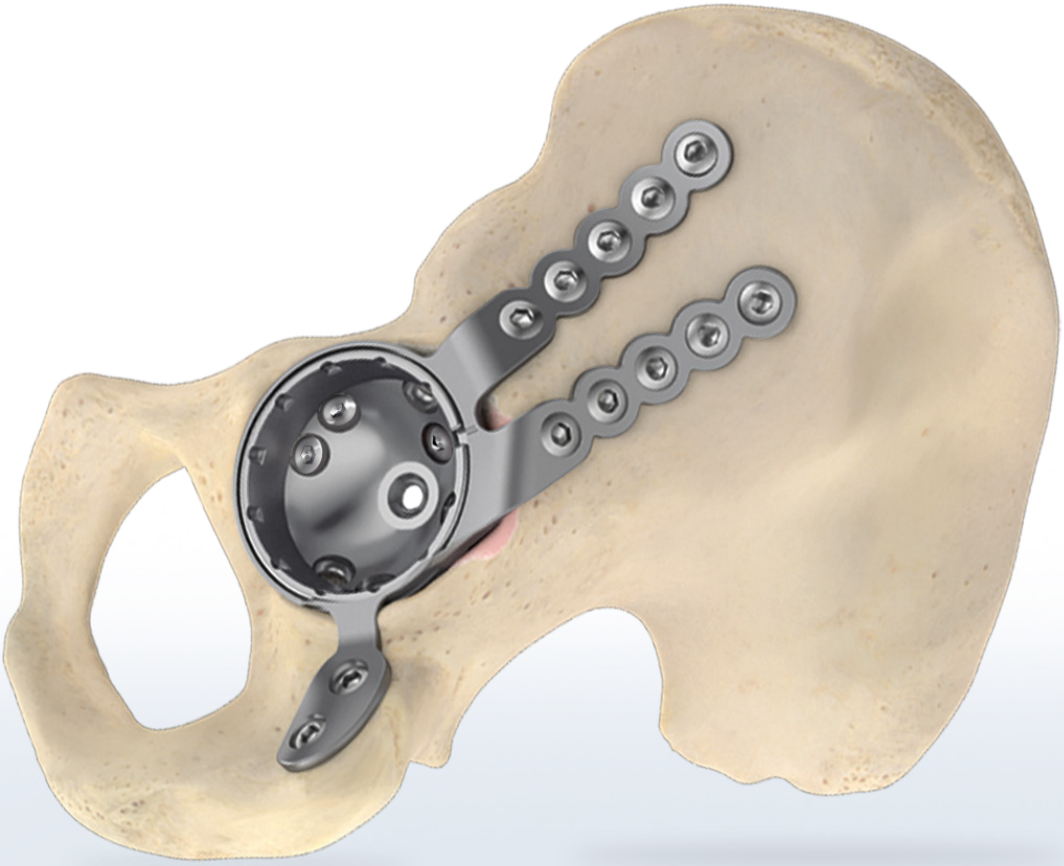
LINK®



MobileLink

Partial Pelvis Replacement

Surgical Technique

CE 0426

Explanation of Pictograms			
	Manufacturer	REF	Article number
MAT	Material number	CE	Caution: Federal law restricts this device to sale by or on the order of a physician

MobileLink
Partial Pelvis Replacement

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Important Information

Intended Use and Compatibility with other LINK Treatment Options

The MobileLink Partial Pelvis Replacement (PPR) System is a Tri-flange Hip arthroplasty acetabular cup system intended to be used in Total Hip Arthroplasty in primary and revision surgeries and in case of extensive osseous acetabular deficits. This System is based on the stainless Endo-Model Partial Pelvis Replacement and LINK MobileLink Acetabular Cup System. It can be used with the following MobileLink components intended to be coupled with the shell internal geometry: UHMWPE inserts, Shell/Insert Adapters, Dual Mobility Inserts and related femoral heads. Please refer to the relevant section of the MobileLink Surgical Technique for details on compatibility with other Hip prosthesis systems, coupling options and related surgical procedures.

Preoperative planning

It is important to plan the intervention preoperatively in order to select the correct implant type and size and its final intraosseous position based on the patient individual anatomy. The surgeon should perform a careful evaluation of the patient´s clinical condition and consider the level of physical activity before performing a hip replacement.

For optimal results, the surgery should be planned in advance using the appropriate templates.
The magnification factor of the X-rays must be compatible with the factor on the templates.
The MobileLink PPR X-ray Template is available in standard 1.1:1 scale.

The implant size must be chosen from adequate AP and ML X-rays with sufficient legibility. Each X-ray should be large enough for application of the whole template. A second X-ray of the unaffected joint is often helpful.

Inadequate pre-operative planning can lead to improper selection of the implants and/or incorrect implant positioning.

In principle, a load-bearing, stable acetabular fossa and solid lateral osseous coverage is desirable.
The **inclination** of the cup should not be significantly above or below 45°.
The **anteversion** should not be significantly above or below 15°.

