

MUTARS®



LUMiC®
Surgical Technique

ic
implantcast

MUTARS®-Münster

LUMiC® Surgical Technique

LUMiC® is developed in cooperation with
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Note: The described surgical technique is the suggested treatment for the uncomplicated procedure. In the final analysis the preferred treatment is that which addresses the needs of the individual patient.

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The Silver Coating

Infections represent the most severe complications of tumour arthroplastic treatments. Although local and systemic antibiotic treatments are considered, the scientific literature reports of infection rates from 5 to 35 percent [1]. Reasons for these high rates are, for example, the long surgery time, the large incisions and the immunosuppression due to chemo therapy and radio therapy as well as the increasing resistance of the bacteria against antibiotic drugs.

Silver, in particular free silver ions, is well known for its broad-spectrum antimicrobial activity. The silver coating has been shown to reduce bacterial colonization on the device surface.

Until now only non-articulating surfaces and surfaces without direct bony contact are coated with silver. In the catalogue information of this surgical technique you can find the supplement *S indicating which MUTARS® components are available in a silver coated version. The eight digit REF number receives an addition after the last digit (e.g. 5220-0020S).

Important Intra-Operative Instructions for the Use of Silver-Coated Implants

It is not permitted to flush the wound with antiseptics that contain H₂O₂, Iodine or heavy metals (such as Betaisodona®) and acetic acid during surgery since this can lead to a subsequent loss of effectiveness of the silver coating due to their oxidative properties. Alternatively, solutions such as NaCl or Lavasept® and Prontosan® can be used. The additional use of antibiotic-containing bone cement can be an advantage particular in case of a septic revision.

The TiN Coating for Allergy Prophylaxis

All metallic implant components release ions to their environment over time. In some patients such ions can elicit allergic reactions. Nickel, cobalt and chromium, which are elements of the base material Co-CrMo of the articulating implant components, are considered the most frequently allergy eliciting metals [2]. The TiN-coating is biocompatible and acts like a barrier; the potential release of allergy eliciting ions of the base material is reduced to a minimum [3]. Also in clinical practice there have never been any evidence of allergic reactions with implants that have been TiN-coated showing an intact surface [5]. Therefore the TiN-coating on implant components is especially suitable for patients with sensitivity to nickel, chromium or cobalt [4][5].

Since almost all components of the MUTARS® tumor system consist of titanium alloy, this only concerns those components, which are made of a cast CoCrMo alloy. The REF-numbers of the TiN-coated implants have the suffix N after the last digit (e.g. 5720-0005N). Items which are available with Silver and TiN coating have the suffix SN after the last digit (e.g. 5720-0005SN).

***S:** Implants are available with Silver coating!

***N:** Implants are available with TiN coating!

***SN:** Implants are available with Silver and TiN coating!

[1] Gosheger et al. 2004. Silver-coated megaendoprotheses in a rabbit model – an analysis of the infection rate and toxicological side effects. *Biomaterials* 25, 5547-5556.

[2] Eben R et al. (2009) Implantatallergieregister - ein erster Erfahrungsbericht. *Orthopäde* 38: 557-562

[3] Wisbey et al. (1987) Application of PVD TiN coating to Co-Cr-Mo based surgical implants. *Biomaterials*, 11

[4] Prof. Thomas LMU München Final Report Effect of a TiNbN or TiN surface coating on cobaltchromium- molybdenum and stainless steel test specimens regarding the release of nickel, chromium and cobalt: evaluation via eluate analysis and in-vitro cytokine release from peripheral human blood cells, Data on file

[5] Baumann A. (2001) Keramische Beschichtungen in der KTEP Standardlösung für Allergiker. *JATROS Orthopädie & Rheumatologie* 6: 16-17



Pre-operative Planning

Pre-operative planning and precise surgical techniques are mandatory for optimal results. The instructions and the procedure given in the surgical technique to the system must be adhered to. Familiarity with the recommended surgical technique and its careful application is essential to achieve the best possible outcome.

Before surgery a surgical planning with regard to the dimensions of the prosthetic model and the positioning of the implant components in the bone has to be carried out by the surgeon.

For this purpose, x-ray templates are available:

Digital templates: Digital templates are included in the data base of the common planning systems. For missing templates, please contact the provider of the planning software and request for these templates.

