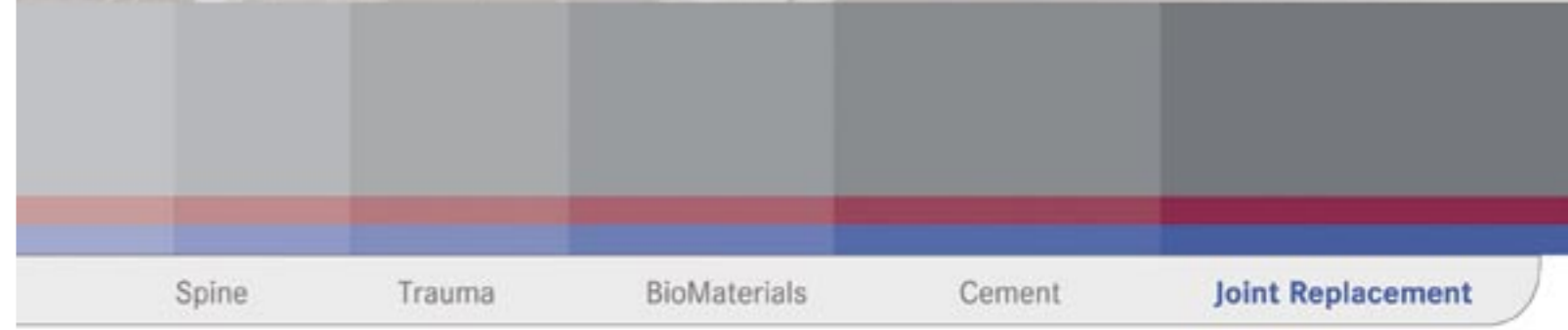




**Exceed™**  
Acetabular System



operative technique



## 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.



### Disclaimer

Biomet Europe, as the manufacturer of this device, does not practice medicine and does not recommend any particular surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and utilising the appropriate techniques for implanting the prosthesis in each individual patient. Biomet Merck is not responsible for selection of the appropriate surgical technique to be utilised for an individual patient.

## Pre-operative Planning

The goal of hip reconstruction is to attempt to reproduce the normal kinematics of the hip by recreating the functional geometry of the acetabulum and proximal femur. Pre-operative planning is mandatory to assess the operative challenges which will be encountered at surgery. The radiographic evaluation of the patient should include standard views: a standing anteroposterior view of the hip and proximal femur of the affected side which allows visualisation of the femur to the level of the isthmus. The degree of magnification should be known for the study. If this is unknown, radiographic markers can be utilised for assessment.

After initial inspection, the teardrop, representing the inferior margin of the medical acetabular wall, should be identified bilaterally. Using a radiographic marking pen place a point at the most inferior aspect of each teardrop. Next, draw a line connecting these points. Locate a point along this line one centimetre lateral to the inferior teardrop. This is the point at which the most inferomedial aspect of the acetabular component will lie when properly positioned. From this point, draw a second line superolaterally at 45 degrees to the first line. This 45 degree line will allow the surgeon to intraoperatively assess the degree of cup abduction and superolateral bone coverage. This eliminates dependence on knowing the position of the pelvis on the table. Using the marking pen, identify the most superior point of the acetabular dome. Measure the vertical distance between this point and the horizontal line and compare the measurement to the contralateral side. This measurement will allow identification of bone loss of the acetabular dome, which must be accounted for to correctly reconstruct the centre of rotation of the hip.

Using the acetabular templates, identify the cup sizes which best matches the profile of the acetabulum without excessive subchondral bone removal. The teardrop and iliopubic line should be used as reference points to determine medial cup placement. The inferior margin of the cup will sit at the level of the bottom of the teardrop. This area is at the level of the transverse ligament at surgery. The proper size acetabular component will not require removal of extensive subchondral bone. Measuring the mouth of the acetabulum from the teardrop to the superior rim represents an alternative technique to cup size measurement without templates (Fig. 01).