Placement outside of these boundaries will result in reduced range of motion, which could subsequently lead to subluxation and/or dislocation of the joint.

INFORMTION:
Preoperative planning provides an initial estimation of the final situation but cannot conclusively determine the most adequate size to be used. The ultimate decision can only be taken intraoperatively.

Implant site and MobileLink PPR preparation

The procedure to prepare the site for prosthesis implantation can slightly change according to the bone defect type.

Protrusion Type
In these cases, there is usually extensive destruction of the floor, medial convexity and roof area of the acetabulum, with preservation of the outer rim craniolaterally, laterally and/or caudally. Occasionally, however, the acetabular area itself is so defective that the bony connection from cranial to caudal is inadequate. A severely loosened acetabular cup will then have migrated craniomedially with extensive bone loss.

Dysplasia Type
This indication is characterized by an extensive defect of the acetabular lodgment in the roof area, with loss of the outer convexity. Often a defect of the floor, with posterior marginal defect is also present.

Depending on the protrusion, the operation can be performed with dorsal approach. If the head of the prosthesis is well into the pelvis, access will be lateral, with a semi-obliquely side-lying patient, since the leg has to be adducted for luxation of the head. With dorsal entry, the junction between the vastus lateralis and the gluteus medius is preserved. This junction can often also be preserved with the lateral entry. Beneath it, the artificial joint is luxated dorsally by bringing the leg into adduction.

If extensive cranial bone defects of the lateral acetabular margin appear, it may be that the incision cannot be performed in the usual way. Instead of passing from lateral femur by way of the trochanter tip, angling dorsally, it will then go from lateral femur by way of the trochanter tip toward the anterior iliac spine at 1 cm distance at the alar crest dorsally. In this form of access, the junction between vastus lateralis and gluteus medius attachment must be parted after preparation of a trochanter lamella.

When preparing the gluteus medius at the ala, provision must be made for refixation. Also, care must be taken to not interfere with the neural and vascular supply in the direction of the coccyx. In the protrusion type, the roof of the acetabulum, notably the ventral convexity, must be restored as third point of support.

After removal of a loosened acetabular cup and cleaning of the inside of the bone, while sparing the open pelvic floor, a piece of bone must be prepared so as to match the interior shape of the pelvis part to be reconstructed with a good fit.

Bony reconstruction of bone loss in the acetabular floor **Fig. 1**

Chips of spongiosa - prepared with a bone mill - are placed between the inside of the pelvic ala and the piece of bone to be transplanted. This bone graft must be stably fixed to the acetabular rim by means of two cancellous screws. The location of the screws should be chosen so that they will not interfere with the milling of the acetabular site with a greater reamer. In addition, the bone graft must withstand this operation without motion (Fig. 1).

Bony reconstruction of the acetabular rim with bone grafts secured with screws **Fig. 2**

In dysplasia type defects, surgical procedure is as previously described. First the acetabular lodgment is cleaned. Then the bony apposition of the external pelvis in the acetabular area is cleaned, and a piece of bone is prepared for reconstruction of the roof of the acetabulum with the exterior convexity (Fig. 2).

Fig. 3

Closure of the central acetabular floor defect with a bone graft after reaming

Before reaming, rough pre-shaping with an oscillating saw is often helpful, especially in sclerotic bone. Reaming is performed according to the acetabulum size and bone defects according to the procedure outlined in the MobileLink Surgical Technique to determine the flanged final flanged cup size. Additional bone grafting may be required in extensive acetabular floor bone loss (Fig. 3).

Fig. 4a

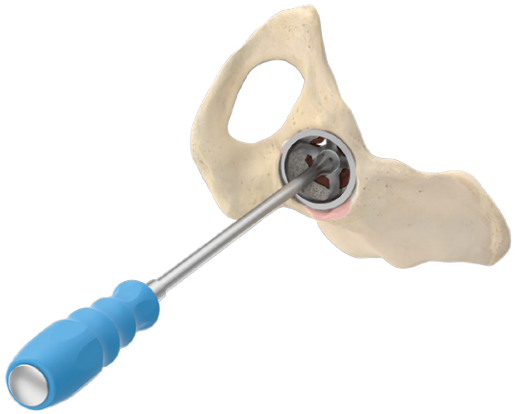

Fig 4b

Reaming and Determine the Shell Size

In the illustrated situation the initial reamer size corresponds to the width of the acetabular cup entrance. In normal anatomy the reamer is inserted into the acetabulum at approximately 45° inclination and 15° anteversion.

Consecutively Reamers with increasing diameters are applied until areas of bloody subchondral compact bone become visible but without compromising the supportive structure for secure anchoring of the Shell (Fig. 4a). It is essential to keep the reamer head absolutely steady. Following preparation of the acetabulum, the Trial Cup is attached to the Universal Handle and is inserted into the acetabulum (Fig 4b).

