iwet

SURGICAL TECHNIQUES

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TABLE OF CONTENTS

LOCKING PLATES

Locking plates are used for bone osteosynthesis, reconstruction of broken bones, and corrective orthopedic procedures, including TPO, 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.

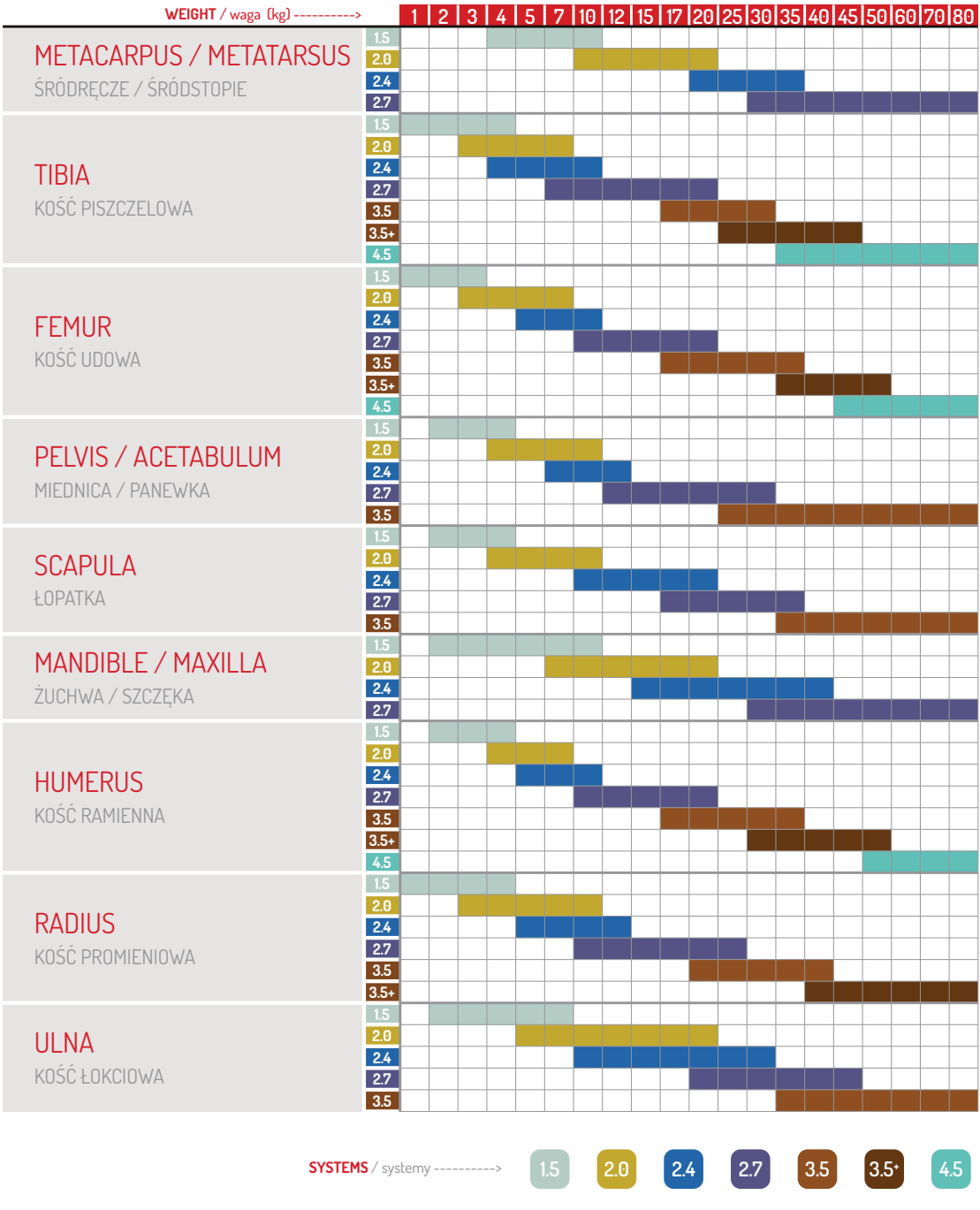
Locking plates SYSTEM 2.7 are intended mainly for treatment of long bone fractures in medium-sized animals weighing from 6 to 25 kg, scapula fractures in animals from 15 to 35 kg and fractures of the mandible / jaw in animals over 25 kg.

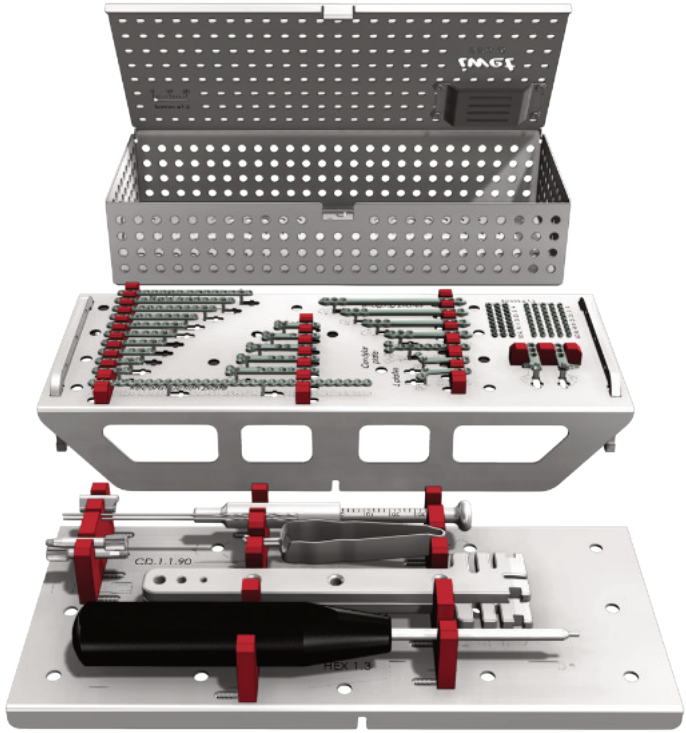
Locking plates SYSTEM 3.5 are intended mainly for treatment of long bone fractures in animals weighing 15 to 50 kg, scapula fractures in animals over 30 kg.

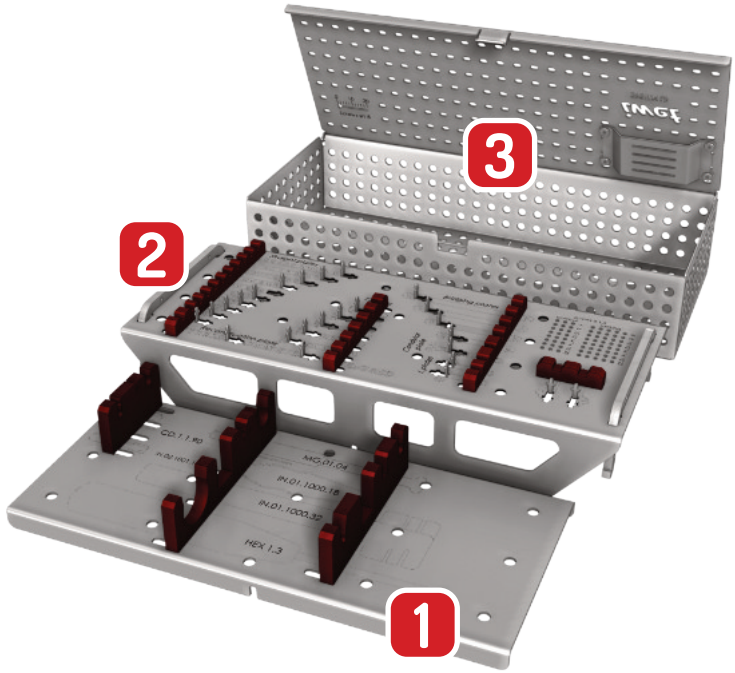
Locking plates SYSTEM 4.5 are intended mainly for treatment of long bone fractures in animals weighing over 50 kg or for treatment of fractures in big animals like goats, horses etc.

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






3
2
1

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 WKRĘTAK 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 PĘSETA DO WKRĘTÓW	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

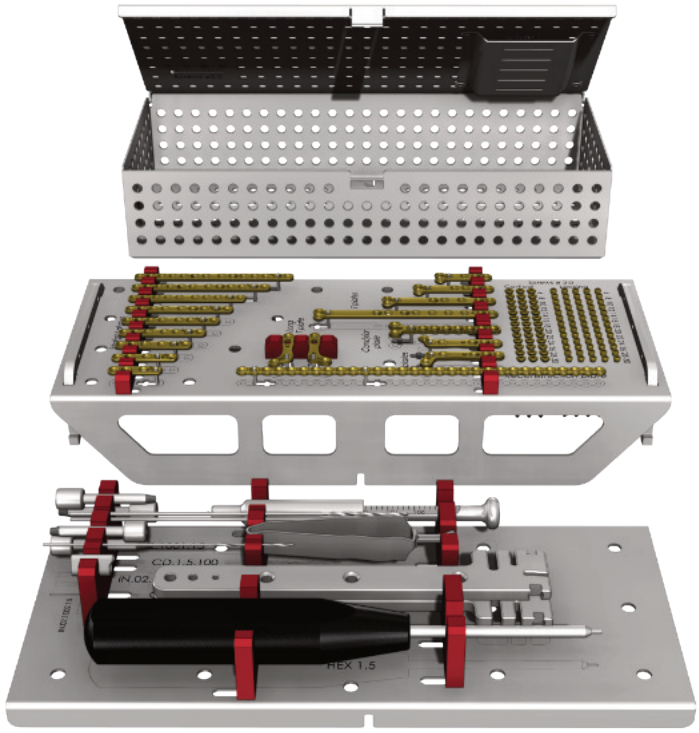
SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

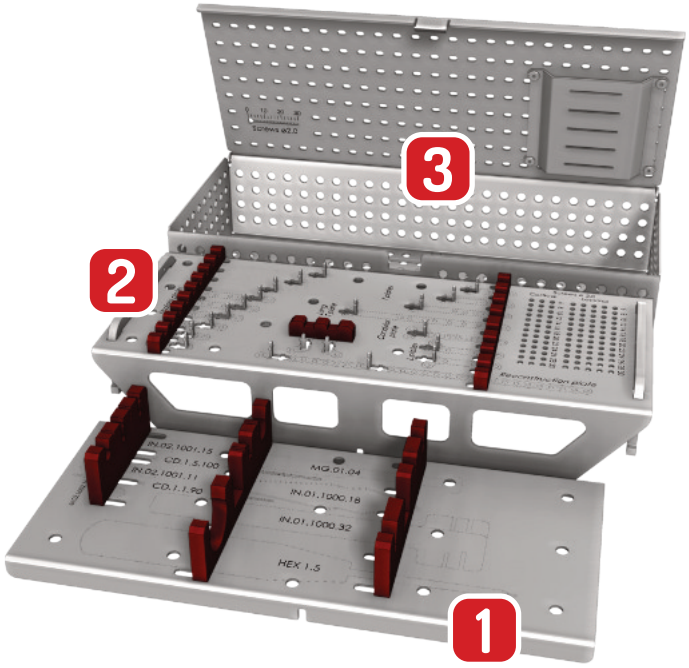
IZ.01.1004.Z

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


CD.1.5.100
IN.02.
HEX 1.5


3
2
1
IN.02.1001.15
CD.1.5.100
IN.02.1001.11
CD.1.1.90
MQ.01.04
IN.01.1000.18
IN.01.1000.32
HEX 1.5

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 WKRĘTAK 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 PĘSETA DO WKRĘTÓW	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

