Primary Stability and Simple Application
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The Allofit®/Allofit-S® Alloclassic® Cup System Uncemented – Surgical Technique

Contents

Foreword 4

Indications 5

Preoperative Planning 6

Surgical Approach 7

Exposing the Acetabulum 7
Reaming the Acetabulum 7
Cleaning the Reamer Handle 8
Selecting the Implant 9
Implanting the Titanium Shell without Screw Holes (Allofit) 10
Implanting the Titanium Shell with Screw Holes (Allofit-S) 11
Inserting the Screws (Allofit-S) 12
Fitting the Cup Insert 13
Changing the Cup Insert 15

Product Overview 17

Allofit Implants 17
Cancellous Bone Screws 18
Sulene® Alpha Inserts 19
Durasul® Alpha Inserts 20
Cerasul® Alpha Inserts 22
Metasul® Alpha Inserts 22
Allofit Instruments 24
Instruments for Spherical Reamers 27
Instruments for Trial Inserts 28
Instruments for Cancellous Bone Screws 29
The Allofit/Allofit-S Cup System

Hemispherical cups for uncemented implantation have gained wide acceptance in recent years. One of the main reasons for this is that they reconstruct the original shape of the acetabulum, thereby ensuring minimum bone resection. This makes it possible to maintain and use the subchondral bone area as a load-bearing element. Unlike most other uncemented spherical cups, Allofit cups have a flattened pole area. This ensures that the implant cannot shift at the peak of its hemisphere, instead it transfers load to the periphery of the cup. The cup is slightly larger than the reamed acetabulum, which provides primary stability. The cup locks in the area of the subchondral bone, which both anchors the implant and restores the original physiological function of load transfer.

Primary anchorage of the titanium shell is supported by an excellent macrostructure. Long-term anchoring through osseointegration is ensured by the use of a proven material for the cup, the titanium-wrought alloy Protasul®-Ti with a rough-blasted surface.

In cases of uncemented modular acetabular cups in the past, it was shown that an incomplete metal insert backing, particularly where the polyethylene walls are thin, can cause problems and may lead to implant failure. In the Allofit cup system, it was therefore ensured that the polyethylene walls would be thick enough, and also that all screw holes in the titanium shell were designed for capping. The insert is seated and secured in the shell by a snap mechanism that holds the insert firmly in place.

The Allofit cup system provides the surgeon with a reliable prosthesis that is easy to handle and offers considerable freedom of choice because of its modular design. Titanium shells with or without the possibility of additional screw fixation are available as anchoring components. Neutral and 10-degree hooded polyethylene inserts, as well as Metasul and Cerasul inserts, can be combined with the titanium shells. This makes it possible to individually select the most suitable acetabular cup for the patient in an economic and practical way.
Indications

The Allofit® cup can be used for all forms of coxarthrosis if the bone quality and quantity is adequate and there is sufficient bone coverage.

The bispherical basic design with polar flattening is preferable to the purely spherical cup, even in the case of poor bone quality, as is common in osteoporotic or rheumatoid patients, for achieving stable anchorage.

Furthermore, in cases of primary dysplasia of the hip, the Allofit® cup can be used in combination with hooded polyethylene inserts, which can be implanted with stable rotation in any position.

If no stability by means of press-fit is achieved in cases of poor bone quality or in a revision operation, the Allofit®-S cup with screw holes offers additional options.
Preoperative Planning

X-ray templates are available for preoperative planning of an Allofit cup. Together with a current X-ray overview of the pelvis, these are a practical aid for planning the surgical procedure.

The aim of preoperative planning is to determine the most favorable position of the implant and its approximate size, and anticipate potential surgical complications. A load-bearing, stable acetabular floor and solid lateral bony tissue are desirable. An extensively preserved osseous circumference of the acetabulum is a prerequisite for primary stability of the cup.

In cases of acetabular dysplasia, preoperative planning helps in deciding whether the implant bed must be supported by using bone grafts. The center of rotation should approximate physiological conditions as closely as possible.

