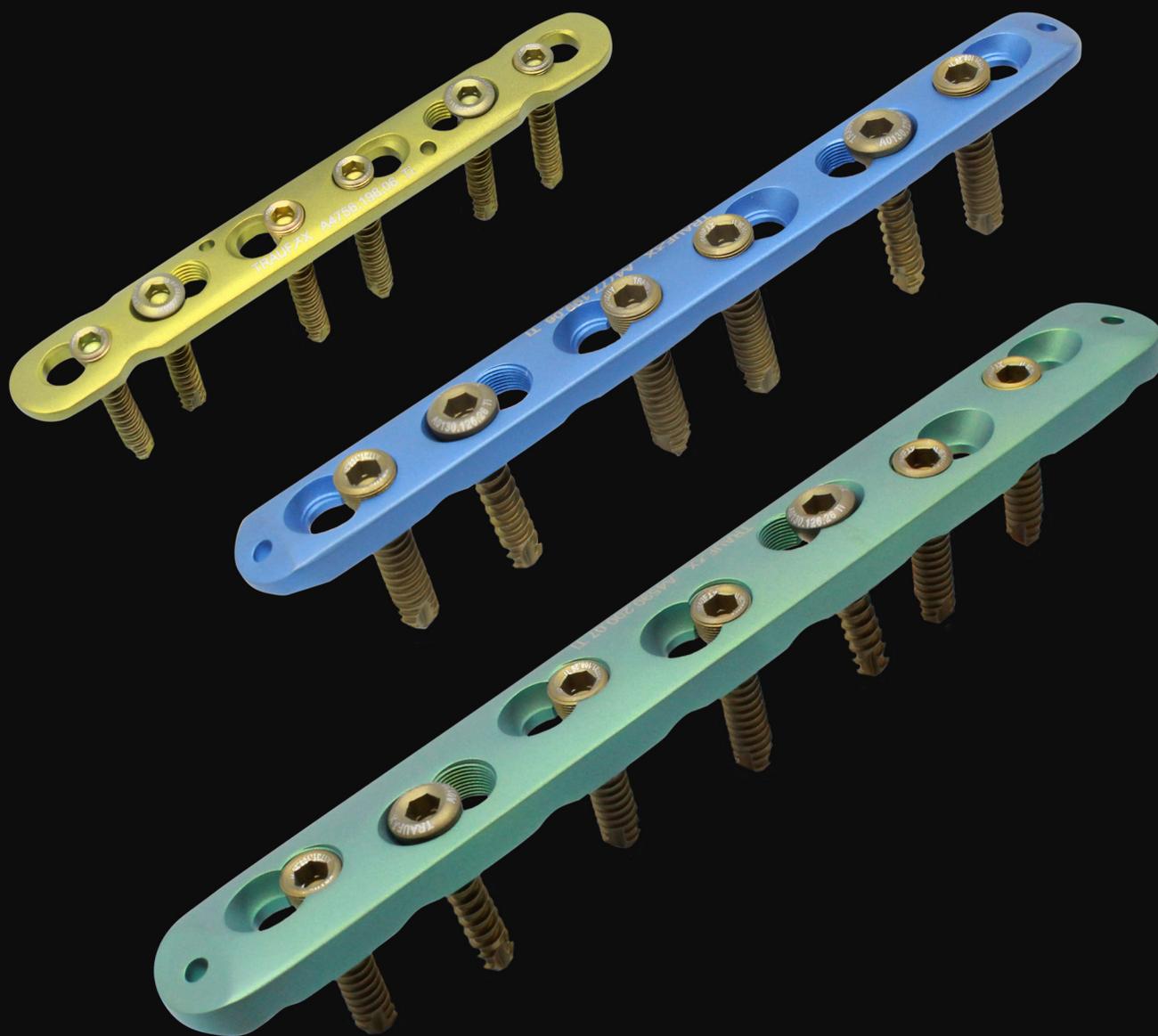


## SURGICAL TECHNIQUE

3.5 mm ALP Titanium locking plate

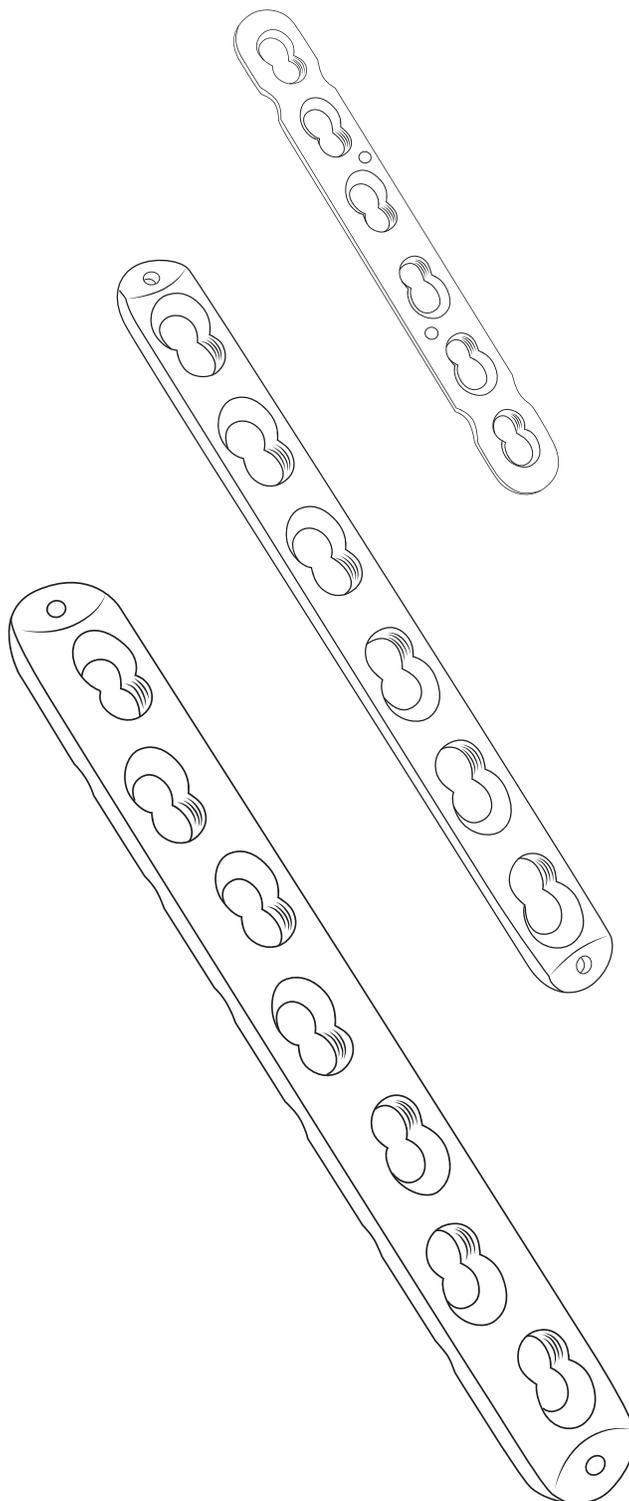
4.5mm ALP Titanium narrow locking plate

4.5 mm ALP Titanium broad locking plate



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## INTRODUCTION

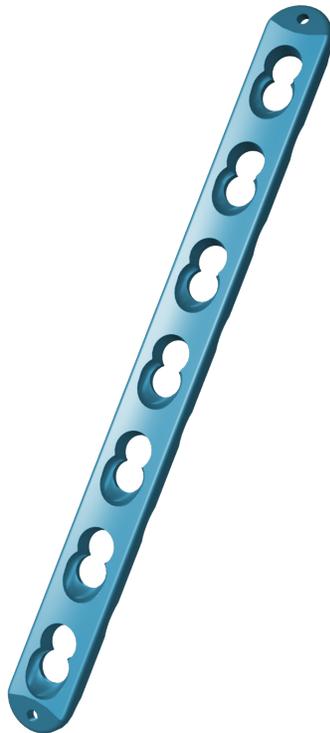
This technique is proposed to describe the use of the instruments and implants, without the desire to interfere with the experience and decisions of the traumatologist since the vast clinical and surgical experience supports it to determine which is the best proposal for each patient in particular.

