Take a walk with us...

implantcast

Revision Systems
Hip & Knee

Table of Contents

Nota Bene: The indications stated in this brochure refer only to revision procedures. Please refer to the respective surgical techniques and instructions for use to determine whether the use in primary cases is also indicated. Ultimately, however, every surgeon has to decide which implant to use for which indication and which patient. The operating surgeon has to decide which implant is considered to be most sensible and effective.

joint	primary surgery	following surgery	total
hip	150.284	17.081	167.365
knee	119.131	13.378	132.509
total	269.415	30.459	299.874

Data from the German Endoprostheses Registry (EPRD) on primary and following surgeries on hip and knee joint in 2018[3]

Introduction

The primary implantation of an endoprosthesis on the hip joint was the sixth most common surgery in German hospitals in 2018 with 239.204 procedures. Compared to 2008, the number increased by 29.717 surgeries. The implantation of a knee endoprosthesis was in 14th place with 190.427 procedures. In comparison to 2008, there was an increase of 35.705 surgeries.[1,2]

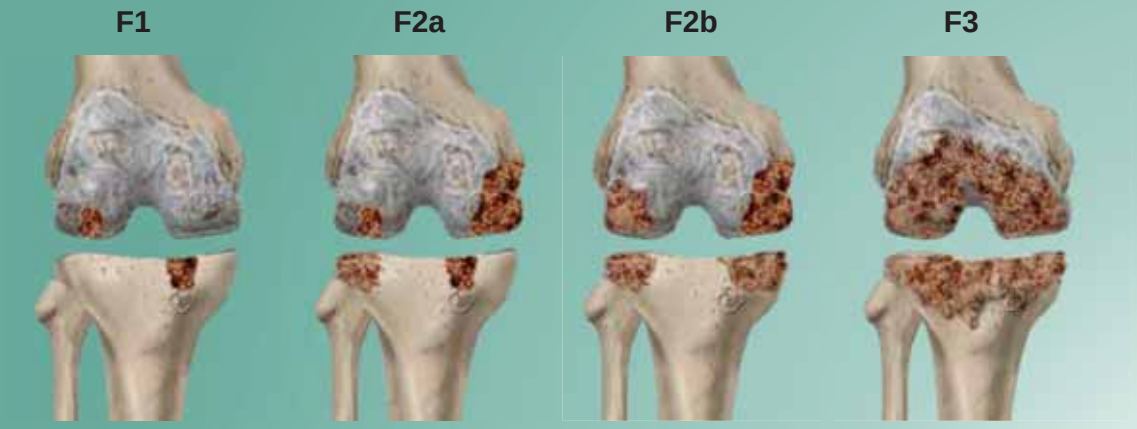
With the increasing number of primary interventions, the revision of endoprostheses is also coming into focus. Since 2010, according to the Federal Health Monitoring, between 35.000 and 37.000 revisions, changes and removals of a hip endoprosthesis have taken place in Germany every year. In the same period, between 24.000 and 26.000 knee endoprostheses per year were revised, changed or removed.[2] The German Endoprostheses Registry (EPRD) provides more detailed information on the revision procedures.[3] In 2018, a total of 17.081 following surgeries on the hip joint and 13.378 following surgeries on the knee joint were registered. The median age of the patients was 75 and 70 years, respectively.

The most common cause of a following surgery on the hip joint was the loosening of one or more implant components with a share of 29,8%. The cup was primarily affected. Other reasons for revision were infections (15,2%), luxations (11,7%) and periprosthetic fractures (10,9%).
Most of the following procedures (25,6%) changed the head, cup and cup insert. All components (stem, head, cup and insert) were changed in 23,4% of the revision procedures. In the majority of the sugeries (74,1%) the bone-anchored components stem and/or cup were replaced.

Most of the following surgeries on the knee joint were also due to loosening of one or more components (25,0%) or an infection (14,7%). Bone-anchored components were replaced in 60,7% of the cases, the insert was changed exclusively in 21,6% of the surgeries.

implantcast offers you a broad product portfolio to supply your revision cases. An allergy or infection prophylaxis is also possible thanks to innovative implant coatings. As developer of the MUTARS® system, implantcast has many years of experience in revision and tumor arthroplasty and can also offer the right implant for your revision.

Bone Defects according to Andersen Orthopedic Research Institute (AORI)[4]



Defects of the Ligaments

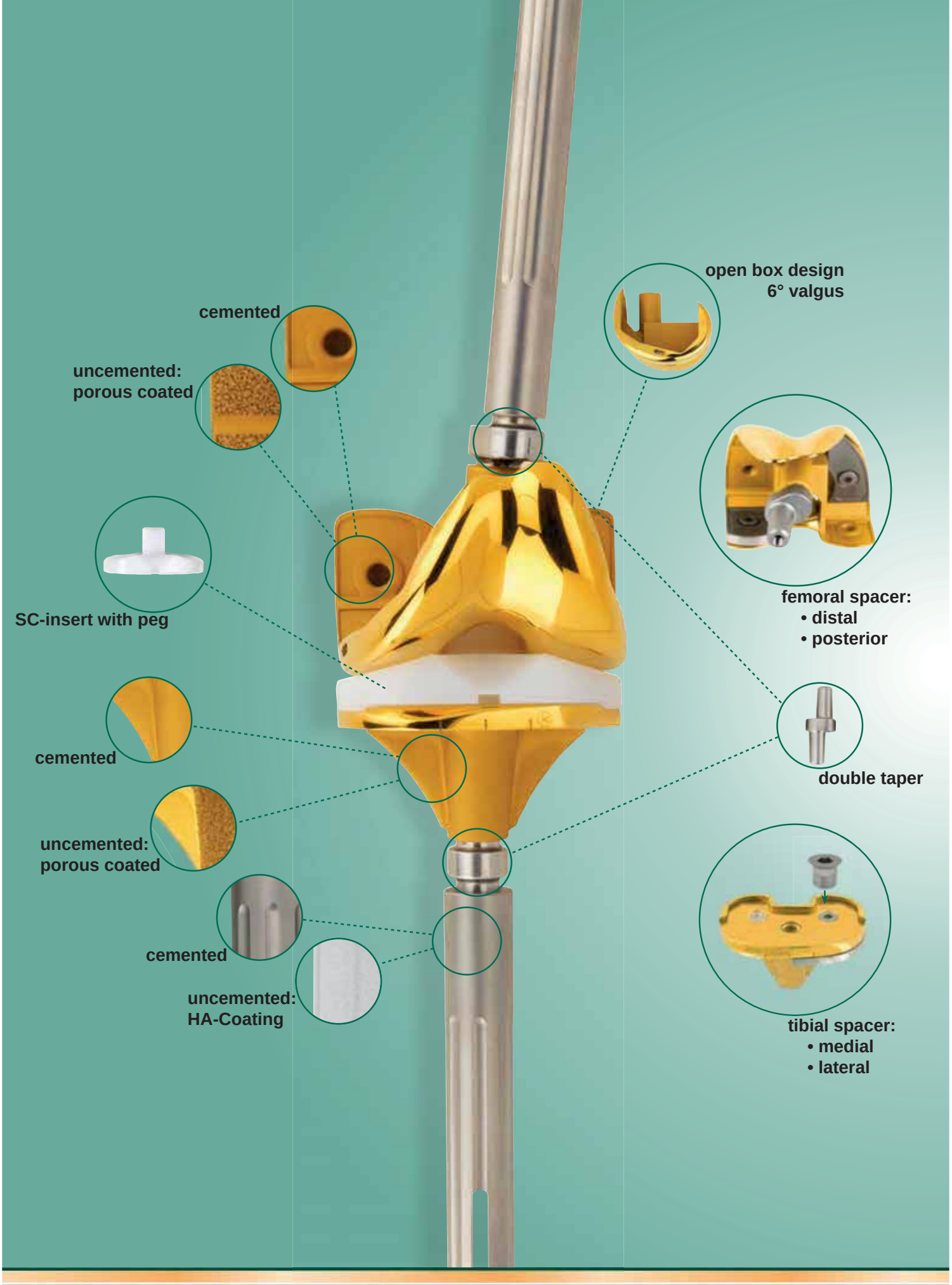
Knee Revision

ACS® SC Fixed Bearing

ACS® SC Mobile Bearing

MUTARS® GenuX® MK

MUTARS® KRI MK


cemented
uncemented:
porous coated
SC-insert with peg
cemented
uncemented:
porous coated
cemented
uncemented:
HA-Coating
open box design
6° valgus
femoral spacer:
• distal
• posterior
double taper
tibial spacer:
• medial
• lateral

ACS® SC Fixed Bearing

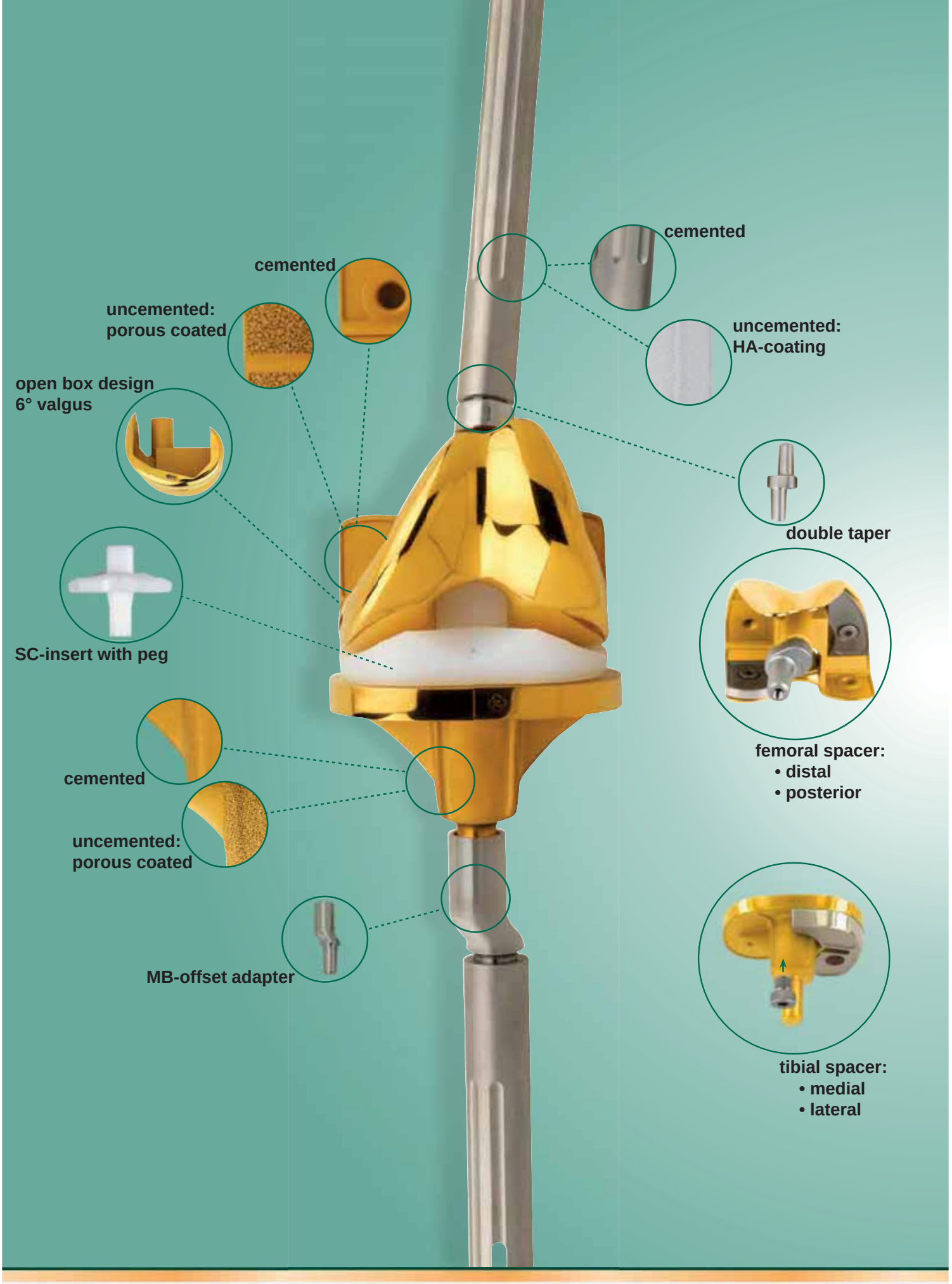
Indications

- loss/defect of both cruciate ligaments
- instabilities of the collateral ligaments
- femoral and/or tibial bone defects

Product details

The ACS® FB SC system is a semi-constrained knee system that allows the use of offsets, stems and spacer. For the treatment of large bone defects, the system can be combined with EPORE® Cones and metaphyseal components. During articulation the peg of the PE-insert is guided in the femoral box between the femoral and tibial components as well as stabilized by the femoral spindle.

