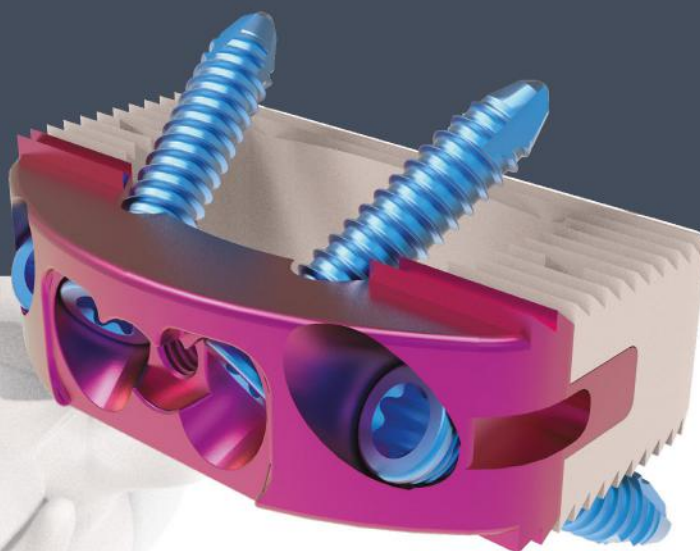


# SURGICAL TECHNIQUE



ESA

Anterior Lumbar  
ALIF Peek Cage





Anterior Lumbar  
ALIF Peek Cage

## TABLE OF CONTENTS

<b>INTRODUCTION</b>	<b>2-3</b>
<b>SURGICAL TECHNIQUE</b>	<b>4-20</b>
<b>IMPLANT TYPES</b>	<b>21-23</b>
<b>INSTRUMENT CONTAINER</b>	<b>24-25</b>
<b>INSTRUMENT TYPES</b>	<b>26-30</b>
<b>CONTACT</b>	<b>31</b>



Anterior Lumbar  
ALIF Peek Cage

# INTRODUCTION

## **ESA Features**

- The ideal combination of optimized stability, improved imaging properties, and operational simplicity, the ESA is a unique interbody device offering an intuitive approach to ALIF procedures.
- Enhanced stability is provided by combining the benefits of the divergent bone screw design
- Locking Screw Design: It has been shown that implants with divergent screw designs offer more stability than implants with convergent screw designs in lateral bending, extension, and axial rotation
- Unique Implant Design: Medial screw hole orientation provides ease of use to the surgeon as surgical instruments cross the midline of the incision and do not encounter soft tissue
- Accessible Insertion Angle: 35° screw insertion angle allows for ease in screw insertion
- Comprehensive Array of Flexible Instrumentation: Intuitively designed to accommodate steep angles and further assist with ease in screw insertion
- Simple Bone Screw Insertion: Bone screws are self-centering, self-drilling, and self-tapping for fast insertion.





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# INTRODUCTION



## Indications

Lumbar and lumbosacral pathologies which may require anterior segmental arthrodesis, including

- Localised symptomatic degenerative disc disease
- Revision surgery for failed decompression syndrome
- Pseudoarthrosis

## Contraindications

- Spinal fractures
- Spinal tumour
- Osteoporosis
- Infection



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# SURGICAL TECHNIQUE

1

## Patient positioning



For an anterior approach to the lower lumbar levels position the patient in a slight Trendelenburg position. (Figure 1a)

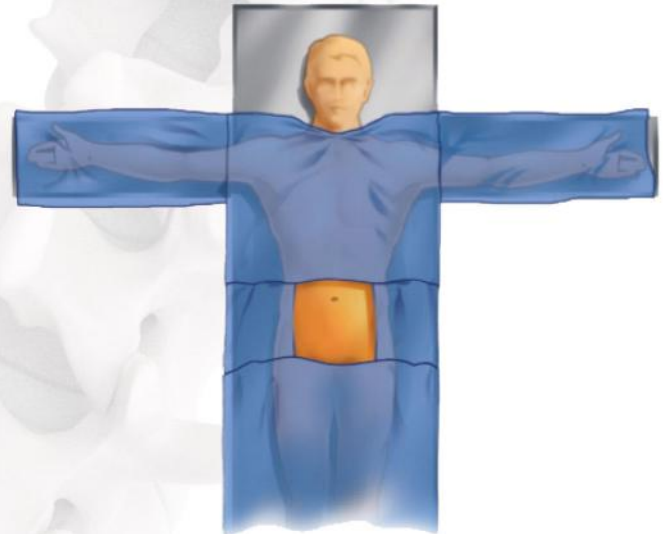


Figure 1a

2

## Exposure



The surgical approach depends on the level to be treated. Locate the correct operative level and incision site by taking a lateral fluoroscopic view while holding a straight metal instrument on the side of the patient. It is recommended to expose the operative level through a standard retroperitoneal approach. However other approaches may be indicated based on the patient's anatomy and pathology. (Figure 2a)

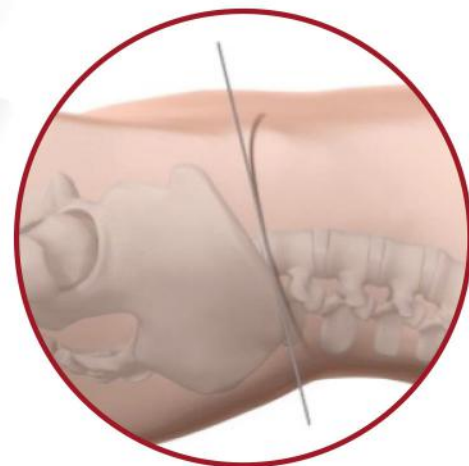


Figure 2a



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## SURGICAL TECHNIQUE

3

Prepare Disc Space



Remove disc material through an incision in the annulus fibrosus. Excise the disc material and remove the cartilaginous endplates to expose the underlying bony vertebral endplates. Adequate preparation of the endplates without compromising the structural integrity is important to enable the access of an appropriate vascular supply to the bone graft to enable fusion. Once the endplates have been prepared, complete additional surgical procedures. (Figure 3a)

