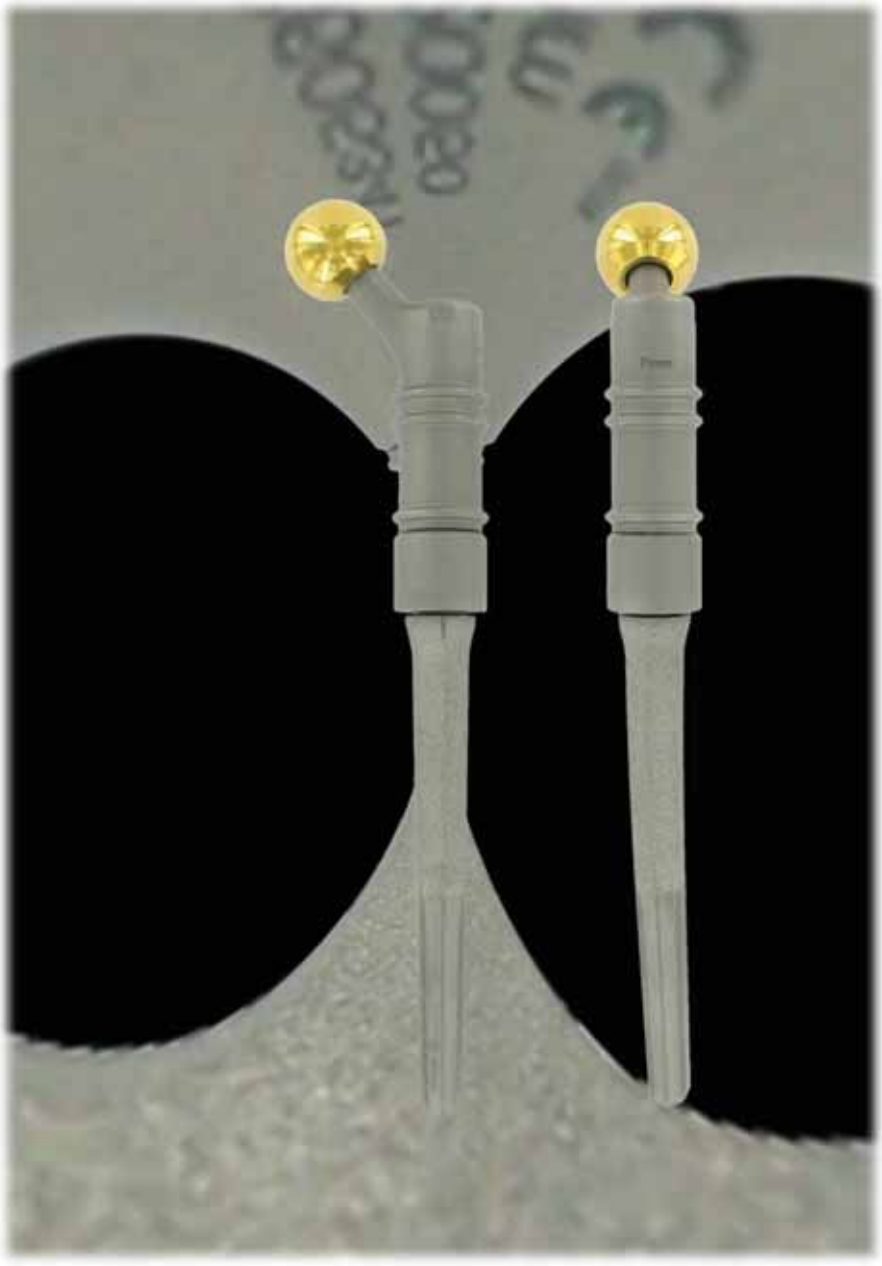
MUTARS®

implantcast



Proximal Femur

surgical technique

with RS stem

MUTARS®-Münster

Proximal Femur

surgical technique

with RS stem

MUTARS® was developed in co-operation with
Prof. Dr. W. Winkelmann (former director)
and Prof. Dr. G. Gosheger (director), Clinic and
Polyclinic for General Orthopedics and Tumororthopedics
at the University Hospital of Münster, Germany.
MUTARS® has been in successful clinical use since 1992.

