



# InFrame™ Surgical Technique Guide

The intramedullary micro nail for proximal phalanx fractures designed by hand surgeons



EXSOMED™  
Innovations in Hand Surgery

## INDICATIONS FOR USE

The ExsoMed InFrame cannulated micro nail is intended for fixation of intra-articular and extra-articular fractures and non-unions of small bones and small bone fragments; arthrodesis of small joints; bunionectomies and osteotomies, including scaphoid and other carpal bones, metacarpals, tarsals, metatarsals, patella, ulnar styloid, capitellum, radial head and radial styloid.

The InFrame System is provided sterile. The implant is manufactured from stainless steel and is offered in 2.0mm diameter. The implants are provided sterile packed while a separate sterile packed instrument kit provides the tools for implantation.

**Multiple lengths** for treatment of various fracture patterns

- **2.0mm diameter:** 12-48mm (2.0mm increments)

**Specifically sized for the phalanx** intramedullary canal to facilitate early, active mobilization post-op protocols for accelerated healing and faster return to daily activities

**Non-compression design** avoids shortening in oblique or comminuted fractures

**Fully threaded design** to achieve abundant cortical and cancellous bone purchase in the intramedullary canal

**Dual lead** to allow faster micro nail advancement for surgical efficiency



**Hex design** to reduce the risk of stripping the implant

**Cannulated** for accurate placement



**2.0mm diameter design** allows cross implantation constructs, enhancing rotational stability, cortical bone purchase, and intramedullary fit



**Innovative delivery mechanism** via the dual diameter guidewire eliminates the need for a dedicated reamer and reaming step, offering simple and accurate implantation of the device

## SURGICAL TECHNIQUE

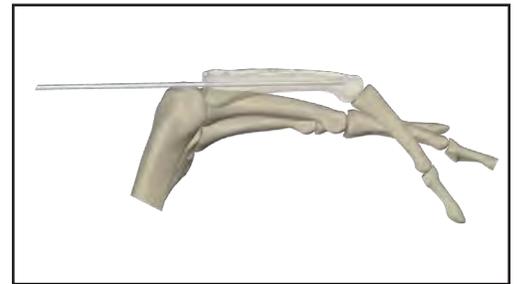
### 1 REDUCE AND INSERT GUIDEWIRE

- Reduce the phalanx fracture under fluoroscopic imaging with a closed reduction technique
- Insert the dual diameter guidewire via antegrade or retrograde approach
- Fully advance the guidewire into the phalanx until the trocar tip passes the far side cortical wall
- Retract guidewire so that the trocar tip reaches the desired final implant position

**Note:** When advancing or retracting the guidewire, always ensure that the wire driver collet clamps on only the larger diameter of the wire (please see diagram to the right). Clamping on the smaller diameter may result in excessive torsional stresses that are applied to the guidewire. Exercise care while handling the guidewire to avoid bending during use.

**OR Tip:** Depending on the fracture pattern and clinical assessment, open techniques may be utilized to optimally reduce the fracture.

d.



# SURGICAL TECHNIQUE

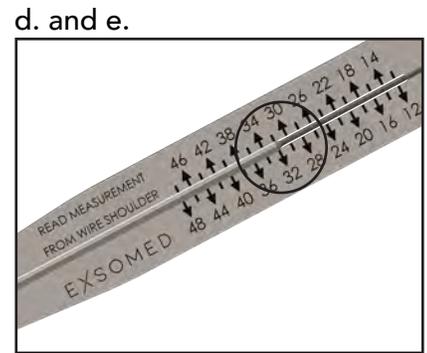
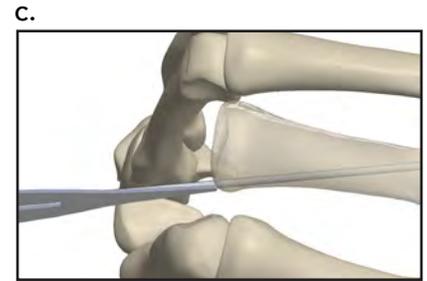
**OR Tip:** Avoid penetrating the articular surfaces whenever possible. Advancing past the far side of the cortical wall will aid in removing the guidewire after implant placement.