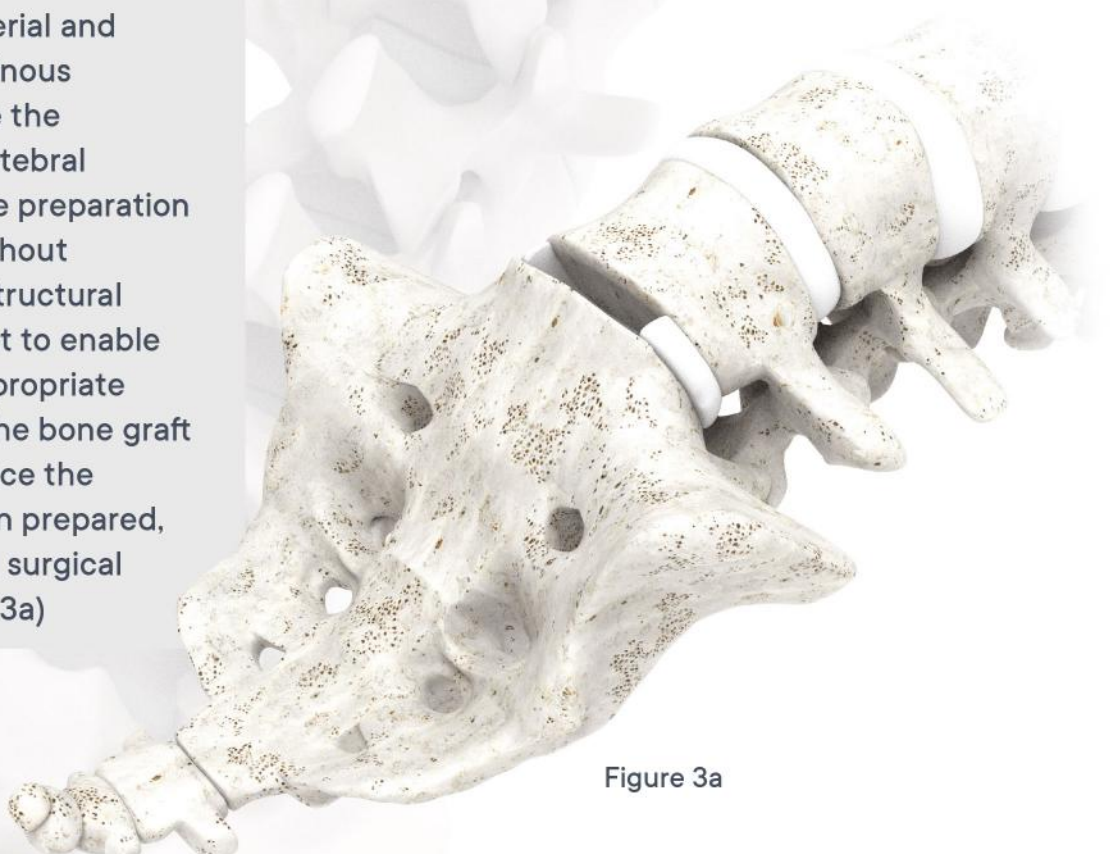


Figure 3a



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## SURGICAL TECHNIQUE

4

Connect Trial Implant to Trial Implant Holder

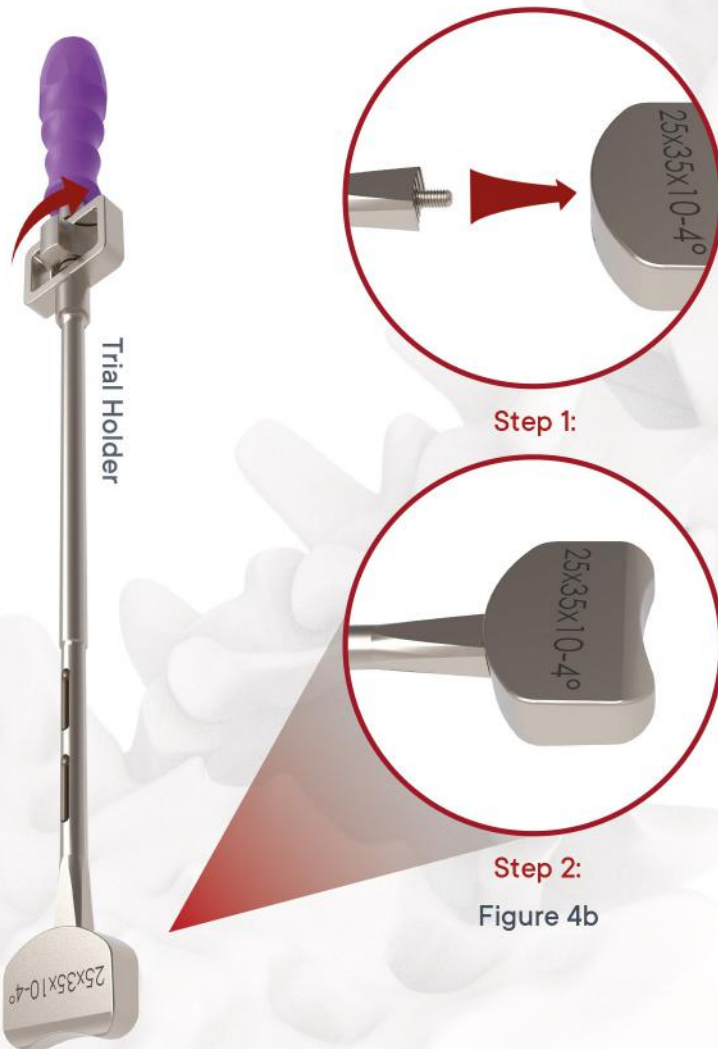


Figure 4a



Select the trial implant corresponding to the footprint size determined by the footprint trialing. Select the height and angle corresponding to that considered appropriate based on preoperative planning, the anatomical features evident after disc clearance and endplate preparation, and the requirements in order to restore normal spinal alignment and disc height. Mount the chosen trial implant on the **Trial Holder (ALF008)**. Secure it by turning the knob on the back of the **Trial Holder (ALF008)**. (Figure 4a, 4b)



