



Exceed™
Acetabular System

Spine

Trauma


BioMaterials

Cement

Joint Replacement

design rationale

BOMET
Europe

The image shows the Exceed™ acetabular system components. In the foreground, there is a purple spherical femoral head and a white acetabular shell with a porous outer coating and a central opening. The background features a blue-tinted X-ray of a hip joint, showing the acetabulum and femoral head in place.

Exceed™ acetabular system

Designer

Designed in conjunction with Mr E. Smith FRCS BSc MB BCh at the Avon Orthopaedic Centre, Bristol, UK, the Exceed™ Acetabular System has been derived from features that are common to all Biomet Merck cementless components. These are the clinically proven closed pore porous coating, the extensively tested RingLoc® liner retaining mechanism and ArCom® polyethylene liners.

Removable Screw Hole Blanking Plugs

The component dome holes are pre-blanked with titanium plugs that can be removed intra-operatively from the shell. This intra-operative flexibility allows the insertion of a solid shell which can be converted to a component with holes should supplementary screw fixation be necessary. These plugs are removed by means of a specially designed extractor that obviates the necessity to apply torque to the implanted shell.

Repositionable Liners

The shell also includes the intra-operative option for repositioning the acetabular liner. This is accomplished by means of a modified RingLoc® liner retaining mechanism. This combined with an aperture in the face of the acetabular component allows for accurate and secure locking of the liner.

Maximising Polyethylene Thickness

The Exceed™ Acetabular System also includes liners that are specific to the shell diameter. This maximises polyethylene thickness between the smallest and largest diameter components.



Primary and Secondary Fixation

Closed Pore Porous Coating

Clinically proven closed pore porous coating more effectively seals the bone/implant interface than a porous coating that has greater inter-connectivity. If pores existing in porous coatings are large and open, they can act as “debris highways”. These “highways” may allow fluids and polyethylene particles access to the bone/implant interface, thus increasing the likelihood of osteolysis.^(1,4) Closed pore porous coating also increases scratch fit stability at the bone implant interface.⁽²⁾

Hydroxyapatite

Exceed™ acetabular components are available with or without hydroxyapatite coating. Hydroxyapatite is sprayed directly into the closed pore porous coating. This process increases the amount of in-growth and attachment to bone. This also leads to more even distribution of bone onto the surface of the implant.⁽³⁾

Rim Flare

17 degrees of rim flare has been incorporated into the outer geometry of the Exceed™ acetabular shell. This accurately allows size for size reaming and increases the contact pressure at the rim of the acetabulum. This contact pressure contributes significantly to the primary stability of the shell.



Acetabular Liners and Retaining Mechanism

RingLoc[®] – ReLoc[®] Mechanism

The ReLoc liner mechanism employed in the Exceed acetabular component is a development of the extensively tested RingLoc system. Developments include a small aperture in the face of the shell and a modified retaining ring. Again, extensive testing ⁽¹²⁾ has validated the mechanism to have similar properties to that of the original RingLoc mechanism as tested by Greenwald ⁽⁵⁾ and Fehring. ⁽⁶⁾

Honed Inner Surface

The inner surface of the Exceed acetabular component has been 'honed' to a surface finish of 0.12 Microns (Ra). This honed surface removes any machining marks and **reduces particular debris generation** should there be any micro-motion at the liner/shell interface. **Improved congruency and liner/ shell integrity** under load further reduces the risk of polyethylene debris generation.

Maximising Polyethylene Thickness

The Exceed Acetabular System also includes liners that are specific to the shell diameter. This **maximises polyethylene thickness** between the smallest and largest diameter components.

Liner Options

Liners are available in Standard, Hi-Wall and 10 degree versions. Standard liners should be used where stability of the joint is achieved at trial reduction. Hi-wall liner should be used where additional stability is required. 10 degree liner should be used where a shell may have been mal-aligned and increased anteversion is required.



Solid or Holed

The Exceed™ acetabular component incorporates a feature unique to Biomet Merck systems. Although supplied as a solid shell with an apical hole and apical hole blanking screw, the Exceed™ shell incorporates three screw holes that have been blanked with titanium alloy plugs. Each of these plugs can be removed from the shell intra-operatively by means of a specially designed plug removal instrument. This feature eliminates the need to carry both solid and holed shells thus reducing inventory and confusion.

Supplementary Screw fixation

Should primary stability not be achieved, supplementary screw fixation can be implemented using cancellous bone screws. These are available in a diameter of 6.5mm and lengths of 15mm to 50mm in 5mm increments. (NB. Prior to screw fixation, the titanium alloy plugs must first be removed).

Apical Hole

The apical hole allows for visual and tactile confirmation that the shell is fully seated within the acetabulum ensuring that a line to line fit is achieved. An apical hole blanking screw is supplied separately packed within the shell.