## 2 MEASURE AND SELECT IMPLANT SIZE

- Verify that the guidewire tip is positioned at the desired final implant location
- Create a stab incision adjacent to the guidewire entry site until the scalpel blade contacts the bone
- Insert the depth gauge (adjacent to the guidewire, via the incision) until the depth gauge tip contacts the bone
- Align the guidewire within the center groove of the depth gauge
- Read the length marking at the diameter transition of the guidewire (illustrated in the diagram as 32mm) to obtain the appropriate implant length

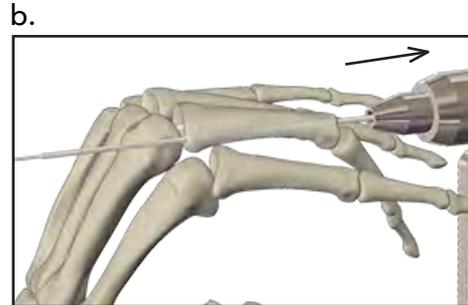
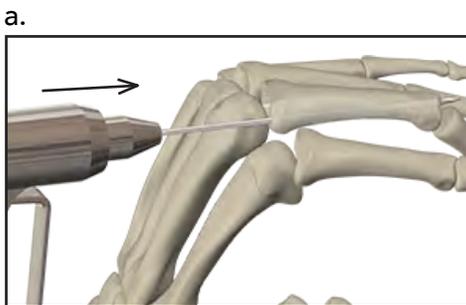
**OR Tip:** A #15 scalpel is recommended for incision. Per clinical assessment, it may be appropriate to downsize by 2mm or more from the depth gauge reading to account for any tissue between the depth gauge and bone, as well as for the subosseous placement of the implant trailing end.

*InFrame implants and the surgical sets are packaged separately. Surgical sets are compatible with all sizes of InFrame implants offered.*



## 3 INSERT IMPLANT

- After measurement, clamp the larger diameter of the guidewire to drive it farther through the bone until enough guidewire is exiting so that the leading end of the guidewire can be clamped
- Reposition the wire driver and clamp the larger diameter of the guidewire at the exiting end to position the guidewire so that the smaller diameter segment spans the fracture while the larger diameter segment can be held within the cortex

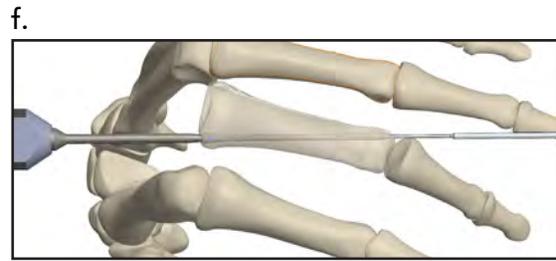
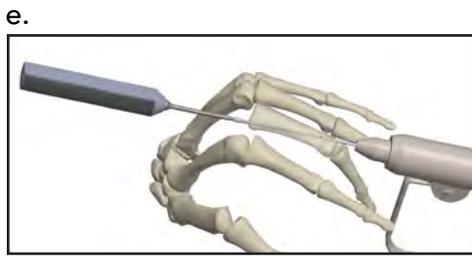


- Slide the appropriately sized implant over the smaller diameter of the pre-positioned guidewire
- Slide the driver down the guidewire until the driver tip engages the drive feature of the implant trailing end



## SURGICAL TECHNIQUE

- e. Turn the driver clockwise to advance the implant along the smaller diameter of the guidewire until you reach approximately 75% insertion, then grab the larger diameter of the guidewire using a wire driver to advance the guidewire, toward the leading end, until the larger diameter of the guidewire is outside of the phalanx intramedullary canal
- f. Continue to turn the driver clockwise to advance the implant to the desired depth within the phalanx while maintaining reduction of the fracture to avoid gapping at the fracture site



**Note:** If excessive torque is encountered upon implant insertion, back out the implant 2-3 turns before continuing implantation (similar action used with standard bone taps).