Fig. 01

## Step 01

### Patient Positioning

The Exceed™ acetabular cup can be implanted using any of the standard approaches for total hip arthroplasty. In any approach the goal is to achieve a full exposure of the proximal femur and the acetabulum. Full exposure of the hip joint allows a direct view down the femoral canal and the visualisation of the rim and depth of the acetabulum. Effective preparation of the bone and implantation can be carried out when these are realised.

## Reaming the Acetabulum

It is important to remove all soft tissue and any articular cartilage. In order to seat the acetabular component, some loss of subchondral bone may be inevitable.

Acetabular preparation is undertaken using the grater reamers supplied in the Exceed™ instrument trays (Fig. 02).



Fig. 02  
Showing how to assemble grater reamer.

***It is important to note that, whenever possible, subchondral bone particularly peripheral bone, should be preserved.***

The axis of the grater reamer should be positioned at 40 to 45 degrees from the vertical axis, and in 10 to 15 degrees of anteversion (Fig. 03).

Begin reaming with the smallest available grater reamer, increasing the diameter of each sequential grater reamer until the required diameter is achieved. The final grater reamer used should be equivalent to the diameter of acetabular shell to be implanted.

(e.g. 54mm diameter Exceed™ acetabular shell = 54mm diameter grater reamer).

***Note: If acetabular osteotomes are used, final shaping must still be achieved using the hemispherical grater reamer to ensure a congruent fit between the shell and the floor of the acetabulum.***



Fig. 03

## Step 02

## Step 03

### Gauging the Acetabulum

Thoroughly clean and dry the acetabulum.

Insert the acetabular shell gauge into the reamed acetabulum (Fig. 04). The diameter of the shell gauge should correspond to final diameter grater reamer used. Should there be gaps between the gauge and the acetabulum, it may be necessary to increase the diameter of the final grater reamer.

The acetabular gauges are used to:

- Check the acetabulum has been reamed to the correct size.
- Ensure the acetabulum is hemispherical.
- Check the inherent stability of the shell. If the gauge is tight within the prepared acetabulum, supplementary screw fixation may not be necessary. However, should the gauge be loose within the prepared acetabulum supplementary screw fixation will be necessary. If this is the case, then the blanking screws can be removed prior to shell impaction. See Step 08.



Fig. 04



Fig. 05



Fig. 06

## Step 04

### Acetabular Component Insertion

Upon correct sizing, attach the appropriate Exceed™ acetabular shell directly to the inserter handle as shown (Fig. 05).

To facilitate orientation of the shell, an acetabular alignment device is available (Fig. 06).

For correct positioning of the shell, the cluster of three dome holes should be positioned in the superior/posterior quadrant, with the cup impacted at 40 to 45 degrees of inclination from the horizontal axis of the pelvis and with 10 to 15 degrees anteversion.

The alignment rods shown in Fig. 06 allow for 15 degrees of anteversion. Should more than 15 degrees be required it will be necessary to antevert the device visually.



Fig. 07



Fig. 08

## Step 05

### Seating the Acetabular Component

Check via the apex hole to determine whether the shell is in full contact with bone. If not, the impactor handle must be re-attached to the shell and further impaction is required until the shell is fully seated. Failure to fully seat the shell into the acetabulum may compromise the quality of fixation (Fig. 07).

Once the shell is fully seated, the apical screw is threaded into position by means of the 2.5mm hexagonal screwdriver.

*The Exceed™ acetabular shell is supplied as a solid shell with the option of removing titanium blanking plugs intra-operatively should supplementary screw fixation be necessary.*

*After the shell has been correctly positioned within the acetabulum, it is important to check the position of the retaining circlip, as this can rotate during impaction. Ensure the two protrusions of the circlip are correctly located within the window (Fig. 08). Failure to do this, may result in damage to the liner retaining mechanism.*

## Step 06

### Trial Reduction

The acetabular liners for the Exceed™ acetabular shell are available in three styles. These are Standard, Hi-wall and 10-degree.

