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# Surgical Technique

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Silicone implants

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MCP / PIP

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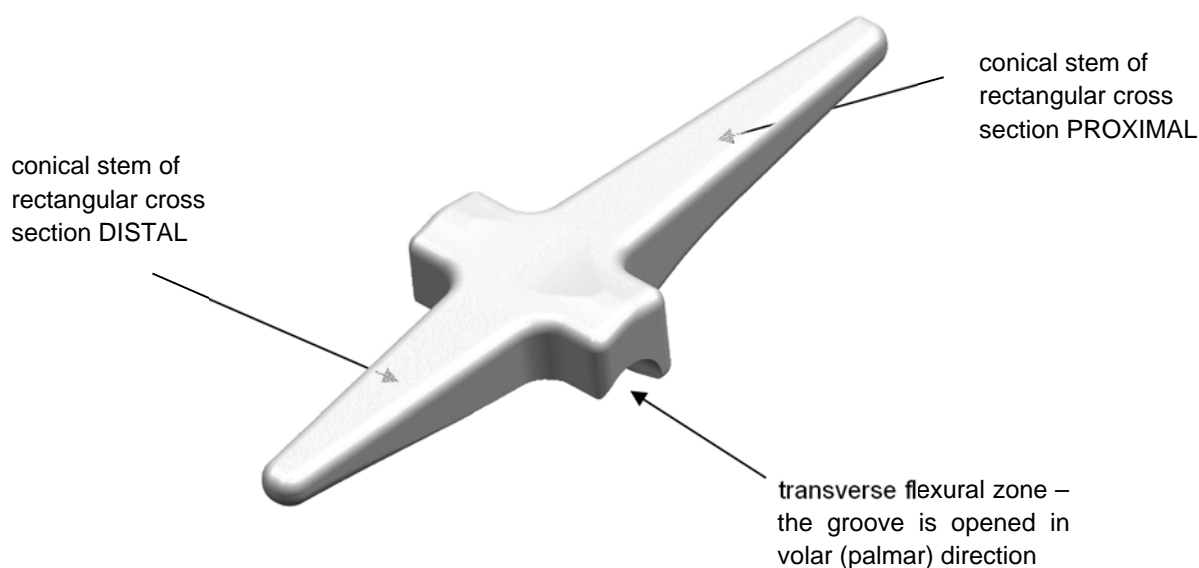
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## IMPLANT

The endoprosthesis is a single cast constituted by medial transverse flexural zone of circular cross section of which smooth conical stems (shafts) of rectangular cross section extend proximally and distally. The transverse flexural zone of the implant is provided by a groove on the volar (palmar) surface to facilitate flexibility. Walls of this groove form a 30° angle with the vertical and they converge in rounded vertex. The flexural groove is open at a 60° angle in the volar direction. Shafts of the implant are loosely placed in a diaphysis of finger articles, they are not cemented and on the contrary their shift in the long axis of a diaphysis (so called piston effect) facilitates a flexion in the area of the flexural zone of the endoprosthesis. The rectangular cross section of shafts prevents possible tendency to rotate.

Implants are supplied in 7 sizes designated by numerical series from 2 to 8. Size 2 is the smallest. Each of the seven sizes is marked with a size number directly on the implant anchor shaft.

Material used for production of the endoprosthesis is silicone by the NUSIL company designated MED 4550. This material is intended for use in human implantation for a period of greater than 30 days and it meets needed mechanical properties. The surface of the implant is smooth, without coatings or any other modifications.



**Fig. 1** The main parts of the implant

### CAUTION!

This publication is intended to serve as a guide to the use of the above-mentioned implant. For the sake of brevity, it focuses only on the basic operating procedure and assumes that the operator and other personnel are perfectly familiar with the general rules of operation when using metacarpo-phalangeal (MCP) and proximal-interphalangeal (PIP) joint replacements. Before using the implant, it is necessary to familiarize with the instructions for use.

## INDICATION

The implant is intended for replacement of a metacarpophalangeal (MCP) and interphalangeal (PIP) joint.

1. Fixed or stiff joints by the progressive polyarthritis, traumatic or arthritic destructions.
2. An X-ray image of joint destruction or subluxation.
3. Contracture of small hand muscles (mm, lumbricales et interosei) and deformities - Swan neck and Buttonhole.
4. Ulnar deviation at the MCP joints incorrigible by plastic ligament correction.