Radiographic templates: Alternatively radiographic templates are available in various scale factors, which can be obtained from your local representative.



insert options for MUTARS® LUMiC®

LUMiC® Cup	<i>inner-Ø LUMiC® Cup</i>	<i>implacross® PE insert 15° neutral 0 mm</i>	<i>implacross® PE insert 15° offset 4 mm</i>	<i>2M insert 15°</i>
size 50	44	36/44	36/44	42/44
size 54	48	36/48	36/48	44/48
size 60	52	36/52	36/52	46/52

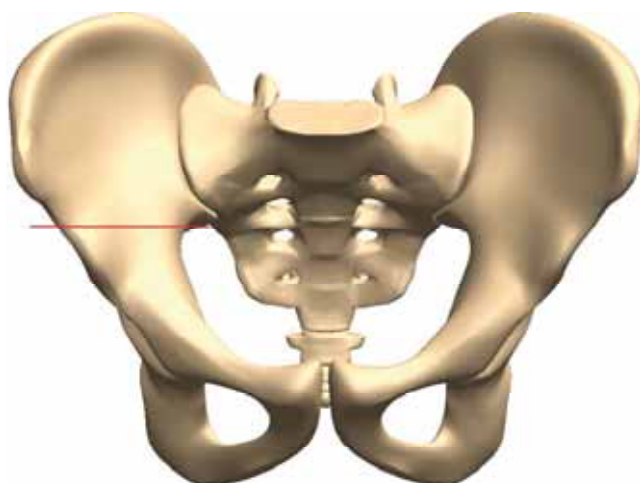


Figure 1

Positioning

The patient is positioned on the contra lateral side. The pelvic should be free to move fore- and backwards during operation. The chest is supported anterior and posterior in a $\frac{3}{4}$ posterior posture.

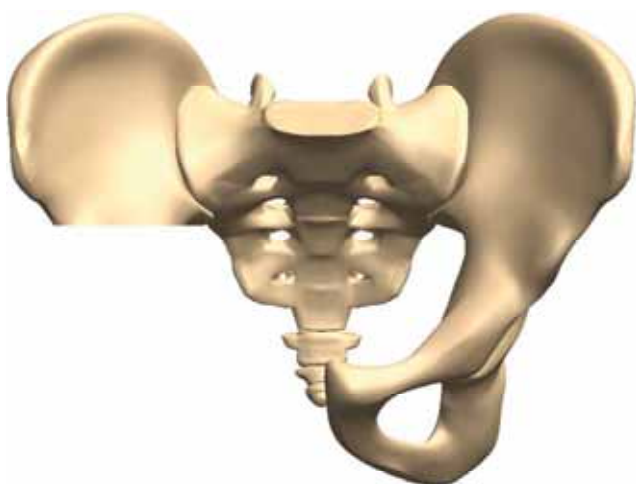


Figure 2

Resection

Resect according to the preoperative planning (Fig. 2).

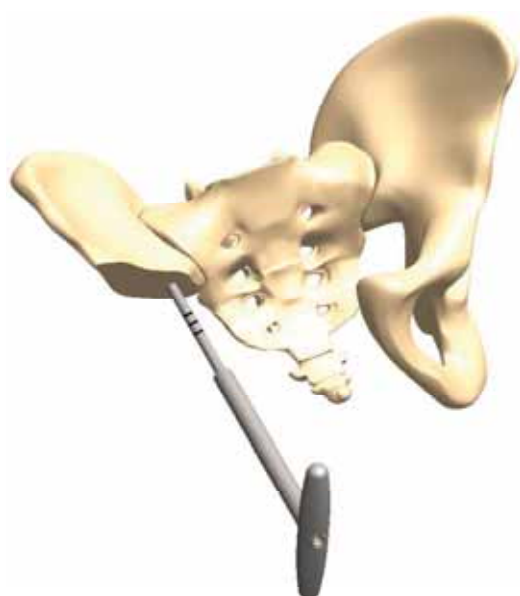


Figure 3

Push the drill guide under pressure in the space between the iliac blades (Fig. 3). Use X-ray or CAS to make sure not to perforate the iliac blades. An accurate starting point is crucial for the next steps in the procedure. The drill guide is calibrated to determine the stem length.

The K-wire is placed in the drill guide and gently tapped in with use of a mallet. The K-wire should reach the cortical bone in the upper iliac region for good fixation.

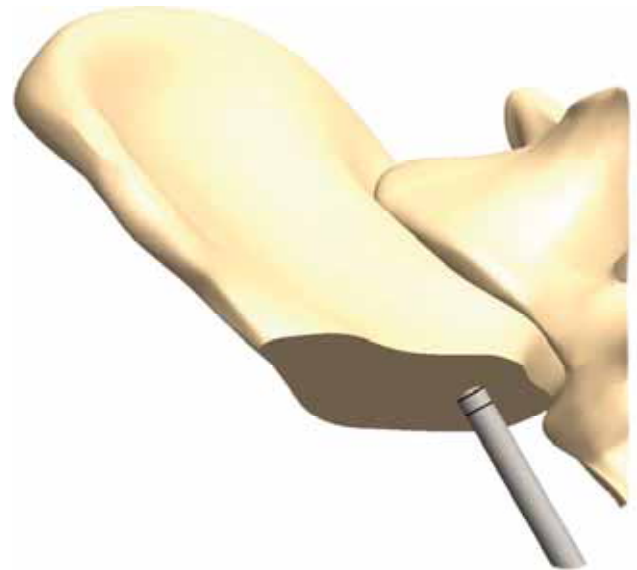


Figure 4

Remove the drill guide (Fig. 5).