With the Exceed™ acetabular shell one has the opportunity to trial various liner options in order to optimise the joint stability. In the majority of cases, Standard or Hi-wall liners are used. However, if the shell has been positioned too vertical or too open, it is possible to change the inclination or antevert the bearing surface by use of the 10-degree liner. If a shell has been positioned in such a manner that even after trial reduction with a 10-degree liner joint stability has still not been achieved, it is recommended the shell be removed and repositioned correctly.

During trial reduction it is important to note the orientation of the trial liner, as this corresponds to the position of the definitive implant. It is important to remove any soft tissue or debris prior to insertion of the trial liner.

For stability, the Hi-wall or 10 degree feature of the trial liner should be placed in the optimum position.

**Do not mark or scratch the inside surface of the acetabular shell.**



Standard Trial Liner



Hi-Wall Trial Liner



10 Degree Trial Liner



Fig. 09

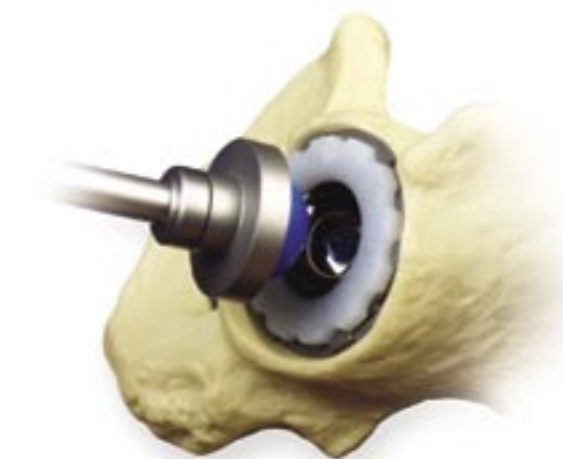


Fig. 10

### Acetabular Liner Insertion

## Step 07

Manually position the acetabular liner in the shell ensuring that orientation matches that of the trial liner. Use the acetabular liner pusher to fully impact the Arcom® polyethylene liner into the shell (Fig 09).

Check the liner is correctly seated. If the liner has not been seated correctly, the liner will either 'flip out' of the shell or will not sit flush with the acetabular shell. If the liner is removed by means of this test, first inspect the liner and ring for damage. If no damage is present, repeat the liner insertion instructions.

**After the shell has been correctly positioned within the acetabulum, it is important to check the position of the retaining circlip, as this can rotate during impaction. Ensure the two protrusions of the circlip are correctly located within the window (Fig. 08). Failure to do this, may result in damage to the liner retaining mechanism.**

**When M2a or C2a acetabular liners are to be inserted, ensure the blue plastic button is assembled with the impactor handle and impactor plate. This is used to prevent damage to the articulating surface (Fig. 10).**

## Step 08

### Blanking plug removal

For primary cases where good bone stock is present and the shell is fully seated, the use of fixation screws is generally unnecessary. However, in cases where motion can be detected between the shell and acetabulum, or where bone quality is not optimum, supplementary screw fixation is advised.

When the 6.5mm diameter dome screws are to be utilised they should be placed postero-superiorly into the thick part of the ilium.

Should screw fixation be necessary, the blanking plugs must be removed from the shell by means of a special plug removal instrument. (Fig. 11) In order to remove the blanking plugs one must first manually thread the plug removal adapter into the appropriate blanking plug. (Fig. 12) The plug removal instrument is then placed over the plug removal adapter; ensuring the tip of the plug removal instrument is inserted in the manner shown. (Fig. 13) The blanking plug is then extracted from the shell by squeezing both handles. This procedure is repeated until the required amount of blanking plugs are removed.

In many instances it is known prior to shell insertion and seating that supplementary screw fixation is necessary. If this is the case, the blanking plugs can be removed from the shell prior to insertion utilising the same procedure described above.



