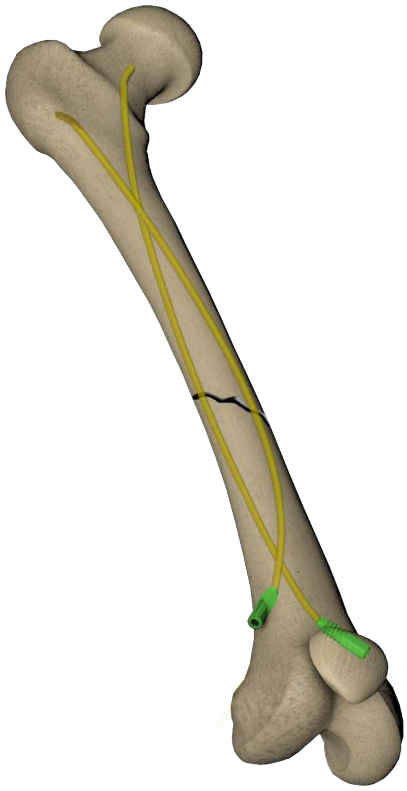
ST/55A

INTRAMEDULLARY OSTEOSYNTHESIS
Elastic intramedullary nail for children

- *IMPLANTS*
- *INSTRUMENT SET 40.6380.500*
- *SURGICAL TECHNIQUE*



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SYMBOLS DESCRIPTION

	Caution - pay attention to a special procedure.
	Perform the activity under X-Ray control.
	Information about the next stages of a procedure.
	Proceed to the next stage.
	Return to the specified stage and repeat the activity.

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The manufacturer reserves the right to introduce design changes.
Updated INSTRUCTIONS FOR USE are available at the following website: ifu.chm.eu

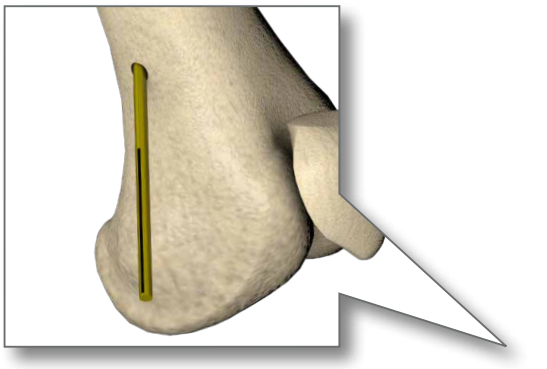
I. INDICATIONS

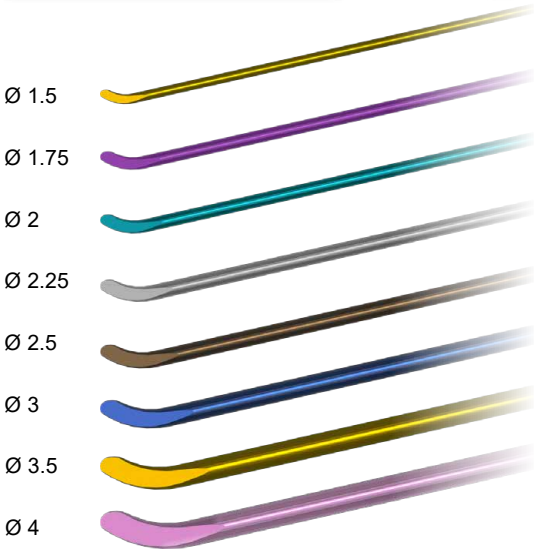
Elastic intramedullary nails for children are intended for fractures of lower limbs in children and small patients, and fractures of upper limbs in all patients. These nails can also be used in bones with a narrow medullary canal. Elastic nails do not disturb bone growth in children.