- cemented and uncemeted version
- 6 femoral sizes
- 5 sizes PE-inserts in heights of 10 to 20mm
- 6 tibial sizes
- 4 offset adapter: 0, 2, 4, 6mm
- 16 stems: uncoated or with HA-coating;
  length: 100, 150, 200mm; ø 12-22 mm
- spacer: femoral (distal and posterior, 5 and 10mm);
  tibial (5 and 10mm)


cemented
uncemented:
HA-coating
cemented
uncemented:
porous coated
open box design
6° valgus
double taper
SC-insert with peg
femoral spacer:
• distal
• posterior
cemented
uncemented:
porous coated
MB-offset adapter
tibial spacer:
• medial
• lateral

ACS® SC Mobile Bearing

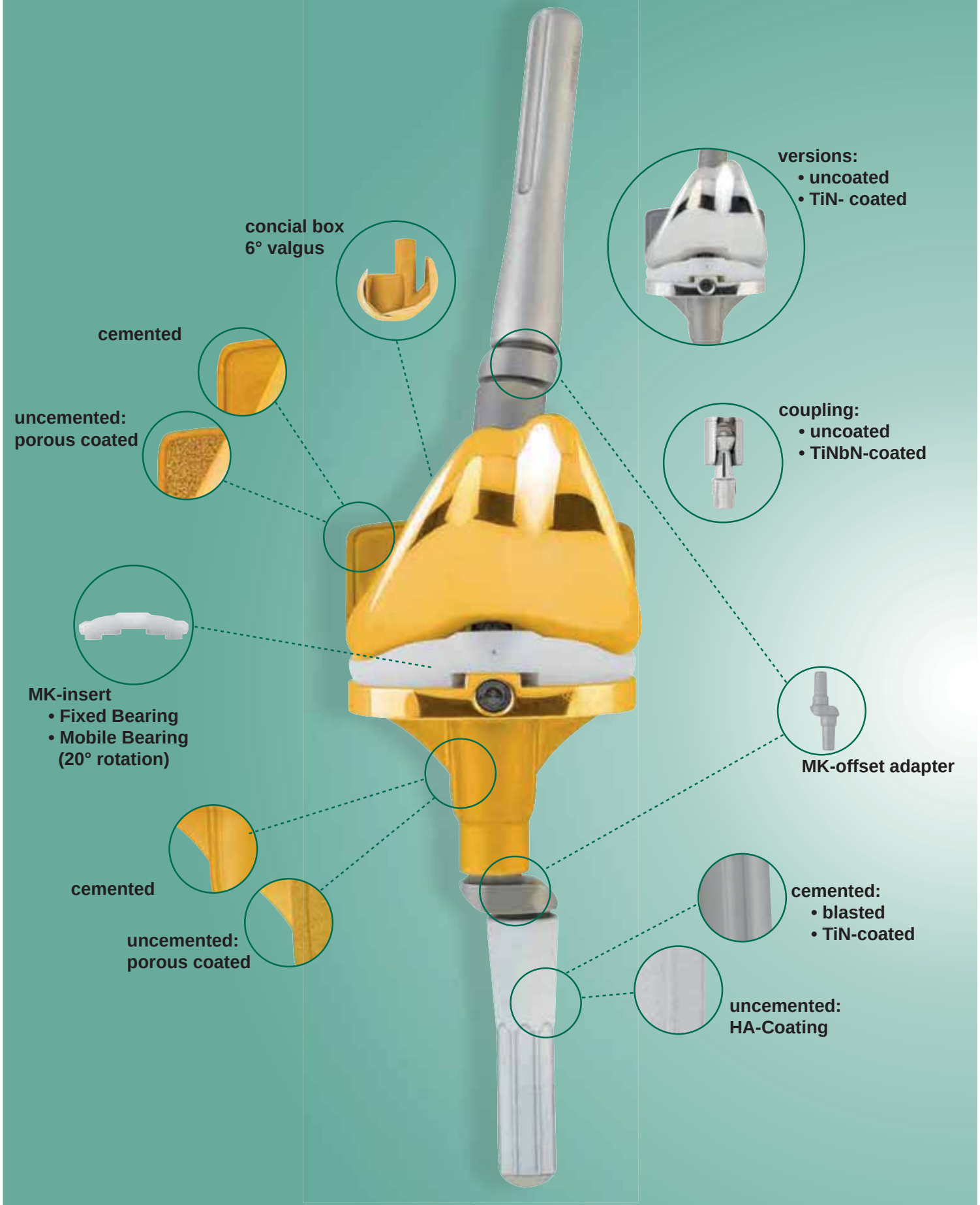
Indications

- loss/defect of both cruciate ligaments
- instabilities of the collateral ligaments
- femoral and/or tibial bone defects

Product details

The ACS® MB SC system is a semi-constrained knee system that allows the use of offsets, stems and spacer. For the treatment of large bone defects, the system can be combined with EPORE® Cones and metaphyseal components. During articulation the peg of the PE-insert is guided in the femoral box between the femoral and tibial components as well as stabilized by the femoral spindle. The mobile bearing design allows for a free rotation of the PE-insert.

- cemented and uncemeted version
- 6 femoral sizes
- 5 sizes PE-inserts in heights of 10 to 20mm
- 5 tibial sizes
- 4 offset adapter: femoral: 0, 2, 4, 6mm
  tibial: 2, 4mm
- 16 stems: uncoated or with HA-coating;
  length: 100, 150, 200mm; ø 12-22 mm
- spacer: femoral (distal and posterior, 5 and 10mm);
  tibial (5 and 10mm)


versions:
• uncoated
• TiN- coated
concial box
6° valgus
cemented
uncemented:
porous coated
coupling:
• uncoated
• TiNbN-coated
MK-insert
• Fixed Bearing
• Mobile Bearing
(20° rotation)
MK-offset adapter
cemented
uncemented:
porous coated
cemented:
• blasted
• TiN-coated
uncemented:
HA-Coating

MUTARS® GenuX® MK

Indications

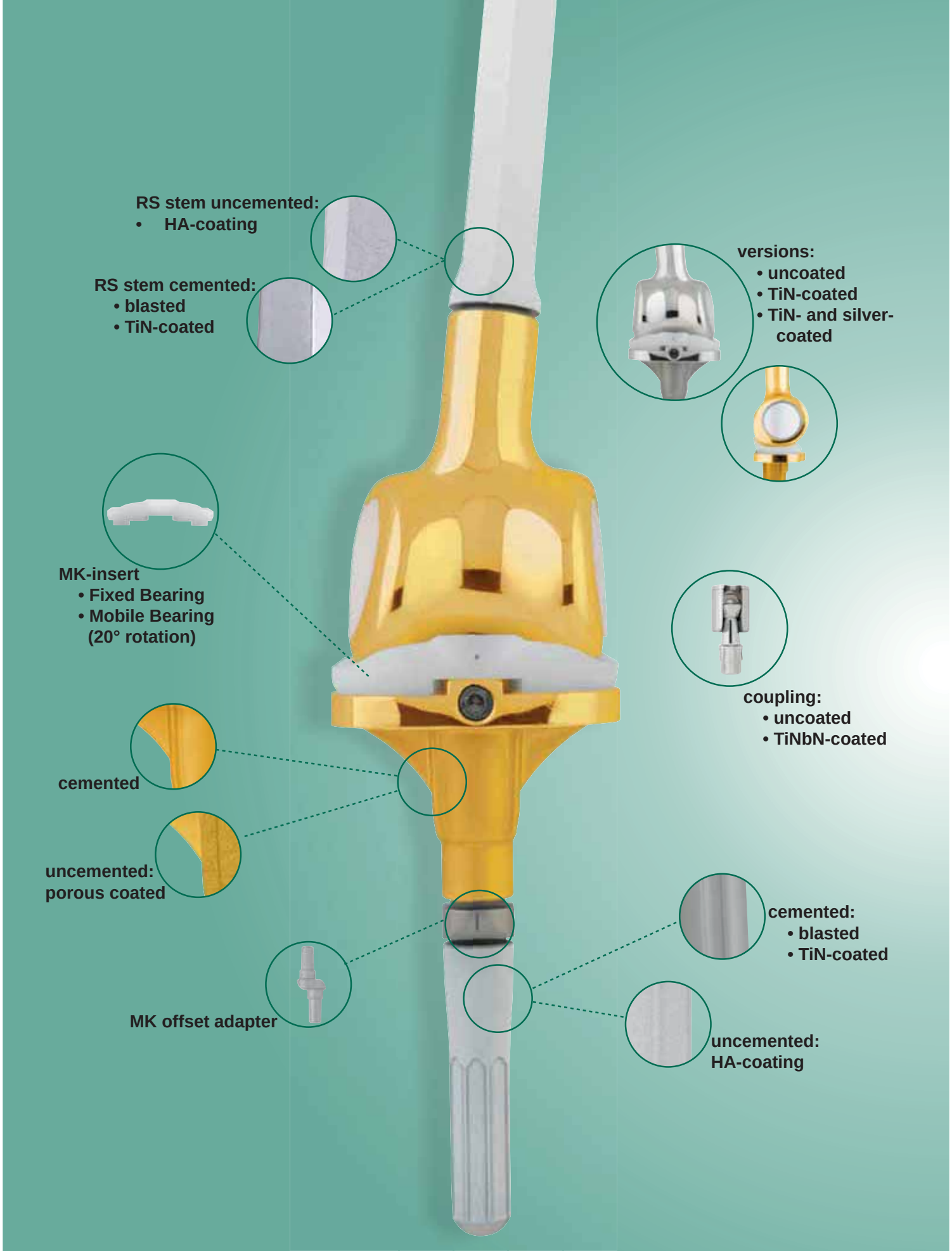
- large bone defects
- loss/defect of both cruciate ligaments and the collateral ligaments

Product details

The MUTARS® GenuX® MK revision knee system is a constrained system that allows the use of offsets, stems and spacer. For the treatment of large bone defects, the system can be combined with EPORE® Cones and metaphyseal components. The coupling between femur and tibia stabilizes the knee joint in all axes.

- cemented and uncemented version
- Mobile Bearing and Fixed Bearing option
- 5 femoral sizes*
- 5 sizes PE-inserts in heights of 12,5 to 17,5mm*
- 5 tibial sizes*
- 4 offset adapter: 0, 2, 4, 6 mm
- MK stems: uncoated, TiN-coating or with HA-coating length: 125, 150, 200, 250 mm; ø 11-28 mm
- spacer: femoral (distal and posterior: 5-10mm); tibial (5-45mm)

*Please request availability


RS stem uncemented:
• HA-coating
RS stem cemented:
• blasted
• TiN-coated
versions:
• uncoated
• TiN-coated
• TiN- and silver-coated
MK-insert
• Fixed Bearing
• Mobile Bearing
(20° rotation)
coupling:
• uncoated
• TiNbN-coated
cemented
uncemented:
porous coated
cemented:
• blasted
• TiN-coated
MK offset adapter
uncemented:
HA-coating

MUTARS® KRI MK

Indications

- loss of the distal femoral condyles
- no stabilizing ligament structures

Product details

The MUTARS® KRI MK revision system is a constrained knee system that completely replaces the femoral condyles. Apart from the femoral component, the individual components of the system are identical to the GenuX® MK revision knee, making it easy to switch between the two joint replacements during surgery. This system can also be combined and expanded with EPORE® Cones and metaphyseal components for the treatment of large bone defects.

- cemented and uncemented version
- Mobile Bearing and Fixed Bearing option
- 1 femoral size
- 5 sizes PE-inserts in heights of 12,5 to 17,5mm*
- 5 tibial sizes*
- 4 offset adapter: 0, 2, 4, 6 mm
- RS stems: uncoated, TiN-coating or with HA-coating length: 120, 150, 200, 250 mm; ø 12-22 mm
- spacer: tibial 5-45mm

*Please request availability

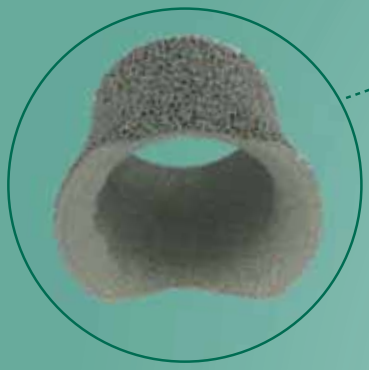
EPORE® Defect Filler

EPORE® Cones KRI & RS Arthrodesis

EPORE® Cones Metaphyseal

EPORE® Metaphyseal Components

EPORE® Cones Cortical



femoral and tibial

EPORE® Cones KRI & RS Arthrodesis

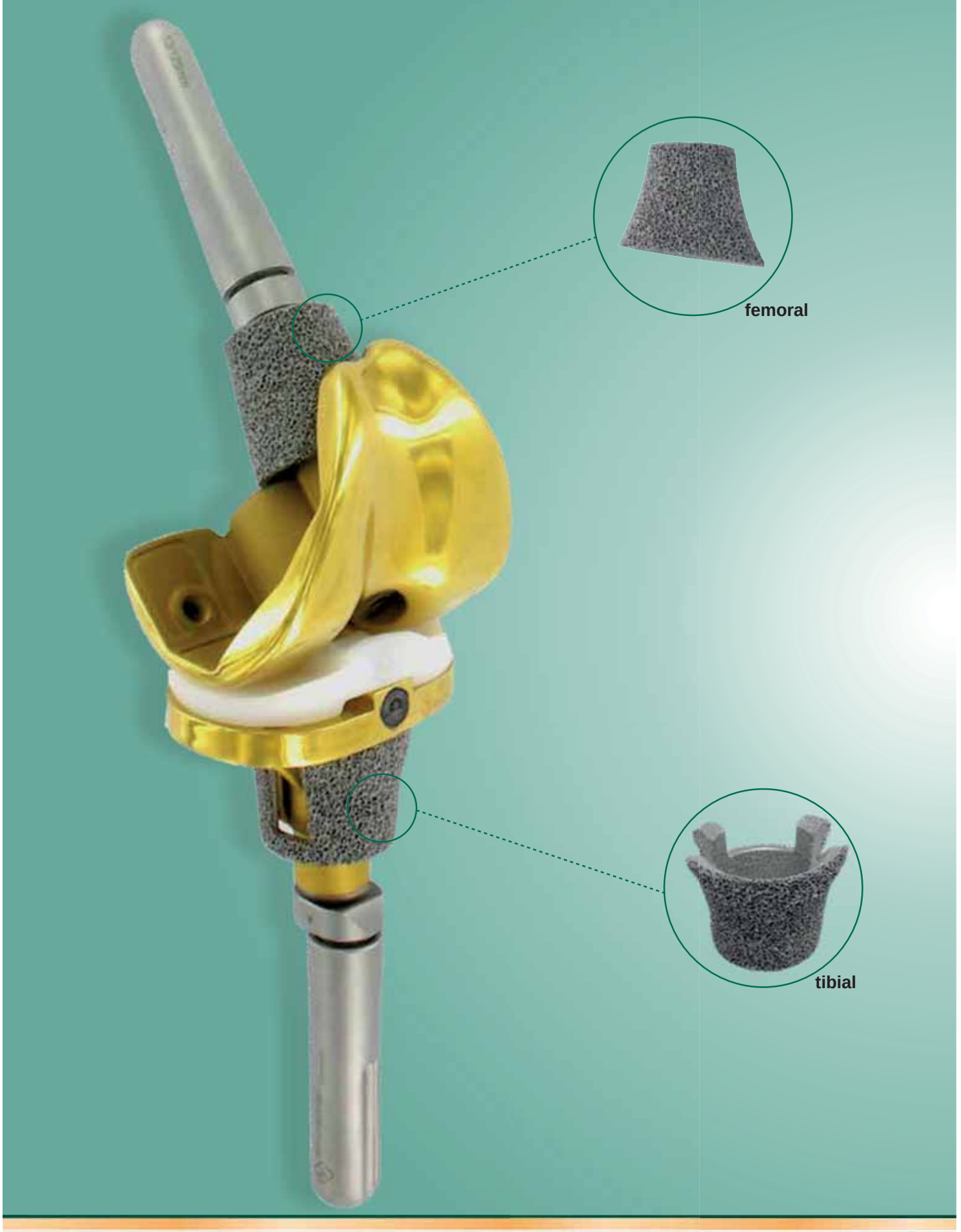
Indication

- large bone and cavity defects within the proximal tibia and distal femur

Product details

The EPORE® Cones KRI & RS Arthrodesis offer the possibility of treating large bone defects with standard implants. Their porous surface structure is supposed to stimulate the bone to grow into the implant, which results in very good secondary stability.

