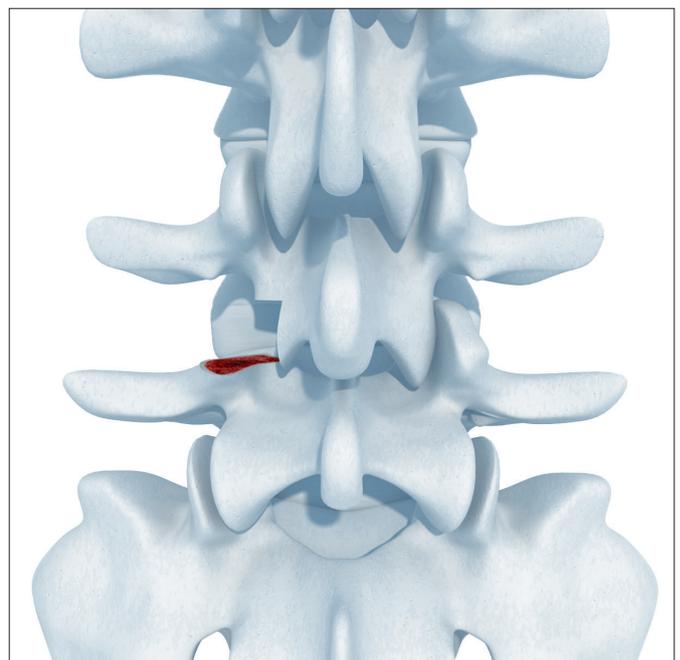
### Instruments

03.605.508 Osteotome, straight, black

03.605.520 Laminectomy Punch, 40°, 4.0 mm, black

Prepare a window for the transforaminal approach using the osteotome to remove the inferior facet of the cranial vertebra and the superior facet of the caudal vertebra.

With the punch, additional bone or osteophytes can be removed.



# Access and Exposure

## Open transforaminal approach

### 1. Retraction with an open transforaminal approach

---

#### Instrument

---

03.812.040 Lamina Spreader for T-PAL

---

Make a standard open incision, retract the muscle layer to view the desired segment.

Distract the segment if desired. Position the lamina spreader for T-PAL at the base of the spinous processes. Distract carefully until required distraction is achieved.

Distraction opens the posterior disc space and promotes exposure both for decompression and delivery of the implant.



### 2. Cut transforaminal window

---

#### Instruments

---

03.605.508 Osteotome, straight, black

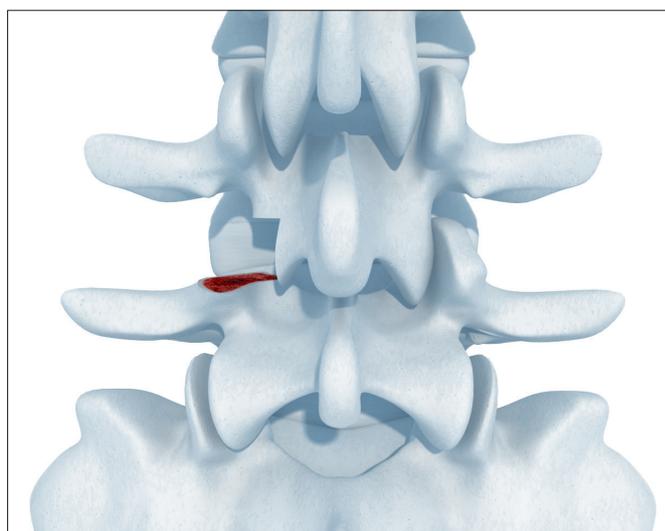
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03.605.520 Laminectomy Punch, 40°, 4.0 mm, black

---

Prepare a window for the transforaminal approach using the osteotome to remove the inferior facet of the cranial vertebra and the superior facet of the caudal vertebra.

With the laminectomy punch, additional bone or osteophytes can be removed.



# Discectomy

## Instruments

03.605.507	Rasp, dual-sided, bayoneted, black
03.605.510	Ring Curette, straight, bayoneted, black
03.605.514	Rongeur, curved, 4.0 mm, black
03.605.520	Laminectomy Punch, 40°, 4.0 mm, black
03.605.527	Rongeur, straight, 4.0 mm, black
03.605.529	Curette, rectangular, angled, right, bayoneted, black
03.605.530	Curette, rectangular, angled, left, bayoneted, black
03.803.054	Curette, rectangular, bayoneted, black
389.767– 389.777	Shaver for Intervertebral Discs, size 7–17 mm
394.951	T-Handle with Quick Coupling

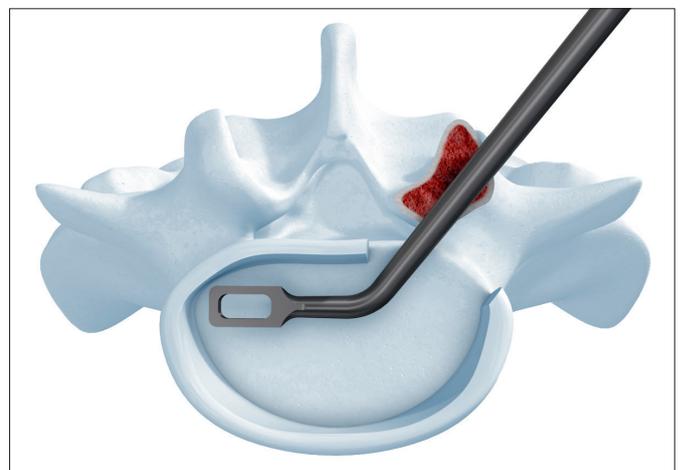
Through an incision above the pedicle, access the foramen and remove disc material, using any of the following instruments: box and ring curettes, rongeurs as well as disc shavers.

**Precaution:** The annulus should be preserved as much as possible to provide additional support for the T-PAL implant and prevent migration of bone graft and bone graft substitute into the spinal canal.

The shavers can initially be used to ream out disc material or for final removal of the disc material and cartilaginous tissue.

For removal of the tissue in the far lateral disc space, use the left/right angled curettes and the curved rongeur.

**Warning:** Provide enough lateral exposure to the disc to reduce dural retraction.



# Disc Space Preparation

## 1. Prepare endplates

---

### Instrument

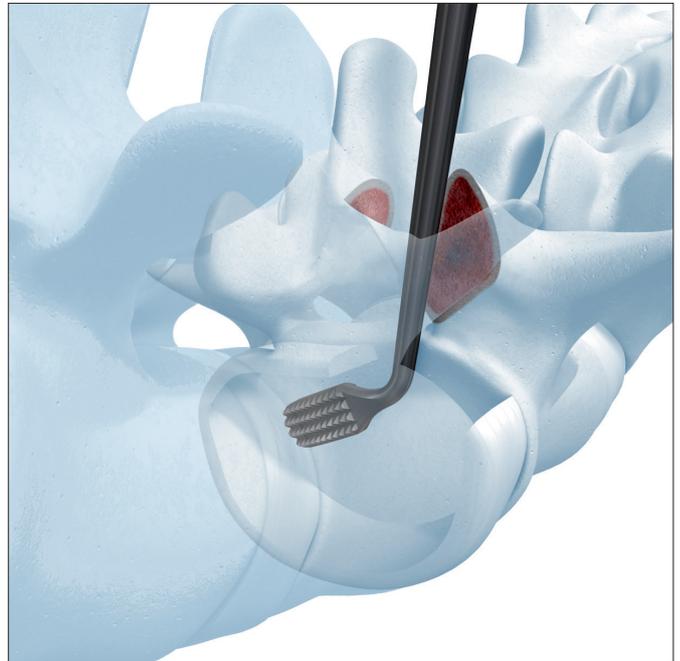
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03.605.511	Rasp, dual-sided, angled, bayoneted, black
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---

When the discectomy is completed, use the rasp to remove the superficial cartilaginous layers of the endplates to expose the bleeding bone.