II. IMPLANTS

Elastic intramedullary nail for children

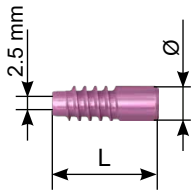
Ø [mm]	L [mm]	Catalogue no.
1.5	300	3.5089.300
1.75		3.2418.300
2		3.5090.300
2.25		3.2419.300
2.5		3.5091.300
1.5	350	3.5089.350
1.75		3.2418.350
2.25		3.2419.350
1.5	440	3.5089.440
1.75		3.2418.440
2		3.5090.440
2.25		3.2419.440
2.5		3.5091.440
3		3.5092.440
3.5		3.5093.440
4		3.5094.440





End cap

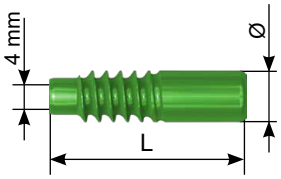
Ø [mm]	L [mm]	Catalogue no.
5.5	15	3.5088.055



The maximum diameter of the nail - 2.5 mm

End cap

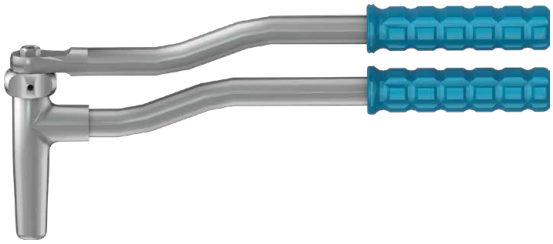
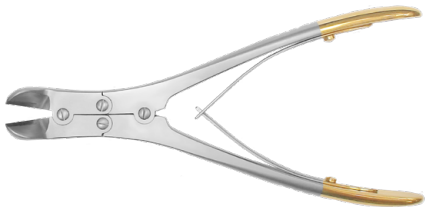
Ø [mm]	L [mm]	Catalogue no.
7.5	28	3.5088.075



The maximum diameter of the nail - 4 mm

III. INSTRUMENT SET

Instrument set for elastic nails 40.6380.500

	Name	Pcs	Catalogue no.
	Handle	1	40.6381.000
	Awl 5.0	1	40.6382.000
	Awl 3.2	1	40.6383.000
	Drill 5.0	1	40.6384.000
	Drill 3.2	1	40.6385.000
	Handle	1	40.6386.000
	Impactor-extractor	1	40.6387.000
	Nails cutting device	1	40.6388.100
	Mallet large	1	40.6389.000
	Mallet small	1	40.6390.000
	Wire bending massive pliers with conical holder with mallet	1	40.3198.000
	Protective guide 5.0	1	40.2539.050
	Mallet	1	40.4595.000
	Wire cutting pliers 23 cm hardened *(max wire cutting diameter - 2mm)*	1	40.3176.000

Instrument set for elastic nails 40.6380.500

	Name	Pcs	Catalogue no.
	Star screwdriver T15	1	40.0670.000
	Star screwdriver T25	1	40.0671.000
	Stand	1	40.6399.500

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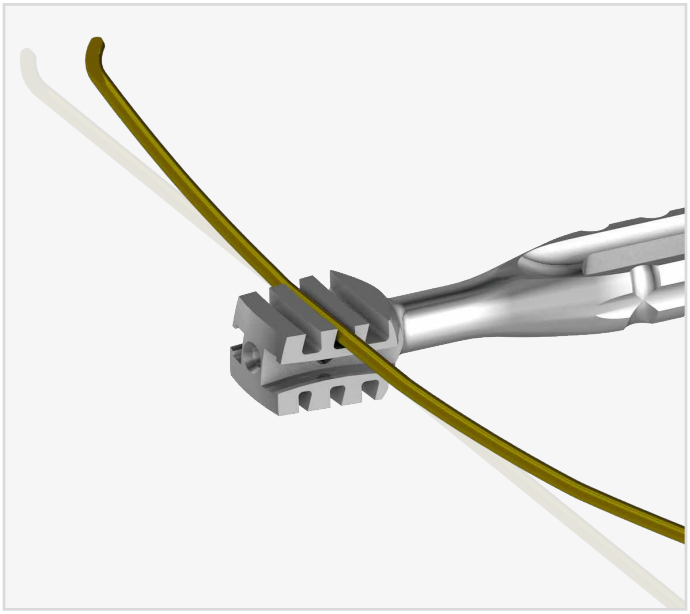
IV. SURGICAL TECHNIQUE

