

SURGICAL TECHNIQUES



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LOCKING PLATES



Locking plates are used for bone osteosynthesis, reconstruction of broken bones, and corrective orthopedic procedures, including TP0, TPLO / CBLO or corrective osteotomy.

Locking plates SYSTEM 1.5 are intended mainly for treatment of long bone fractures in very small animals up to 4 kg, metacarpal or metatarsal fractures in animals from 4 to 10 kg, fractures of the mandible / jaw in animals up to 10 kg and fractures of ulna in animals up to 7 kg.

Locking plates SYSTEM 2.0 are intended mainly for treatment of long bone fractures in small animals up to 7 kg, fractures of the scapula in animals from 4 to 11 kg and fractures of the mandible / jaw in animals up to about 22 kg.

Locking plates SYSTEM 2.4 are intended mainly for treatment of long bone fractures in medium-sized animals weighing from 4 to 12 kg, scapula fractures in animals from 8 to 20 kg and fractures of the mandible / jaw in animals from 12 to 40 kg.

Locking plates SYSTEM 2.7 are intended mainly for treatment of long bone fractures in medium-sized animals weighing from 6 to 25 kg, scapula fractures in animals from 15 to 35 kg and fractures of the mandible / jaw in animals over 25 kg.

Locking plates SYSTEM 3.5 are intended mainly for treatment of long bone fractures in animals weighing 15 to 50 kg, scapula fractures in animals over 30 kg.

Locking plates SYSTEM 4.5 are intended mainly for treatment of long bone fractures in animals weighing over 50 kg or for treatment of fractures in big animals like goats, horses etc.

After recognizing the type of fracture and determining the method of treatment, the appropriate implant for case and patient should be chosen. Before inserting the plate, bone reposition should be done, for this purpose a Kirschner wire can be inserted in intramedullary canal, which in the initial phase of stabilization will help in restoring the bone length and maintaining the axis.

PLATE SELECTION CHART

WEIGHT / waga (kg) ----->		1	2	3	4	5	7	10	12	15	17	20	25	30	35	40	45	50	60	70	80
METACARPUS / METATARSUS ŚRÓDRĘCZE / ŚRÓDSTOPIE	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
TIBIA KOŚĆ PISZCZEŁOWA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
FEMUR KOŚĆ UDOWA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
PELVIS / ACETABULUM MIEDNICA / PANEWKA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
SCAPULA ŁOPATKA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
MANDIBLE / MAXILLA ŻUCHWA / SZCZĘKA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
HUMERUS KOŚĆ RAMIENNA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
RADIUS KOŚĆ PROMIENIOWA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				
ULNA KOŚĆ ŁOKCIOWA	1.5																				
	2.0																				
	2.4																				
	2.7																				
	3.5																				

SYSTEMS / systemy ----->

1.5

2.0

2.4

2.7

3.5

3.5+

4.5

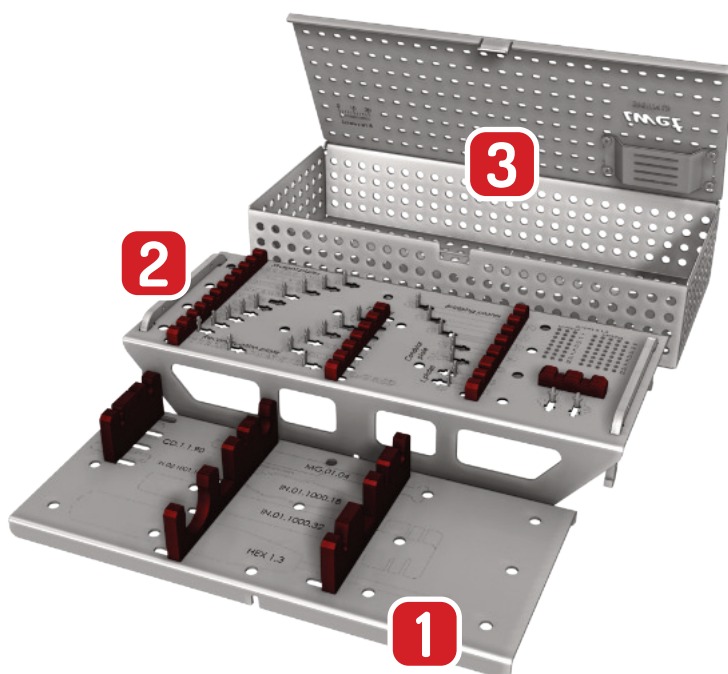
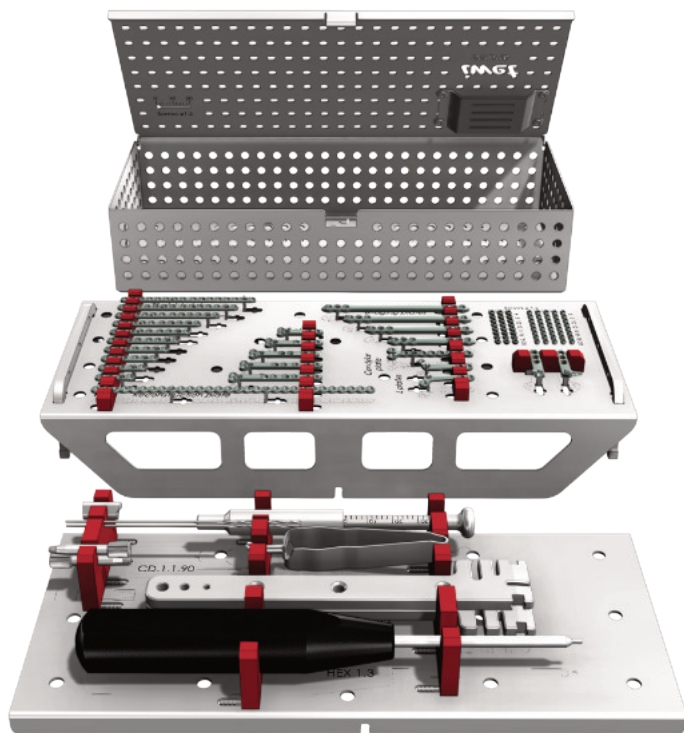
1.2



LOCKING PLATES

1.5

SYSTEM



Instrument set for locking plates 1.5

	REF
Threaded drill guide ø1.1 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø1.1 (X2)	IN.02.1001.1115
Compression drill sleeve ø1.1 TULEJKA WIERTARSKA KOMPRESYJNA Ø1.1	IN.02.1002.11
Drill bit ø1.1 x 90 (x2) WIERTŁO Ø1.1 X 90 (X2)	CD.1.1.90
Screwdriver HEX 1.3 WKRETAK STOŻKOWY HEX 1.3	IN.01T.1000.17.13
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.04
Universal bending irons (x2) WYGINAKI UNIWERSALNE (X2)	IN.01.1000.32
Tweezers for screws PESETA DO WKRETAW	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1004



Sys 1.5


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1004.0

Ti



SS


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1004.Z

LCP Containers and trays – for sterilization

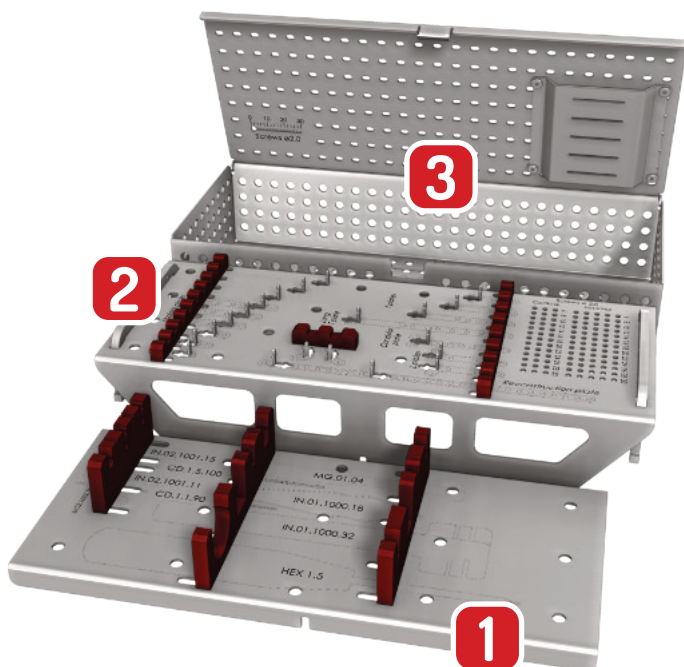
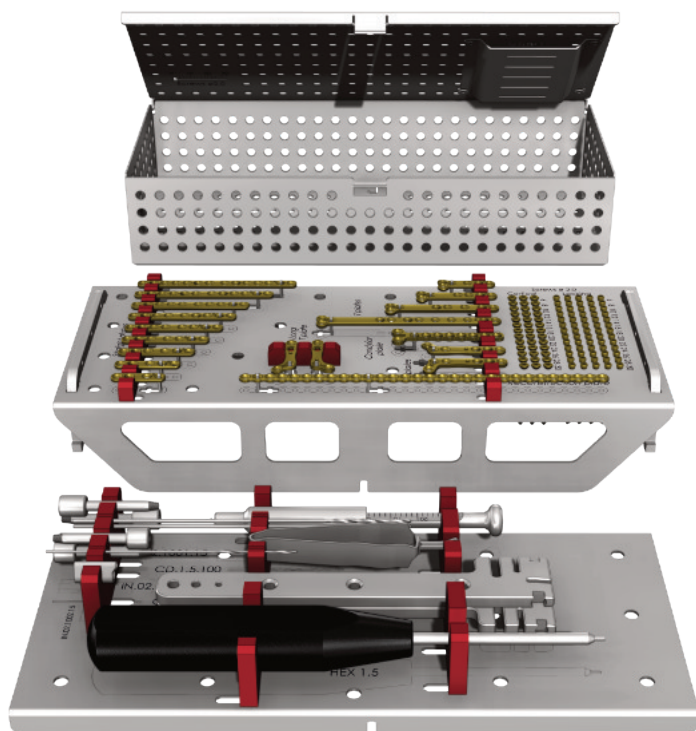
REF	IZ.01.1004
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3
WYMIARY / DIMENSIONS	255x108x54

Sys 1.5



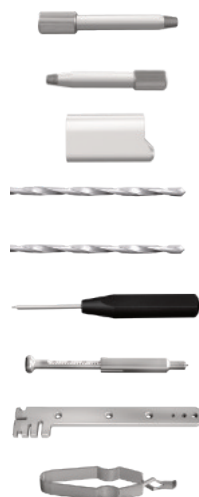
2.0

SYSTEM



Instrument set for locking plates 2.0

	REF
Threaded drill guide ø1.5 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø1.5 (X2)	IN.02.1001.15
Threaded drill guide ø1.1 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø1.1 (X2)	IN.02.1001.11
Compression drill sleeve ø1.5 TULEJKA WIERTARSKA KOMPRESYJNA Ø1.5	IN.02.1002.15
Drill bit ø1.1 x 90 WIERTŁO Ø1.1 X 90	CD.1.1.90
Drill bit ø1.5 x 100 (x2) WIERTŁO Ø1.5 X 100 (X2)	CD.1.5.100
Screwdriver HEX 1.5 WKRETAK STOŻKOWY HEX 1.5	IN.01T.1000.17.15
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.04
Universal bending irons (x2) WYGINAKI UNIWERSALNE (X2)	IN.01.1000.32
Tweezers for screws PESETA DO WKRETAW	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1003



Sys 2.0


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1003.0

Ti



SS


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1003.Z

LCP Containers and trays - for sterilization

REF	IZ.01.1003
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3

Sys 2.0

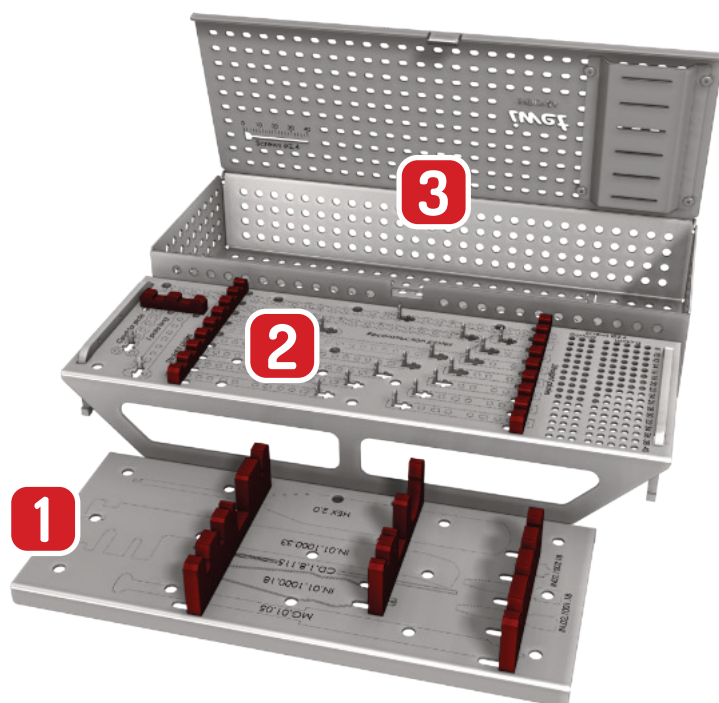
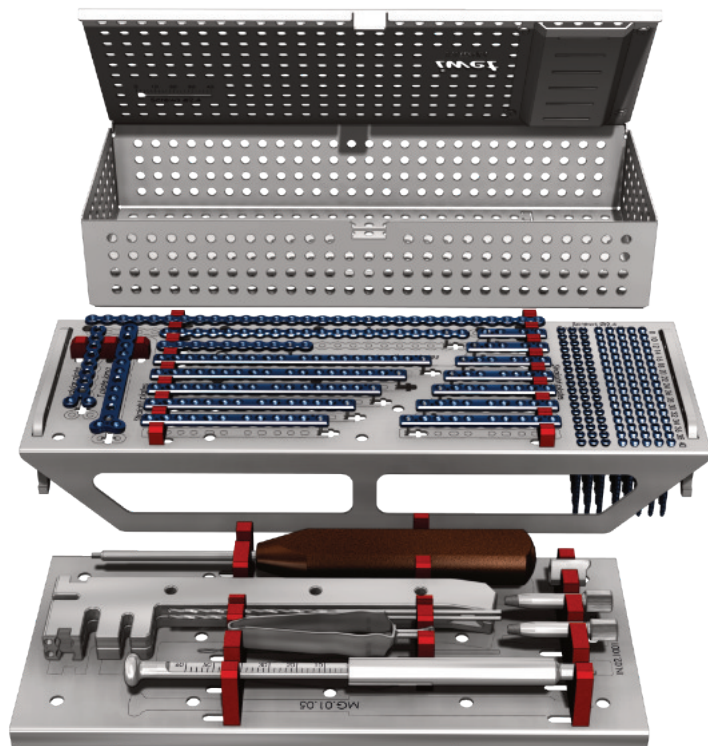


WYMIARY / DIMENSIONS

255x108x54

2.4

SYSTEM



Instrument set for locking plates 2.4

	REF
Threaded drill guide ø1.8 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø1.8 (X2)	IN.02.1001.18
Compression drill sleeve ø1.8 TULEJKA WIERTARSKA KOMPRESYJNA Ø1.8	IN.02.1002.18
Drill bit ø1.8 x 115 (x2) WIERTŁO Ø1.8 X 115 (X2)	CD.1.8.115
Screwdriver HEX 2.0 WKRETAŁ STOŻKOWY HEX 2.0	IN.01T.1000.17.20
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.05
Universal bending irons (x2) WYGINAKI UNIWERSALNE (X2)	IN.01.1000.33
Tweezers for screws PESETA DO WKRETAŁ	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1000



Sys 2.4


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1000.0

Ti



SS


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1000.Z

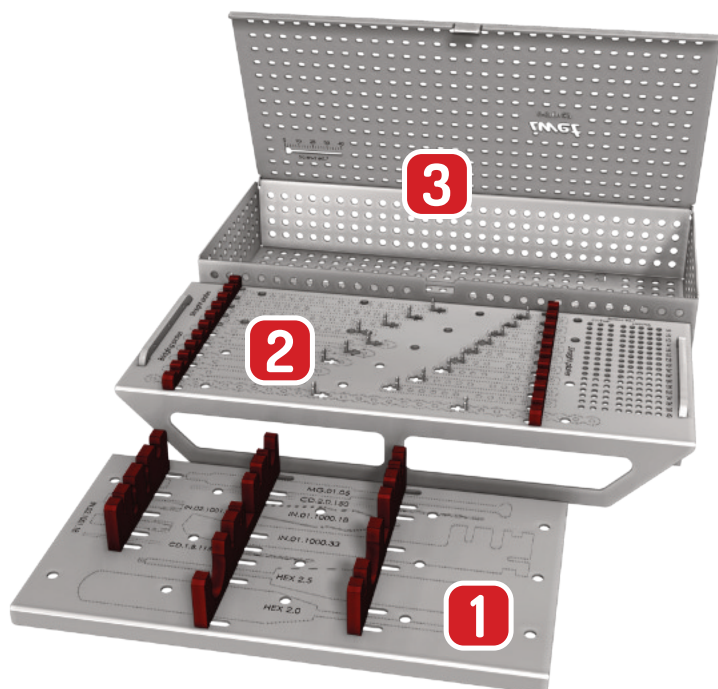
LCP Containers and trays – for sterilization

REF	IZ.01.1000
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3
WYMIARY / DIMENSIONS	290x112x54

