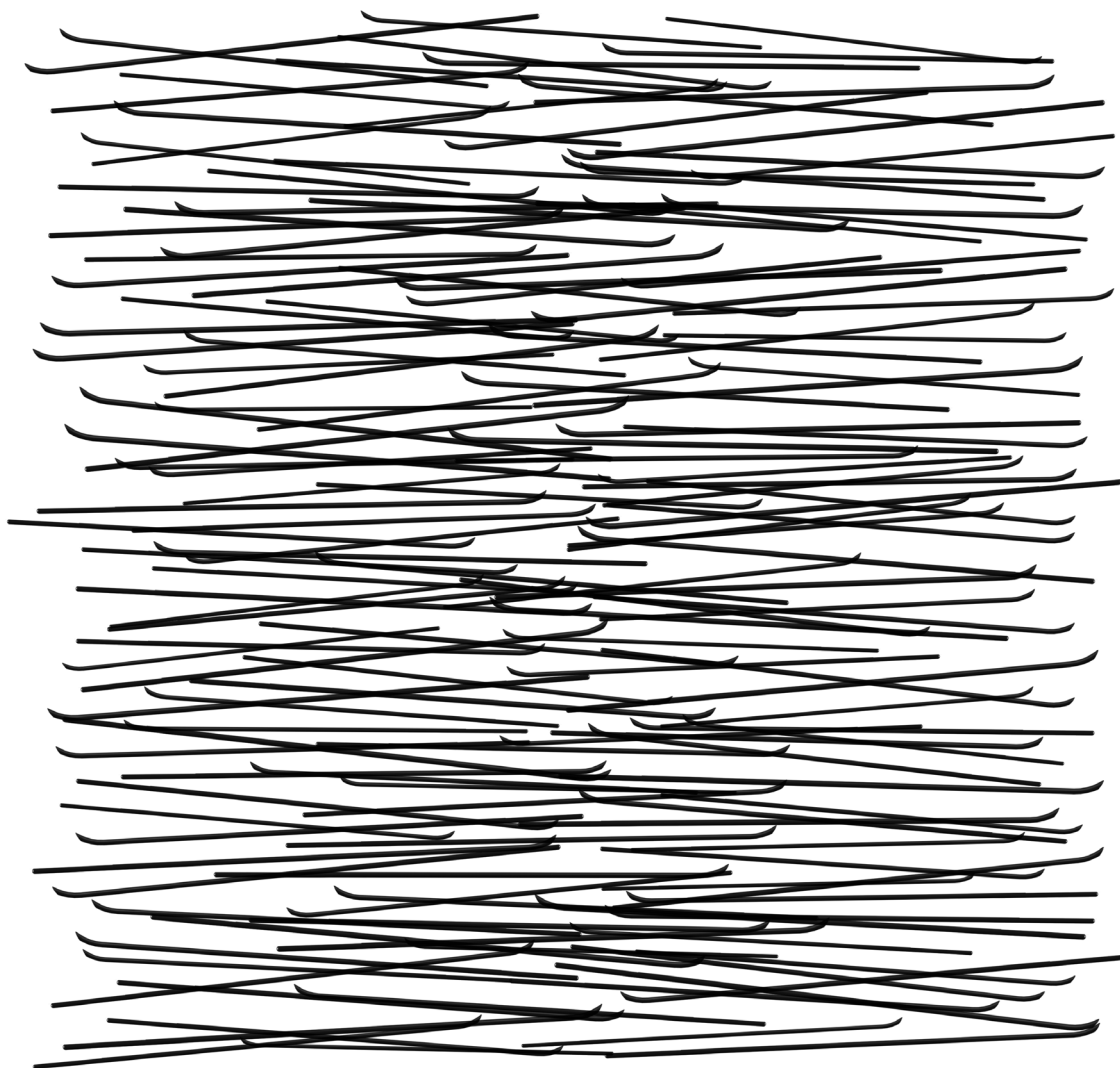


**ITS.**

**Implants**  
trauma



**FTN**

Flexible Titanium Nail



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# Introduction



## ○ Preface

When used in appropriate indications, Flexible Titanium Nails offer the possibility for early functional treatment including minimally invasive fracture reduction, retention with elastical stable medullary nailing allowing for undisturbed periosteal bone healing.

Benefits are the minimally invasive surgical technique avoiding open reduction and soft tissue irritation, and the chance for undisturbed periosteal bone healing.



