

ARTHROPLASTY – REVISION SYSTEMS

# Cerclage System



Beznoska®

MANUAL

# Preface

**The new cerclage system of BEZNOSKA, s.r.o. is a supplementary osteosynthetic method that was developed with the aim to solve successfully incidental situations and complications that may occur both during primary and revision surgeries of total joint replacements.**

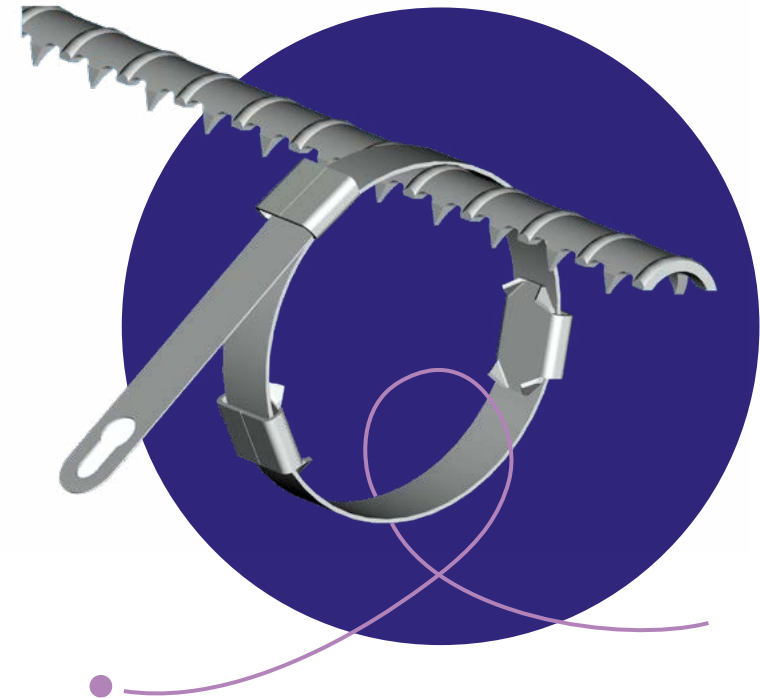
In the first scenario, there might appear fissures in the upper end of the femur when the femoral component is being inserted, either due to bone osteoporosis or poor matching between the implant and the prepared intramedullary canal. Also, the system might be a suitable solution in cases involving a fracture of the large trochanter.

In revision surgeries, the cerclage system is suitable for trap-door synthesis or trap-door osteotomy necessary for perfect removal of bone cement. The cerclage system is suited to fissures or fractures of long bones in exceptional cases only.

The cerclage system consists of a compressive cerclage tape, a slider with spikes, and groove-shaped plates with a limited contact facet. Compression of the tape, in order to assure a higher osteosynthesis stability, is achieved by using a stretching device. For perfect fixation of the cerclage tape on the uneven bone surface we use a slider with sharp spikes that are strung on the tape. To increase the stabilizing effect of cerclage, we may add a pair of narrow plates being cross-positioned on the opposite side of the bone at an angle of 70 – 110 degrees.

The cerclage tape and the slider with the spikes are made of unalloyed titanium (ISO 5832-2); the plates of titanium alloy (ISO 5832-3). The surface of the implants is fine sand-blasted.

The cerclage system is accompanied with a simple instrumentation set that allows its easy application.



## Cerclage Indication

### a) primary total hip joint surgery:

- fissures;
- fractures of greater trochanter;
- osteoporosis;

### b) revision surgery:

- trap-door synthesis or trap-door osteotomy;
- higher implant stability if the bone is weak;
- osteoporosis;
- fracture prevention of inferior bone quality;

### c) fractures, fissures of long bones (exceptionally).

## Mechanical test of the stability of the four-band cerclage set

The cerclage system durability test was performed at the station for testing of composite materials of AERO Vodochody Ltd. RVK 355 Prague-Letňany.

The test sample was consisted of a four-tape set of cerclage tapes fastened onto an artificial bone (Fig.1). The bone was longitudinally cut. The compression load on the bone was exerted over the head of cementless stem (SF) that was pushed into the bone under increasing pressure. At a pressure of 3300 N (ISO 7206-4), the set of tapes was still stable, without any sign of damage to the tapes. At a pressure of 3860 N, the stem was driven 22 mm into the bone, the artificial bone cracked, and the eyelet of the upper cerclage tape was partly stretched (fig. 2, 3). The other tapes remained unchanged.

