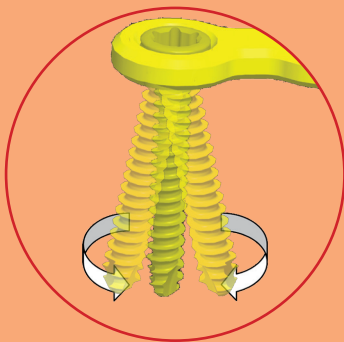
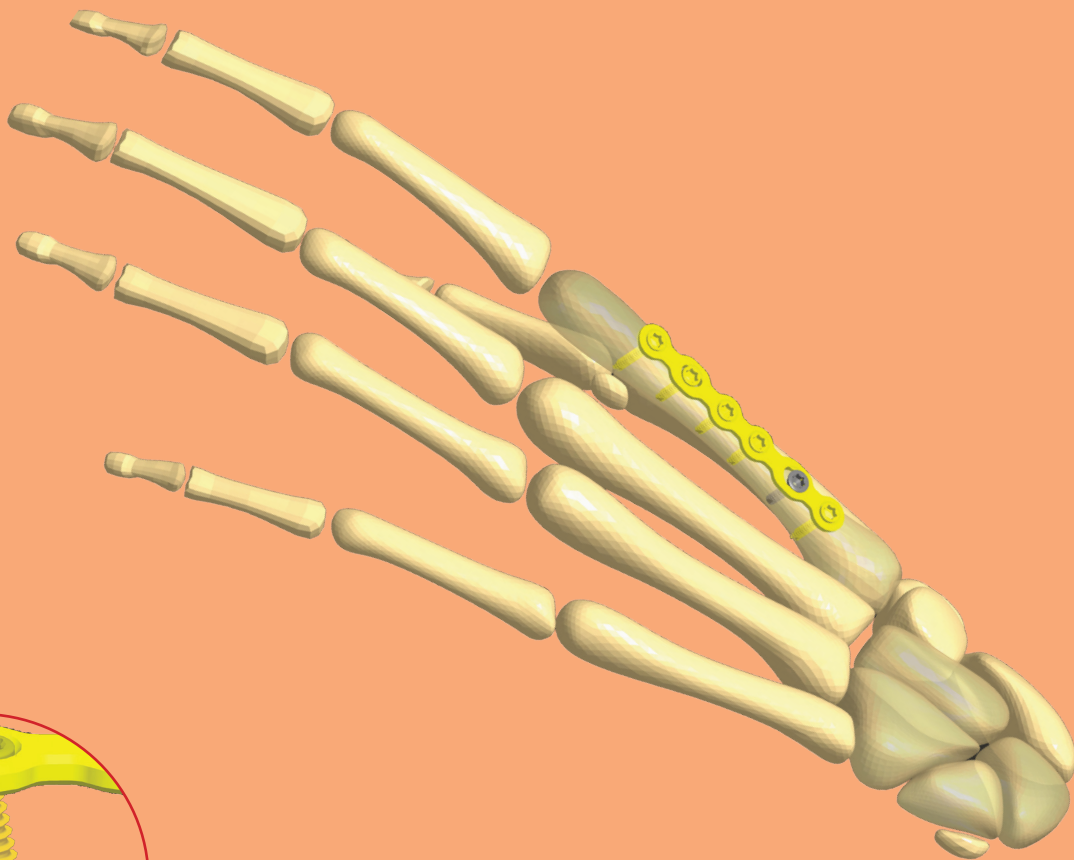


Vortex

Vortex Hand and Foot



$\pm 15^\circ$

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Budapest, Hungary

The following surgical description contains general outlines for Vortex Hand and Foot plating. However, the operating surgeon shall adapt the content to the patient, fracture type and all other relevant factors that may have influence on the outcome of the surgery.

Therefore, Sanatmetal Ltd. strongly recommends participation on workshops and trainings prior to the initial operation.

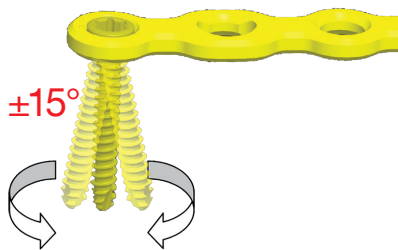
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The Vortex polyaxial angle stabilized product family is completed with Vortex Hand and Foot (VHF) system. With its wide range of sizes and shapes it enables the operating surgeon to find optimal solutions for fractures and degenerative disorders needing bone fixation for the hand and foot.

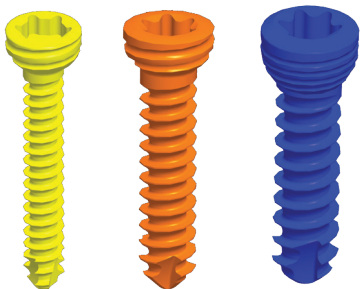
The VHF system while small in size still supports the whole Vortex advantage package both for the user and the patient.

1.1 | The implant

- Polyaxial angle stabilized system in step - free ± 15 deg angulation of insertion



- Optimal, pre-determined screw directions in the holes
- Maximum 3 times of correction possibility when misidentifying the correct screw direction
- Rounded edges to protect nearby soft tissues
- Oval holes for positioning and compression
- Easy-to modellate and cuttable plates
- Self tapping but blunt ended screws



- Anodized Titanium raw material
- Torx recess screws

1.2 | The instruments

- Capable of drilling in preset and ± 15 deg directions step – free
- Instruments and implants in one tray
- Optimized instruments
- Color coded torque limiting screwdrivers

1.3 | Indications

- Hand and foot arthrodesis, and
- Metacarpus,
- Metatarsus,
- Hand and foot finger

fracture treatments.