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Nota Bene: 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.

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 immunosupression 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 H_2O_2, 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.

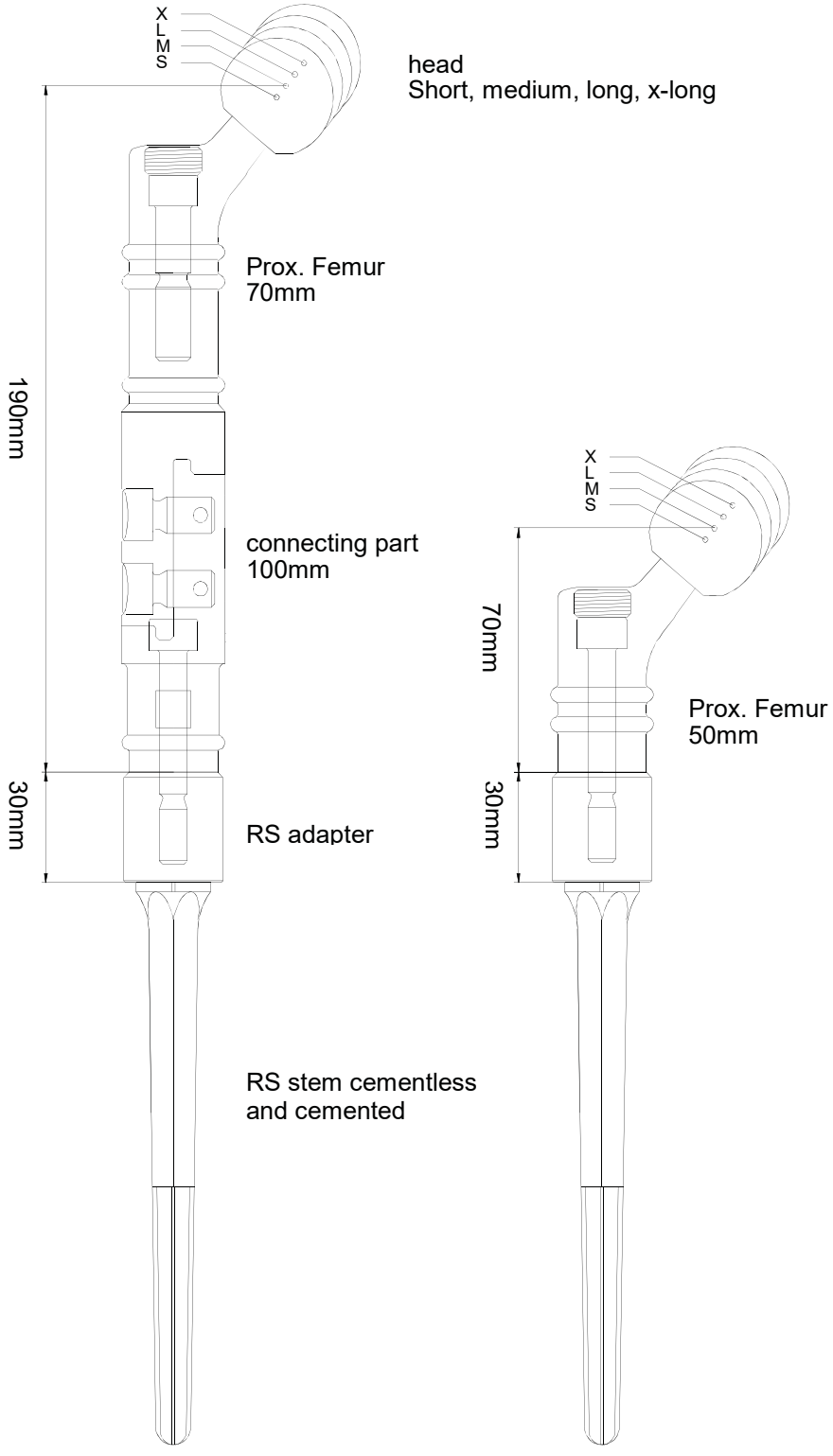
The TiN coating for allergy prophylaxis

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 CoCrMo 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 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 megaendoprostheses 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 & Rheumatologie6: 16-17