Fig. 11



Fig. 12



Fig. 13a



Fig. 13b



Fig. 14



Fig. 15

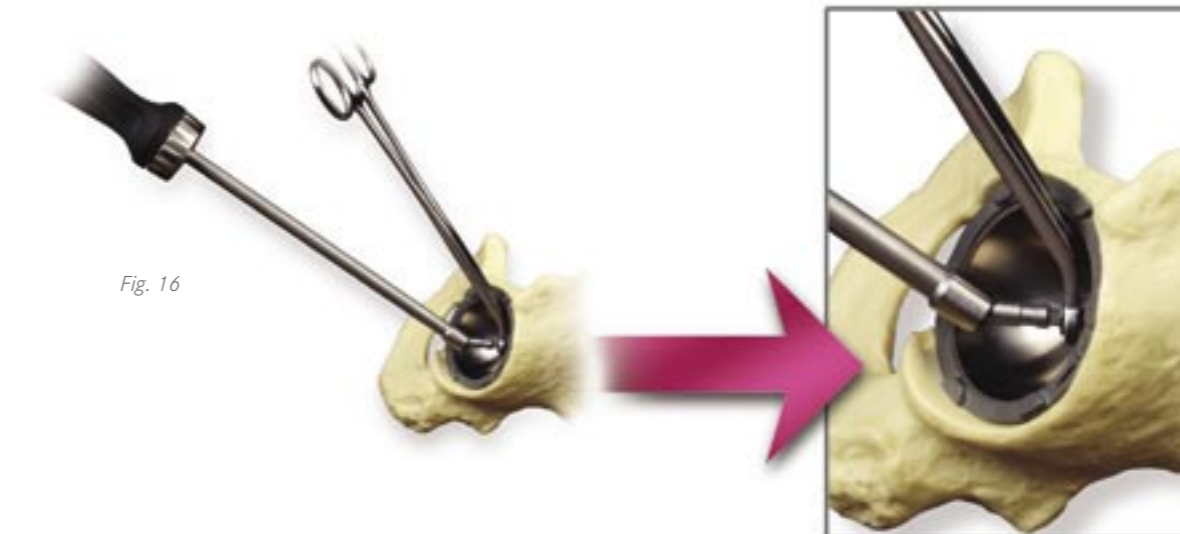


Fig. 16

## Supplementary Screw Fixation

Prepare the screw holes utilising the quick connect drill bits, the drill guide and the flexible drill bit shaft (Fig. 14).

Place a finger posteriorly into the sciatic notch to ensure the screws do not penetrate the posterior aspect of the hemipelvis.

**NOTE: Screws should never be placed in the anterior-medial area of the acetabulum.**

Measure the length of the drill holes with the flexible depth gauge (Fig. 15).

Insert the low profile dome screws using the forceps and universal joint screwdriver (Fig. 16).

**NOTE: To avoid impingement of the acetabular liner, check that all screw heads are seated below the inner surface of the shell.**

## Step 09

## Acetabular liner removal

If for some reason the final acetabular liner needs to be removed, this can be achieved with the aid of two special instruments. The liner removal instrument is first placed over the liner and the forceps are placed into the pocket. The forceps are then used to open the retaining ring whilst the liner removal instrument is squeezed and the liner removed (Fig. 17).

*It is recommended that the liner be fully inspected for damage before it is resealed. Should any damage be visible, it is recommended that a new liner be used. It is also necessary to check the retaining ring for damage. Should the retaining ring be damaged, spare rings are available.*



Fig. 17

## Acetabular shell removal

Should it be necessary to remove the Exceed™ acetabular component, first remove the acetabular liner as described above.

*All 6.5mm diameter cancellous bone screws must be removed prior to attempting shell removal. These are removed by means of the 3.5mm hexagon screwdriver (Fig. 18).*



Fig. 18

The shell is then removed by means of the shell removal instrument and threaded locking bolt. The corresponding shell removal device is first placed into the shell and secured in place by means of the threaded locking bolt. The slide hammer is then threaded into the locking bolt (Fig. 19).

