



Surgical technique / Product information

Bipolar and Hemiheads



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Preservation in motion

*Building on our heritage
Moving technology forward
Step by step with our clinical partners
Towards a goal of preserving mobility*

Preservation in motion

As a Swiss company, Mathys is committed to this guiding principle and pursues a product portfolio with the goal of further developing traditional philosophies with respect to materials or design in order to address existing clinical challenges. This is reflected in our imagery: traditional Swiss activities in conjunction with continuously evolving sporting equipment.

Table of contents

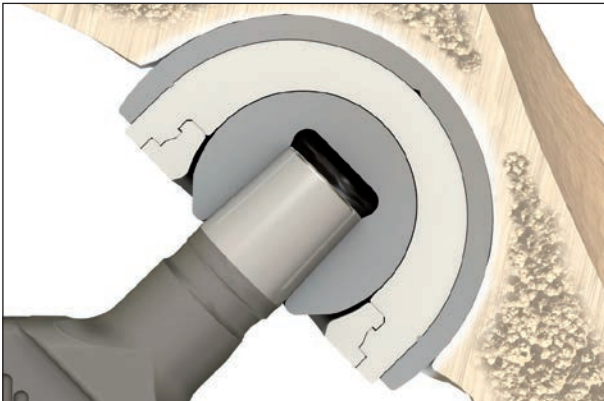
Introduction	4
1. Indications and contraindications	6
2. Preoperative planning	6
3. Surgical technique	7
3.1 Bipolar head	7
3.2 Hemihead	10
4. Implants	11
5. Instruments	15
5.1 Bipolar head	15
5.2 Hemihead	18
5.3 Measuring templates	18
6. Symbols	19

Remark

Please make yourself familiar with the handling of the instruments, the product-related surgical technique and the warnings, the safety notes as well as the recommendations of the instruction leaflet before using an implant manufactured by Mathys Ltd Bettlach. Make use of the Mathys user training and proceed according to the recommended surgical technique.

Introduction

Bipolar and Hemiheads are used for hemiarthroplasty. Here the femoral component of the joint is fitted with a prosthesis, while the acetabulum is left in its natural state.

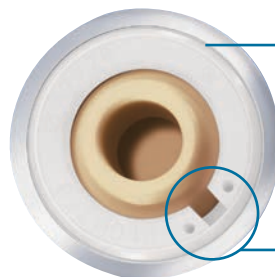


Bipolar head

The basic concept is based on a double-ball system. The external component is generally immobile in the natural acetabulum. The main articulation of the joint takes place in the form of a multi-dimensional rotational movement in the artificial joint gap between the femoral head and the inside of the outer shell. Occasionally, there is also sliding between the outer shell and the acetabulum or the cartilage, respectively.

The Bipolar head is available in two materials: Stainless Steel and CoCrMo.

Modular Bipolar heads for articulation in the natural acetabulum have been used clinically for more than 25 years.



An eccentricity of the rotational centres of the inner head and the outer shell leads to self-centring in the acetabulum.

The system is to be fixated additionally by an integrated polyethylene locking ring (UHMWPE) with snap mechanism.



Advantages of bipolar hip arthroplasty¹

- Straightforward surgical technique
- Rapid mobilisation and swift rehabilitation thanks to low surgical trauma
- Increased dislocation safety



Advantages of unipolar hip arthroplasty¹

- Low burden on the patient thanks to straightforward and time-saving surgical technique
- Large head diameter reduces the risk of dislocation
 - Rapid mobilisation of the patients

Size 38–44 mm



Size 46–58 mm

¹ Data on file at Mathys Ltd Bettlach

1. Indications and contraindications

Indications

- Fractures of the femoral head or neck

Contraindications

- Primary or secondary osteoarthritis of the hip
- Local and/or general infection
- Hypersensitivity to any of the materials used
- Severe soft tissue, nerve or vessel insufficiency that jeopardise the function and long-term stability of the implant
- Patients for whom a different type of reconstruction surgery or treatment is likely to be successful

For further information, please refer to the instructions for use or ask your Mathys representative.