The Trial Cup is used to determine the size of the Shell as the reamed cavity may be larger than originally intended. As soon as the Trial is firmly seated in the reamed acetabulum the corresponding size of the Shell is to be selected.

INFORMTION:
Appropriate reaming should be based upon the patient's bone quality and determined by the surgeon intraoperatively.

Partial Pelvis Replacement flange bending/ cutting and Implant fixation

The MobileLink Partial Pelvis Replacement (Tri-flanged cup) with suitable cup diameter and appropriate length of flanges is placed into the prepared acetabulum to check correct fitting.

Flange bending, cutting and shortening

Depending on the anatomy and bone defect flanges may require manual bending/cutting or shortening to achieve a good fit between the pelvis and the flanged cup once correctly seated.

Fig. 5

Flange bending

To adapt the flange orientation to the patient's anatomy flanges can be bend and set by using the Rod Bender for flanges (15-8262/01).

To apply the necessary forces, two Rod Benders, are necessary. One is positioned to fix the cup or flange. The second Rod Bender is used as a counterpart and to bend the flange into the predetermined position (Fig. 5).

The correct position of the final flange orientation is verified by inserting the cup into the acetabulum.

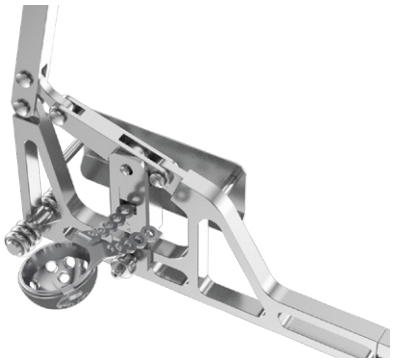

Fig. 6a

Flange cutting / shortening

For cutting the caudal flange or shortening the 5-hole flanges a Side-Cutter with Double Action (18-2000/00) must be used (Fig 6a - 6b). This instrument is equipped with a limit-stop and allows the complete removal of the caudal flange and the step-wise adaption of the 5-hole flange length (minus one or two holes) according the patients anatomy.

For adaption of the 5-hole flanges length choose the Cutting device for 5-holes flanges (18-2000/10). For the removal of the caudal flange, choose the cutting device for caudal flange (18-2000/20).

Fig 6b

Fig. 7

Implantation

The MobileLink Partial Pelvis Replacement with flanges as eventually reshaped is placed in the prepared acetabular site (Fig 7). The metal back is supported by the reconstructed acetabulum and the other parts of the pelvis through flanges fixation. To secure flanges and the MobileLink PPR Shell, holes are drilled in the pelvis bone and cancellous screws are used. Bone grafts should be secured by screws as well when possible. The cranial screws engage the pelvic ala only. 25 mm cancellous screws with full thread are usually used.

The MobileLink PPR Shell is fixed according to the procedure and instruments included in the MobileLink Surgical Technique for a standard acetabular Shell.

CAUTION:
The head of the Polar Screw (if used) should not protrude from the internal surface of the MobileLink PPR shell, otherwise the Insert cannot be seated correctly.

Screw Fixation of the MobileLink PPR

The MobileLink PPR Shell must additionally be fixed with Cancellous Bone Screws. The MobileLink PPR Shells are not delivered with Closing Screws.

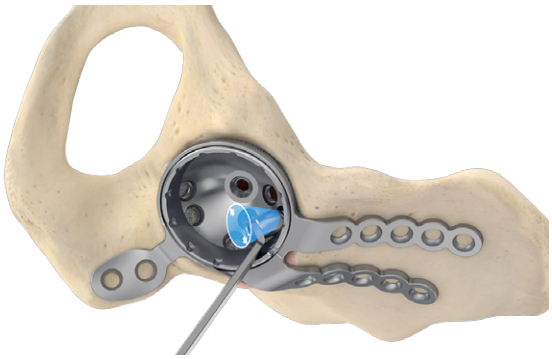

Fig. 8a

A hole is drilled into the bone with the help of the Drill Guide, which is inserted into the hole in the desired direction with a maximum angulation of approximately +/-15° (Fig. 8a - 8b).

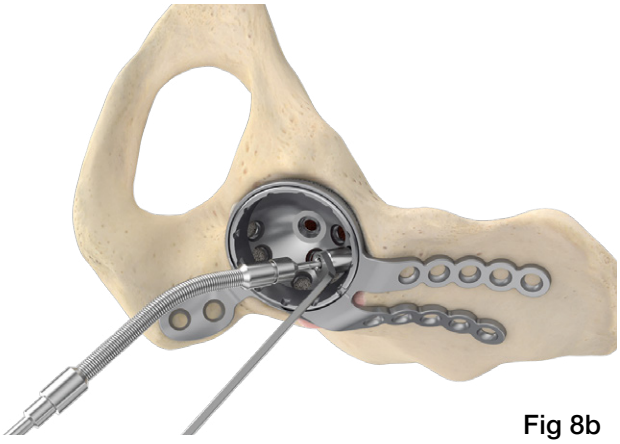

Fig 8b

Fig. 9

Use the Curved Depth Gauge to identify the correct length of the Cancellous Bone Screws (Fig. 9).