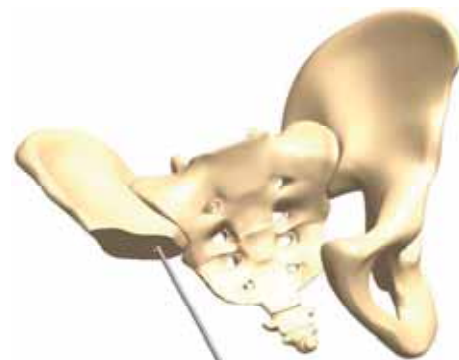


Figure 5

Connect the handle for modular stem reamer with the LUMiC® stem reamer of the previously determined length and diameter and pull it over the K-wire (Fig. 6).

In case of using the cemented stems prepare the bone with the modular reamer Ø10mm in the respective length.



Figure 6

Ream until the end of the reamer is flush with the resection level (Fig. 7a & 7b).
Remove the reamer. Manual reaming is preferred.

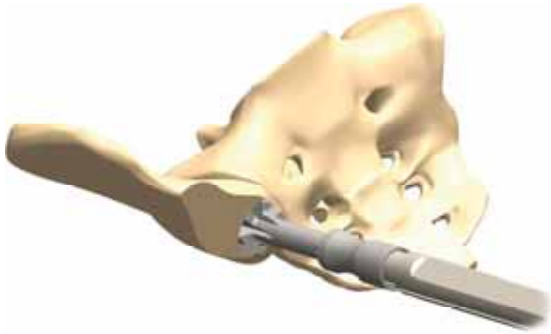


Figure 7a

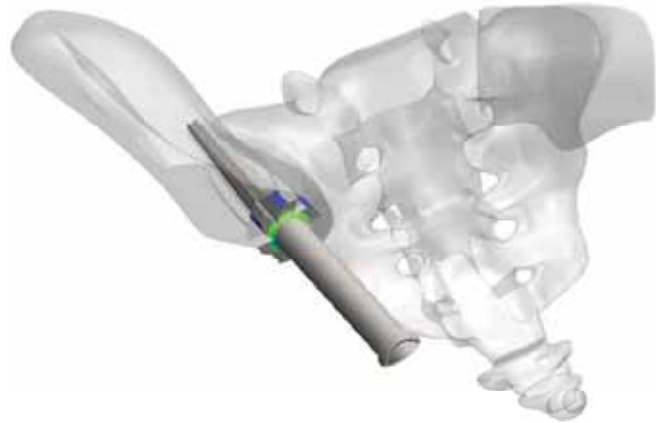


Figure 7b

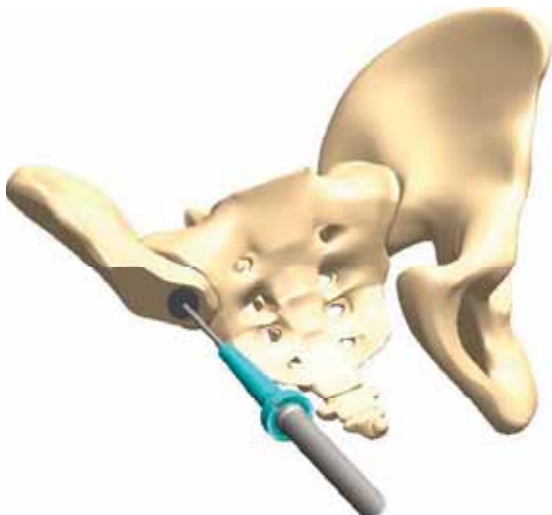


Figure 8

Attach the trial stem with the same length as the previously used reamer to the LUMiC® stem impactor. Make sure the LUMiC® stem impactor is attached securely to the stem. Implant the trial stem into the reamed canal. Make sure the fin slots are aligned in the right position (Fig.8).