## CHARACTERISTICS OF THE IMPLANT

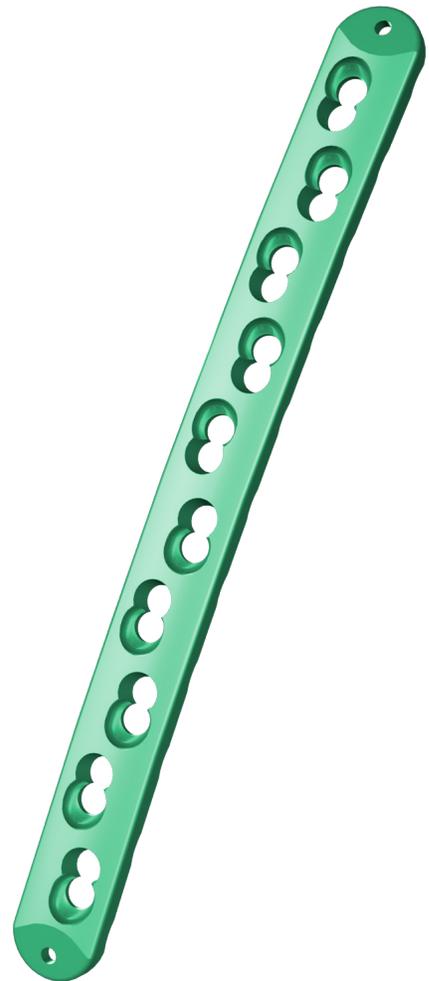
- It offers a conservation of bloody supply in bone tissue thanks to low-profile notches.
- They are manufactured in titanium Ti6AL4V ELI (ASTM F136).
- They are supplied non-sterile.



3.5mm ALP Locking Plate



4.5mm ALP Narrow Locking Plate



4.5mm ALP Broad Locking Plate

## Combined Holes (LCP)

### ALP screw housing (A)

- Reduces the risk of screw loosening.
- An excessive torque is not applied to the cortical bone.
- The angulation of both the auger and the screw facilitate their insertion.

### DCP screw housing (B)

- They allow dynamic compression to be generated using standard screws.
- It allows an angulation of 7° to the screw.



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## Screws

- They are manufactured in titanium Ti6AL4V ELI (ASTM F136).
- They are supplied non-sterile.
- Self-tapping.
- Hexagonal input.
- Standard and locking.

---

## Surgical indications

Devices that are used in conjunction with other types of implants (screws) for the treatment of extra-articular fractures of the metaphysis that may extend to the diaphyseal area.

- 3.5 mm ALP locking plate: for radius and ulna.
- 4.5 mm ALP narrow locking plate: for tibia.
- 4.5 mm ALP broad locking plate: for femur.

## General contraindications

- Systemic inflammatory response syndrome (to be evaluated by the surgeon).
- Septicemia.
- Osteomyelitis.
- Patient unable to comply with postoperative care.
- Hypersensitivity to materials (stainless steel and titanium).

## SURGICAL DESCRIPTION

### Preoperative planning.

Complete the preoperative radiographic assessment and develop the preparatory plan, determining the length of the plate, the approximate length of the screws and the necessary instruments.

### Approach

Expose area to operate according to the preferences of the surgeon. An open or percutaneous approach may be used, depending on the fracture.