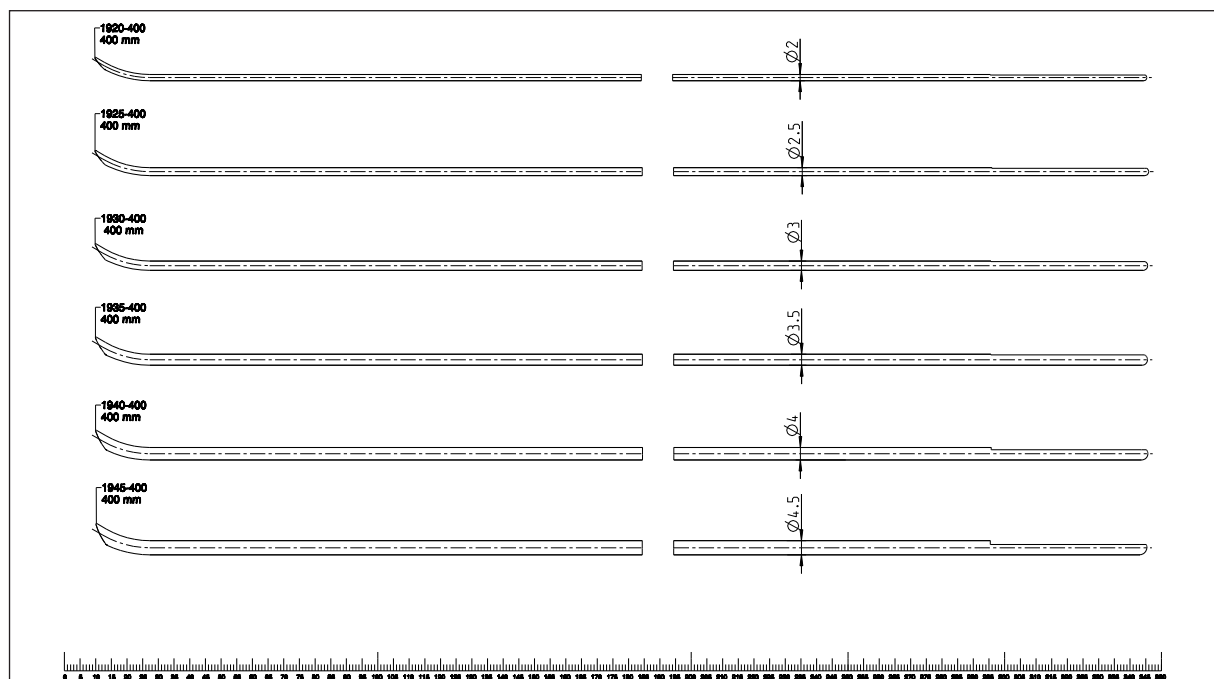
## ○ Properties

### Properties of the material:

- ◆ Nail Material: TiAl6V4 ELI
- ◆ Easier removal of implant after fracture has healed
- ◆ Improved fatigue strength of implant
- ◆ Reduced risk of inflammation and allergy

### Properties of the implant:

- ◆ Intraoperative cutting of the nail is possible
- ◆ Can be shortened individually in a flexible way
- ◆ Length: 400mm
- ◆ Curved, levelled nail tip facilitates insertion and fracture reduction



## ○ Indications & Contraindications

### Indications:

- ◆ Lower leg shaft fractures in patients with open epiphyseal plate - oblique or transverse fractures without fragmentation
- ◆ Femoral shaft fractures in patients with open epiphyseal plate - oblique or transverse fractures without fragmentation
- ◆ Forearm shaft fractures / transverse or short oblique fractures
- ◆ Subcapital humeral fractures possibly involving greater and lesser tuberosity
- ◆ Supracondylar humeral fractures in children
- ◆ Dislocated metacarpal and metatarsal V-fractures
- ◆ Humeral shaft fractures in children (open epiphyseal plate)
- ◆ Dislocated clavicle

### Contraindications:

- ◆ Fragmented fractures
- ◆ Fractures with larger bone wedge
- ◆ Existing infections in the fracture zone and operation area
- ◆ Common situations that do not allow osteosynthesis
- ◆ Obesity
- ◆ Lack of patient compliance

## Surgical Technique

# 2.

## ○ Surgical Technique - Forearm Fracture

- ◆ Radial insertion distally at the styloid process – ulnar insertion (sparing soft tissue) from proximal at the olecranon.
- ◆ Nail thickness approx.  $1/3$  to  $1/2$  of the minimum medullary diameter.
- ◆ Nails should be inserted into the opposite corticalis (radial head or distal ulna, respectively), otherwise there is a risk of delayed fracture healing.
- ◆ No cast required for immobilization
- ◆ Functional therapy, allows for exercise until pain indicates exact reduction



## ○ Surgical Technique - Humerus, Subcapital

- ◆ Insertion of nails - 3 nails after anterolateral incision slightly distal of the deltoid muscle attachment
- ◆ Drilling with awl
- ◆ Reduction closed
- ◆ Spread open nails 2.5 - 3.0mm in the humeral head
- ◆ Possibly percutaneous reposition of dislocated tuberosities, and fixation with cannulated screws
- ◆ Immobilization with Resch's bandage for 3 weeks





## ○ Surgical Technique - Shaft Fracture (femur, lower leg, humerus)

- ◆ Insertion via 2 opposing incisions (medial & lateral)
- ◆ Drilling - dilate with awl - nail diameter approx.  $1/3$  of the minimum medullary diameter
- ◆ No immobilization by cast or splint
- ◆ Functional therapy - exercise until pain occurs