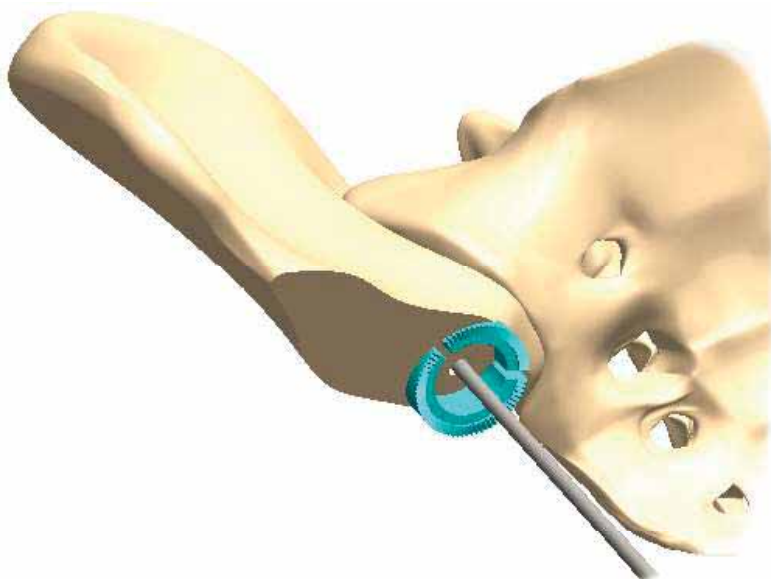


Figure 9

Remove the LUMiC® stem impactor (Fig.9).

Fix the fin chisel to the canulated shell impactor (fig.10). In case of a 65mm trial stem use the 65mm fin adapter, in case of a 75mm trial stem use the 75mm fin adapter. There is no adapter needed for the 85mm trial stem.

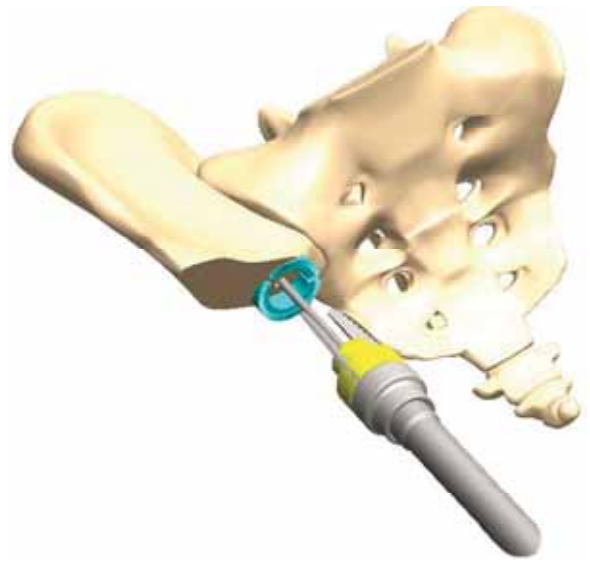


Figure 10

Gently hammer the fin chisel through slots until it stops (fig.11).

Move the fin chisel only axial. Avoid bending loads, otherwise the fin blades could break. Remove all components except the trial stem.

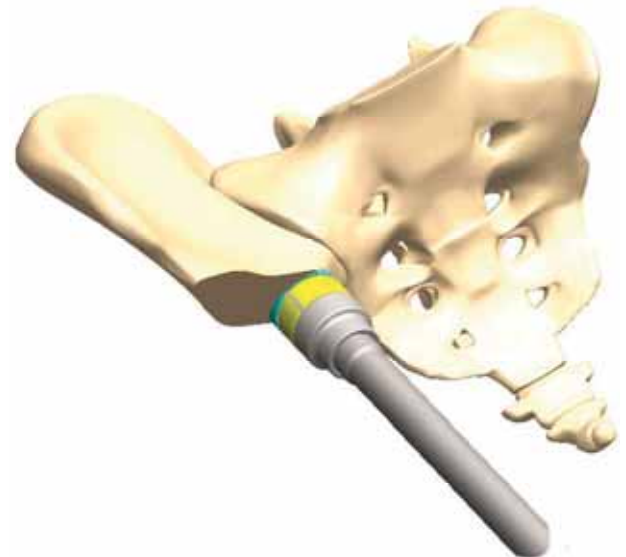


Figure 11

Connect the chosen trial cup and the trial stem with the LUMiC® screw (fig.12a). The cup positioner can be used. Perform a trial reposition to check the length and soft tissue tensioning.

The LUMiC® cup can be rotated in 5 degree increments in order to prevent luxation. In order to adjust the rotation for optimal stability, first the proximal femur replacement should be performed.



Figure 12a



Figure 12b

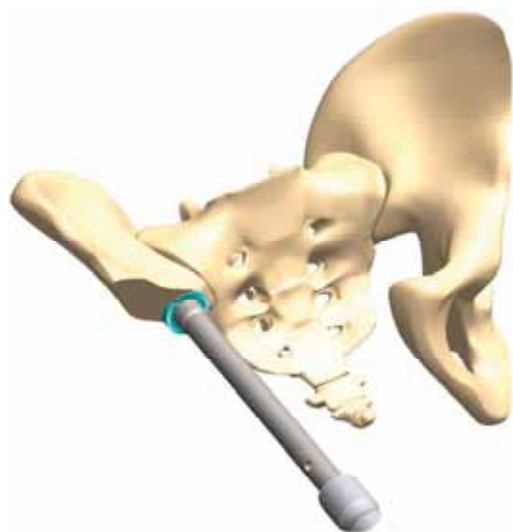


Figure 13

Remove all components. The trial stem is removed with the help of the LUMiC® disassembling adapter (Fig. 13).