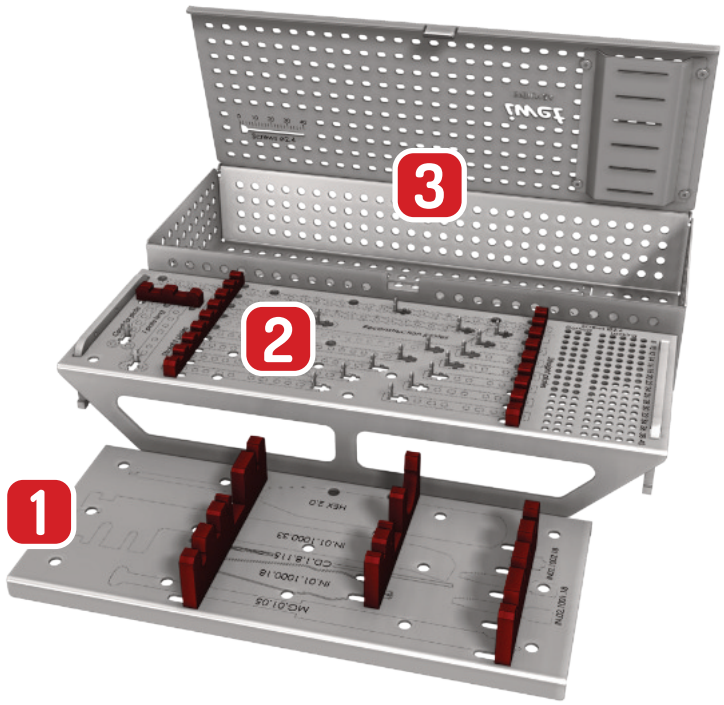
SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1003.Z

LCP Containers and trays – for sterilization

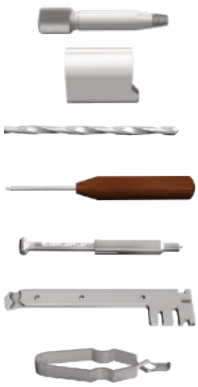
REF	IZ.01.1003
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3
WYMIARY / DIMENSIONS	255x108x54

Sys 2.0


3
2
1

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 WKRĘTAK 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 PĘSETA DO WKRĘTÓW	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

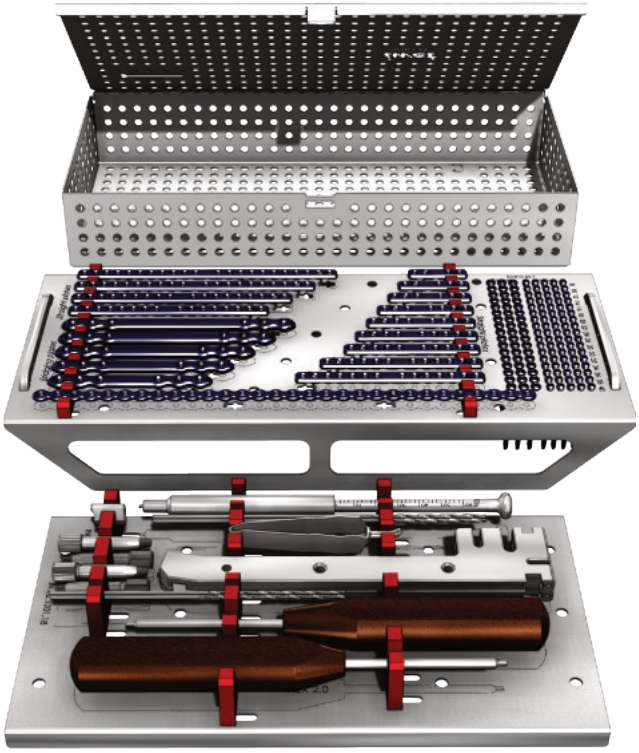
SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

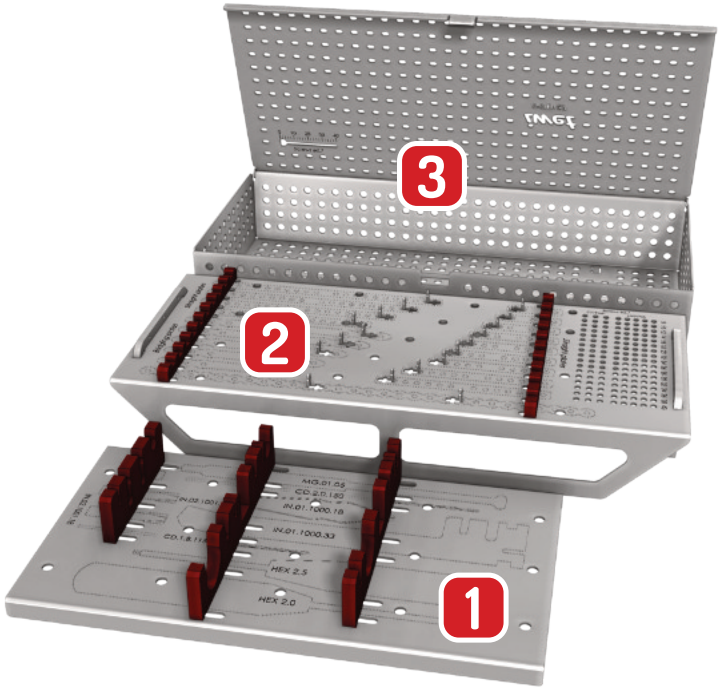
IZ.01.1000.Z

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




3
2
1

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 WKRĘTAK STOŻKOWY HEX 2.0	IN.01T.1000.17.20
Screwdriver HEX 2.5 WKRĘTAK 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 PĘSETA DO WKRĘTÓW	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

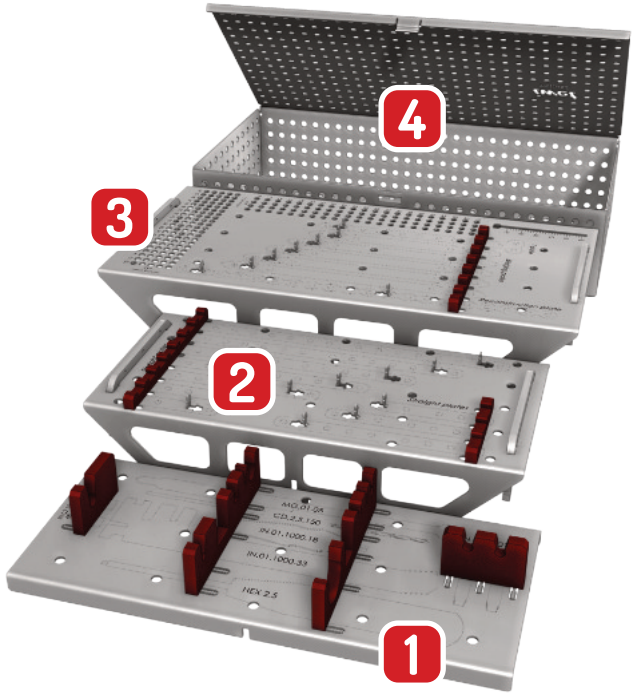
SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

IZ.01.1001.Z

LCP Containers and trays – for sterilization

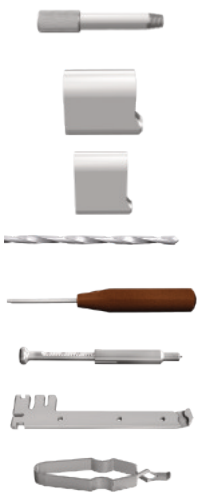
REF	IZ.01.1001
Sterilization tray for instruments PALETA DO STERYLIZACJI INSTRUMENTARIUM	1
Sterilization tray for implants PALETA DO STERYLIZACJI IMPLANTÓW	2
Sterilization container for implants and instruments KONTENER DO STERYLIZACJI IMPLANTÓW I INSTRUMENTARIUM	3
WYMIARY / DIMENSIONS	305x139x54

Sys 2.7


4
3
2
1

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 TPLO plates TULEJKA WIERTARSKA KOMPRESYJNA Ø2.5 PŁYTKI TPLO 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 WKRĘTAK 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 PĘSETA DO WKRĘTÓW	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

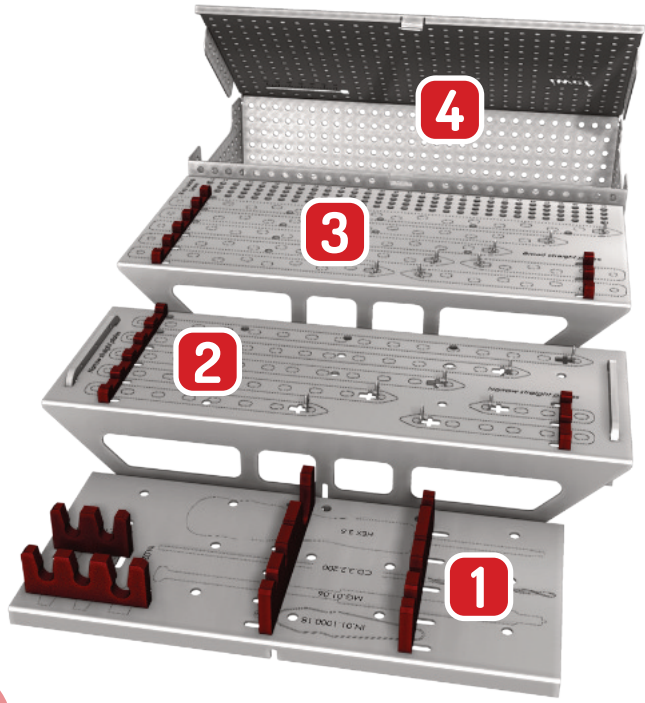
SET WITH IMPLANTS
ZESTAW Z IMPLANTAMI

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
3
2
1

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 WKRĘTAK STOŻKOWY HEX 3.5	IN.01T.1000.17.35
Depth gauge MIARKA GRUBOŚCI KOŚCI	MG.01.06
Tweezers for screws PĘSETA DO WKRĘTÓW	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 *

REF
IN.06.1000.1

*/ RECOMMENDED FOR SYS **2.7/3.5/4.5**

AO quick coupling screwdriver handle with torque limiter

SHAFT SIZE TRZPIEŃ	SYSTEM	TORQUE MOMENT	REF
HEX 2.0	2,4 / 2,7	0,8 Nm	IN.08.1002.08
HEX 2.5	3,5	1,5 Nm	IN.08.1002.15

0.8

1.5

0.4

AO quick coupling torque limiter adapter

SHAFT SIZE TRZPIEŃ	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 WKRĘTA	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

Ss

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

0.4 Nm 0.8 Nm 1.5 Nm

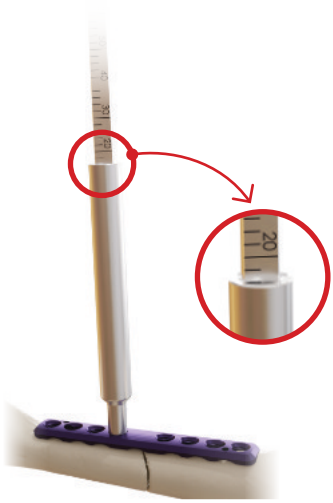
4. Using a dedicated screwdriver, screw in the locking screw, remembering not to tighten the screw by force, if the instrument set is equipped with a torque limit screwdriver, it should be used.