- cemented connection between cone and implant
- EPORE® Cones KRI and RS Arthrodesis for central metaphyseal defects
- system-specific for MUTARS® KRI and RS Arthrodesis
- defect-guided surgery technique
- 3 sizes
- identical cone for femoral and tibial treatments


femoral
tibial

EPORE® Cones Metaphyseal

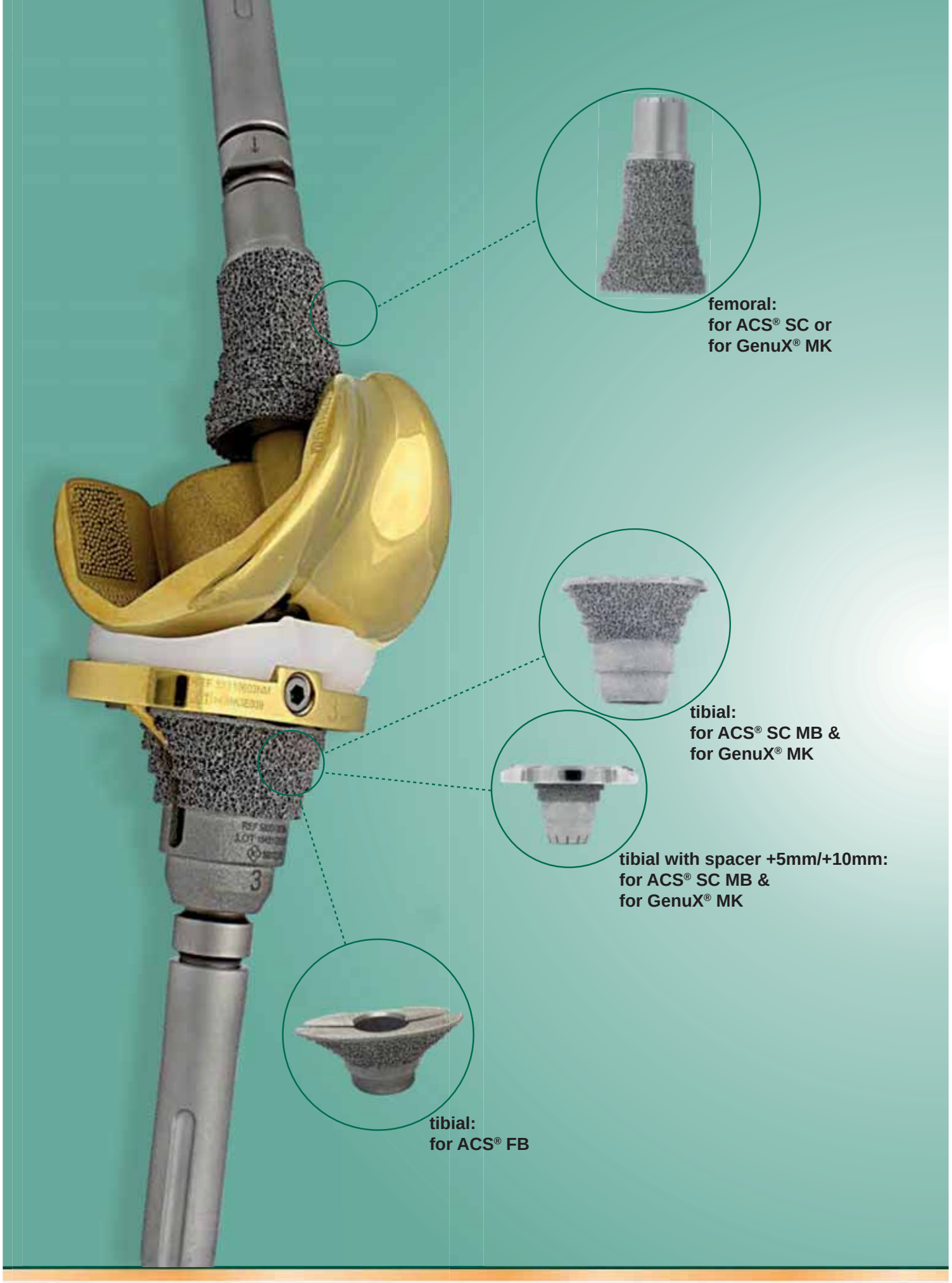
Indication

- large bone and cavity defects within the proximal tibia and distal femur

Product details

The EPORE® Cones metaphyseal offer the possibility of treating large bone defects with standard implants. Their porous surface structure is supposed to stimulate the bone to grow into the implant, which results in very good secondary stability.

- cemented connection between cone and implant
- EPORE® Cones metaphyseal for central, metaphyseal bone defects without cortical damage
- reconstruction of load bearing surface
- intramedullary guided surgery technique
- system-unspecific
- 4 femoral sizes
- 4 tibial sizes



femoral:
for ACS® SC or
for GenuX® MK

tibial:
for ACS® SC MB &
for GenuX® MK

tibial with spacer +5mm/+10mm:
for ACS® SC MB &
for GenuX® MK

tibial:
for ACS® FB

EPORE® Metaphyseal Components

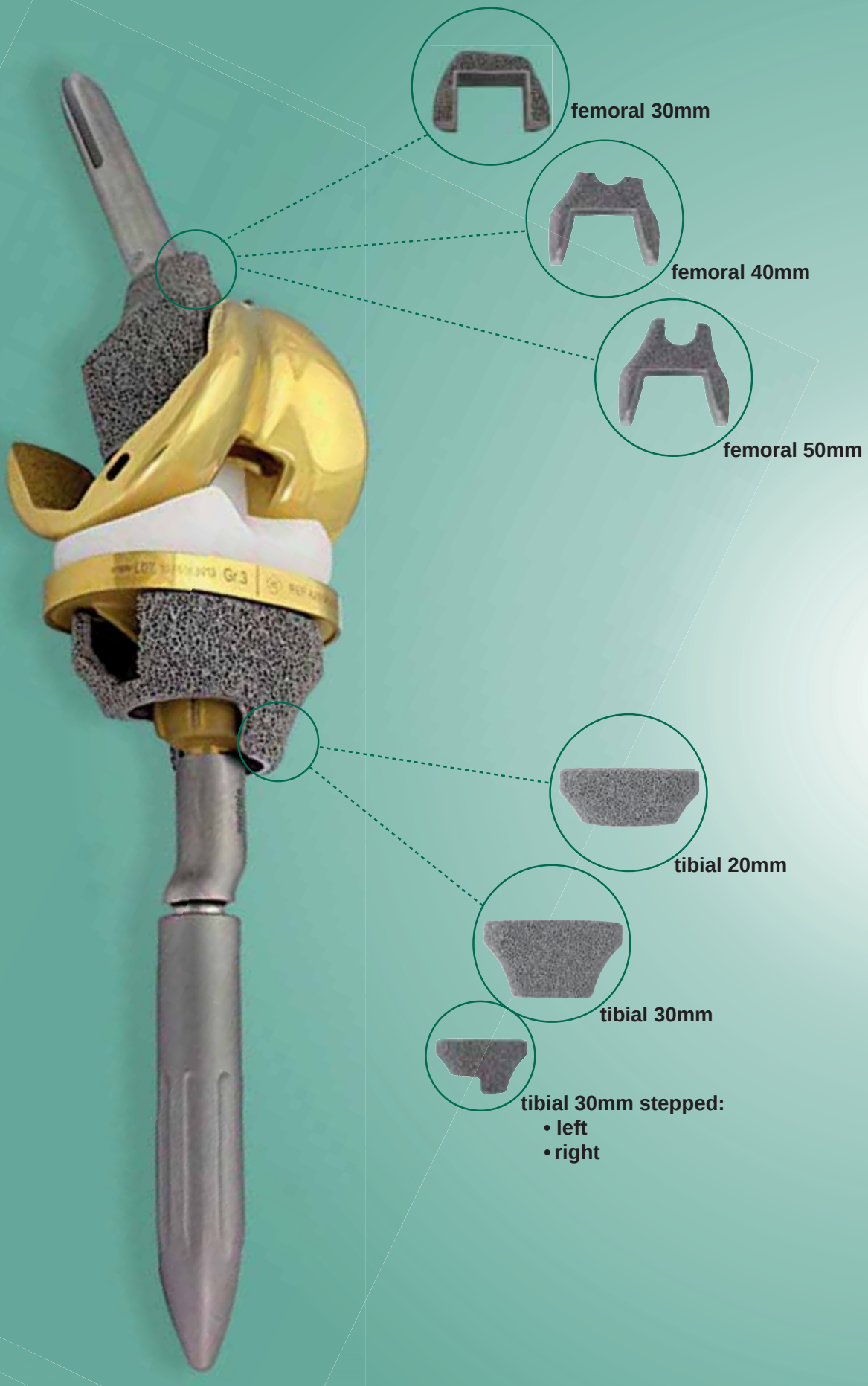
Indication

- large, central bone and cavity defects within the proximal tibia and distal femur

Product details

The EPORE® metaphyseal components offer the possibility of treating large central bone defects with the standard implants ACS® SC and GenuX® MK. Their porous surface structure is supposed to stimulate the bone to grow into the implant, which results in very good secondary stability.

- uncemented connection between metaphyseal component and implant
- EPORE® metaphyseal components for central metaphyseal bone defects without cortical damage
- intra- and extramedullary guided surgery technique
- system-specific for
    - GenuX® MK
    - ACS® SC MB
    - ACS® SC FB
- 4 femoral sizes each
- 4 tibial sizes each
- 14 sizes of metaphyseal components tibial with spacer +5mm/+10mm


femoral 30mm
femoral 40mm
femoral 50mm
tibial 20mm
tibial 30mm
tibial 30mm stepped:
• left
• right

EPORE® Cones Cortical

Indication

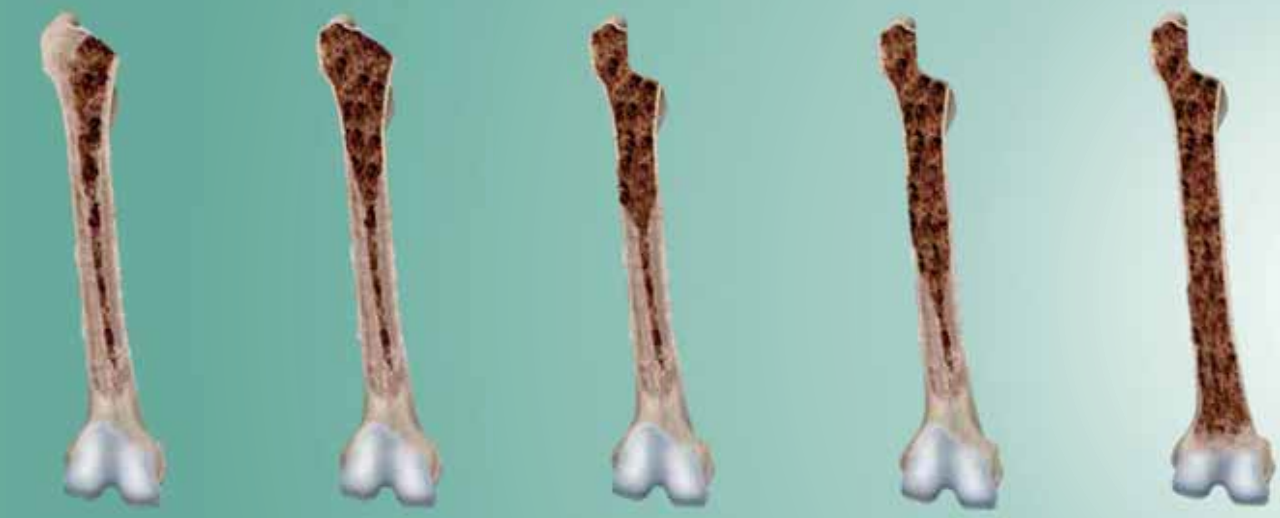
- Large bone and cavity defects within the proximal tibia and distal femur

Product details

The EPORE® Cones cortical offer the possibility of treating large bone defects with standard implants. Their porous surface structure is supposed to stimulate the bone to grow into the implant, which results in very good secondary stability.