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## SURGICAL TECHNIQUE

5

Insert Trial Implant



Controlled light hammering on the **Trial Holder (ALF008)** may be required to position the trial implant between the vertebral bodies to the desired depth. (Figure 5a)



**NOTE:**

If the trial spacer is too large, preventing insertion with an appropriate amount of force, repeat using an incrementally smaller trial spacer or different angle.

Trial Holder

Figure 5a





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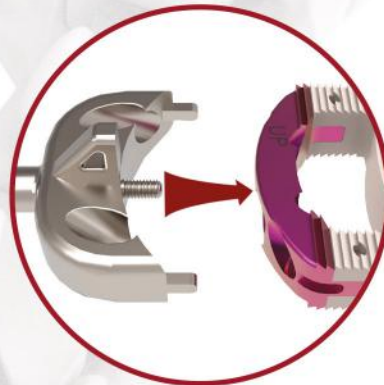
# SURGICAL TECHNIQUE

6

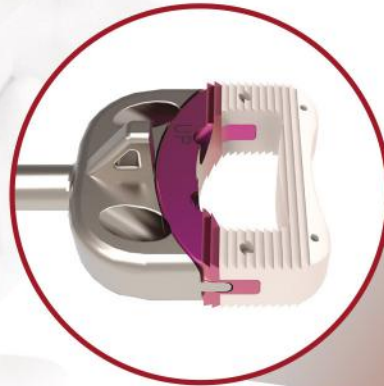
## Implant Preparation



Dock the keyed connection interface of the assembled **Inserter (25x35 ALF002, 29x40 ALF004)** into the corresponding docking feature on the implant. After the **Inserter (25x35 ALF002, 29x40 ALF004)** has been positioned, secure it by turning the coupling clockwise to tighten the coupling screw. **I-Handle (ALF009)** (Figure 6a, 6b)



Step 1:



Step 2:  
Figure 6a



Figure 6b



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# SURGICAL TECHNIQUE

6

## Implant Preparation



Fill the implant in the **Packing Block (ALF011)** with the graft material until it protrudes from its cavities in order to ensure optimal contact with the vertebral endplates. Use the **Tamp (ALF005)** to firmly pack autograft material into the implant. Do not use excessive force to compress or impact the graft into the implant as this may interfere with vascular integration and bony healing. (Figure 6c, 6d)