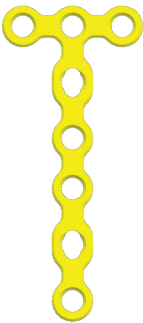
2.1 | 1,5 mm XS straight plate

Holes	Version
6H	universal
12H	universal
Raw material	
anodized Titanium	
Color	
yellow	



2.2 | 1,5 mm XS T-plate

Holes	Version
head: 3;5H	universal
tail: 5;11H	universal
Raw material	
anodized Titanium	
Color	
yellow	



2.3 | 1,5 mm XS L-plate

Holes	Version
6H	universal
12H	universal
Raw material	
anodized Titanium	
Color	
yellow	



2.4 | 1,5 mm XS parallel plate

Holes	Version
6H	universal
8H	universal
12H	universal
16H	universal
Raw material	
anodized Titanium	
Color	
yellow	



2.5 | Vortex screw Ø1,5 mm

Raw material	
anodized Titanium	
Size	
6-24 mm	
Color	
yellow	



2.6 | Cortical screw-TX Ø1,5 mm

Raw material	
anodized Titanium	
Size	
6-24 mm	
Color	
grey	



2 | Implant range

2.7 | 2,0 mm XS straight plate

Holes	Version
6H	universal
12H	universal
Raw material	
anodized Titanium	
Color	
orange	



2.8 | 2,0 mm XS T-plate

Holes	Version
head: 3;5H	universal
tail: 5;11H	universal
Raw material	
anodized Titanium	
Color	
orange	



2.9 | 2,0 mm XS L-plate

Holes	Version
6H	universal
12H	universal
Raw material	
anodized Titanium	
Color	
orange	



2.10 | 2,0 mm XS parallel plate

Holes	Version
6H	universal
8H	universal
12H	universal
16H	universal
Raw material	
anodized Titanium	
Color	
orange	



2.11 | Vortex screw Ø2,0 mm

Raw material	
anodized Titanium	
Size	
6-24 mm	
Color	
orange	



2.12 | Cortical screw-TX Ø2,0mm

Raw material	
anodized Titanium	
Size	
6-24 mm	
Color	
grey	



2.13 | Spider plate

Size	Version
Small	universal
Large	universal
Raw material	
anodized Titanium	
Color	
grey	



2.14 | Mini T-plate

Holes	Version
head: 3-5H	universal
tail: 5-11H	universal
Raw material	
anodized Titanium	
Color	
grey	



2.15 | Mini L-plate

Holes	Version
6H	universal
12H	universal
Raw material	
anodized Titanium	
Color	
grey	



2.16 | Vortex straight plate Mini

Holes	Version
4H	universal
5H	universal
6H	universal
7H	universal
8H	universal
10H	universal
Raw material	
anodized Titanium	
Color	
grey	



2.17 | Vortex screw Ø2,7 mm

Raw material	
anodized Titanium	
Size	
8-34 mm	
Color	
blue	



2.18 | Cortical screw-TX Ø2,7mm

Raw material	
anodized Titanium	
Size	
8-34 mm	
Color	
grey	



3 | Surgical description

Technique of 1,5 mm screws

The following procedure describes the surgical technique of the 1,5 mm screws and plates. The instruments for the 2 and the 2,7 mm technique are color marked: the 2 mm screws' instruments are orange while the 2,7 mm screws' instruments are blue marked in the following text.

3.1 | Reposition of the fracture

Perform reposition while using image intensifier even in case of open reposition. Open reposition is subsequent to incision. Use Kirschner wires for temporary fixation.

3.2 | Plate selection

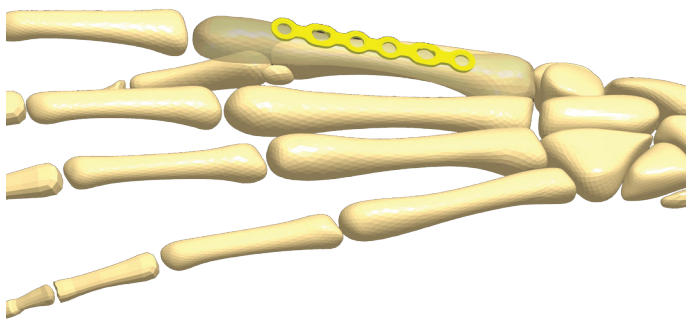
Select the VHF plate most suitable for the application. The plates can be cut to appropriate length.

3.3 | Incision

Perform incision while paying attention to the anatomy of the area.

3.4 | Insertion of the plate

Place the plate on the bone surface. The plate can be modellated if needed.



3.5 | Fixation possibilities

VHF system offers three techniques:

- Monoaxial
- Compression
- Polyaxial

3.6 | Monoaxial technique

3.6.1 | Pre drilling

Perform pre drilling on the appropriate place with the 1,1 mm spiral drill (1,5 mm spiral drill, 2 mm spiral drill) through the conical side of the 1,1 mm Double drill sleeve - PAS (1,5 mm double drill sleeve PAS, 2 mm double drill sleeve PAS) Drilling shall be performed in the centerline of the conical sleeve in case of the 1,1 mm technique.

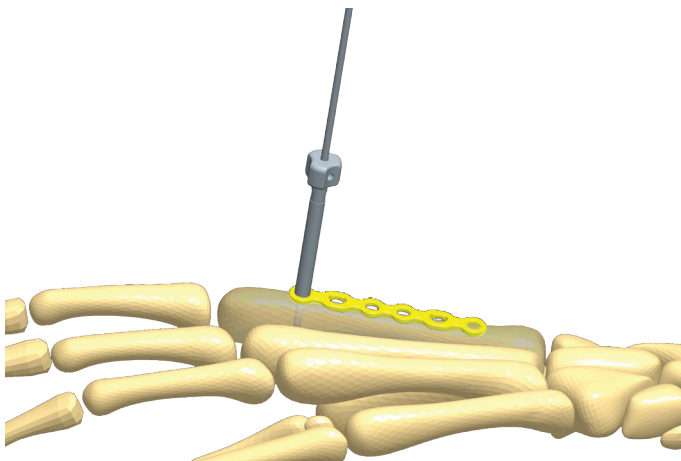
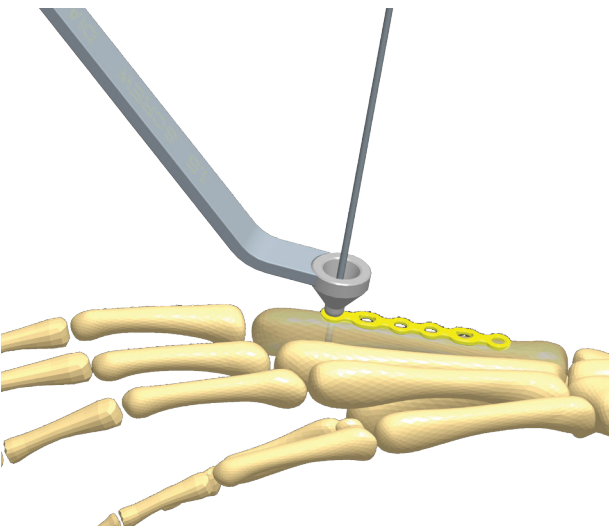
Attention!