System Overview



MUTARS® Proximal Femur

proximal femur replacement with RS stem

assembling options

by using a head with neck length medium
(length in mm)

Components						
Reconstruc-tion	**Prox. Femur**	**RS adapter 30mm**	**Connecting part 100 mm**	**Extension piece**	**Screw M8**	**Screw M10**
100 mm	50	30	-	-	60	-
120 mm	70	30	-	-	80	-
140 mm	50	30	-	40	100	
160 mm	50	30	-	60	120	-
180 mm	50	30	-	80	140	
200 mm	50	30	100		60	25
220 mm	70	30	100		60	45
240 mm	50	30	100	40	60	65
260 mm	50	30	100	60	60	85
280 mm	50	30	100	80	60	105
300 mm	50	30	100	40 + 60	60	125

In the case of a resection length of 200 mm or longer, we recommend using the 100 mm MUTARS® connecting part.

Note: Please notice that the amount of implants and instruments send with an individual shipment may differ from the information in the catalogue information of this brochure. Please make sure, during the preoperatively planning, that all necessary implants and instruments are available for the surgery.

figure 1a and 1b

Tumor resection

Resect the tumor and measure the length of the explant. The minimum bone resection is 100 mm.

Remark

The hexagonical RS stem locks into the cavity due to its tapered design.
To combine the RS stem with the MUTARS® components a RS-Adapter 30mm is needed (Abb. 1a and 1b)

Femoral bone preparation

Cementless implantation

Ream the femoral medullary cavity with a flexible reamer up to the depth in which a of rigid stem fixation is possible (fig. 2).

figure 2

Remark

Please consider that the RS broach used afterwards should be 3mm larger than the used reamer.
Example: If a 14mm stem should be implanted, the 11mm reamer and the 14 mm broach are used.

For a **cemented implantation** please use the cemented stem which is 2mm smaller than the used RS broach.

Preparation of the femoral cavity

Assemble the MUTARS® RS broach and the broach handle (fig. 3a).

Make sure that the curvature of the broach corresponds to the ante-curvature of the femur during the preparation of the intramedullary canal (fig. 3a) (Check the mark on the broach).

The implant length is marked on the broach. The insertion depth of the implant is visualised on the proximal ring mark of the broaches (fig. 3b).
The mark represents the centre of rotation when using the proximal parts and extension pieces.

If a Proximal Femur 50 is used the mark 50MM represents the rotational centre (considering the RS-Adapter 30mm) (fig. 3b).

Remark
For the preparation for a 250 mm stem the 200 mm broaches are used.

figure 3a and 3b

figure 4a 4b 4c

figure 5a and 5b

Implantation of the RS stem

Screw the guide rod into the stem and mount the MUTARS® RS stem impactor onto the stem (use the same size as the previously used broach) (fig. 4a to 4c).

Insert the stem while respecting the correct curvature of the stem (fig. 5a). The correct implant depth can be controlled by observing the ring marks on the impactor (fig. 5b).

The stem should be seated firmly in the femoral bone.

Remark: If a distal locking is preferred please make sure that the stem offers the locking holes. The stem with holes are marked with * in the table on page 3. Please use 4,5 mm locking screws or the locking bolts, which are shown in the implant information chapter of this brochure.

After correct seating of the stem remove the impactor and the guide rod.

Trial reduction using the trial components

Mount the RS adapter 30mm onto the RS stem (fig. 6a and 6b).

figure 6a and 6b

Mount the Proximal trial femur and the possibly needed trial extension pieces (possible enlargement from 20 to 260 mm; see table page 2) onto the top of the RS adapter (fig. 7a).

Insert a trial screw of the correct length (see table on page 2) (fig. 7a).

Place the medium trial head on the neck (fig. 7b)

Perform a trial reduction and check the muscle tension, the joint stability and the leg length.

Please check the rotational alignment. If necessary, adjust the rotation in steps of 5°.

Remove all trial components.

figure 7a and 7b

figure 8

Implantation of the proximal components

Combine the proximal implant components on the RS adapter.
Insert the bar screw of the correct length (see table on page 2).