## CAUTION!

Indication should be carefully considered in case of a severe osteoporosis, passed infections, marked overweight and with patients with hard physical strain, patients addicted to narcotics and alcohol, or with mentally ill patients, for whom cooperation is not guaranteed. The implant is intended for single use only and cannot be reused!

Contraindication:

- Infectious diseases or local infections
- Serious neuromuscular or vein diseases
- Insufficient quality of bone or skin structures
- An allergy to the silicone material

Components should never be used for a test-setting as for this purpose yellow testing templates are included in the set of instruments. Bedding of components has to be performed on definitively shaped areas only.

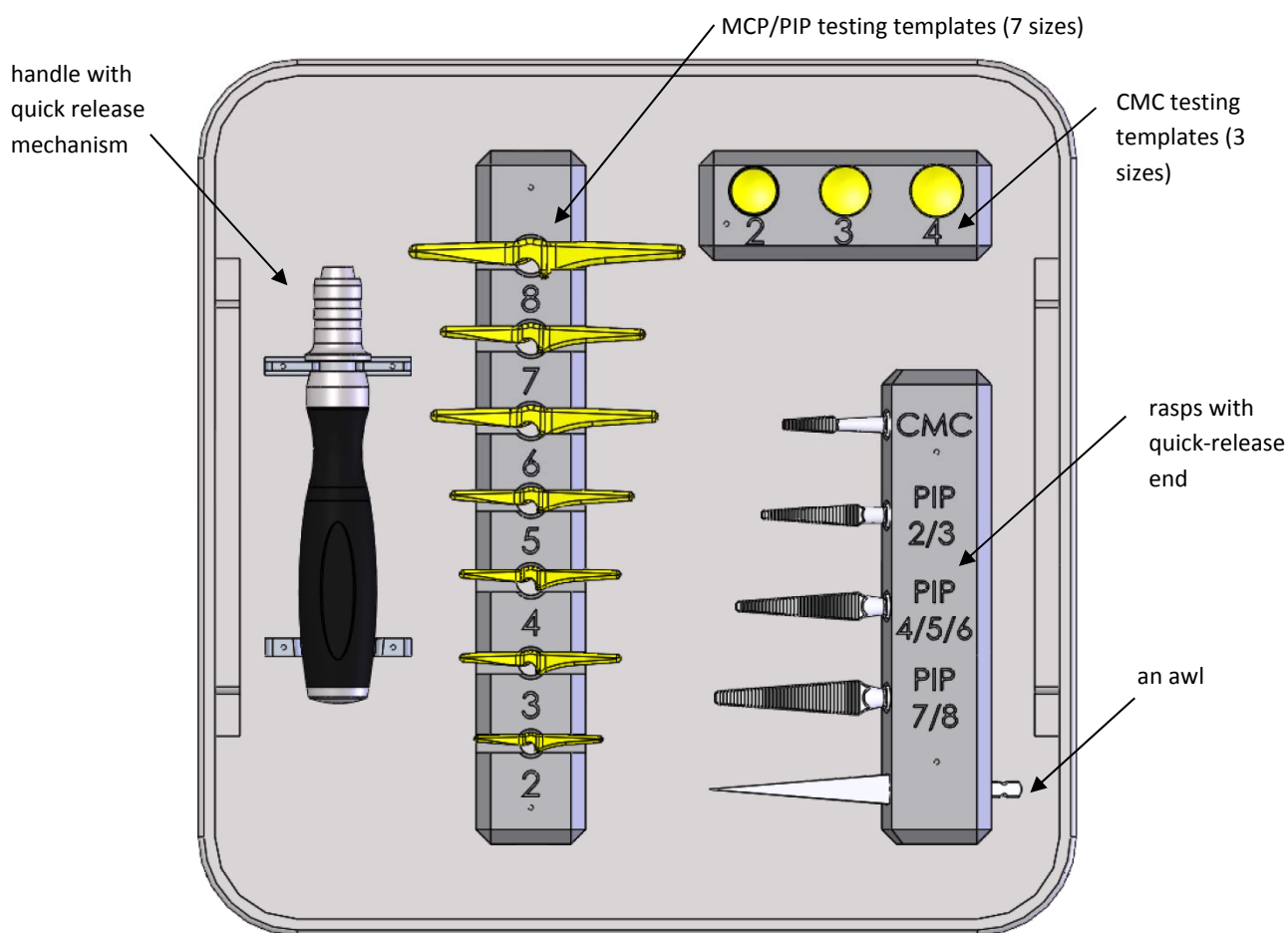
## CAUTION!