Figure 14

The final stem can optionally be implanted with the use of the K-wire (Fig.14).



Figure 15

Connect the final stem with the LUMiC® stem impactor and put the stem over the k-wire (Fig. 15). For final impactation remove the k-wire and connect the canulated shell impactor with the LUMiC® impactor adapter.

After the stem is impacted half way remove the K-wire to prevent it from clamping.

Make sure the stem has a proper primary fixation. It should have full bone contact for optimal stability (Fig. 16a). Take care of the correct position of the fins.

RIGHT



Figure 16a

WRONG



Figure 16b

Fix the desired LUMiC® cup to the stem with the help of the LUMiC® cup inserter (Fig.17). The cup positioner can be used to adjust the position. Optionally the alignment guide can also be used. A second trial reduction can be performed. Fix the screw with the use of the hex screw driver and use a trial insert.

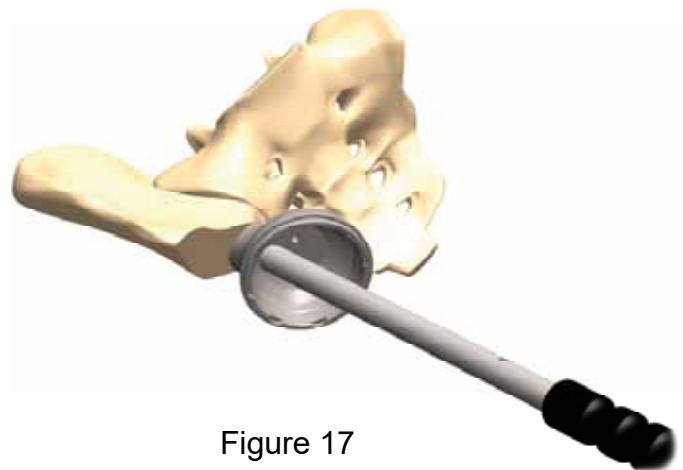


Figure 17

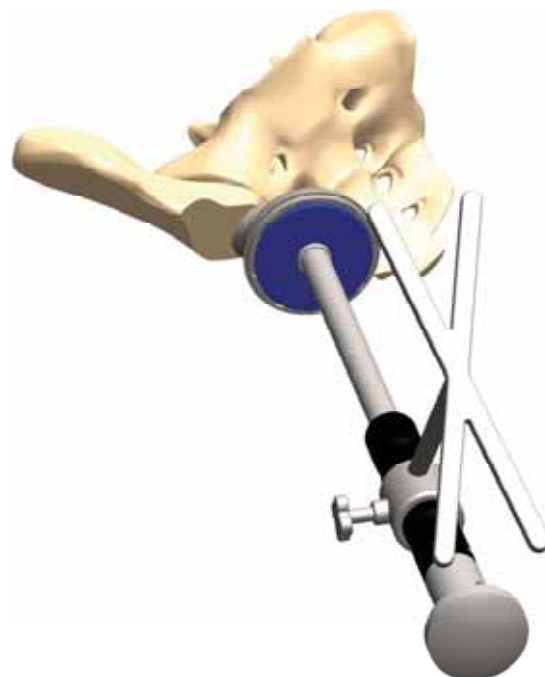


Figure 18

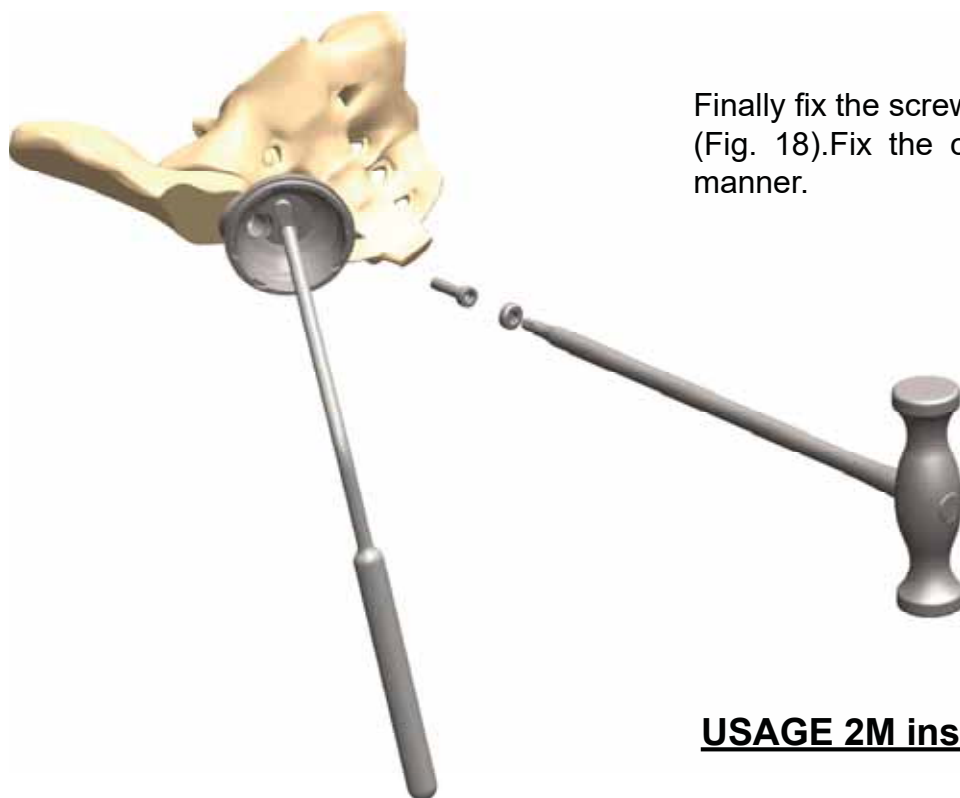


Figure 19

Finally fix the screw with the counter lever (Fig. 18). Fix the counter screw in the same manner.