The inclination of the cup should form an angle of 40°–45° to the pelvic horizontal line. A cup template of appropriate size is placed between the acetabular root and teardrop figure, which serve as a reference to determine the shell diameter. The cup should be placed in an anteversion of 10°–15° interoperatorly. However, it should be kept in mind that the correct cup orientation also depends on the femoral implant position.
Surgical Approach

The Allofit cup can be implanted using a variety of surgical approaches. The specific approach depends on the surgeon’s preference and therefore may differ from the procedure shown below.

Exposing the Acetabulum
A clean and clear exposure of the acetabulum is a prerequisite for successful implantation. The capsule is excised in its entire circumference so that reamers can be easily introduced. All fibrous, cartilaginous and bony structures preventing the preparation of the acetabulum must be removed.

Reaming the Acetabulum
The acetabular bone bed is reamed based on its size and prepared in 2 mm steps. The aim is to create an anatomically shaped acetabular implant bed so that the cup is gripped by bone on all sides and anchored in well-vascularized bone. This establishes the prerequisites for primary and secondary stability.
Important: Reaming must be minimal to preserve bone stock and the morphology of the acetabulum.

In flat acetabuli, first ream the central acetabular floor with a relatively small reamer and then deepen according to the preoperative planning (Fig. 2a). In normal acetabuli, deepening is not required. Once the necessary depth has been reached, incline the reamer at around 40° to the longitudinal axis of the body and form a hemispherical implant bed using the next largest reamer (Fig. 2b). This cranial reamer direction is maintained until:

1. The necessary depth has been attained, and
2. 50–60% of the acetabular roof has been reamed to vascularized bone.

The anterior and posterior acetabular roof must remain stable and solid.

The reaming process is completed when these conditions are met.

To obtain an implant bed being as symmetrical as possible and to avoid thermal necrosis, the final reaming should be performed manually. The reamer is inserted to a depth where its equator is entirely covered by bone; this does not apply to dysplastic acetabuli, for which an additional implant bed must be created.

Cleaning the Reamer Handle
To clean the reamer handle, the white tissue protector is removed from the reamer handle. Then push the locking sleeve up and turn it to the right (Fig. 3a).

Next, pull the coupling apart (Fig. 3b). After cleaning, reassemble the locking sleeve in reverse order.
Selecting the Implant

After reaming, the trial shell is tapped in at 40°–45° inclination and 10°–15° anteversion and its stability is checked. Stability is carefully tested under pulling, tilting and rotating loads. The contact between the acetabular floor and trial shell can be verified with the control hook after unscrewing the setting instrument.

If the trial shell does not have a sufficient fixation base, the acetabulum must be adequately deepened with the last reamer used, after which the stability of the trial shell is checked again. If the trial shell is not seated firmly enough even with sufficient osseous enclosure, choose the next largest trial implant.

Caution: To protect the acetabulum, the trial shell is slightly larger (1 mm) than the reamer of the nominal size due to its lack of surface structure. The definitive implant is 2 mm larger, and will therefore fit even more tightly.

If there is an “onlay effect” despite this, perform an additional primary anchoring with at least two cancellous bone screws.

The trial shell can be removed by tipping out.
Implanting the Titanium Shell Without Screw Holes (Allofit)

**Important:** The nominal size of the definitive shell must match the last reamer used; the excess of 2 mm has been taken into account. Oversizing and selection of a larger implant than prereamed is only advisable for soft bone, as the risk of pelvic fracture would be increased.

The titanium shell is completely screwed to the setting instrument and tapped in with 40°–45° inclination and 10°–15° anteversion (Fig. 5).

Any soft tissue which remains between the bone and the implant must be resected.

It is absolutely essential to align the shell before tapping in and maintain the selected setting direction.

The control hook is used to check whether the implant was driven to the acetabular floor. The shell must also maintain its stable seating under pulling, rotating and tipping loads.