**Warning:** Excessive removal of the subchondral bone may weaken the vertebral endplate. The entire removal of the endplate may result in subsidence and a loss of segmental stability.



## 2. Pack disc space

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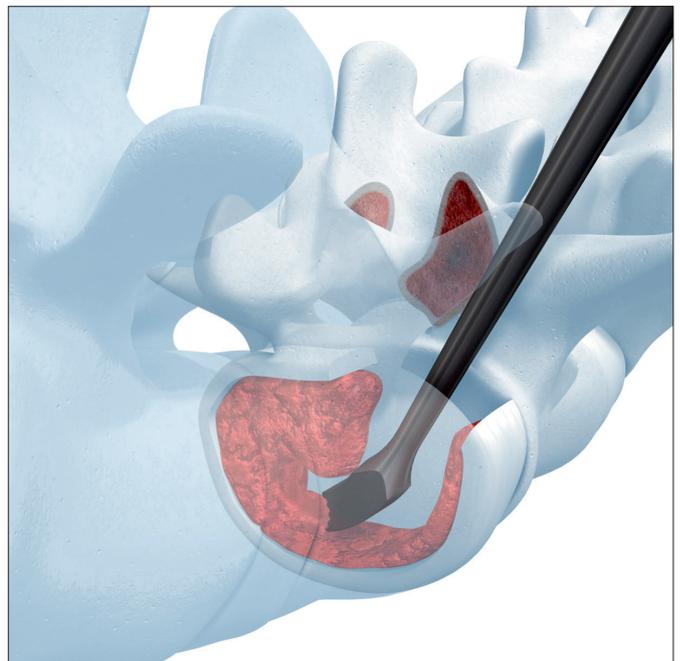
### Instrument

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03.605.532	Impactor, curved, standard, bayoneted, black
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---

Before the T-PAL cage is implanted, the anterior and far lateral disc space should be filled with bone graft or bone graft substitute.



# Trial for Implant Size

## 1. Assemble applicator and connect non detachable trial implant

### Instruments

03.812.001	Applicator Outer Shaft
03.812.307– 03.812.317	T-PAL Small Trial Implant, size 7–17 mm, non detachable
03.812.507– 03.812.517	T-PAL Large Trial Implant, size 7–17 mm, non detachable
03.812.004	Applicator Knob

The applicator must be assembled before insertion of the trial.

Attach the applicator knob to the proximal end of the applicator outer shaft by turning the knob counterclockwise until it stops (1).

Select an appropriately sized trial implant. Insert the trial implant shaft into the applicator outer shaft making sure that the arrow on the outer shaft is aligned with the distal opening of the trial implant shaft (2). The trial implant shaft should now be trapped inside the applicator outer shaft (3).

Turn the applicator knob clockwise to secure the trial implant. During this attaching procedure the security ring moves upwards, so that the green color band is visible. Continue to turn the knob until it is tightened.

**Warning:** Ensure the arrows on the end of the applicator align with those on the trial implant. The contact surfaces between the trial and the applicator should have no gap (3).

**Note:** For disassembly pull the security ring down, turn the applicator knob counterclockwise until it stops. Push the small button on the applicator knob and simultaneously pull the trial implant shaft out of the applicator outer shaft. Turn the applicator knob clockwise. For detailed disassembly instructions please refer to page 34.

**Warning:** Please read first the applicator instructions on page 32 - 33.



## 2. Insert trial implant

### Optional instrument

SFW691R Prodisc-L Combined Hammer

Recheck the firm connection of trial implant to applicator. Insert the trial implant into the disc space, ensuring that the orientation of the trial implant is correct. The trial implant tip should be orientated medially. Maintain 10–15° between the applicator handle and the sagittal plane during trial implant insertiozn (1).

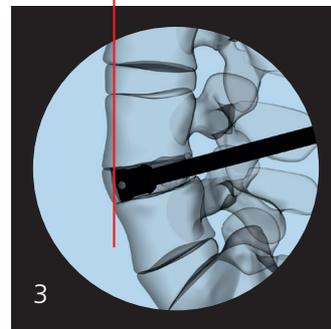
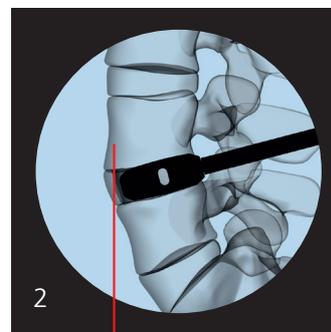
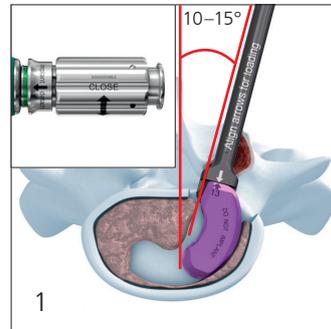
Controlled and light hammering on the applicator may be required to advance the trial implant into the intervertebral disc space. Use fluoroscopy to confirm position and fit of the trial implant. The tip should be positioned near the anterior edge of the adjacent vertebral bodies (2).

### Notes:

- Firm connection of trial implant to applicator can be checked manually by applying pressure on the lateral side of the trial implant with the thumb. Trial implant should not pivot.
- Use soft tissue retractor 389.857–389.859 to protect soft tissue.
- Use fluoroscopy during the insertion to confirm anterior positioning of the trial implant.

### Warnings:

- The trial tip indicates approximate final anterior position of the trial implant (3).
- Maintain 10–15° between the applicator handle and the sagittal plane during trial implant insertion.



### 3. Position trial implant

#### Optional Instrument

SFW691R Prodisc-L Combined Hammer

Turn the applicator knob counterclockwise until it stops (1)

**Precaution:** Ensure applicator knob is turned counterclockwise until it stops to avoid deformation of the applicator outershaft.

Controlled and light hammering on the applicator may be required to pivot the trial implant into final position (2).

