

Cempadic[®]



Surgical Technique
knee cement spacer

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The cement spacer molds
based on the idea of
Prof. Dr. med Jürgen Bruns, Hamburg.



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Nota Bene: The described surgical technique is the suggested treatment for the uncomplicated procedure. In the final analysis the preferred treatment is that which addresses the needs of the individual patient.

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Introduction

Due to degenerative changes of the human joint it may become necessary to replace the joint with a prosthesis. The joint replacement is a common and successful treatment. However, due to many reasons, a small number of patients that undergo such orthopedic surgical procedure suffer from infection at the surgical site and generally around the implanted joint prosthesis. In order to cure such an infection in a two-stage re-implantation, the implanted joint prosthesis is generally removed, the site is thoroughly debrided and washed, antibiotics are applied to the infected site via temporary implant until the infection is eliminated and a new revision type joint prosthesis is then implanted during a subsequent orthopedic surgical procedure. The temporary implants are usually pads made intraoperatively of bone cement with rough surfaces not suitable for articulating during continuous passive motion machines (CPM) used for mobilisation of the patients. Due to the lack of mobilisation the joints are stiff and the soft tissues are very tight when the cement spacers are replaced by the final revision implant components.

Cempadic® cement spacer molds knee

Cempadic® Spacer (cement pads implantcast)



Figure A Cempadic® femoral mold 4 right



Figure B Cempadic® tibial mold 4

The Cempadic® spacer molds consisting of two parts and made of silicone allow the surgeon to customise cement spacers with the ACS® total knee design and achieve smooth articulating surfaces which allow the mobilisation of the patient with a low wear rate compared to hand made spacers.

The Cempadic® spacer molds are reusable and can be cleaned and resterilised as normal instruments.

Cempadic® knee molds are available in the femoral sizes 2 to 4 (right and left) and tibial sizes 3 to 5. It is recommended to use the standard viscosity implabond bone cement with or without antibiotics.

The mixing can be performed in a syringe or manually.

Note: A set of Cempadic® knee spacer molds are manufactured upon request. On special demand Hip spacer molds (including femoral stem and acetabular) are available, too.

The following explanation shows the cement mixing by spatula and bowl and the cement application by hand.

Generally the use of a lavage system is recommended (see catalogue section).



Modelling of the spacers

The femoral and the tibial spacers are made separately in a two stage procedure. Determine the femoral and the tibial sizes. For each component a 40g package of bone cement is used.

Depending of the size the amount of cement differs. The following table 1 shows the recommended cement amount per size when implabond cement type 1 or type G1 is used.

femoral size 2	tibial size 3	ca. 30g
femoral size 3	tibial size 4	ca. 35g
femoral size 4	tibial size 5	ca. 40g

table 1

General instruction for use for implabond bone cement at a temperature of 20°C

Mix the whole powder and liquid to obtain a homogenous mixture. Prepare the mixture according to the type of cement (manual or syringe application). Mix the appropriate quantity of cement according to the size of the cavity.

Powder:

-Carefully open the sachet and carefully pour all the content into the bowl (fig. 3).

Liquid:

- Open the blister and open the sterile ampule.
- Do not break the ampule above the bowl (risk of remains of glass).
- The whole liquid is poured onto the powder (fig. 4).

Manual application (implabond 1 and G1)

- Mix carefully so as to minimise the formation of air bubbles for 45 seconds.
 - Leave the mixture alone for app. 2 minutes.
 - Take the cement in gloved hand and knead it until it no longer adheres to the fingers.
 - After additional 3 minutes please insert the cement in the bone cavity.
 - The implant is inserted and held firmly in place until the cement has set hard. Any excess cement is removed before hardening.
- Hardening time in normal environmental conditions (temperature 20°C +/-1°C, humidity 50% +/-10%) is 10 minutes:



figure 1



figure 2



figure 3



figure 4



figure 5a



figure 5b



figure 6a



figure 6b



figure 7



figure 8

Modelling of the femoral spacer

Mix the bone cement in the ic cement mixing bowl or with the ic-vac syringe. If a syringe is used, remaining cement of the small amount of 40g may rest in the tube. Therefore we recommend to mix the cement in a bowl.