IV.1. NAIL BENDING

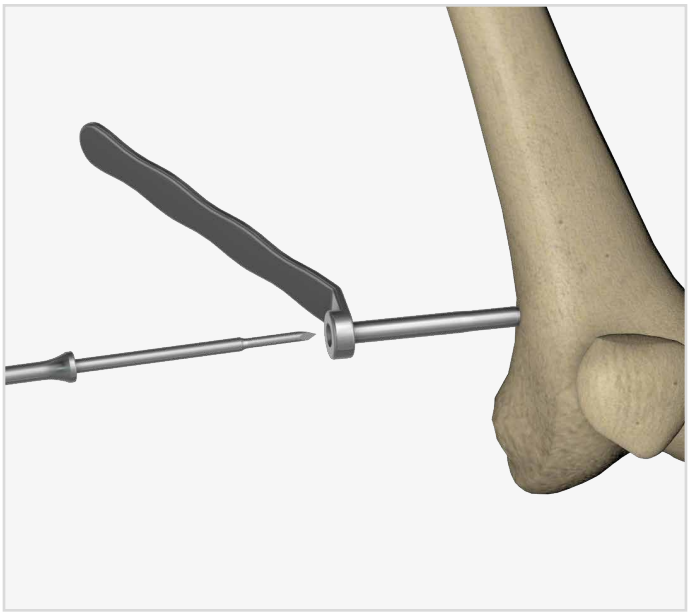
Match the nail shape to the shape of medullary canal with the help of handle **[40.6381]** and wire bending massive pliers with conical holder with mallet **[40.3198.000]**. The bent tip should be at the level of fracture. Handle has specific bending radii in which particular nails should be bent depending of the nail diameter.

NOTE:
Do not bend the nail in the same place, repeatedly. This may result in the loss of its mechanical properties or in extreme cases, fracture of the implant.
- **It is important to shape the nail with the least possible amount of bends. Excessive bending can result in post-operative fracture of the implant.**
- **Implants bent repeatedly cannot be used.**



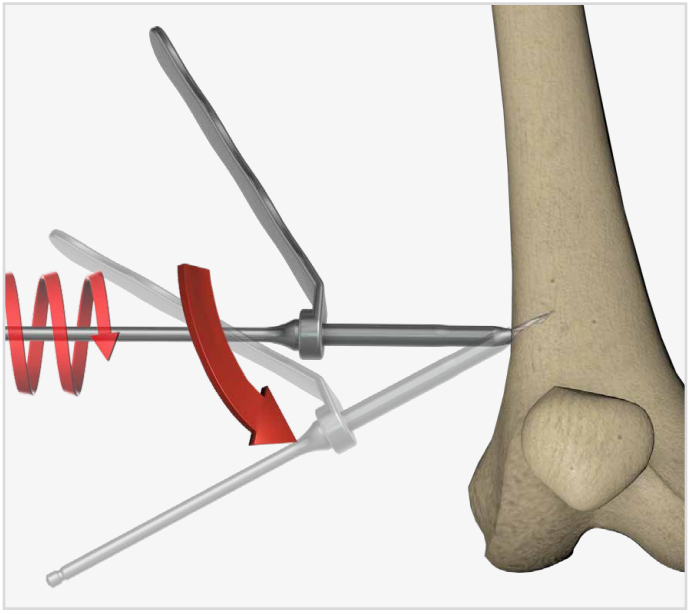
IV.2. PUNCTURING THE CORTICAL LAYER

It is possible to puncture the first cortical layer either with drills 5.0 and 3.2 or with awls 5.0 and 3.2. The use of protective guide 5.0 is recommended for both methods in order to prevent any damage to soft tissue and to prevent too deep puncture *(as the devices can puncture the bone up to the depth of 22 mm)*. The opening and nail entry point should be at least from 10 to 30 mm away from the joint part of long bones.