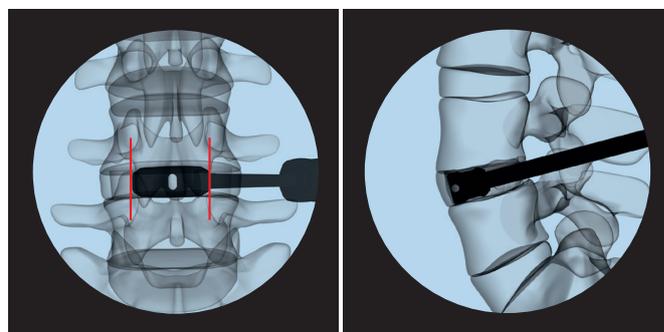
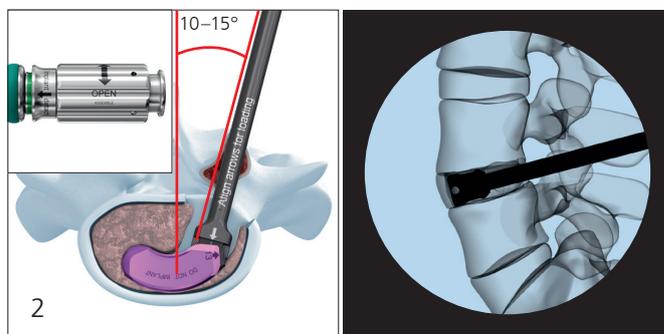
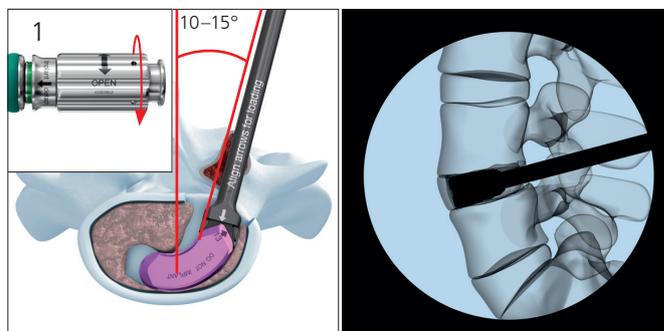
- Use fluoroscopy during the pivoting procedure and confirm fit and position of the trial implant. Each trial has a medial/lateral and an anterior/posterior opening for position control. If the trial implant appears too small or too tight, try the next larger or smaller size height until the most secure fit is achieved.

#### Notes:

- Ensure that the trial implant is positioned where the implant will be placed.

#### Warnings:

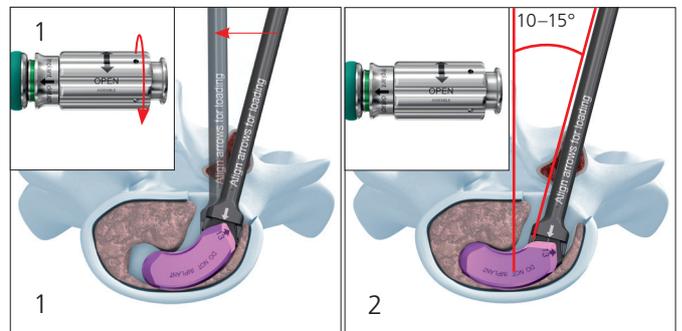
- Maintain 10–15° between the applicator handle and the sagittal plane during trial implant insertion.



### Optional: Position trial implant

If trial implant does not pivot automatically, turn the applicator handle medially to initiate pivoting upon impaction (1). After pivoting is initiated the applicator handle must be turned back to an angle of 10–15° from the sagittal plane to pivot the trial implant into final position (2).

**Warning:** Maintain 10–15° between the applicator handle and the sagittal plane for final trial implant insertion.



## 4. Remove non detachable trial implant

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### Instruments

03.809.972 Oracle Slide Hammer

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### Optional instrument

SFW691R Prodisc-L Combined Hammer

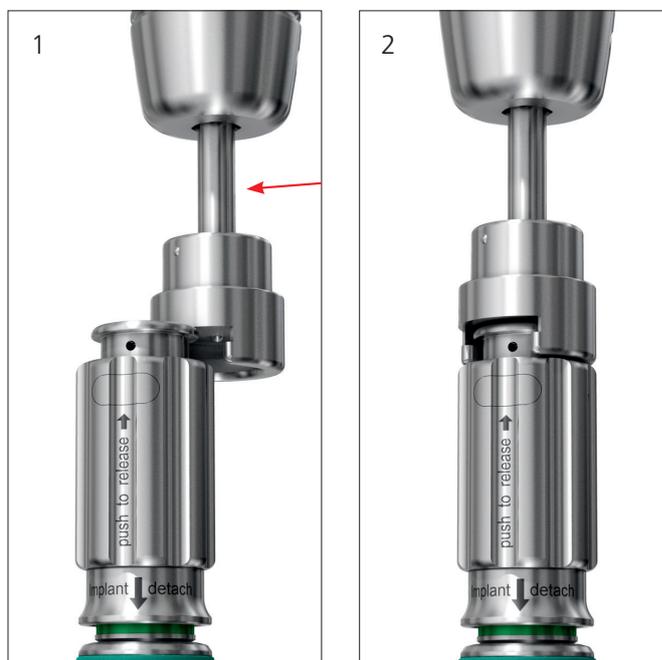
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**Warning:** The applicator must be in the pivoting position to remove the trial implant.

Slide the slide hammer onto the end of the applicator knob with quick coupling (1). While holding the handle with one hand, apply an upward force to the slide hammer with the other hand. Repeat this procedure until the trial implant is removed (2).

Optionally the combination hammer may also be used to remove the trial implant.

Remove the slide hammer from the handle by pushing on the end of the slide hammer.



To detach the trial implant from the applicator pull the security ring down and simultaneously turn the knob counterclockwise until it stops (3). Push the small button on the applicator knob and remove the trial implant (4).

Insert the applicator inner shaft into the applicator outer shaft making sure that the arrow on the outer shaft is aligned with the distal opening of the inner shaft (5). The applicator inner shaft should now be trapped inside the outer shaft. The applicator is now ready to accept the implant.

**Note:** If the security ring cannot be pulled down, turn the knob clockwise a quarter turn. The ring can now be pulled down.



# Implant Preparation

## 1. Select implant

### Implants and Instruments

08.812.007S– 08.812.017S	T-PAL Small, Cage, height 7–17 mm, PEEK, sterile
08.812.207S– 08.812.217S	T-PAL Large, Cage, height 7–17 mm, PEEK, sterile
04.812.007S– 04.812.017S	T-PAL Small, Cage, height 7–17 mm, Titanium, sterile
04.812.207S– 04.812.217S	T-PAL Large, Cage, height 7–17 mm, Titanium, sterile
108812007– 108812015	T-PAL ProTi 360° Small, cage, height 7-15mm, sterile
108812207– 108812215	T-PAL ProTi 360° Large, cage, height 7-15mm, sterile
03.812.044	Packing Block for T-PAL

Select the T-PAL implant that corresponds to the height and size measured using the trial implant in the previous steps.

Insert the selected implant into the appropriate packing block place.

**Note:** Cages available in three material types PEEK, Titanium & the ProTi 360° PEEK Titanium Integrated.



## 2. Pack implant

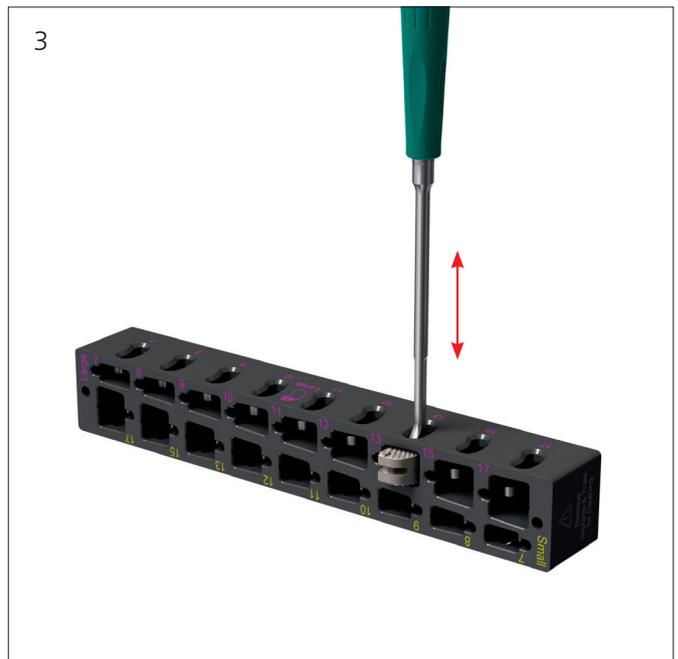
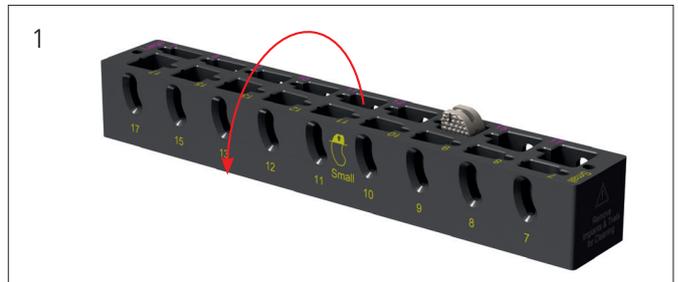
### Instrument