Ø of screw	1.5	2.0	2.4	2.7	3.5	4.5
Screwdriwer	HEX 1.3	HEX 1.5	HEX 2.0		HEX 2.5	HEX 3.5
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

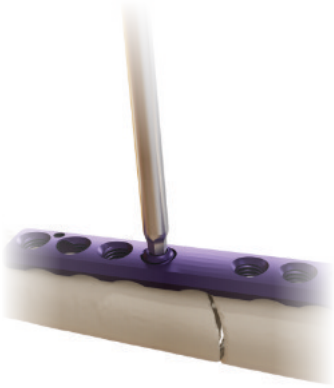
1. Drill a hole for the cortical screw by proper drill bit through two layers of cortical bone.

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
Screwdriwer	HEX 1.5		HEX 2.0	HEX 2.5		HEX 3.5

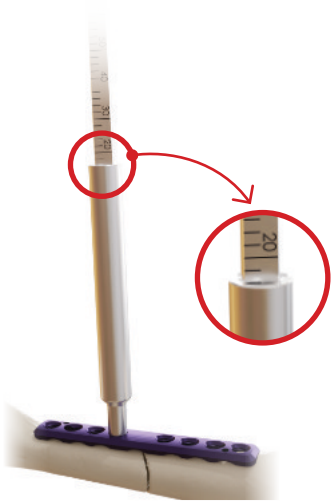
COMPRESSION BY LOCKING SCREW

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).

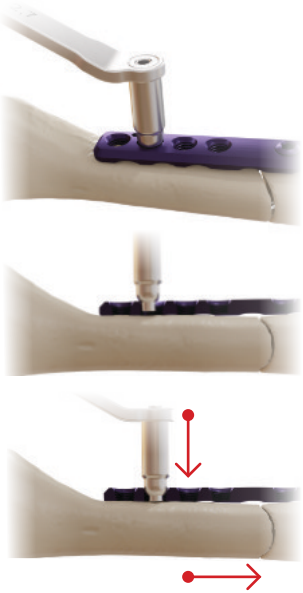
Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Depth gauge	MG.01.04		MG.01.05			MG.01.06

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
Screwdriwer	HEX 1.3	HEX 1.5	HEX 2.0		HEX 2.5	HEX 3.5
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	

0.4 Nm 0.8 Nm 1.5 Nm



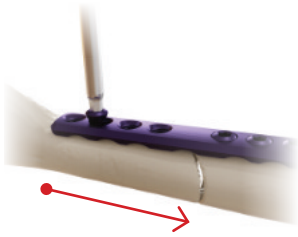
1.

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.

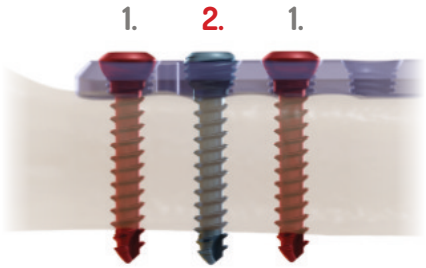
Screw diameter	1.5	2.0	2.4	2.7	3.5	4.5
Drill bit	1.1	1.5	1.8	2.0	2.5	3.2



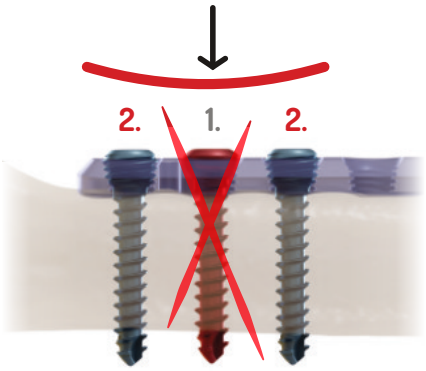
3.

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
Screwdriwer	HEX 1.5		HEX 2.0	HEX 2.5		HEX 3.5

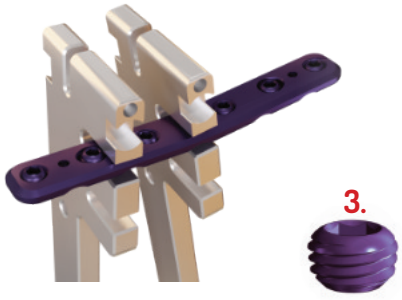


It is very important to remember about the correct order in which the bone screws are inserted in one fracture, first cortical screws (1) and after then locking screws (2).



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.

TPLO locking plates

TPLO saw blade adaptors

REF
IN.03.1000.1_M6
IN.03.1000.1_M7

Ss

» 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

Ss

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

Ss

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 PROMIEŃ 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

Ss

TPLO saw blades

CUTTING RADIUS PROMIEŃ 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

Ss

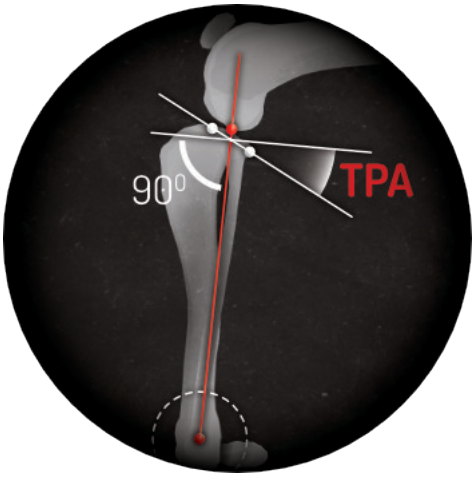
1. Principles of correct preoperative X-Ray.

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.

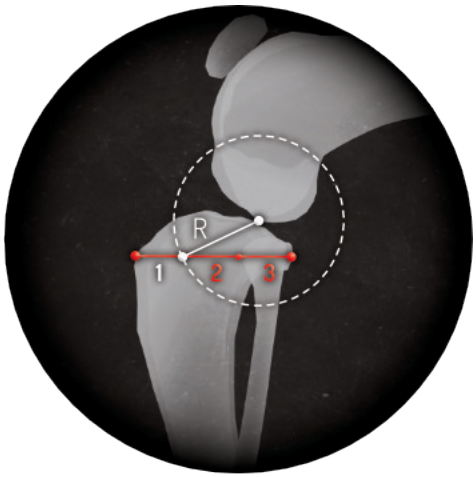
2. TPA measurements.

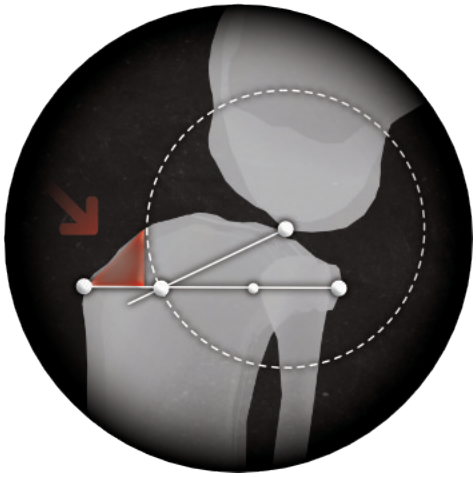
- To measure TPA (Tibial Plateau Angle) set and draw tibial mechanical axis - connect the center of ankle joint with the tip of the aligned intercondylar eminence.
- Draw TP (Tibial Plateau) line, which is a line of tibial articular surface, a line connecting two extreme points of this surface or a line 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.





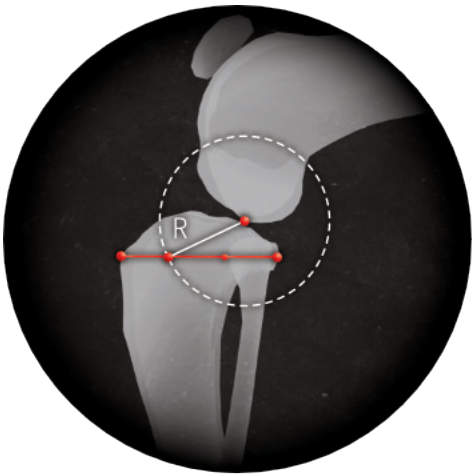
- To pick the correct size of the blade, draw a line through all the width of the tibia from the patellar ligament attachment point to the rear edge of the tibial articulation surface. Divide this line into 3 equal segments and mark the cranial part.
- Draw the line from the top of the intercondylar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

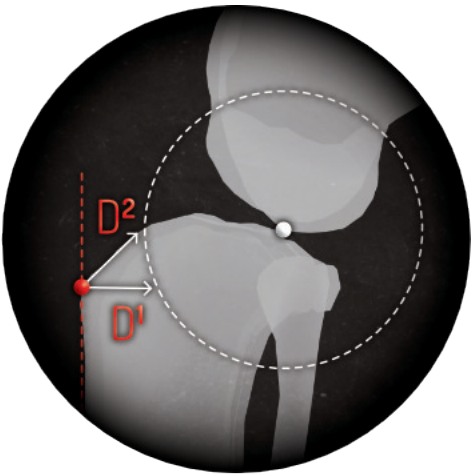
4. Osteotomy rotation point.

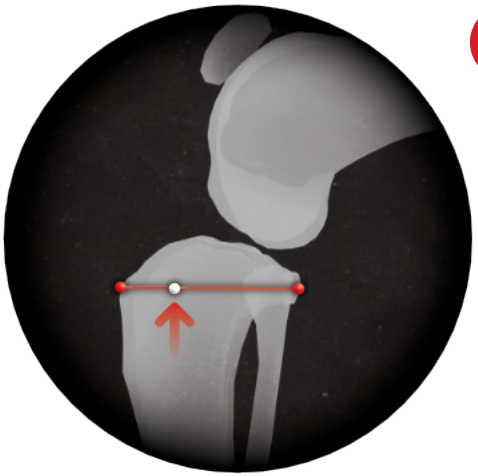
- The correct placement of center of rotation should be on the intercondylar eminence to save the mechanical axis of tibia.

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.