If a trial reduction is planned with the trial insert, it is possible to fix the trial insert to the titanium shell using an attachment screw (Fig. 6).

The hole at the pole of the titanium shell is locked with the polar screw. This is set steadily on the placement instrument and screwed in accurately (Fig. 7). In addition to sealing the polar hole, the screw is also used for correct centering when fitting the cup insert.
Implanting the Titanium Shell With Screw Holes (Allofit-S)

**Important:** The nominal size of the definitive shell must match the last reamer used; the excess of 2 mm has been taken into account. Oversizing and selection of a larger implant than prereamed is only advisable for soft bone, as the risk of a pelvic fracture would be increased.

The titanium shell is completely screwed to the setting instrument and tapped in with 40°–45° inclination and 10°–15° anteversion (Fig. 8). Any soft tissue which remains between the bone and the implant must be resected. It is absolutely essential to align the cup correctly before tapping in, as its position cannot be changed after tapping in.

The Allofit-S cup has an orientation groove at the equator of the shell indicating the position of the screw holes in the shell. The holes must be placed correctly in the direction of the load transfer. A deviating orientation may not be biomechanically suitable and could lead to vascular and nerve lesions caused by the screws.

The control hook is used to check whether the implant was driven to the acetabular floor.

Where necessary, a trial reduction is performed with the trial insert during stem preparation or after implanting the stem (Fig. 9).

The hole at the pole of the titanium shell is locked with the polar screw. This is set steadily on the placement instrument and screwed in accurately (Fig. 10). In addition to sealing the polar hole, the screw is also used for correct centring when fitting the cup insert.
Inserting the Screws (Allofit-S)

*Zimmer* 6.5 mm countersunk screws must be used. To simplify the initial insertion of the self-tapping cancellous bone screws, 3.2 mm holes are drilled into the subchondral bone (Fig. 11).

Tapping of the drill holes is recommended only in cases of sclerotic bone. This is used purely to break through the hard osseous parts. Since the screws are only to be anchored in cancellous bone, lengths of up to 30 mm are normally sufficient. The screws should not penetrate the opposite cortex.

The geometry of the screw holes allows the screws in all cup sizes to be orientated within a range of around 10° in all directions (Fig. 12).

**Caution:** The specified Ti-6Al-4V screws have a lower shearing resistance than screws made of steel or CoCrMo alloys.

The screws must be screwed in fully. Projecting screw heads would make correct fitting of the cup insert impossible.

Unused screw holes in the titanium shell can be capped with a screw hole plug (Fig. 13). The plug is placed on the appropriate setting instrument and fixed in the screw hole of the titanium shell with a light tap. The screw hole plugs are intended for single use only and cannot be snapped into the shell more than once.
Fitting the Cup Insert

After implanting the femoral component and the trial reduction, decide whether a neutral or hooded cup insert is to be used. The trial insert is then removed. The polar screw is fitted (Fig. 14). This must always be screwed in as the polar screw accepts the polyethylene peg of the liner into its hole, centring the insert.

Bone or soft tissue remnants must not overlap the edge of the titanium shell as they may prevent the insert from snapping into position. The shell edge must be free from any tissue and particular attention must be paid to the posterior inferior bony edge of the acetabulum.

The size of the cup inserts is indicated by a letter code. This code matches the size on the corresponding titanium shell.

The supplied insert is attached to the setting instrument, introduced into the cleaned shell, and is carefully centered. The polyethylene peg must be centred in the hole of the polar screw (Fig. 15).

To do this, use the setting instrument to position the insert at the entrance plane of the shell. In this position, the insert is turned clockwise using the setting instrument (Fig. 16). If it can easily be turned concentrically, it is only tapped lightly with a hammer.
If it can no longer be rotated with low torque, it sits concentrically and can be tapped in definitively (Fig. 17). If the insert can still be turned with low torque after tapping it lightly, this indicates nonconcentric positioning or soft tissues between insert and cup. After removing the soft tissue remnants and correctly positioning the insert, repeat the process (Fig. 16) until the insert cannot be turned after tapping it lightly. Only then it can be tapped in completely.