Sys 2.4

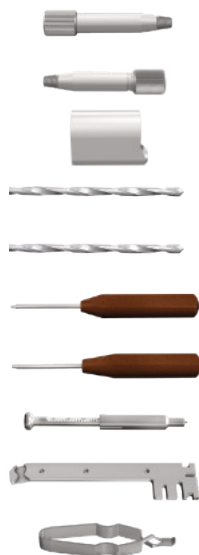


SYSTEM



Instrument set for locking plates 2.7

	REF
Threaded drill guide ø2.0 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø2.0 (X2)	IN.02.1001.20
Threaded drill guide ø1.8 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø1.8 (X2)	IN.02.1001.18
Compression drill sleeve ø2.0 TULEJKA WIERTARSKA KOMPRESYJNA Ø2.0	IN.02.1002.20
Drill bit ø2.0 x 150 (x2) WIERTŁO Ø2.0 X 150 (X2)	CD.2.0.150
Drill bit ø1.8 x 115 (x2) WIERTŁO Ø1.8 X 115 (X2)	CD.1.8.115
Screwdriver HEX 2.0 WKREŃTAK STOŻKOWY HEX 2.0	IN.01T.1000.17.20
Screwdriver HEX 2.5 WKREŃTAK STOŻKOWY HEX 2.5	IN.01T.1000.17.25
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.05
Universal bending irons (x2) WYGINAKI UNIWERSALNE (X2)	IN.01.1000.33
Tweezers for screws PESETA DO WKREŃTÓW	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1001



Sys 2.7


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1001.0

Ti



SS


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1001.Z

LCP Containers and trays - for sterilization

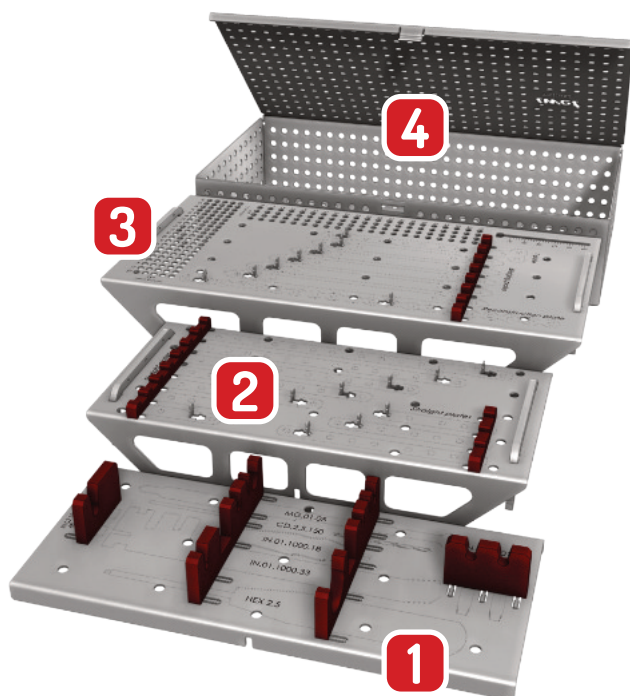
REF	IZ.01.1001
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3
WYMIARY / DIMENSIONS	305x139x54

Sys 2.7



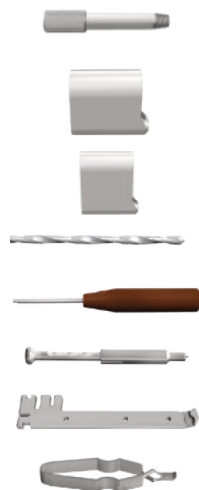
3.5

SYSTEM



Instrument set for locking plates 3.5

	REF
Threaded drill guide ø2.5 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø2.5 (X2)	IN.02.1001.25
Compression drill sleeve ø2.5 anatomical locking TPO plates TULEJKA WIERTARSKA KOMPRESYJNA Ø2.5 PŁYTKI TPŁO ANATOMICZNE BLOKOWANE	IN.02.1002.2568
Compression drill sleeve ø2.5 TULEJKA WIERTARSKA KOMPRESYJNA Ø2.5	IN.02.1002.25108
Drill bit ø2.5 x 150 (x2) WIERTŁO Ø2.5 X 150 (X2)	CD.2.5.150
Screwdriver HEX 2.5 WKRETAŁK STOŻKOWY HEX 2.5	IN.01T.1000.1725
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.05
Universal bending irons (x2) WYGINAKI UNIWERSALNE (X2)	IN.01.1000.33
Tweezers for screws PĘSETA DO WKRETAŁÓW	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1002



Sys 3.5


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1002.0

Ti



SS


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1002.Z

LCP Containers and trays – for sterilization

REF	IZ.01.1002
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	3
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	4

WYMIARY / DIMENSIONS

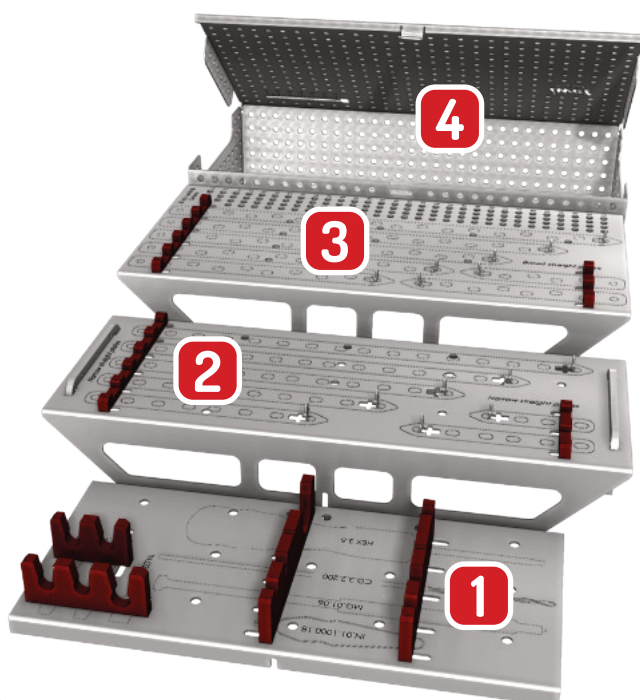
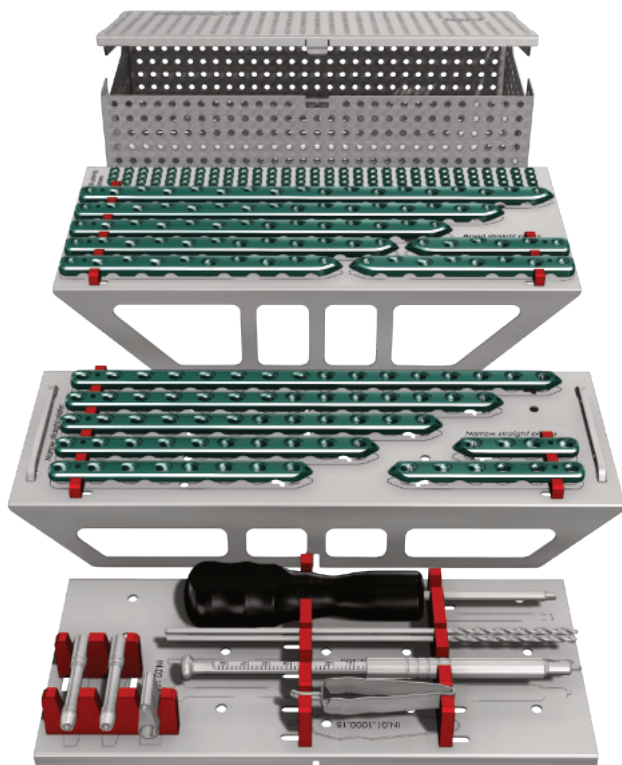
305x160x70

Sys 3.5



4.5

SYSTEM



Instrument set for locking plates 4.5

	REF
Threaded drill guide ø3.2 (x2) TULEJKA WIERTARSKA GWINTOWANA Ø3.2 (X2)	IN.02.1001.32
Compression drill sleeve ø3.2 TULEJKA WIERTARSKA KOMPRESYJNA Ø3.2	IN.02.1002.32
Drill bit ø3.2 x 200 (x2) WIERTŁO Ø3.2 X 200 (X2)	CD.3.2.200
Screwdriver HEX 3.5 WKRETAK STOŻKOWY HEX 3.5	IN.01T.1000.17.35
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.06
Tweezers for screws PESETA DO WKRETAŁ	IN.01.1000.18
SET OF STERILIZATION CONTAINERS AND TRAYS ZESTAW: KONTENER I PALETY STERYLIZACYJNE	IZ.01.1005



Sys 4.5


SET WITHOUT IMPLANTS
ZESTAW BEZ IMPLANTÓW

IZ.01.1005.0

Sys 4.5


SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1005.Z

LCP Containers and trays - for sterilization

REF	IZ.01.1005
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	3
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	4
WYMIARY / DIMENSIONS	330x170x80

Sys 4.5



Bone plate bending press *



*/ RECOMMENDED FOR SYS 2.7/3.5/4.5

REF
IN.06.1000.1





A0 quick coupling screwdriver handle with torque limiter

SHAFT SIZE		SYSTEM	TORQUE	REF STAINLESS STEEL
HEX 1.3/1.5	TORX TX5/TX6	1,5 / 2,0	0,4 Nm	IN.08.1002.04
HEX 2.0	TORX TX8	2,4 / 2,7	0,8 Nm	IN.08.1002.08
HEX 2.5	TORX TX15	3,5	1,5 Nm	IN.08.1002.15



A0 quick coupling torque limiter adapter

SHAFT SIZE TRZPIEN	SYSTEM	TORQUE MOMENT	REF
HEX 1.3/1.5	1,5 / 2,0	0,4 Nm	IN.08.1001.04



Drill guides for compression holes

Ø OF DRILL BIT Ø WIERTŁA	Ø OF SCREW Ø WKRETA	REF
1,1	1,5	PW.02.11
1,5	2,0	PW.02.15
1,8	2,4	PW.02.18
2,0	2,7	PW.02.20
2,5	3,5	PW.02.25



LOCKING SCREW INSERTING

1.

To insert locking screw stabilizing bone fractures, screw in the appropriate drill sleeve for the locking screws in the threaded hole.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill sleeve	1.1	1.5	1.8	2.0	2.5	3.2

2.

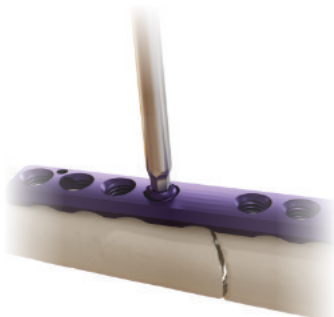
Drill a hole for locking screw by proper drill bit through two layers of cortical bone.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill bit	1.1	1.5	1.8	2.0	2.5	3.2

3.

To measure the length of the screw, remove the drill bit and the guide sleeve, then in the drilled hole place the appropriate depth gauge. The hook should be led through two cortical bones, so that its bent part rests against the outer side of the second cortex. Touch the surface of the plate. From the scale, read the bone thickness with the bone plate. In order to ensure maximum fixing, to the result add 2-3mm (measured value is 16mm, add 2-3mm, so screw length should be around 18mm).

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Depth gauge	MG.01.04	MG.01.05	MG.01.06			



4.

Using a dedicated screwdriver, screw in the locking screw, remembering not to tighten the screw by force, if the instrument set is equipped with a torque limit screwdriver, it should be used.

Ø of screw	1.5	2.0	2.4	2.7	3.5	4.5
Screwdriver	HEX 1.3	HEX 1.5	HEX 2.0		HEX 2.5	HEX 3.5
	TX 5	TX 6	TX 8		TX 15	-
Torque	0.4 Nm		0.8 Nm		1.5 Nm	4 Nm
Torque limiter	IN.08.1001.04		IN.08.1002.08		IN.08.1002.15	

CORTICAL SCREW INSERTING



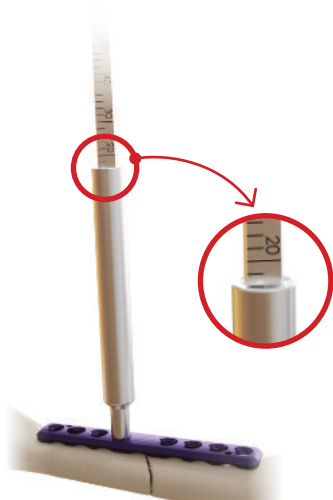
1.

Drill a hole for the cortical screw by proper drill bit through two layers of cortical bone.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill bit	1.1	1.5	1.8	2.0	2.5	3.2

2.

To measure the length of the screw, remove the drill bit and the guide sleeve, then in the drilled hole place the appropriate depth gauge. The hook should be led through two cortical bones, so that its bent part rests against the outer side of the second cortex. Touch the surface of the plate. From the scale, read the bone thickness with the bone plate. In order to ensure maximum fixing, to the result add 2-3mm (measured value is 16mm, add 2-3mm, so screw length should be around 18mm).



Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Depth gauge	MG.01.04		MG.01.05		MG.01.06	



3.

Using a dedicated screwdriver, screw in the cortical screw, remembering that over tightening can lead to damaging the connections between the screw and the bone and breaking the thread.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Screwdriver	HEX 1.5	HEX 2.0	HEX 2.5	HEX 3.5		

COMPRESSION BY LOCKING SCREW



1.

To insert the locking screw in the compression position, put the drilling sleeve for compression screws on the drilling sleeve for locking screws. (The pointed side of the compression screw drilling sleeve should be directed towards the plate) Then screw the drilling sleeve in the nearest threaded hole on the compression side of the locking - compression hole.

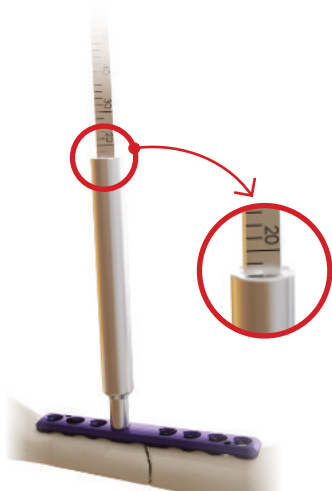
Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill sleeve	1.1	1.5	1.8	2.0	2.5	3.2



2.

Drill a hole for the compression screw by drilling by proper drill bit through two layers of cortical bone.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill bit	1.1	1.5	1.8	2.0	2.5	3.2



3.

To measure the length of the screw, remove the drill bit and the guide sleeve, then in the drilled hole place the appropriate depth gauge. The hook should be led through two cortical bones, so that its bent part rests against the outer side of the second cortex. Touch the surface of the plate. From the scale, read the bone thickness with the bone plate. In order to ensure maximum fixing, to the result add 2-3mm (measured value is 16mm, add 2-3mm, so screw length should be around 18mm).

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Depth gauge	MG.01.04			MG.01.05		MG.01.06



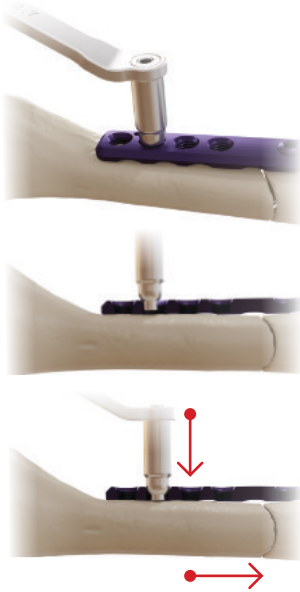
4.

Using a dedicated screwdriver, screw in the locking screw, remembering not to tighten the screw by force, if the instrument set is equipped with a torque limit screwdriver, it should be used.

Ø of screw	1.5	2.0	2.4	2.7	3.5	4.5
Screwdriver	HEX 1.3	HEX 1.5	HEX 2.0		HEX 2.5	HEX 3.5
	TX 5	TX 6	TX 8		TX 15	-
Torque	0.4 Nm		0.8 Nm		1.5 Nm	4 Nm
Torque limiter	IN.08.1001.04		IN.08.1002.08		IN.08.1002.15	



COMPRESSION BY CORTICAL SCREW



1.

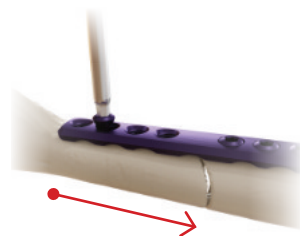
To insert the cortical screw in the compression position insert the compression guide on the outer edge of unthreaded part of the locking-compression hole, without pressing it against the bone and plate. If neutral position is necessary lightly push the guide to the bone, it will move it towards the threaded part of the hole.



2.

Drill a hole for the cortical screw by proper drill bit through two layers of cortical bone.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill bit	1.1	1.5	1.8	2.0	2.5	3.2

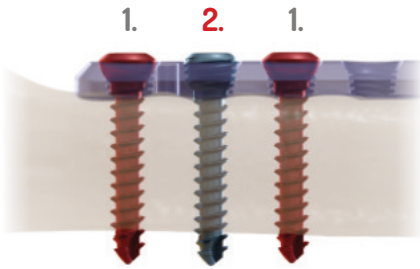


3.

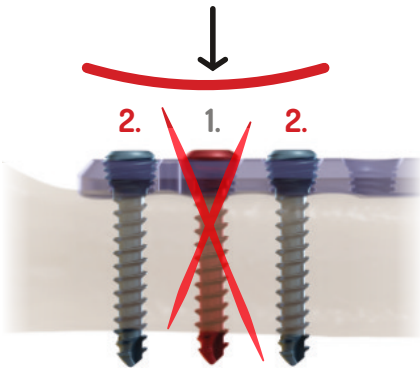
Using a dedicated screwdriver, screw in the cortical screw, remembering that over tightening can lead to damaging the connections between the screw and the bone and breaking the thread.

Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Screwdriver	HEX 1.5	HEX 2.0	HEX 2.5	HEX 3.5		

LOCKING PLATE PRINCIPLES



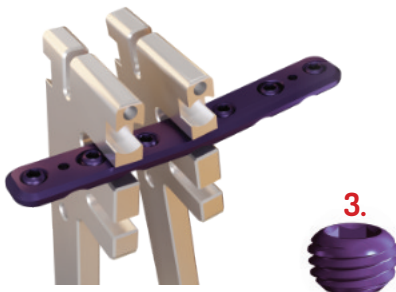
It is very important to remember about the correct order in which the bone screws are inserted in one fracture, first cortical screws (1) and after then locking screws (2).