TPLO rotation - Reference chart

PREOPERATIVE TIBIAL PLATEAU ANGLE (TPA)

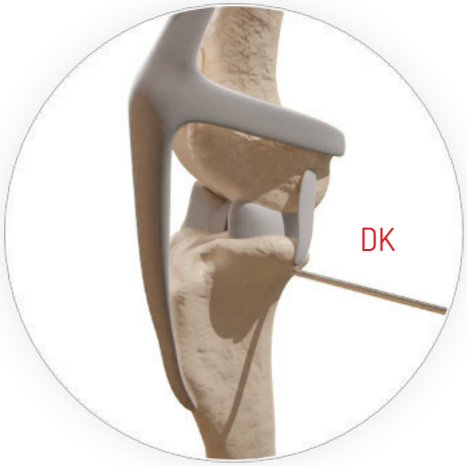
SAW RADIUS (MM)	15°	16°	17°	18°	19°	20°	21°	22°	23°	24°	25°	26°	27°	28°	29°	30°	31°	32°	33°	34°	35°	36°	37°	38°	39°	40°
	ROTATION (MM) - PROVIDES RESULTANT 5° TPA																									
9	1,6	1,7	1,9	2,0	2,2	2,4	2,5	2,7	2,8	3,0	3,1	3,3	3,4	3,6	3,7	3,9	4,1	4,2	4,4	4,5	4,7	4,8	5,0	5,1	5,3	5,4
12	2,0	2,2	2,4	2,6	2,9	3,1	3,3	3,5	3,7	3,9	4,1	4,3	4,5	4,7	4,9	5,1	5,3	5,5	5,7	5,9	6,1	6,3	6,4	6,6	6,8	7,0
15	2,6	2,8	3,1	3,3	3,6	3,8	4,1	4,3	4,6	4,9	5,1	5,4	5,6	5,9	6,1	6,4	6,6	6,9	7,1	7,4	7,6	7,9	8,1	8,4	8,6	8,8
18	3,1	3,4	3,7	4,0	4,3	4,6	4,9	5,2	5,5	5,8	6,1	6,5	6,8	7,1	7,4	7,7	8,0	8,3	8,6	8,9	9,2	9,5	9,8	10,1	10,3	10,6
21	3,6	4,0	4,3	4,7	5,0	5,4	5,8	6,1	6,5	6,8	7,2	7,5	7,9	8,3	8,6	9,0	9,3	9,7	10,0	10,4	10,7	11,1	11,4	11,8	12,1	12,4
24	4,1	4,5	5,0	5,4	5,8	6,2	6,6	7,0	7,4	7,8	8,2	8,6	9,0	9,5	9,9	10,3	10,7	11,1	11,5	11,9	12,3	12,7	13,1	13,5	13,9	14,3
27	4,7	5,1	5,6	6,0	6,5	7,0	7,4	7,9	8,4	8,8	9,3	9,7	10,2	10,6	11,1	11,6	12,0	12,5	12,9	13,4	13,8	14,3	14,7	15,2	15,6	16,1
30	5,2	5,7	6,2	6,7	7,2	7,8	8,3	8,8	9,3	9,8	10,3	10,8	11,3	11,8	12,3	12,9	13,4	13,9	14,4	14,9	15,4	15,9	16,4	16,9	17,4	17,9
33	5,8	6,3	6,9	7,5	8,1	8,6	9,2	9,8	10,4	10,9	11,5	12,1	12,7	13,3	13,8	14,4	15,0	15,6	16,1	16,7	17,3	17,9	18,4	19,0	19,6	20,2

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

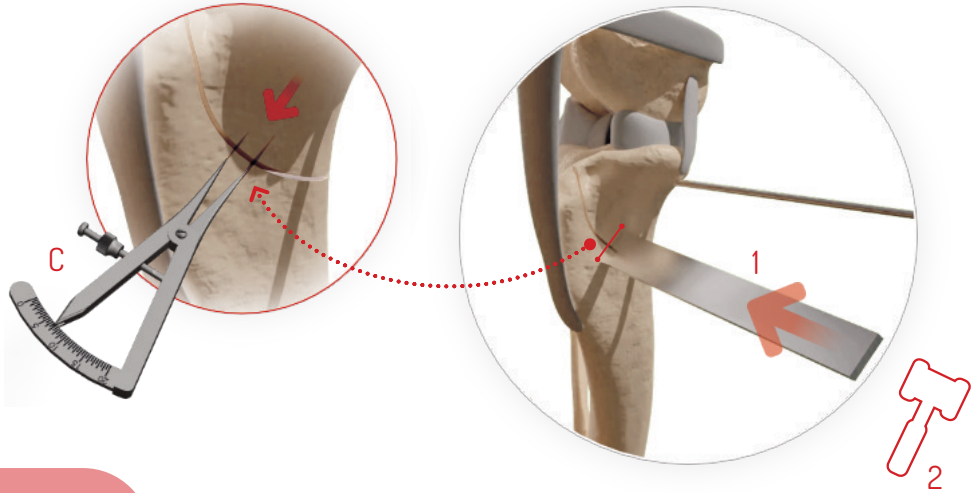
1. Bone preparation.

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.



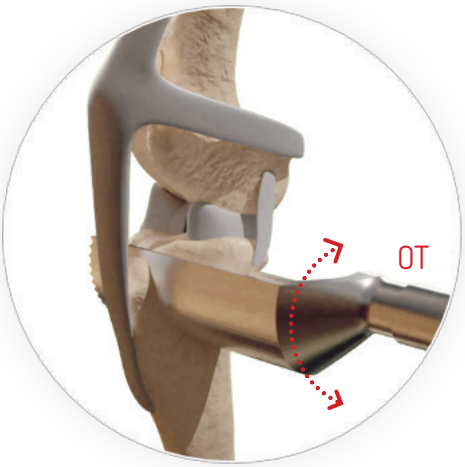
2. Marking.

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.



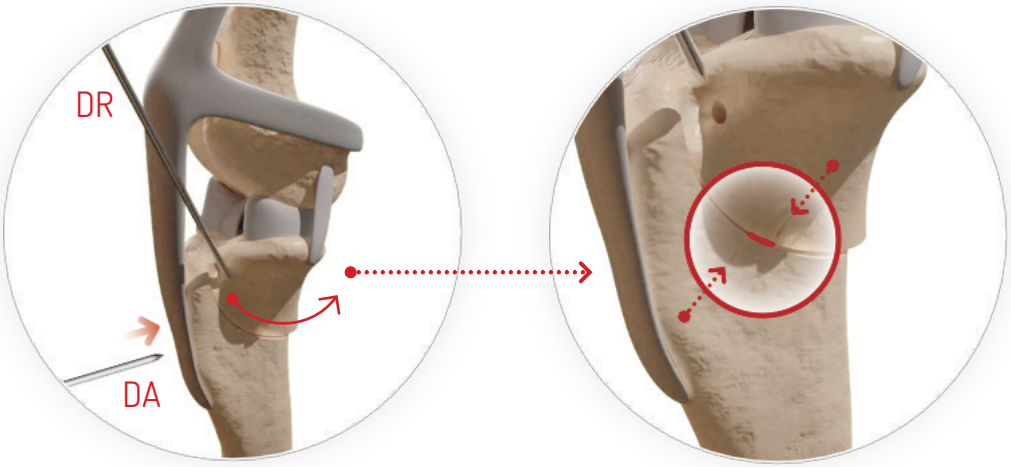
3. Cutting.

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.

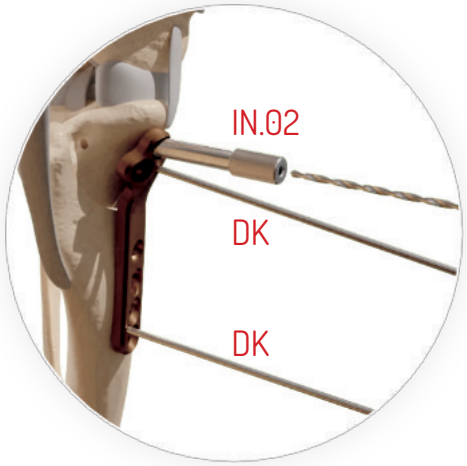


NOTE:
Correct diameters of DA and DR wires are in the table on page 2.6

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).

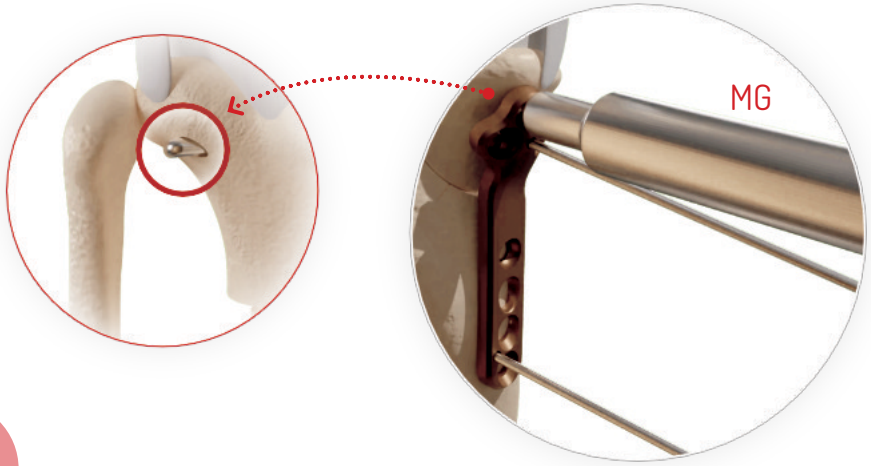
ATTENTION:
Make sure that there is no risk of joint perforation with drill bit or screws.
If necessary, use Multi–Locking Screws to avoid it.



6. Determination of the screw length.

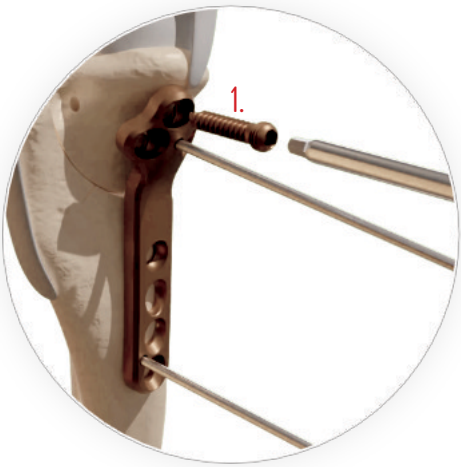
Use the correct depth gauge (MG) and measure the thickness of the bone and plate. Remember to add self-tapping tip length to the measurement:

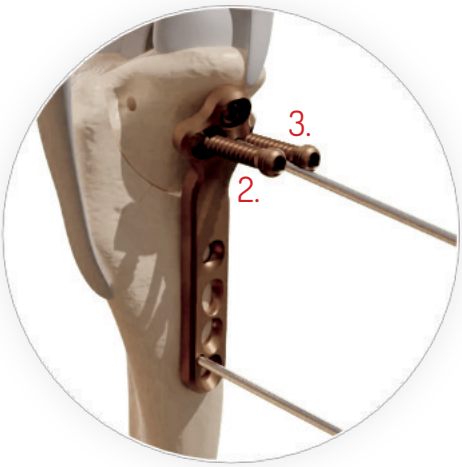
- Add 2 mm to measurement for system 1.5 to 2.7
- Add 3 mm to measurement for system 3.5 and 4.5



7. Locking screw insertion.

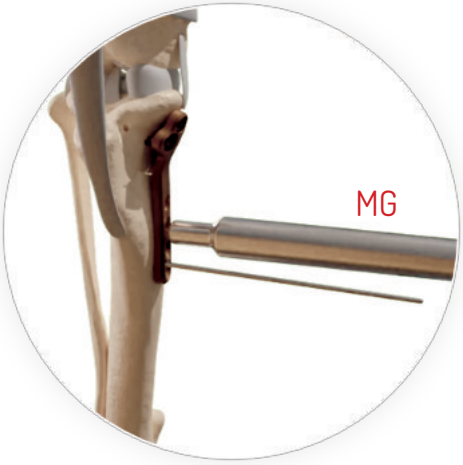
Use a dedicated screwdriver to screw in the locking screw. Remember not to overtighten the screw, if there is a torque limiter in your instrument set, you should use it.