2. Preoperative planning



Preoperative templating can be performed on standard radiographs or with a digital planning system. The main goal is to plan the appropriate implant as well as its size and position, to restore the individual biomechanics of the hip joint. That way, potential problems can already be anticipated before surgery. In most cases, restoring hip biomechanics can be achieved by reconstructing the original hip rotation center, the leg length as well as the femoral offset.²

It is recommended to document the preoperative planning in the patient's file.

² Scheerlinck Th., «Primary hip arthroplasty templating on standard radiographs. A stepwise approach». Acta Orthop Belg, 2010. 76(4): p. 432-442

3. Surgical technique

3.1 Bipolar head

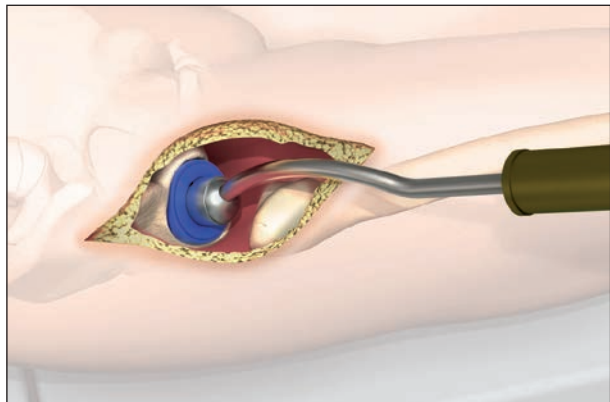


Fig. 1

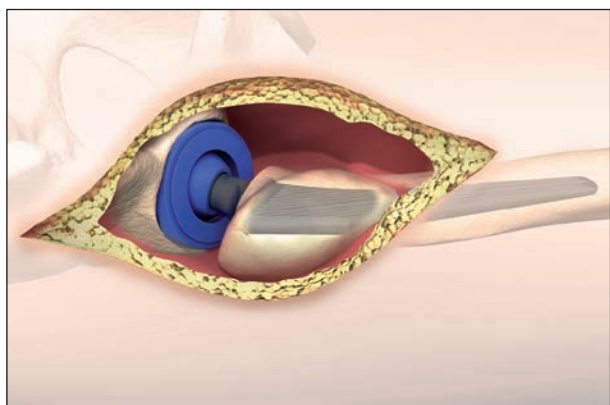


Fig. 2



When the Bipolar head is used, the natural acetabulum is preserved.

The acetabulum must not be processed using a reamer.

Size determination

To determine the size of the bipolar implant, the acetabulum is measured using the curved Cup Impactor, the Combination Bolt and the Bipolar Trial Head (Fig. 1).

Neck length determination

The Trial Head is placed on the cone of the already implanted stem and then combined with the Bipolar Trial Head.

Remark

Trial heads for trial reductions are available in the following diameter sizes: 28mm with S, M, L, XL and XXL neck lengths.

An overview of the neck lengths of heads and trial heads can be found in chapter Implants and Instruments.

Remark

Possible neck length restrictions are documented in the surgical technique and instruction leaflet of the corresponding stems.

During the trial reduction, neck length is determined, and joint stability and leg length are controlled (Fig. 2).

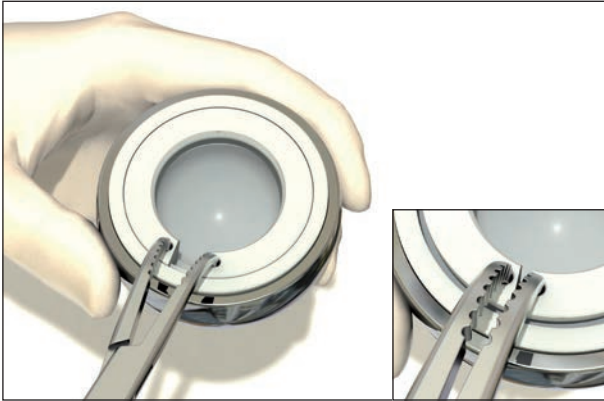


Fig. 3



Fig. 4



Fig. 5

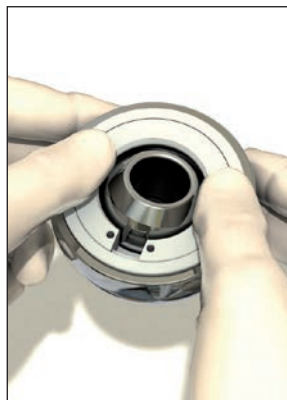


Fig. 6

Joining of the Bipolar head

The final implant should be selected corresponding to the trial implants. The Bipolar head is supplied together with the ring as a whole.