Inserting screws in a different order especially inserting a cortical screw (1) between two locking screws (2) may lead to stress in the plate and neighbouring locking screws, which may result in implant fracture or abnormal healing process.



To compress the fracture, firstly fix the plate to one side of the fractured bone with at least two locking (2) or three cortical screws (1), then insert the locking (2) or cortical screw (1) into the compression hole on the opposite side of the plate.



Locking plates should be shaped between holes, if holes are in the the bending zone, fill them with locking screws (2) or threaded plugs (3) before bending the plate in order to prevent holes deformation.

TPL0 locking plates



TPLO saw blade adaptors

REF
IN.03.1000.1_M6
IN.03.1000.1_M7



» Other sizes on request



Threaded drill guides

SYSTEM	Ø OF DRILL BIT Ø WIERTŁA	REF
1,5	1,1	IN.02.1001.1115
2,0	1,1	IN.02.1001.11
2,0	1,5	IN.02.1001.15
2,4	1,8	IN.02.1001.18
2,7	2,0	IN.02.1001.20
3,5	2,5	IN.02.1001.25
4,5	3,2	IN.02.1001.32



Wedge osteotomy gauges

RANGE OF ANGLE ZAKRES KĄTA	REF
9°-25°	IN.01.1000.20
26°-35°	IN.01.1000.21
36°-45°	IN.01.1000.22



Castroviejo caliper

RANGE OF LENGHT ZAKRES DŁ.	REF
0-20mm	IN.01.1000.37



Adapters for modular TPLO blades

MODULAR HUB UCHWYT	FOR BLADE DLA OSTRZA	REF
SMALL / MAŁY	R12/R15/R18/R21	OT.02.00.0.1
LARGE / DUŻY	R24/R27/R30	OT.02.01.0.1

» Adapters and screws included



Modular TPLO blades

CUTTING RADIUS PROMIEN CIĘCIA	REF
R12	OT.02.12.1
R15	OT.02.15.1
R18	OT.02.18.1
R21	OT.02.21.1
R24	OT.02.24.1
R27	OT.02.27.1
R30	OT.02.30.1



TPLO saw blades

CUTTING RADIUS PROMIEN CIĘCIA	REF
R9	OT.01.09.1
R12	OT.01.12.1
R15	OT.01.15.1
R18	OT.01.18.1
R21	OT.01.21.1
R24	OT.01.24.1
R27	OT.01.27.1
R30	OT.01.30.1
R33	OT.01.33.1



1. Principles of correct preoperative X-Ray.

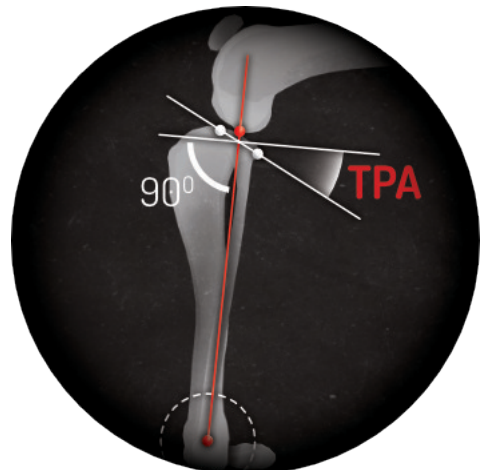


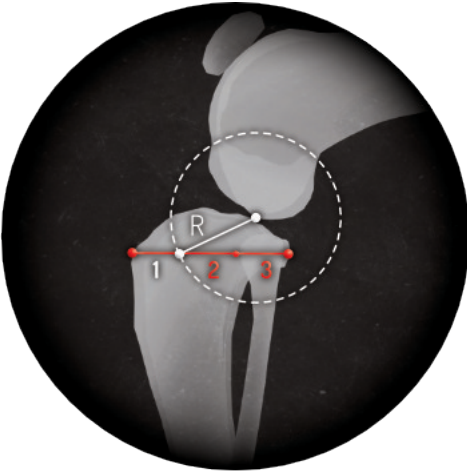
To perform a correct preoperative planning, make lateral and sagittal X-Ray view with the distal part of the femur and the ankle joint visible. Knee and ankle joints should be bent to 90° and the central beam should be directed at the knee joint or if it is impossible, to the proximal part of the tibia. Remember also to align tibial and femoral condyles as well as intercondylar eminence.

2. TPA measurements.

- To measure TPA (Tibial Plateau Angle) set and draw tibial mechanical axis – connect the center of ankle joint with the tip of the aligned intercondylar eminence.
- Draw TP (Tibial Plateau) line, which is a line of tibial articular surface, a line connecting two extreme points of this surface or a line tangent to it depending on its shape.
- In the end, draw a perpendicular line to the tibial axis through its intersection point with Tibial Plateau (TP) line.

The **TPA** is an angle between the line perpendicular to the tibial bone axis and the TP line.

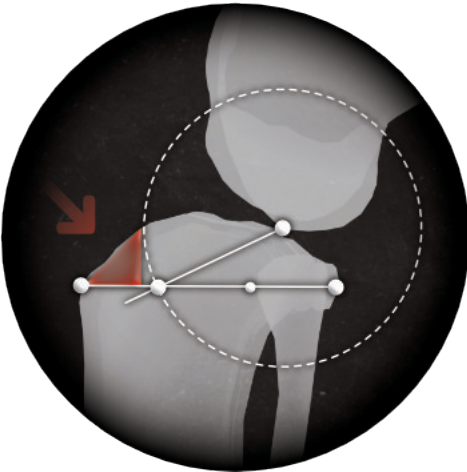


3.**Blade size selection.**

- To pick the correct size of the blade, draw a line through all the width of the tibia from the patellar ligament attachment point to the rear edge of the tibial articulation surface. Divide this line into 3 equal segments and mark the cranial part.

- Draw the line from the top of the intercondylar eminence to the caudal end of the marked segment and measure it. Pick the closest blade radius to the measured value from the available sizes.

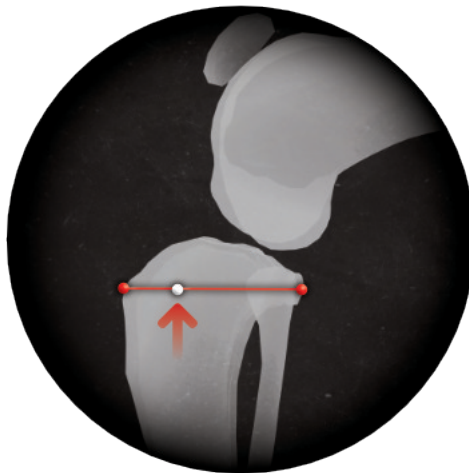
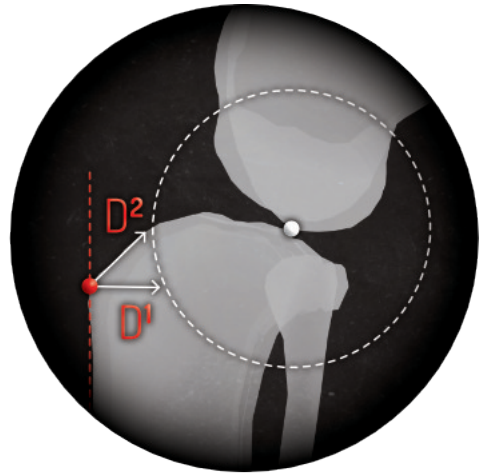
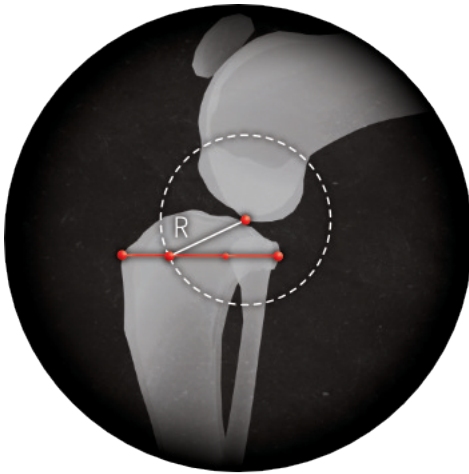
- The correctly chosen size of the blade should leave the right-angled triangle shape on the remaining part of the tibia. If the shape is closer to hourglass, the blade is chosen incorrectly.

**4.****Osteotomy rotation point.**

- The correct placement of center of rotation should be on the intercondylar eminence to save the mechanical axis of tibia.

5. Osteotomy positioning.

- Introduce the needle anterior to the medial collateral ligament to mark the position of intercondylar eminence. If you do not have the intraoperative X-Ray, measure **D1** and **D2** distance to position the blade correctly.



6. Determination of the rotation.

- After measuring the TPA and selection of the correct blade size, you can determine the rotation with the TPLO rotation - Reference chart. The safe rotation point marked with an arrow occurs in different places and depends on the distal attachment of the patellar ligament, the lower this point is, the more rotation we can perform.

PREOPERATIVE TIBIAL PLATEAU ANGLE (TPA)

TPLO rotation – Reference chart

15° 16° 17° 18° 19° 20° 21° 22° 23° 24° 25° 26° 27° 28° 29° 30° 31° 32° 33° 34° 35° 36° 37° 38° 39° 40°

ROTATION (MM) – PROVIDES RESULTANT 5° TPA

SAW RADIUS (MM)	ROTATION (MM) – PROVIDES RESULTANT 5° TPA																															
	9	16	17	19	20	22	24	25	27	28	30	31	33	34	36	37	39	41	42	44	45	47	48	50	51	53	54					
12	20	20	22	24	26	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	64	66	68	70					
15	26	26	28	31	33	36	38	41	43	46	49	51	54	56	59	61	64	66	69	71	74	76	79	81	84	86	88					
18	31	31	34	37	40	43	46	49	52	55	58	61	65	68	71	74	77	80	83	86	89	92	95	98	101	103	106					
21	36	36	40	43	47	50	54	58	61	65	68	72	75	79	83	86	90	93	97	100	104	107	111	114	118	121	124					
24	41	41	45	50	54	58	62	66	70	74	78	82	86	90	95	99	103	107	111	115	119	123	127	131	135	139	143					
27	47	47	51	56	60	65	70	74	79	84	88	93	97	102	106	111	116	120	125	129	134	138	143	147	152	156	161					
30	52	52	57	62	67	72	78	83	88	93	98	103	108	113	118	123	129	134	139	144	149	154	159	164	169	174	179					
33	58	58	63	69	75	81	86	92	98	104	109	115	121	127	133	138	144	150	156	161	167	173	179	184	190	196	202					

K-wires table for TPLO plates

	SYSTEM 3.5	SYSTEM 2.7	SYSTEM 2.4	SYSTEM 2.0	SYSTEM 1.5
Rotation K-wire (DR)	2.5/3.0 mm	2.2/2.5 mm	1.8/2.0/2.2 mm	1.6/1.5 mm	1.5/1.4 mm
Antirotation K-wire (DA)	1.5/1.6/1.8 mm	1.2/1.4 mm	1.2/1.0 mm	1.0 mm	0.8/1.0 mm

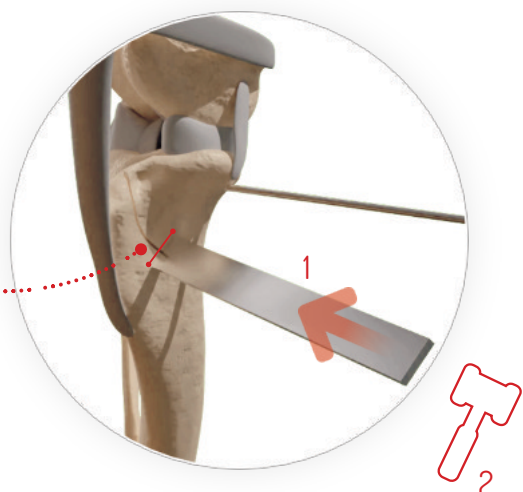
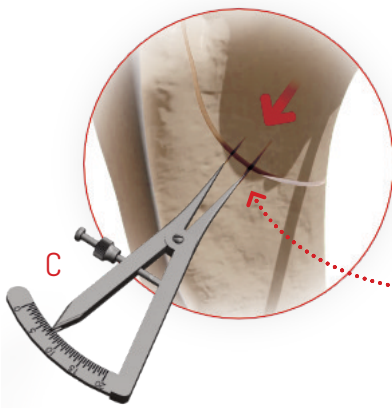
1. Bone preparation.

Firstly, mark the planned cutting line on the tibial bone with TPLO blade (OT). If it is causing problems, you can use guide K-Wire, but remember that using the wire moves the correct center of rotation.



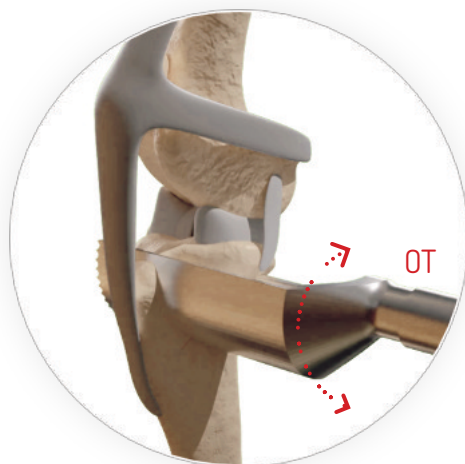
2. Marking.

Mark the bone with the osteotome (1) and mallet (2) on both sides of the cutting line, then use Castroviejo caliper to measure the distance read from the TPLO rotation chart and mark it on the distal fragment.



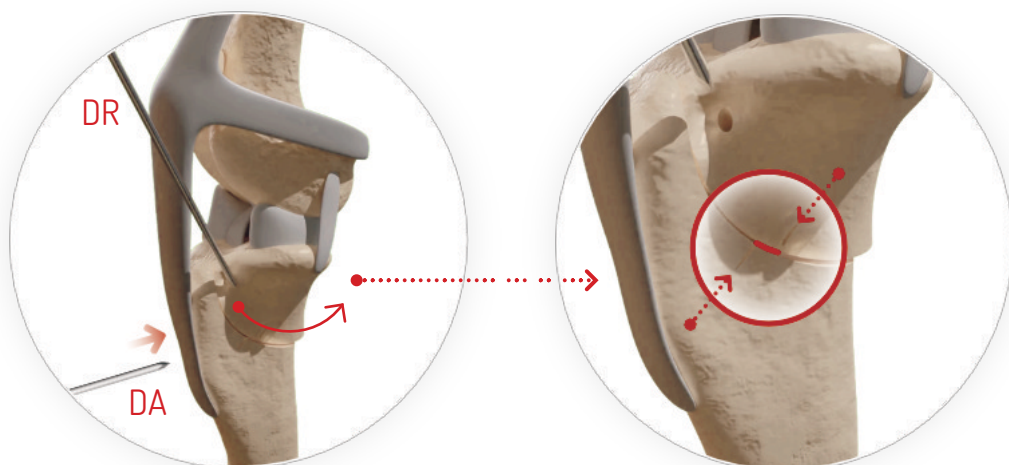
3. Cutting.

Hold the saw perpendicular to the sagittal plane and perform the cut using the blade size selected before. Remove the blade and guide wire if it was used.



4. Bone fragment rotation.

Introduce the rotation K-wire (DR) and perform the rotation read from the TPLO rotation chart. After achieving the correct rotation, block the fragments with anti-rotation K-wire wire (DA), passing through the patellar ligament attachment point.



NOTE:

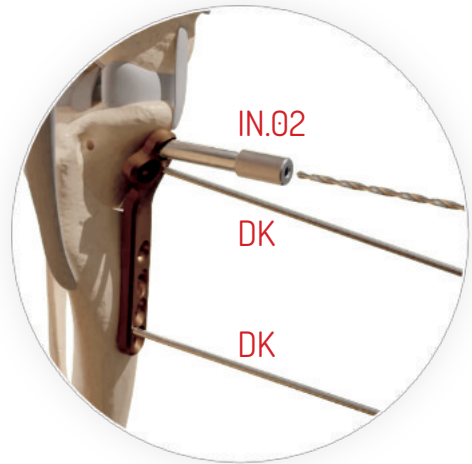
Correct diameters of DA and DR wires are in the table on page 2.6

5. Initial plate positioning.

When the fragments are temporarily fixed, put the plate on the bone and fix it with K-Wires (DK), then prepare the holes in the head of the plate with correct threaded drill guide (IN.02).

ATTENTION:

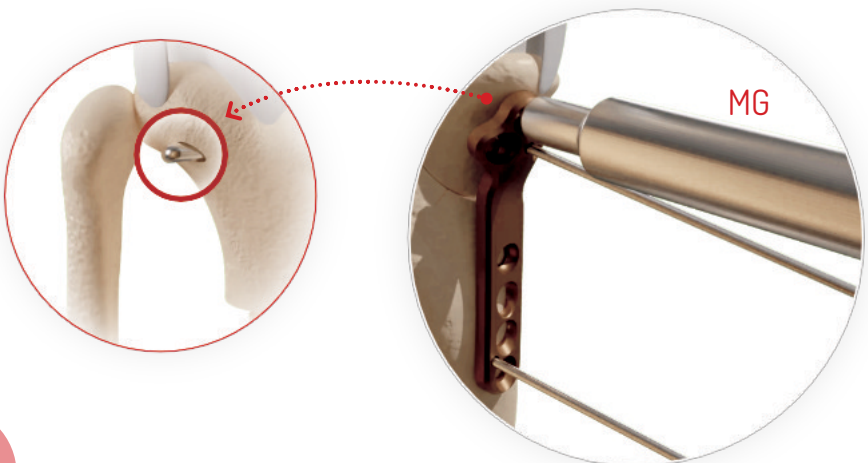
Make sure that there is no risk of joint perforation with drill bit or screws.
If necessary, use Multi-Locking Screws to avoid it.