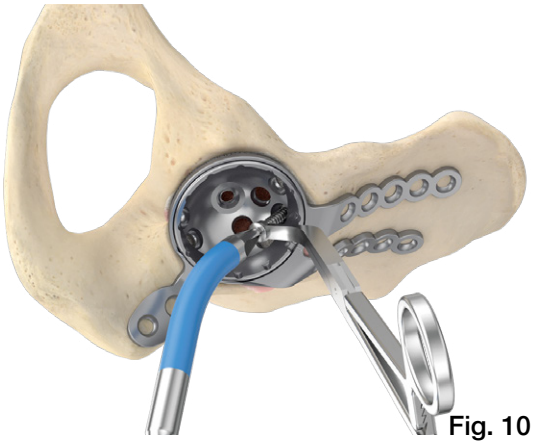

Fig. 10

To insert the Cancellous Bone Screws the Flexible or Rigid Screwdriver may be used (Fig. 10).

CAUTION:
The head of the Cancellous Bone Screws should not protrude from the internal surface of the Shell, otherwise the Insert or Shell/Insert Adapter cannot be seated correctly.

CAUTION:
Only Cancellous Bone Screws listed in this catalog are compatible.

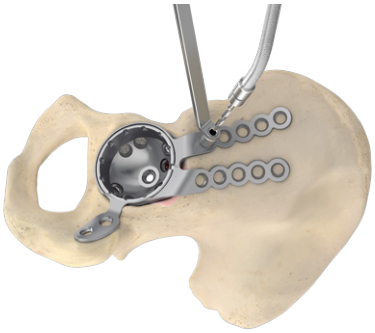

Fig. 11a

The same procedure applies for the screws in the MobileLink PPR flanges (Fig. 11a-c).

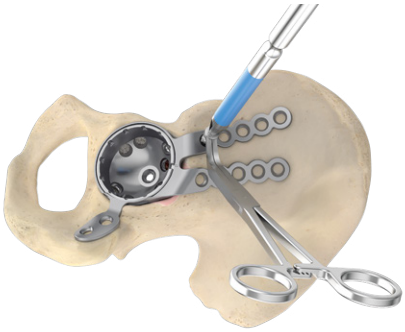

Fig 11b

Fig 11c

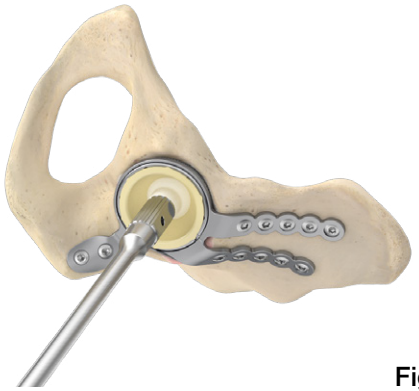

Fig. 12

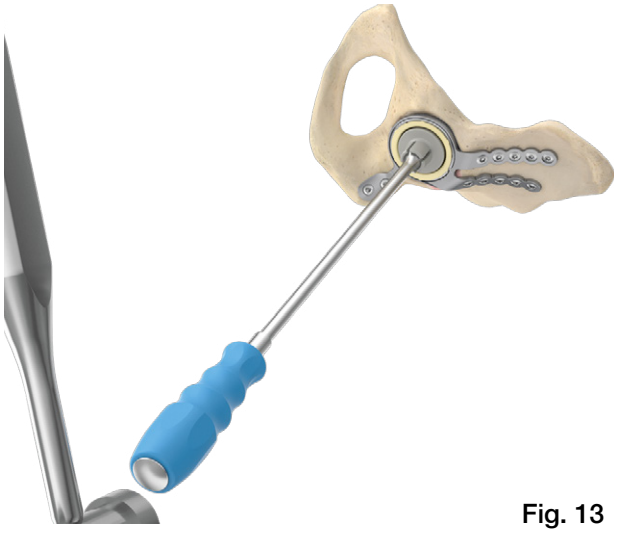

Fig. 13

Fig. 14

Implantation of the UHMWPE Insert

Before the introduction of the Insert, the inside of the MobileLink PPR Shell is carefully cleaned and checked that surrounding soft tissues do not interfere with the introduction of the Insert.

UHMWPE Inserts can be introduced without the use of a Positioning Instrument. When introducing, the Insert is held between the thumb and index finger.

The Insert is pressed into the MobileLink PPR Shell using the index finger, at which the pegs have to be correctly aligned with the recessed areas at the Shell.

The UHMWPE Inserts can also be positioned with the Insert Positioner (Fig. 12).

Assemble the Driver Head corresponding to the head size on the Universal Handle. Fix the UHMWPE Insert with a light tap on the Driver Head assembly, to achieve a stable connection between the Insert and the MobileLink PPR Shell (Fig. 13).