Remark

After removal of the packaging, the implant must be visually examined for damages before implantation. Only undamaged implants may be used.

The locking ring must be removed from the Bipolar head using the Reduction Forceps. The forceps tips are inserted into the holes of the locking ring. By compressing the ring, its diameter becomes smaller, and it can be released from the Bipolar head (Fig. 3).

The femoral head is placed in the Bipolar head at the desired neck length (Fig. 4).

Remark

The femoral head diameter must always match the inner diameter of the Bipolar head.

Subsequently, the locking ring is placed on the femoral head using the Bipolar reduction forceps (Fig. 5).

The locking ring is pressed into the shell. Take care to ensure that the locking ring **latches uniformly and is positioned correctly** (Fig. 6).



Fig. 7

Prior to implantation, the correct fitting of the locking ring is to be checked. To this end, run your finger over the edge of the locking ring. This must fit firmly without protruding unilaterally.

The femoral head must be able to move freely in the shell (Fig. 7).

Remark

After cleaning and drying of the stem cone, the implant must be visually inspected before implantation to check that there are no damages nor residues on the implant.

The assembled Bipolar head is mounted onto the cone with a positive fit (applying rotation and axial pressure). The Bipolar head is seated with a hammer blow on the head impactor in an axial direction.

Remark

Before reduction, the joint space must be free of any foreign matter. Depending on the approach, the muscle insertions are reattached, and the wound is closed layer by layer.

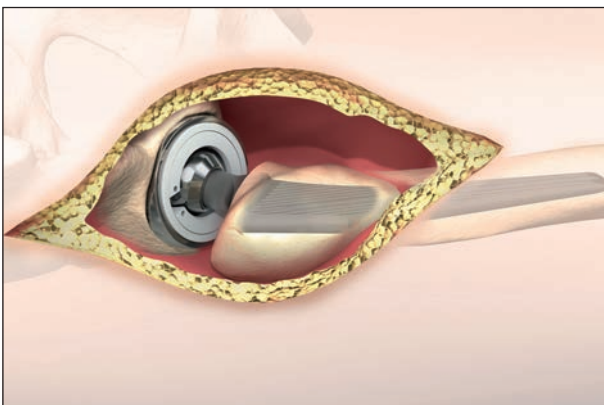


Fig. 8



The position of neurovascular structures can be altered in patients requiring revision of a Bipolar head. Caution should be exercised, especially after dislocations.



Patients should be followed-up in regular intervals.

Removal of the Bipolar head

First the hip is dislocated. Afterwards the assembled Bipolar head is carefully removed, taking care not to damage the stem cone. An extractor for heads can be used for example.

Alternatively the Bipolar head first can be disassembled, by removing the locking ring as described in Fig. 3 on page 8. Afterwards the femoral head is carefully removed, taking care not to damage the stem cone. An extractor for heads can be used for example.

A new acetabular component can be implanted, which is described in a separate surgical technique. For further information contact your local Mathys representative.