Figure 6c

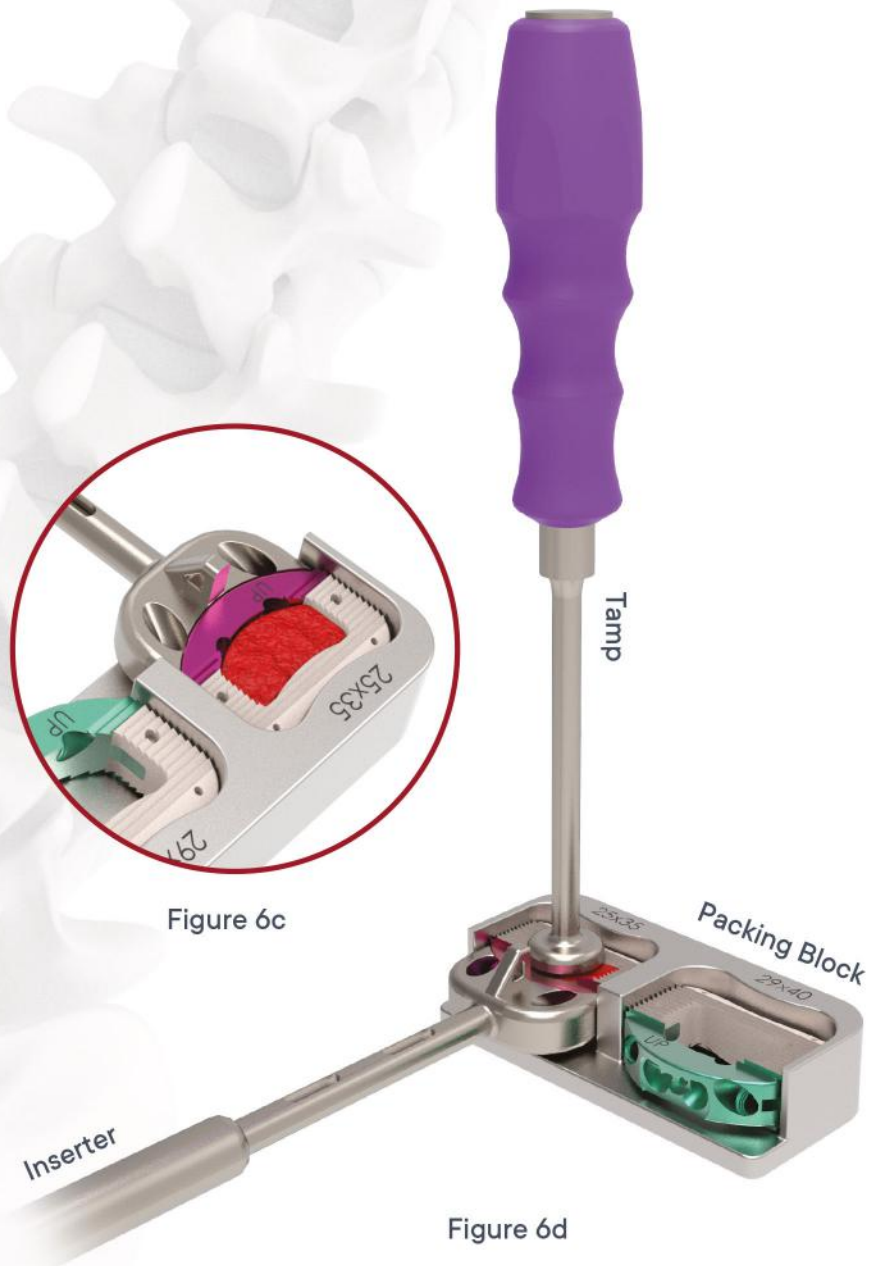


Figure 6d



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# SURGICAL TECHNIQUE

7

Implant Insertion



Figure 7a



Controlled and light hammering on the **Insertor (25x35 ALF002, 29x40 ALF004)** may be required to advance the implant into the intervertebral disc space. Use fluoroscopic imaging during implant insertion to assess implant positioning. (Figure 7a)



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# SURGICAL TECHNIQUE

7

Implant Insertion



Figure 7b



In case the implant needs to be repositioned use the **Impactor** (25X35 ALF001, 29x40 ALF018) to manually manipulate the implant position. If necessary, a **Hammer** (ALF022) can be used to fixation I-Handle (ALF009) (Figure 7b, 7c)



Figure 7c




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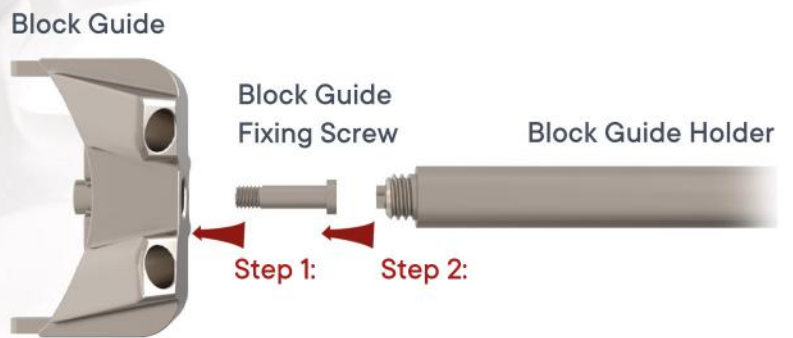
# SURGICAL TECHNIQUE

8

## Assemble Block Guide



Attach a **Block Guide Fixing Screw (ALF016)** to the **Block Guide (25x35 ALF008, 29x40 ALF019)**. Next, attach a **Block Guide (25x35 ALF008, 29x40 ALF019)** to the **Block Guide Holder (ALF007)**. Secure **Block Guide (25x35 ALF008, 29x40 ALF019)** by turning the knob on the back of the **Block Guide Holder (ALF007)**. (Figure 8a, 8b and 8c)





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# SURGICAL TECHNIQUE

9


## Screw Preparation



Figure 9a



Figure 9b

 Attach a **T-Handle (ALF010)** to the **Flexible Driver (ALF003)**. Next, attach a **Modular Awl Bit Ø2.9 (ALF013)** to the **Flexible Driver (ALF003)**. Then thread the thread lock sleeve all the way down on the screwdriver tip. (Figure 9a, 9b)