The conclusion is that the cerclage system proved to have a high stability even under extremely high compression load simulated on a trial set (fig. 1).



fig. 1



fig. 2



fig. 3

# Surgical Technique

- 1/** The mobile fastening part of the guiding device for coupling cerclage tape must always be in front. To achieve this, keep turning the handle to the left (fig. 4).

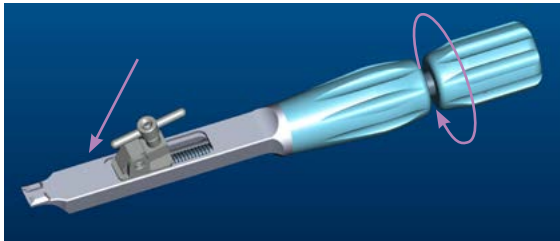


fig. 4

- 2/** Push the guiding device under the bone from the medial side, so that the bent point of the guiding device protrudes laterally. Thread the end of the band into the eyelet of the guiding device and pull the band underneath the bone (fig. 5, 6).

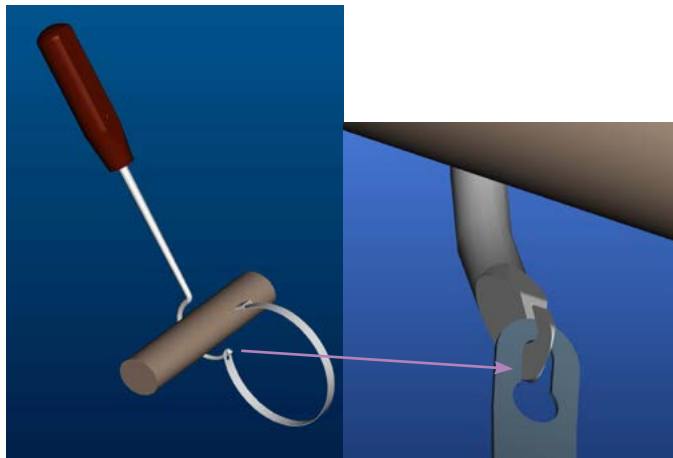


fig. 5

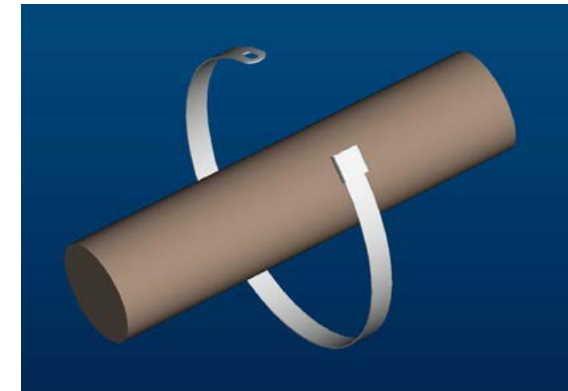


fig. 6

- 3/** Using your hand, pull the end of the band through its eyelet and, manually or using a pair of nippers, pull the band tight around the bone (fig. 7).

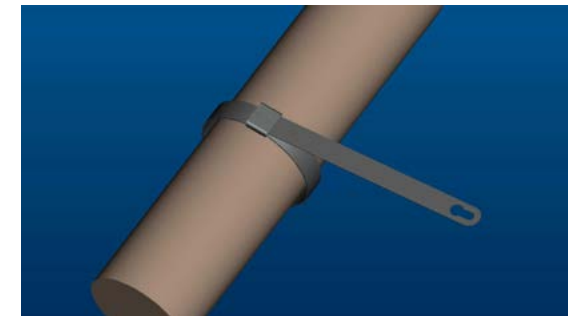


fig. 7

- 4/ Take the loose end of the band and put it into the movable end of the stretcher. Fasten the band in the stretcher by turning the loop to the right. Keep turning to the right to tighten the band around the bone, until we find the tightness adequate (fig. 8).

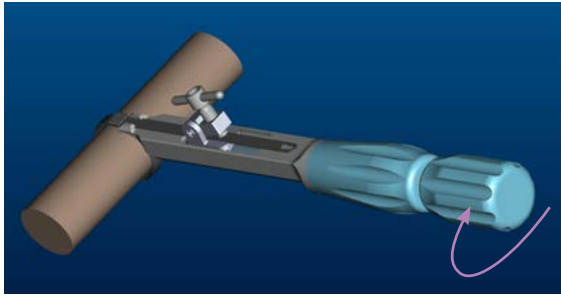


fig. 8

- 5/ Now it is time to lift the stretcher up to draw it above the bone, thereby bending the band around the eyelet by more than 90° (fig. 9). Next, loosen the loop and pull the stretcher out.