3.2 Hemihead

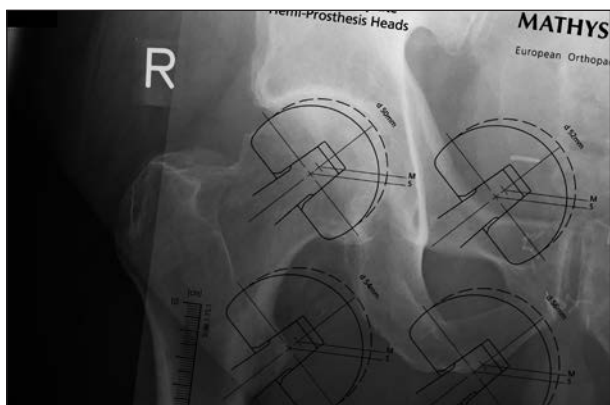


Fig. 9

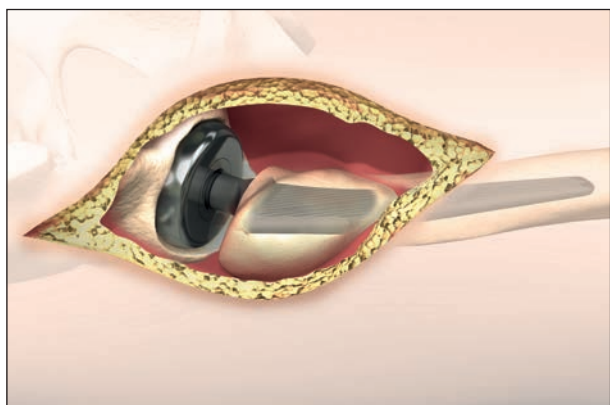


Fig. 10



When the Hemihead is used, the natural acetabulum is preserved. The acetabulum must not be processed using a reamer.

Size determination

The head size is determined according to the pre-operative planning using the measuring templates (Fig. 9).

The implant size and correct neck length of the implant are determined with the Trial Hemiheads.

Remark

After cleaning and drying of the stem cone, the implant must be visually inspected before implantation to check that there are no damages nor residues on the implant.

The Hemihead is mounted onto the cone with a positive fit (applying rotation and axial pressure). The Hemihead is seated with a hammer blow on the head impactor in an axial direction.

Remark

Before reduction, the joint space must be free of any foreign matter.

Depending on the approach, the muscle insertions are reattached, and the wound is closed layer by layer.



The position of neurovascular structures can be altered in patients requiring revision of a Hemihead. Caution should be exercised especially after dislocations.



Patients should be followed-up in regular intervals.

Removal of the Hemihead

First the hip is dislocated. The Hemihead is carefully removed, taking care not to damage the stem cone. An extractor for heads can be used for example.

A new acetabular component can be implanted, which is described in a separate surgical technique. For further information contact your local Mathys representative.

4. Implants



Bipolar head, CoCrMo and Stainless Steel

CoCrMo	Stainless Steel	Outside Diameter (OD)	Femoral head diameter
52.34.0090	–	39 mm	22.2 mm
52.34.0091	–	40 mm	22.2 mm
52.34.0092	–	41 mm	22.2 mm
52.34.0093	–	42 mm	22.2 mm
52.34.0094	–	43 mm	22.2 mm
52.34.0100	54.11.0042	42 mm	28 mm
52.34.0101	–	43 mm	28 mm
52.34.0102	54.11.0044	44 mm	28 mm
52.34.0103	–	45 mm	28 mm
52.34.0104	54.11.0046	46 mm	28 mm
52.34.0105	–	47 mm	28 mm
52.34.0106	54.11.0048	48 mm	28 mm
52.34.0107	–	49 mm	28 mm
52.34.0108	54.11.0050	50 mm	28 mm
52.34.0109	–	51 mm	28 mm
52.34.0110	54.11.0052	52 mm	28 mm
52.34.0111	–	53 mm	28 mm
52.34.0112	54.11.0054	54 mm	28 mm
52.34.0113	–	55 mm	28 mm
52.34.0114	54.11.0056	56 mm	28 mm
52.34.0115	–	57 mm	28 mm
52.34.0116	54.11.0058	58 mm	28 mm
52.34.0117	–	59 mm	28 mm

Material CoCrMo: CoCrMo; UHMWPE

Material Stainless Steel: FeCrNiMnMoNbN; UHMWPE

Bipolar heads can be combined with Ceramic, Stainless Steel and CoCrMo femoral heads by Mathys.