6. Determination of the screw length.

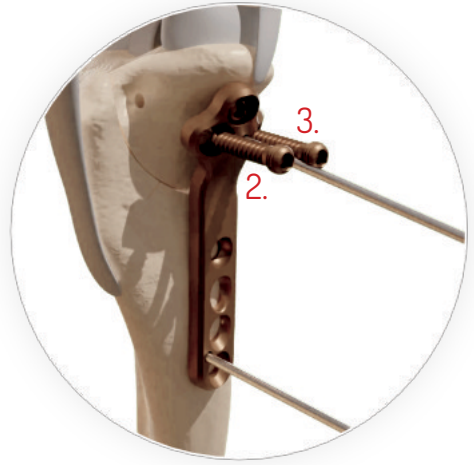
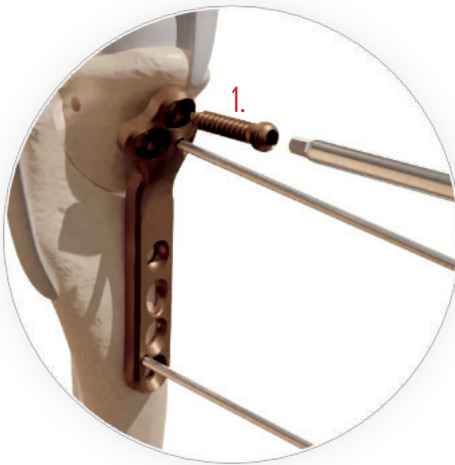
Use the correct depth gauge (MG) and measure the thickness of the bone and plate. Remember to add self-tapping tip length to the measurement:

- Add 2 mm to measurement for system 1.5 to 2.7
- Add 3 mm to measurement for system 3.5 and 4.5



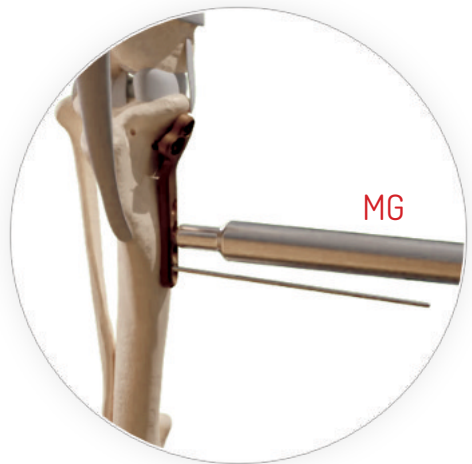
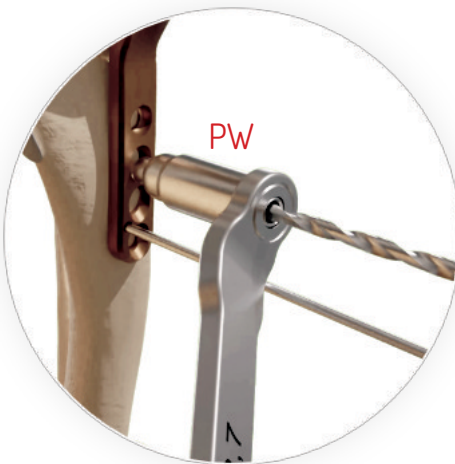
7. Locking screw insertion.

Use a dedicated screwdriver to screw in the locking screw. Remember not to overtighten the screw, if there is a torque limiter in your instrument set, you should use it.



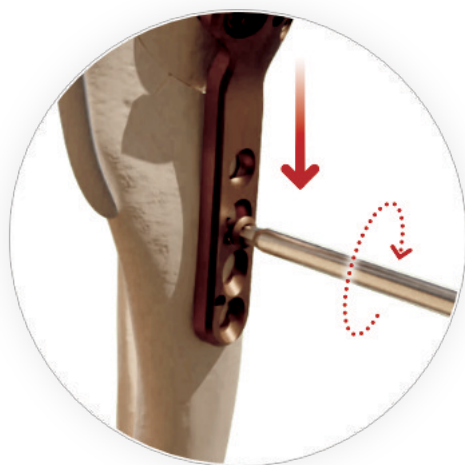
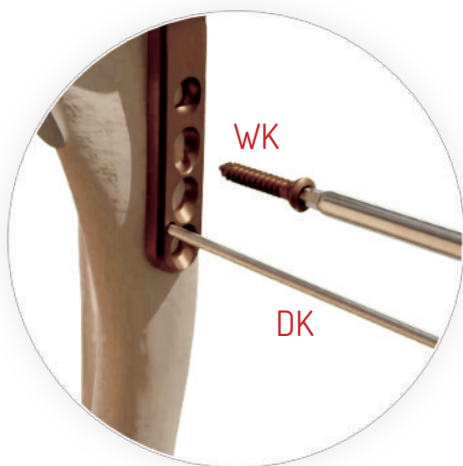
8. Compression hole.

To drill a hole for a compression screw, use the drill guide (PW). Make sure that it is on the compression side of the hole and that it is not pressed to the plate. Use the method from point 6 to determine the correct length of the screw.



9. Compression with cortical screw.

Introduce the cortical screw to the compression hole without tightening. Remove the K-wires (DK) and tighten the screw to perform the compression.



10. Locking screw insertion.

When the compression is done, use the threaded drill guide (IN.02) and the drill bit to prepare the holes (1,2,3) in the shaft of the plate. The drill bit and the screw should go through both layers of cortical bone.

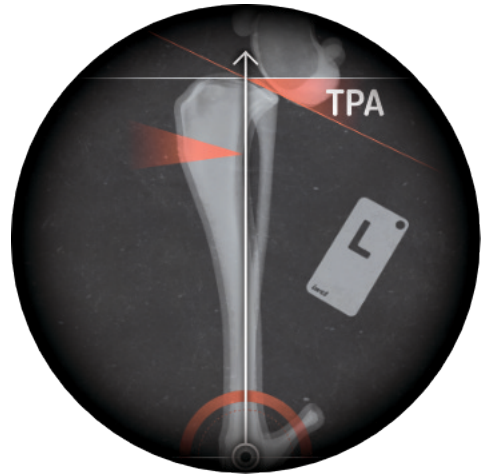


TPL0 CW0 locking plates

1. Preoperative X - Ray.

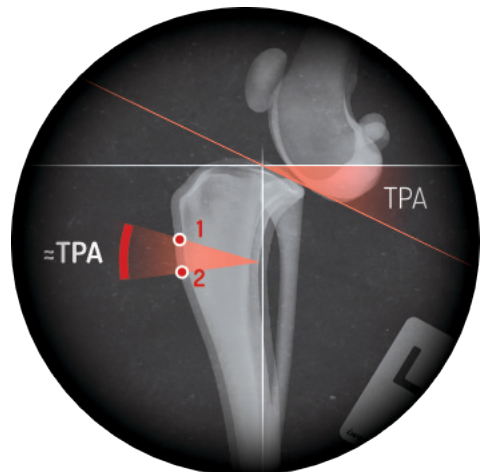
- Principles of correct preoperative X-Ray and determination of the **TPA angle** during the CWO (Cranial Wedge Osteotomy) procedure are the same as in the TPLO procedure. *

*) See point 1 in TPLO locking plates surgical technique.



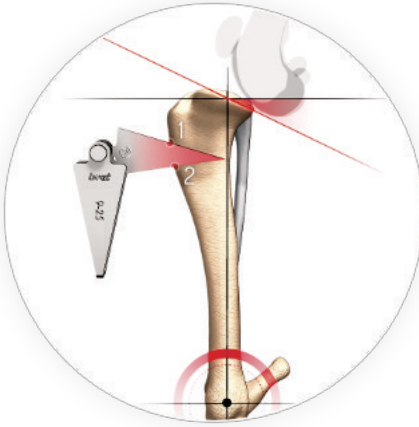
2. Positioning of the osteotomy.

- The angle of the wedge should be the same as the Tibial Plateau Angle (TPA) measured before. The starting point of the first cut should be 2-3 mm below the lower attachment of patellar ligament.
- The starting point of the second cut is on the front edge of the tibial crest and is determined by the measured TPA.



3. Determination of the cutting lines.

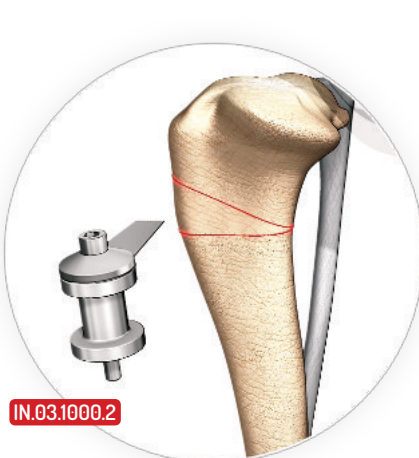
- Use the wedge osteotomy gauge to determine the cutting lines. Pull out a leaf corresponding to the previously measured TPA angle and put it on the bone. Then mark (e.g. with an electrocautery) the lines to cut the wedge.



IN.01.1000.(20/21/22)

4. Bone cutting.

- Cut along the previously marked lines, remembering about continuous cooling of the blade with a sterile Physiological Saline Solution or Ringer's solution. After cutting the first line to the half of required depth, use the wedge osteotomy gauge again to confirm the correct position of the wedge. If the first line moved during the cutting process, mark the new wedge line on the bone to maintain the correct angle.



IN.03.1000.2



5. Osteotomy reduction.

- Slowly perform the osteotomy reduction. Avoid unnecessary movements of the bone fragments. You can use the cerclage wire loop or reduction forceps.

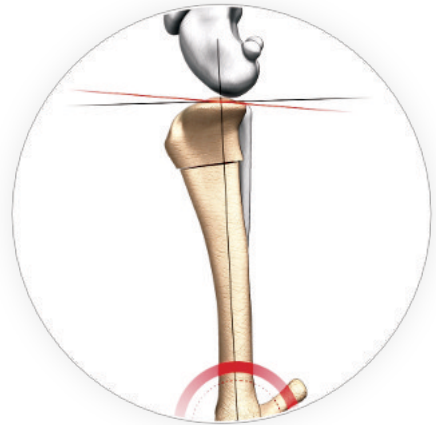
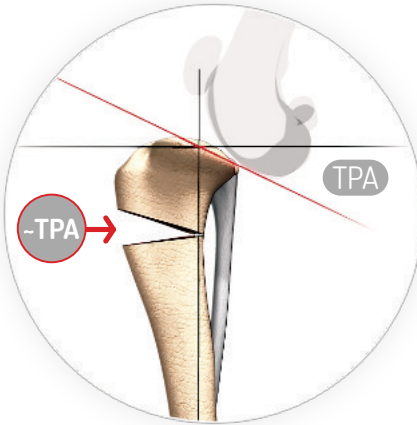


PLATE FIXATION

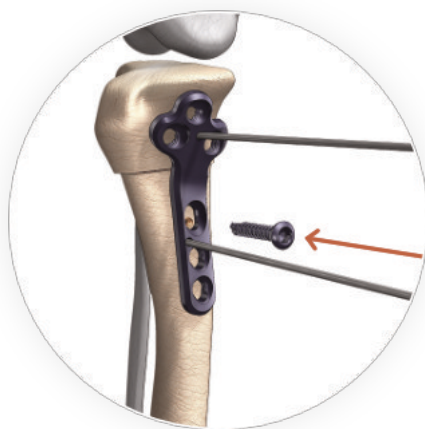
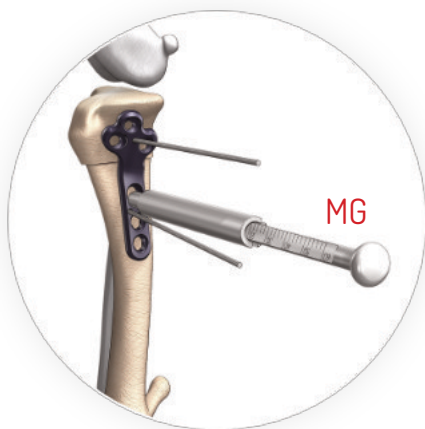
6. Bone plate positioning.

- When the bone fragments are temporarily stabilized, place the plate on the bone and use the K-wires (DK) to temporary fix it.
- Prepare a hole for compression screw using drill guide for compression holes (PW). Do not press the guide to the plate and make sure that the guide is in compression side of the hole. Drill through both layers of cortical bone.



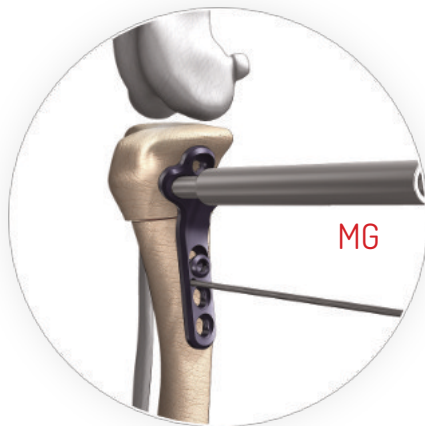
7. Cortical screw insertion.

- Use the correct depth gauge (MG) to measure the thickness of bone with the plate, remembering to add the length of self-tapping tip of the screw:
 - add 2 mm to the result for 1.5 to 2.7 system
 - add 3 mm to the result for 3.5 to 4.5 system
- Insert the cortical screw in the compression hole. Do not tighten the screw.



8. Locking screw holes preparation.

- Use the threaded drill guide (IN.02) to drill the holes in the head of the plate. Then measure the length of the screws with a bone thickness gauge (MG) according to the method shown in point 7.



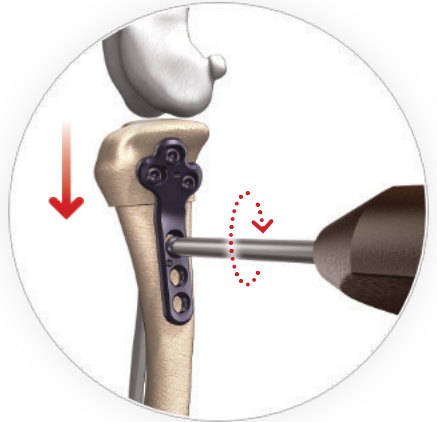
9. Locking screw insertion.

- Screw in the locking screws with a dedicated screwdriver, remembering not to tighten the screw with too much force, if the instrument set is equipped with a torque screwdriver, it should be used.



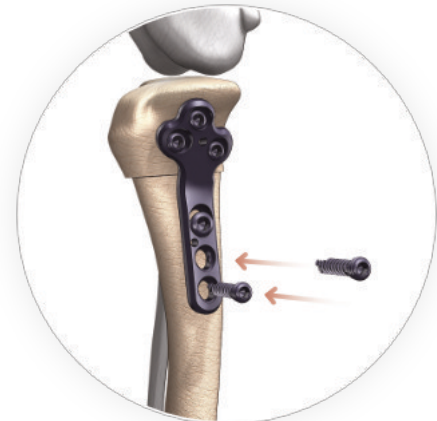
10. Compression.

- Remove the K-wires and tighten the cortical screw in the compression hole. Remember not to overtighten the screw. It can cause thread damage in the cortical bone.



11. Shaft screws insertion.

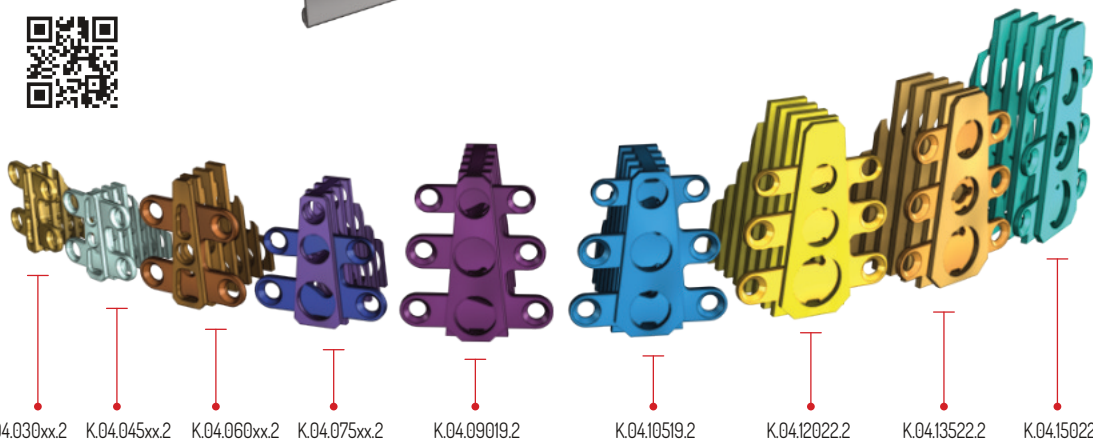
- When compression is done, use the method shown in point 8 to prepare holes for locking screws in the shaft of the plate.