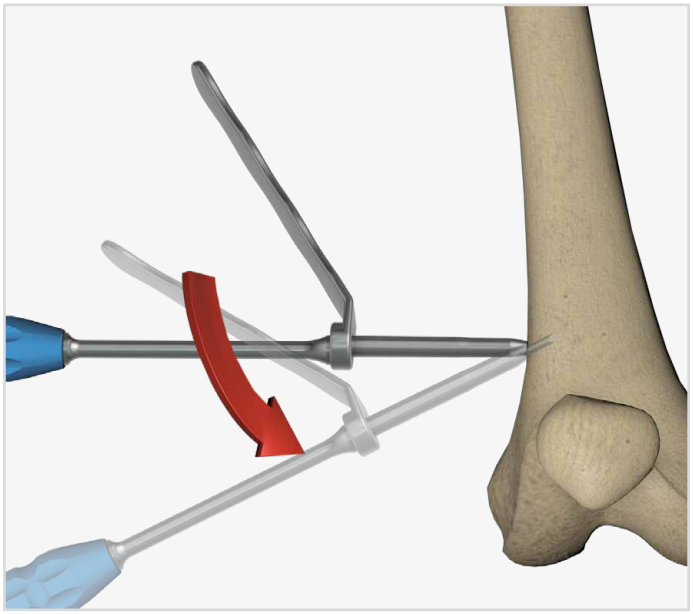
IV.2.1. Opening of cortical layer with a drill

Drill 5.0 **[40.6384]** should be used for opening preparation in cortical layer for nails with diameter of 3.0, 3.5, 4.0, while for nails with smaller diameters drill 3.2 **[40.6385]** should be used. Insert the drill through the protective guide **[40.2539.050]** at an angle of 90° and reach the cortical layer of bone. Direct the drill slantwise towards the fracture as soon as the cortical layer is punctured.



IV.2.2. Opening of cortical layer with an awl

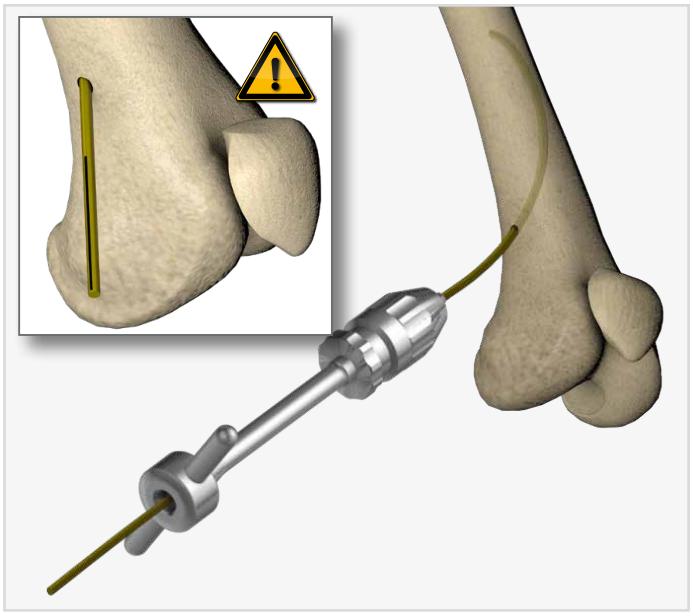
In order to open the nail insertion opening in the cortical layer use awl 5.0 **[40.6382]** for nails with diameter of 3.0, 3.5, 4.0; for nails with smaller diameter use awl 3.2 **[40.6383]**. Insert the awl through the protective guide **[40.2539.050]** at an angle of 90° and reach the cortical layer of bone. Direct the awl slantwise towards the fracture as soon as the cortical layer is punctured.