### Reduction of fracture

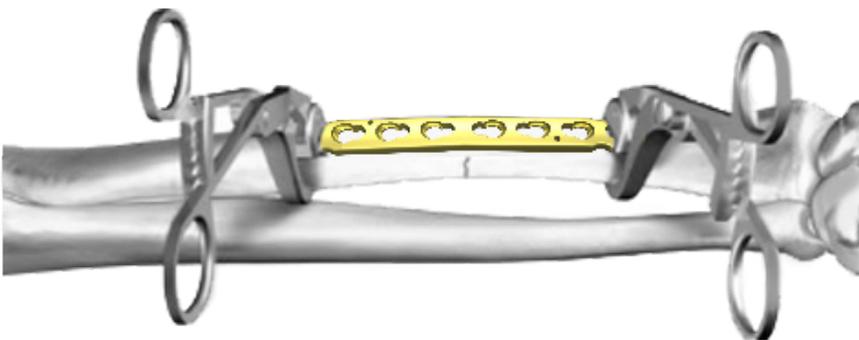
**Tip:** Before proceeding to the reduction, the application of an external fixative or a large distractor can facilitate the visualization and reduction of the articular surface.

Reduce the fracture fragments and check the reduction with the image intensifier. The reduction can be stabilized by the following methods:

- Independent Kirschner wires.
- Kirschner wires through the plate.
- Schanz screw (independent traction).
- Traction screws through the plate.
- Locking screws through the plate.

### Plate placement

Position and fix the plate on the bone. If using axial dynamic compression, make sure the middle of the plate is above the fracture line.



## Non-locking screw

Insert non-locking screws to ensure axial compression on both sides of the fracture.

Implant	Screw	Guide	Drill bit
3.5 mm ALP titanium locking plate	3.5 mm titanium cortex screw	2.5 mm Universal Drill Guide	2.5 mm Drill Bit, quick coupling
4.5 mm ALP titanium narrow locking plate	4.5mm titanium cortex screw	3.2 mm Universal Drill Guide	3.2 mm Drill Bit, quick coupling
4.5mm ALP titanium broad locking plate	4.5mm titanium cortex screw	3.2 mm Universal Drill Guide	3.2 mm Drill Bit, quick coupling

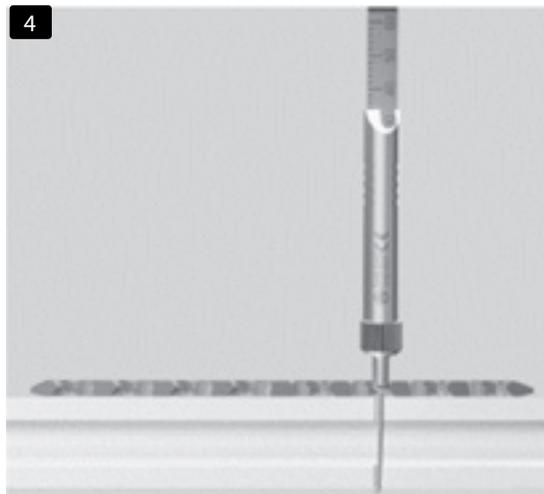
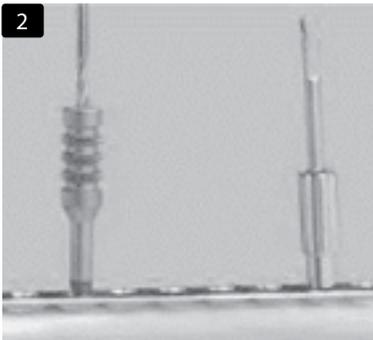
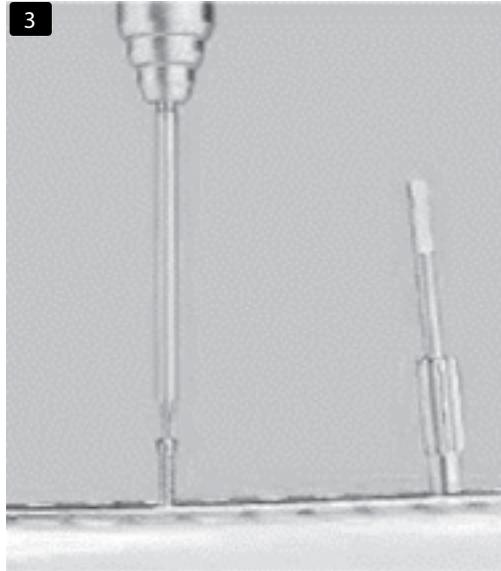
- 1) Drill both corticals using the corresponding guide.
- 2) Measure depth.
- 3) Tapping.
- 4) Insert cortex screw.
- 5) The second cortex should be introduced eccentrically.
- 6) Tighten alternately to achieve compression of the fracture.