Then the correct positioning of the Insert in the MobileLink PPR Shell is controlled.

Check the correct positioning of the Insert manually with circular motion of the index finger at the cup entrance (Fig 14).

CAUTION:
Range of motion is decreased for non-neutral UHMWPE Inserts

INFORMATION:
Neutral UHMWPE Inserts should be the preferred choice of insert.

Final Reduction

With the final acetabular components in place, continue with the implantation of the femoral components. Once all final implants are placed, perform the final reduction of the hip and check for joint stability and range of motion (Fig 15).

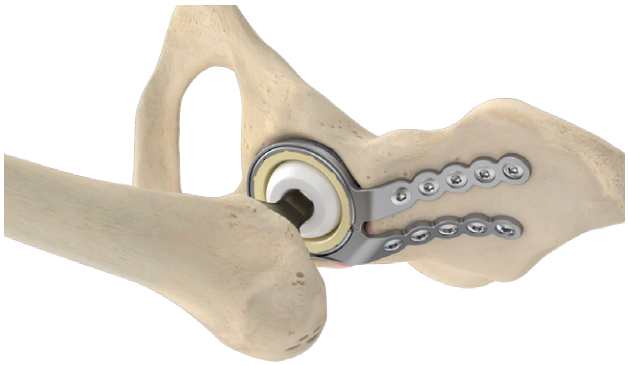

Fig. 15

Optional Shell/Insert Adapter (Face Changer)

Different types of Shell/Insert Adapters can be used to restore the center of rotation and anteversion angle (Fig. 16).

Fig. 16

The surgical steps for the implantation of Shell/Insert Adapter (Face Changer) are performed according to the MobileLink Acetebular Cup System Surgical Technique.

Optional Dual Mobilty Inserts

The MobileLink PPR can be transformed into a Dual Mobility system with the Dual Mobility Insert (Fig. 17).

The surgical steps for the implantation of a Dual Mobility Insert are performed according to the MobileLink Acetebular Cup System Surgical Technique.

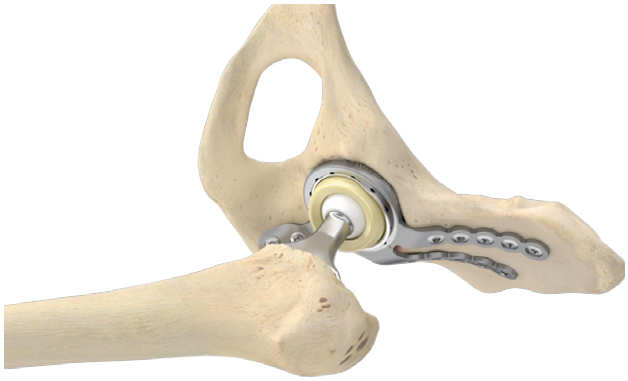

Fig. 17

MobileLink Partial Pelvis Replacement (PPR)

Shells

MAT Tilastan-E (Ti6Al4V) and pure titanium cpTi

REF	Item Description	Shell Size / Outer Ø (mm)	For Insert size
18-2025/48	MobileLink PPR, TrabecuLink, O.D.= 48 mm, right	48	B
18-2035/48	MobileLink PPR, TrabecuLink, O.D.= 48 mm, left	48	
18-2025/52	MobileLink PPR, TrabecuLink, O.D.= 52 mm, right	52	C
18-2035/52	MobileLink PPR, TrabecuLink, O.D.= 52 mm, left	52	
18-2025/56	MobileLink PPR, TrabecuLink, O.D.= 56 mm, right	56	D
18-2035/56	MobileLink PPR, TrabecuLink, O.D.= 56 mm, left	56	
18-2025/60	MobileLink PPR, TrabecuLink, O.D.= 60 mm, right	60	E
18-2035/60	MobileLink PPR, TrabecuLink, O.D.= 60 mm, left	60	
18-2025/62	MobileLink PPR, TrabecuLink, O.D.= 62 mm, right	62	F
18-2035/62	MobileLink PPR, TrabecuLink, O.D.= 62 mm, left	62	
18-2025/64	MobileLink PPR, TrabecuLink, O.D.= 64 mm, right	64	
18-2035/64	MobileLink PPR, TrabecuLink, O.D.= 64 mm, left	64	
18-2025/68	MobileLink PPR, TrabecuLink, O.D.= 68 mm, right	68	
18-2035/68	MobileLink PPR, TrabecuLink, O.D.= 68 mm, left	68	

Cancellous Bone Screws for Shells

MAT Tilastan -S (Ti6Al4V)

REF	Ø × length mm	REF	Ø × length mm
180-658/15	6.5 × 15	180-658/45	6.5 × 45
180-658/20	6.5 × 20	180-658/50	6.5 × 50
180-658/25	6.5 × 25	180-658/55	6.5 × 55
180-658/30	6.5 × 30	180-658/60	6.5 × 60
180-658/35	6.5 × 35	180-658/70	6.5 × 70
180-658/40	6.5 × 40	180-658/80	6.5 × 80

Spare Polar Screw for Shells

MAT Tilastan -S (Ti6Al4V)

REF
183-700/00

The implants shown on this page are part of the MobileLink Acetabular Cup System, manufactured by Waldemar Link Gmbh. For further details, refer to MobileLink Acetabular Cup System Surgical Technique.