- cemented connection between cone and implant
- EPORE® Cones cortical for central and decentralized bone defects of the metaphysis with cortical damage
- reconstruction of the joint line
- defect-guided surgery technique
- system-unspecific
- 4 femoral sizes per height
- 4 tibial sizes per height

Paprosky Classification Femur



I II IIIa IIIb IV

Hip Stem Revision

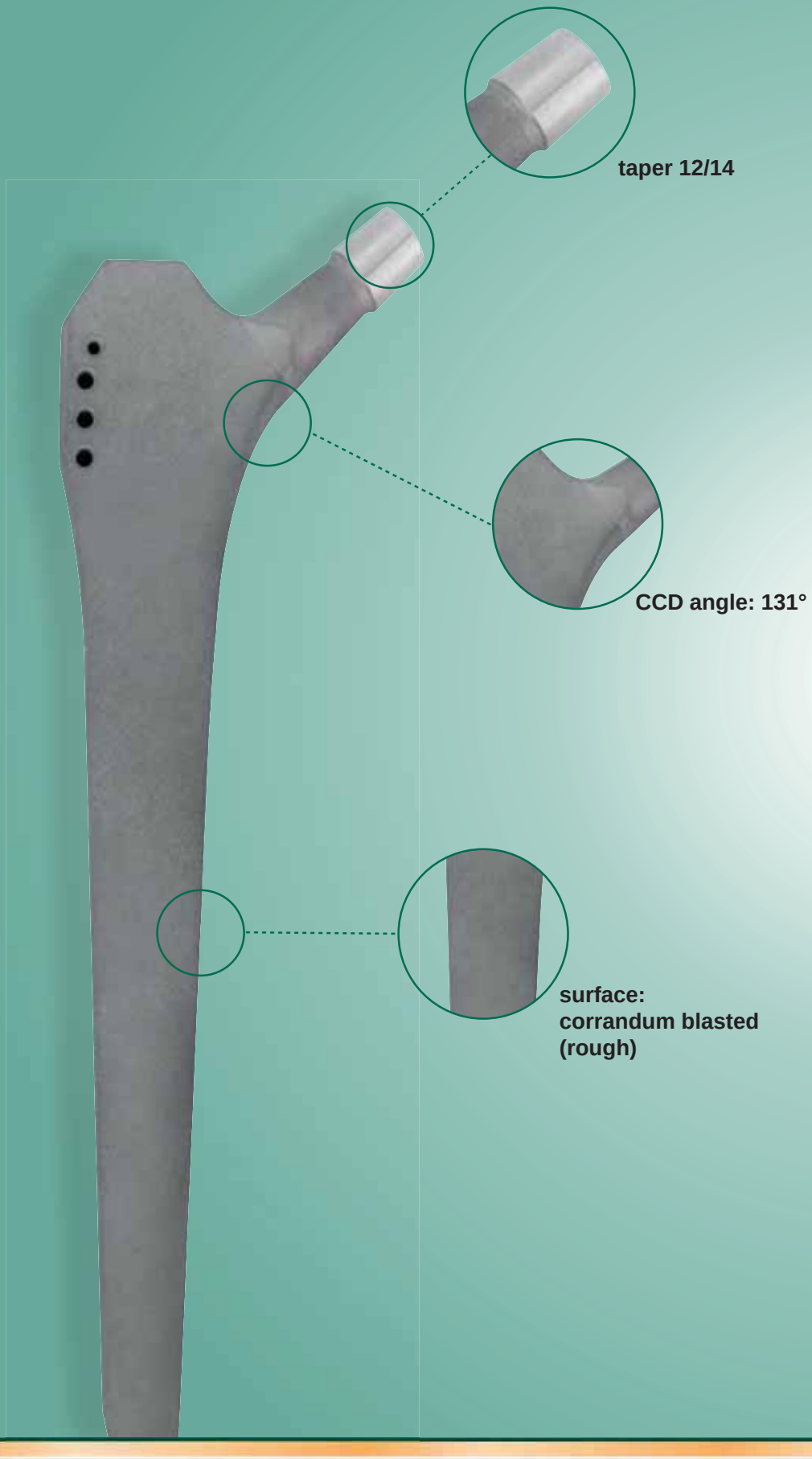
DiaLoc® RS Hip Stem

Bicana® Hip Stem

Cortina Hip Stem

MUTARS® RS Hip System

Stem extractors are available.


taper 12/14
CCD angle: 131°
surface:
corrandum blasted
(rough)

DiaLoc® RS Hip Stem

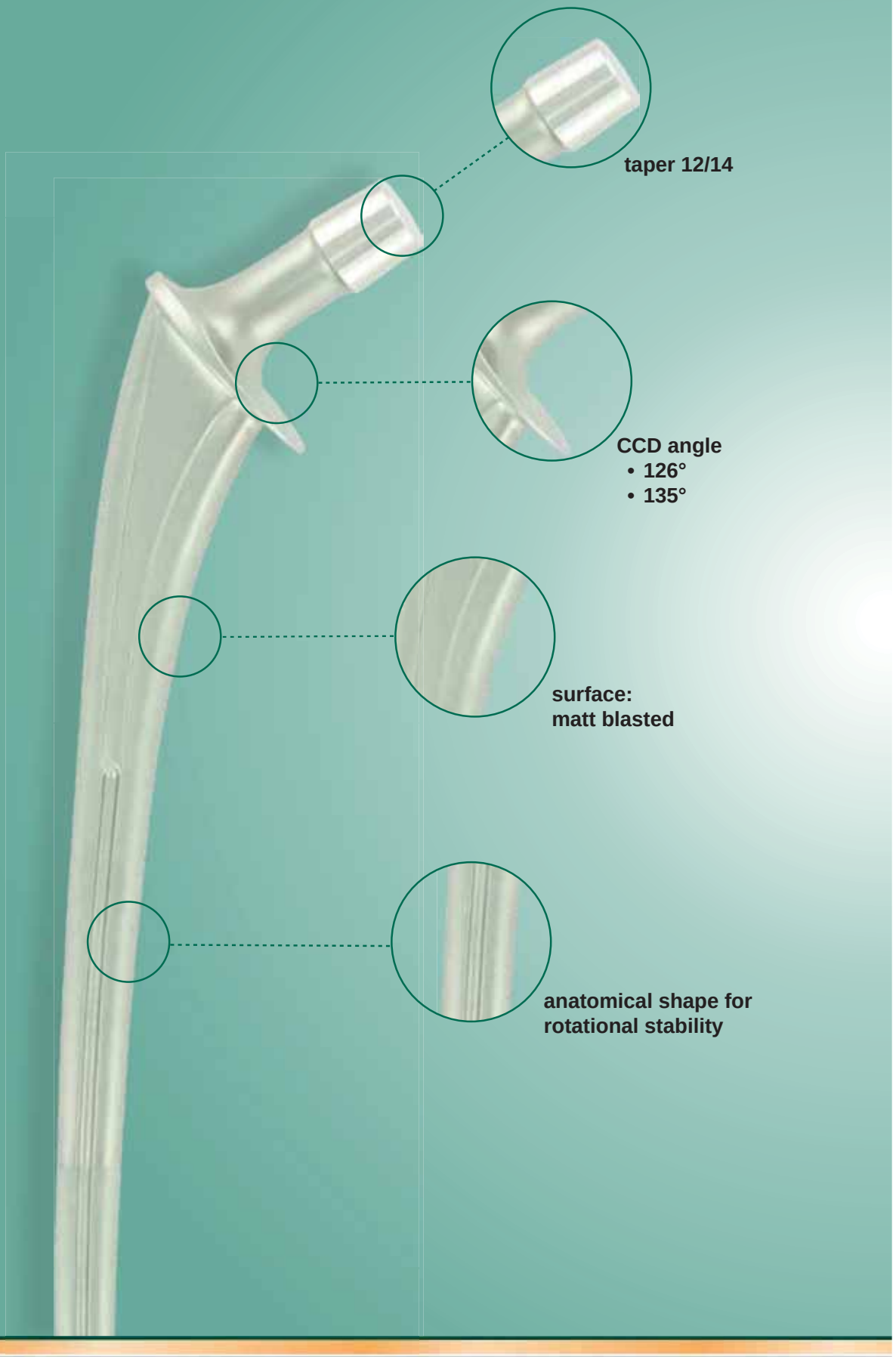
Indication

- revision hip arthroplasty

Product details

cementless revision stem in Zweymüller design based on the DiaLoc® stem

- material: implatan®; $TiAl_6Nb_7$ acc. to ISO 5832-11
- coating: none; rough surface
- CCD angle: 131°
- length: 181-221mm
- size spectrum: 8 sizes
- tapered, rectangular design provides high rotational and primary stability


taper 12/14
CCD angle
• 126°
• 135°
surface:
matt blasted
anatomical shape for
rotational stability

Bicana® Hip Stem

Indication

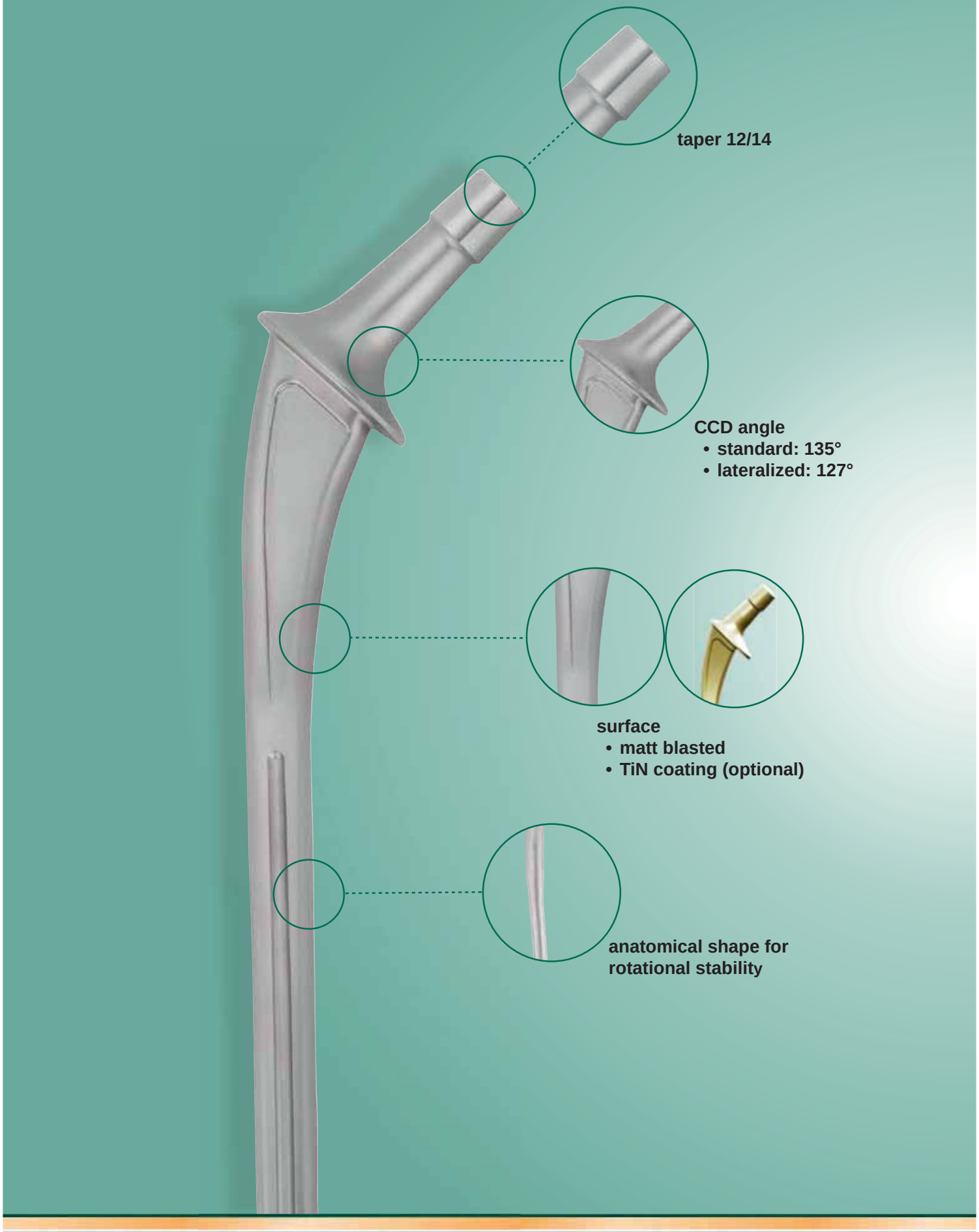
- revision hip arthroplasty

Product details

cemented, anatomical hip stem with collar

- material: implavit®; CoCrMo acc. to ISO 5832-4
- coating: none; surface matt blasted
- CCD angle: 126° and 135°
- length: 200-300mm
- size spectrum: 9 sizes 126°; 6 sizes 135°
- double curvation (S-shape) stabilises the implantat against rotational forces

- for primary procedures, the Bicana® hip stem is also available in lengths of 130 and 150mm


taper 12/14
CCD angle
• standard: 135°
• lateralized: 127°
surface
• matt blasted
• TiN coating (optional)
anatomical shape for
rotational stability

Cortina Hip Stem

Indication

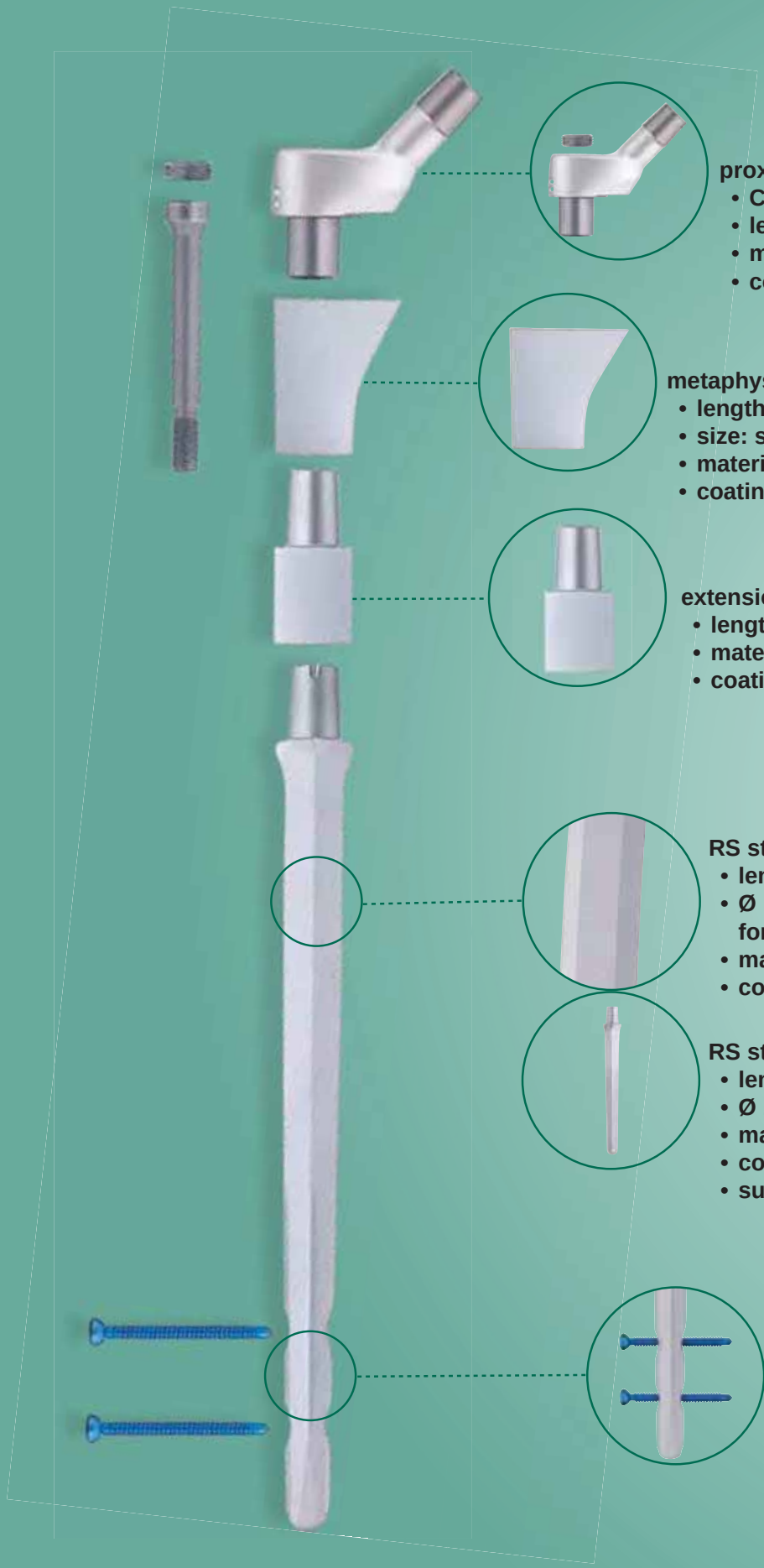
- revision hip arthroplasty

Product details

cemented, anatomical hip stem with collar

- material: implavit®; CoCrMo acc. to ISO 5832-4
- coating: TiN (optional)
- CCD angle: 135° standard; 127° lateralized
- length: 200-300mm
- size spectrum: 9 sizes standard; 9 sizes lateralized
- anatomical, S-shaped stem shape provides additional rotational stability