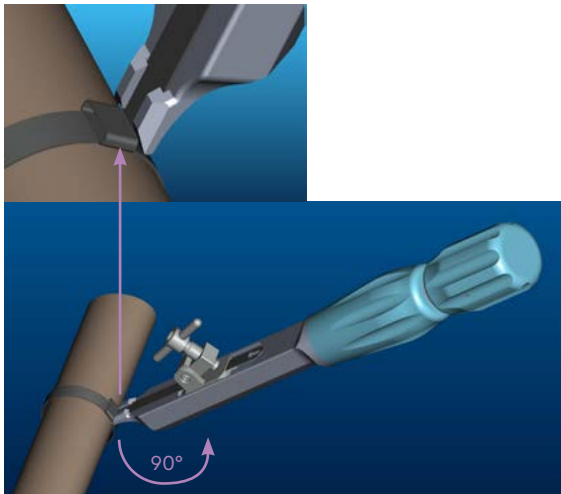


fig. 9

- 6/ Apply the metal measuring tape and cut the band off with the nippers in the marked point (fig. 10). Lay the nippers against the metal tape in the marked point.

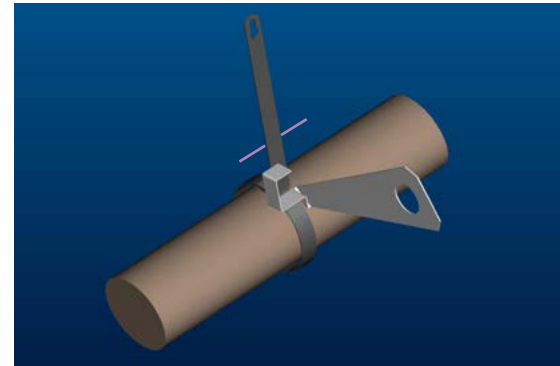


fig. 10

- 7/ Put the bending device on the band in the place just cut, and bend the loose end of the band by about 90° (fig. 11, 12, 13).