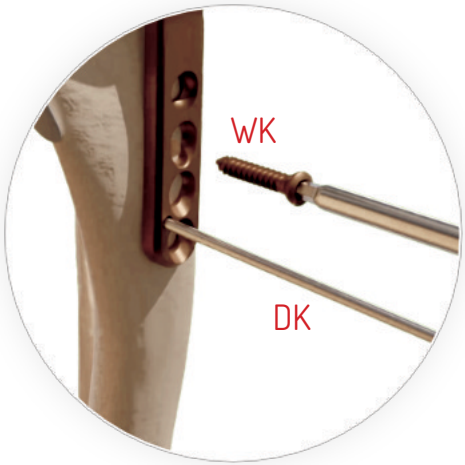
8. Compression hole.

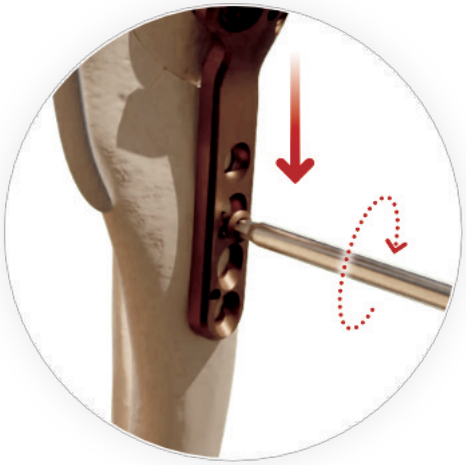
To drill a hole for a compression screw, use the drill guide (PW). Make sure that it is on the compression side of the hole and that it is not pressed to the plate. Use the method from point 6 to determine the correct length of the screw.



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.

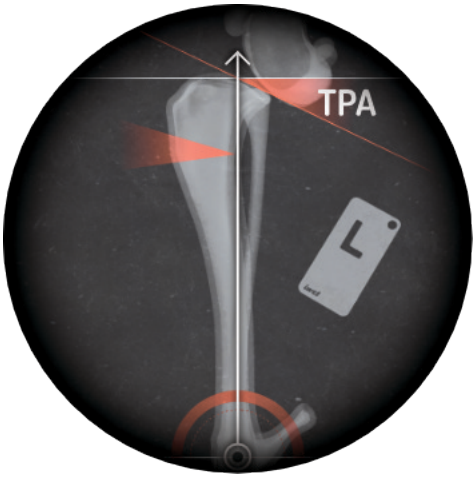
When the compression is done, use the threaded drill guide (IN.02) and the drill bit to prepare the holes (1,2,3) in the shaft of the plate. The drill bit and the screw should go through both layers of cortical bone.

TPLO CWO locking plates

1. Preoperative X - Ray.

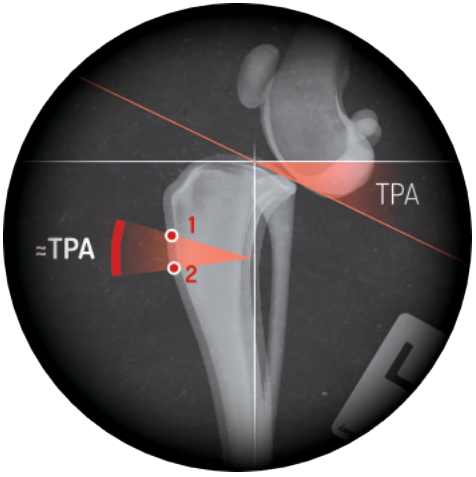
- Principles of correct preoperative X-Ray and determination of the TPA angle during the CWO (Cranial Wedge Osteotomy) procedure are the same as in the TPLO procedure. *

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



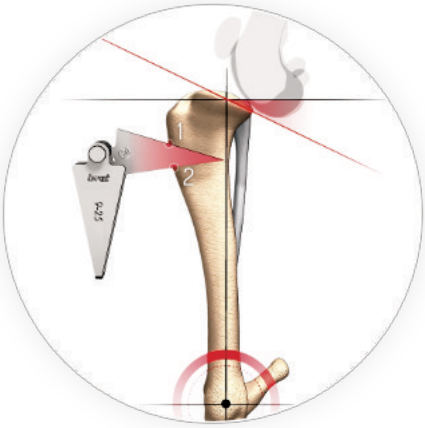
2. Positioning of the osteotomy.

- The angle of the wedge should be the same as the Tibial Plateau Angle (TPA) measured before. The starting point of the firs 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.



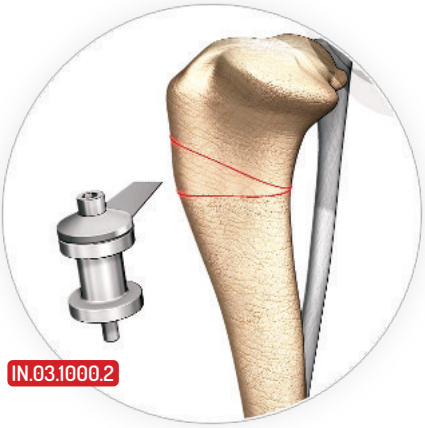
3. Determination of the cutting lines.

- 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.



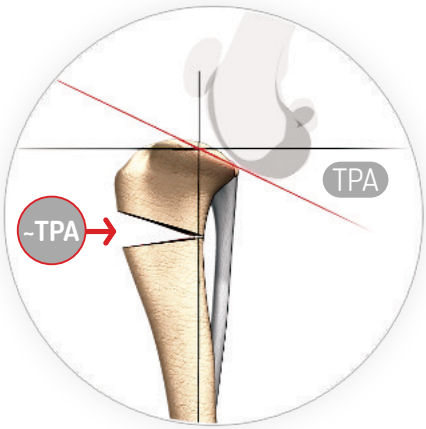
4. Bone cutting.

- 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.



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.



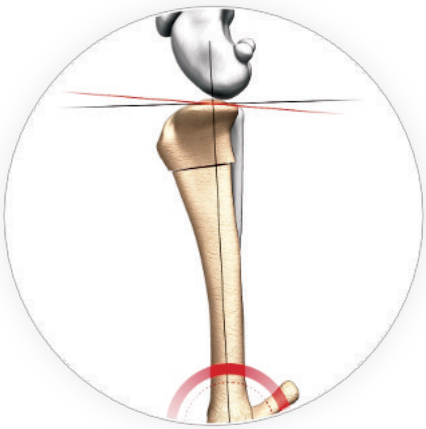
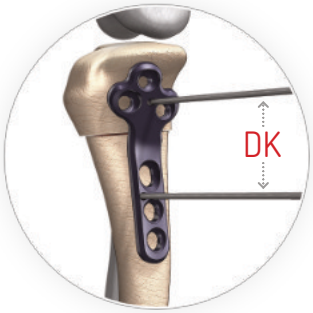


PLATE FIXATION

6. Bone plate positioning.

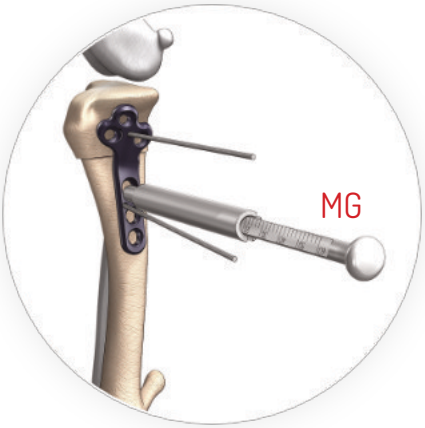
- When the bone fragments are temporarily stabilized, place the plate on the bone and use the K-wires (DK) to temporary fix it.
- Prepare a hole for compression screw using drill guide for compression holes (PW). Do not press the guide to the plate and make sure that the guide is in compression side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

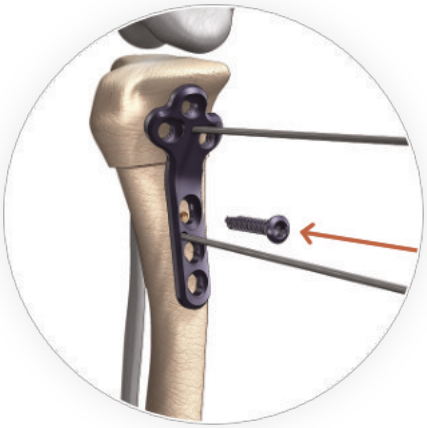


7. Cortical screw insertion.

- 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

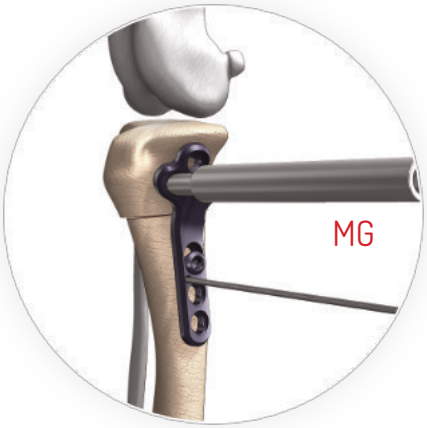
- Insert the cortical screw in the compression hole. Do not tighten the screw.





8. Locking screw holes preparation.

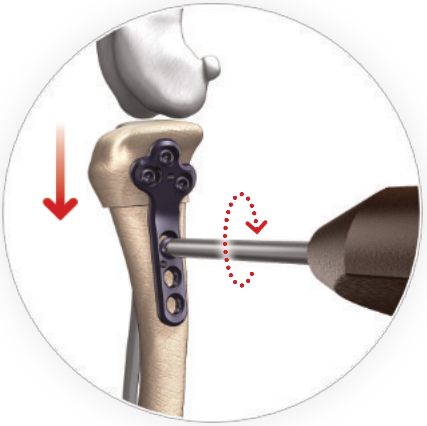
- Use the threaded drill guide (IN.02) to drill the holes in the head of the plate. Then measure the length of the screws with a bone thickness gauge (MG) according to the method shown in point 7.



9. Locking screw insertion.

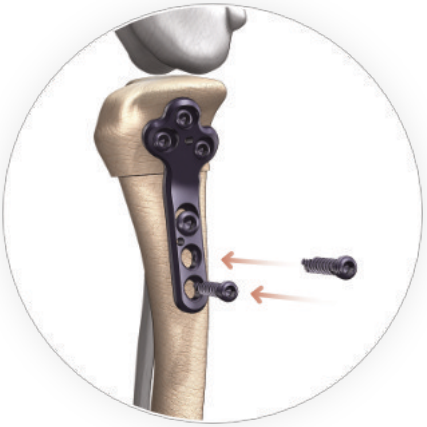
- Screw in the locking screws with a dedicated screwdriver, remembering not to tighten the screw with too much force, if the instrument set is equipped with a torque screwdriver, it should be used.