- for primary procedures, the Cortina hip stem is also available in lengths of 130-170mm



proximal component
- CCD angle: 135° / 127°
- length: 32mm / 42mm
- material: implatan®; $TiAl_6V_4$
- coating: silver (optional)

metaphyseal component
- length: 40mm / 50mm
- size: standard / small
- material: implatan®; $TiAl_6V_4$
- coating: HA (optional)

extension piece
- length: 25mm
- material: implatan®; $TiAl_6V_4$
- coating: HA (optional)

RS stem cementless
- length: 150, 200 and 250mm
- Ø 12-22mm (in 1mm steps); for length 250mm: Ø 14-22mm
- material: implatan®; $TiAl_6V_4$
- coating: HA (optional)

RS stem cemented
- length: 120, 150 and 200mm
- Ø 12-18mm (in 2mm steps)
- material: implavit®; CoCrMo
- coating: TiN (optional)
- surface: matt blasted

interlocking screw holes for cementless stems
- 200mm: Ø 15-22mm
- 250mm: Ø 17-22mm

MUTARS® RS Hip System

Indications

- revision surgery in cases of femoral implant component loosening with extended calcar resorption of the proximal femur and enlarged medullary canal or with a large lytic area of the proximal femoral cortex
- revision surgery in cases of femoral implant component loosening due to peri/subprosthetic fractures
- revision cases of extensive comminuted fractures of the proximal femoral segment in elderly patients with indicated prostheses, in whom, however, a sufficient fixation of a standard-arthroplasty cannot be performed

Product details

revision system according to the modular principle

- cementless and cemented treatment possible
- curved stems
- for cementless revision: two distal interlocking screw holes

  200mm: Ø 15-22mm

  250mm: Ø 17-22mm
- system allows implant lengths of 192-417mm

Paprosky Classification Acetabulum

1

2a

2b

2c

3a

3b

Hip Cup Revision

EcoFit® Hip Cup EPORE®

EcoFit® 2M Hip Cup

EPORE® Acetabular spacer

ic Acetabular Ring

ic Reinforcement Cage

MUTARS® PRS

MUTARS® RS Cup

MUTARS® LUMiC®


screw holes
• none (NH)
• three
• seven (Multihole)
EPORE® structure
screw holes closed by plugs

EcoFit® Hip Cup EPORE®

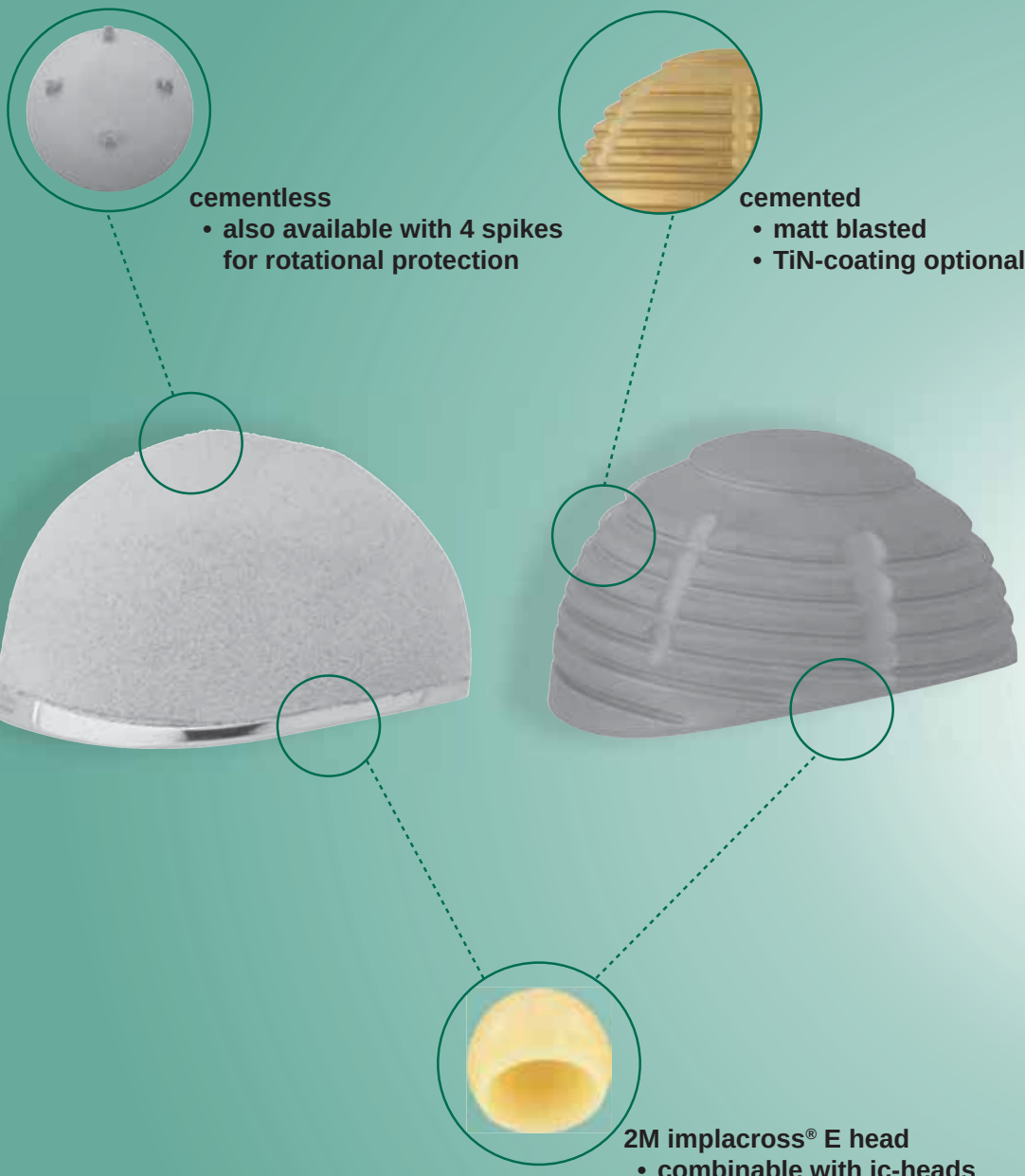
Indication

- revision hip arthroplasty

Product details

cementless cup with highly porous structure EPORE®

- material: implatan®; $TiAl_6V_4$
- coating: TCP (optional)
- size spectrum: Ø 42-72mm (in 2mm steps)
- screw holes: three, seven (Multihole)
  with sufficient bone quality: NH version without screw holes
- insert options
  - PE cup insert 0° and 10°
  - implacross® PE cup insert 0° and 10°
  - implacross® E PE cup insert 0° and 10°
  - ceramic cup insert BIOLOX® delta



cementless
- **also available with 4 spikes for rotational protection**

cemented
- **matt blasted**
- **TiN-coating optional**

2M implacross® E head
- **combinable with ic-heads Ø 22, 28 and 32mm**
- **also available in UHMWPE**

EcoFit® 2M Hip Cup

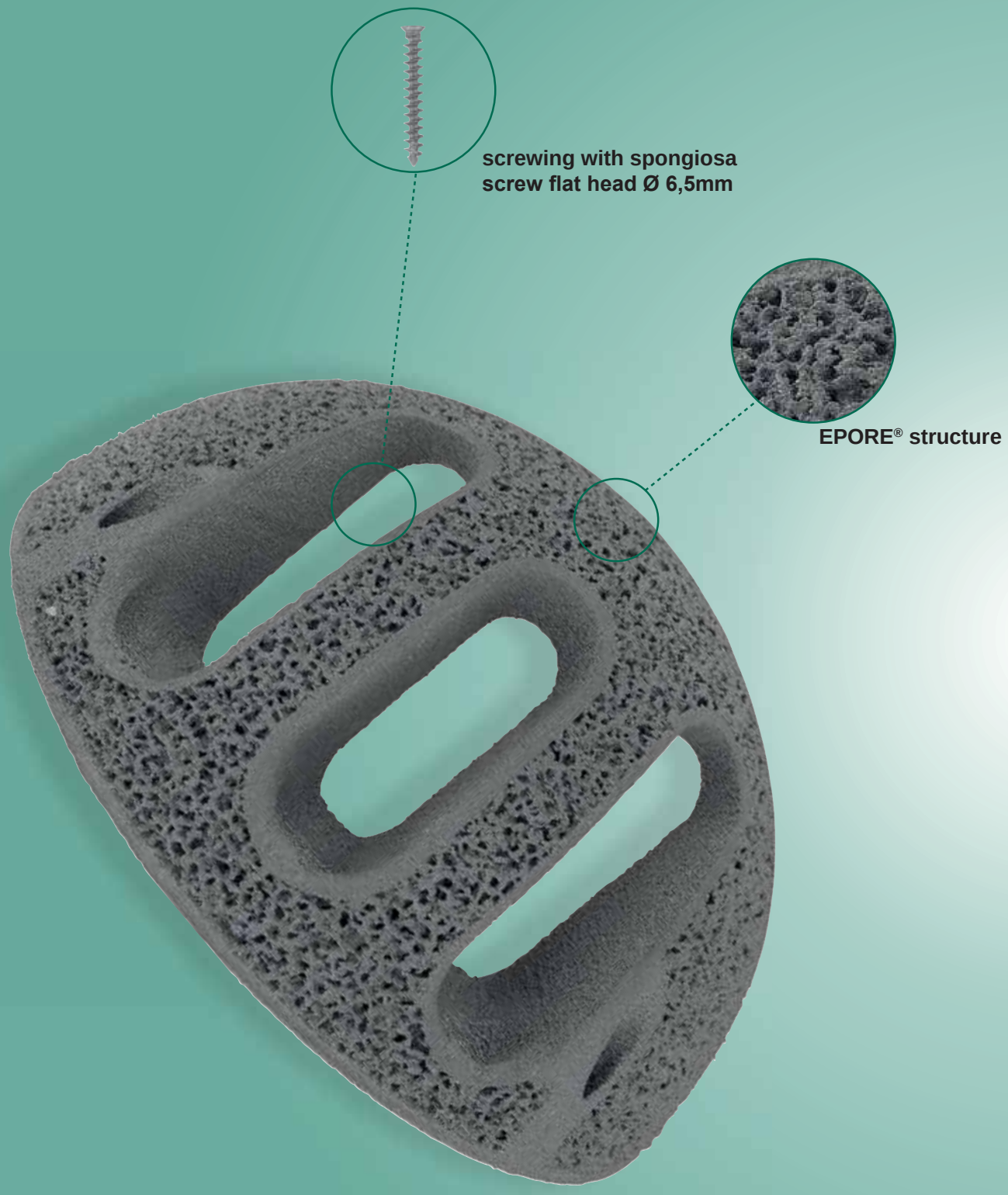
Indication

- revision hip arthroplasty with increased risk of dislocation

Product details

tripolar cup system

- cementless and cemented version
- material: implavit®; CoCrMo acc. to ISO 5832-4
- coating
  - cementless: cpTi + HA
  - cemented: TiN (optional)
- size spectrum
  - cementless: Ø 42-64mm (in 2mm steps); (version with spikes Ø 44-62mm)
  - cemented: Ø 44-64mm (in 2mm steps)
- 2M-head options
  - 2M implacross® E head (crosslinked UHMWPE with vitamin E)
  - EcoFit® 2M head (UHMWPE)