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## SURGICAL TECHNIQUE

9

Screw Preparation - Awl

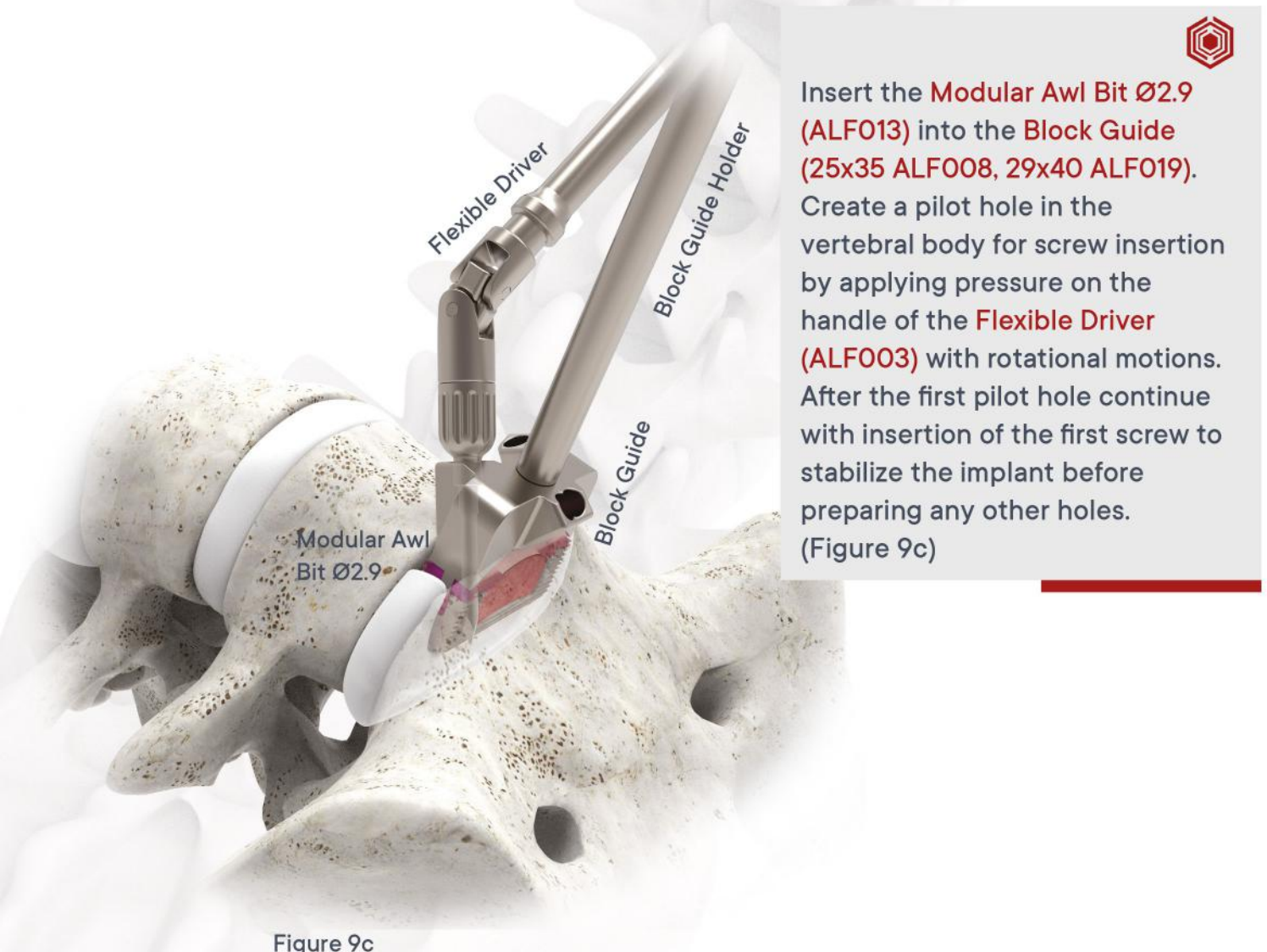


Figure 9c



Anterior Lumbar  
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## SURGICAL TECHNIQUE

9

Screw Preparation - Drilling (Optional)



Attach a **T-Handle (ALF010)** to the **Flexible Driver (ALF003)**. Next, attach a **Modular Drill Bit Ø3.2 (ALF014)** to the **Flexible Driver (ALF003)**. Then thread the thread lock sleeve all the way down on the screwdriver tip. (Figure 9d, 9e)



Figure 9d



Figure 9e





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# SURGICAL TECHNIQUE

10

## Screw Selection

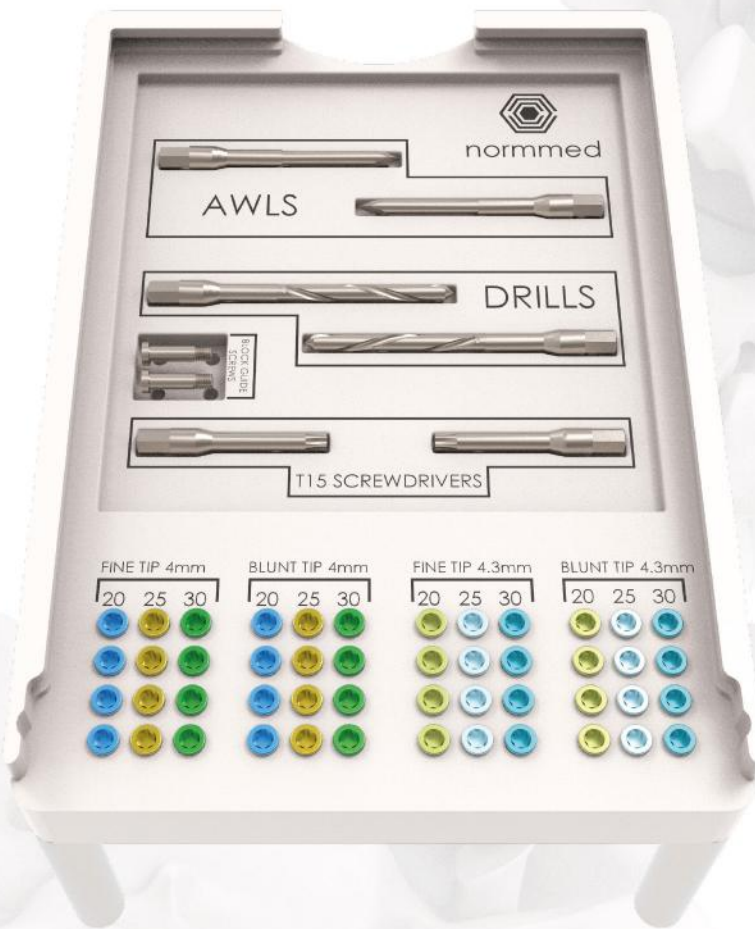
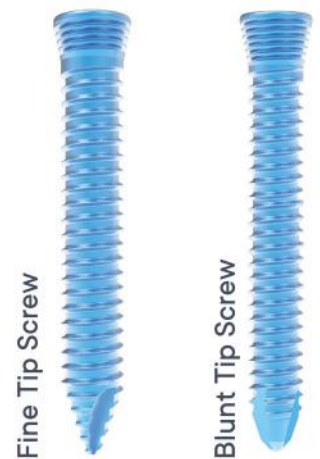


Figure 10a



Select an appropriate screw type and length based on patient anatomy and clinical requirements. For a two-level procedure, proper consideration should be given to the screw length on the common vertebral body to prevent screw interference. (Figure 10a)