TTA R+





K.04.030xx.2

K.04.045xx.2

K.04.060xx.2

K.04.075xx.2

K.04.09019.2

K.04.10519.2

K.04.12022.2

K.04.13522.2

K.04.15022.2





TTA R+ cages

SIZE ROZMIAR	HOLES OTW.	REF TITANIUM
3x7	4	K.04.03007.2
3x10	4	K.04.03010.2
4,5x9	4	K.04.04509.2
4,5x12	4	K.04.04512.2
6x13	4	K.04.06013.2
6x16	4	K.04.06016.2

SIZE ROZMIAR	HOLES OTW.	REF TITANIUM
7,5x13	4	K.04.07513.2
7,5x16	4	K.04.07516.2
9x19	6	K.04.09019.2
10,5x19	6	K.04.10519.2
12x22	6	K.04.12022.2
13,5x22	6	K.04.13522.2
15x22	6	K.04.15022.2

• CORTICAL SCREWS /wkrety korowe



SCREWDRIVER /wkretak HEX 2.0

DRILL GUIDE 1.8 /prowadnik wiertła PW.02.18

DRILL BIT 1.8 /wiertło CD.1.8.115

DEPTH GAUGE /miarka grubości MG.01.05

SAW GUIDE TTA R+ /Prowadnica ostrza IN.01.1000.(13/14)

BONE SPREADER /Rozszerzacz kostny IN.01.1000.(8/9/10)

NECESSARY/KONIECZNE ● OPTIONAL/OPCJONALNE ●

Saw guides for TTA R+

for TTA R+ cages	REF
3 / 4,5	IN.01.1000.13
6 / 7,5 / 9 / 10,5 / 12 / 13,5 / 15	IN.01.1000.14



Tapered HEX Screwdrivers



SIZE ROZMIAR	Ø OF SCREW Ø WKRETA		REF
	CORTICAL / KOROWE	LOCKING / BLOKOWANE	
HEX 1,3	-	1,5	IN.01T.1000.17.13
HEX 1,5	1,5 / 2,0	2,0	IN.01T.1000.17.15
HEX 2,0	2,4	2,4 / 2,7	IN.01T.1000.17.20
HEX 2,5	2,7 / 3,5	3,5	IN.01T.1000.17.25
HEX 3,5	4,5	4,5	IN.01T.1000.17.35



Bone Spreader for TTA R+

WIDTH SZER.	REF
4x6	IN.01.1000.8
9x12	IN.01.1000.9
13,5x15	IN.01.1000.10



Drill guides for compression holes

Ø OF DRILL BIT Ø WIERTŁA	Ø OF SCREW Ø WKRETA	REF
1,1	1,5	PW.02.11
1,5	2,0	PW.02.15
1,8	2,4	PW.02.18
2,0	2,7	PW.02.20
2,5	3,5	PW.02.25

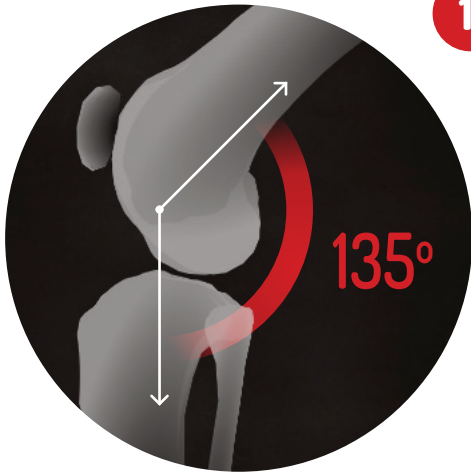


1.

Principles of correct preoperative X-Ray.

Using good quality radiographs is necessary to calculate the degree of tibial tubercle advancement. To prepare the correct X-Ray, bend the knee joint to **135°** and take the lateral view, remembering that medial and lateral tibial and medial and lateral femoral condyles should be aligned.

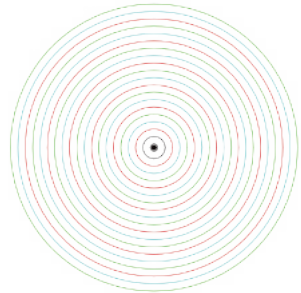
!! Correct position on X-Ray is necessary to properly use X-Ray templates.



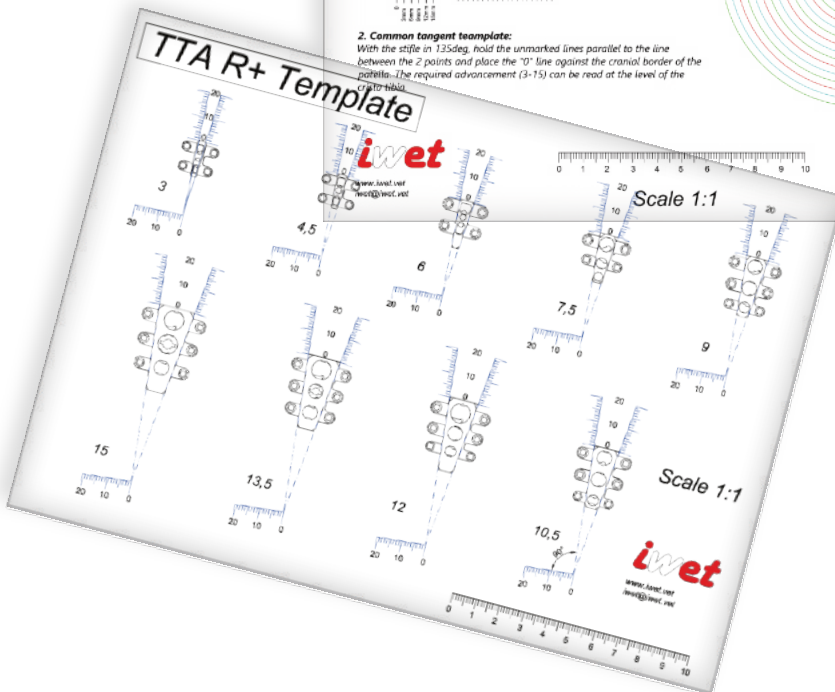
TTA R+ MEASUREMENT



2. Common tangent template:
With the stifle in 135deg, hold the unmarked lines parallel to the line between the 2 points and place the "0" line against the cranial border of the patella. The required advancement (3-15) can be read at the level of the condyles.



1. Circles:
Match the appropriate circle to the condyles of the femur and mark the centre point. Do the same with the condyles of the tibia. Connect the 2 points.



2.

Determination of the centers of condyles.

POINT 1: FEMORAL CONDYLES CENTER POINT.

Align one of the circles on the templates with the edge of femoral condyles and mark the center point.



POINT 2: TIBIAL CONDYLES CENTER POINT.

Align the correct circle with the edge of tibial condyles and mark the center point.



Determining the line for measurement.

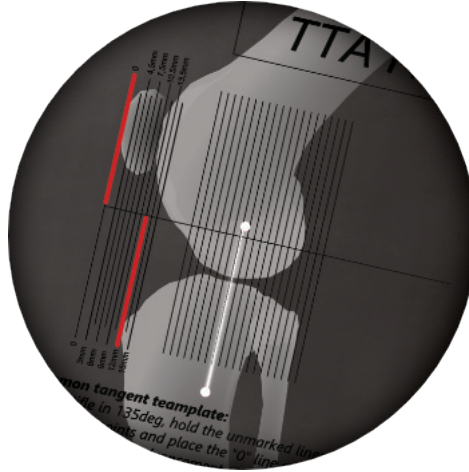
Draw a line connecting the centers of tibial and femoral condyles.



4.

Required advancement measurement.

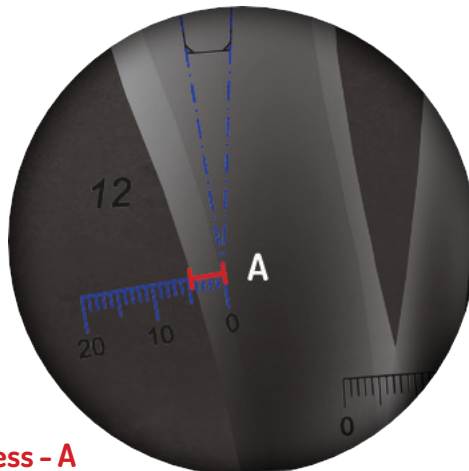
Align unmarked lines parallel to the line connecting the centers of the condyles. Align the "0" line to the cranial edge of the patella. Required advancement value is at the junction of one of the marked lines with the tibial crest. The number next to the line is the size of the required cage.



5.

Cortical bone thickness measurement.

Put the planned cutting line to the inner edge of cortical bone. Cortical bone thickness is on the junction of the outer edge of the bone with the scale on the template.

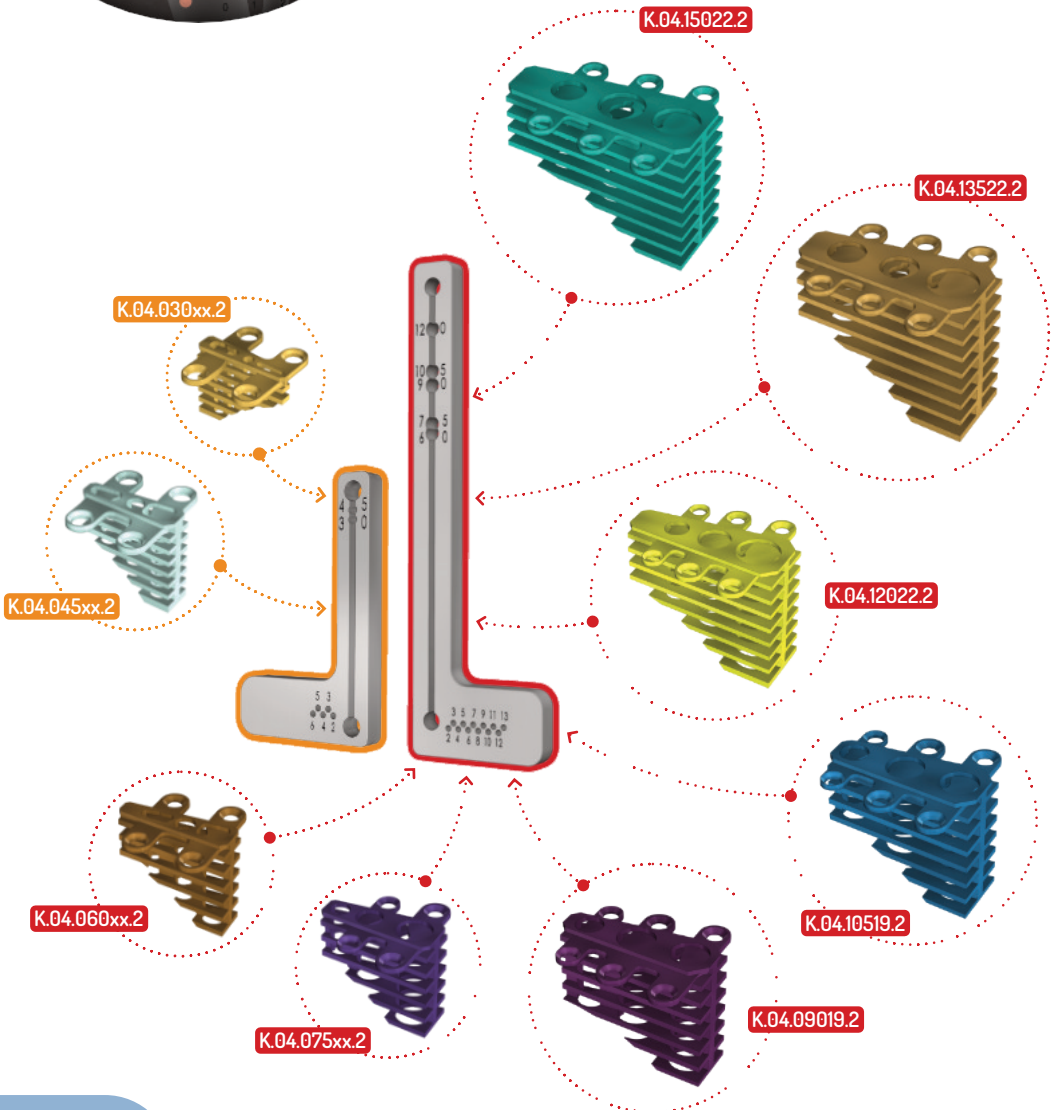
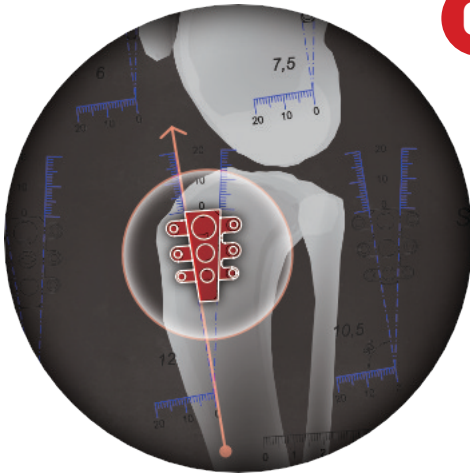


Read cortical bone **thickness - A**

6.

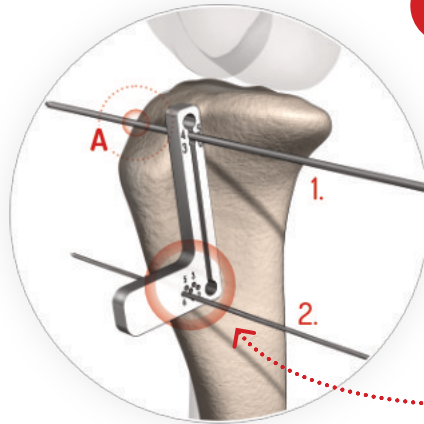
Cage positioning.

After cortical bone thickness measurement, move the cage template to the planned position and check if there is enough space on tibial crest to put all cortical screws.



1. Saw Guide positioning.

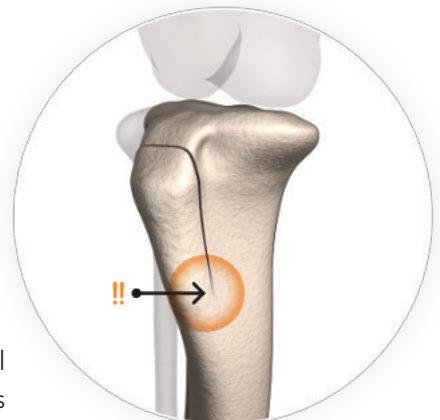
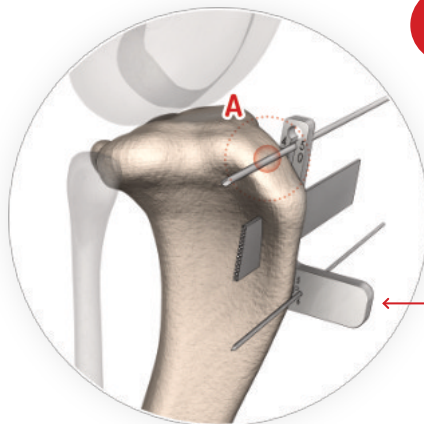
Insert \varnothing 1.6 K-wire into the hole marked with planned cage size in the vertical arm of the guide, then insert the wire with the guide on it through infrapatellar bursa, located just above the surface of the proximal tibia. In perfect conditions, the wire should be placed just in front of Gerdy's tubercle.



● Insert \varnothing 1.0 K-wire into the hole in distal part of the guide, marked with the measured cortical bone thickness.

2. Bone cutting.

Carefully perform the cut through the line determined by saw guide.



IMPORTANT!!

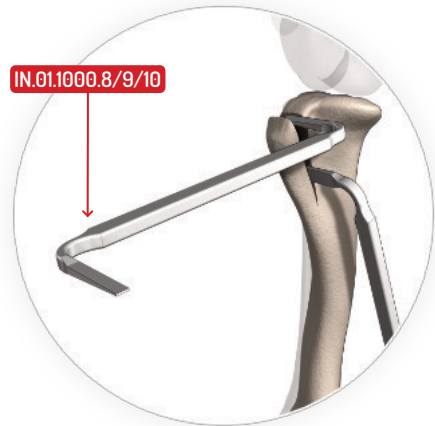
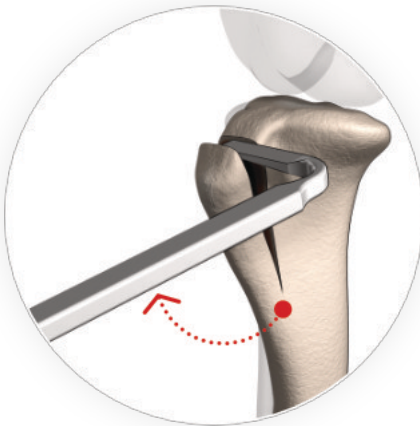
The uncut thickness of the bone should be equal to the previous measure of cortical bone thickness with X-Ray template.

3. Spreaders usage.

Insert the appropriate spreader (IN.01.1000.8/9/10) vertically into the slot and rotate it clockwise to open the gap very slowly (about 1 mm per minute). To lock the size of the gap, you can put other spreader below vertically.

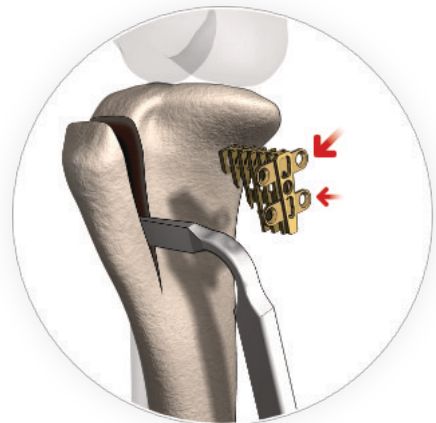
ATTENTION!

Do not rotate the second spreader! It can cause a tibial tuberosity fracture!



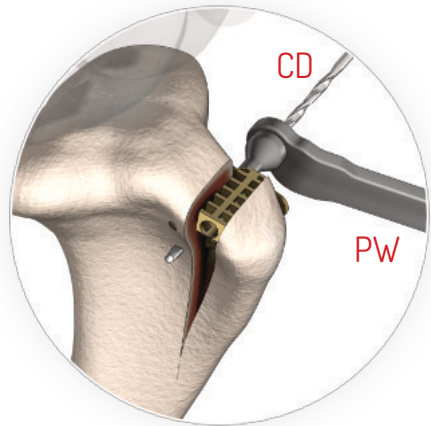
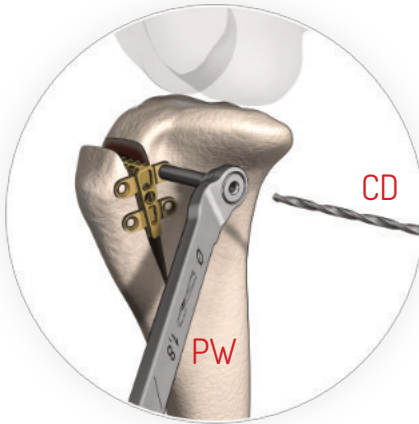
4. Cage insertion.

Profile the ears of the cage, insert the implant into the gap and remove the spreader (IN.01.1000.8/9/10).