### 4 CONFIRM IMPLANT PLACEMENT AND ARTICULAR RANGE OF MOTION

- a. Verify the final implant position and proper length with fluoroscopic imaging
- b. Remove the guidewire via the trocar end of the guidewire
- c. Ensure that the final implant location does not inhibit articular function

**OR Tip:** *Implants should be buried below the outer surface of the bone at both ends.*

### 5 ADDITIONAL IMPLANT

Per clinical assessment, if additional implants are desired to be inserted into the same phalanx:

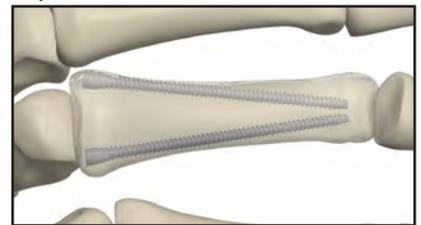
- a. Repeat step 1b above
- b. Verify under fluoroscopic imaging that a spacing of 0.5mm or more in all planes exists between the previously placed implant and the newly placed guidewire
- c. Repeat steps 2 through 4 above

Some examples of possible InFrame constructs include: V or X patterns

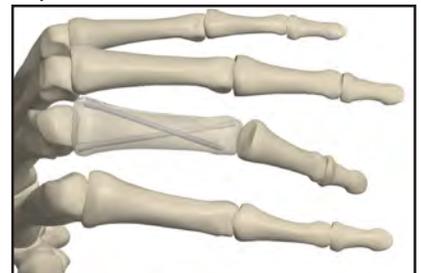
**Note:** Damage may occur to the threads if the implant/guidewire spacing is not verified. Excessive torque may occur if the implant/guidewire spacing is not verified. Ensure initial device is fully implanted prior to placing any additional implants.

**OR Tip:** *Verifying the implant/guidewire spacing will ensure that thread damage does not occur when placing the implant due to intersecting implant trajectories. If continued excessive torque is encountered during the second implant placement, remove the second implant, and place a shorter length implant to avoid implant collision.*