Anterior Lumbar  
ALIF Peek Cage

# SURGICAL TECHNIQUE


11

Screw Insertion



Figure 11a

Figure 11b

 Attach a **T-Handle (ALF010)** to the **Flexible Driver (ALF003)**. Next, attach a **Modular T15 Driver Bit (ALF015)** to the **Flexible Driver (ALF003)**. Then thread the thread lock sleeve all the way down on the screwdriver tip. **Guiding Forceps (ALF023)** (Figure 11a, 11b and 11c)

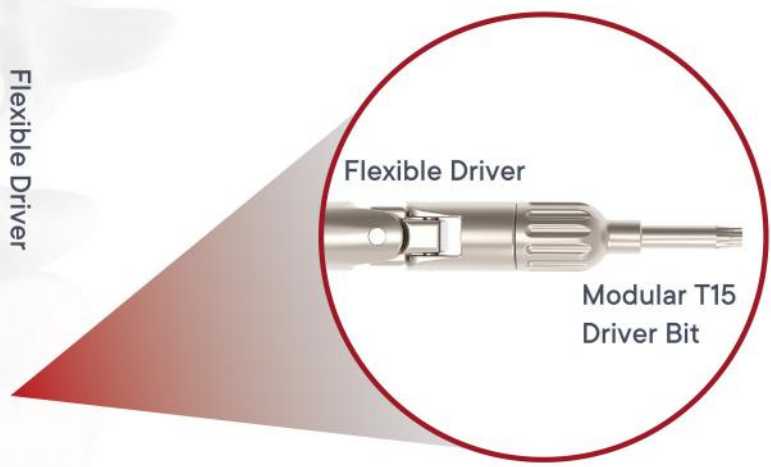


Figure 11c



Anterior Lumbar  
ALIF Peek Cage

# SURGICAL TECHNIQUE

11

Screw Insertion

Flexible Driver

Block Guide Holder

Block Guide

Modular T15  
Driver Bit



According to the preoperative planning and intraoperative findings select the appropriate screw length (20 mm screws are recommended for use in most cases). Insert the screws with the **Flexible Driver (ALF003)** and **Modular T15 Driver Bit (ALF015)**. (Figure 11c)

Figure 11c



Anterior Lumbar  
ALIF Peek Cage

## SURGICAL TECHNIQUE

12

Verify Implant Positioning



The optimal position for the implant is centered within the periphery of the vertebral body and achieving appropriate fit and fill of the disc space. Verify the location of the implant relative to the vertebral bodies in the AP and lateral directions under fluoroscopy. (Figure 12a)



Figure 12a



Anterior Lumbar  
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## SURGICAL TECHNIQUE

13

Remove Implant



Figure 13a

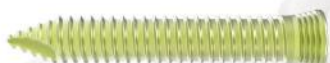
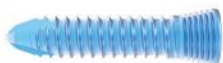
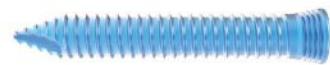


Completely separate the end-plate fusion areas prior to implant removal. An osteotome may be required to mobilize the implant if bony healing and integration has commenced. Carefully remove the implant from disc space by pulling on the trial implant holder. Controlled, light hammering with a **Slap Hammer (ALF020)** may be required to remove the implant from the disc space. **I-Handle (ALF009)**, **Inserter (25x35 ALF002, 29x40 ALF004)** (Figure 13a)



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ALIF Peek Cage

# IMPLANT TYPES



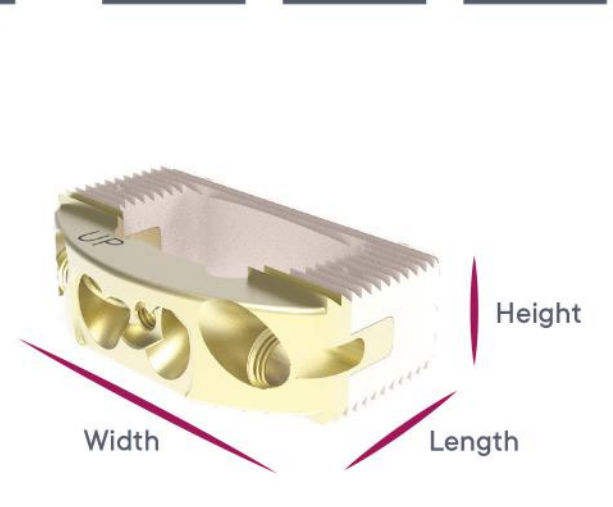
Catalogue No.	Description	Piece
NALCSF4020	Norm Alif Cage Fine Tip Screw Ø4.00x20mm	4
NALCSF4025	Norm Alif Cage Fine Tip Screw Ø4.00x25mm	4
NALCSF4030	Norm Alif Cage Fine Tip Screw Ø4.00x30mm	4
NALCS4020	Norm Alif Cage Screw Ø4.00x20mm	4
NALCS4025	Norm Alif Cage Screw Ø4.00x25mm	4
NALCS4030	Norm Alif Cage Screw Ø4.00x30mm	4
NALCSF4320	Norm Alif Cage Fine Tip Screw Ø4.30x20mm	4
NALCSF4325	Norm Alif Cage Fine Tip Screw Ø4.30x25mm	4
NALCSF4330	Norm Alif Cage Fine Tip Screw Ø4.30x30mm	4
NALCS4320	Norm Alif Cage Screw Ø4.30x20mm	4
NALCS4325	Norm Alif Cage Screw Ø4.30x25mm	4
NALCS4330	Norm Alif Cage Screw Ø4.30x30mm	4



Anterior Lumbar  
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# IMPLANT TYPES