USAGE 2M insert 15° for LUMiC®

If using a 2M insert 15° for the LUMiC® cup screw the fastening bolt into the central bore hole with the help of the setscrew wrench 3,5mm (Fig. 20 and 21).



Figure 20



fastening bolt

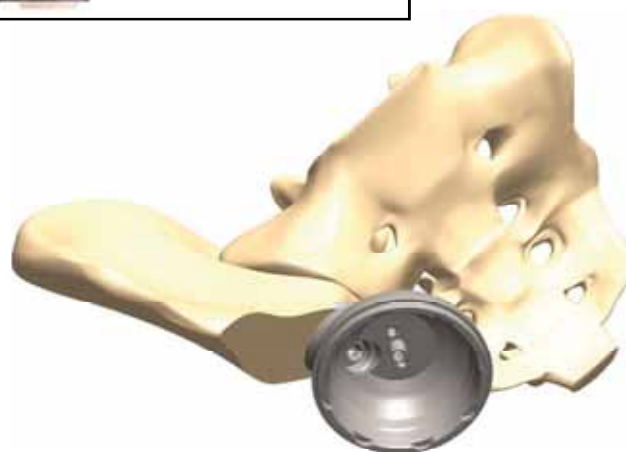


Figure 21

The 2M insert 15° is positioned with the 2M insert 15° positioner (Fig. 22) into the cup. To re-attach soft tissue and muscles the attachment tube can be used. Drill a hole in the iliac bone and fix the attachment tube to the bone with use of non resorbable sutures.

NOTE: After impacting the 2M insert 15° a gap of 1-2mm between MUTARS® LUMiC® cup and 2M insert 15° will appear (Fig. 22a).

gap 1-2 mm

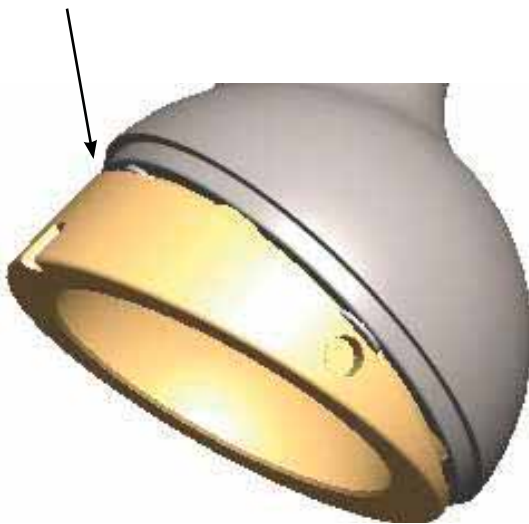
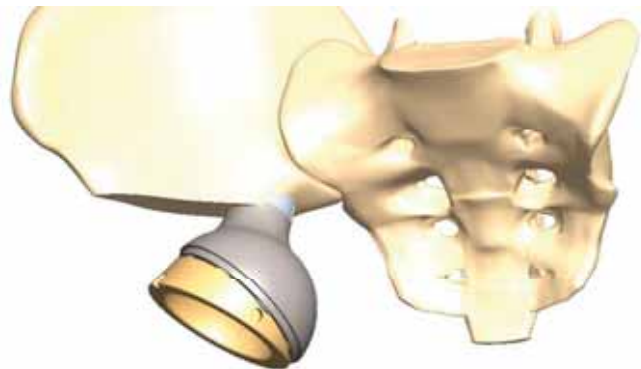


Figure 22a



Figure 22



Combine the 2M-head of the respective size with the desired ic-head. For this use the assembling aid. ic-head and 2M-head will be combined by turning the thread of the assembling aid. With the head impactor and some slightly strokes the combined heads can be fixed on the taper of the femoral stem.