03.812.043 Cancellous Bone Impactor for T-PAL

Turn the packing block on its side and use the cancellous bone impactor to firmly pack the filling material into the implant cavities (1).

Make sure the implant is well placed in the packing block to avoid implant damage while bone graft filling (2).

It is important to fill the implant until the filling material protrudes from its perforations in order to ensure optimal contact with the vertebral endplates (3).



### 3. Connect implant to the applicator

#### Instruments

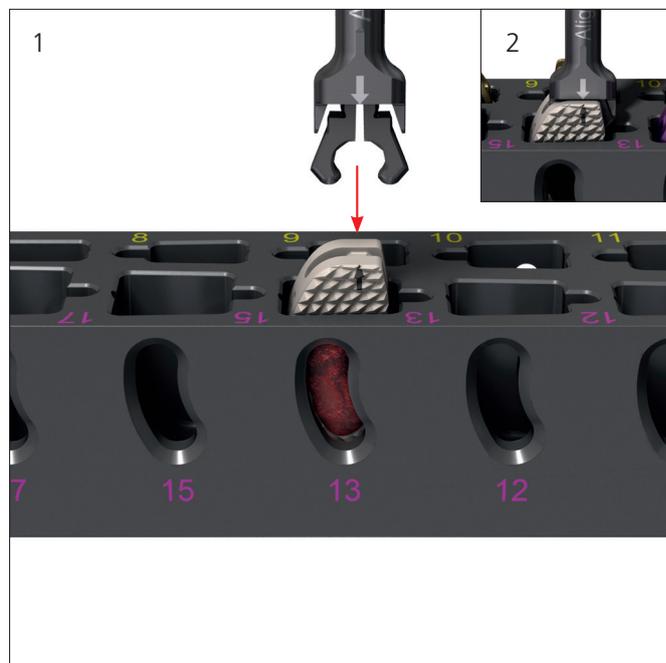
03.812.001	Applicator Outer Shaft
03.812.003	Applicator Inner Shaft
03.812.004	Applicator Knob

To connect the implant to the applicator turn the packing block upwards again. Pull the security ring down and simultaneously turn the knob at the proximal end of the applicator counterclockwise. The applicator jaws open (1). Place the jaws over the proximal end of the implant making sure to align the arrows on the end of the applicator with those on the implant (2).

Turn the applicator knob clockwise to close the jaws. During this closing procedure the security ring moves upwards, so that the green color band is visible. Continue to turn the knob until it is tightened (3).

**Note:** When the applicator knob is tightened, the implant cannot pivot or detach.

**Warning:** Ensure the arrows on the end of the applicator align with those on the implant. The contact surfaces between the implant and the applicator should have no gap (2).



# PEEK and ProTi 360° Implant Insertion

## 1. Insert implant

### Optional Instrument

SFW691R Prodisc-L Combined Hammer

Recheck the firm connection of implant to applicator. Insert the implant into the disc space, ensuring that the orientation of the implant is correct. The implant tip should be orientated medial. Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion (1).

Controlled and light hammering on the applicator may be required to advance the implant into the intervertebral disc space.

- Use fluoroscopy to confirm position and fit of the implant.

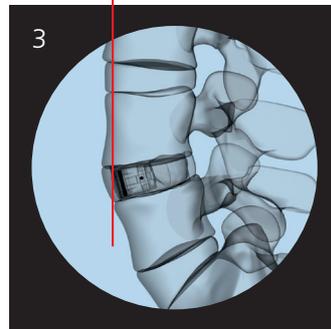
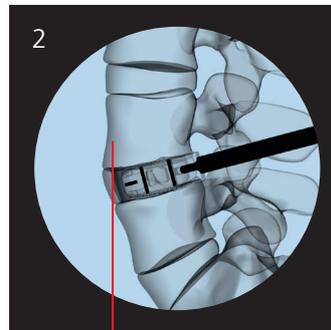
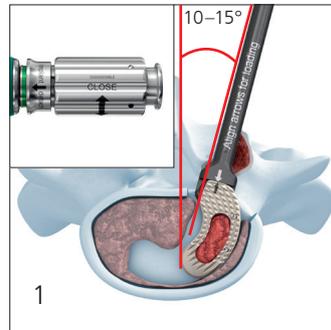
The tip should be positioned near the anterior edge of the adjacent vertebral bodies (2).

### Notes:

- Firm connection of implant to applicator can be checked manually by applying pressure on the lateral side of the implant with the thumb. Implant should not pivot.
- Use soft tissue retractor 389.857–389.859 to reduce soft tissue damage/injury.
- Use fluoroscopy during the insertion to confirm anterior position of the implant.
- The anterior marker pins of the implant are located approximately 2 mm from the edge of the implant.

### Warnings:

- The implant tip marker pin indicates approximate final anterior position of implant (3).
- Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion.



## 2. Position implant

### Optional Instrument

SFW691R Prodisc-L Combined Hammer

Turn the applicator knob counterclockwise until it stops (1).

**Precaution:** Ensure applicator knob is turned counterclockwise until it stops to avoid trial or applicator outershaft deformation.

Controlled and light hammering on the applicator may be required to pivot the implant into final position (2).

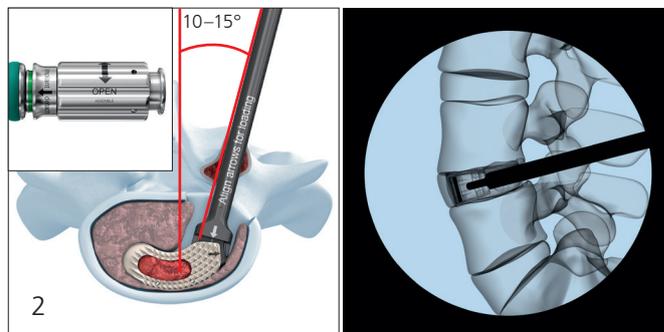
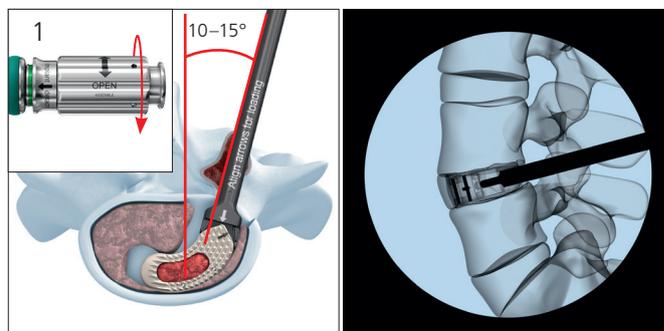
- Use fluoroscopy during the pivoting procedure and confirm fit and position of the implant.

