Convincing Primary Stability
The *Allofit* acetabular cup was developed in 1993. The goal was to create a reliable implant that was simple to use, achieved excellent primary stability and offered all tribological options. Moreover, the implant was to be suitable for both primary and revision indications.

Introduction to the market took place in 1995. Over 400’000 implantations over a period of 16 years reflect the great success of the *Allofit* acetabular system. Mid to long-term clinical results look promising and do not show signs of migration or significant radiolucency.¹

The system has been constantly expanded with new tribological components and today offers an option for all current bearing materials.

The Allofit cup is available in sizes 42 to 64 mm.

The Allofit-S cup is available in sizes 42 to 74 mm, and is provided with three, five, six or seven screw holes, depending on the size.

Thanks to the modularity, it is possible to combine the Allofit cup with all current tribological bearings and different articulation diameters.

A broad assortment of cup inserts provides a large selection of tribological options.

For polyethylene pairings, both standard polyethylene (Sulene®) and highly cross-linked polyethylene (Durasul®) inserts are available.

High-quality hard-hard pairings – metal-metal (Metasul®) and ceramic-ceramic (Cerasul®) inserts – are included in the scope.

For a greater range of motion (ROM) and joint stability, the Allofit system also provides large head diameters up to 36 mm for combination with highly cross-linked polyethylene (Durasul) inserts.
**Design and Concept**

*An Elegant Press-Fit Solution – Thanks to Bispherical Design*

The *Allofit* cup imitates the original shape of the acetabulum, and is therefore a bone-conserving implant.

As a result, it is possible to preserve and use the subchondral bone as support for the implant.

The polar region of the *Allofit* cup is flattened. This improves the press-fit effect because the area of bone contact is concentrated on the equatorial portions of the implant, thus improving primary and secondary stability.

In its equatorial region, the implant exceeds the dimension of the prepared acetabulum by 2 mm. This oversizing in combination with the macrostructure of the cup is aimed at providing high initial stability.
The cup is anchored primarily into the subchondral bone layer which serves not only to anchor the implant but also, in line with its original function, to bear the load.

**Macrostructure**

More than 1,000 teeth – one millimeter in height – form the macrostructure on the patented surface of the Allofit/Allofit-S cup.

The exterior surface of the shell has two differently structured zones.

The surface area is significantly increased as a result of the macrostructure and the rough-blasted surface of the bio-compatible pure titanium. This provides good conditions for rapid, firm secondary stability which is a pre-condition for a durable long-term fixation.

**Equatorial Zone**

This zone includes seven concentric rows of teeth that are shaped like small barbs.

In addition, in this area the cup has six grooves that ensure additional rotational stability. These structures give the implant high rotational and lever-out stability and provide a firm and stable press-fit.

**Polar Zone**

From the eighth row on, the teeth are oriented towards the pole of the cup. This structure provides additional rotational stability but does not prevent the cup from being impacted into the desired position.
**Pole Closure**

A central hole at the pole of the shell serves to incorporate the cup impactor. This method permits intraoperative check of the implant position.

Before the cup insert is seated, the polar hole is closed with a screw that prevents direct contact between polyethylene and bone.

Furthermore, the recess inside the polar screw facilitates centering and orientation of the polyethylene insert.

**Screw Option**

Depending on the diameter of the implant, the *Allofit-S* cup offers the option of additional fixation with up to three, five, six or seven cancellous bone screws.

Unused screw holes can be closed with screw hole plugs as needed.

**Connection Between Metal Shell and Cup Insert**

There is a shaped interlock between the cup insert and the metal shell. On the inner surface of the shell, in the polar region, there are two spikes made of the Protasul®-10 alloy that provide additional rotational stability of the insert within the outer shell. (Fig. 1)

A tightly fitting snap-fit mechanism, acting over the entire circumference, locks the insert into the metal shell and prevents relative motion between the two components. (Fig. 2, Fig. 3)

Heat expansion of the cup insert when it moves from room temperature to body temperature is also taken into account. After the incision has been closed, this expansion gives the insert additional stability, since the polyethylene expands more than the titanium shell. This effect also exists for hard pairings because the metal or ceramic insert is embedded in polyethylene (sandwich construction).

The short polar peg in the pole of the insert serves to center it. (Fig. 4) After it has been impacted into place it also increases lever-out stability of the insert in the shell.

In its correct position, the insert slightly overlaps the edge of the shell in order to prevent damage to the femoral head during repositioning. (Fig. 5)
Indications

The Allofit cup can be used for all forms of coxarthrosis, provided that there is sufficient bone quantity and quality as well as sufficient bony coverage.

Compared to fully hemispherical cups, the bispherical design with polar flattening has the advantage of achieving stable anchoring, even with poor bone quality, as found in osteoporosis or rheumatoid arthritis.

Moreover, the Allofit cup can be used in the case of primary hip dysplasia in combination with hooded polyethylene inserts, which can be implanted rotationally stable in every position.

If no press-fit stability is obtained under poor bone conditions or in revision surgery, the Allofit-S cup with screw holes offers additional options.

Case Studies

Case 1: Female, 77 years old

Preoperative | Postoperative | Postoperative, 9 years and 5 months

Case 2: Female, 67 years old

Preoperative | Postoperative, 6 years | Postoperative, 10 years
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