Inserts for MobileLink Acetabular Cup Components

UHMWPE Inserts – X-LINKed

Standard (Neutral)
MAT UHMWPE X-LINKed

Anti-luxation
MAT UHMWPE X-LINKed
Shoulder height 5 mm

REF	Head Ø mm	Insert size
183-350/28	28	A
183-351/28	28	B
183-351/32	32	
183-352/28	28	C
183-352/32	32	
183-352/36	36	
183-353/28	28	D
183-353/32	32	
183-353/36	36	
183-354/28	28	E
183-354/32	32	
183-354/36	36	
183-355/28	28	F
183-355/32	32	
183-355/36	36	

REF	Head Ø mm	Insert size
183-740/28	28	A
183-741/28	28	B
183-741/32	32	
183-742/28	28	C
183-742/32	32	
183-742/36	36	
183-743/28	28	D
183-743/32	32	
183-743/36	36	
183-744/28	28	E
183-744/32	32	
183-744/36	36	
183-745/28	28	F
183-745/32	32	
183-745/36	36	

The implants shown on this page are part of the MobileLink Acetabular Cup System, manufactured by Waldemar Link Gmbh. For further details, refer to MobileLink Acetabular Cup System Surgical Technique.

Inserts for MobileLink Acetabular Cup Components

UHMWPE Inserts – E-Dur

Standard (Neutral)
MAT E-Dur (Vitamin E blended Highly Crosslinked UHMWPE)

REF	Head Ø mm	Insert size
183-360/28	28	A
183-361/28	28	B
183-361/32	32	
183-362/28	28	C
183-362/32	32	
183-362/36	36	
183-363/28	28	D
183-363/32	32	
183-363/36	36	
183-364/28	28	E
183-364/32	32	
183-364/36	36	
183-365/28	28	F
183-365/32	32	
183-365/36	36	

Anti-luxation
MAT E-Dur (Vitamin E blended Highly Crosslinked UHMWPE), Shoulder height 5 mm

REF	Head Ø mm	Insert size
183-370/28	28	A
183-371/28	28	B
183-371/32	32	
183-372/28	28	C
183-372/32	32	
183-372/36	36	
183-373/28	28	D
183-373/32	32	
183-373/36	36	
183-374/28	28	E
183-374/32	32	
183-374/36	36	
183-375/28	28	F
183-375/32	32	
183-375/36	36	

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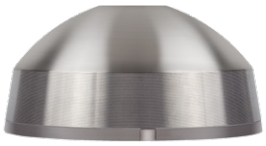
Shell/Insert Adapter

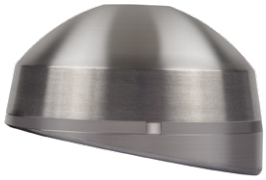
incl. Fixation Screw except for the Neutral (0 mm offset, 0° inclination) Shell/Insert Adapter

MAT Tilastan -S (Ti6Al4V)

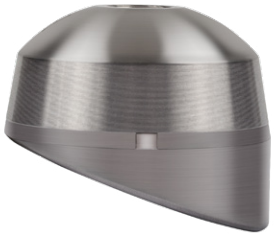


neutral
0 mm offset, 0° inclination

+ 4 mm offset,
0° inclination



+ 4 mm offset,
+ 10° inclination



+ 8 mm offset,
+ 20° inclination

REF	For Shell size (Outer Ø)	Offset	Inclination	Insert that fits into Adapter
183-590/01*	46 - 48 mm	+ 4 mm	0°	A
183-600/06*		+ 4 mm	10°	
183-610/06*		+ 8 mm	20°	
183-580/01	50 - 52 mm	0 mm	0°	B
183-590/02		+ 4 mm	0°	
183-600/01		+ 4 mm	10°	
183-610/01		+ 8 mm	20°	
183-580/02	54 - 56 mm	0 mm	0°	C
183-590/03		+ 4 mm	0°	
183-600/02		+ 4 mm	10°	
183-610/02		+ 8 mm	20°	
183-580/03	58 - 60 mm	0 mm	0°	D
183-590/04		+ 4 mm	0°	
183-600/03		+ 4 mm	10°	
183-610/03		+ 8 mm	20°	
183-580/04	62 - 72 mm	0 mm	0°	D
183-590/05		+ 4 mm	0°	
183-600/04		+ 4 mm	10°	
183-610/04		+ 8 mm	20°	

* On request (lead time could increase)

Spare Shell/Insert Adapter Fixation Screw

MAT Tilastan -S (Ti6Al4V)

REF
183-710/00

The implants shown on this page are part of the MobileLink Acetabular Cup System, manufactured by Waldemar Link Gmbh. For further details, refer to MobileLink Acetabular Cup System Surgical Technique.