10. Compression.



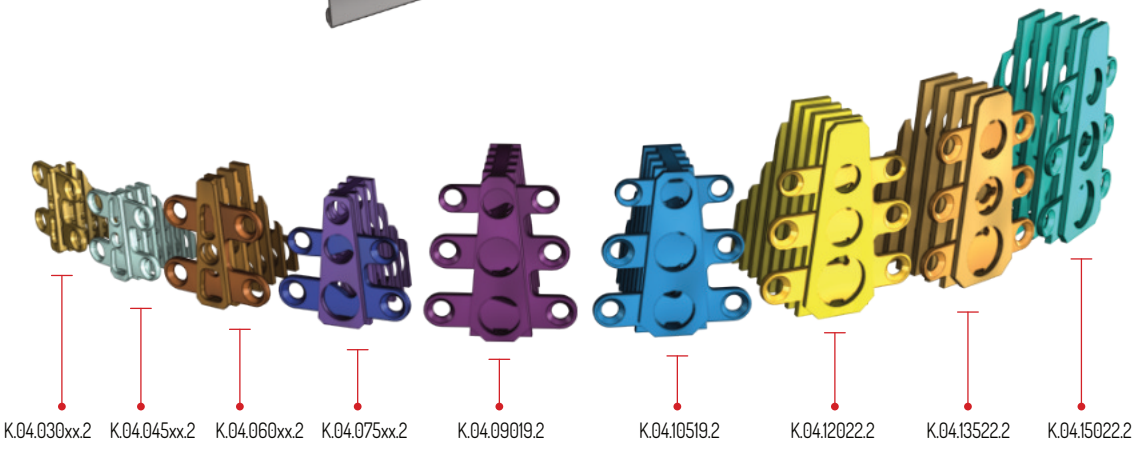
- Remove the K-wires and tighten the cortical screw in the compression hole. Remember not to overtighten the screw. It can cause thread damage in the cortical bone.

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

CASE

Ti

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** /wkręty korowe — ø **2,4**

SCREWDRIVER /wkrętak — **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

Ss

Tapered HEX Screwdrivers

SIZE ROZMIAR	Ø OF SCREW Ø WKRĘTA		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

Ss

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

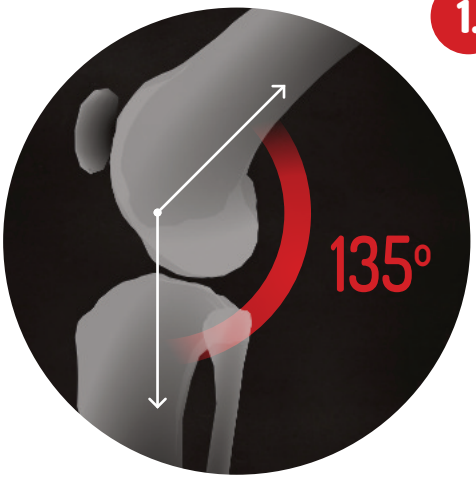
Bone Spreader for **TTA R+**

Ss

Drill guides for compression holes

Ø OF DRILL BIT Ø WIERTŁA	Ø OF SCREW Ø WKRĘTA	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

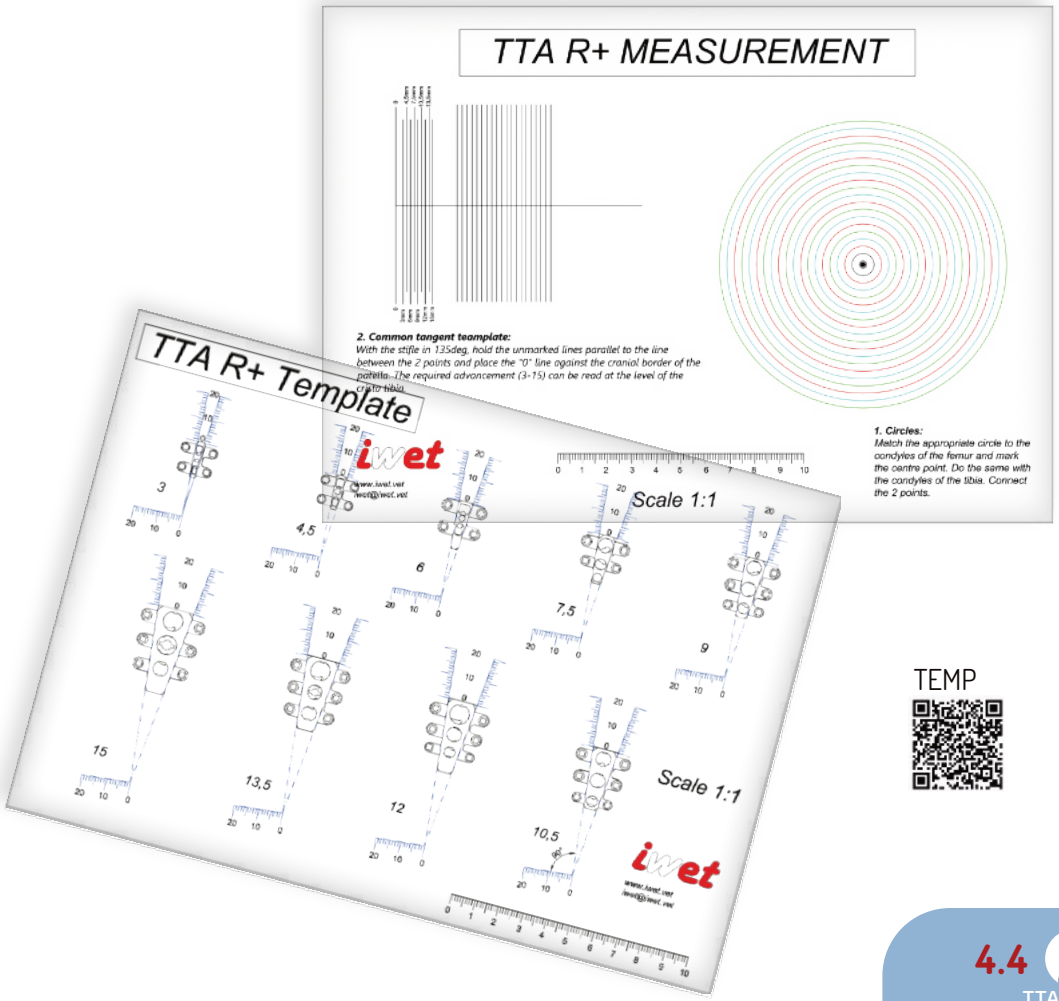
Ss



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.



TEMP

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.

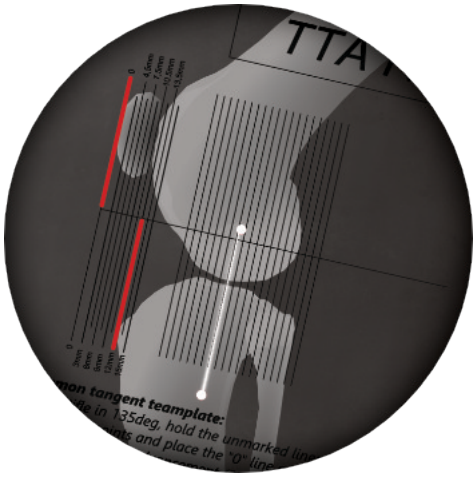
POINT 2: TIBIAL CONDYLES CENTER POINT.
Align the correct circle with the edge of tibial condyles and mark the center point.

Determining the line for measurement.

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

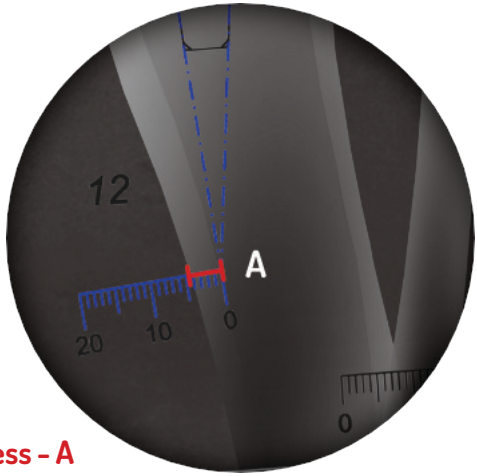
4. Required advancement measurement.

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.

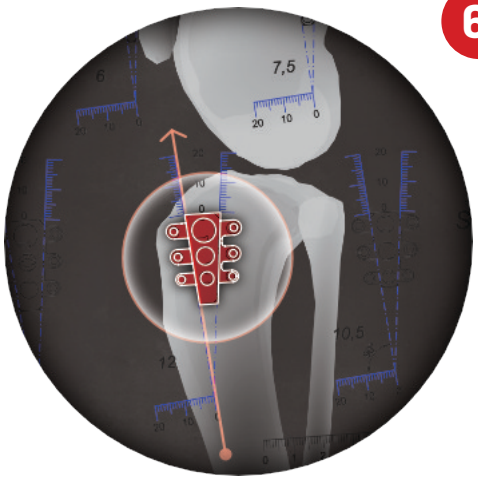


5. Cortical bone thickness measurement.

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.

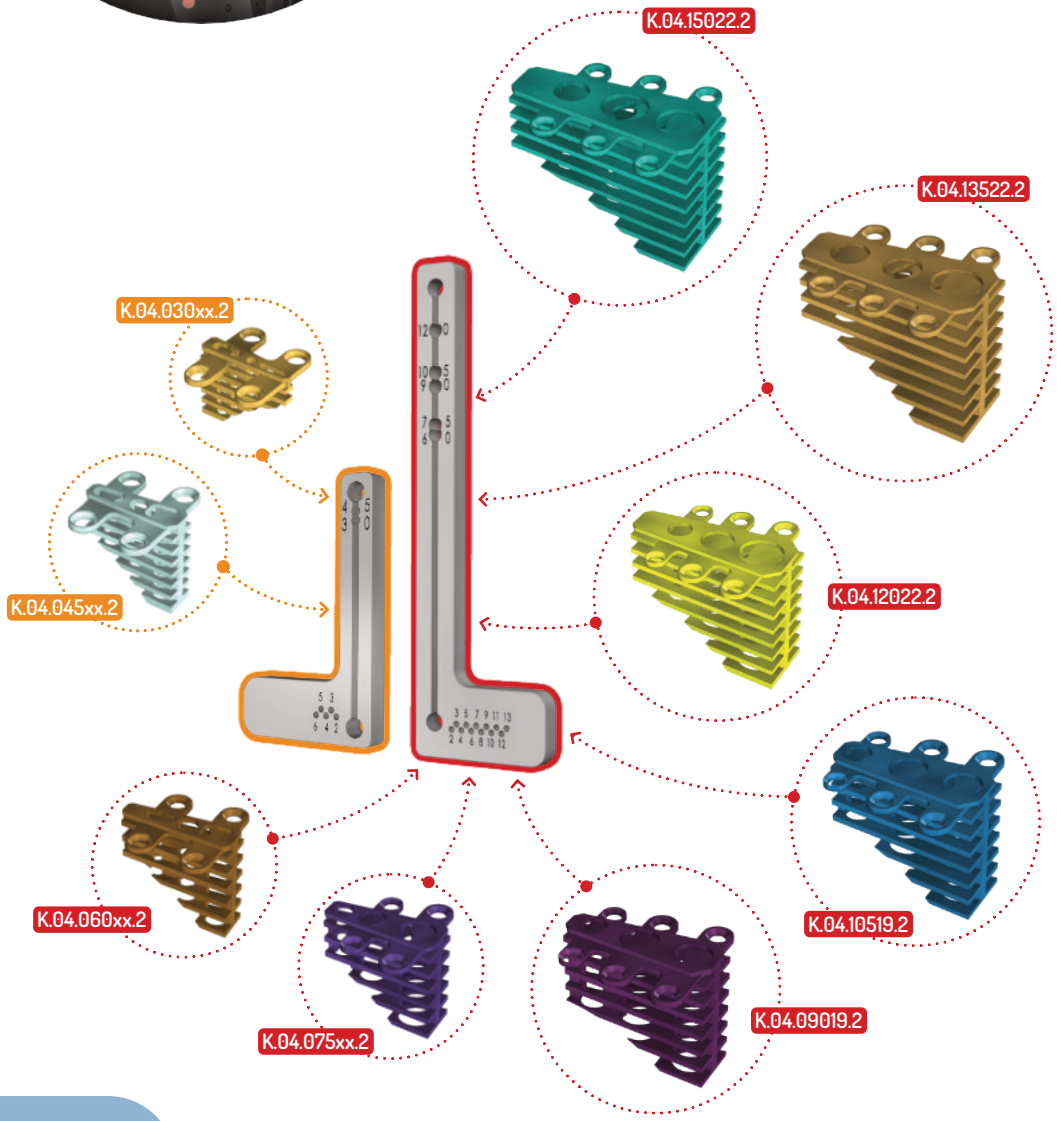


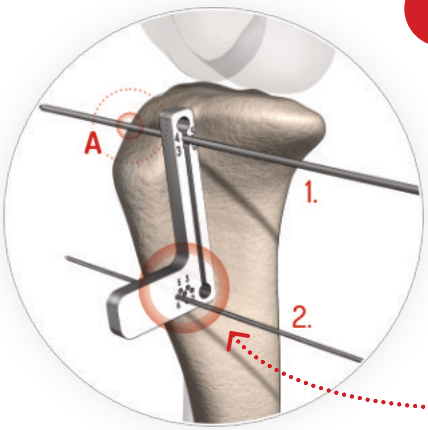
Read cortical bone **thickness – A**



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.