Tighten the bar screw with the socket wrench (fig. 8).

figure 9

Final trialing

Once more, use the trial head to control the muscle tension (fig. 9).

Please check the rotational alignment. If necessary adjust the rotation in steps of 5°.

Remove the trial head when sufficient tension is achieved.

Final implant assembling

Lock the bar screw with the MUTARS® swring wrench (fig. 10).
Secure the assembly with the engineers' wrench (fig. 11).

Lock the safety screw in the same way.

figure 10

figure 11

figure 12

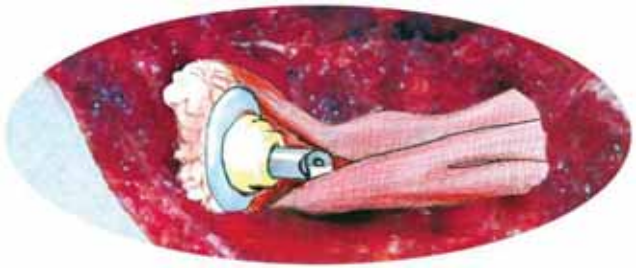


figure 13

figure 14

figure 15

The use of the attachment tube

Fix the tube, first proximally and then distally.
Pull the tube over the joint capsule and fix the tube to the capsule wall (fig. 12).

Put on a head or bipolar head and reduce the joint (fig. 13). Afterwards tighten the tube and fix the tube over and under the pads of the MUTARS® components (fig. 14).
Suture the muscles and tendon tissues to the meshes of the tube.

The trevira tube should turn up inward on the end. Put the tube over the rest of the joint capsule, if necessary split the tube (fig. 14).

Subsequently fix the tube on the rest of the capsule wall with sutures (fig. 15).

IMPLANTS

***S:** For anti-infective treatment, silver coated implants are available.
***N:** For anti-allergic treatment, TiN coated implants are available.
***SN:** Implants are coated with silver and TiN.

MUTARS® Proximal Femur incl. safety screw *S

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5710-0205 50 mm
5710-0207 70 mm

MUTARS® RS coupling device 30mm *S

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5772-0030 30 mm

MUTARS® extension piece *S

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5772-2504 40 mm
5772-2506 60 mm
5772-2508 80 mm
5772-2510 100 mm

MUTARS® connecting part *S

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5730-0100 100 mm

IMPLANTS

MUTARS® screw

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5792-1002	M10x 25 mm
5792-1004	M10x 45 mm
5792-1006	M10x 65 mm
5792-1008	M10x 85 mm
5792-1010	M10x105 mm
5792-1012	M10x125 mm
5792-1014	M10x145 mm
5792-1016	M10x165 mm
5792-1018	M10x185 mm
5792-1020	M10x205 mm
5792-1022	M10x225 mm
5792-1024	M10x245 mm

MUTARS® RS coupling device screw

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3

5792-0060	M8 x 60 mm
5792-0080	M8 x 80 mm
5792-0100	M8 x 100 mm
5792-0120	M8 x 120 mm
5792-0140	M8 x 140 mm

MUTARS® RS stem cementless

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

6762-1512	12/150 mm
6762-1514	14/150 mm
6762-1516	16/150 mm
6762-1518	18/150 mm
6762-1520	20/150 mm
6762-2012	12/200 mm
6762-2014	14/200 mm
6762-2016	**16/200 mm***
6762-2018	**18/200 mm***
6762-2020	**20/200 mm***
6762-2514	14/250 mm
6762-2516	16/250 mm
6762-2518	**18/250 mm***
6762-2520	**20/250 mm***

***with locking hole for Ø 4,5mm screws**
Odd numbered dimeters only on special demand!

cortical screw Ø 4,5 mm

mat.: implatan®;$TiAl_6V_4$ according to ISO 5832-3

5792-4525	L: 25 mm
5792-4530	L: 30 mm
5792-4535	L: 35 mm
5792-4540	L: 40 mm
5792-4545	L: 45 mm
5792-4550	L: 50 mm
5792-4555	L: 55 mm
5792-4560	L: 60 mm