Hemihead, Stainless Steel

Sizes 38–44 mm

Item no. / S -4 mm	Item no. / M 0 mm	OD
2.30.420	67092	38 mm
2.30.421	67093	40 mm
2.30.422	67094	42 mm
2.30.423	67095	44 mm

Material: FeCrNiMnMoNbN

Cone: 12/14 mm



Hemihead, Stainless Steel

Sizes 46–58 mm

Item no. / S -4 mm	Item no. / M 0 mm	OD
2.30.424	67096	46 mm
2.30.425	67097	48 mm
2.30.426	67098	50 mm
2.30.427	67099	52 mm
2.30.428	67100	54 mm
2.30.429	67101	56 mm
2.30.430	67102	58 mm

Material: FeCrNiMnMoNbN

Cone: 12/14 mm



Head, Stainless Steel

Item no.	OD	Neck length	
54.11.1031	22.2 mm	S	-3 mm
54.11.1032	22.2 mm	M	0 mm
54.11.1033	22.2 mm	L	+3 mm
2.30.410	28 mm	S	-4 mm
2.30.411	28 mm	M	0 mm
2.30.412	28 mm	L	+4 mm
2.30.413	28 mm	XL	+8 mm
2.30.414	28 mm	XXL	+12 mm

Material: FeCrNiMnMoNbN
Cone: 12/14 mm



Head, CoCrMo

Item no.	OD	Neck length	
52.34.0125	22.2 mm	S	-3 mm
52.34.0126	22.2 mm	M	0 mm
52.34.0127	22.2 mm	L	+3 mm
2.30.010	28 mm	S	-4 mm
2.30.011	28 mm	M	0 mm
2.30.012	28 mm	L	+4 mm
2.30.013	28 mm	XL	+8 mm
2.30.014	28 mm	XXL	+12 mm

Material: CoCrMo
Cone: 12/14 mm



Hip Head, ceramys

Item no.	OD	Neck length	
54.47.0010	28mm	S	-3.5 mm
54.47.0011	28mm	M	0 mm
54.47.0012	28mm	L	+3.5 mm

Material: ZrO₂-Al₂O₃
Cone: 12/14mm



Hip Head, symarec

Item no.	OD	Neck length	
54.48.0010	28mm	S	-3.5 mm
54.48.0011	28mm	M	0 mm
54.48.0012	28mm	L	+3.5 mm

Material: Al₂O₃-ZrO₂
Cone: 12/14mm



Hip Head, Bionit2

Item no.	OD	Neck length	
5.30.010L	28mm	S	-3.5 mm
5.30.011L	28mm	M	0 mm
5.30.012L	28mm	L	+3.5 mm

Material: Al₂O₃
Cone: 12/14mm



Revision head, ceramys

Item no.	OD	Neck length	
54.47.2010	28mm	S	-3,5 mm
54.47.2020	28mm	M	0 mm
54.47.2030	28mm	L	+3,5 mm
54.47.2040	28mm	XL	+7 mm

Material: ZrO₂-Al₂O₃, Ti6Al4V
Cone: 12/14mm

5. Instruments

5.1 Bipolar head

Bipolar head instrumentation, even sizes, 54.01.0001A for Stainless Steel Bipolar heads

Bipolar head instrumentation, 51.34.0372A for CoCr Bipolar heads

Item no.	Description	Stainless Steel 54.01.0001A	CoCr 51.34.0372A
51.34.0457	Bipolar head CoCr Tray		x
51.34.0458	Bipolar head CoCr Inlay		x
51.34.0459	Bipolar head CoCr Lid		x
54.03.4002	Bipolar tray	x	
54.03.4004	Bipolar lid	x	
51.34.0272	Bipolar Trial Head 39/22.2		x
51.34.0273	Bipolar Trial Head 40/22.2		x
51.34.0274	Bipolar Trial Head 41/22.2		x
51.34.0275	Bipolar Trial Head 42/22.2		x
51.34.0276	Bipolar Trial Head 43/22.2		x
54.02.0142	Bipolar Trial Head 42/28	x	x
54.02.0143	Bipolar Trial Head 43/28		x
54.02.0144	Bipolar Trial Head 44/28	x	x
54.02.0145	Bipolar Trial Head 45/28		x
54.02.0146	Bipolar Trial Head 46/28	x	x
54.02.0147	Bipolar Trial Head 47/28		x
54.02.0148	Bipolar Trial Head 48/28	x	x
54.02.0149	Bipolar Trial Head 49/28		x
54.02.0150	Bipolar Trial Head 50/28	x	x
54.02.0151	Bipolar Trial Head 51/28		x
54.02.0152	Bipolar Trial Head 52/28	x	x
54.02.0153	Bipolar Trial Head 53/28		x
54.02.0154	Bipolar Trial Head 54/28	x	x
54.02.0155	Bipolar Trial Head 55/28		x
54.02.0156	Bipolar Trial Head 56/28	x	x
54.02.0157	Bipolar Trial Head 57/28		x
54.02.0158	Bipolar Trial Head 58/28	x	x
51.34.0277	Bipolar Trial Head 59/28		x
54.02.1031	Trial head 22.2 S		x
54.02.1032	Trial head 22.2 M		x
54.02.1033	Trial head 22.2 L		x
3.30.100	Trial head 28 S blue	x	x
3.30.101	Trial head 28 M blue	x	x
3.30.102	Trial head 28 L blue	x	x
3.30.106	Trial head 28 XL blue	x	x
3.30.107	Trial head 28 XXL blue	x	x
54.02.4003	Bipolar reduction forceps	x	x
55.02.0702	RM Classic impactor curved 3 rd gen.	x	x
51.34.0278	Bipolar combination bolt 22.2		x
54.02.4101	Bipolar combination bolt 28	x	x
3.30.005	Gauge for head	x	x
5209.00	Extractor f/trial heads	x	x