IV.3. NAIL INSERTION

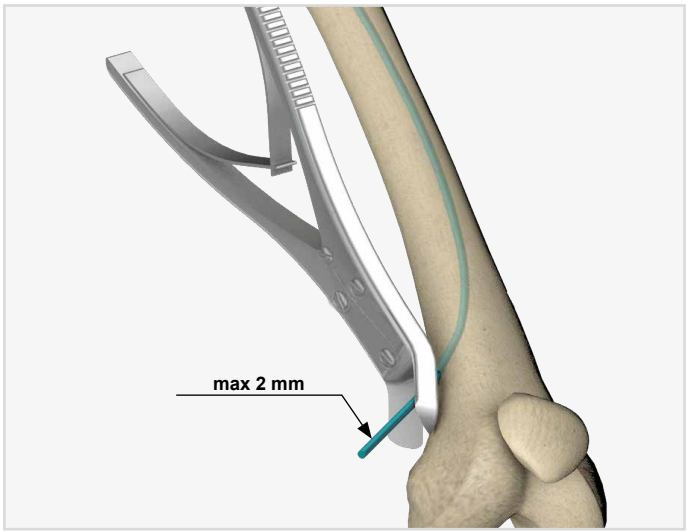
Attach the handle **[40.6386]** to a selected implant. Insert this coupled system into the previously opened medullary canal. If necessary, attach the impactor-extractor **[40.6387]** to the handle **[40.6386]** and continue the insertion while hitting with a mallet **[40.4595]**. Repeat this actions until the needed amount of nails has been inserted. The inserted nails should cross above and below the line of fracture. The tips of bent nails should be at the level of fracture.

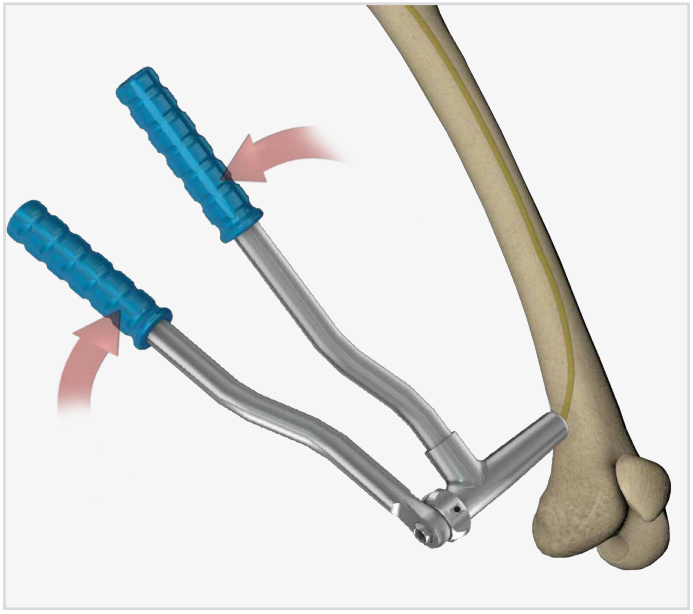
Visible marker indicates the location of the bent fragment of the nail.



IV.4. CUTTING THE NAIL ENDS OFF

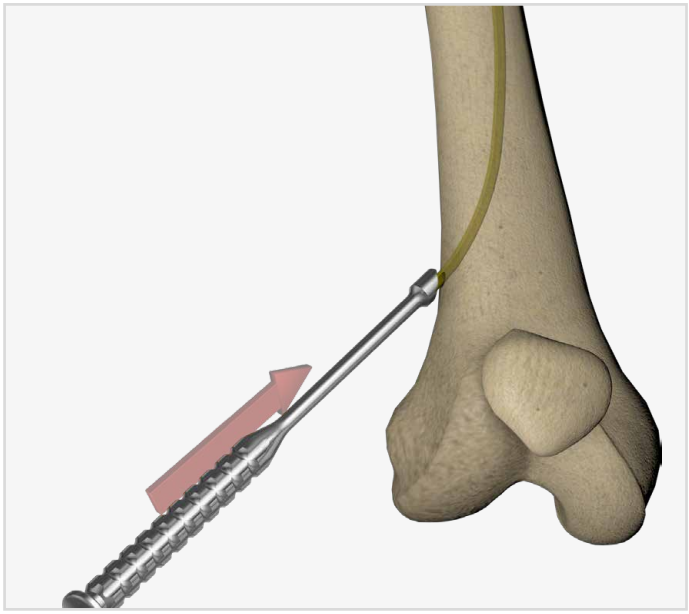
Use wire cutting pliers **[40.3176]** or nails cutting device **[40.6388.100]** to cut the protruding tips of implants.