IMPLANTS



MUTARS® LUMiC® cup

incl. safety screw

Mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3

REF	size
5711-0050	Ø 50mm
5711-0054	Ø 54mm
5711-0160	Ø 60mm
5711-0060S	Ø 60mm*

*S silver coated

MUTARS® LUMiC® cup HA

incl. safety screw

Mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3 with implaFix® HA; HA- coating acc. to ISO 13779-2

REF	size
5711-0250	Ø 50mm
5711-0254	Ø 54mm
5711-0260	Ø 60mm

MUTARS® LUMiC® stem cementless HA

Mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3 with implaFix® HA; HA- coating acc. to ISO 13779-2



REF	size
5711-1865	8x65mm
5711-1875	8x75mm
5711-1885	8x85mm
5711-1065	10x65mm
5711-1075	10x75mm
5711-1085	10x85mm

MUTARS® LUMiC® stem cemented

Mat.: implavit®; CoCrMo acc. to ISO 5832-4



REF	size
5711-2865	8x65mm
5711-2875	8x75mm
5711-2885	8x85mm

MUTARS® LUMiC® screw

Mat.: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3



REF	size
5711-1002	M6x28mm

IMPLANTS

fastening bolt for MUTARS®

LUMiC® cup

Mat.: implatan®, TiAl₆V₄ acc. to ISO 5832-3

REF
5711-1003



implacross® PE-insert 15° neutral 0mm

Mat.: implacross®, crosslinked UHMWPE

REF	size
0227-3644	Ø 36/44
0227-3648	Ø 36/48
0227-3652	Ø 36/52



implacross® PE-insert 15° Offset 4mm

Mat.: implacross®, crosslinked UHMWPE

REF	size
0228-3644	Ø 36/44
0228-3648	Ø 36/48
0228-3652	Ø 36/52



2M insert 15° for MUTARS® RS cup and LUMiC® TiN

Mat.: implavit®, CoCrMo acc. to ISO 5832-4 with
TiN coating, UHMWPE acc. to ISO 5834-2

REF	size
0242-4244	Ø 42/44
0242-4448	Ø 44/48
0242-4652	Ø 46/52



2M implacross® E head

Mat.: implacross® E, crosslinked UHMWPE with
Vitamin E

REF	size
2905-2842	Ø 28/42
2905-2844	Ø 28/44
2905-2846	Ø 28/46



EcoFit® 2M head

Mat.: UHMWPE acc. to ISO 5834-2

REF	size
2906-2842	Ø 28/42
2906-2844	Ø 28/44
2906-2846	Ø 28/46



IMPLANTS

CoCrMo

implavit® CoCrMo
acc. to ISO 5832-12

ic-head

Titanium

implatan® TiAl₆V₄
acc. to ISO 5832-3
with TiN-coating

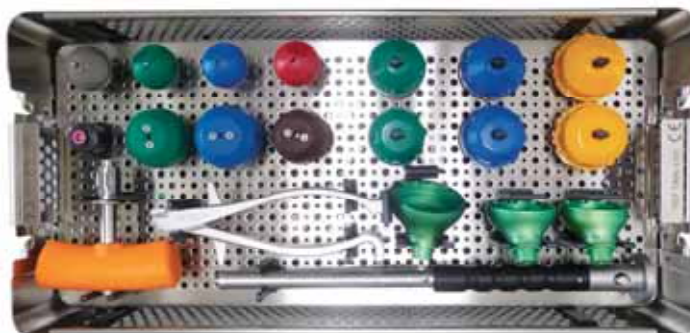
REF	size	REF
2387-2800	28mm, S	2787-2800
2387-2805	28mm, M	2787-2805
2387-2810	28mm, L	2787-2810
2387-2815	28mm, XL	2787-2815
2387-3600	36mm, S	2787-3600
2387-3605	36mm, M	2787-3605
2387-3610	36mm, L	2787-3610
2387-3615	36mm, XL	2787-3615