5. Holes preparation.

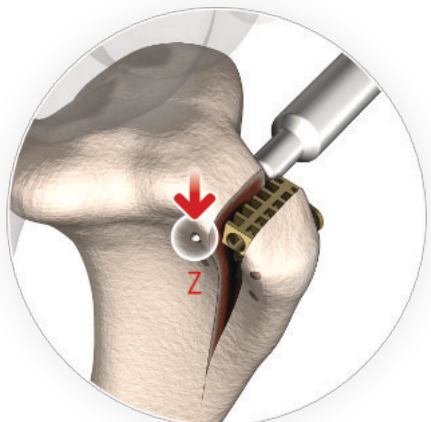
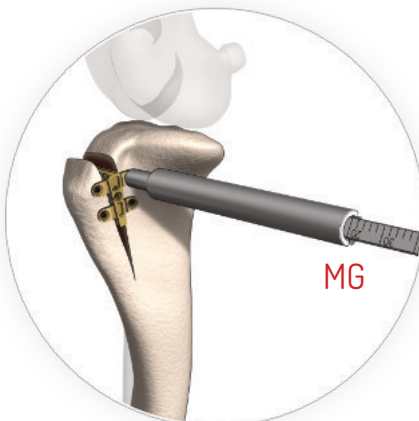
Use the drill guide (PW) and the drill bit (CD) to drill the holes through both layers of cortical bone.



6. Determination of screw length.

Use depth gauge (MG) to determine the proper length of the screw. The hook of the gauge should go through both layers of cortical bone and the bent part should rest on the external surface of the second cortex.

- Add 5-6 mm
(if the measured value equals 10mm, then the proper length of the screw equals 16mm).



7.**Cage fixing.**

Use the HEX 2.0 screwdriver to introduce the correct screws to the drilled holes.

ATTENTION!

It is recommended to fill the voids around the cage.

You can use an autologous bone graft or a bone substitute.





TRANS TOOL



Trans TOOL | DEVICE FOR TIBIAL TUBEROSITY TRANSPOSITION

SYSTEM	REV./MM * OBR./MM	REF
1,5	2,5	IN.07.1000.15.1
2,0	2,0	IN.07.1000.20.1
2,4 / 2,7	2,0	IN.07.1000.2427.1
3,5	1,5	IN.07.1000.35.1



*) Recommended transposition 1mm per 1 minute

Saw guides for TTA R+

for TTA R+ cages DO KLINOW TTA R+	REF STAINLESS STEEL
3 / 4,5	IN.01.1000.13
6 / 7,5 / 9 / 10,5 / 12 / 13,5 / 15	IN.01.1000.14



Tapered HEX screwdrivers

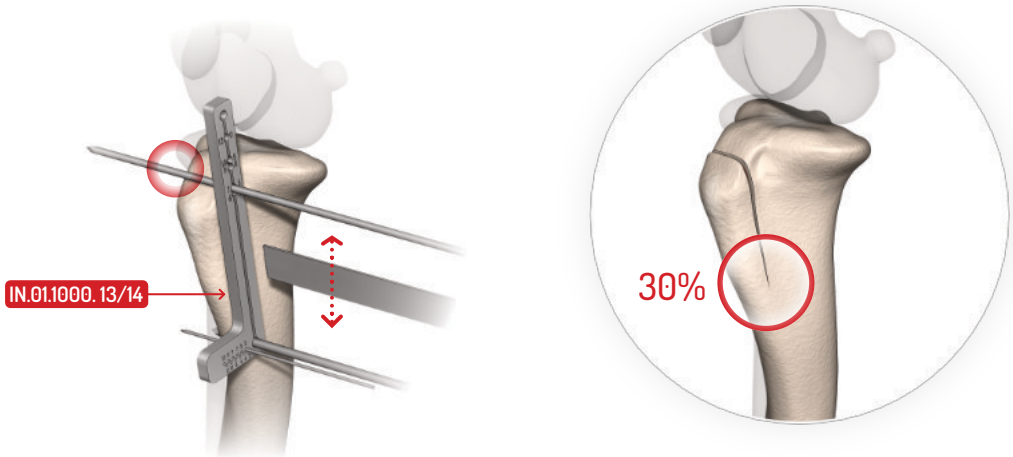


SIZE ROZMIAR	Ø OF SCREW Ø WKRETA		REF
	KOROWE / CORTICAL	BLOKOWANE / LOCKING	
HEX 1,3	-	1,5	IN.01T.1000.17.13
HEX 1,5	1,5 / 2,0	2,0	IN.01T.1000.17.15
HEX 2,0	2,4	2,4 / 2,7	IN.01T.1000.17.20
HEX 2,5	2,7 / 3,5	3,5	IN.01T.1000.17.25
HEX 3,5	4,5	4,5	IN.01T.1000.17.35



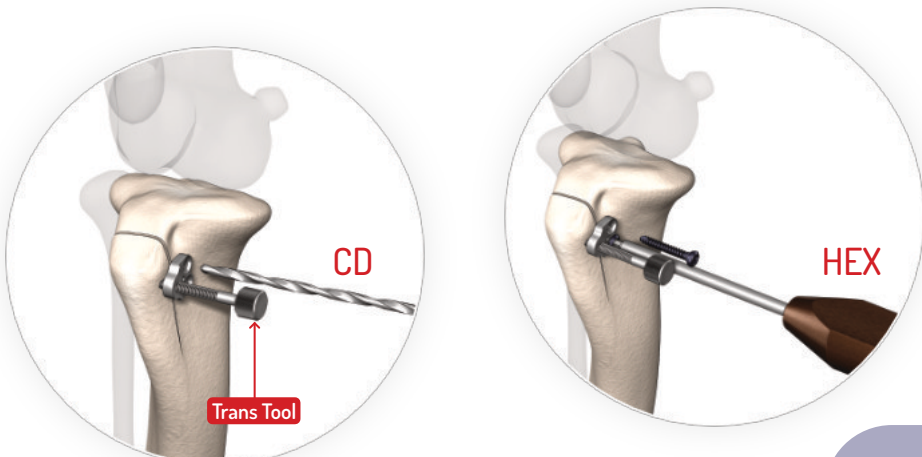
1. Bone preparation.

Carefully perform the cut on tibial bone through the correct size of saw guide. The cut should be done in **30%** of total width of the tibia in lateral view.



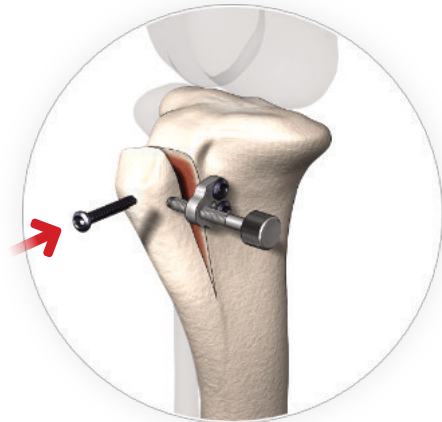
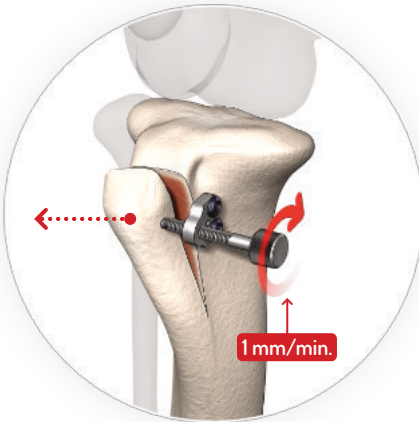
2. Trans TOOL attachment.

When the cut is done, put the tool on the bone with the holes aiming the bone axis. You can use K-wire to temporary fix the device. Use the correct drill bit (**CD**) to prepare the holes for cortical screws (System 1.5/2.0/2.4/3/5) or use threaded drill guide and drill bit to prepare the holes for locking screws (System 2.4/3.5). With the correct screwdriver, screw in the screws, remembering not to overtighten them.



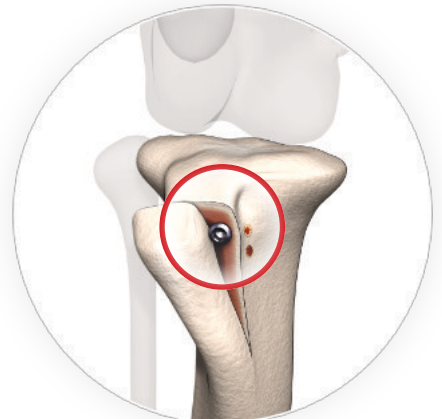
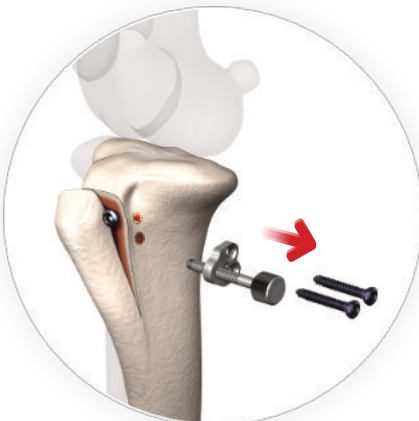
3. Tibial tuberosity transposition.

With the knurled bolt, perform the tibial tuberosity transposition at a rate **1 mm/min.** Recommended revolutions per minute for each system is in the table on [page 5.1](#).



4. Tibial tuberosity fixation.

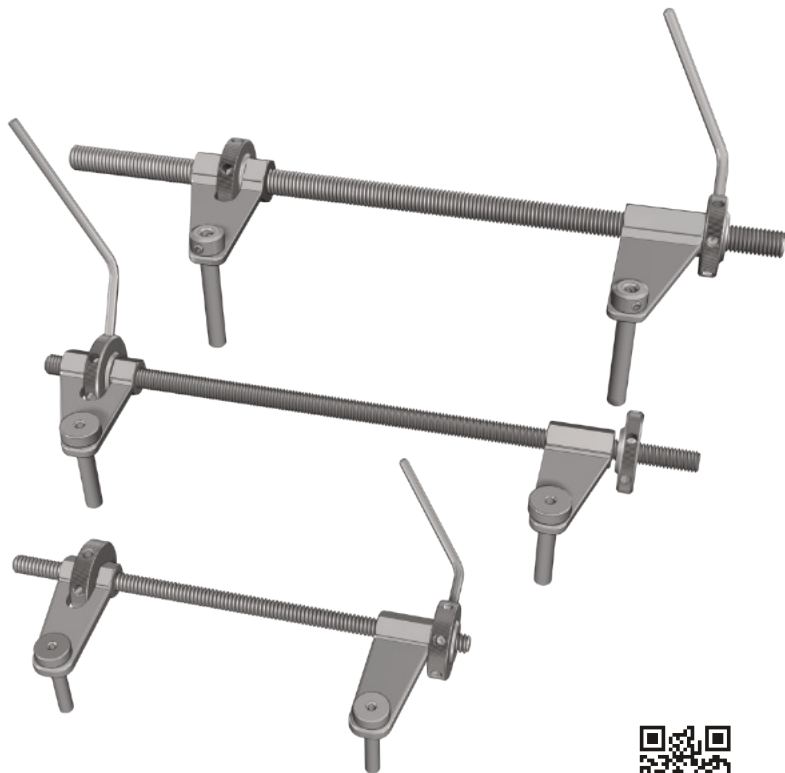
Perform the patella movement test. If the movement is correct, fix the tuberosity to the tibia. To accomplish this you can use compression screw, cortical screw, K-wires or wire girth. When the fixation is done, loosen the knurled bolt and remove the cortical screws to detach the device from the bone.



DISTRACTORS

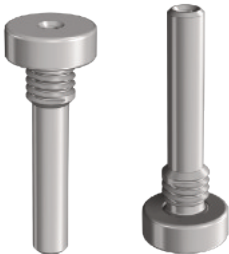


Distractors



	Wire diameter Ø DRUTU	Rod dimensions WYMIAR PRĘTA	REF
Distractor-S DYSTRAKTOR-S	ø 2	ø 6 x 150	D.01.2000.1
Distractor-M DYSTRAKTOR-M	-	ø 8 x 250	D.01.1000.1
Sleeve ø3 /Tuleja *	ø 3	-	D.01.1000.30.1
Sleeve ø2 /Tuleja *	ø 2	-	D.01.1000.20.1
Distractor-L DYSTRAKTOR-L	ø 4-5	ø 12 x 330	D.01.3000.1

* One size of sleeves in the set

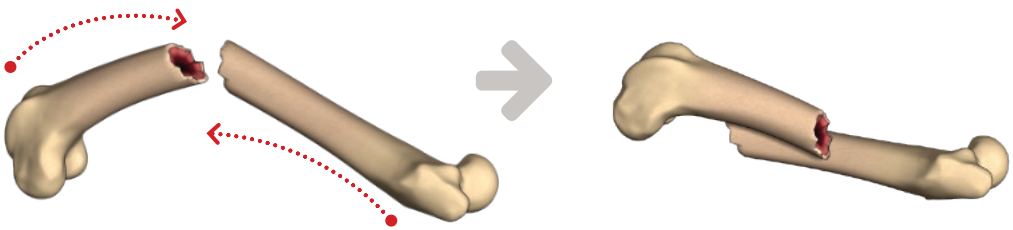


DISPLACEMENT OF BONE FRAGMENTS

Natural bone fragment displacement.

Limb fracture causes natural displacement of the bone fragments as a result of muscle contraction. Restoring the correct length of the limb and bone fragment reposition often requires lots of strength and is hard to maintain. With bone distractor, bone reposition is much easier.

IN THIS CASE, USING THE DISTRACTOR IS RECOMMENDED.

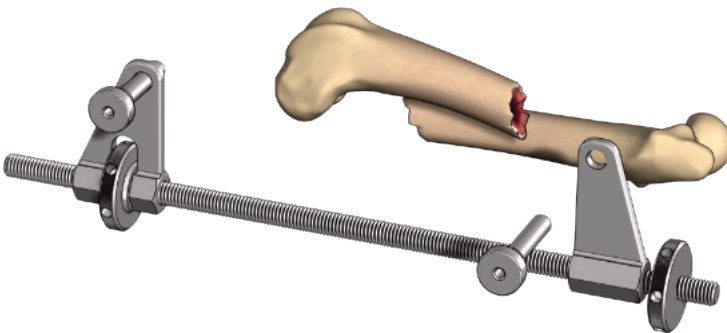


SETTING THE INITIAL POSITION OF THE DISTRACTOR

1.

Sleeve insertion.

Insert both sleeves (*) in the ears of the distractor.

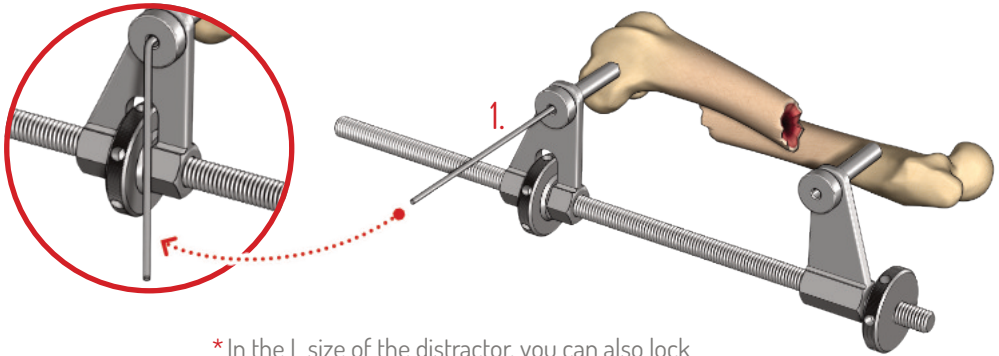


* Choose the size of the sleeves in M size of the distractor.

2.

Locking the sliding part of the distractor.

Insert the K-wire (1) into the bone through the mounted sleeve.
Lock the wire by bending it at the inlet of the sleeve hole (*).

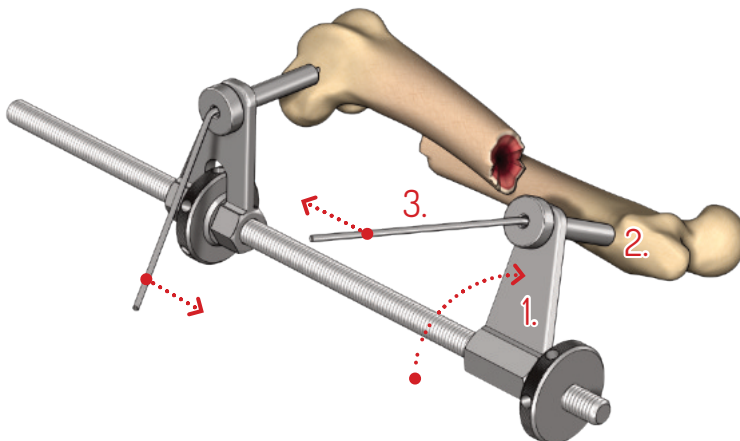


* In the L size of the distractor, you can also lock the special screw in the head of the sleeve.

3.

Locking the rotating part of the distractor.

Set the rotating part of the distractor (1) in the correct position.
Insert the K-wire (3) into the bone through the sleeve (2).
Lock the wire by bending it at the inlet of the sleeve hole (*).

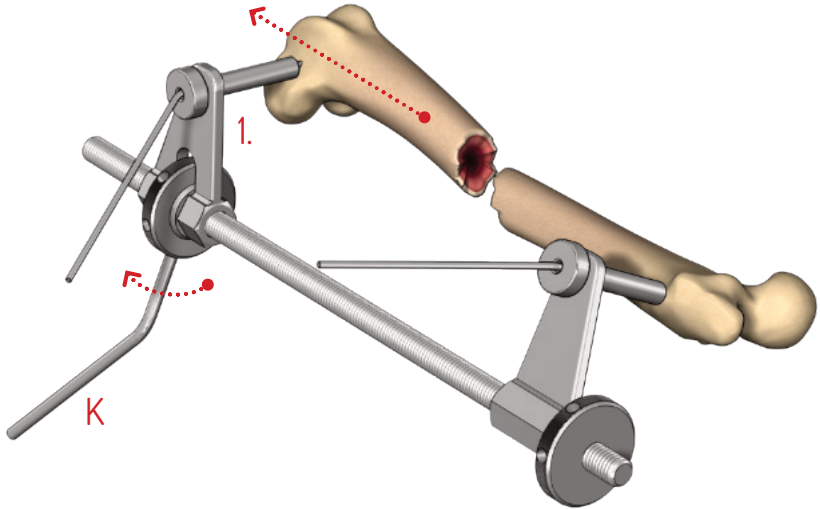


* In the L size of the distractor, you can also lock the special screw in the head of the sleeve.