With a medial/lateral fluoroscopic image of the cage in the final position, the two anterior pins of the implant should appear as one line.

In an anterior/posterior fluoroscopic image, the two anterior pins should be equidistant to the pedicles. The tip pin indicates the lateral edge of the implant.

**Note:** If bone graft or bone graft substitutes are placed into the disc space after trialing, the implant may not reach the same position as the trial.

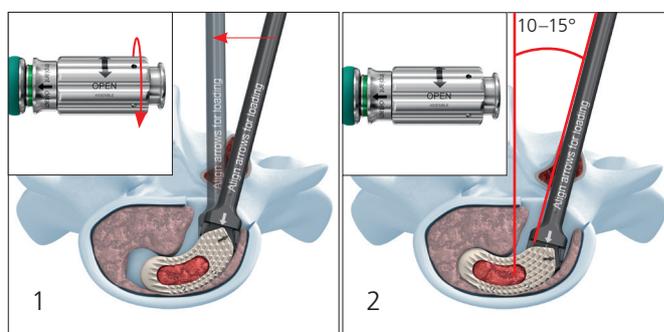
**Warning:** Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion.



### Optional: Position implant

If implant does not pivot automatically, turn the applicator handle medially to initiate pivoting upon impaction (1). After pivoting is initiated the applicator handle must be turned back to an angle of 10–15° from the sagittal plane to pivot the implant into final position (2).

**Warning:** Maintain 10–15° between the applicator handle and the sagittal plane for final implant insertion.



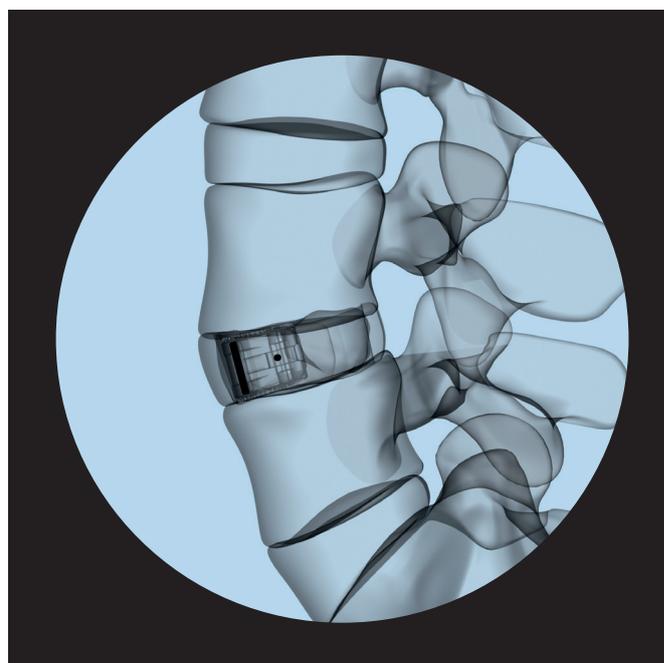
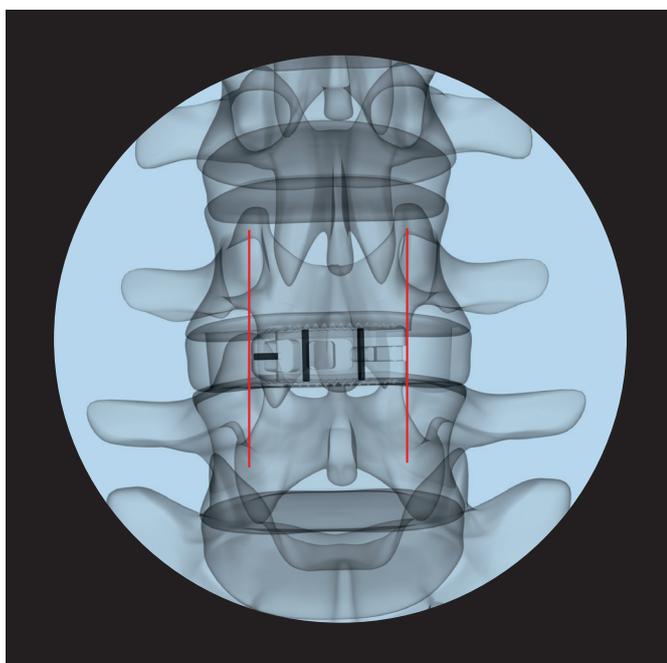
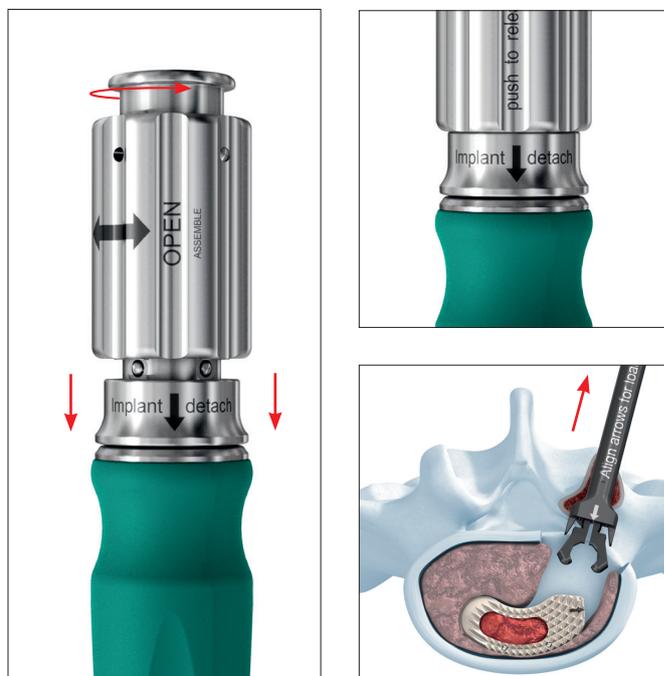
### 3. Detach implant

To detach the implant, pull the security ring down and simultaneously turn the applicator knob counterclockwise until it stops. The applicator can now be removed from the implant.

- Use fluoroscopy to verify final position of the implant. With a medial/lateral fluoroscopic image, the two anterior pins of the implant should appear as one line and the tip marker as a dot.

**Notes:**

- If the security ring cannot be pulled down, turn the knob clockwise a quarter turn. The ring can now be pulled down.
- If the applicator does not disengage from the implant move the applicator handle laterally to free the instrument.



# Titanium Implant Insertion

## 1. Insert implant

### Optional instrument

SFW691R Prodisc-L Combined Hammer

Recheck the firm connection of implant to applicator. Insert the implant into the disc space, ensuring that the orientation of the implant is correct. The implant tip should be orientated medial. Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion (1).

Controlled and light hammering on the applicator may be required to advance the implant into the intervertebral disc space.