## ○ Surgical Technique - Supracondylar Humeral Fracture in Children

- ◆ Closed reduction
- ◆ Insertion of 2 nails from proximal
- ◆ Cast for 3 weeks

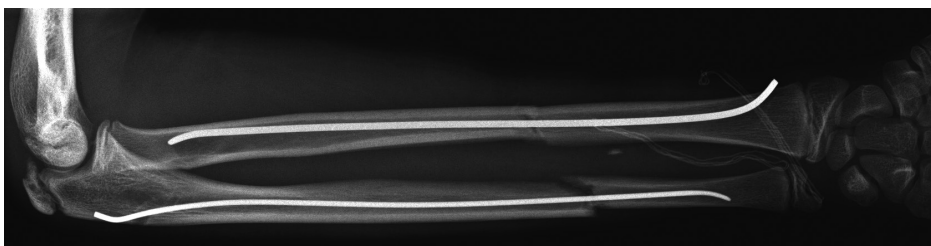
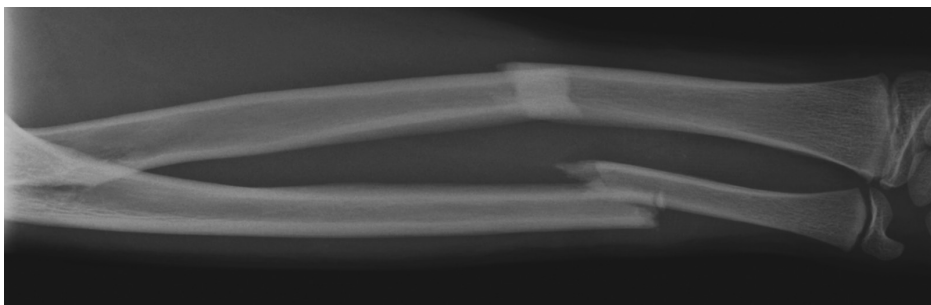
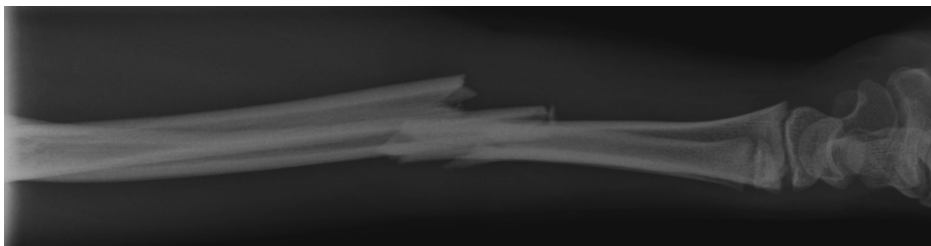
## ○ Surgical Technique - Metacarpal - Os metatarsal V

- ◆ Incision
- ◆ Drilling
- ◆ Reduction with nails

## ○ Explantation

- ◆ After 6-9 months (depending on age and fracture), the material is removed
- ◆ Early after bony consolidation

## ○ Case studies



Information

3.

## o Dotize®

### Chemical process - anodization in a strong alkaline solution\*

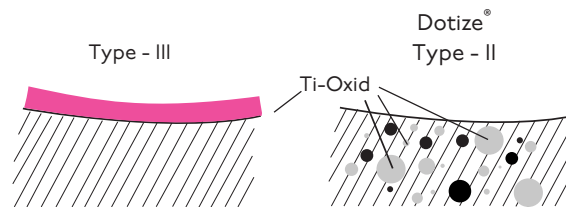
#### Type III anodization

- ◆ Layer thickness 60-200nm
- + Different colors
- Implant surface remains sensitive to:  
Chipping  
Peeling  
Discoloration

#### Dotize

#### Type II anodization

- ◆ Layer thickness 2000-10 000nm
- + Film becomes an interstitial part of the titanium
- No visible cosmetic effect



#### Anodization Type II leads to following benefits\*

- ◆ Oxygen and silicon absorbing conversion layer
- ◆ Decrease in protein adsorption
- ◆ Closing of micro pores and micro cracks
- ◆ Reduced risk of inflammation and allergy
- ◆ Hardened titanium surface
- ◆ Reduced tendency of cold welding of titanium implants
- ◆ Increased fatigue resistance of implants
- ◆ Improved wear and friction characteristics

## ○ Order list

Titanium Nail, Flexible, D=2.0mm, L=400mm	I920-400
Titanium Nail, Flexible, D=2.5mm, L=400mm	I925-400
Titanium Nail, Flexible, D=3.0mm, L=400mm	I930-400
Titanium Nail, Flexible, D=3.5mm, L=400mm	I935-400
Titanium Nail, Flexible, D=4.0mm, L=400mm	I940-400
Titanium Nail, Flexible, D=4.5mm, L=400mm	I945-400

For detailed cleaning and sterilization instructions, please refer to package insert.









**ITS. GmbH**  
Autal 28, 8301 Lassnitzhöhe, Austria  
Tel.: +43 (0) 316 / 211 21 0  
Fax: +43 (0) 316 / 211 21 20  
office@its-implant.com  
www.its-implant.com

CE 0297

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