## Locking screw

Insert the locking screws.

Implant	Screw	Guide	Drill Bit	Screwdriver	Torque handle
3.5 mm ALP titanium locking plate	3.5 mm ALP titanium cortex screw	2.7 mm sleeve	2.7 mm drill bit, quick coupling	2.5 mm hexagonal AO	1.5 Nm torque
	3.5 mm ALP titanium cancellous screw	2.7 mm sleeve	2.7 mm drill bit, quick coupling	2.5 mm hexagonal AO	1.5 Nm torque
4.5 mm ALP titanium narrow locking plate	5.0 mm ALP titanium cortex screw	3.2 mm sleeve	3.2 mm drill bit, quick coupling	3.5 mm hexagonal AO	4.0 Nm torque
	5.5 mm ALP titanium cancellous screw	4.0 mm sleeve	4.0 mm drill bit, quick coupling	3.5 mm hexagonal AO	4.0 Nm torque
4.5mm ALP titanium broad locking plate	5.0 mm ALP titanium cortex screw	3.2 mm sleeve	3.2 mm drill bit, quick coupling	3.5 mm hexagonal AO	4.0 Nm torque
	5.5 mm ALP titanium cancellous screw	4.0 mm sleeve	4.0 mm drill bit, quick coupling	3.5 mm hexagonal AO	4.0 Nm torque

- 1) Screw the drill guide to the plate.
- 2) Drill with drill bit.
- 3) Measure depth.
- 4) Insert and locked screw.



## IMPLANT REMOVAL

The decision to remove the implant corresponds to the treating physician. Removal of the implant is recommended after completion of the consolidation process, whenever feasible and appropriate for the patient. To remove the screws, first clear the screw head, eliminating any tissue that may have penetrated the hexagonal entry to ensure that the screwdriver enters correctly and to reduce the risk of damage to the screwdriver preventing removal. Unscrew all the screws and remove them and then remove the plate.

## IMPLANTS

### 3.5mm ALP Locking Plate

- 198.05 3.5mm ALP titanium locking plate 5 holes
- 198.06 3.5mm ALP titanium locking plate 6 holes
- 198.07 3.5mm ALP titanium locking plate 7 holes
- 198.08 3.5mm ALP titanium locking plate 8 holes
- 198.10 3.5mm ALP titanium locking plate 10 holes
- 198.12 3.5mm ALP titanium locking plate 12 holes

### 4.5mm ALP Narrow Locking Plate

- 199.06 4.5mm ALP titanium narrow locking plate 6 holes
- 199.07 4.5mm ALP titanium narrow locking plate 7 holes
- 199.08 4.5mm ALP titanium narrow locking plate 8 holes
- 199.09 4.5mm ALP titanium narrow locking plate 9 holes
- 199.10 4.5mm ALP titanium narrow locking plate 10 holes
- 199.12 4.5mm ALP titanium narrow locking plate 12 holes
- 199.14 4.5mm ALP titanium narrow locking plate 14 holes

### 4.5mm ALP Broad Locking Plate

- 200.05 4.5mm ALP titanium broad locking plate 5 holes
- 200.06 4.5mm ALP titanium broad locking plate 6 holes
- 200.07 4.5mm ALP titanium broad locking plate 7 holes
- 200.08 4.5mm ALP titanium broad locking plate 8 holes
- 200.09 4.5mm ALP titanium broad locking plate 9 holes
- 200.10C 4.5mm ALP titanium broad locking plate 10 holes
- 200.11C 4.5mm ALP titanium broad locking plate 11 holes
- 200.12C 4.5mm ALP titanium broad locking plate 12 holes
- 200.13C 4.5mm ALP titanium broad locking plate 13 holes
- 200.14C 4.5mm ALP titanium broad locking plate 14 holes
- 200.15C 4.5mm ALP titanium broad locking plate 15 holes
- 200.16C 4.5mm ALP titanium broad locking plate 16 holes

**Note:** The plates of 10, 11, 12, 13, 14, 15 and 16 holes a curvature in the body to adapt to the curve of the diaphysis of the femur.