screwing with spongiosa
screw flat head Ø 6,5mm
EPORE® structure

EPORE® Acetabular spacer

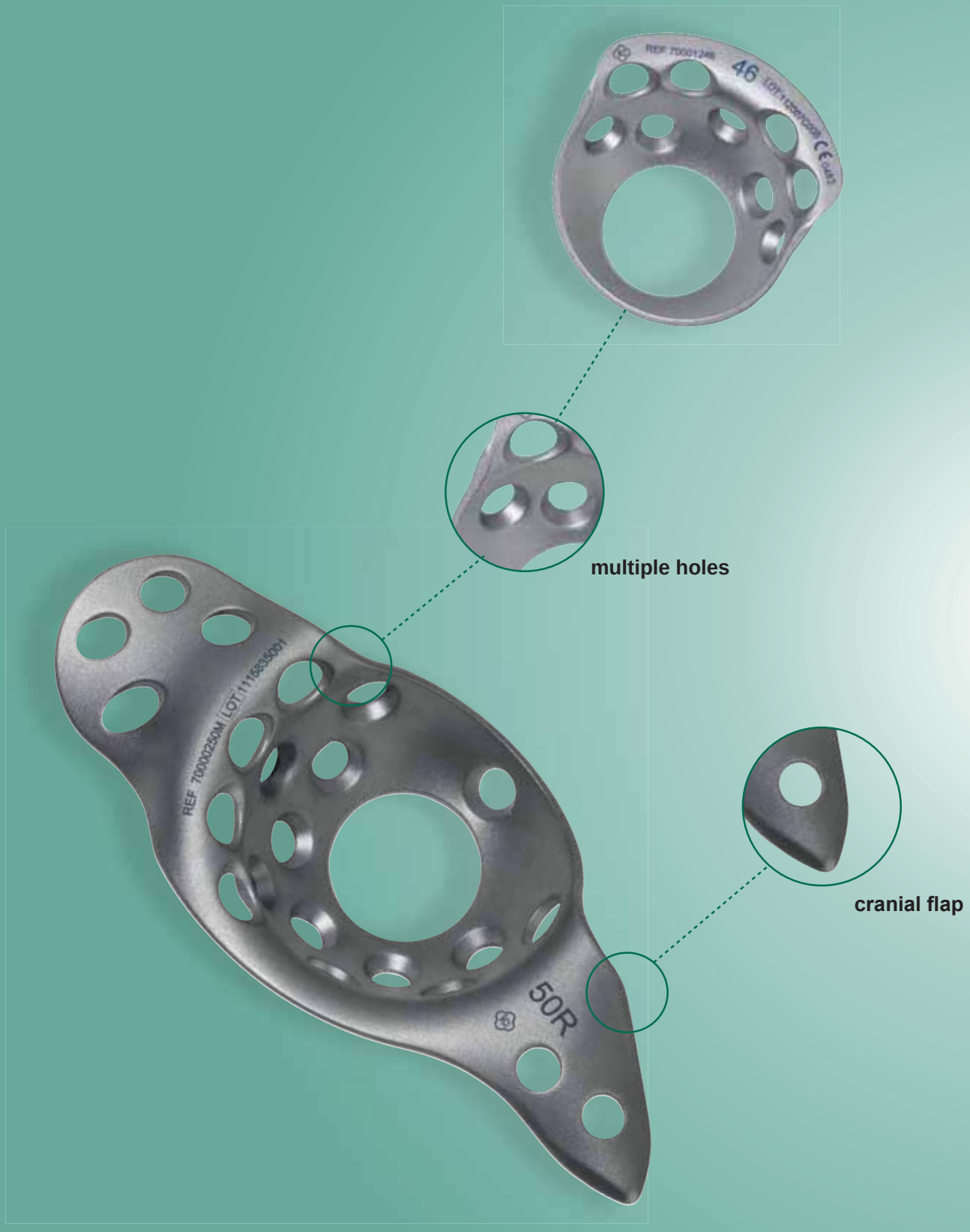
Indication

- bone defects in the acetabulum

Product details

cementless spacer with highly porous structure EPORE®

- material: implatan®; $TiAl_6V_4$
- size spectrum: Ø 54-66mm (in 4mm steps)
- height: 10, 15 and 20mm
- screw holes for fixation
- combination with implantcast hip cup systems


multiple holes
cranial flap
50R

ic Acetabular Ring

Indication

- revision hip arthroplasty

Product details

cementless reconstruction implant

- material: pure titanium acc. to ISO 5832-2 Grade 1
- size spectrum: Ø 42-58mm (in 2mm steps)
- anchorage drill holes for fixation
- combination with a cemented cup (Mueller PE cup or EcoFit® 2M cup)

ic Reinforcement Cage

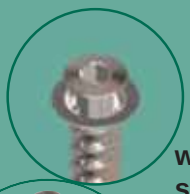
Indication

- revision hip arthroplasty

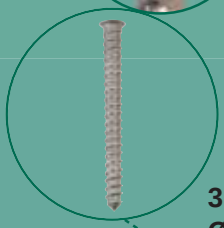
Product details

cementless reconstruction implant

- material: pure titanium acc. to ISO 5832-2 Grade 1
- size spectrum: Ø 44-62mm (in 6mm steps); right and left respectively
- hemispherical cup with distal flange and proximal plate
- anchorage drill holes for fixation
- combination with a cemented cup (Mueller PE cup or EcoFit® 2M cup)



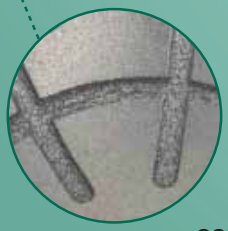
with shim also for Ø 6,5mm
spongiosa screws



3 screw holes for
Ø 8mm spongiosa screws

MUTARS® PRS with
cemented EcoFit® 2M
cup

EPORE® structure



cement notches

MUTARS® PRS

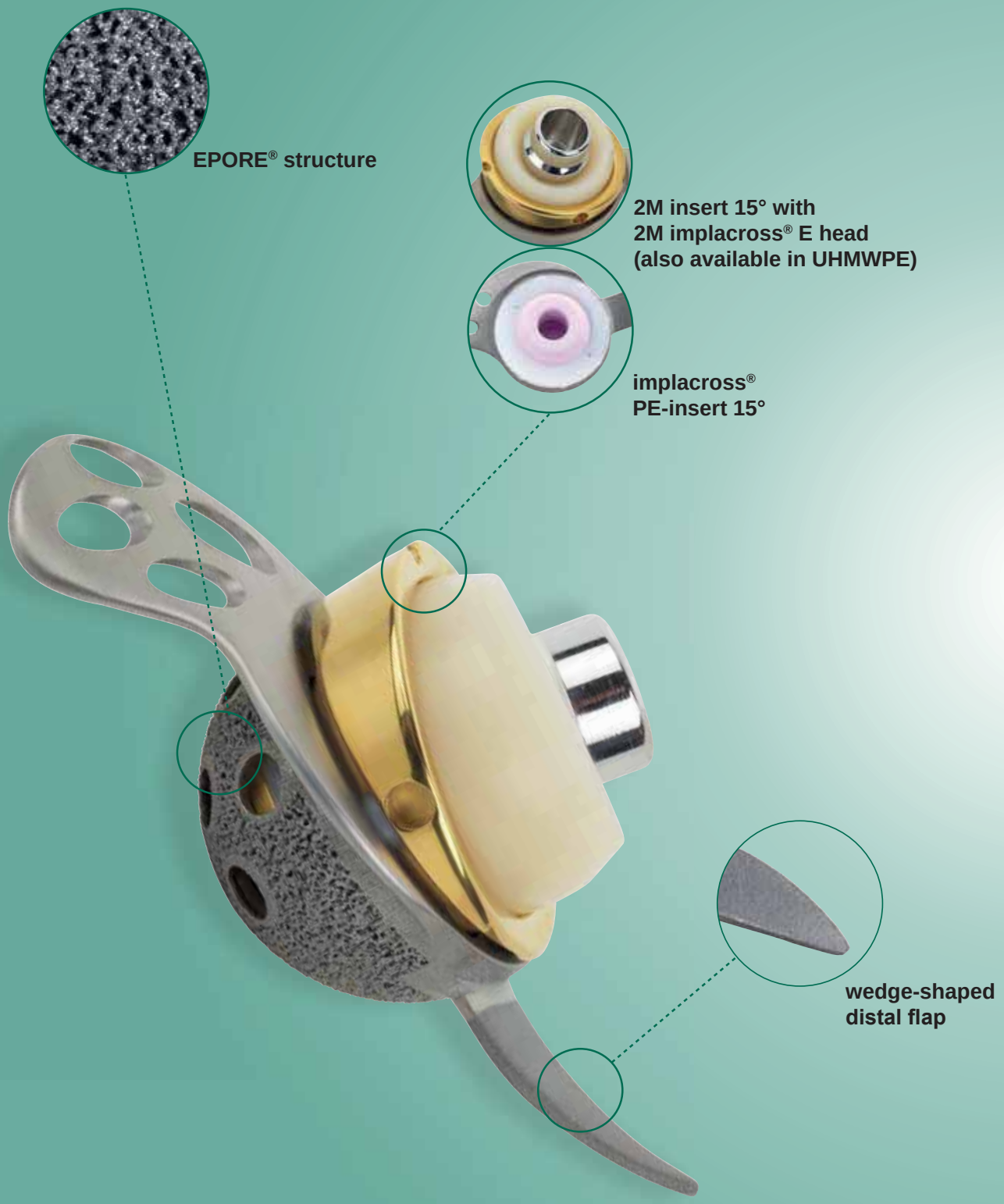
Indication

- large cavitary/segmental acetabular defects

Product details

cementless reconstruction shell with highly porous structure EPORE®

- material: implatan®; $TiAl_6V_4$
- size spectrum: Ø 52-72mm (in 4mm steps)
- screw holes for fixation (10x Ø 6,5mm; 3x Ø 8mm)
- combination with EcoFit® 2M cup cemented or PE-cup Mueller II


EPORE® structure
2M insert 15° with
2M implacross® E head
(also available in UHMWPE)
implacross®
PE-insert 15°
wedge-shaped
distal flap

MUTARS® RS Cup

Indication

- large cavitary/segmental acetabular defects

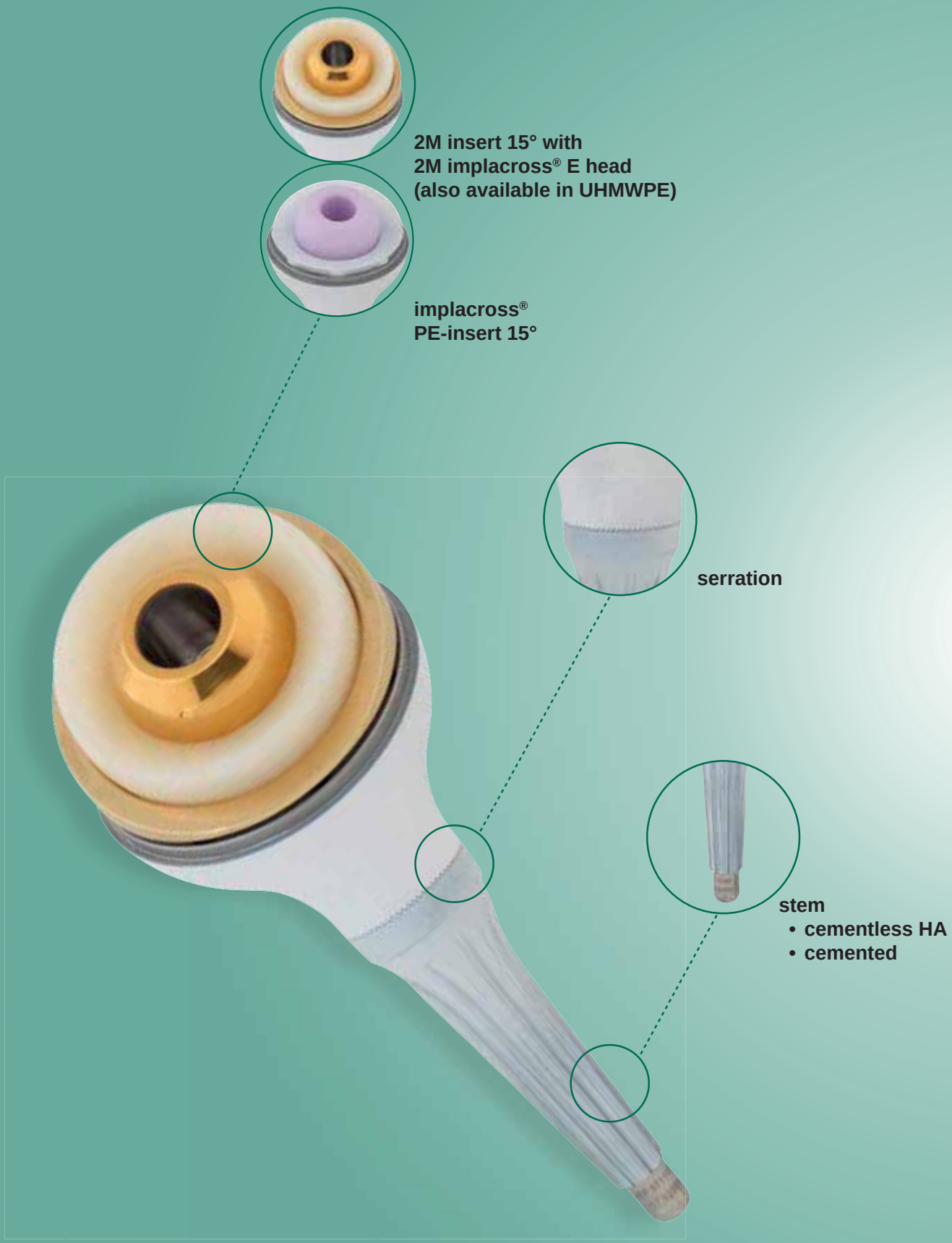
Product details

cementless revision cup with highly porous structure EPORE®

- material: implatan®; $TiAl_6V_4$
- size spectrum: Ø 46-62mm (in 4mm steps); right and left respectively
- anatomically shaped caudal and cranial flaps
- screw holes for fixation
- insert options

  implacross® PE-insert 15° neutral 0mm and Offset 4mm

  2M insert 15° and 2M implacross® E head (also available in UHMWPE) for tripolar treatment



2M insert 15° with
2M implacross® E head
(also available in UHMWPE)

implacross®
PE-insert 15°

serration

stem
- cementless HA
- cemented

MUTARS® LUMiC®

Indication

- partial pelvic replacement in complex or repeated revisions or very large bone defects of the hip

type II pelvectomy according to Enneking

Product details

modular pedestal cup

- material: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3
- coating: HA (optional), silver (sz. Ø 60mm, optional)
- size spectrum: Ø 50, 54 and 60mm
- stem options

  cementless HA: Ø 8mm and 10mm; length 65, 75 and 85mm (implatan®; $TiAl_6V_4$)

  cemented: Ø 8mm; length 65, 75 and 85mm (implavit®; CoCrMo)
- insert options

  implacross® PE-insert 15° neutral 0mm and Offset 4mm

  2M insert 15° and 2M implacross® E head (also available in UHMWPE) for tripolar treatment