Use the straight side of the double drill sleeve for drilling in case of 2 mm and 2,7 mm technique.

The straight side of the double drill sleeve will automatically guide the drillbit into neutral position.

When drilling in round holes use the Double drill sleeve – PAS, while drilling into oval holes shall be done through Double drill sleeve – V.

As an alternative solution screw the 1,1 mm threaded sleeve (1,5 mm threaded sleeve, 2 mm threaded sleeve) into the hole.

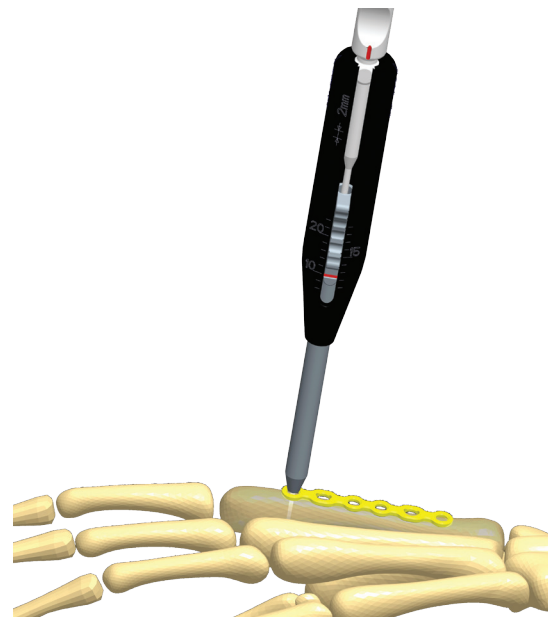


3 | Surgical description

Technique of 1,5 mm screws

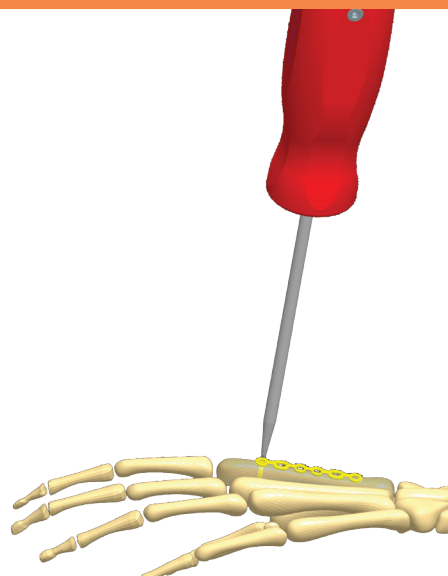
3.6.2 | Length gauging

Perform length gauging with the hooked gauge.



3.6.3 | Screw insertion

Use the TA7/0,2 Nm (TA7/0,2 Nm; T9/1 Nm) screwdriver to drive the Vortex screw into the hole. Tighten until the screwdriver clicks. This ensures optimal torque for the screw.



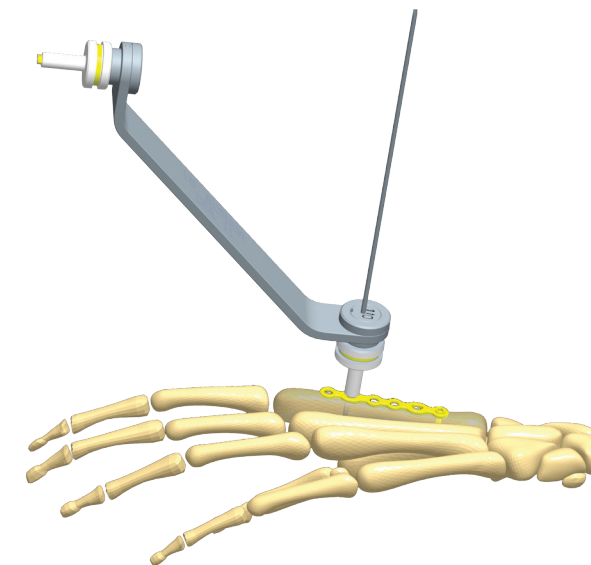
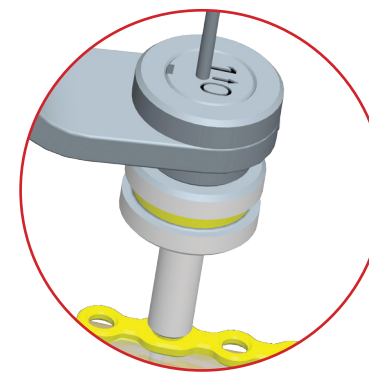
3.7 | Compression technique

Compression can be obtained if there is at least one fixing screw on the other side of the fracture.

You can use maximum 2 compression screws per plate. Maximum amount of compression is 1 mm while with a single compression screw it is 0,8 mm.

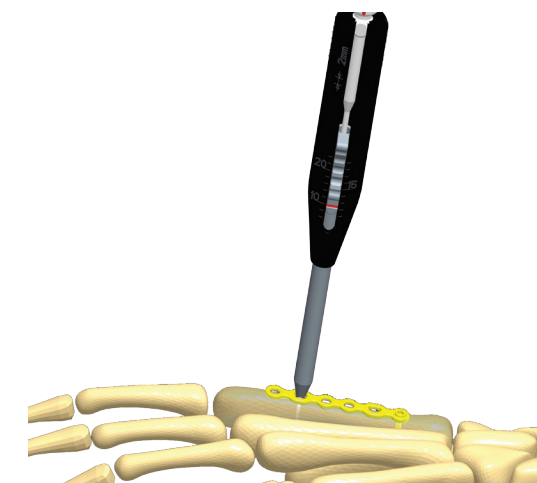
3.7.1 | Pre drilling

Drill with the 1,1 mm spiral drill (1,5 mm spiral drill, 2 mm spiral drill) through the compression side of the 1,1 mm (1,5 mm, Mini) Double drill sleeve – V. Compression can be obtained only in the oval compression holes. Mind the arrows pointing toward the fracture.