Catalogue No.	Length	Height	Width	Lordotic Angle	Piece
NALC25351004	25	10	35	4°	1
NALC25351204		12		4°	1
NMLC25351404		14		4°	1
NALC25351604		16		4°	1
NALC25351804		18		4°	1
NALC25352004		20		4°	1
NALC25351009		10		9°	1
NALC25351209		12		9°	1
NALC25351409		14		9°	1
NALC25351609		16		9°	1
NALC25351809		18		9°	1
NALC25352009		20		9°	1
NALC25351014		10		14°	1
NALC25351214		12		14°	1
NALC25351414		14		14°	1
NALC25351614		16		14°	1
NALC25351814	18	14°	1		
NALC25352014	20	14°	1		





Anterior Lumbar  
ALIF Peek Cage

# IMPLANT TYPES

Catalogue No.	Length	Height	Width	Lordotic Angle	Piece
NALC29401004	29	10	40	4°	1
NALC29401204		12		4°	1
NALC29401404		14		4°	1
NALC29401604		16		4°	1
NALC29401804		18		4°	1
NALC29402004		20		4°	1
NALC29401009		10		9°	1
NALC29401209		12		9°	1
NALC29401409		14		9°	1
NALC29401609		16		9°	1
NALC29401809		18		9°	1
NALC29402009		20		9°	1
NALC29401014		10		14°	1
NALC29401214		12		14°	1
NALC29401414		14		14°	1
NALC29401614		16		14°	1
NALC29401814	18	14°	1		
NALC29402014	20	14°	1		



Thickness 10mm



Thickness 12mm



Thickness 14mm



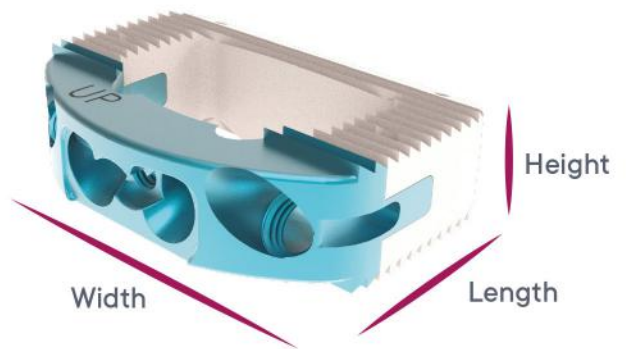
Thickness 16mm



Thickness 18mm



Thickness 20mm





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# INSTRUMENT CONTAINER



*This container is made of wiremesh stainless steel. It has a high stability, low weight and good sterilization feature.*