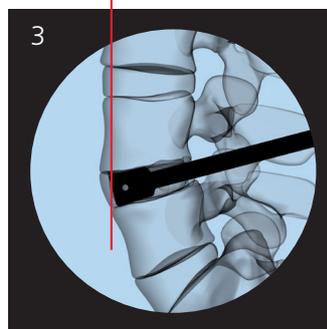
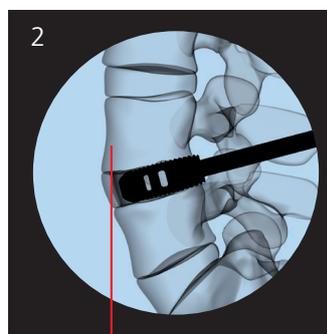
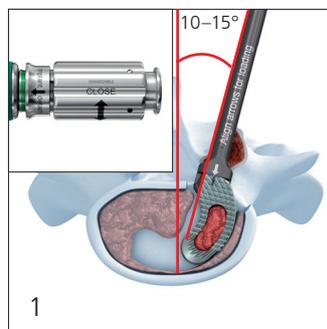
- ① Use fluoroscopy to confirm position and fit of the implant. The tip should be positioned near the anterior edge of the adjacent vertebral bodies (2).

### Notes:

- Firm connection of implant to applicator can be checked manually by applying pressure on the lateral side of the implant with the thumb. Implant should not pivot.
- Use soft tissue retractor 389.857–389.859 to protect soft tissue.
- ① • Use fluoroscopy during the insertion to confirm anterior position of the implant.

### Warnings:

- The implant tip indicates approximate final anterior position of the implant (3).
- Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion.



## 2. Position implant

### Optional instrument

SFW691R      Prodisc-L Combined Hammer

Turn the applicator knob counterclockwise until it stops (1).

**Precaution:** Ensure applicator knob is turned counterclockwise until it stops to avoid trial or applicator outershaft deformation.

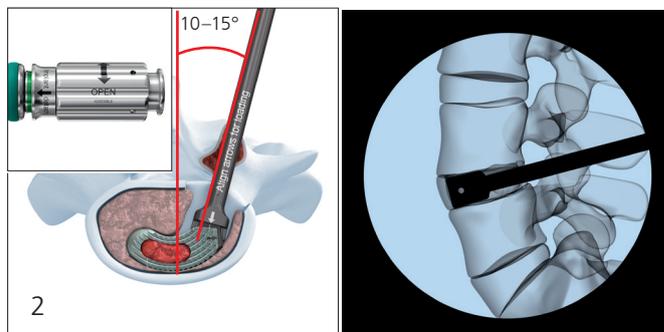
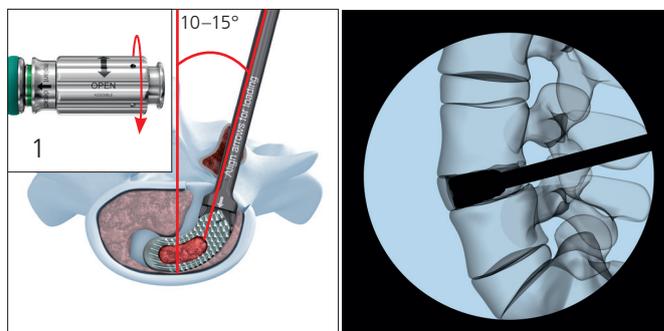
Controlled and light hammering on the applicator may be required to pivot the implant into final position (2).

- Use fluoroscopy during the pivoting procedure and confirm fit and position of the implant. Each implant has a medial/lateral and an anterior/posterior opening for position control.

### Notes:

- If bone graft or bone graft substitutes are placed into the disc space after trialing, the implant may not reach the same position as the trial.

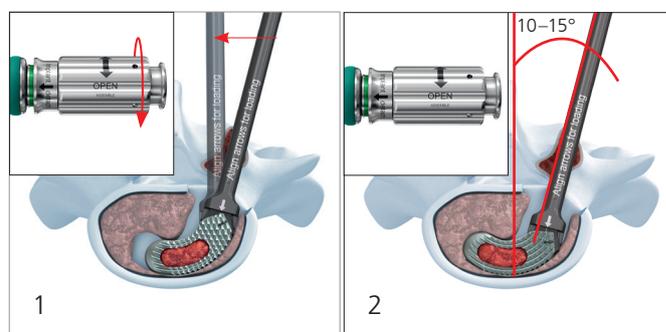
**Warning:** Maintain 10–15° between the applicator handle and the sagittal plane during implant insertion.



**Optional: Position implant**

If implant does not pivot automatically, turn the applicator handle medially to initiate pivoting upon impaction (1). After pivoting is initiated the applicator handle must be turned back to an angle of 10–15° from the sagittal plane to pivot the implant into final position (2).

**Warning:** Maintain 10–15° between the applicator handle and the sagittal plane for final implant insertion.



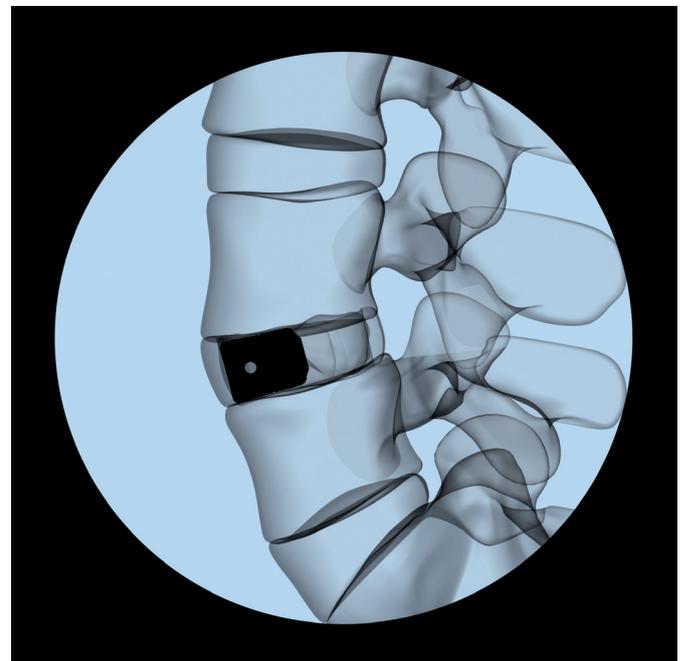
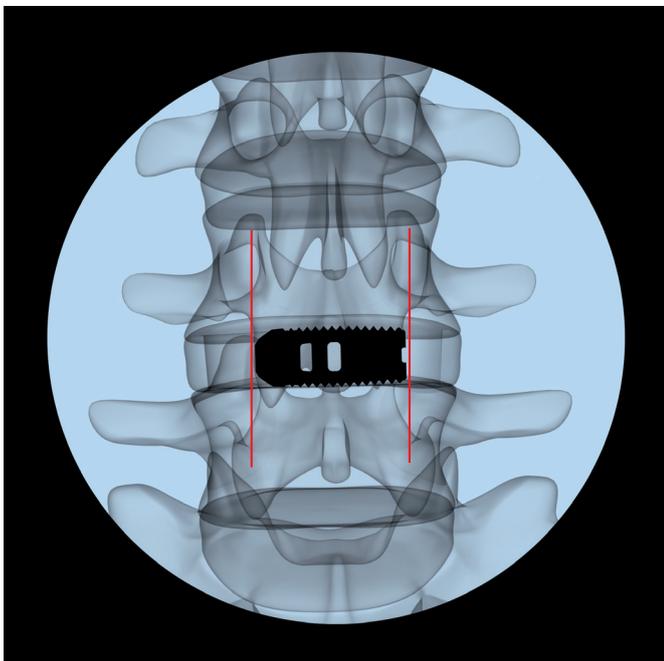
### 3. Detach implant

To detach the implant, pull the security ring down and simultaneously turn the applicator knob counterclockwise until it stops. The applicator can now be removed from the implant.