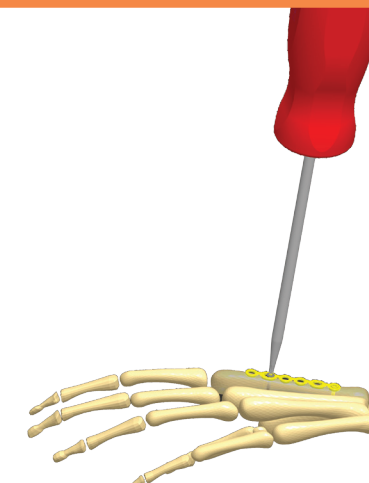
3.7.2 | Length gauging

Perform length gauging with the hooked gauge.



3.7.3 | Screw insertion

Use the TA7/0,2 Nm (TA7/0,2 Nm; T9/1 Nm) screwdriver to drive the Vortex screw into the hole. Tighten until the screwdriver clicks. This ensures optimal torque for the screw.



3 | Surgical description

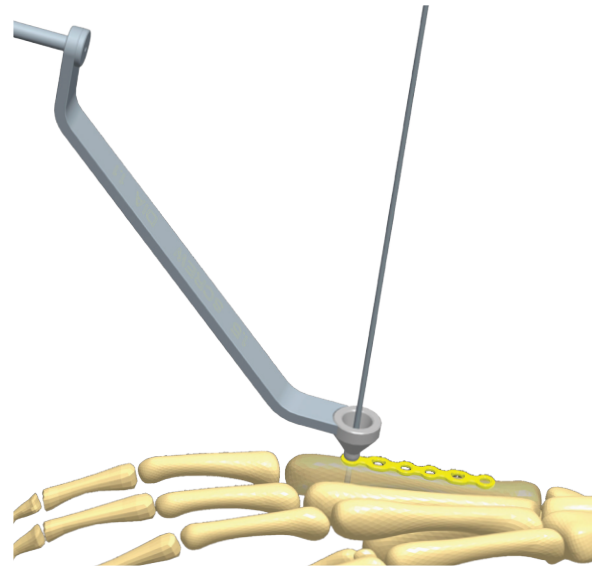
Technique of 1,5 mm screws

3.8 | Poliaxial technique

There is a $\pm 15^\circ$ deviation from the anatomically optimized base direction while maintaining locking.

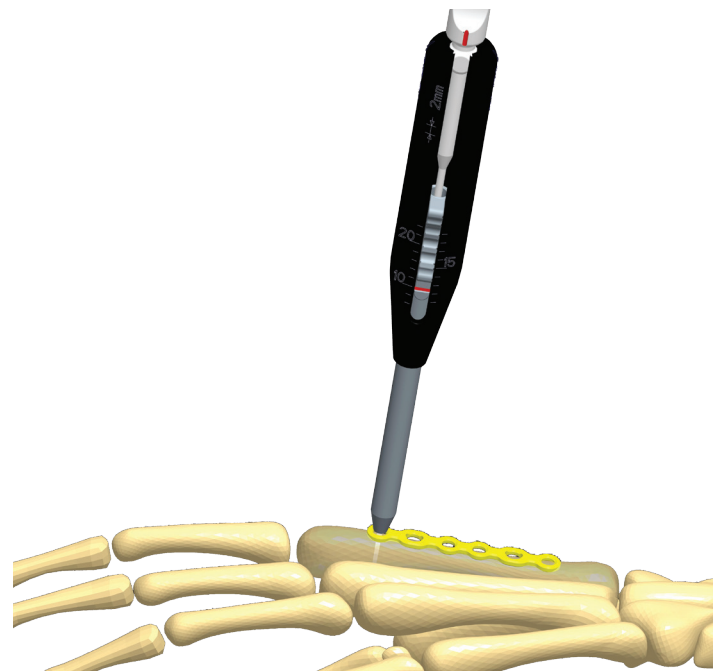
3.8.1 | Pre drilling

Position the 1,1 mm double drill sleeve (1,5 mm double drill sleeve, 2 mm double drill sleeve) with the conical side to the hole of the plate. This will give a 30° freedom of choice for the direction of drilling. Drill in the chosen direction with the 1,1 mm spiral drill (1,5 mm spiral drill, 2 mm spiral drill).



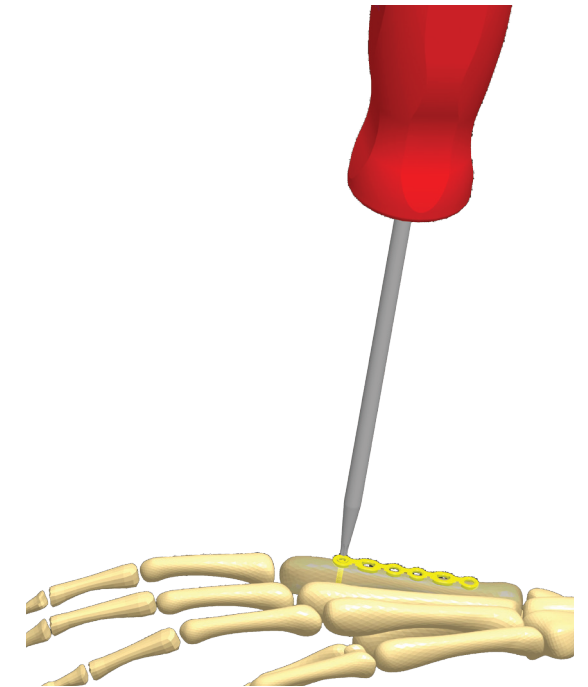
3.8.2 | Length gauging

Perform length gauging with the hooked gauge.



3.8.3 | Screw insertion

Use the TA7/0,2 Nm (TA7/0,2 Nm; T9/1 Nm) screwdriver to drive the Vortex screw into the hole. Tighten until the screwdriver clicks. This ensures optimal torque for the screw.



3 | Surgical description

Technique of Spider plate

Indications - Spider plate

- Carpus arthrosis
- Carpus instability

3.9 | Incision

Perform incision as per the local anatomy.