Bipolar Trial Head

Item no.	OD	Femoral head diameter
51.34.0272	39 mm	22.2 mm
51.34.0273	40 mm	22.2 mm
51.34.0274	41 mm	22.2 mm
51.34.0275	42 mm	22.2 mm
51.34.0276	43 mm	22.2 mm
54.02.0142	42 mm	28 mm
54.02.0143	43 mm	28 mm
54.02.0144	44 mm	28 mm
54.02.0145	45 mm	28 mm
54.02.0146	46 mm	28 mm
54.02.0147	47 mm	28 mm
54.02.0148	48 mm	28 mm
54.02.0149	49 mm	28 mm
54.02.0150	50 mm	28 mm
54.02.0151	51 mm	28 mm
54.02.0152	52 mm	28 mm
54.02.0153	53 mm	28 mm
54.02.0154	54 mm	28 mm
54.02.0155	55 mm	28 mm
54.02.0156	56 mm	28 mm
54.02.0157	57 mm	28 mm
54.02.0158	58 mm	28 mm
51.34.0277	59 mm	28 mm

Trial head



Item no.	Description	Neck length
54.02.1031	Trial head 22.2 S	-4 mm
54.02.1032	Trial head 22.2 M	0 mm
54.02.1033	Trial head 22.2 L	+4 mm
3.30.100	Trial head 28 S blue	-4 mm
3.30.101	Trial head 28 M blue	0 mm
3.30.102	Trial head 28 L blue	+4 mm
3.30.106	Trial head 28 XL blue	+8 mm
3.30.107	Trial head 28 XXL blue	+12 mm



Item no.	Description
54.02.4003	Bipolar reduction forceps



Item no.	Description
55.02.0702	RM Classic impactor curved 3 rd gen.



Item no.	Description
51.34.0278	Bipolar combination bolt 22.2
54.02.4101	Bipolar combination bolt 28



Item no.	Description
3.30.005	Gauge for head



Item no.	Description
5209.00	Extractor f/trial heads

5.2 Hemihead



Trial hemihead

Item no. / S-4mm	Item no. / M0mm	OD
56.02.0038	51.34.0221	38 mm
56.02.0040	51.34.0222	40 mm
56.02.0042	51.34.0223	42 mm
56.02.0044	51.34.0224	44 mm
56.02.0046	51.34.0225	46 mm
56.02.0048	51.34.0226	48 mm
56.02.0050	51.34.0227	50 mm
56.02.0052	51.34.0228	52 mm
56.02.0054	51.34.0229	54 mm
56.02.0056	51.34.0230	56 mm
56.02.0058	51.34.0231	58 mm

5.3 Measuring templates

The following measuring templates are available for Bipolar and Hemihead implants:

Item no.	Description
330.010.001	Bipolar Head SS Template
330.010.090	Bipolar Head CoCrMo Template
330.010.072	Hemi-Prosthesis Heads Template

Digital measuring templates are available upon request for commonly used planning software products.

6. Symbols



Manufacturer



Correct



Incorrect



Caution

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