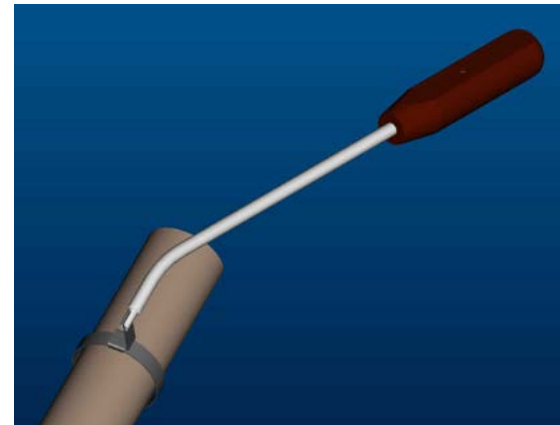


fig. 11

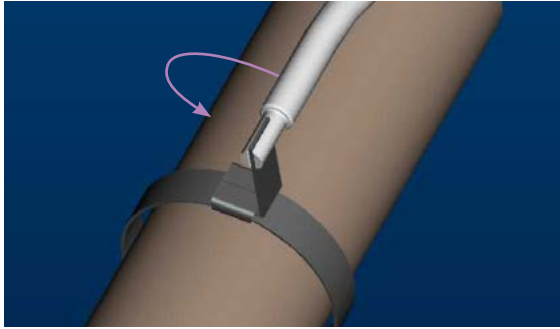


fig. 12



fig. 13

**8/** Pull out the bending device and, using the stamper, fold the bent part of the tape onto the bone (fig. 14 - 16).

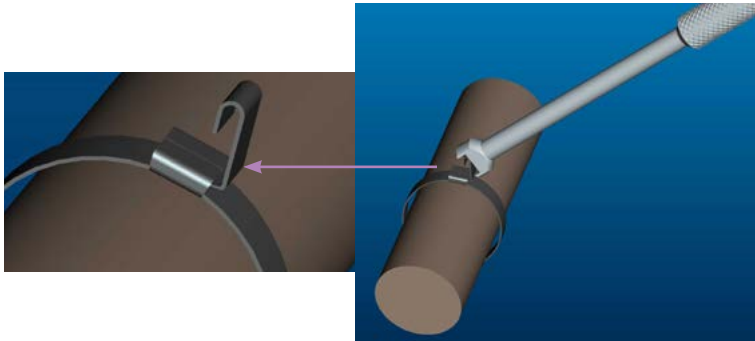


fig. 14

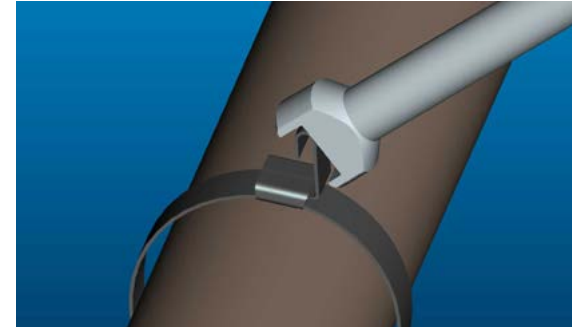


fig. 15

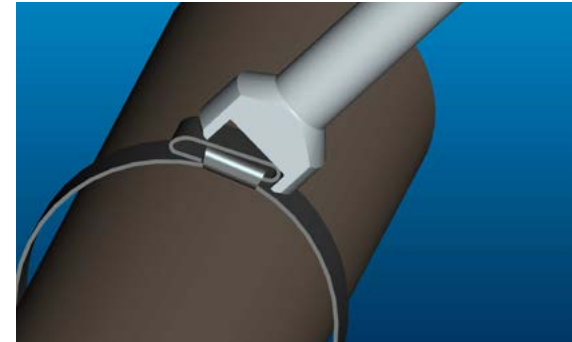


fig. 16

# Devices increasing the cerclage stability

If using the cerclage method on a very unevenly shaped bone (articulated), it helps to complement the tape with at least one slider with sharp spikes (fig. 17).

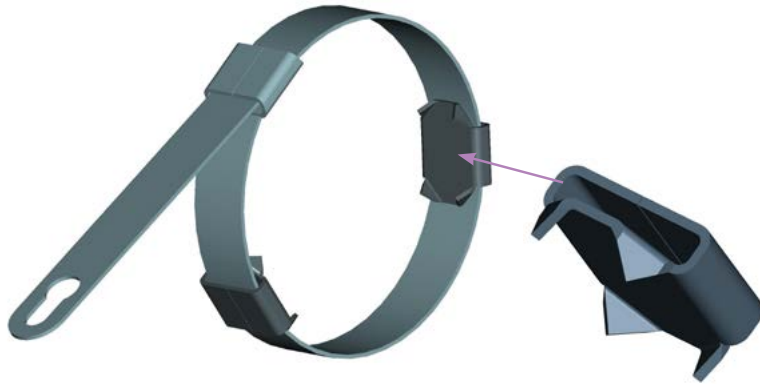


fig. 17

For further improvement of stability, it is advised to apply a pair of plates with spikes that must be brought into a very close contact with the surface of the bone (fig. 18, 19).

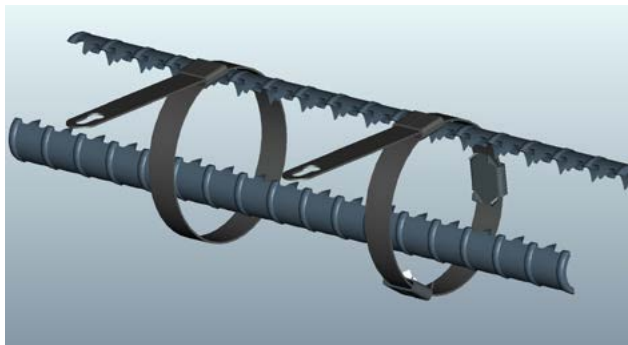


fig. 18

From the anatomical and mechanical perspective, it is recommended to position the plates at an angle of 70° to 110° (fig. 19).