Please prevent that the non mixed liquid get in touch to the silicone mold, because this can cause lead to a change of the colour of the mold.

Put the powder and the liquid according to the suppliers instructions for use. With implabond bone cement you put first the powder and pour the liquid over it. Mix the cement for 45 seconds and leave the mixture alone for 2 minutes.

Take the cement in gloved hand and knead it until it no longer adheres to the fingers and form a role (fig. 5a) with a diameter of app. 2cm.

No later then additional 3 minutes please fill this role into the open femoral mold (fig. 5b).

Due to the determined size the amount of cement should be reduced according to the size (table 1).

Slide in the piston into the femoral mold and push it down until the mold is completely filled with cement. Remove obsolete bone cement (fig. 6a and fig. 6b).

If the piston can not be inserted completely, cement has to be removed from the mold and the procedure has to be repeated.

Keep the mold under pressure for about 3 minutes. After hardening of the cement (10 minutes, at 20°C), open the mold and take out the molded femoral component (fig. 7).

Check the articulating surface of the component. If necessary, please remove unevenesses. Shape the femoral component by the use of a knife, chisel or forceps (fig. 8).

Please perform the shaping of the component far away from the patient not to risk sterility due to cement particles flying through the theatre.

Modelling of the tibial spacer

Repeat the earlier described mixing procedure. Open the tibial mold and fill a small portion of bone cement into the lower half of the mold to fill the central peg (fig. 9a).

Due to the determined size the amount of cement should be reduced according to the size (table 1). Fill the rest of bone cement in the upper half of the mold and fill the articulating surface (fig. 9a).

Close the mold by putting the lower half over the upper half (fig. 9b). Compress the mold till the mold is completely filled with cement. Remove obsolete cement.

Keep the mold under pressure for app. 3 minutes. After hardening of the cement (9 minutes at 20°C) open the mold and take out the molded tibial component (fig. 10).

Check the mold and remove unevenesses. Shape the component by the use of a knife, chisel and forceps (fig. 11).

Please perform the shaping of the component far away from the patient, not to risk sterility due to cement particles flying through the theatre.



figure 9a



figure 9b



figure 10



figure 11



figure 12a



figure 12b

Checking of the joint line

Insert the molded components into the knee joint. Due to the bone defect situation different amounts of additional cement have to be added in order to fill the gap and restore the original joint line correctly (fig. 12a and fig. 12b).

Cementing the spacers

According to the bone defects additional bone cement has to be applied under the femoral and the tibial component. Mix an appropriate portion of cement and place it under both components. Impact the components to the bone.

Remove obsolete bone cement and extend the knee. Make sure that the pressure is not too high to assure both components remain at the joint line and the joint line can be restored as planned (fig. 13a und fig. 13b)

After cement hardening the stability of the joint should be checked again.

Please notice, that the customised spacers are gap filling pads (fig. 14) which should enable the mobilisation by a continuous passive motion machine (CPM) for the time of infection therapy. Overloading can lead to increased cement wear or breakage of the components.



figure 13a



figure 13b



figure 14



Material

Cempadic® femoral spacer mold

0298-0612 size 2 left
0298-0613 size 3 left
0298-0614 size 4 left
0298-0615 size 5 left

0298-0602 size 2 right
0298-0603 size 3 right
0298-0604 size 4 right
0298-0604 size 5 right

Cempadic® tibial spacer mold

0298-0902 size 2
0298-0903 size 3
0298-0904 size 4
0298-0905 size 5

implabond bone cement 40g

D041140 implabond 1
standard viscosity
D041140G implabond G1
standard viscosity with antibiotics

ic bowl and spatula

ic88-0446

ic vac cement syringe

0298-1740 (single pack)

ic vac cement gun

0298-1750 (no figure)

ic lavage

0067-8001 ic-Lavage set with nozzles and
splash shield
0067-8002 ic-Lavage femoral brush with
suction





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