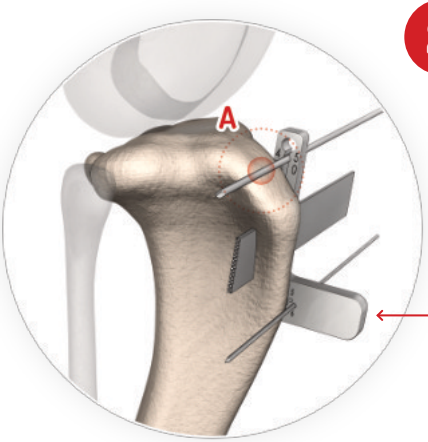




1. Saw Guide positioning.

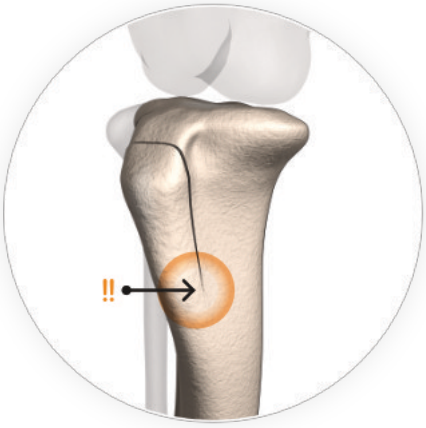
Insert ø 1.6 K-wire into the hole marked with planned cage size in the vertical arm of the guide, then insert the wire with the guide on it through infrapatellar bursa, located just above the surface of the proximal tibia. In perfect conditions, the wire should be placed just in front of Gerdy's tubercle.

Insert ø 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.



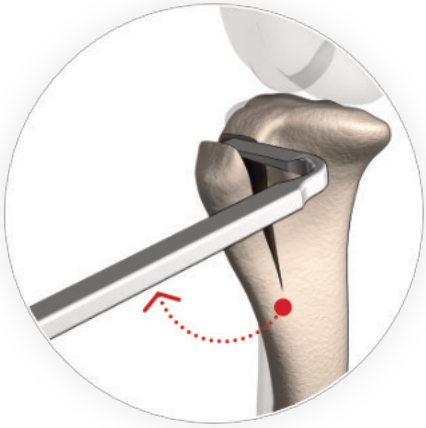
IMPORTANT!!

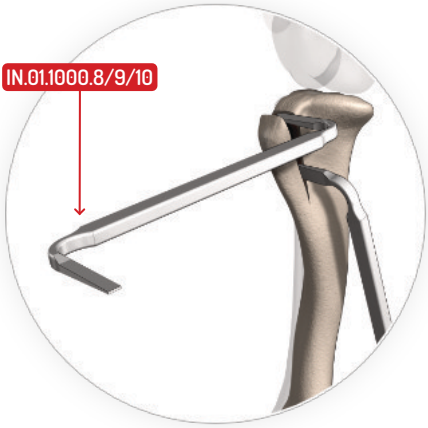
The uncut thickness of the bone should be equal to the previous measure of cortical bone thickness with X-Ray template.

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.

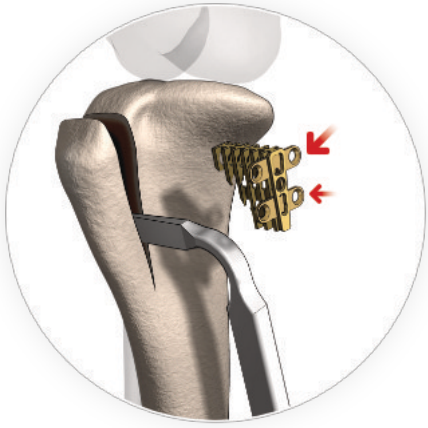
ATTENTION!
Do not rotate the second spreader! It can cause a tibial tuberosity fracture!





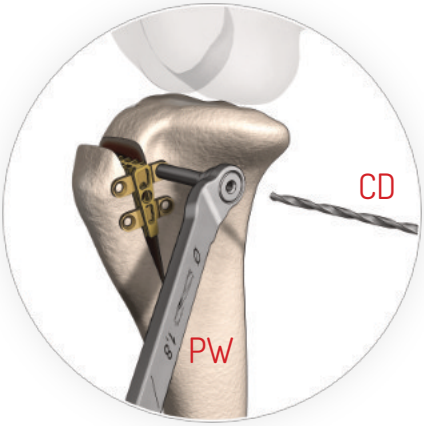
4. Cage insertion.

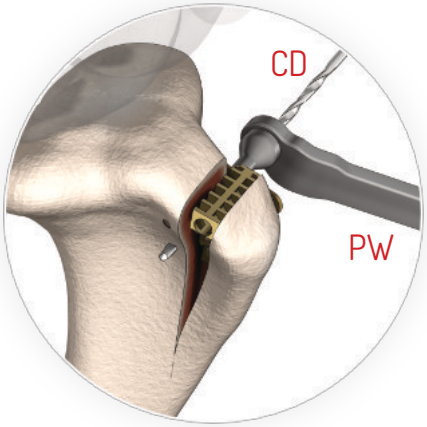
Profile the ears of the cage, insert the implant into the gap and remove the spreader (IN.01.1000.8/9/10).



5. Holes preparation.

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

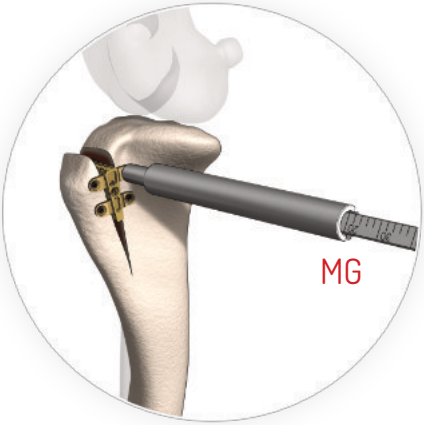


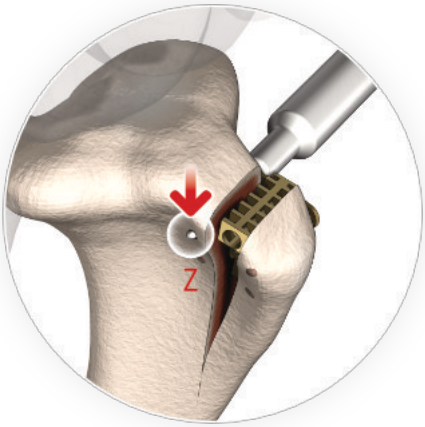


6. Determination of screw length.

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

Ss

*) Recommended transposition 1mm per 1 minute

Saw guides for **TTA R+**

for TTA R+ cages DO KLINÓW 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

Ss

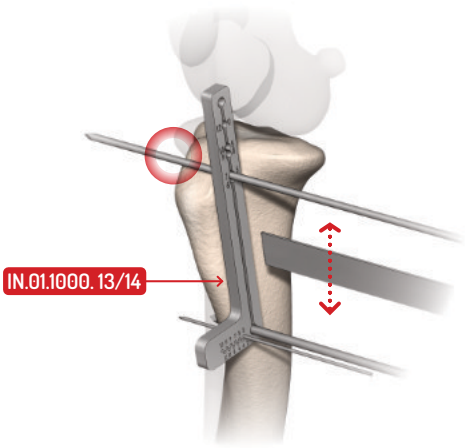
Tapered HEX screwdrivers

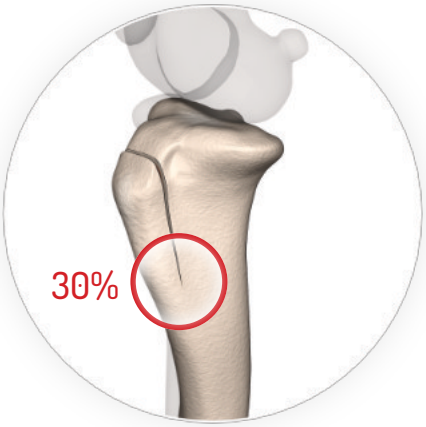
SIZE ROZMIAR	Ø OF SCREW Ø WKRĘTA		REF
	KOROWE / CORTICAL	BLOKOWANE / LOCKING	
HEX **1,3**	-	1,5	IN.01T.1000.17.13
HEX **1,5**	1,5 / 2,0	2,0	IN.01T.1000.17.15
HEX **2,0**	2,4	2,4 / 2,7	IN.01T.1000.17.20
HEX **2,5**	2,7 / 3,5	3,5	IN.01T.1000.17.25
HEX **3,5**	4,5	4,5	IN.01T.1000.17.35

Ss

1. Bone preparation.

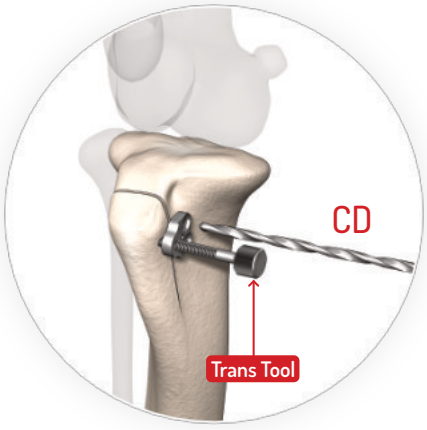
Carefully perform the cut on tibial bone through the correct size of saw guide. The cut should be done in 30% of total width of the tibia in lateral view.