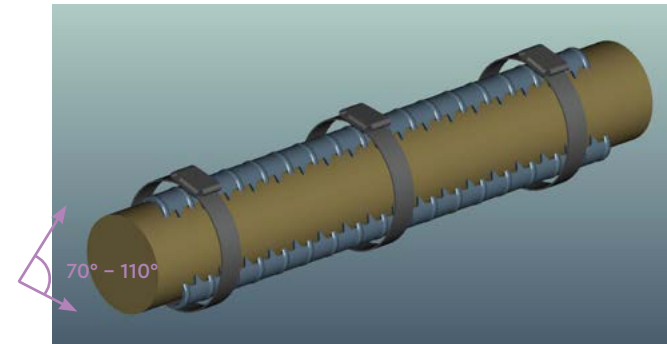


fig. 19

# Extraction of the cerclage tape

## 1/ Accessing the eyelet

Straighten out the bent part of the tape over the eyelet, using a flat tool – chisel or flat screwdriver, etc. (fig. 20, 21).

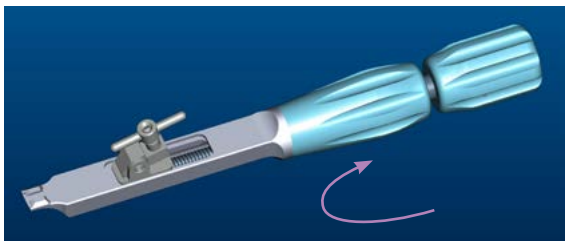


fig. 20

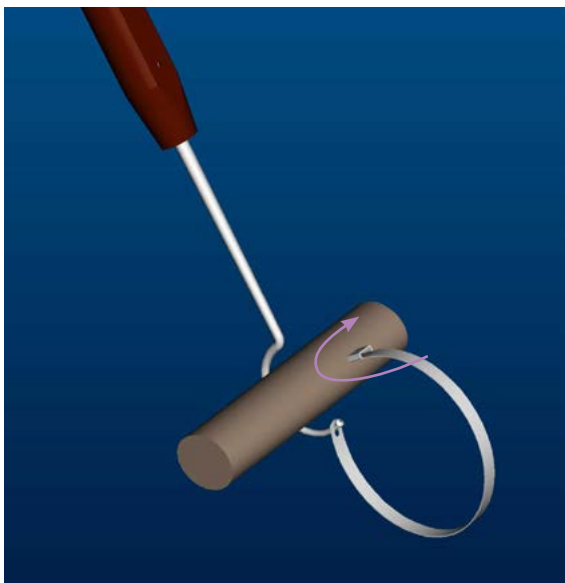


fig. 21

## 2/ Opening up the eyelet

Open up the eyelet using a flat tool and a pair of pliers (fig. 22 – 25).

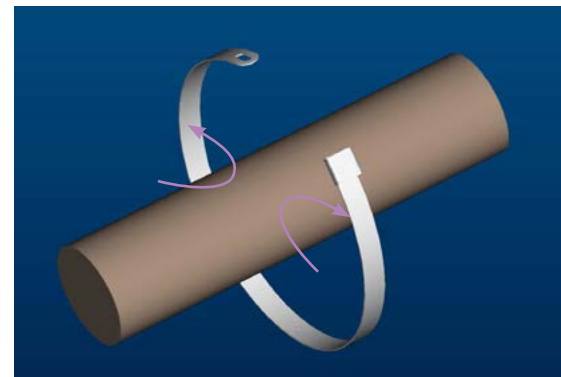


fig. 22

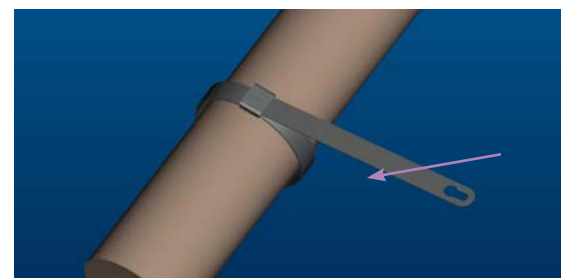


fig. 23



### 3/ Adjusting the locked end of the tape

Squeeze the end of the tape using a pair of pliers (fig. 26) or remove it by clipping it off. This eliminates damaging soft tissue when pulling the band out.