- Use fluoroscopy to verify final position of the implant. With a medial/lateral fluoroscopic image, lateral opening of the titanium T-PAL implant should be visible.

**Notes:**

- If the security ring cannot be pulled down, turn the knob clockwise a quarter turn. The ring can now be pulled down.
- If the applicator does not disengage from the implant move the applicator handle laterally to free the instrument.



# Posterior Support

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## 1. Pack disc space

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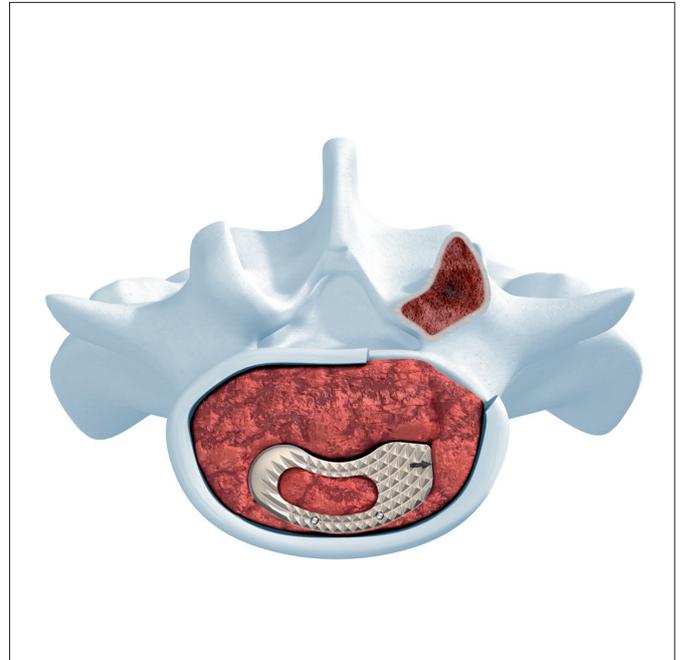
Instrument

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03.605.532     Impactor, curved, standard, bayoneted,  
                         black

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After the T-PAL cage is implanted, fill the posterior disc space and the lateral disc space with bone graft or bone graft substitute to create desired conditions for fusion.



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## 2. Supplemental fixation

The T-PAL cage is intended to be used in combination with posterior fixation.

# Implant Removal

## Implant removal with the applicator

### Instruments

03.812.001 Applicator Outer Shaft

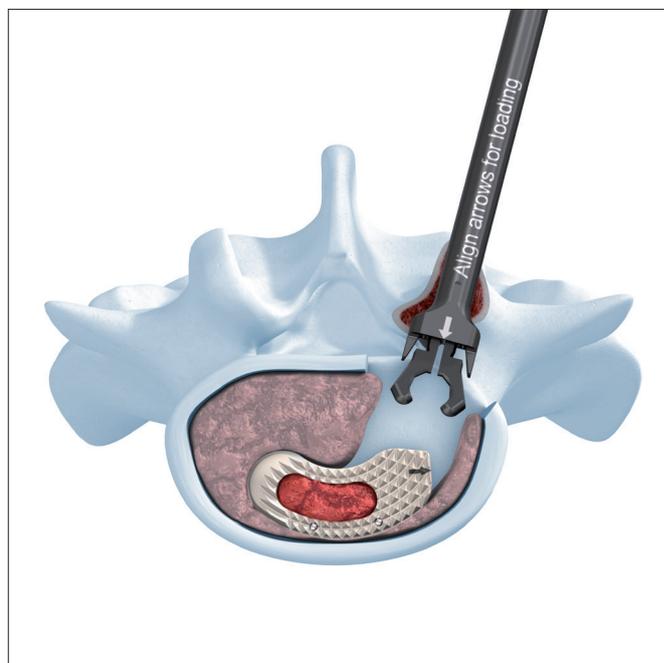
03.812.003 Applicator Inner Shaft

03.812.004 Applicator Knob

Ensure that the applicator is in the fully open position. Locate the implant and close the applicator by turning the knob clockwise until the security ring is moving upwards. There should be no gap between the applicator knob and the security ring. To ensure that the knob is in contact with the security ring, turn the knob counterclockwise until it stops, in this position the implant can pivot but not detach from the applicator. The implant can now be removed. The slap hammer may be required to facilitate removal.

**Note:** Distraction of the segment may facilitate implant removal. However, if possible, do not distract before ensuring a firm connection between the implant and the applicator.

**Warning:** The applicator must be in the pivoting position to remove the implant.



## Implant removal with the removal tool

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### Instrument

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03.812.005      Removal Tool for T-PAL

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### Optional instrument

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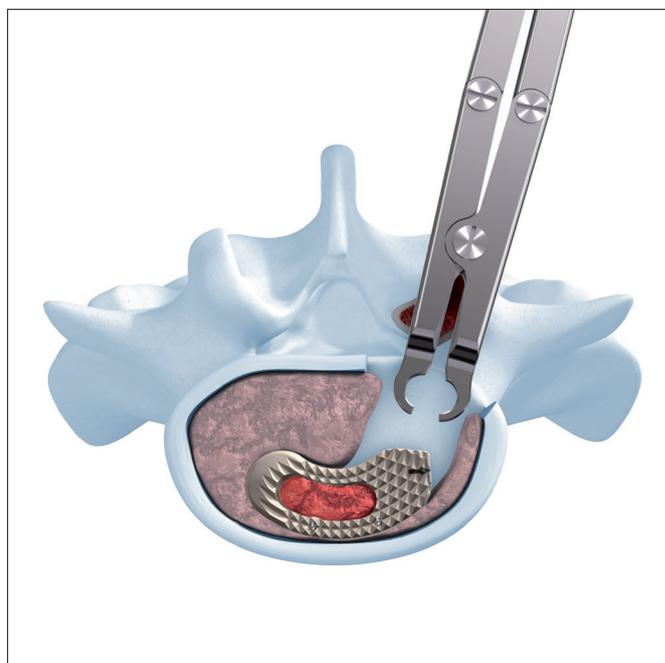
03.809.972      Oracle Slide Hammer

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Ensure that the removal tool for T-PAL is in the fully open position. Locate the implant and squeeze the handle firmly. Advance the speed nut to lock the handle. The implant can now be removed. The slide hammer may be required to facilitate removal.

### Notes:

- **When the removal tool handle is squeezed, the implant can pivot but not detach from the removal tool.**
- **Distraction of the segment may facilitate implant removal. However, if possible, do not distract before ensuring a firm connection between the implant and the removal tool.**

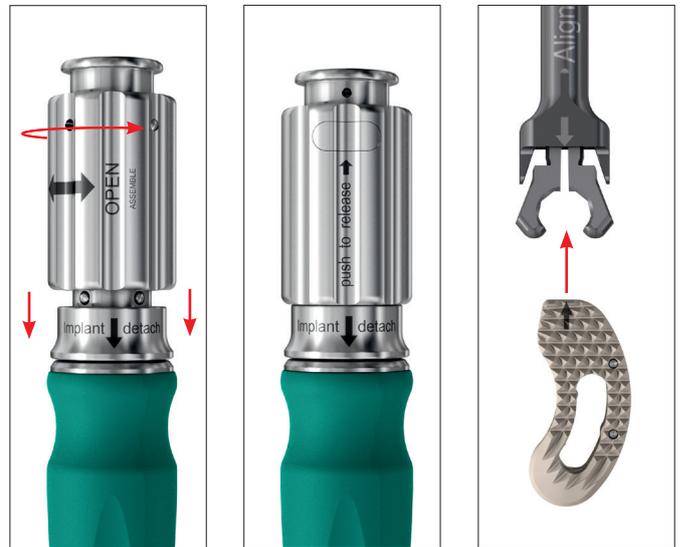


# Applicator Instructions

## Attach position

Pull the security ring down and simultaneously turn the knob counterclockwise. No gap between the handle, security ring and the applicator knob should be present. The green color band should not be visible.