V pattern



X pattern

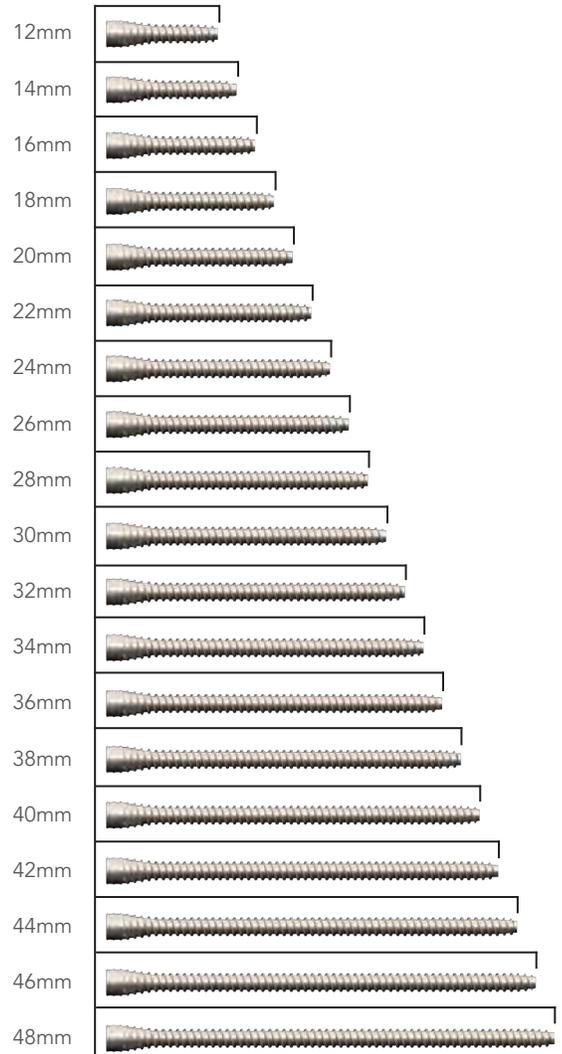


# ORDERING INFORMATION



## InFrame Sterile Implants, 2.0mm

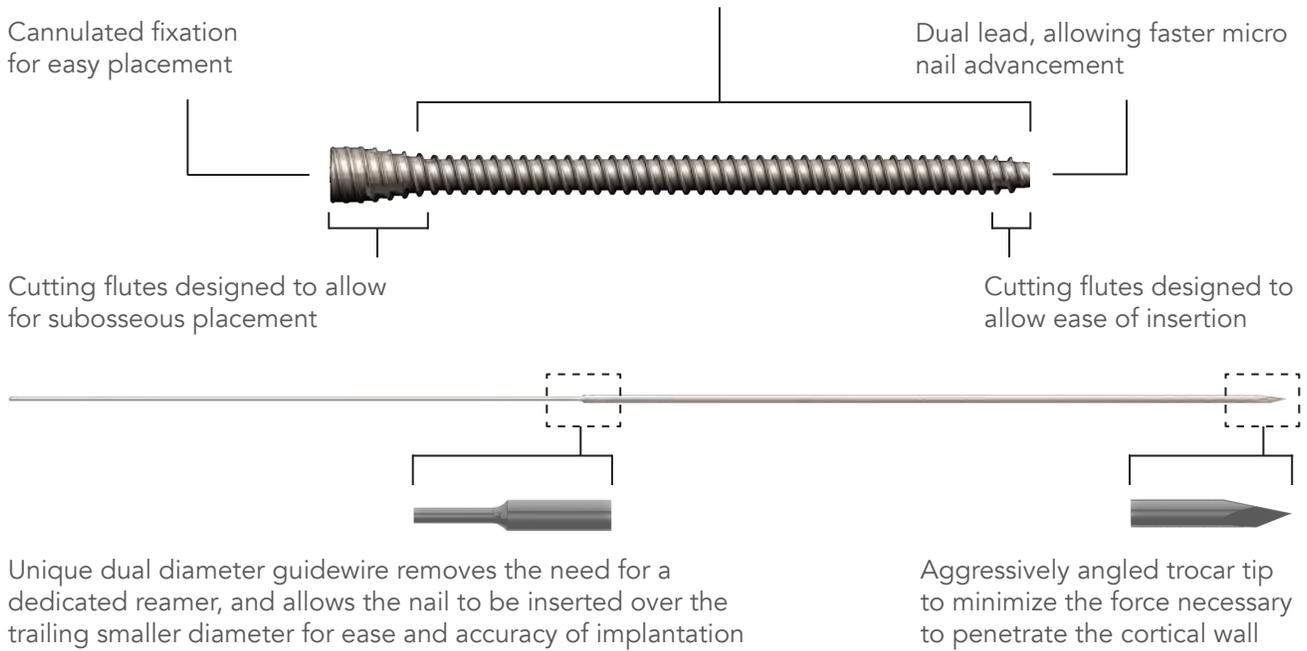
EXINF922012	InFrame Implant, 2.0 x 12mm
EXINF922014	InFrame Implant, 2.0 x 14mm
EXINF922016	InFrame Implant, 2.0 x 16mm
EXINF922018	InFrame Implant, 2.0 x 18mm
EXINF922020	InFrame Implant, 2.0 x 20mm
EXINF922022	InFrame Implant, 2.0 x 22mm
EXINF922024	InFrame Implant, 2.0 x 24mm
EXINF922026	InFrame Implant, 2.0 x 26mm
EXINF922028	InFrame Implant, 2.0 x 28mm
EXINF922030	InFrame Implant, 2.0 x 30mm
EXINF922032	InFrame Implant, 2.0 x 32mm
EXINF922034	InFrame Implant, 2.0 x 34mm
EXINF922036	InFrame Implant, 2.0 x 36mm
EXINF922038	InFrame Implant, 2.0 x 38mm
EXINF922040	InFrame Implant, 2.0 x 40mm
EXINF922042	InFrame Implant, 2.0 x 42mm
EXINF922044	InFrame Implant, 2.0 x 44mm
EXINF922046	InFrame Implant, 2.0 x 46mm
EXINF922048	InFrame Implant, 2.0 x 48mm



## InFrame 2.0mm Disposable Instrument Kit

EXINF912000	InFrame Instrument Kit	2 Dual Diameter Guidewires, Single Trocar 254mm, 1.6mm x 0.8mm Diameter 1 Depth Gauge 1 Cannulated Hex Driver
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Fully threaded, non-compression, 2.0mm diameter design to achieve abundant cortical purchase and optimal intramedullary fit within the phalanx



## InFrame 2.0mm Disposable Instrument Kit - Sterile Packed



Cannulated Hex Driver



Dual Diameter Guidewire, Single Trocar, 254mm, 1.6mm x 0.8mm Diameter (x2)



Depth Gauge

**EXSOMED™**  
Innovations in Hand Surgery

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