3.10 | Plate selection

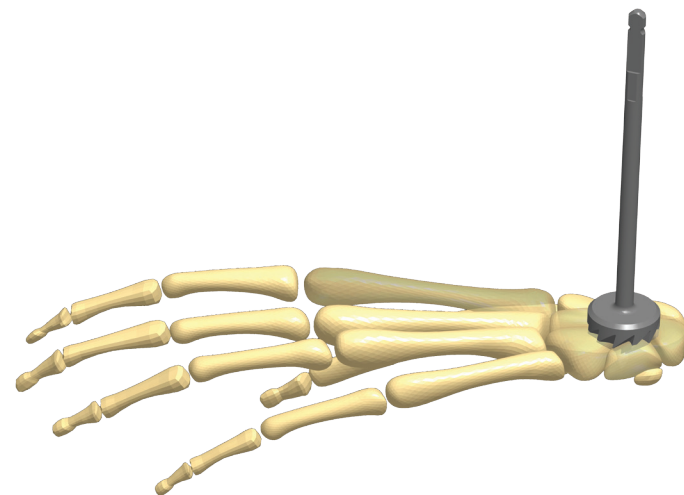
Select the most appropriate size Spider plate (Small, Large)

3.11 | Stabilization

After reaching the optimal position of the carpal bones fix them temporarily with Kirschner wires. Check with image intensifier.

3.12 | Reaming

Ream the place of the plates with the appropriate size reamer.



3.13 | Plate insertion

Place the selected Spideret plate into the prepared nest.

3.14 | Fixation possibilities

In case of Spider plates two techniques can be applied:

- Monoaxial, and
- Polyaxial

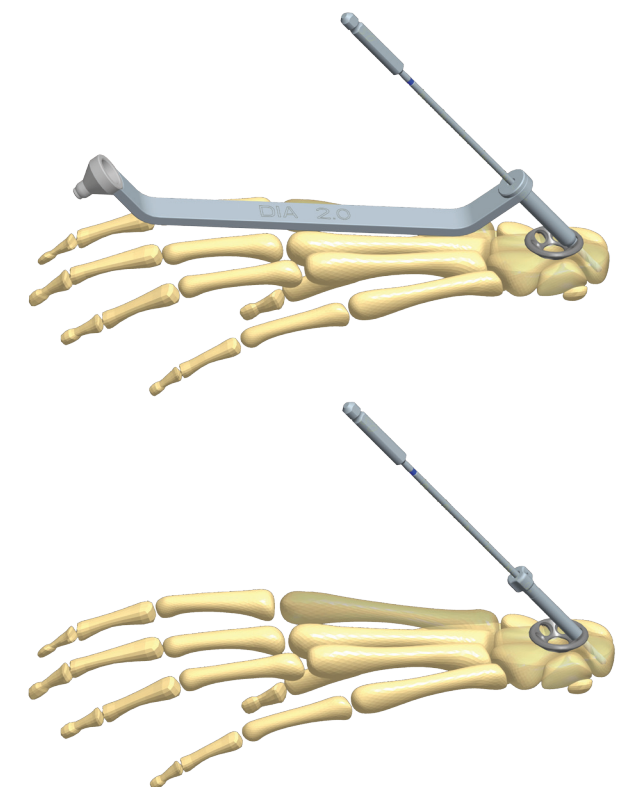
3.15 | A monoaxial techniques

3.15.1 | Pre drilling

Perform drilling with 2 mm spiral drill through the straight side of the Double drill sleeve – PAS. The straight side of the double drill sleeve will automatically guide the drillbit into neutral position.

If you wish to measure length with the scaled drillbit place the blue drill stop just above the spiral part. For details see 3.15.2.

As an alternative solution drive the threaded sleeve into the selected hole.

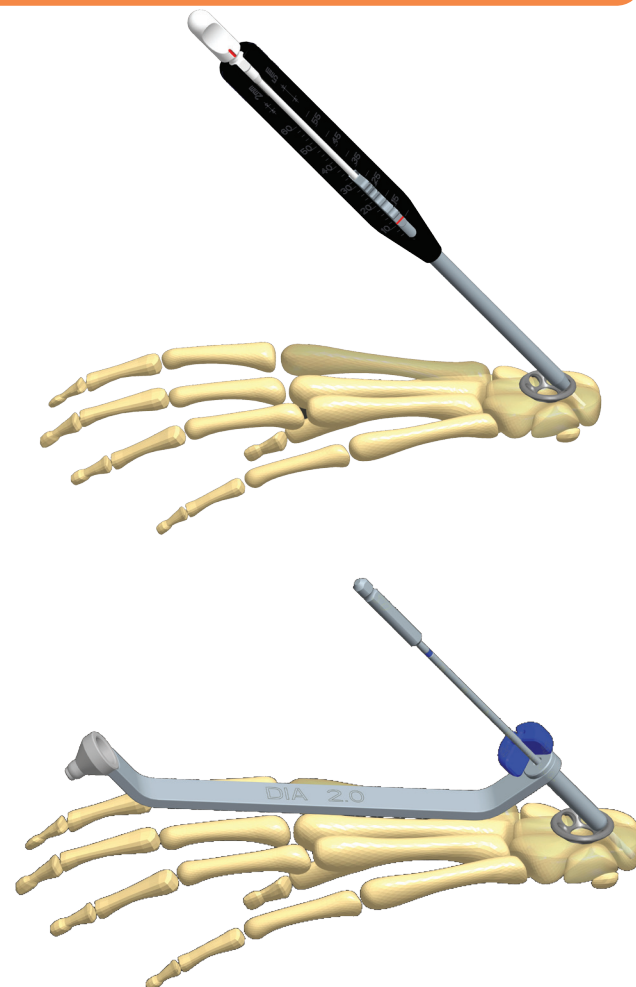


3 | Surgical description

Technique of Spider plate

3.15.2 | Length gauging

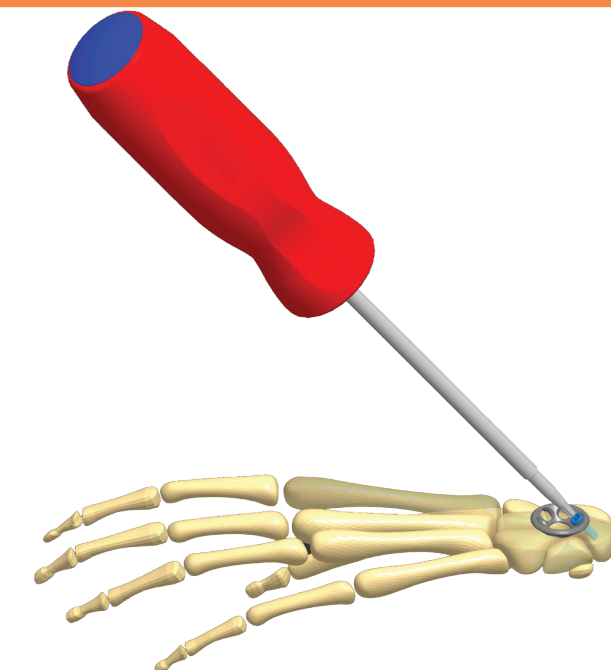
Perform length gauging with the hooked gauge.