Revision Products

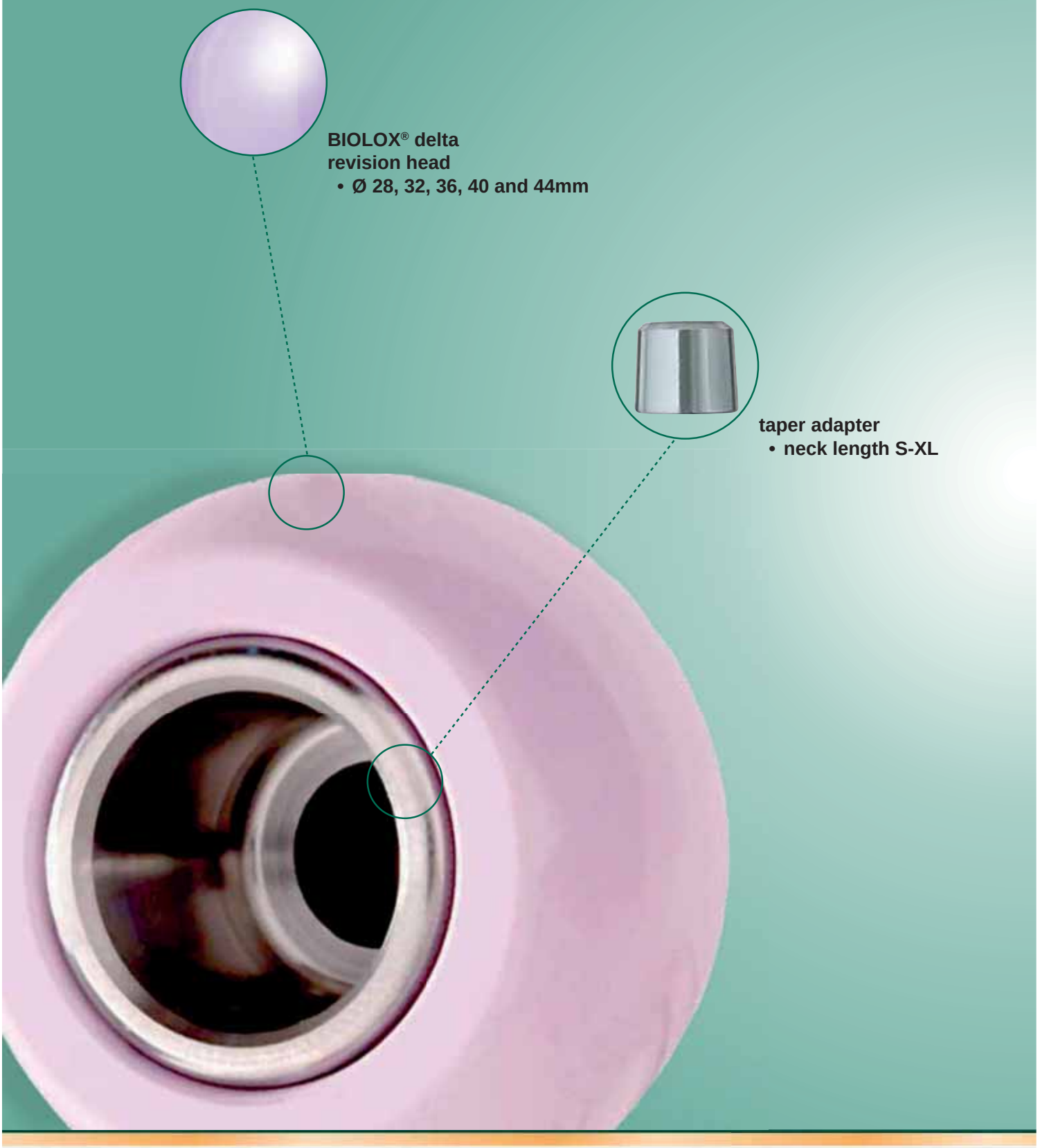
ic-head Revision BIOLOX® delta

Trochanter Plate

ic-Cerclage

implabond 1G and 3G

CERASORB® Bone Replacement Material


BIOLOX® delta
revision head
• Ø 28, 32, 36, 40 and 44mm
taper adapter
• neck length S-XL

ic-head Revision BIOLOX® delta

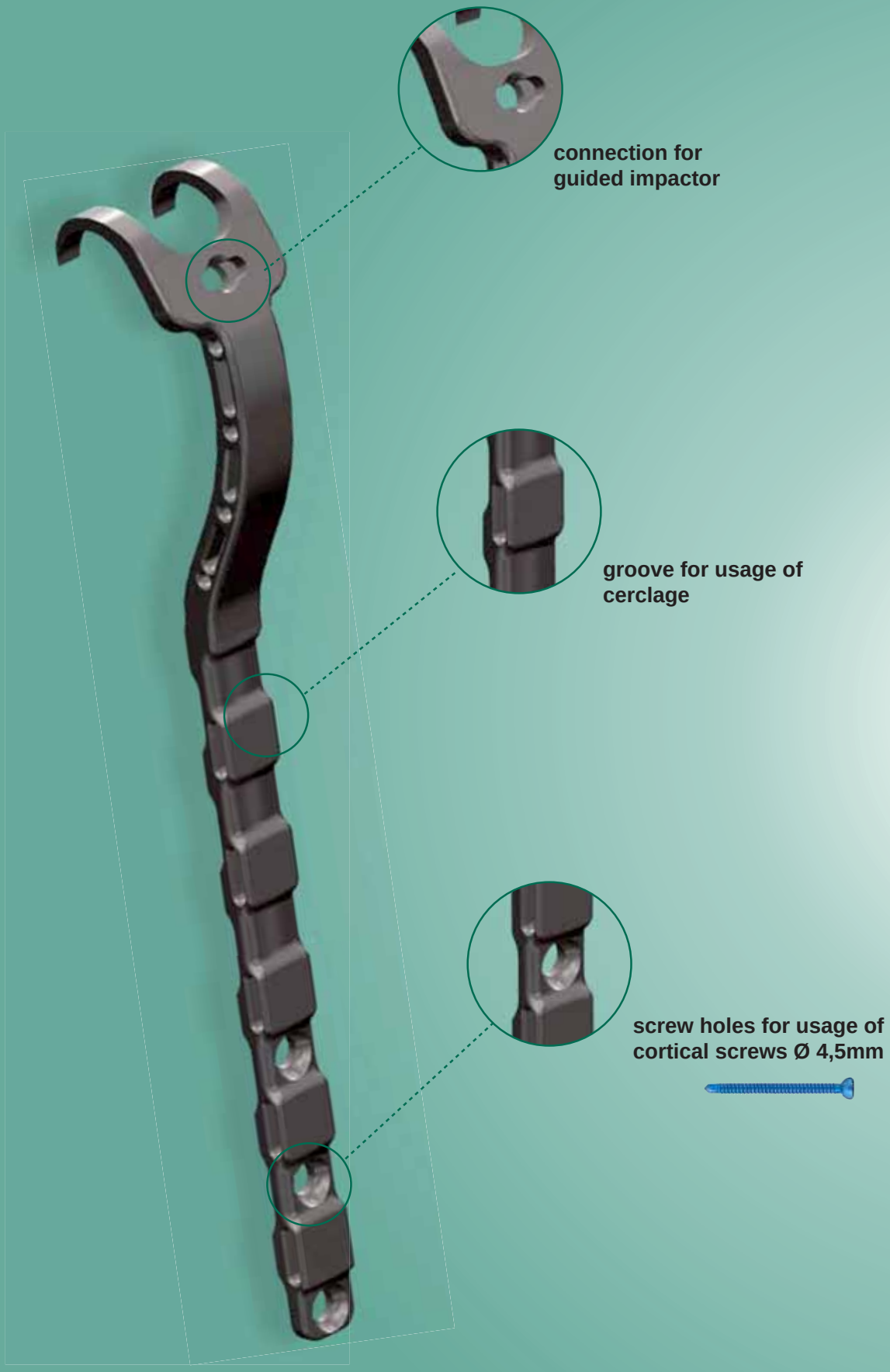
Indication

- cup revision or replacement of a ball head onto a prosthesis stem left *in situ*

Product details

revision head with taper adapter

- material: head made of zirconia and alumina (zirconia toughened alumina (ZTA)); taper adapter made of $TiAl_6V_4$ acc. to ISO 5832-3 and ASTM F136
- size spectrum: Ø 28, 32, 36, 40 and 44mm S-XL
- use with only minor damaged taper
- tapers which are flattened, crushed or chamfered require a revision of the hip stem


connection for
guided impactor
groove for usage of
cerclage
screw holes for usage of
cortical screws Ø 4,5mm

Trochanter Plate

Indications

- osteotomy of the Greater Trochanter
- stable fractures of the proximal femur

Product details

osteosynthesis implant

- material: implatan®; $TiAl_6V_4$ acc. to ISO 5832-3
- size spectrum: 120, 160, 200, 240mm
- three screw holes for usage of Ø 4,5mm cortical screws
- grooves for usage of cerclage

ic-Cerclage

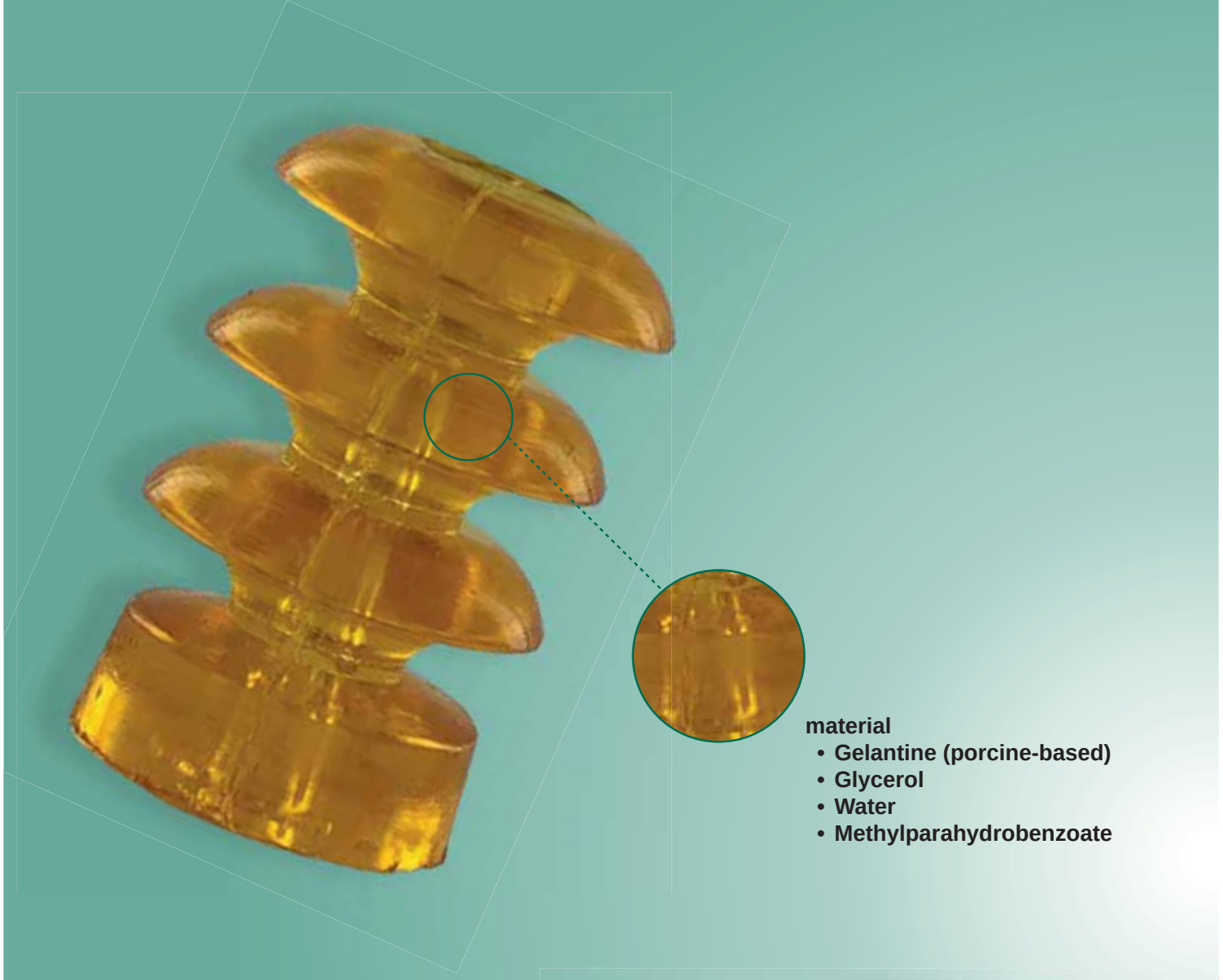
Indication

- bone fractures of large hollow bones

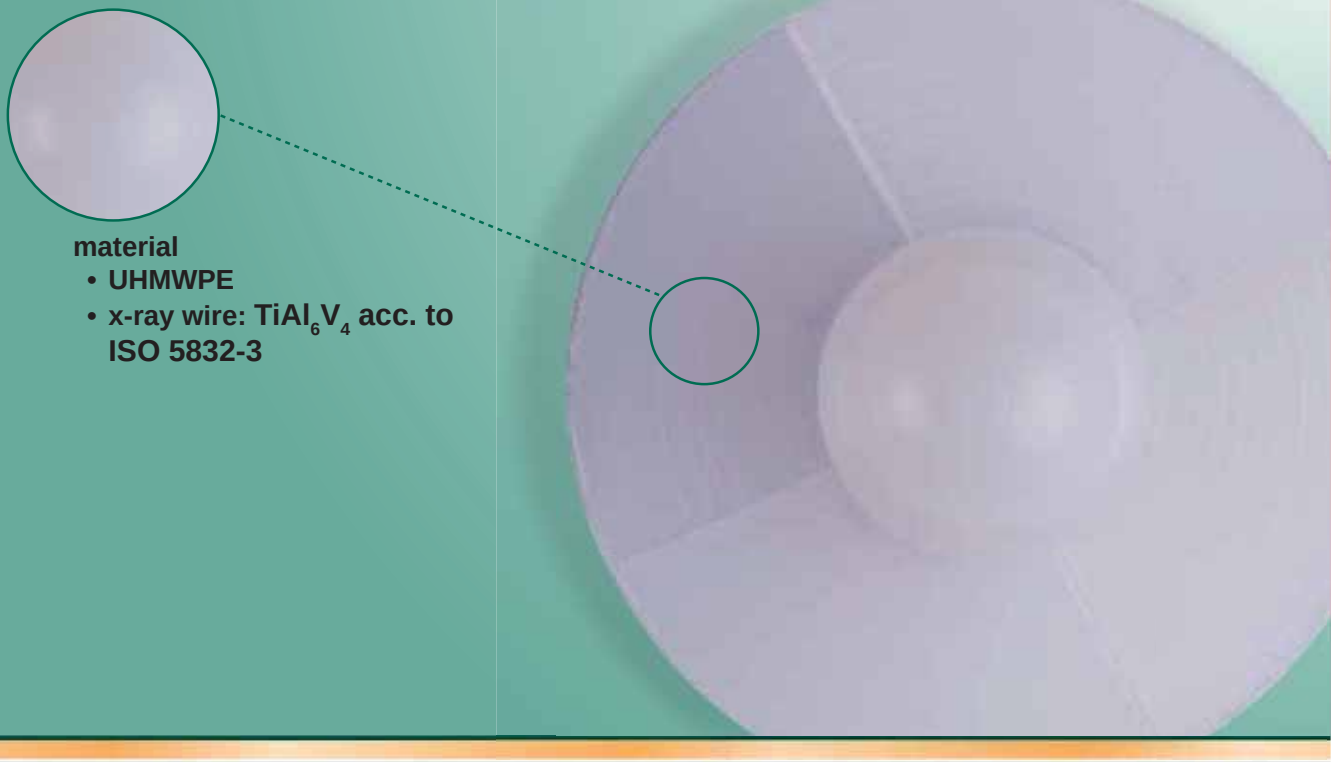
Product details

osteosynthesis implant

- material: pure titanium acc. to ISO 5832-2 Grade 1
- ic-cerclage: 8mm; surface matt blasted on both sides
- ic-cerclage band titanium 2R: 8mm; surface roughly blasted on the bone side
- ic-titanium cerclage wire: Ø 1,4mm; length 50cm or 5m



material
- **Gelantine (porcine-based)**
- **Glycerol**
- **Water**
- **Methylparahydrobenzoate**



material
- **UHMWPE**
- **x-ray wire: $TiAl_6V_4$ acc. to ISO 5832-3**

implabond 1G
implabond 3G

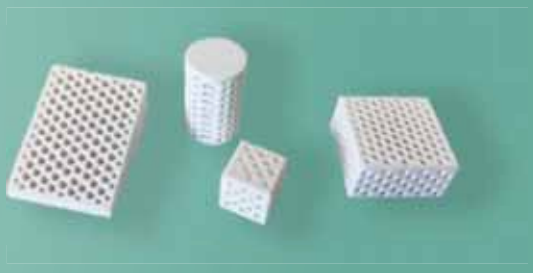
CERASORB®

Indications

- septic revisions
- increased risk of infection

Indication

- bone defects



Product details

bone cement with gentamicin

- standard and low viscosity
- intramedullary plug UHMWPE

  size spectrum: small (Ø 24mm), large (Ø 27mm)
- ic cement restrctor resorbable

  size spectrum: Ø 8-18mm (in 2mm steps)

Product details

bone replacement material

- resorbable, pure-phase β-tricalcium phosphat-ceramic matrix
- available as granulate, foam or block form (cube, cuboid, cylinder, wedge)

Further interesting case studies on patient specific implants and instruments can be found in the C-Fit 3D® brochures.