Articulating Surface Options

For intra-operative flexibility the Exceed™ system can be supplied with 3 articulating surface options. These options incorporate the use of ArCom® polyethylene. ArCom® is an isostatically moulded polyethylene that is sterilised in an inert argon atmosphere. ArCom® polyethylene has proven significantly better wear characteristics than traditionally manufactured polyethylene's. ^(8,9,10,11)

All Polyethylene Liner *(Fig. 01)*

All polyethylene liners are available with inner diameters of 22.225mm, 26mm and 28mm. The choice of inner diameter is dependent on the outer shell diameter chosen.

M²a (Metal on Metal) *(Fig. 02)*

The M2a liner incorporates a high nitrogen/high carbon chrome cobalt insert that has been moulded into the polyethylene liner. Stringent testing has validated the integrity of the liner/insert interface.⁽⁷⁾ These are available with an I.D. of 28mm.

C²a (Ceramic on Ceramic) *(Fig. 03)*

The C2a liner incorporates an Alumina insert moulded into a polyethylene liner. Again stringent testing has validated the integrity of the liner/inert interface.⁽¹³⁾ These are available with an I.D. of 28mm.



References

1. "Symposium: Porous Coating Methods: The Pros and Cons" Contemporary Orthopaedics, September 1993, pp. 269-296.
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4. Effect of Circumferential Plasma Spray Porous Coating on the Rate of Femoral Osteolysis after THR. Emerson, et. al. JBJS 1999.
5. Performance Characteristics of Two Piece Acetabular Cups. Series II. Greenwald, et.al. AAOS.
6. Motion at the Modular Acetabular Shell and Liner Interface. A Comparative Study. Fehring, et.al. Clin Orthop. 1999.
7. Integrity Testing of Moulded Inlay - Biomet Merck Ltd, - Data on File.
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10. Shroeder, Pzorki, 42nd AORS, Atlanta, GA. Feb. 1996.
11. Li et. al. 43rd AORS San Francisco, CA. Feb. 1997.
12. Strength of Liner Mechanism - Biomet Merck Ltd. Facility - data on file.
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Exceed™ acetabular system



Implants

Implants		
<i>Exceed Acetabular Shell - Catalogue Numbers</i>		
Shell Diameter	Hydroxyapatite & Porous Coated	Porous Coated
40mm	131133	130800
42mm	131134	130801
44mm	131113	130802
46mm	131114	130803
48mm	131115	130804
50mm	131116	130805
52mm	131117	130806
54mm	131118	130807
56mm	131119	130808
58mm	131120	130809
60mm	131121	130810
62mm	131122	130811
64mm	131123	130812
66mm	131124	130813



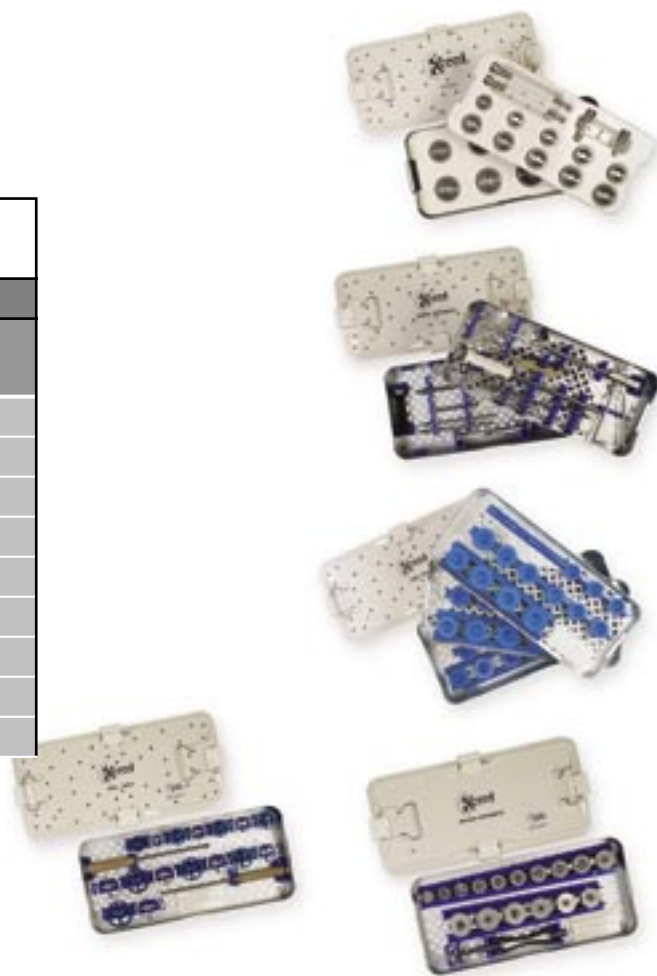
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Instruments

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