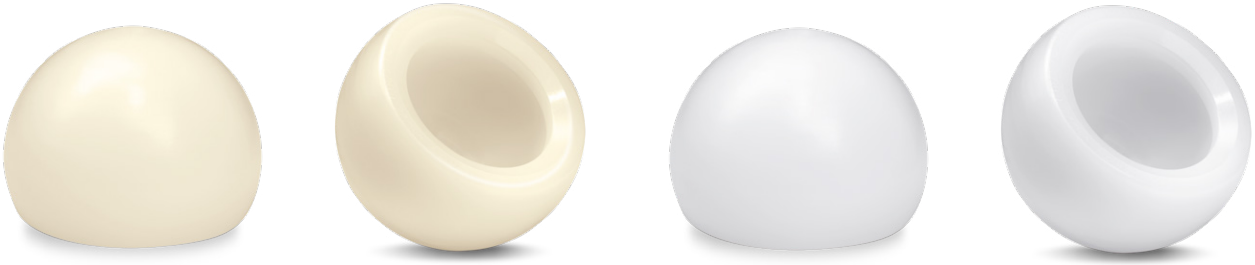
Dual Mobility Insert

Polished inner surface

MAT CoCrMo

REF	Insert size
183-905/01	B
183-910/01	C
183-915/01	D
183-920/01	E
183-925/01	F

Dual Mobility Liner



Liner

MAT E-Dur

(Vitamin E blended Highly Crosslinked UHMWPE)

Liner REF	Inner Ø mm	Outer Ø mm	For Dual Mobility Insert size
184-270/02	22	36	B
184-280/01	28	40	C
184-280/03	28	44	D
184-280/05	28	48	E
184-280/06	28	50	F

Liner

MAT UHMWPE

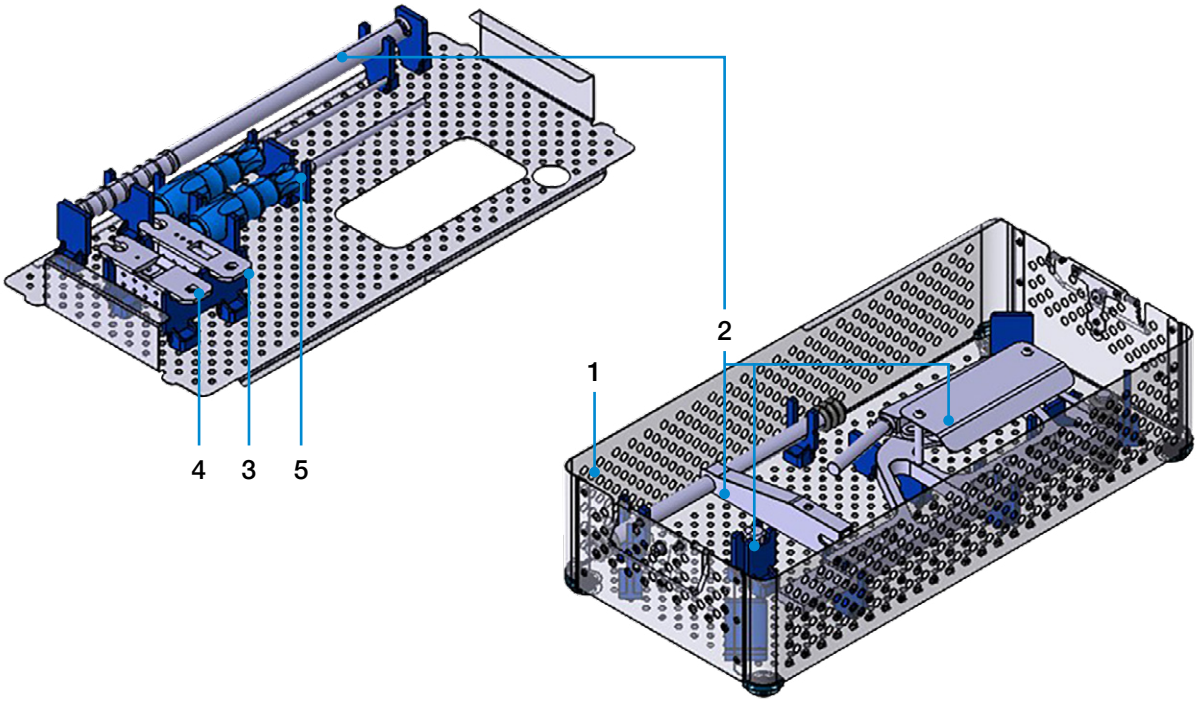
Liner REF	Inner Ø mm	Outer Ø mm	For Dual Mobility Insert size
184-250/02	22	36	B
184-260/01	28	40	C
184-260/03	28	44	D
184-260/05	28	48	E
184-260/06	28	50	F

The implants shown on this page are part of the MobileLink Acetabular Cup System, manufactured by Waldemar Link Gmbh. For further details, refer to MobileLink Acetabular Cup System Surgical Technique.