4.

Bone fragments reposition with sliding part.

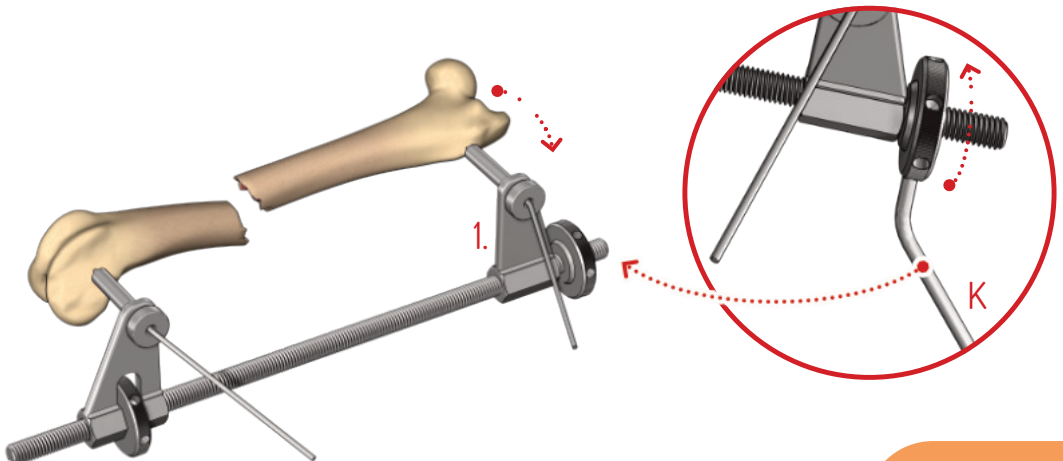
Slowly spread the bone fragments. Use the knob in the sliding part (1). If it's difficult, you can use the spanner (K) to increase the strength.



5.

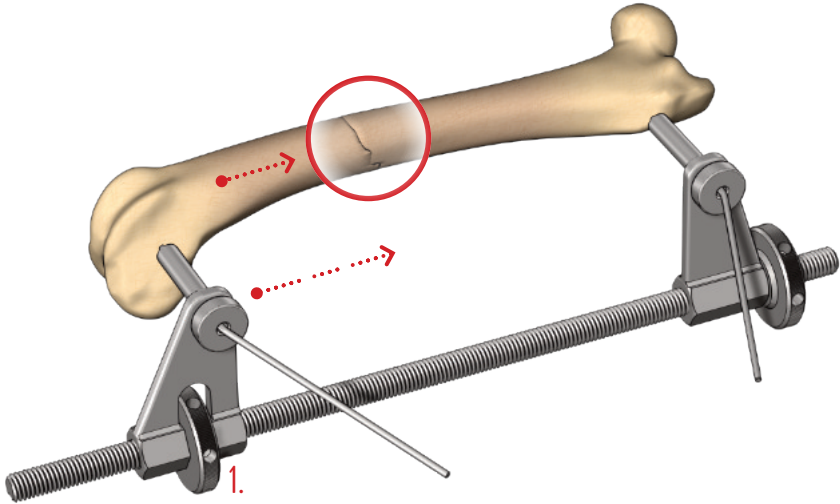
Reposition of fragments with rotating part.

If you need to rotate the fragments, use the rotating part (1) and set the bone fragment in the correct position. Lock the position of the rotating part with the noob. You can also use spanner (K) to increase the strength of rotation.



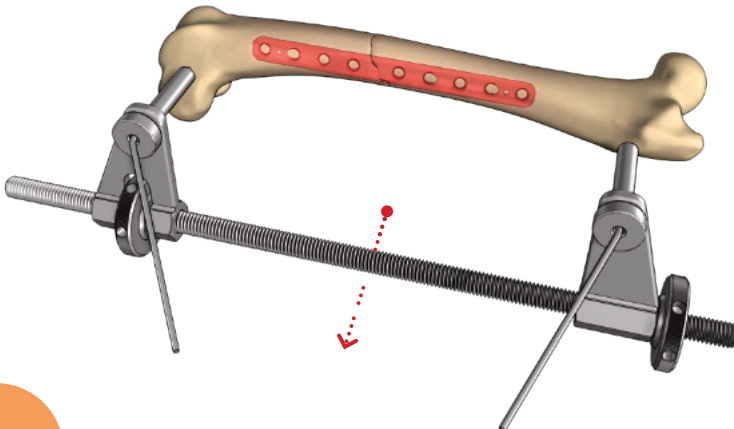
6. Final bone fragments reposition.

Move the bone fragments by using the knob (1) in the sliding part of the distractor. If it is needed, you can also perform the compression.



7. Osteosynthesis.

When the final reposition of fragments is done, use adequate implants or external fixators to stabilize the fracture and remove the distractor.



DAMAGED SCREW EXTRACTION



Hollow reamer – for broken bone screws



Ø WKRETA Ø OF SCREW (A)	Ø OTWORU Ø OF HOLE (B)	REF STAINLESS STEEL
1,5	3,2	IN.05.1002.15
2,0	3,5	IN.05.1002.20
2,4	3,5	IN.05.1002.24
2,7	4,0	IN.05.1002.27
3,5	5,0	IN.05.1002.35
4,5	6,0	IN.05.1002.45

Dimensions: (mm)



Extractors – for damaged screws




ROZMIAR SIZE	SYSTEM	DŁUGOŚĆ LENGTH	REF STAINLESS STEEL
HEX 1,3	1.5	80	IN.05.1000.13
HEX 1,5	1.5 / 2.0	80	IN.05.1000.15
HEX 2,0	2.4 / 2.7	80	IN.05.1000.20
HEX 2,5	2.7 / 3.5	80	IN.05.1000.25
HEX 3,5	4.5	80	IN.05.1000.35

Dimensions: (mm)

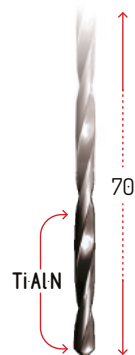


Carbide drill for metal – for damaged screw removal



SYSTEM 	Ø WIERTŁA Ø OF DRILL BIT	HEX	REF Carbide + TiAlN
1.5 / 2.0	1,5	HEX 1.3/1.5	MD.1.5.70
2.0 / 2.4 / 2.7	2,0	HEX 1.5/2.0	MD.2.0.70
2.4 / 2.7 / 3.5	2,5	HEX 2.0/2.5	MD.2.5.70
2.7 / 3.5	3,0	HEX 2.0/2.5	MD.3.0.70
3.5 / 4.5	3,5	HEX 2.5/3.5	MD.3.5.70
4.5	4,0	HEX 3.5	MD.4.0.70
4.5	4,5	HEX 3.5	MD.4.5.70

Dimensions: (mm)



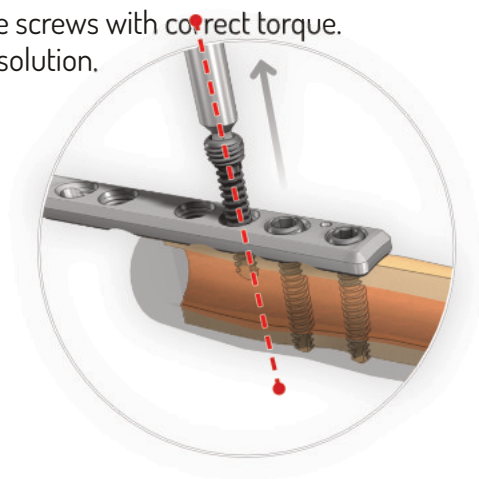
Standard Implant removal.

During insertion and extraction of the implant take care to align the axis of the screwdriver with the axis of the screw. **The screwdriver should not show any signs of damage!**

One of the most important things is to tighten the screws with **correct torque**. Screwdriver handle with torque limiter is a good solution.

Even though all recommendations are followed, the screws can sometimes be damaged during insertion or removal. *

* Torx screwdrivers has a much lower tendency to damage the socket.

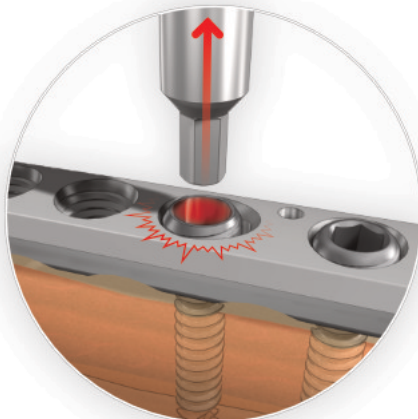
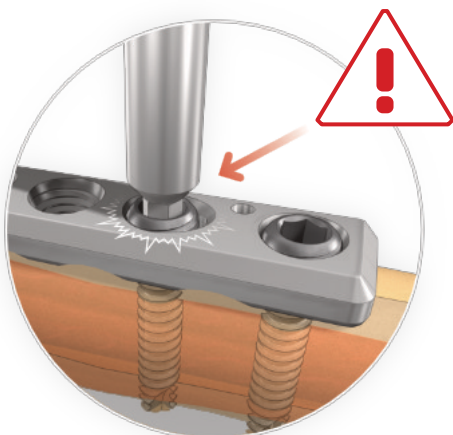


SCREW DAMAGE

1.

Screw socket damage.

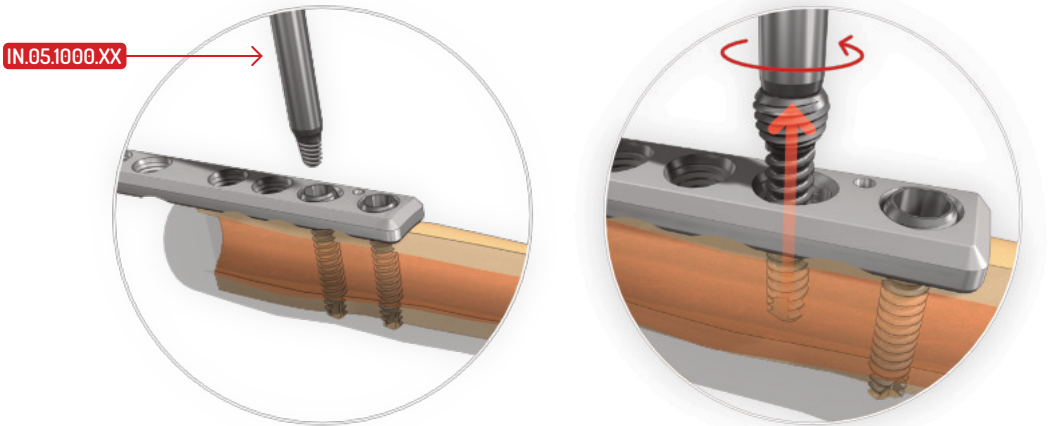
If you notice damage of the screw socket, stop removing it with the screwdriver immediately. If the damage will be too heavy, the extractor may not work properly.



2. Using the EXTRACTOR.

If the socket is damaged use the EXTRACTOR in the size corresponding to the socket size.

Screw in the extractor counterclockwise slowly. Gently push it in the socket during insertion until it locks inside the socket. Then remove the screw by continuing to rotate it.



3. Using the drill bit for metal.

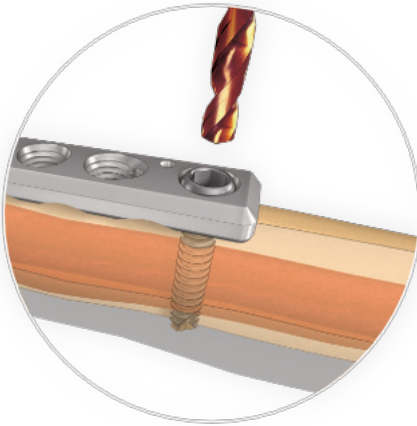
In case if using the extractor was unsuccessful, use the SPECIAL drill bit for metal. After drilling you can try to use the extractor of bigger size. ⚠



4.

Selection of proper drill bit for metal.

To use a bigger extractor, use the drill bit of the same size as HEX socket in the screw **1**. To remove the head, use the drill bit of the same or bigger size as the screw shaft **2**. If the shaft diameter is bigger than **2**, use drill bit **2** as intermediate step and use drill bit **3** as final step.

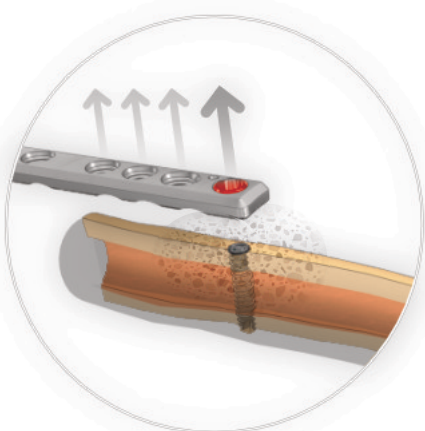


HEX	Ø OF DRILL BIT		
	1	2	3
HEX 1.3	1,5	-	-
HEX 1.5	1,5	2,0	-
HEX 2.0	2,0	2,5	3,0
HEX 2.5	2,5	3,0	3,5
HEX 3.5	3,5	4,0	4,5

5.

Bone plate removal.

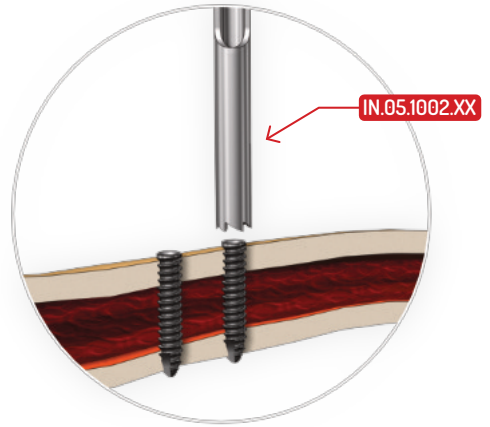
Drill the socket until the head of the screw disconnects from the shaft. Remove the plate and all the debris left from drilling.



6. HOLLOW REAMER SELECTION.

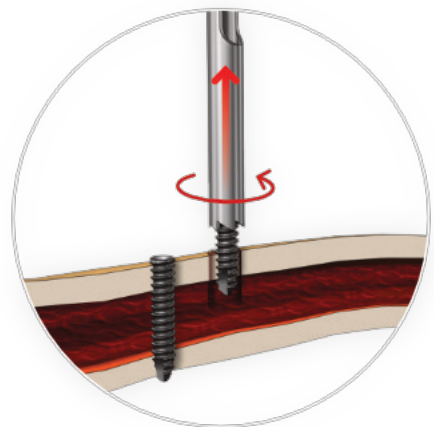
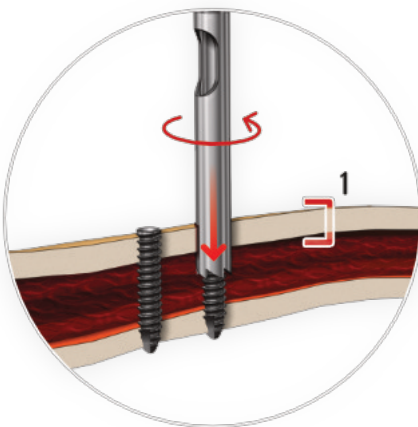
The inner diameter (**A**) must be bigger than the diameter of the screw shaft.

* Size of reamers correspond with systems of screws (1.5/2.0/2.4/2.7/3.5/4.5).



7. TYPICAL case.

Drill counterclockwise through the first cortex. The screw shaft should lock inside the reamer and screw out automatically. ⚠



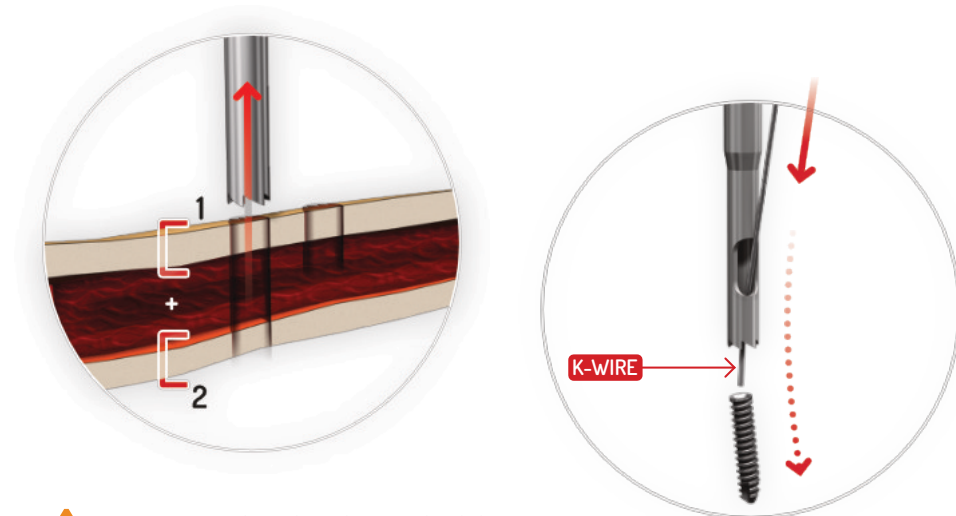
Drill slowly and carefully
to avoid heat generation!

8.**NON TYPICAL case.**

If the screw shaft does not screw out automatically try to use pliers to remove the remaining shaft from the bone.

**9.****Second use of hollow reamer.**

If it is impossible to use pliers or the pliers were unsuccessful drill through the second cortex and take out the reamer with the screw shaft inside. Then remove the shaft from the reamer by pushing k-wire through the hole in the reamer.