## SCREWS

### 3.5 mm TITANIUM CORTEX SCREW

- 112.12 3.5 mm titanium cortex screw 12mm
- 112.14 3.5 mm titanium cortex screw 14mm
- 112.16 3.5 mm titanium cortex screw 16mm
- 112.18 3.5 mm titanium cortex screw 18mm
- 112.20 3.5 mm titanium cortex screw 20mm
- 112.22 3.5 mm titanium cortex screw 22mm
- 112.24 3.5 mm titanium cortex screw 24mm
- 112.26 3.5 mm titanium cortex screw 26mm
- 112.28 3.5 mm titanium cortex screw 28mm
- 112.30 3.5 mm titanium cortex screw 30mm
- 112.32 3.5 mm titanium cortex screw 32mm
- 112.34 3.5 mm titanium cortex screw 34mm
- 112.36 3.5 mm titanium cortex screw 36mm
- 112.38 3.5 mm titanium cortex screw 38mm
- 112.40 3.5 mm titanium cortex screw 40mm
- 112.45 3.5 mm titanium cortex screw 45mm
- 112.50 3.5 mm titanium cortex screw 50mm
- 112.55 3.5 mm titanium cortex screw 55mm
- 112.60 3.5 mm titanium cortex screw 60mm



### 4.5 mm TITANIUM CORTEX SCREW

- 126.12 4.5 mm titanium cortex screw 12mm
- 126.14 4.5 mm titanium cortex screw 14mm
- 126.16 4.5 mm titanium cortex screw 16mm
- 126.18 4.5 mm titanium cortex screw 18mm
- 126.20 4.5 mm titanium cortex screw 20mm
- 126.22 4.5 mm titanium cortex screw 22mm
- 126.24 4.5 mm titanium cortex screw 24mm
- 126.26 4.5 mm titanium cortex screw 26mm
- 126.28 4.5 mm titanium cortex screw 28mm
- 126.30 4.5 mm titanium cortex screw 30mm
- 126.32 4.5 mm titanium cortex screw 32mm
- 126.34 4.5 mm titanium cortex screw 34mm
- 126.36 4.5 mm titanium cortex screw 36mm
- 126.38 4.5 mm titanium cortex screw 38mm
- 126.40 4.5 mm titanium cortex screw 40mm
- 126.45 4.5 mm titanium cortex screw 45mm
- 126.50 4.5 mm titanium cortex screw 50mm
- 126.55 4.5 mm titanium cortex screw 55mm
- 126.60 4.5 mm titanium cortex screw 60mm
- 126.65 4.5 mm titanium cortex screw 65mm
- 126.70 4.5 mm titanium cortex screw 70mm



### 3.5 mm TITANIUM CORTEX LOCKING SCREW

- 106.12 3.5 mm titanium cortex locking screw 12mm
- 106.14 3.5 mm titanium cortex locking screw 14mm
- 106.16 3.5 mm titanium cortex locking screw 16mm
- 106.18 3.5 mm titanium cortex locking screw 18mm
- 106.20 3.5 mm titanium cortex locking screw 20mm
- 106.22 3.5 mm titanium cortex locking screw 22mm
- 106.24 3.5 mm titanium cortex locking screw 24mm
- 106.26 3.5 mm titanium cortex locking screw 26mm
- 106.28 3.5 mm titanium cortex locking screw 28mm
- 106.30 3.5 mm titanium cortex locking screw 30mm
- 106.32 3.5 mm titanium cortex locking screw 32mm
- 106.34 3.5 mm titanium cortex locking screw 34mm
- 106.36 3.5 mm titanium cortex locking screw 36mm
- 106.38 3.5 mm titanium cortex locking screw 38mm
- 106.40 3.5 mm titanium cortex locking screw 40mm
- 106.45 3.5 mm titanium cortex locking screw 45mm
- 106.50 3.5 mm titanium cortex locking screw 50mm
- 106.55 3.5 mm titanium cortex locking screw 55mm
- 106.60 3.5 mm titanium cortex locking screw 60mm