The implant or trial can be attached.



## Insertion position

Turn the applicator knob clockwise to close the jaws. During this closing procedure the security ring moves upwards, so that the green color band is visible. Continue to turn the knob until it is tightened.

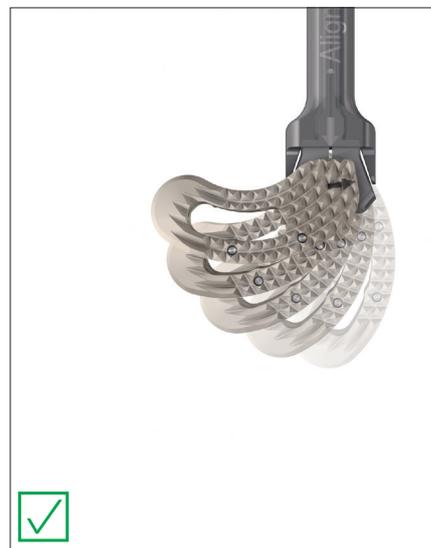
In the insertion position; the implant or trial is fixed. The implant or trial cannot pivot or detach.



**Pivoting position**

Turn the applicator knob counterclockwise until it stops. The applicator knob and the security ring will now be in contact.

In this position the implant or trial can pivot 80°. Implant or trial cannot detach from applicator.

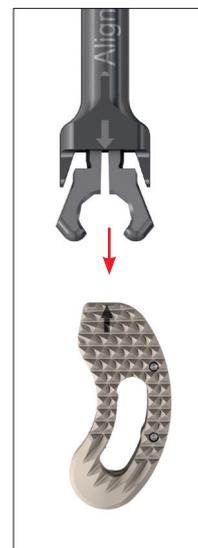


**Detach position**

Pull the security ring down and simultaneously turn the knob counterclockwise. No gap between the handle, security ring and the Applicator knob should be present. The green color band should not be visible.

The implant or trial can be detached.

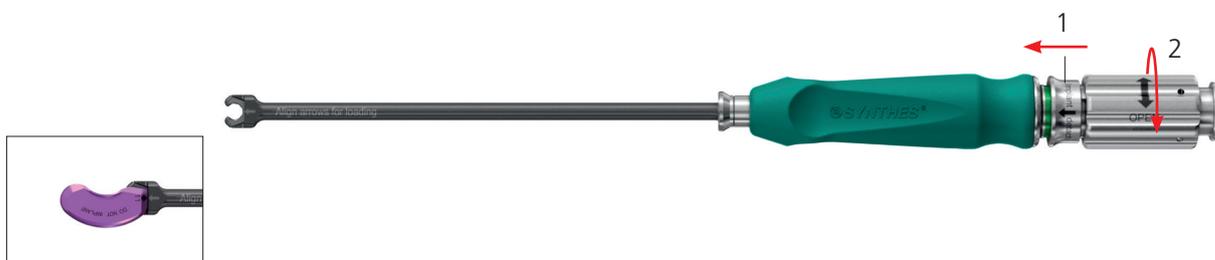
**Note:** If the security ring cannot be pulled down, turn the knob clockwise a quarter turn. The ring can now be pulled down.



Applicator Outer Shaft  
 Inner Shaft  
 Knob  
 T-PAL Small Trial Implant, size 7–17 mm, non detachable  
 T-PAL Large Trial Implant, size 7–17 mm, non detachable

**03.812.001**  
**03.812.003**  
**03.812.004**  
**03.812.307–317**  
**03.812.507–517**

1



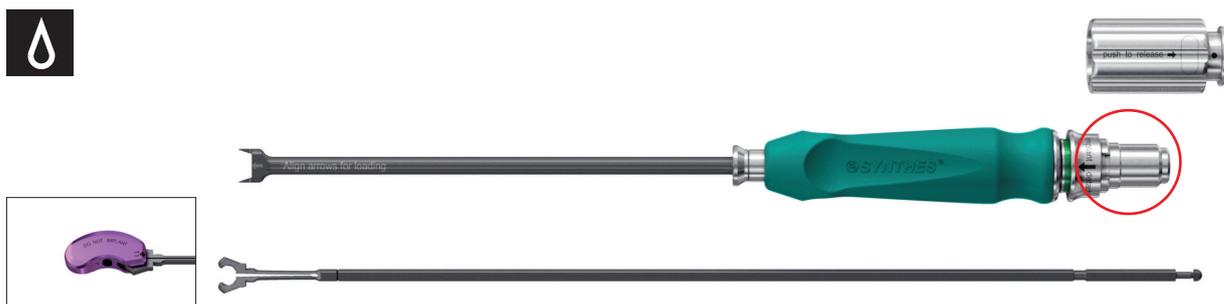
2



3

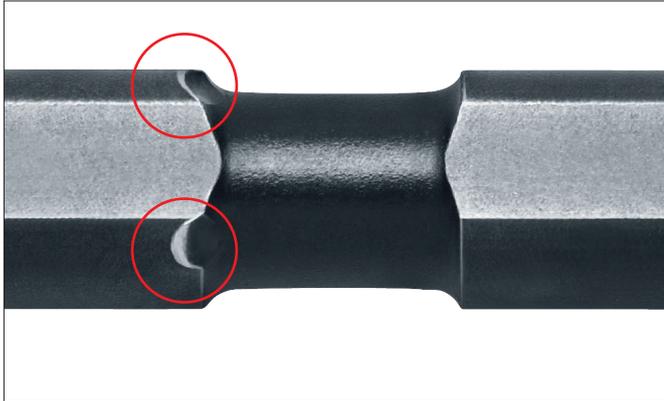


4



# Function Control

## 03.812.003      Applicator Inner Shaft



### Possible damage

- Overlaying deformation at the edge of the groove

### Prevention

- none

### Recommendation

- Exchange instrument

# Indications and Contraindications

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Please refer to the corresponding Instructions for Use for specific information on Intended use, Indications, Contraindications, Warnings and Precautions, Potential Adverse Events, Undesirable Side Effects and Residual Risks. Instructions for Use are available at [www.depuysynthes.com/ifu](http://www.depuysynthes.com/ifu)

**ProTi 360° please refer to the corresponding Instructions for Use for specific information on its use, indications, contraindications, precautions, warnings and side effects.**

# Bibliography

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Aebi M, JS Thalgott, JK Webb. (1998). AO ASIF Principles in Spine Surgery. Berlin: Springer-Verlag.

Aebi M, Arlet V, Webb JK (2007). AOSPINE Manual (2 vols), Stuttgart, New York: Thieme.



For recognized manufacturer refer to product label

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**PEEK and Ti**

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[www.jnjmedicaldevices.com](http://www.jnjmedicaldevices.com)

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