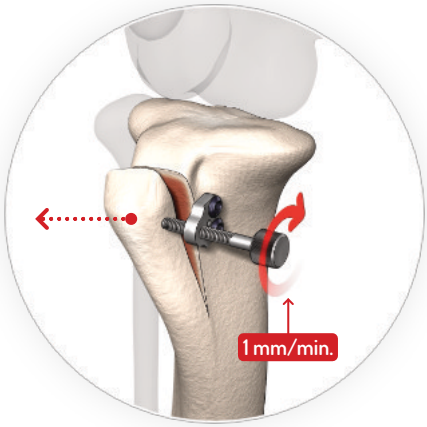
2. Trans TOOL attachment.

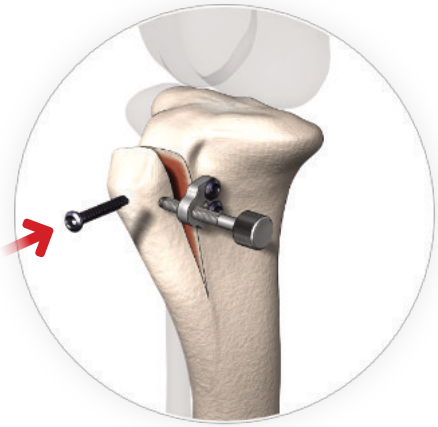
When the cut is done, put the tool on the bone with the holes aiming the bone axis. You can use K-wire to temporary fix the device. Use the correct drill bit (CD) to prepare the holes for cortical screws (System 1.5/2.0/2.4/3/5) or use threaded drill guide and drill bit to prepare the holes for locking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



3. Tibial tuberosity transposition.

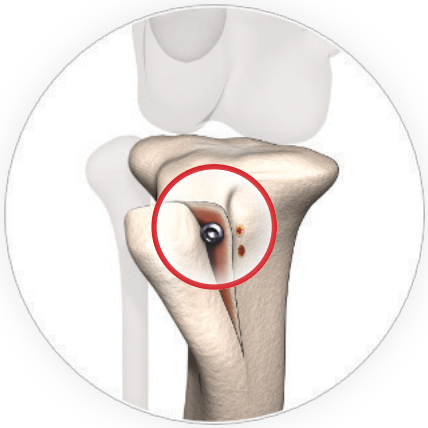
With the knurled bolt, perform the tibial tuberosity transposition at a rate 1 mm/min. Recommended revolutions per minute for each system is in the table on page 5.1





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

Distract

	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

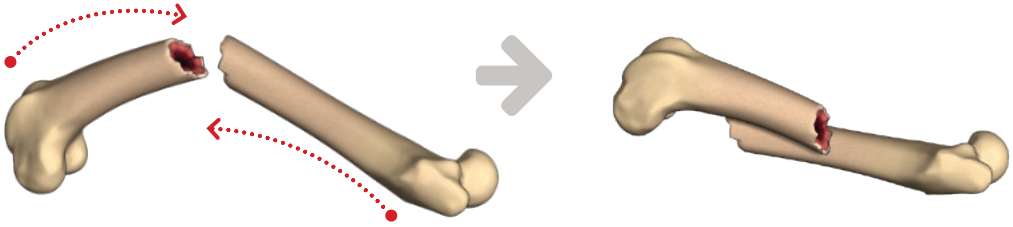
ø2 / ø3

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.

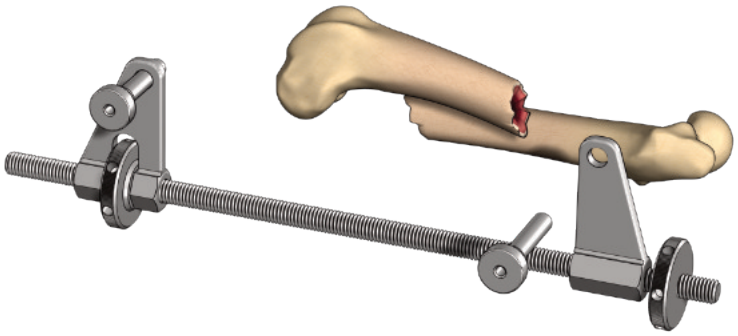
IN THIS CASE, USING THE DISTRACTOR IS RECOMMENDED.



SETTING THE INITIAL POSITION OF THE DISTRACTOR

1. ### Sleeve insertion.

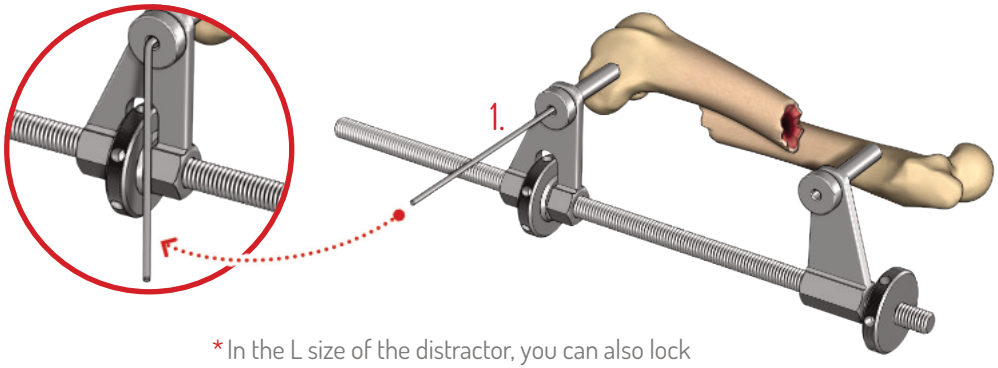
Insert both sleeves (*) in the ears of the distractor.



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

2. Locking the sliding part of the distractor.

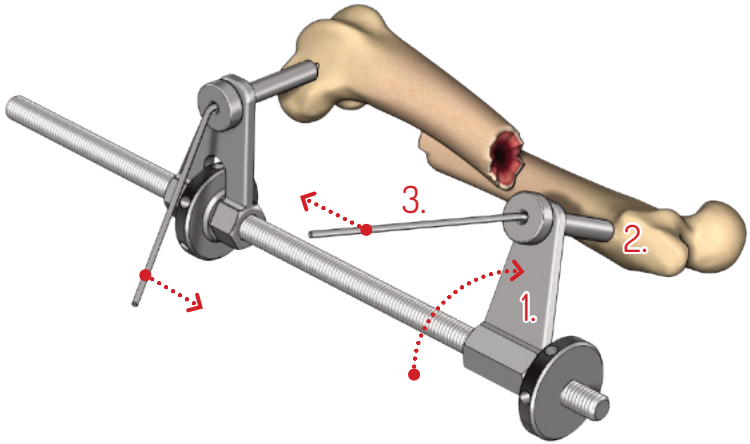
Insert the K-wire (1) into the bone through the mounted sleeve.
Lock the wire by bending it at the inlet of the sleeve hole (*).



* 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.

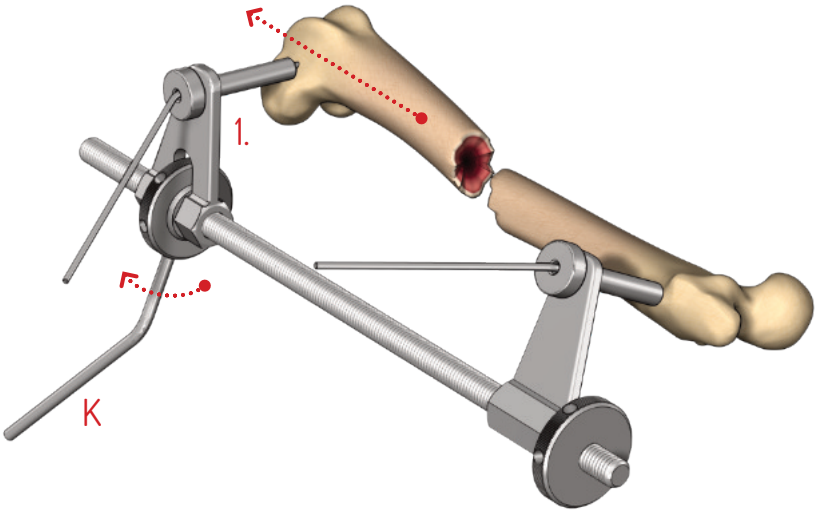
Set the rotating part of the distractor (1) in the correct position.
Insert the K-wire (3) into the bone through the sleeve (2).
Lock the wire by bending it at the inlet of the sleeve hole (*).



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

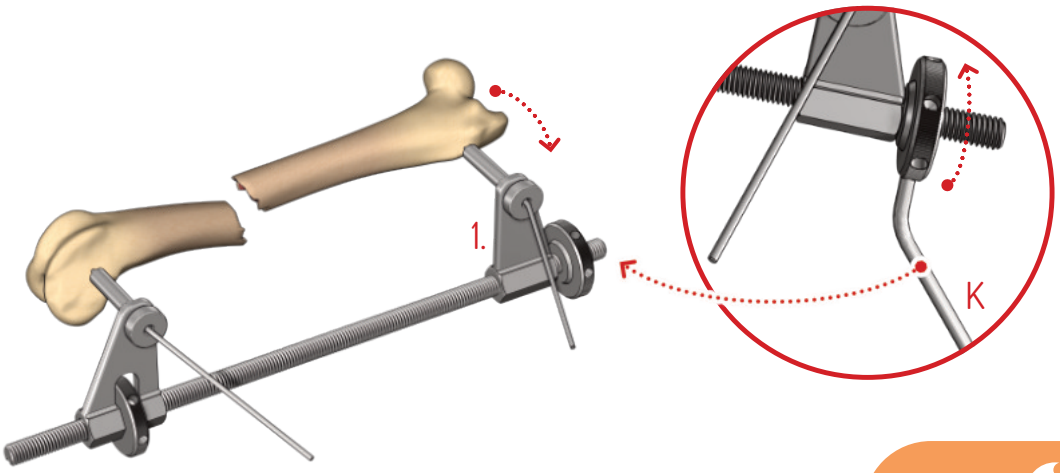
4. Bone fragments reposition with sliding part.

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



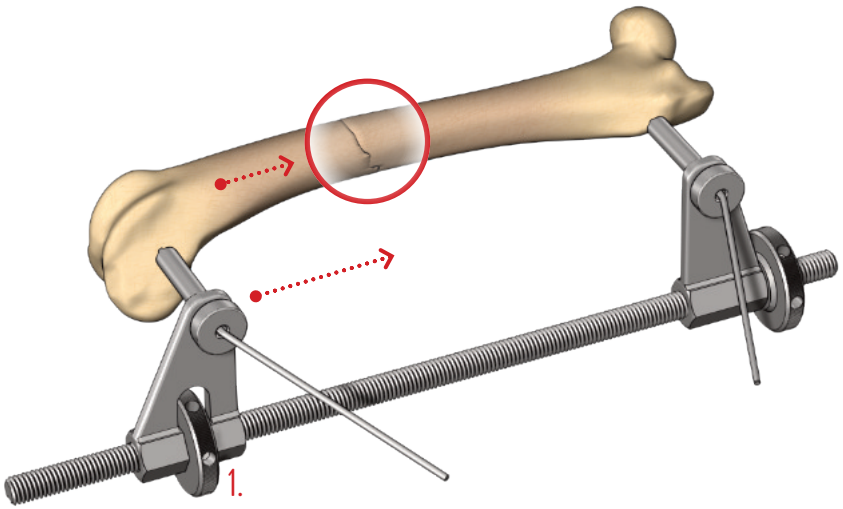
5. Reposition of fragments with rotating part.

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.