IMPLANTS

MUTARS® RS stem cemented *N

mat.: implavit®; CoCrMo according to ISO 5832-4

6760-1215	12/150 mm
6760-1415	14/150 mm
6760-1615	16/150 mm
6760-1815	18/150 mm
6761-1220	12/200 mm
6761-1420	14/200 mm
6761-1620	16/200 mm
6761-1820	18/200 mm

MUTARS® attachment tube

mat.: polyethylenterephtalat

5900-0300	35 mm
5900-0310	55 mm

ic-head CoCrMo

mat.: implavit®; CoCrMo according to ISO 5832-12

2387-2800	28 mm, S
2387-2805	28 mm, M
2387-2810	28 mm, L
2387-2815	28 mm, XL
2387-3200	32 mm, S
2387-3205	32 mm, M
2387-3210	32 mm, L
2387-3215	32 mm, XL

ic-head Titan

mat.: implatan®; $TiAl_6V_4$ according to ISO 5832-3 with TiN-coating

2787-2800	28 mm, S
2787-2805	28 mm, M
2787-2810	28 mm, L
2787-2815	28 mm, XL
2787-3200	32 mm, S
2787-3205	32 mm, M
2787-3210	32 mm, L
2787-3215	32 mm, XL

The ic-heads Titan and CoCrMo with neck lengths of XXL and XXXL are available on special demand.

IMPLANTS

ic-head Biolox® *forte*

mat.: Al_2O_3 according to ISO 6474-1

2587-2800	28 mm, S
2587-2805	28 mm, M
2587-2810	28 mm, L
2587-3200	32 mm, S
2587-3205	32 mm, M
2587-3210	32 mm, L

ic-bipolar head CoCrMo

mat.: implavit®; CoCrMo according to ISO 5832-4 and UHMW-PE acc. to ISO 5834-2

2151-0044	28/44 mm
2151-0046	28/46 mm
2151-0048	28/48 mm
2151-0050	28/50 mm
2151-0052	28/52 mm
2151-0054	28/54 mm
2151-0056	28/56 mm
2151-0058	28/58 mm
2151-0060	28/60 mm

PE-cup Müller type II

mat.: UHMW-PE according to ISO 5834-2

1021-2844	28/44 mm
1021-2846	28/46 mm
1021-2848	28/48 mm
1021-2850	28/50 mm
1021-2852	28/52 mm
1021-2854	28/54 mm
1021-2856	28/56 mm
1021-2858	28/58 mm
1021-3244	32/44 mm
1021-3246	32/46 mm
1021-3248	32/48 mm
1021-3250	32/50 mm
1021-3252	32/52 mm
1021-3254	32/54 mm
1021-3256	32/56 mm
1021-3258	32/58 mm

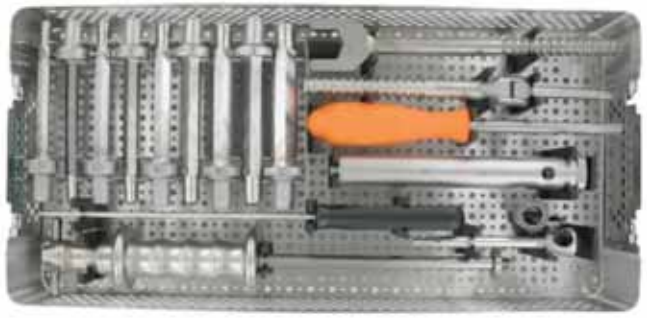
The PE cups are also available with a snap mechanism to lower the risk of subluxations.