(Alternative method: place the drill stop just above the spiral part. Drill through the straight part of the Double drill sleeve – PAS. Read the scale at the side of the drill stop which touched the sleeve.)

3.15.3 | Screw insertion

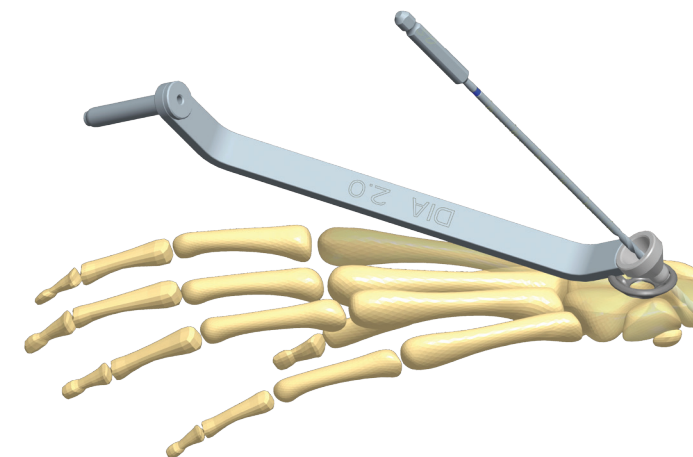
Use the T9/1 Nm screwdriver to drive the Vortex screw into the hole. Tighten until the screwdriver clicks. This ensures optimal torque for the screw.



3.16 | Polyaxial technique

3.16.1 | Pre drilling

Drill with the 2 mm drillbit through the conical part of the 2 mm Double drill sleeve – PAS.

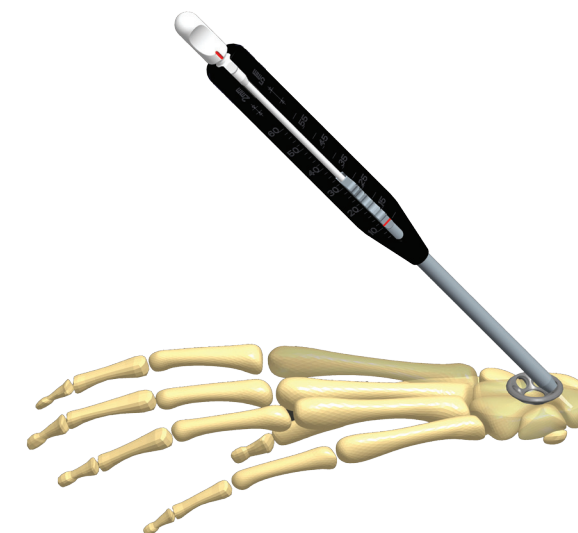


3.16.2 | Length gauging

Perform length gauging with the hooked gauge.

Attention!

When using polyaxial technique only the hooked gauge can be used.

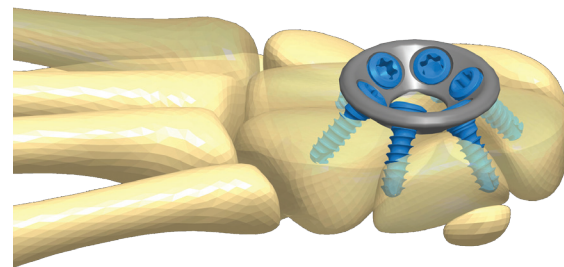
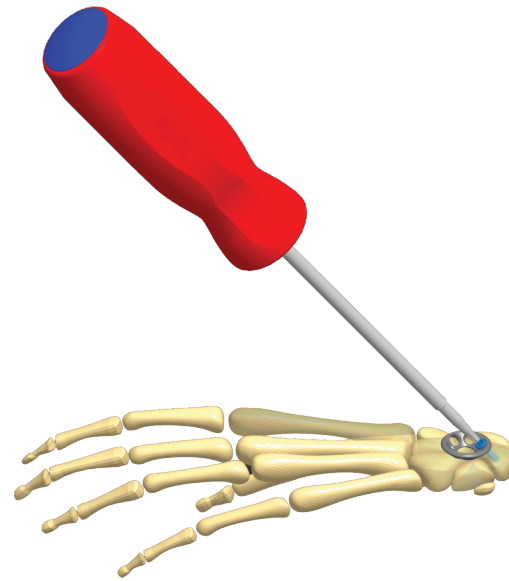


3 | Surgical description

Technique of Spider plate

3.16.3 | Screw insertion

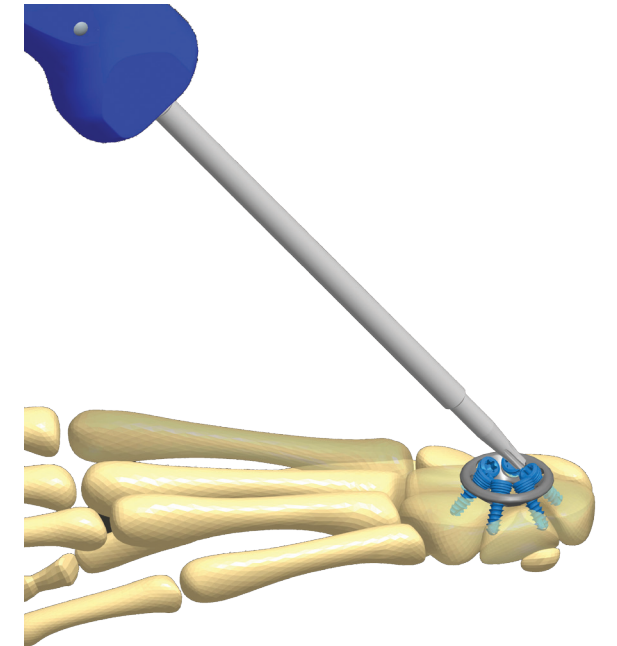
Use the T9/1 Nm screwdriver to drive the Vortex screw into the hole. Tighten until the screwdriver clicks. This ensures optimal torque for the screw.