### 3.5 mm TITANIUM CANCELLOUS LOCKING SCREW

- 107.12 3.5 mm titanium cancellous locking screw 12mm
- 107.14 3.5 mm titanium cancellous locking screw 14mm
- 107.16 3.5 mm titanium cancellous locking screw 16mm
- 107.18 3.5 mm titanium cancellous locking screw 18mm
- 107.20 3.5 mm titanium cancellous locking screw 20mm
- 107.22 3.5 mm titanium cancellous locking screw 22mm
- 107.24 3.5 mm titanium cancellous locking screw 24mm
- 107.26 3.5 mm titanium cancellous locking screw 26mm
- 107.28 3.5 mm titanium cancellous locking screw 28mm
- 107.30 3.5 mm titanium cancellous locking screw 30mm
- 107.32 3.5 mm titanium cancellous locking screw 32mm
- 107.34 3.5 mm titanium cancellous locking screw 34mm
- 107.36 3.5 mm titanium cancellous locking screw 36mm
- 107.38 3.5 mm titanium cancellous locking screw 38mm
- 107.40 3.5 mm titanium cancellous locking screw 40mm
- 107.45 3.5 mm titanium cancellous locking screw 45mm
- 107.50 3.5 mm titanium cancellous locking screw 50mm
- 107.55 3.5 mm titanium cancellous locking screw 55mm
- 107.60 3.5 mm titanium cancellous locking screw 60mm



## 5.0 mm TITANIUM CORTEX LOCKING SCREW

- 108.20 5.0 mm titanium cortex locking screw 20mm
- 108.22 5.0 mm titanium cortex locking screw 22mm
- 108.24 5.0 mm titanium cortex locking screw 24mm
- 108.26 5.0 mm titanium cortex locking screw 26mm
- 108.28 5.0 mm titanium cortex locking screw 28mm
- 108.30 5.0 mm titanium cortex locking screw 30mm
- 108.32 5.0 mm titanium cortex locking screw 32mm
- 108.34 5.0 mm titanium cortex locking screw 34mm
- 108.36 5.0 mm titanium cortex locking screw 36mm
- 108.38 5.0 mm titanium cortex locking screw 38mm
- 108.40 5.0 mm titanium cortex locking screw 40mm
- 108.42 5.0 mm titanium cortex locking screw 42mm
- 108.44 5.0 mm titanium cortex locking screw 44mm
- 108.46 5.0 mm titanium cortex locking screw 46mm
- 108.48 5.0 mm titanium cortex locking screw 48mm
- 108.50 5.0 mm titanium cortex locking screw 50mm
- 108.55 5.0 mm titanium cortex locking screw 55mm
- 108.60 5.0 mm titanium cortex locking screw 60mm
- 108.65 5.0 mm titanium cortex locking screw 65mm
- 108.70 5.0 mm titanium cortex locking screw 70mm



## 5.5 mm TITANIUM CANCELLOUS LOCKING SCREW

- 109.40 5.5 mm titanium cancellous locking screw 40mm
- 109.45 5.5 mm titanium cancellous locking screw 45mm
- 109.50 5.5 mm titanium cancellous locking screw 50mm
- 109.55 5.5 mm titanium cancellous locking screw 55mm
- 109.60 5.5 mm titanium cancellous locking screw 60mm
- 109.65 5.5 mm titanium cancellous locking screw 65mm
- 109.70 5.5 mm titanium cancellous locking screw 70mm
- 109.75 5.5 mm titanium cancellous locking screw 75mm
- 109.80 5.5 mm titanium cancellous locking screw 80mm
- 109.85 5.5 mm titanium cancellous locking screw 85mm
- 109.90 5.5 mm titanium cancellous locking screw 90mm