*It is important to note that prior to using the slide hammer, the shell should be sufficiently loosened from the floor of the acetabulum. Failure to break the bone implant interface sufficiently will result in irreversible damage to the acetabulum.*



Fig. 19

## Exceed™ acetabular system



### Implants

Exceed Acetabular Shell - Catalogue Numbers		
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
68mm	131125	130814
70mm	131126	130815



Shell Diameter	RingLoc-X ArCom Acetabular Liner - Catalogue Numbers								
	Standard Liner			Hi-Wall Liner			10° Liner		
	22.22mm	26mm	28mm	22.22mm	26mm	28mm	22.22mm	26mm	28mm
40mm	11-044022	-	-	11-054022	-	-	11-064022	-	-
42mm	11-044222	-	-	11-054222	-	-	11-064222	-	-
44mm	11-044422	11-044426	-	11-054422	11-054426	-	11-064422	11-064426	-
46mm	11-044622	11-044626	11-044628	11-054622	11-054626	11-054628	11-064622	11-064626	11-064628
48mm	-	11-044826	11-044828	-	11-054826	11-054828	-	11-064826	11-064828
50mm	-	-	11-045028	-	-	11-055028	-	-	11-065028
52mm	-	-	11-045228	-	-	11-055228	-	-	11-065228
54mm	-	-	11-045428	-	-	11-055428	-	-	11-065428
56mm	-	-	11-045628	-	-	11-055628	-	-	11-065628
58mm	-	-	11-045828	-	-	11-055828	-	-	11-065828
60mm	-	-	11-046028	-	-	11-056028	-	-	11-066028
62mm	-	-	11-046228	-	-	11-056228	-	-	11-066228
64mm	-	-	11-046428	-	-	11-056428	-	-	11-066428
66mm	-	-	11-046628	-	-	11-056628	-	-	11-066628
68mm	-	-	11-046828	-	-	11-056828	-	-	11-066828
70mm	-	-	11-047028	-	-	11-057028	-	-	11-067028

# Exceed™ acetabular system

## Instruments

Catalogue Number	Description
31-100581	Exceed - General Instrument Tray Complete
31-100585	Exceed - Grater Reamer Tray Complete
31-100583	Exceed - Trial Liner Tray Complete
31-100607	Exceed - Trial Shell Tray Complete
31-100587	Exceed - Shell Removal Instrument Tray Complete
31-600026	Exceed - Blanking Plug Removal Adaptor
31-100591	Exceed - Quick Coupling Twist Drill 3.2/35mm
31-100592	Exceed - Quick Coupling Twist Drill 3.2/50mm
31-100593	Exceed - Quick Coupling Twist Drill 3.2/75mm
31-100626	Exceed - X-Ray Templates 110% Magnification
31-100627	Exceed - X-Ray Templates 115% Magnification
31-100628	Exceed - X-Ray Templates 120% Magnification



Shell Diameter	RingLoc-X Trial Acetabular Liner - Catalogue Numbers								
	Standard Liner			Hi-Wall Liner			10° Liner		
	22.22mm	26mm	28mm	22.22mm	26mm	28mm	22.22mm	26mm	28mm
40mm	31-044022	-	-	31-054022	-	-	11-064022	-	-
42mm	31-044222	-	-	31-054222	-	-	11-064222	-	-
44mm	31-044422	31-044426	-	31-054422	31-054426	-	11-064422	11-064426	-
46mm	31-044622	31-044626	31-044628	31-054622	31-054626	31-054628	11-064622	11-064626	31-064628
48mm	-	31-044826	31-044828	-	31-054826	31-054828	-	11-064826	31-064828
50mm	-	-	31-045028	-	-	31-055028	-	-	31-065028
52mm	-	-	31-045228	-	-	31-055228	-	-	31-065228
54mm	-	-	31-045428	-	-	31-055428	-	-	31-065428
56mm	-	-	31-045628	-	-	31-055628	-	-	31-065628
58mm	-	-	31-045828	-	-	31-055828	-	-	31-065828
60mm	-	-	31-046028	-	-	31-056028	-	-	31-066028
62mm	-	-	31-046228	-	-	31-056228	-	-	31-066228
64mm	-	-	31-046428	-	-	31-056428	-	-	31-066428
66mm	-	-	31-046628	-	-	31-056628	-	-	31-066628
68mm	-	-	31-046828	-	-	31-056828	-	-	31-066828
70mm	-	-	31-047028	-	-	31-057028	-	-	31-067028

**28mm trial liners are supplied complete within Exceed Trial Liner Tray 31-100583**