3.17 | Plate removal

Before removal unlock all the screws first with T9 non torque limiting screwdriver and leave them in place. Otherwise the unlocking of the last screw could move the plate thus damaging soft tissues.

When all screws are unlocked remove them and the plate as well.



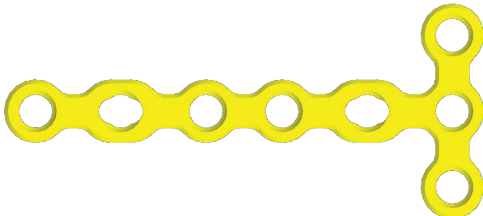
4.1 | 1,5 mm XS straight plate



Anodized Titanium

Cat. no	Size
280411006	6H
280411012	12H

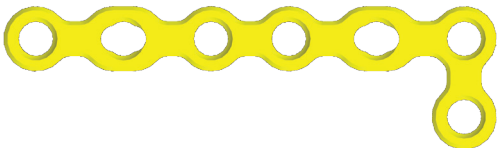
4.2 | 1,5 mm XS T-plate



Anodized Titanium

Cat. no	Size
280412305	head 3H, tail 5H
280412311	head 3H, tail 11H
280412505	head 5H, tail 5H
280412511	head 5H, tail 11H

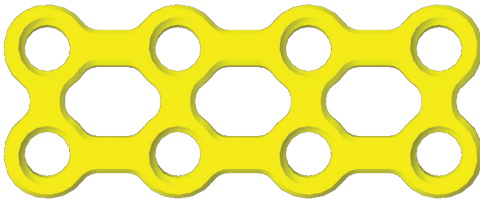
4.3 | 1,5 mm XS L-plate



Anodized Titanium

Cat. no	Size
280413006	6H
280413012	12H

4.4 | 1,5 mm XS parallel plate



Anodized Titanium

Cat. no	Size
280414006	6H
280414008	8H
280414012	12H
280414016	16H

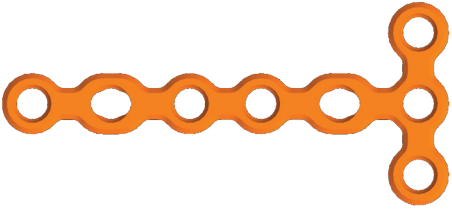
4.5 | 2,0 mm XS straight plate



Anodized Titanium

Cat. no	Size
280421006	6H
280421012	12H

4.6 | 2,0 mm XS T-plate



Anodized Titanium

Cat. no	Size
280422305	head 3H, tail 5H
280422311	head 3H, tail 11H
280422505	head 5H, tail 5H
280422511	head 5H, tail 11H

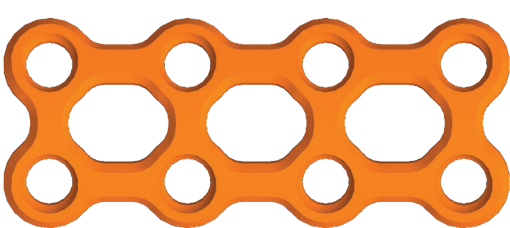
4.7 | 2,0 mm XS L-plate



Anodized Titanium

Cat. no	Size
280423006	6H
280423012	12H

4.8 | 2,0 mm XS parallel plate



Anodized Titanium

Cat. no	Size
280424006	6H
280424008	8H
280424012	12H
280424016	16H

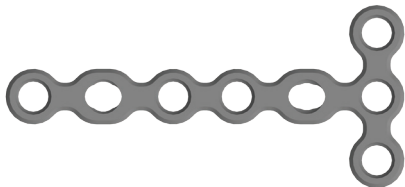
4.9 | Vortex Spider plate



Anodized Titanium

Cat. no	Size
280430001	Small
280430002	Large

4.10 | Vortex Mini T plate



Anodized Titanium

Cat. no	Size
280432305	head 3H, tail 5H
280432311	head 3H, tail 11H
280432505	head 5H, tail 5H
280432511	head 5H, tail 11H

4.11 | Vortex Mini L plate



Anodized Titanium

Cat. no	Size
280433006	6H
280433012	12H

4.12 | Vortex straight plate Mini



Anodized Titanium

Cat. no	Size
275208004	4H
275208005	5H
275208006	6H
275208007	7H
275208008	8H
275208010	10H

4.13 | Vortex screw - Ø1,5 mm

Anodized Titanium

Cat. no	Size
260815006	6
260815007	7
260815008	8
260815009	9
260815010	10
260815011	11
260815012	12
260815013	13
260815014	14
260815015	15
260815016	16
260815017	17
260815018	18
260815019	19
260815020	20
260815021	21
260815022	22
260815023	23
260815024	24



4.14 | Vortex screw - Ø2,0 mm

Anodized Titanium

Cat. no	Size
260820006	6
260820007	7
260820008	8
260820009	9
260820010	10
260820011	11
260820012	12
260820013	13
260820014	14
260820015	15
260820016	16
260820017	17
260820018	18
260820019	19
260820020	20
260820021	21
260820022	22
260820023	23
260820024	24



4.15 | Cortical screw - TX Ø1,5 mm

Anodized Titanium

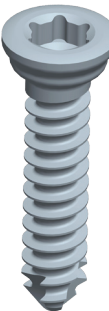
Cat. no	Size
267515006	6
267515008	8
267515010	10
267515012	12
267515014	14
267515016	16
267515018	18
267515020	20
267515022	22
267515024	24



4.16 | Cortical screw - TX Ø2,0 mm

Anodized Titanium

Cat. no	Size
267520006	6
267520008	8
267520010	10
267520012	12
267520014	14
267520016	16
267520018	18
267520020	20
267520022	22
267520024	24