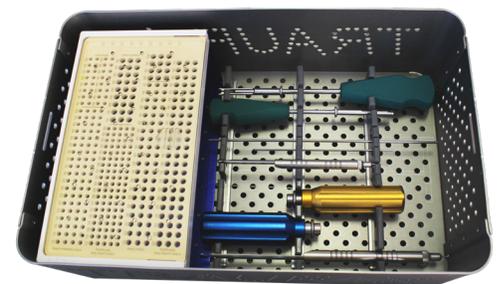
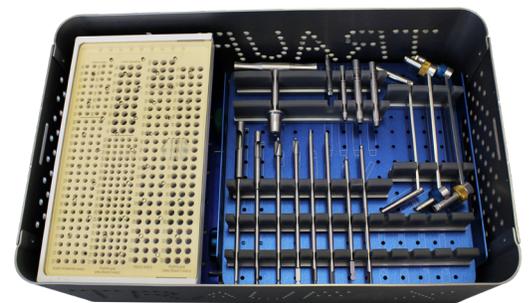
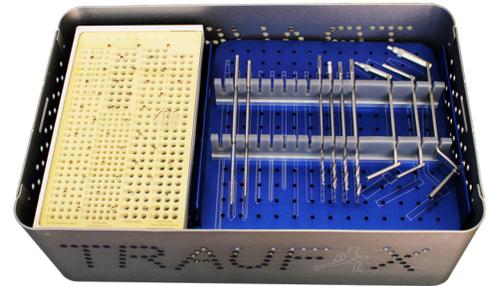
## Bibliography

Rüedi, Thomas P, Murphy, William M. AO Principles of Fracture Management Ed. Masson 2002.

## INSTRUMENTAL

### QTY. EQUIPMENT

- 2 1.5 mm ± 1 mm threaded guide wire
- 2 2.0 mm ± 1 mm threaded guide wire
- 1 Screwdriver for 3.5 / 4.0 screw with 2.5 mm hexagon screw holder
- 1 Screwdriver for 3.5 / 4.0 screw with 3.5 mm hexagon screw holder
- 1 3.2 mm eccentric neutral drill bit guide
- 1 2.5 mm eccentric neutral drill bit guide
- 1 4.5/6.5 mm double drill bit guide
- 1 2.5/3.5 mm double drill bit guide
- 1 3.2/4.5 mm double drill bit guide
- 1 AO Handle with 1.5 Nm torque wrench
- 1 AO Handle with 4.0 Nm torque wrench
- 1 T-handle, quick coupling (AO)
- 1 60 mm stainless steel depth gauge
- 1 90 mm stainless steel depth gauge
- 1 Countersink, for 6 mm ± 1 mm
- 1 Countersink, for 8 mm ± 1 mm
- 1 2.5 mm AO Hexagonal Screwdriver
- 1 3.5 mm AO Hexagonal Screwdriver
- 1 2.5 mm sweeping screw extractor tip
- 1 3.5 mm sweeping screw extractor tip
- 1 Tap for 3.5 +/- 1 mm
- 1 Tap for 4.5 +/- 1 mm
- 1 8.5 mm ± 0.5 mm reamer tip (punch) for large fragments
- 1 6.5 mm ± 0.5 mm reamer tip (punch) for small fragments
- 1 2.5 mm Drill Bit, quick coupling
- 1 2.7 mm Drill Bit, quick coupling
- 1 3.2 mm Drill Bit, quick coupling
- 1 3.5 mm Drill Bit, quick coupling
- 1 4.0 mm Drill Bit, quick coupling
- 2 2.7 mm Sleeve
- 2 3.2 mm Sleeve
- 2 4.0 mm Sleeve







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Carretera Doctor Mora a San Miguel de Allende km 3.4,  
C.P. 37967, Comunidad de San Rafael, Doctor Mora,  
Guanajuato, México.  
Tel. +52 419 688 1191