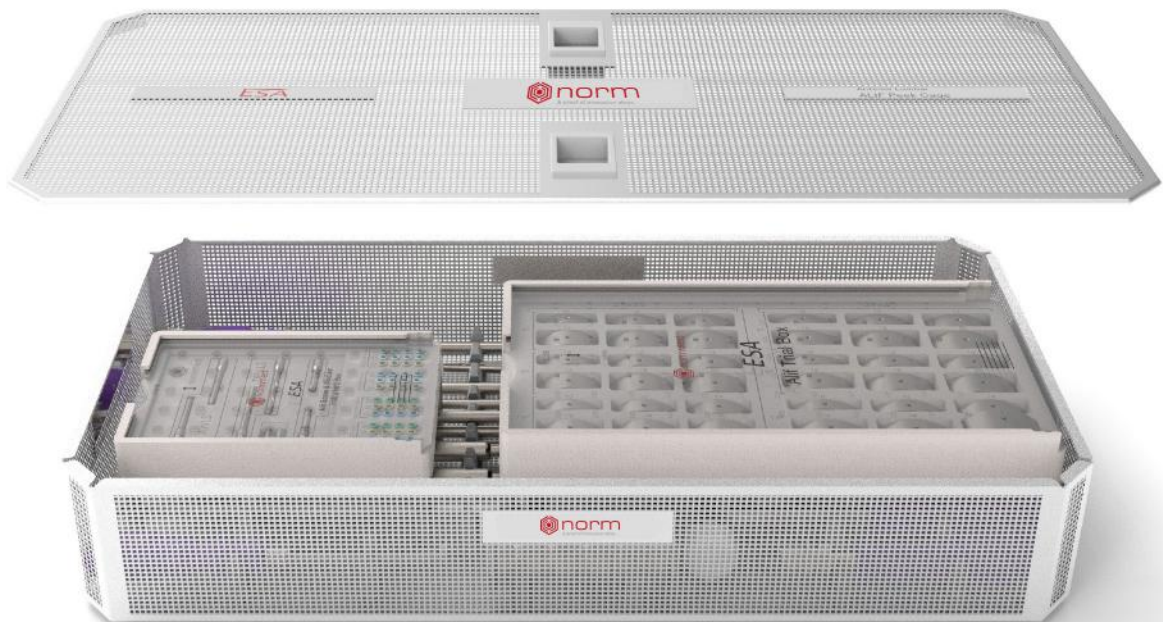


**Container**

**ESA**

Anterior Lumbar  
ALIF Peek Cage

# INSTRUMENT CONTAINER

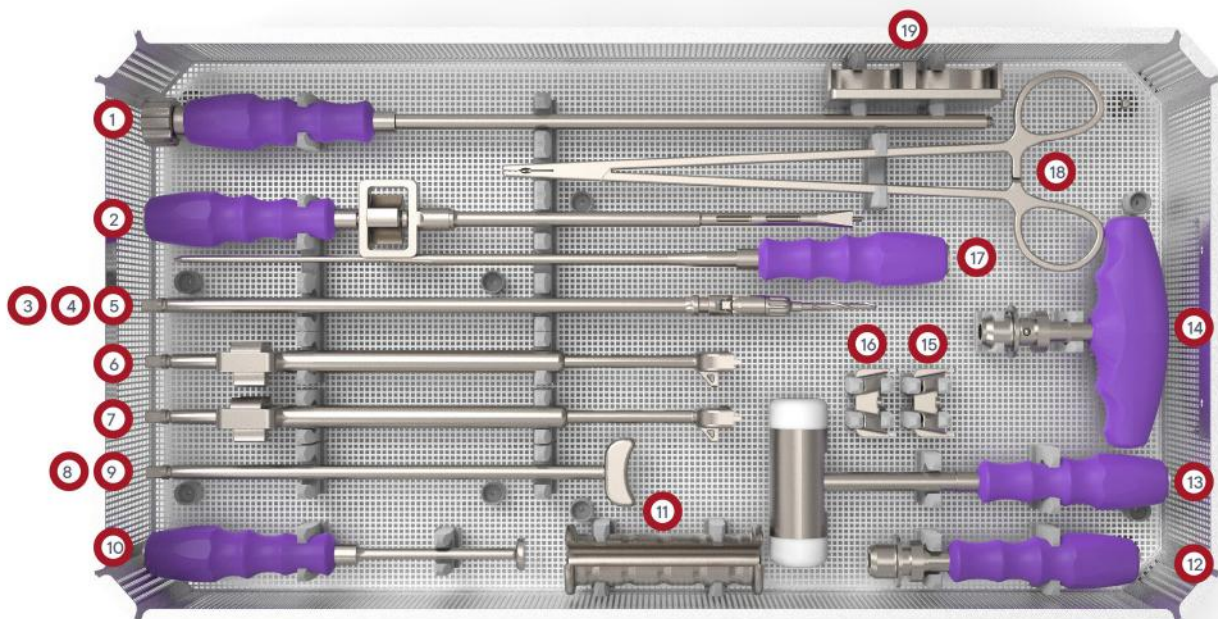


**Container**



Anterior Lumbar  
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# INSTRUMENT TYPES










Set No.	Catalogue No.	Description	Piece
01	ALF007	Block Guide Holder	1
02	ALF006	Trial Holder	1
03	ALF003	Flexible Driver with Modular Drill Bit Ø3.2	1



Anterior Lumbar  
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## INSTRUMENT TYPES

	Set No.	Catalogue No.	Description	Piece
	04	ALF003	Flexible Driver with Modular Awl Bit Ø2.9	1
	05	ALF003	Flexible Driver with Modular T15 Driver Bit	1
	06	ALF002	Inserter 25x35	1
	07	ALF004	Inserter 29x40	1
	08	ALF001	Impactor 25x35	1
	09	ALF018	Impactor 29x40	1
	10	ALF005	Tamp	1
	11	ALF020	Slap Hammer	1
	12	ALF009	I-Handle	1



Anterior Lumbar  
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## INSTRUMENT TYPES



Set No.	Catalogue No.	Description	Piece
13	ALF022	Hammer	1



14	ALF010	T-Handle	1
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15	ALF008	Block Guide 25x35	1
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16	ALF019	Block Guide 29x40	1
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17	ALF021	Straight Screwdriver	1
----	--------	----------------------	---



18	ALF023	Guiding Forceps	1
----	--------	-----------------	---

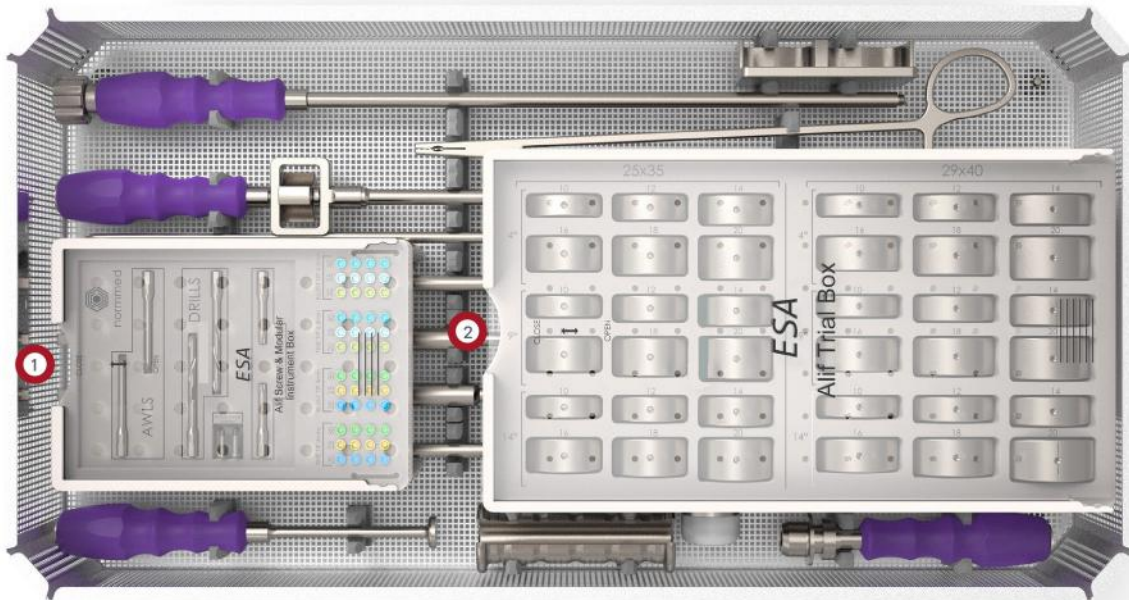


19	ALF011	Packing Block	1
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Anterior Lumbar  
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# INSTRUMENT TYPES



Set No.	Catalogue No.	Description	Piece
01	ALF012	Screw and Modular Instrument Box	1



Anterior Lumbar  
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# INSTRUMENT TYPES

Set No. Catalogue No. Description Piece



02

ALF017

Trial Box

1

**ESA**

Anterior Lumbar  
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## CONTACT



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Revision Date: 21.07.2020, Revision No: 02

**ESA** Surgical Technique Norm

31