**Products cannot be combined with the other manufacturers products!**

A thorough acquaintance with the surgical implantation technique is an essential and apparent precondition for performing the surgery. The patient must be informed of the rules of conduct after the implantation and of the related rehabilitation. The patient should be advised to strictly follow the instructions of the physician.

## SET OF INSTRUMENTS

A set of surgical instruments supplied by the manufacturer of the implant is necessary for application of ProSpon metacarpo-phalangeal (MCP) and proximal-interphalangeal (PIP) joint replacement. It is necessary, as well, to follow this surgical procedure. When handling the product it is necessary to prevent any damage, which could adversely affect its quality and service life, especially the damage caused with a sharp blades. The set of instruments should be treated regularly and perfectly clean as its damaged parts may lead to the implant failure. Before the surgery, the completeness and functionality of the instrument set must be checked.



**Fig. 2** The basic instrument set is common for MCP/PIP and CMC implants. Special rasp, an awl and yellow silicone test templates are included.

**NOTE.** THE PROCEDURE GIVEN IS SCHEMATIC ONLY. THIS SURGICAL TECHNIQUE DOES NOT SUBSTITUTE THE NECESSARY KNOWLEDGE OF SURGICAL TREATMENT WITH A MCP OR PIP REPLACEMENT. THIS KNOWLEDGE IS EXPECTED FROM THE SURGEON.

## SURGERY – MCP JOINT REPLACEMENT

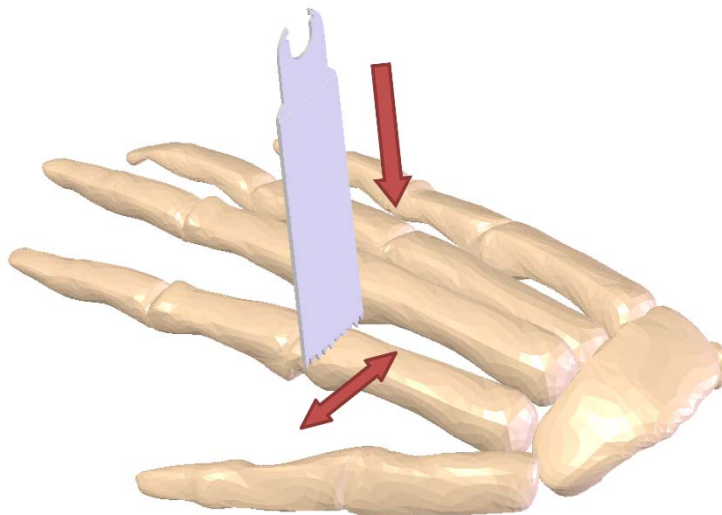
Significant attention must be given during the surgery to preserve the aponeurosis structures, collateral sinews and ligaments, vascular and nervous systems of the finger and other tissues.

When replacing the metacarpophalangeal (MCP) joint, a transversal incision above the necks of the metacarpal bones must be executed. By means of a longitudinal cut above the edge of the extensor sinew (tendon), the extensor hood (cowl) is opened. The metacarpal necks must be interrupted along the edges of the joint areas by means of a oscillating saw and sharp chisel. The head must be removed together with the synovial membrane.