4.17 | Vortex screw - Ø2,7 mm

Anodized Titanium

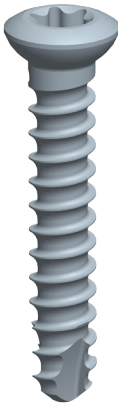
Cat. no	Size
260827108	8
260827109	9
260827110	10
260827111	11
260827112	12
260827113	13
260827114	14
260827115	15
260827116	16
260827117	17
260827118	18
260827119	19
260827120	20
260827121	21
260827122	22
260827123	23
260827124	24
260827125	25
260827126	26
260827127	27
260827128	28
260827129	29
260827130	30
260827131	31
260827132	32
260827133	33
260827134	34



4.18 | Cortical screw - TX Ø2,7 mm

Anodized Titanium

Cat. no	Size
267527008	8
267527010	10
267527012	12
267527014	14
267527016	16
267527018	18
267527020	20
267527022	22
267527024	24
267527026	26
267527028	28
267527030	30
267527032	32
267527034	34



Screw details

Screw size	1,5 mm	2,0 mm	2,7 mm
Thread dia	1,5 mm	2,0 mm	2,7 mm
Torx recess	TA7	TA7	T9
Head dia	2,8 mm	3,4 mm	4 mm
Pre-hole	1,1 mm	1,5 mm	2,0 mm
Pitch	0,5 mm	0,6 mm	0,9 mm
Color	yellow	orange	blue

Plate details

Description		Indication	Cross section (mm)	Image	Size	Length (mm)	Screw	
							Poliaxial	Cortical
1,5 XS straight plate		Hand	5x1,3		6H; 12H	38;77	1,5	1,5
1,5 XS T-plate		Hand	5x1,3		3;5H head 5;11H tail	38;77	1,5	1,5
1,5 XS L-plate		Hand	5x1,3		6H; 12H	38;77	1,5	1,5
1,5 XS parallel plate		Hand	5x1,3		4H; 6H; 8H	27,5-57,5	1,5	1,5
2,0 XS straight plate		Hand	6x1,8		6H; 12H	44;89	2,0	2,0
2,0 XS T-plate		Hand	6x1,8		3;5H head 5;11H tail	44;89	2,0	2,0
2,0 XS L-plate		Hand	6x1,8		6H; 12H	44;89	2,0	2,0
2,0 XS parallel plate		Hand	6x1,8		4H; 6H; 8H	33-69	2,0	2,0
Spider plate		Hand	17x1,8 20x1,8		small large	-	2,7	2,7
Arthrodesis plate	straight	Hand	8/12x3		4+5H	120	2,7	2,7
	bent	Hand	8/12x3		4+4H	117,5	2,7	2,7
Mini straight plate		Hand, Foot	8x2,5		4H-10H	47-101	2,7	2,7
Mini T-plate		Foot	7x2		3;5H head 5;11H tail	50,2;101,4	2,7	2,7
Mini L-plate		Foot	7x2		6H; 12H	50,2;101,4	2,7	2,7

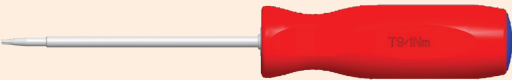
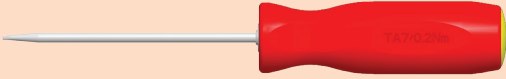
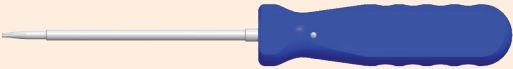
5.1 | Filled up tray

Surgical instruments			
Description	Size	Quantity	Cat. no
Spiral drill	1,1x85mm	1	939511085
Spiral drill	1,5x110mm	4	939515110
Spiral drill	2x125 mm	1	280114903
Double drill sleeve - V	Mini	1	275208901
Double drill sleeve - V	1,1 mm	1	280410901
Double drill sleeve - V	1,5 mm	1	280420901
Double drill sleeve - PAS	2 mm	1	280114902
Double drill sleeve - PAS	1,1 mm	1	280410902
Double drill sleeve - PAS	1,5 mm	1	280420902
Threaded sleeve	2 mm	2	280114906
Threaded sleeve	1,5 mm	2	280420903
Threaded sleeve	1,1 mm	2	280410903
Length gauge	2.7-3.5 mm	1	280114905
Length gauge	1,5-2 mm	1	280410904
Drill stop	2 mm	2	210510222
Screw forceps		1	939999002
Torque screwdriver	T9 / 1 Nm	1	210510036
Torque screwdriver	TA7 / 0.2 Nm	1	210510056
Screwdriver	T9	1	210720009
Screwdriver	TA7	1	210720007
Reamer	Small	1	280430901
Reamer	Large	1	280430902
Kirschner wire	1,1x80mm	4	937511080
Kirschner wire	1,5x100mm	4	937515100
Cutting plier		1	410090003
Tray - VHF			280400801
Filled up tray (VHF)			280400800

5.2 | Instruments

Spiral drill (1,1x85 mm)	939511085
Spiral drill (1,5x110 mm)	939515110
Spiral drill (2x125 mm)	280114903
Double drill sleeve - V (Mini)	275208901
Double drill sleeve - V (1,1 mm)	280410901
Double drill sleeve - V (1,5 mm)	280420901
Double drill sleeve - PAS (2 mm)	280114902
Double drill sleeve - PAS (1,1 mm)	280410902
Double drill sleeve - PAS (1,5 mm)	280420902
Threaded sleeve (2 mm)	280114906
Threaded sleeve (1,5 mm)	280420903

5.2 | Instruments

Threaded sleeve (1,1 mm)	 280410903
Length gauge (2,7-3,5 mm)	 280114905
Length gauge (1,5-2 mm)	 280410904
Screw forceps	 939999002
Drill stop (2 mm)	 210510222
Torque screwdriver (T9 / 1 Nm)	 210510036
Torque screwdriver (TA7 / 0.2 Nm)	 210510056
Screwdriver (T9)	 210720009
Screwdriver (TA7)	 210720007

5.2 | Instruments

Reamer (Small)	 280430901
Reamer (Large)	 280430902
Kirschner wire (1,1x80 mm)	 937511080
Kirschner wire (1,5x100 mm)	 937515100
Cutting plier	410090003

Product Family

■ TRAUMATOLOGY

- 1.1. Intramedullary nails
- 1.2. Plates
- 1.3. Screws
- 1.4. Fixateur
- 1.5. Other

■ ORTHOPAEDICS

■ DENTAL

■ SPINE

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