Instruments

MobileLink Acetabular Cup System Instrument Sets are necessary and the following items:

MobileLink PPR, Basic Instruments



1	18-2000/99	**Instrument Tray,** empty
2	18-2000/00	**Side-Cutter with Double Action**
3	18-2000/10	**Cutting device**, for 5-holes flanges
4	18-2000/20	**Cutting device**, for caudal flange
5	15-8262/01	**Rod Bender for flanges**, 235 mm, (two are required)

INFORMATION:
Additional information can be found in the implant specific surgical technique for MobileLink Acetabular Cup System.

Accessories

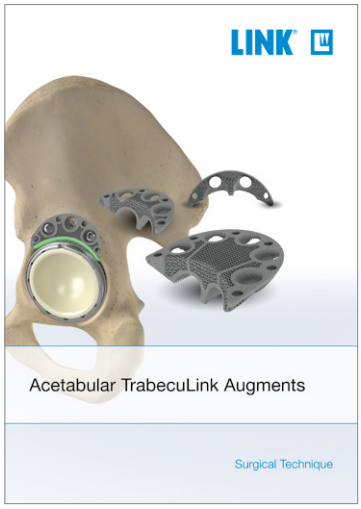
X-ray Templates for MobileLink PPR 110% actual size

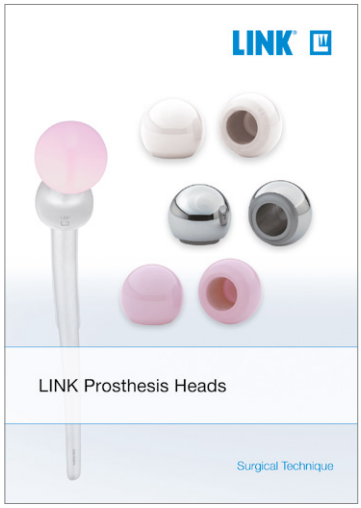
REF	X-ray Templates
18-2010/00	**MobileLink PPR X-ray Template** for Shell

Instruction for Cleaning and Maintenance

Specific instructions for instruments are available on request

Additional Information





For more information please register for our LINK Media Library (link-ortho.com)

Specified Indications and Contraindications: MobileLink Partial Pelvis Replacement
Indications
Revision after implant loosening on large acetabular defects
Severe pathological condition affecting the articulation
Extensive primary and secondary destruction of the joint to the extent that the functional efficiency of the locomotive apparatus is reduced
Post-surgical conditions after previous operations with or without consequent use of a prosthesis
Contraindications
Poor general state of health
Acute or chronic infections, local and systemic
Allergies to (implant) materials
Distinctive muscular, nerve, vascular or other diseases which put the affected limb at risk
Insufficient /inadequate bone mass or quality which prevents a stable anchoring of the prosthesis
Acetabulum fracture

Important Information

Please note the following regarding the use of our implants:

1. **Choosing the right implant is very important.**
   The size and shape of the human bone determines the size and shape of the implant and also limits the load capacity. Implants are not designed to withstand unlimited physical stress. Demands should not exceed normal functional loads.

2. **Correct handling of the implant is very important.**
   Under no circumstances should the shape of a finished implant be altered, as this shortens its life span. Our implants must not be comboned with implants from other manufacturers. The instruments indicated in the Surgical Technique must be used to ensure safe implantation of the components.

3. **Implants must not be reused.**
   Implants are supplied sterile and are intended for single use only. Used implants must not be used again.

4. **After-treatment is also very important.**
   The patient must be informed of the limitations of the implant. The load capacity of an implant cannot compare with that of healthy bone!

5. **Unless otherwise indicated, implants are supplied in sterile packaging.**
   Note the following conditions for storage of packaged implants:
   - Avoid extreme or sudden changes in temperature.
   - Sterile implants in their original, intact protective packaging may be stored in permanent buildings up until the "Use by" date indicated on the packaging.
   - They must not be exposed to frost, dampness or direct sunlight, or mechanical damage.
   - Implants may be stored in their original packaging for up to 5 years after the date of manufacture. The "Use by" date is indicated on the product label.
   - Do not use an implant if the packaging is damaged.

6. **Traceability is important.**
   Please use the documentation stickers provided to ensure traceability.

7. **Further information** on the material composition is available on request from the manufacturer.

Follow the instructions for use!

LINK ITALIA S.P.A.

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The Surgical Technique described has been written to the best of our knowledge and belief, but it does not relieve the surgeon of his/her responsibility to duly consider the particularities of each individual case.

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