Intramedullary plug

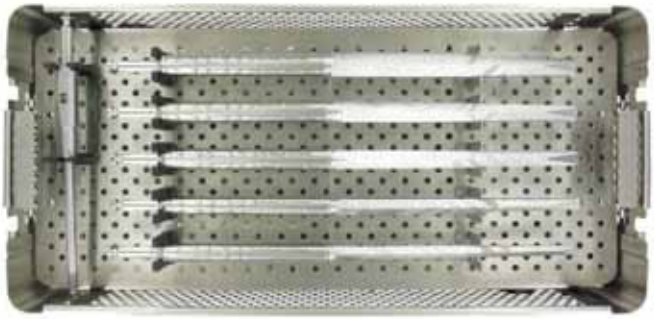
mat.: UHMW-PE according to ISO 5834-2

0299-4000	small
0299-4010	large

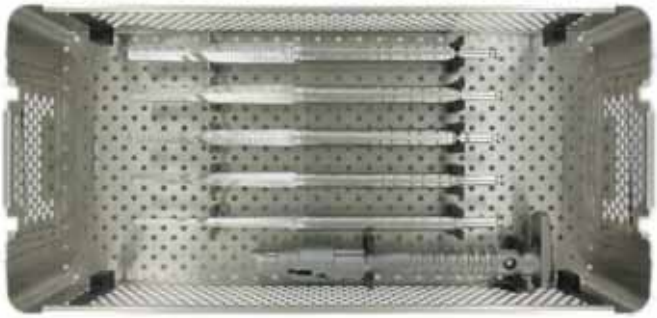
INSTRUMENTS



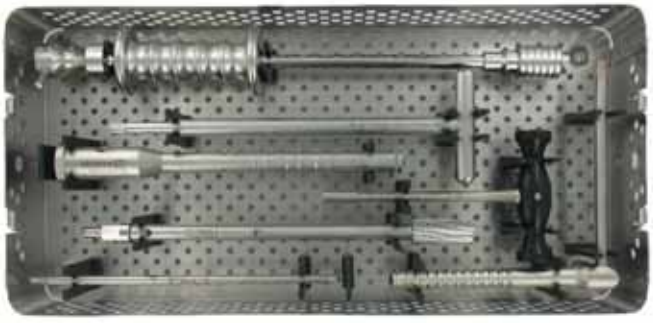
MUTARS® basic instrument container
7999-5712



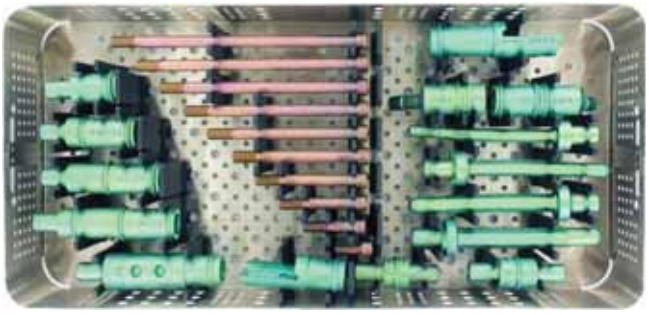
MUTARS® RS broach container
7999-6721 top



MUTARS® RS broach container
7999-6721 bottom



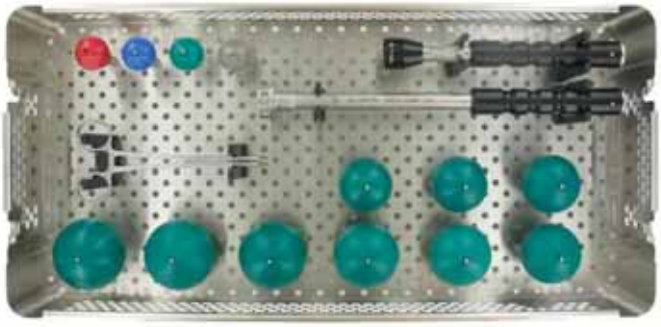
MUTARS® RS ES container 2
7999-6715



MUTARS® trial container
7999-7701

INSTRUMENTS

ic- bipolar head container
7960-9999



INSTRUMENTS

Content MUTARS® basic instrument tray

MUTARS® universal impactor
7210-0000

MUTARS® impact and extract sleeve
7230-0000

MUTARS® socket wrench
7420-0000

alternatively
MUTARS® socket wrench
7421-0000

MUTARS® swing wrench
7411-0000

MUTARS® engineers wrench SW 24
7490-0000

MUTARS® slide hammer
7220-0001

MUTARS® rasp for femoral stem

7760-0112	12 mm
7760-0113	13 mm
7760-0114	14 mm
7760-0115	15 mm
7760-0116	16 mm
7760-0117	17 mm
7760-0118	18 mm

handle for intramedullary plug
7512-4001

MUTARS® medullary cavity reamer cross hole
4220-0000

INSTRUMENTS

Content MUTARS® RS Container 1

MUTARS® RS rasp
6500-1512 12/150mm
6500-1514 14/150mm
6500-1516 16/150mm
6500-1518 18/150mm
6500-1520 20/150mm
6501-2012 12/200mm
6501-2014 14/200mm
6501-2016 16/200mm
6501-2018 18/200mm
6501-2020 20/200mm