Where necessary, a tap plastic impactor provides confirmation that the connection is reliable.

If the insert has snapped into place correctly, the edge is protruding around 1.5 mm over the equator of the titanium shell (Fig. 18).

If unsure, the seating can be checked using a raspatory. If the fitting of the insert is faulty, a new insert must be used. If the polar peg is deformed, it will not be possible to anchor the insert correctly.
Metasul and Cerasul inserts must be handled with special care; there must not be any damage to their metal or ceramic surface. Metasul inserts must only be combined with Metasul femoral heads, and Cerasul inserts with Cerasul or BIOLOX® delta* femoral heads.

Changing the Cup Insert
If the removal of a firmly seated insert becomes necessary, the following approach is often successful: An AO type cancellous bone screw is inserted into the polyethylene insert after making a small pilot drill hole (Fig. 19). This is done centrally for polyethylene inserts if the PE insert is thick enough; otherwise decentrally between articulating surface and shell edge as with Metasul or Cerasul inserts. It is also possible to attempt to lever out the insert at the edge with an osteotome. The inside edge of the shell, where the locking mechanism for the insert is placed, must be protected if a new insert is to be fitted. If a new insert can no longer be reliably anchored in the old shell, the shell must be removed and replaced.

* BIOLOX delta is a trademark of CeramTec AG.
Die Allofit Pfanne kann nur mit Alpha-Einsätzen kombiniert werden!
Die Kompatibilität zwischen Schalen und Einsätzen wird über die pfannenspezifischen Größenabstimmungen mittels Buchstabenzuordnung DD bis TT angegeben.

The Allofit cup shall only be used with Alpha inserts!
The compatibility between the shells and inserts is given by the specific letter codes DD to TT lasered on the respective implants.

Le cotyle Allofit ne doit être utilisé qu’en combinaison avec des inserts Alpha!
La correspondance entre taille de cupule et d’insert est indiquée au moyen de lettres allant de DD à TT gravées sur la cupule et sur l’insert.

Metasul Einsätze dürfen nur mit Metasul Kugelköpfen kombiniert werden!
Cerasul Einsätze dürfen nur mit Cerasul oder BIOLOX delta Kugelköpfen kombiniert werden!

Metasul inlays are to be used only in combination with Metasul femoral heads!
Cerasul inlays are to be used only in combination with Cerasul or BIOLOX delta heads!

Les inserts en Metasul doivent être utilisés uniquement en combinaison avec des têtes sphériques Metasul!
Les inserts en Cerasul doivent être utilisés uniquement en combinaison avec des têtes sphériques Cerasul ou BIOLOX delta!
The Allofit®/Allofit®-S Alloclassic® Cup System Uncemented – Surgical Technique

### Allofit® Implants

#### Allofit® Schale
Allofit® Shell
Cupule Allofit®

1) Protasul®-Ti un cemented
2) Protasul®-10

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#### Allofit®-S Schale
Allofit®-S Shell
Cupule Allofit®-S

1) Protasul®-Ti un cemented
2) Protasul®-10

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Polverschluss M8
Pole plug M8
Obturateur polaire M8

**Protasul®-Ti**

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Schräubenlochverschluss
Screw hole plug
Obturateur des trous de vis

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* Auf Anfrage
* On request
* Sur demande

** Buchstabencodes referenzieren die korrekte Größe des Alpha-Einsatzes.
** Letter code references indicate the correct Alpha insert size.
** Codes de lettre référencent la taille correcte de l’insert Alpha.
Cancellous Bone Screws

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* Auf Anfrage
* On request
* Sur demande
Sulene® Alpha Inserts

Sulene® PE Alpha-Einsatz
Sulene® PE Alpha Insert
Alpha insert Sulene® PE

Sulene® PE Alpha-Einsatz überhöht
Sulene® PE Alpha Insert hooded
Alpha insert Sulene® PE avec rebord