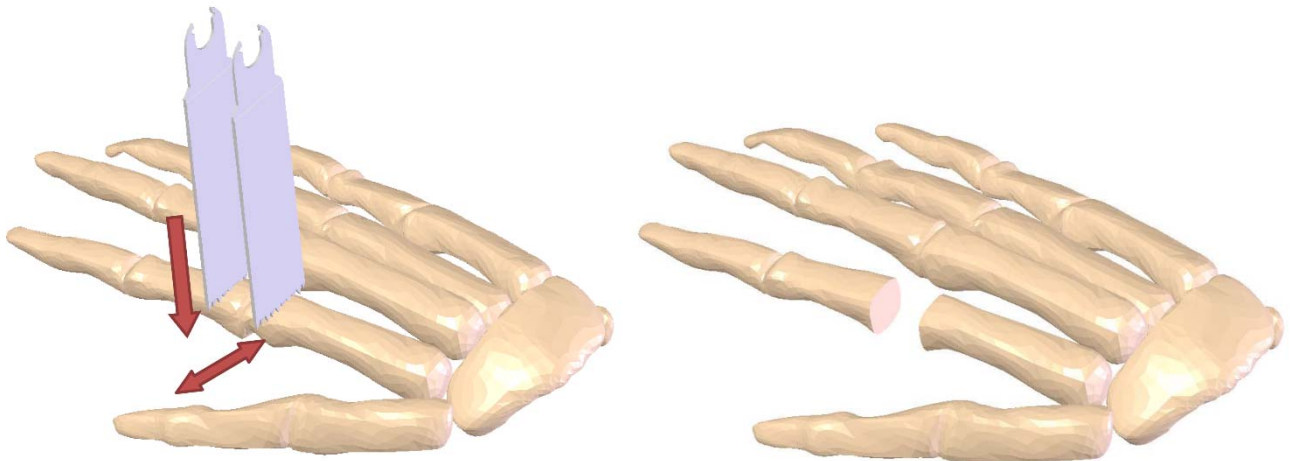
There is no need for a resection of the proximal phalanx base, just remove eventual osteocytes. Subsequently, the stem channel in the metacarpal must be prepared by the means of drilling, a milling cutter or by a special four-edged hand rasp from the instrument set. After setting the maximum flexion, the procedure should proceed in the same way for the preparation of the diaphysis of the phalanx base. Please pay attention to prevent injury to the nerves and vascular bundles.

The created marrowal channels must be flushed using a physiological solution and the implant can then be fitted using anatomic tweezers. Firstly, the longer, proximal stem should be inserted into the metacarpal cavity and after distraction and flexion of the phalanx base the distal stem should be easily inserted into the second prepared cavity.

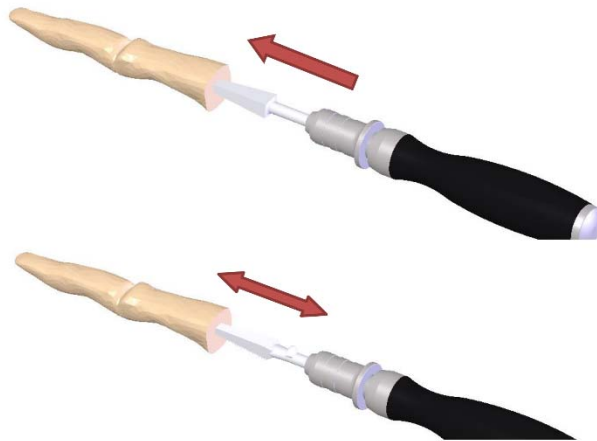
The size of the implant should be predetermined by inserting and testing a yellow template. The implant must be properly settled during extension of the finger and it should fill the resected volume without being compressed. During relative relaxation of the extensor it is imperative to crease the tendon longitudinally or to make a tenodesis to the base of the basic phalanx. After implantation, the extension system should be properly sutured.