Remember that this method does a lot of damage to the bone
so if it is possible the screw should be removed in one of the previous steps !

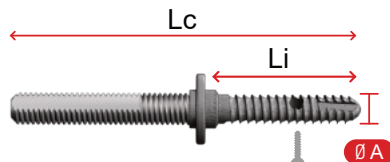


CALCANEUS PROSTHESIS



Calcaneus prosthesis

titanium or titanium with PEO layer*



DIAMETER A Ø PROTEZY	SCREW SYSTEM SYSTEM WKRETA	LENGTH Lc DŁ. CAŁKOWITA LC	LENGTH Li DŁ. IMPLANTOWANA LI	REF TITANIUM	REF* TI + PEO COATING
4.0	2.0	49	20	PR.01.4020.2	PR.01.4020.3
4.0	2.0	51	22	PR.01.4022.2	PR.01.4022.3
4.0	2.0	55	24	PR.01.4024.2	PR.01.4024.3
4.0	2.0	59	26	PR.01.4026.2	PR.01.4026.3
4.0	2.0	63	28	PR.01.4028.2	PR.01.4028.3
4.0	2.0	65	30	PR.01.4030.2	PR.01.4030.3
4.0	2.0	67	32	PR.01.4032.2	PR.01.4032.3
4.0	2.0	69	34	PR.01.4034.2	PR.01.4034.3
4.0	2.0	71	36	PR.01.4036.2	PR.01.4036.3
4.0	2.0	73	38	PR.01.4038.2	PR.01.4038.3
4.0	2.0	75	40	PR.01.4040.2	PR.01.4040.3
4.5	2.0	52	20	PR.01.4520.2	PR.01.4520.3
4.5	2.0	54	22	PR.01.4522.2	PR.01.4522.3
4.5	2.0	56	24	PR.01.4524.2	PR.01.4524.3
4.5	2.0	60	26	PR.01.4526.2	PR.01.4526.3
4.5	2.0	64	28	PR.01.4528.2	PR.01.4528.3
4.5	2.0	66	30	PR.01.4530.2	PR.01.4530.3
4.5	2.0	68	32	PR.01.4532.2	PR.01.4532.3
4.5	2.0	72	34	PR.01.4534.2	PR.01.4534.3
4.5	2.0	74	36	PR.01.4536.2	PR.01.4536.3
4.5	2.0	78	38	PR.01.4538.2	PR.01.4538.3
4.5	2.0	80	40	PR.01.4540.2	PR.01.4540.3
5.0	2.4	52	20	PR.01.5020.2	PR.01.5020.3
5.0	2.4	54	22	PR.01.5022.2	PR.01.5022.3
5.0	2.4	56	24	PR.01.5024.2	PR.01.5024.3
5.0	2.4	60	26	PR.01.5026.2	PR.01.5026.3
5.0	2.4	64	28	PR.01.5028.2	PR.01.5028.3
5.0	2.4	66	30	PR.01.5030.2	PR.01.5030.3
5.0	2.4	68	32	PR.01.5032.2	PR.01.5032.3
5.0	2.4	72	34	PR.01.5034.2	PR.01.5034.3
5.0	2.4	74	36	PR.01.5036.2	PR.01.5036.3
5.0	2.4	78	38	PR.01.5038.2	PR.01.5038.3
5.0	2.4	80	40	PR.01.5040.2	PR.01.5040.3
5.0	2.4	84	42	PR.01.5042.2	PR.01.5042.3
5.0	2.4	86	44	PR.01.5044.2	PR.01.5044.3
5.0	2.4	90	46	PR.01.5046.2	PR.01.5046.3
5.0	2.4	92	48	PR.01.5048.2	PR.01.5048.3
5.0	2.4	96	50	PR.01.5050.2	PR.01.5050.3

*) PEO - Plasma Electrolytic Oxidation ceramic coating

HEX 1.5/2.0		IN.01T.1000.17.(15/20)
DRILL BIT 1.5		CD.1.5.100
DRILL BIT 1.8		CD.1.8.115
DRILL BIT 3.2		CD.3.2.200
DRILL BIT 3.5		CD.3.5.200
DRILL BIT 4.0		CD.4.0.150
DEPTH GAUGE		MG.01.(04/05)
DRILL SLEEVE 1.5/1.8		IN.11.1002.(15/18)
SPANNER FOR THE PROSTHESIS		IN.11.1003.1
TARGETING DEVICE		IN.11.1001.1

IMPLANT SELECTION

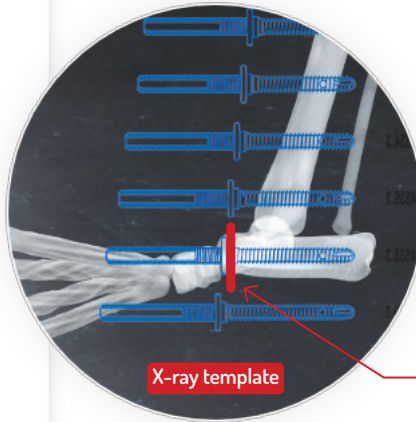
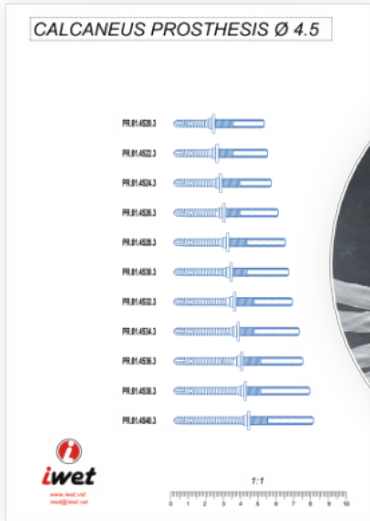
X-ray templates.

Correct X-ray of the ankle joint is performed in a lateral position, placing the beam directly above the calcaneus bone. If the examination room is equipped with a calibration ball, it should be used.



ATTENTION!

Mark the planned cutting line on the X-ray and measure the implanted length **Li** of the prosthesis from it. Appropriate **Li** of the prosthesis fills the medullary canal of the calcaneus bone as much as possible.



X-ray template

CUTTING LINE

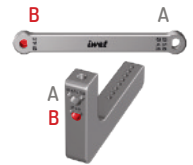
SELECTION OF INSTRUMENTS

HEX 1.5 / DRILL BIT 1.5 2.0

SYS 4.0



DRILL BIT 3.2
DEPTH GAUGE MG.01.04
DRILL SLEEVE 1.5
SPANNER FOR THE PROSTHESIS (hole B)
TARGETING DEVICE (hole B)

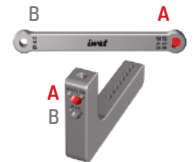


HEX 1.5 / DRILL BIT 1.5 2.0

SYS 4.5



DRILL BIT 3.5
DEPTH GAUGE MG.01.04
DRILL SLEEVE 1.5
SPANNER FOR THE PROSTHESIS (hole A)
TARGETING DEVICE (hole A)

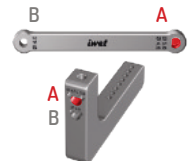


HEX 2.0 / DRILL BIT 1.8 2.4

SYS 5.0



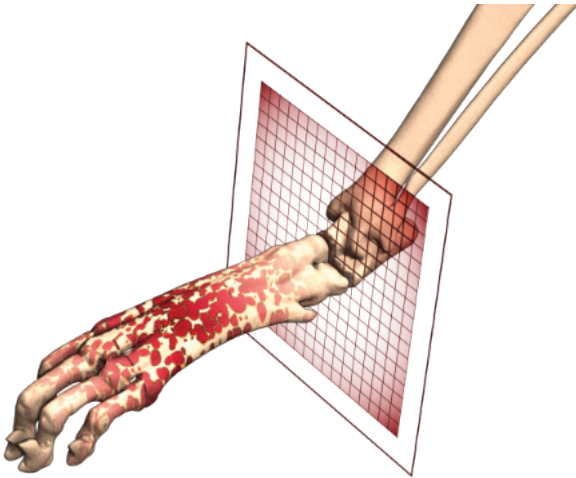
DRILL BIT 4.0
DEPTH GAUGE MG.01.05
DRILL SLEEVE 1.8
SPANNER FOR THE PROSTHESIS (hole A)
TARGETING DEVICE (hole A)



1.

Amputation.

In the first step, remove the damaged tissues or cut off the end of the stump to expose the medullary canal. Preserve as much of the heel bone as possible to allow stable placement of the prosthesis.



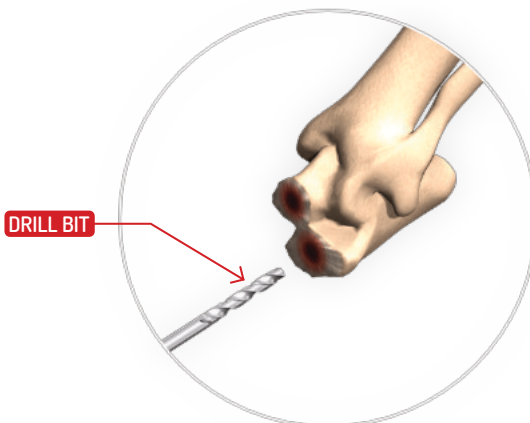
ATTENTION!

Leave enough skin to freely cover the prosthesis ring!

Making a hole for the prosthesis.

After making the cut, use the appropriate drill bit
---> (see **SELECTION OF INSTRUMENTS**)
to drill the medullary canal, do it carefully so you do not drill through it.

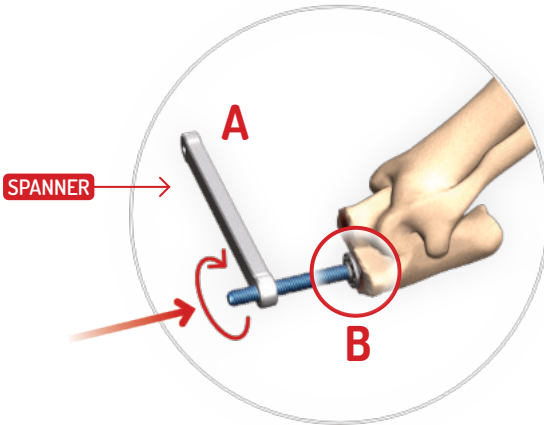
During this operation, you can take an X-ray or mark the appropriate distance on the drill bit.



2. Insertion of the prosthesis.

Carefully insert the calcaneus prosthesis into the medullary canal with a rotary motion (clockwise) using the dedicated spanner (A).

The prosthesis should rest with its collar (B) on the cutted surface of the bone.



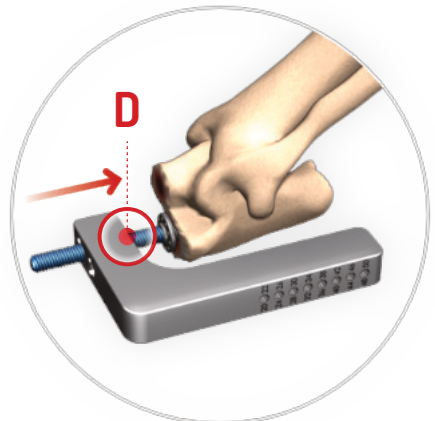
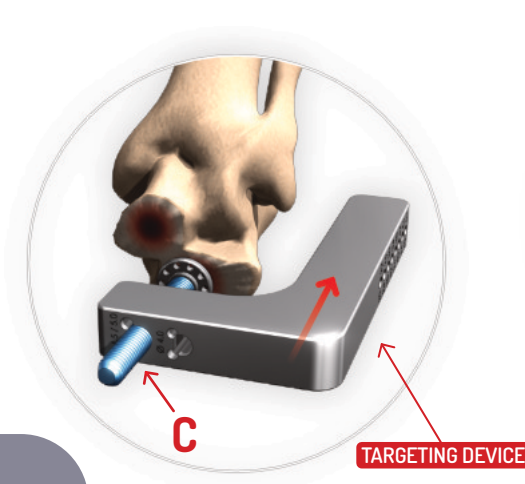
ATTENTION!

Do not overtighten the prosthesis, as this may strip the thread in the bone!

3. Usage of the targeting device.

To prevent the prosthesis from unscrewing, make a hole for the cortical screw into the appropriate place.

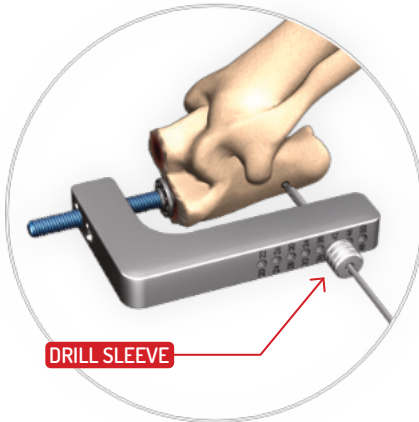
Use the targeting device for this purpose. Insert the device onto the prosthesis shaft through the appropriate hole for the system (C), then move it to the end of the flattening (D) and lock its position on the prosthesis using the set screw in the targeting device.



4.

Drilling a hole for the cortical screw.

When the targeting device is locked in the correct place, insert the drill sleeve into the appropriate hole. The holes in the targeting device correspond to the implanted length (**Li**) of the prosthesis. One hole is suitable for two adjacent implanted lengths marked on the left and right side of the hole.



ATTENTION!

If you feel the RESISTANCE on the drill bit, it is likely that the drill sleeve has been inserted into the wrong hole in the targeting device. **IMMEDIATELY STOP** drilling!



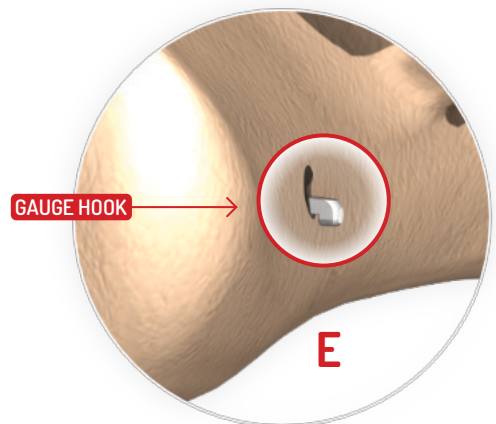
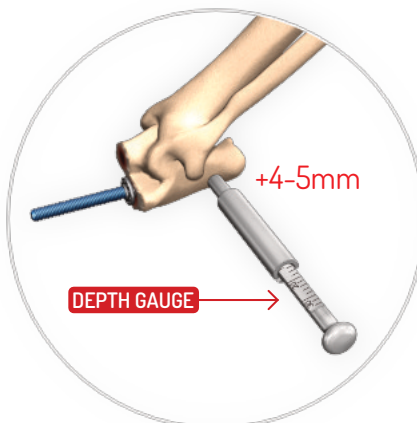
AFTER MAKING A HOLE

the targeting device should be gently removed, taking care not to rotate the prosthesis around its axis.

Locking the prosthesis in the bone.

Use the appropriate depth gauge (see **SELECTION OF INSTRUMENTS**), select the length of the cortical screw, making sure that the gauge hook (**E**) rests on the outer surface of the second layer of cortical bone.

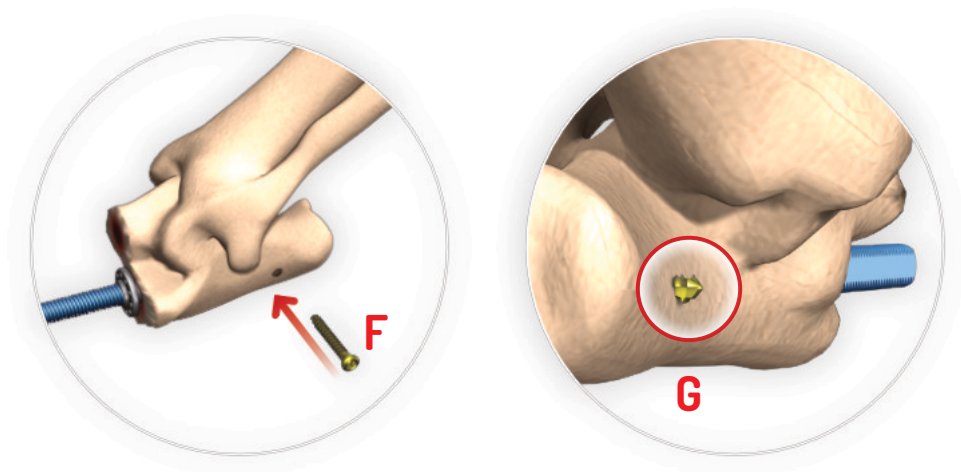
ADD 4-5mm to the measurement.



6.

Locking the prosthesis in the bone.

A correctly made hole allows you to insert an antirotational cortical screw (**F**). The screw should pass through to the outer side (**G**) of the second cortex.



After locking the prosthesis with a screw, gently check it with the spanner if it rotates around its own axis. The correct installation of the implant should also be checked by X-Ray picture.

MOUNTING THE FOOT

7.

Mounting the prosthetic foot on the prosthesis.

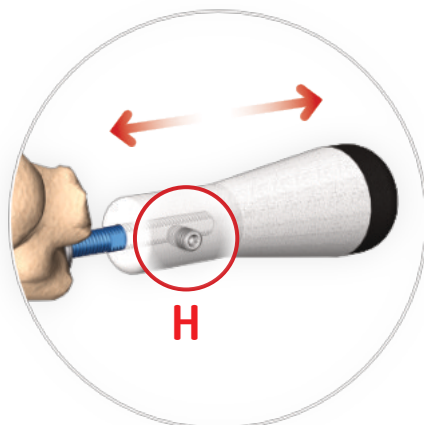
Insert the prosthetic foot to such a distance that the length of the entire prosthesis is equal to the length of the healthy limb.

Rotate the prosthetic foot so that the axis of the anti-rotation screw is perpendicular to the flattening on the prosthesis. Then use the HEX 2.0 screwdriver to tighten the anti-rotation screw (**H**).



ATTENTION!

Do not use too much force, this may result in thread stripping!



You will find us EVERYWHERE 🌐👤