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Sulene® PE Alpha-Einsatz
Sulene® PE Alpha Insert
Alpha insert Sulene® PE

Sulene® PE Alpha-Einsatz überhöht
Sulene® PE Alpha Insert hooded
Alpha insert Sulene® PE avec rebord

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# Durasul® Alpha Inserts

Durasul® PE Alpha-Einsatz
Durasul® PE Alpha Insert
Alpha insert Durasul® PE

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* Auf Anfrage
* On request
* Sur demande
# Durasul® Alpha Inserts

Durasul® PE Alpha-Einsatz überhöht
Durasul® PE Alpha Insert hooded
Alpha insert Durasul® PE avec rebord

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* Auf Anfrage
* On request
* Sur demande
**Cerasul® Alpha Inserts**

Cerasul® Alpha-Einsatz
Cerasul® Alpha Insert
Alpha insert Cerasul®

Sulene® PE/
Cerasul®
uncemented

**Metasul® Alpha Inserts**

Metasul® Alpha-Einsatz
Metasul® Alpha Insert
Alpha insert Metasul®

Sulene® PE/
Protasul® 21WF
uncemented

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* Not available for distribution in the US.
Metasul® Alpha Inserts

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** Available for distribution in the US only.
Allofit® Instruments

Alpha-Sieb (leer)
Alpha tray (empty)
Plateau Alpha (vide)

Einsatz zu Alpha-Sieb (leer)
Insert to Alpha tray (empty)
Alpha plateau supérieur (vide)

Siebdeckel
Tray cover
Couvercle pour plateau

Sieb für Grössen 70–74 mm
Tray for sizes 70–74 mm
Plateau pour cotyles 70–74 mm

All instruments
**Setzinstrument für Titanschale**  
Impactor for titanium shell  
Impacteur pour cupule titane  

**Zielgerät**  
Positioning guide  
Guide de positionnement  

**Lochverschluss-Setzinstrument**  
Setting instrument for screw plug  
Positionneur pour obturateur des trous de vis  

**Pfannenmesskörper**  
Cup measuring instruments  
Cotyle de mesure  

**Messhaken**  
Control hook  
Sonde de contrôle  

**Polverschluss-Setzinstrument**  
Setting instrument for pole plug  
Positionneur pour obturateur polaire  

**Setzinstrument Alpha, gebogen, Schraubkupplung**  
Setting instrument for insert Alpha, curved, screw coupling  
Positionneur pour insert Alpha, plat courbé, raccord fileté  

**Setzinstrument Alpha, gerade Schraubkupplung**  
Setting instrument for insert Alpha, straight, screw coupling  
Positionneur pour insert Alpha, droit raccord fileté  

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* Auf Anfrage  
* On request  
* Sur demande
Schraubendreher für MIS Instrumente
Screwdriver for MIS Instruments
Tournevis pour instruments MIS
REF 01.00502.004*

MIS Allofit® Offset-Einschläger
MIS Allofit® Offset impactor
Impacteur MIS à offset Allofit®
REF 01.00502.005*

MIS Polverschluss-Setzinstrument
MIS setting instrument for pole plug
Positionneur MIS pour obturateur polaire
REF 01.00502.007*

alpha-Aufsatz neutral
Alpha top neutral
Porte-noyau neutre Alpha
Durasul® 22 mm
REF 01.00019.105*

Durasul® EE/28 mm
REF 01.00019.115*

PE, Metasul®, Durasul® 28 mm
REF 01.00019.107

Cerasul® 28 mm, Metasul® 32 mm
REF 01.00019.108

PE, Durasul® 32 mm
REF 01.00019.112

Durasul® 36 mm
REF 01.00019.114

alpha-Aufsatz überhöht
Alpha top with rim
Porte-noyau avec rebord Alpha
PE, Durasul® 22 mm
REF 01.00019.106*