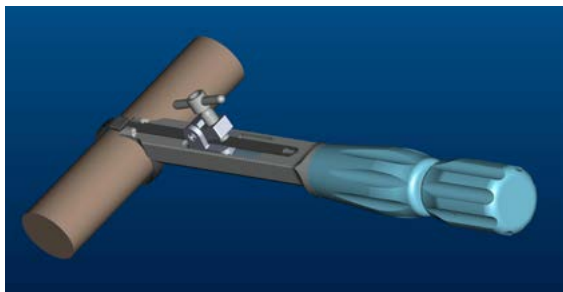


fig. 24

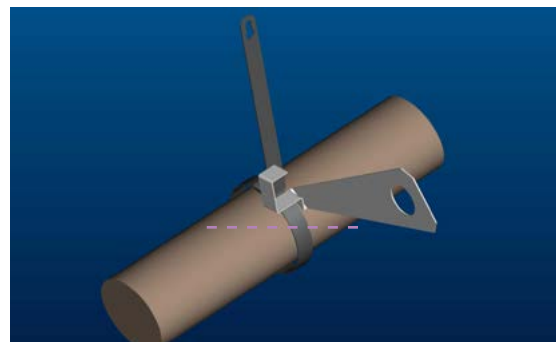


fig. 26

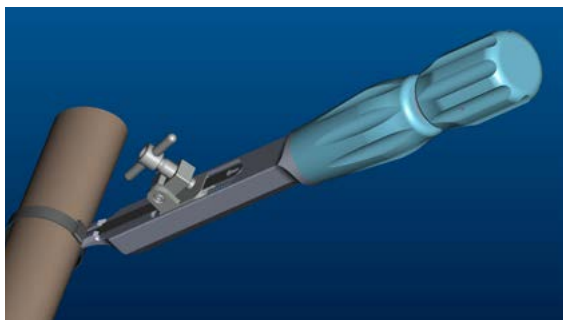


fig. 25

### 4/ Removing the tape

Grip the band eyelet with a pair of pliers and pull out it out.

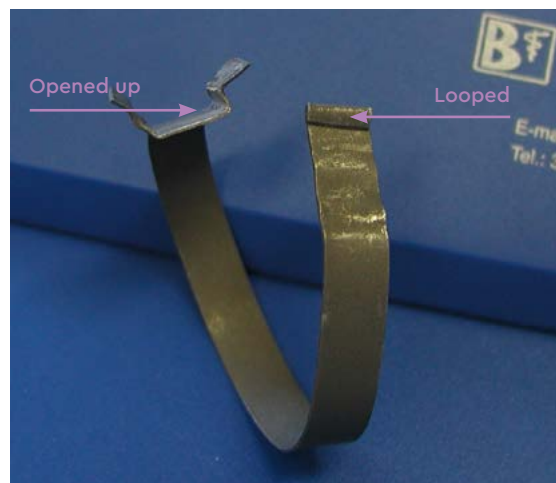


fig. 27

# Instrumentation Set

The set of instruments is laid out in a tray, which facilitates easy orientation in the lay-out of the instruments, not only during transportation, storage, and preparation, but also during the surgery performance. While being transported, the tray is placed in a container where it can be kept sterilized. The lay-out of the instruments is shown hereunder.

## CERCLAGE – SET OF INSTRUMENTS (tray)

	Denomination	Qty	Order no.
1	Cerclage – Set of instruments	1	400000
2	Cerclage – Tape tensioner	1	401300
3	Cerclage – Middle loader, right	1	401302
4	Cerclage – Middle loader, left	1	401303
5	Cerclage – Small loader, right	1	401304
6	Cerclage – Small loader, left	1	401305
7	Cerclage – Measuring metal sheet	1	401306
8	Cerclage – Tape bender	1	401308
9	Cerclage – Impactor	1	401310
10	Cutting pliers, max D2	1	506900

**Note:** The tray lay-out is merely informative and may be changed as per future innovations.



# Catalogue



## Cerclage - Cerclage tape

**Material:** Unalloyed titanium (ISO 5832-2)

Length [mm]	Width [mm]	Thickness [mm]	Order number
270	7,5	0,5	410000



## Cerclage - Slider with pikes

**Material:** Unalloyed titanium (ISO 5832-2)

Length [mm]	Width [mm]	Thickness [mm]	Order number
12	9,5	4,5	410010



## Cerclage - Plate

**Material:** Wrought titanium alloy Ti6Al4V (ISO 5832-3)

Length [mm]	Width [mm]	Thickness [mm]	Order number
170	10	2,5	410020
200			410022
230			410024

IMPLANT  
DESCRIPTION

SURGICAL  
TECHNIQUE


INSTRUMENTS

CATALOGUE

# Beznoska<sup>®</sup>

## Export

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**back  
in motion**

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