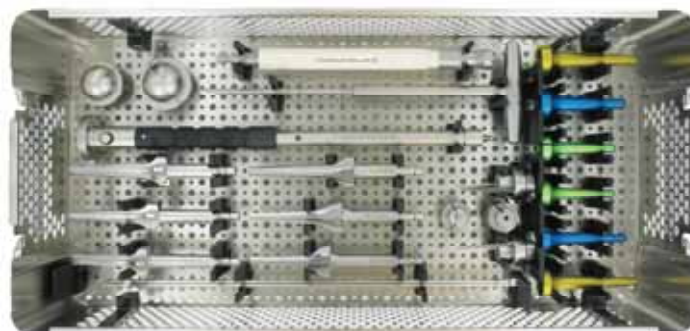


INSTRUMENTS

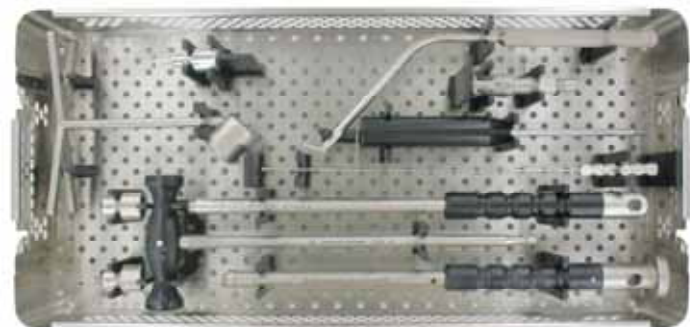
**7999-5701 MUTARS® LUMiC® -
container 1 top**



**7999-5701 MUTARS® LUMiC® -
container 1 bottom**



**7999-5702 MUTARS® LUMiC® -
container 2**



**7999-5704 MUTARS® 2M trial LUMiC®
container**





2950-1068 trial insert 15° container
for LUMiC®

**INSTRUMENTS**

ic T-handle Zimmer-Jakobs
4223-0023



ic-pin extractor
7512-0800



MUTARS® LUMiC® stem impactor
7711-0101



MUTARS® LUMiC® trial cup
7711-0050 Ø 50mm
7711-0054 Ø 54mm
7711-0160 Ø 60mm



trial head snap taper 12/14mm
7962-3600 / 7965-3600 Ø 36mm, small
7962-3605 / 7965-3605 Ø 36mm, medium
7962-3610 / 7965-3610 Ø 36mm, large
7962-3615 / 7965-3615 Ø 36mm, extra large



trial liner 15° neutral 0mm
0230-3644 36/44 mm
0230-3648 36/48 mm
0230-3652 36/52 mm

trial liner 15° offset 4mm
0231-3644 36/44 mm
0231-3648 36/48 mm
0231-3652 36/52 mm

MUTARS® LUMiC® cup positioner
7711-0244 Inlay 44 mm
7711-0248 Inlay 48 mm
7711-0252 Inlay 52 mm



MUTARS® LUMiC® trial screw M6x28mm
7711-0002

INSTRUMENTS

MUTARS® LUMiC® trial stem

7711-1065	10 x 65 mm
7711-1075	10 x 75 mm
7711-1085	10 x 85 mm

MUTARS® LUMiC® trial stem

7711-0865	8 x 65 mm
7711-0875	8 x 75 mm
7711-0885	8 x 85 mm

shell impactor canulated

7711-0110

MUTARS® LUMiC® fin chisel

7711-0100	10mm
7711-0108	8mm

positioner PE-inlay 15°

0282-1532	Ø 32 mm
0282-1536	Ø 36 mm

MUTARS® LUMiC® fin chisel adapter

7711-0165	65 mm
7711-0175	75 mm

MUTARS® LUMiC® drill guide

7711-0102

MUTARS® LUMiC® handle for modular stem reamer

7711-0000

fixation pin 3,2/350 mm with 15mm threaded

4224-0035

MUTARS® LUMiC® stem reamer

7711-1865	8 x 65 mm
7711-1875	8 x 75 mm
7711-1885	8 x 85 mm

MUTARS® LUMiC® stem reamer

7711-2065	10 x 65 mm
7711-2075	10 x 75 mm
7711-2085	10 x 85 mm



INSTRUMENTS



trial insert extractor
1260-0009



ic-adapter outside A/O / inside ic canulated
7512-3602



hexagon screw driver with t-handle 5mm
0287-1003



hip cup alignment guide left/right
3039-2024



MUTARS® LUMiC® counter instrument
7711-0001



MUTARS® LUMiC® cup inserter
7711-0104



MUTARS® LUMiC® impactor adapter
7711-0106



MUTARS® LUMiC® disassembling adapter
7711-0107



ball probe 240mm
7512-0008



hexagon screw driver short 3,5mm
0280-1007

INSTRUMENTS

2M trial insert 15° for MUTARS®

RS cup and LUMiC®

0262-4244 ø 42/44mm

0262-4448 ø 44/48mm

0262-4652 ø 46/52mm



2M trial insert positioner 15° for MUTARS® RS cup and LUMiC®

2950-4244 ø 42/44mm

2950-4448 ø 44/48mm

2950-4652 ø 46/52mm



cup impactor without rim

2950-0342 42mm

2950-0344 44mm

2950-0346 46mm



INSTRUMENTS

ic head assembling tool
2900-2000



2M trial head

2950-2842 28/42mm
2950-2844 28/44mm
2950-2846 28/46mm



alternatively



head impactor
7512-4444



trial head snap taper 12/14mm

7965-2800 Ø 28 mm S
7965-2805 Ø 28 mm M
7965-2810 Ø 28 mm L
7965-2815 Ø 28 mm XL



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