Durasul® EE/28 mm
REF 01.00019.116*

PE, Durasul®, Metasul® 28 mm
REF 01.00019.109

PE, Durasul®, Metasul® 32 mm
REF 01.00019.110

Nachschlagraufsatz
Impactor
Impacteur
flach/flat/plat
Ø mm
22 840.6022*
28 840.6023
32 840.6024
36 01.00209.114
überhöht/hooded/surélevé
Ø mm
22 01.00209.106*
28 840.6032
32 840.6033

* Auf Anfrage
* On request
* Sur demande
Instruments for Spherical Reamers

- **Sieb für sphärische Fräser (leer)**
  - Tray for spherical reamers (empty)
  - Plateau pour fraises sphériques (vide)
  - REF
    - 01.00209.400

- **Adapter AO-3-Backenfutter**
  - Adapter AO-3 jaw chuck
  - Adaptateur AO-3 mandrin
  - REF
    - 5637*

- **Adapter AO-Zimmer-Hudson**
  - Adapter AO-Zimmer-Hudson
  - Adaptateur AO-Zimmer-Hudson
  - REF
    - 840.5015*

- **Antriebswelle für 4-Steg-Fräser, EZ clean, lang**
  - Drive shaft for 4-strut reamers, EZ clean, long
  - Axe d’entraînement pour la fraise à 4 branches, EZ clean, long
  - Größe/Size/Taille
    - 360 mm
    - REF
      - 01.00209.402

- **Antriebswelle für 4-Steg-Fräser, EZ clean, kurz**
  - Drive shaft for 4-strut reamers, EZ clean, short
  - Axe d’entraînement pour la fraise à 4 branches, EZ clean, short
  - Größe/Size/Taille
    - 260 mm
    - REF
      - 01.00209.401*

- **4-Steg-Raffelfräser sphärisch**
  - 4-strut spherical reamer
  - Fraise sphérique à 4 branches
  - Ø mm
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    - 38
    - 40
    - 42
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      - 01.00209.470*
      - 01.00209.472*
      - 01.00209.474*
## Instruments for Trial Inserts

**Alpha-Sieb für Manipuliereinsätze (leer)**  
Alpha tray for trial inserts (empty)  
Plateau Alpha pour inserts de manipulation (vide)

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### Befestigungsschraube
Fixation screw  
Vis de fixation

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### Manipuliereinsatz
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Insert de manipulation

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* Auf Anfrage  
* On request  
* Sur demande
Instruments for Cancellous Bone Screws

Sieb für Knochenschrauben (leer)
Tray for cancellous bone screws (empty)
Plateau pour vis à spongieux (vide)

REF
5901

Schaubenträger
Screw compartment
Porte-vis

REF
5911

Siebdeckel
Tray cover
Couvercle pour plateau

REF
7139

Kardanschraubenzieher 3,5 mm
Cardan hex screwdriver 3.5 mm
Tournevis à cardan 3,5 mm

REF
7798

Bohrlehre Ø 3,2 mm, gerade
Drill guide Ø 3.2 mm, straight
Guide-mèches Ø 3,2 mm, droite

REF
5913

Schaubenzieher gerade 3,5 mm
Screwdriver straight 3.5 mm
Tournevis droit 3,5 mm

REF
5912*

Flex-Welle
Flexible shaft
Tige flexible

REF
75.80.04
Winkelgetriebe
Angular gear
Renvoi d’angle
REF 7799*

Gewindeschneider
Tap
Taraud
Größe/Size/Taille* REF 6.5 x 50 5908

Zentrierhaken
Guiding hook
Crochet de centrage
REF 5174

Spiralbohrer
Drill bit
Mèche
Größe/Size/Taille REF
3.2 x 35 5902
3.2 x 56 5903
3.2 x 70 5904
3.2 x 145 103.32.145

Tiefenmessinstrument
Depth gauge
Jauge de profondeur
REF 7936

T-Griff
T handle
Poignée en T
REF 100.90.210

Schraubenmessgerät
Gauge for screws
Jauge de longueur pour vis
REF 75.80.15*

* Auf Anfrage
* On request
* Sur demande

All instruments