MUTARS® RS stem extractor adapter ES
6500-3007

MUTARS® RS broach impactor
6500-0008

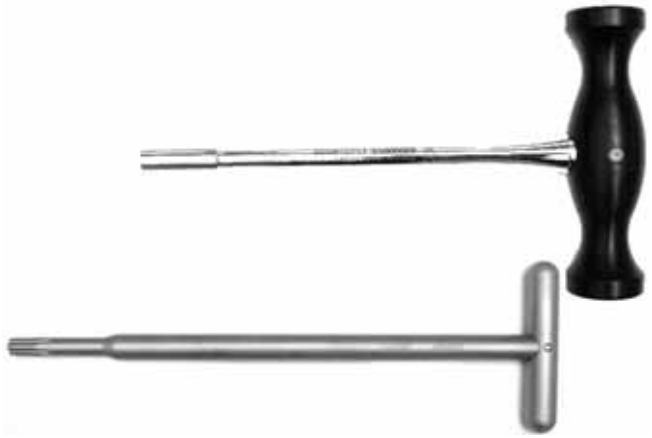
INSTRUMENTS

Content MUTARS® RS ES container 2

slide hammer with snap mechanism
6500-0012

MUTARS® RS ES stem impactor
6500-3000

MUTARS® RS guide rod ES
6500-3003



MUTARS® RS socket wrench SW 6mm
6500-0013

MUTARS® socket wrench 300mm
7420-0300

MUTARS® swing wrench long
7411-0001

MUTARS® RS reamer for metaphyseal part 21mm ES
6500-3021

INSTRUMENTS

Content MUTARS® trial component tray

MUTARS® trial prox. femur
7710-0205 50 mm
7710-0207 70 mm

MUTARS® trial reducer
7730-0220 20 mm
7730-0230 30 mm

MUTARS® trial connecting part 100 mm
7730-0100

MUTARS® trial extensionpiece
7750-0105 105 mm
7750-0125 125 mm

MUTARS® trial extension piece
7772-2504 40 mm
7772-2506 60 mm
7772-2508 80 mm
7772-2510 100 mm

MUTARS® trial femoral stem
7760-0011 11 mm
7760-0013 13 mm
7760-0015 15 mm
7760-0017 17 mm

MUTARS® trial bar screw
7792-1002 M10x25 mm x2
7792-1004 M10x45 mm x2
7792-1006 M10x65 mm
7792-1008 M10x85 mm
7792-1010 M10x105 mm
7792-1012 M10x125 mm
7792-1014 M10x145 mm
7792-1016 M10x165 mm
7792-1018 M10x185 mm
7792-1020 M10x205 mm

INSTRUMENTS

Content ic- bipolar instrument tray

handle for bipolar sizing shell
7960-6000

head impactor
7512-4444

ic-forceps for bipolar head
7960-6010

Probekopf- Schnapp Konus 12/14
trial head snap taper 12/14mm

7962-2800	Ø 28mm, K/S
7962-2805	Ø 28mm, M
7962-2810	Ø 28mm, L
7962-2815	Ø 28mm, XL

alternatevely

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

bipolar head sizing shell

7960-0044	44 mm
7960-0046	46 mm
7960-0048	48mm
7960-0050	50mm
7960-0052	52mm
7960-0054	54mm
7960-0056	56mm
7960-0058	58mm
7960-0060	60mm

implantcast GmbH
Lüneburger Schanze 26
D-21614 Buxtehude
Germany
phone: +49 4161 744-0
fax: +49 4161 744-200
e-mail: info@implantcast.de
internet: www.implantcast.de

CE 0428

Your local distributor:

MUTR1OPE-060718