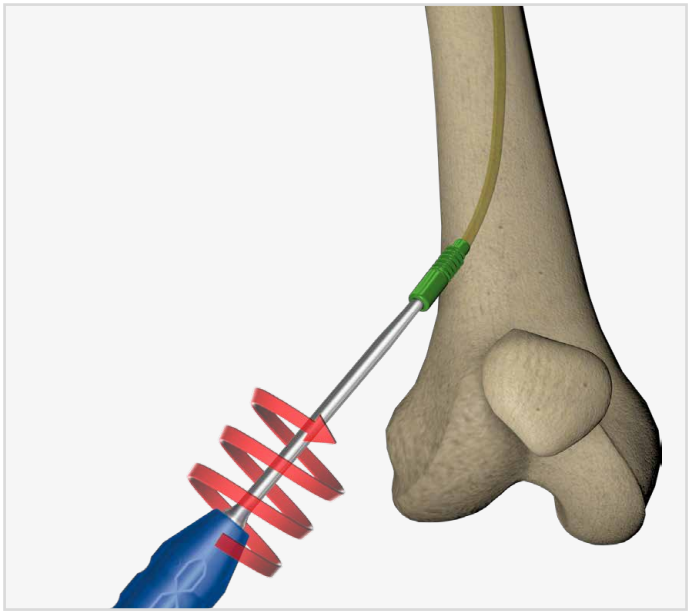
IV.5. FINAL NAIL PLACEMENT

Adjust the final position of implant by hitting with a mallet **[40.4595]** and a large mallet **[40.6389]** for nails with diameter of 3.0, 3.5, 4.0 or a small mallet **[40.6390]** for the nails with remaining available diameters.



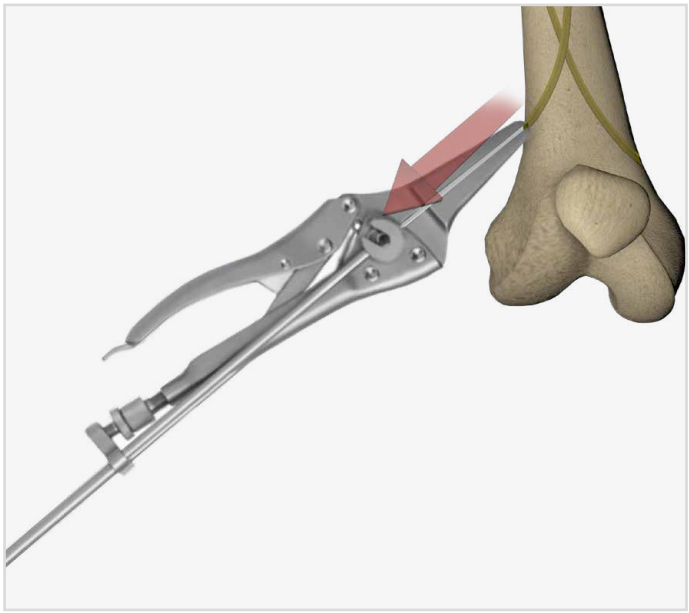
IV.6. INSERTION OF END CAP

Insert an end cap *([3.5088.055] for a nail with maximum diameter of 2.5 mm, [3.5088.075] for a nail with maximum diameter of 4 mm)* on a star screwdriver T25 **[40.0671]** or star screwdriver T15 **[40.0670]** *(depends on the nail diameter)* and screw the end cap into the bone.



IV.7. NAIL REMOVAL

Unscrew the end cap from the bone with a star screwdriver T25 **[40.0671]** or star screwdriver T15 **[40.0670]** *(depends on the nail diameter)*. Clamp the jaws of wire bending massive pliers with conical holder with mallet **[40.3198]** on the protruding end of the implant and remove the nail from the bone with the help of a mallet integrated with the device.



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