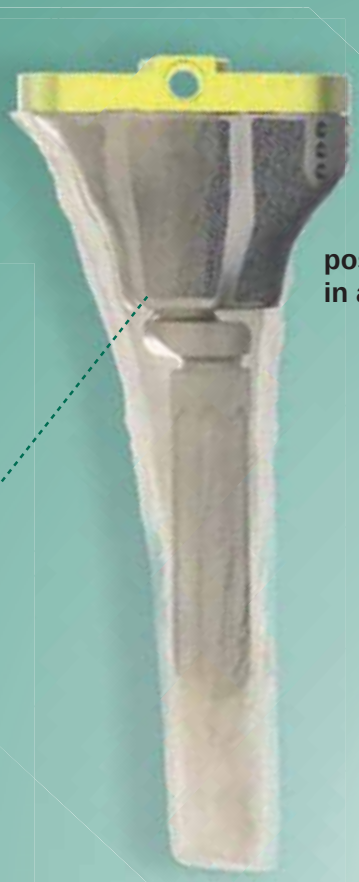
Custom-made Implants

The demand for custom-made implant components increases continuously in revision endoprosthetics.
Complex bone defects after single or multiple revision often do not tolerate treatment with standard implant components. A dedicated software enables us to generate a 3D model of the bone or joint to be reconstructed from high-resolution CT or MRI data. It is possible to segment the body-section radiographs in transversal, saggital and frontal plane. Thus, relevant bones can be reproduced and separated from remaining tissue. Finally, it is exported as a 3D model, which is the basis for constructive implementation of the custom-made implant component. That procedure allows for exact adaptation of the implant to the individual anatomical situation of the patient. Additive manufacturing (3D printing) makes it possible to realize almost any geometry.

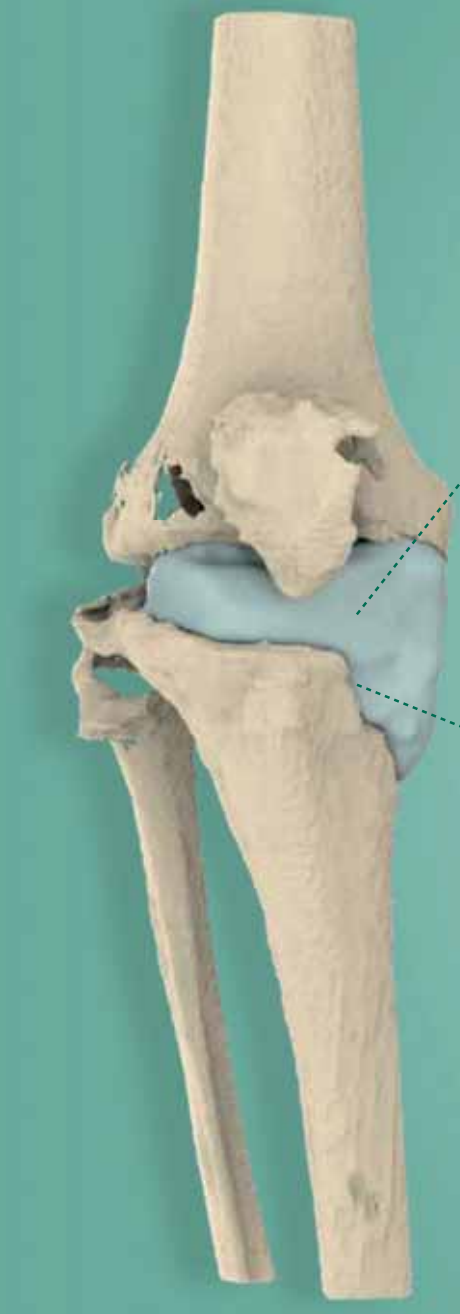
If there is no suitable standard product available for your revision case, we will be happy to design and manufacture patient-specific implants and instruments for you according to your wishes and the patient's needs.

Simply contact our C-Fit 3D® team via email: cfit3d@implantcast.de
Further information can also be found at www.implantcast.de

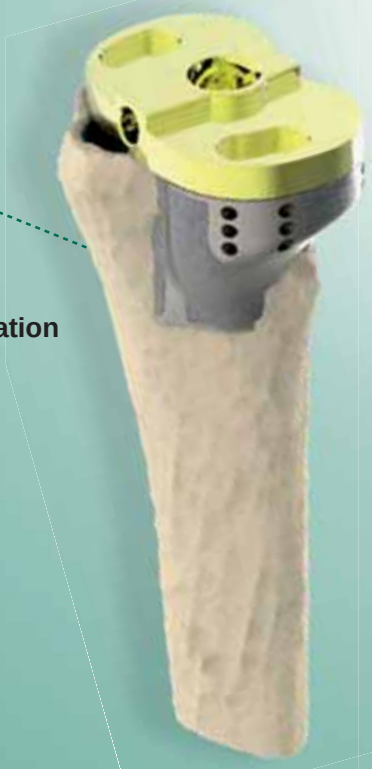
C-Fit 3D®
customized planning & production



postoperative situation
in anterior view



preoperative situation
in anterior view



postoperative situation
in isometric view

Knee Revision

Indication

- two-stage revision after infection of a primary knee endoprosthesis

Standard treatment

- not possible
- augmentation in given extent not possible
- improved soft tissue attachment due to EPORE® structure desired

Product details

cemented GenuX® MK revision knee (standard) with offset adapter and cementless stem in combination with a custom-made EPORE® cone tibial

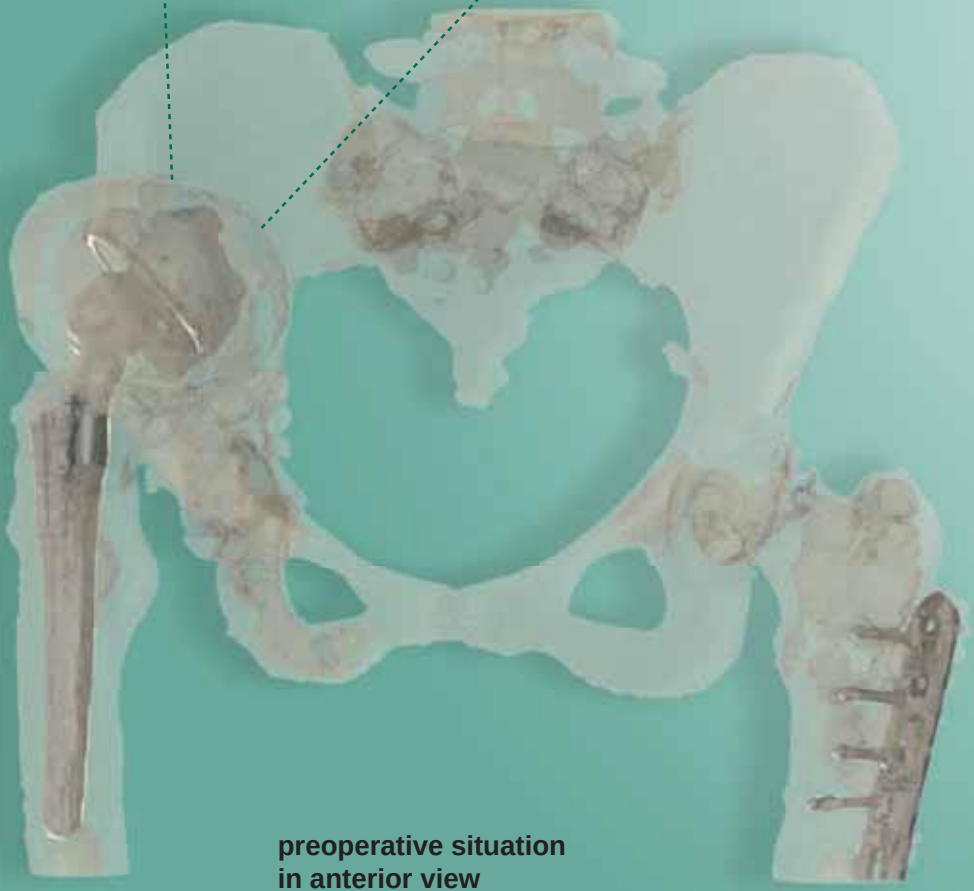
- material of the custom-made implant: implatan®; $TiAl_6V_4$
- coating: none; EPORE® structure
- fixation of the tibial component with bone cement in the EPORE® defect filler
- cementless fixation in the bone
- EPORE® structure is supposed to stimulate the bone to grow into the implant

C-Fit 3D®
customized planning & production

postoperative situation
in lateral view

postoperative situation
in anterior view

patient specific drilling
guide



preoperative situation
in anterior view

Hip Revision

Indication

- revision of a primary hip endoprosthesis due to massive osteolysis

Standard treatment

- not possible
- augmentation in given extent not possible

Product details

cemented EcoFit® 2M cup, 2M implacross® E head with a custom-made partial pelvic replacement with EPORE® structure

- material of the custom-made implant: implatan®; $TiAl_6V_4$
- coating: none; EPORE® structure
- cementless fixation
- four screw holes for use of cortical screws
- EPORE® structure is supposed to stimulate the bone to grow into the implant

Materials

Materials Science

Coatings

Materials Science

implavit® - CoCrMo acc. to ISO 5832-4

The basic material for the manufacturing of femoral and tibial components as well as cemented hip stems is cobalt chromium molybdenum alloy. The investment casting manufacturing process is used. The final shape geometry is realized by machining. The final steps of the manufacturing: grinding, polishing and barrel finishing. Depending on the implant, an additional coating can be applied.

implatan® - $TiAl_6V_4$ acc. to ISO 5832-3

Those knee components that do not have to articulate with each other such as stems and spacers are made from titanium aluminium vanadium alloy. In hip arthroplasty this titanium alloy is used for cementless hip stems and cups. This material is not only strong but it is also inert due to the formation of an extremely stable oxide outer layer which makes it corrosion resistant and extremely biocompatible. The raw material is milled and drilled for the basic implant shape before surface finishing via grinding, polishing and grit-blasting. Again, coating of the implant is also possible.

EPORE® porous osseointegrative surface structure

EPORE® is a surface structure based on titanium alloy ($TiAl_6V_4$). Due to the excellent material properties, such as formability, corrosion resistance and high fatigue strength, EPORE® is ideal as a framework structure for new bone formation. Manufacturing by means of additive manufacturing enables the creation of highly complex porous structures.

Polyethylene

In knee arthoplasty the components which have gliding articulating surfaces (i.e. patellae and tibial inserts) are made of polyethylene.This material is also used for cup inserts in hip arthroplasty. Polyethylene is available in the following variants:

UHMWPE acc. to ISO 5834-2 - ultra high molecular weight polyethylene
implacross® - crosslinked UHMWPE
implacross® E - crosslinked UHMWPE with vitamin E

Coatings

implaFix® cpTi

cpTi (commercially pure titanium) is applied to the implant surface to provide a rough and porous area which promotes bone growth onto the implant. The porous cpTi layer is applied via a plasma spraying process.

implaFix® HA acc. to ISO 13779-2

Hydroxyapatite belongs to a group of chemicals called calcium phosphates and is a natural component of healthy bone. It is an osteoconductive and thus bioactive material which promotes the growth of bone onto and/or into the surfaces of an implant.

TCP - Tricalcium phosphate

From a chemical point of view, the TCP layer is a composite of brushite and hydroxyapatite. Brushit is an early stage of the bone mineral HA and supports the natural ingrowth process of the implant. TCP is resorbed within 6 to 12 weeks via a controlled mechanism and is completely replaced by new bone tissue. Thus the coating remains only until the implant has ingrown and a solid connection between the implant surface and the surrounding bone tissue has been achieved.

pc - porous coating

This type of coating is made up of cobalt chromium molybdenum alloy (CoCrMo) beads each with a diameter of ~300µm. A layer of these beads is sintered to the implant fixation surfaces. Then a second layer is sintered on top of the first layer before a third and final layer is applied. This results in a porous structure that aids osseointegration.

TiN - Titanium nitride

The ceramic TiN-coating is applied to the implant components via a process called physical vapour deposition (PVD). The surface coating is wear-reducing, biocompatible and reduces the risk of allergic reactions to metal components.

Silver

Silver, especially free silver ions, are known for their large antimicrobial spectrum. The properties of silver are used in the coated components to reduce the risk of infection and to increase the implant survivorship.

References

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