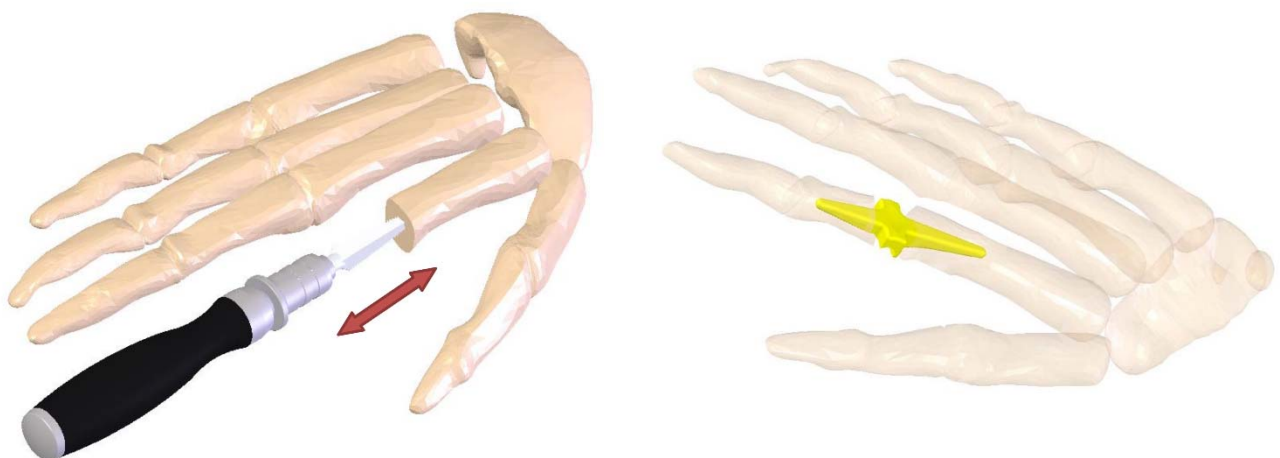
**Fig. 3** Preparing the bones – surgical oscillating saw



**Fig. 4** Preparing the bones - a transversal incisions



**Fig. 5** Preparing the marrowal channel using a special rasp



**Fig. 6** Left: preparing the marrowal channel using a special rasp. Right: inserted implant - the scheme

## SURGERY – PIP JOINT REPLACEMENT

When replacing the proximal interphalangeal (PIP) joint, an S-type cut with a short arm in the transverse bending grooves on the dorsal side of the joint and with longer distal and proximal arms on the proximal and medial phalanx edges, should be executed. Subsequently, the dorsal aponeurosis must be uncovered; the central strip must be cut longitudinally and pulled to the sides. Collateral ligaments, if possible, should be left intact. The resection of the joint faces and milling of the marrowal cavity should be executed in a similar way, as was the case during the MCP joint replacement surgery. After implantation, the extension system should be properly sutured again.

## SURGERY – SWAN NECK DEFORMITY

In the case of a Swan neck deformity, the implantation of the endoprosthesis is executed in the standard way. Consequently, the central strip should be extended by means of the “Z” plastic, which leads to the deformity adjustment.

## SURGERY – BUTTON HOLE DEFORMITY

In the case of a button hole deformity, after stripping the external system, lateral bundles should be insulated and after implantation of the endoprosthesis, the central strip of aponeurosis should be shortened and then reinserted to the base of the middle element of the phalanx.

## RECOMMENDED POSTOPERATIVE CARE

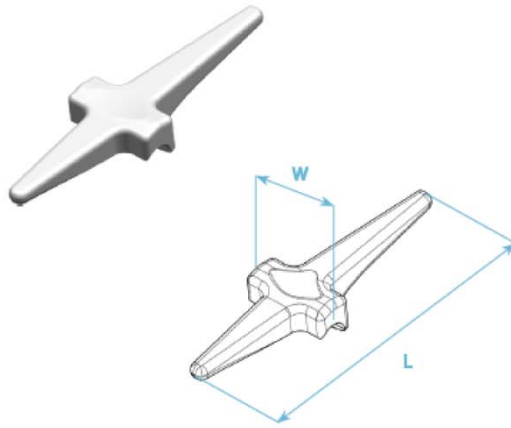
0th to 2nd week – plaster cast

2nd to 6th week – softcast fixation

6th to 12th week - brace

Check-up 3, 6 and 12 months after surgery

## SIZES AND ORDER NUMBERS



### Náhrada kloubu prstního silikonová MCP/PIP joint replacement

- silikon Nusil MED-4550
- necementovaná/cementless

	velikost/size	W	L
<b>Z06110-0200-12035</b>	2	12 mm	35 mm
<b>Z06110-0300-13043</b>	3	13 mm	43 mm
<b>Z06110-0400-14049</b>	4	14 mm	49 mm
<b>Z06110-0500-15055</b>	5	15 mm	55 mm
<b>Z06110-0600-16062</b>	6	16 mm	62 mm
<b>Z06110-0700-17068</b>	7	17 mm	68 mm
<b>Z06110-0800-18075</b>	8	18 mm	75 mm

## MANUFACTURER ADDRESS

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## SALES REPRESENTATIVE: