Trabecular Metal™ Natural Cup System

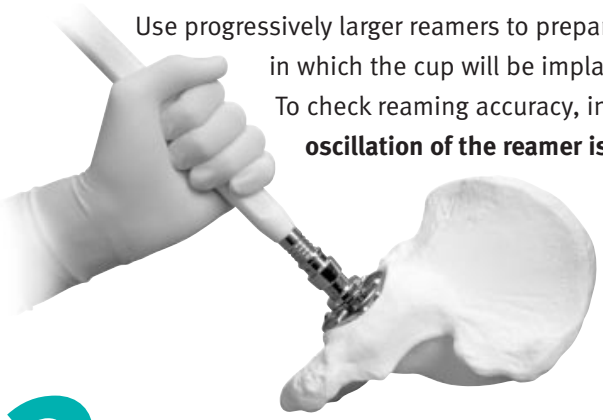
Surgical Technique

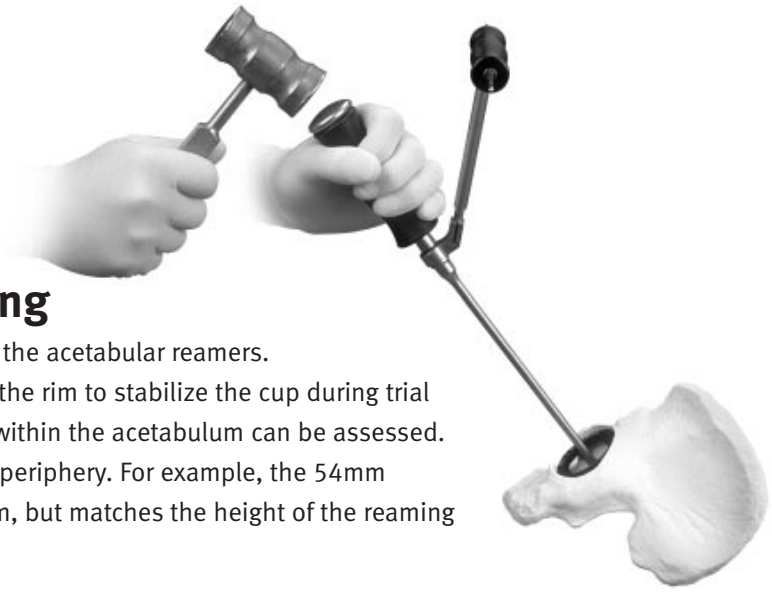
Performance like nature intended... The Best Thing Next to Bone™

zimmer
Confidence in your hands®

1 Acetabular Reaming

Use progressively larger reamers to prepare the acetabulum. Hold the reamer steady in the same position in which the cup will be implanted (approximately 45° of abduction and 15° of anteversion). To check reaming accuracy, insert the provisional shell into the acetabulum. **Note: Gross oscillation of the reamer is not required.**

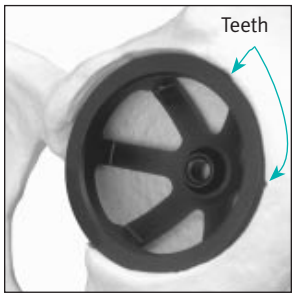


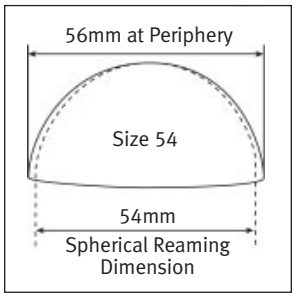


2 Shell Sizing and Positioning

Provisional shell sizes match the outside dimensions of the acetabular reamers.
The provisional shell has protruding 1mm teeth around the rim to stabilize the cup during trial reduction. It also has fenestrations so that cup seating within the acetabulum can be assessed. The elliptical cup provides 2mm of interference fit at its periphery. For example, the 54mm Acetabular Cup has an outer diameter of 56mm at its rim, but matches the height of the reaming at the polar dome of the cup.

Select the provisional shell that is the same size as the last even-numbered reamer used. Screw the Provisional Shell Impactor Handle into the provisonal shell. Place the T-handled Version Guide into the slot on the Impactor Handle. When the Version Guide is perpendicular to the longitudinal axis of the patient, the provisional shell is properly positioned at 45° of abduction. Note the position of the provisional shell so that the cup implant can be seated in the same position.

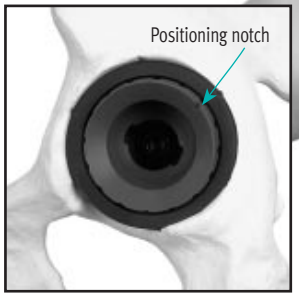




Elliptical geometry of the shell provides a 2mm interference fit at the periphery and implant-bone contact at the dome.

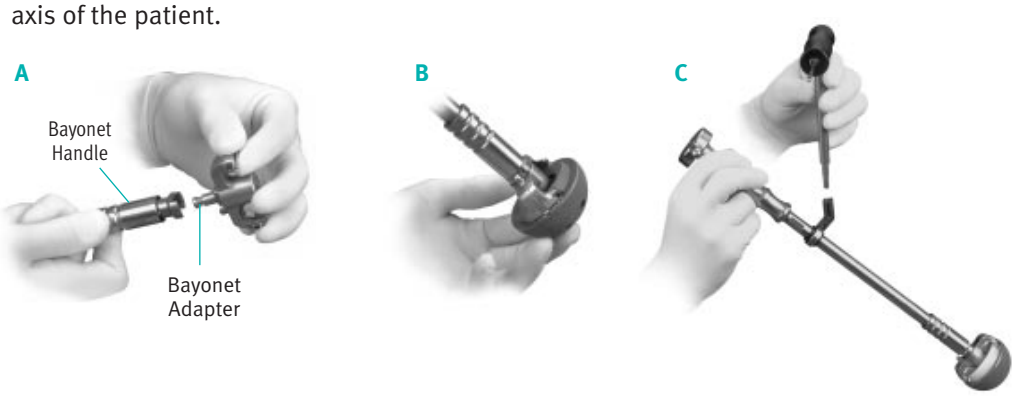
3 Provisional Liner and Trial Range of Motion

Select the provisional liner that matches the previously selected provisional shell. Perform trial reduction. After determining the appropriate face angle and position, mark the bone opposite the positioning notch on the liner. This mark serves as a reference later when positioning the Acetabular Cup. Remove the provisional liner.



4 Instrument Assembly

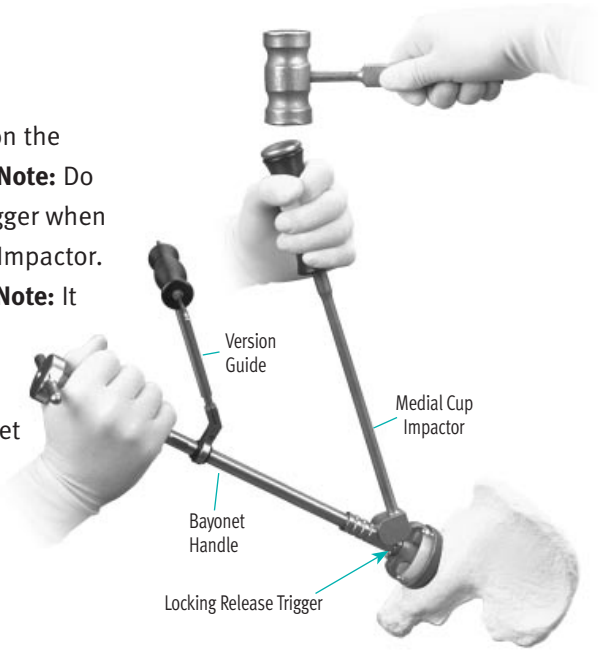
Assemble the Bayonet Adapter and the Bayonet Handle (A). Then, with the Bayonet Adapter positioned on the flat portion of the rim of the Acetabular Cup, turn the adapter until it locks into place (B). Place the Version Guide on the Bayonet Handle (C). During impaction, the Version Guide should again be aligned perpendicular to the longitudinal axis of the patient.

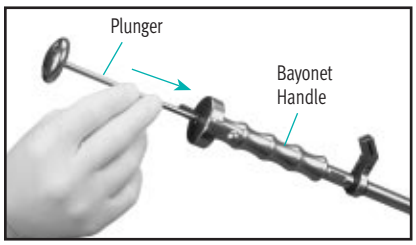


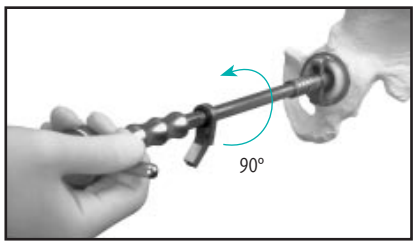
5 Cup Insertion

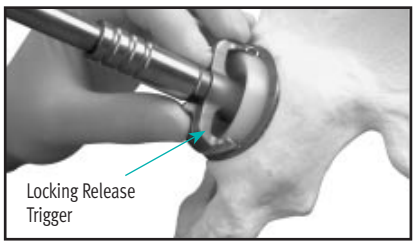
Align the reference mark on the cup with the one previously made on the bone. Place the Medial Cup Impactor against the Bayonet Adapter. **Note:** Do not place the Medial Cup Impactor shaft on the Locking Release Trigger when impacting the cup. Initially seat the cup by tapping the Medial Cup Impactor. Seat the cup in its final position by impacting the Bayonet Handle. **Note:** It is important to ensure the Plunger is **NOT** in the Bayonet Handle during impaction.

To release the cup after impaction, slide the Plunger into the Bayonet Handle. Depress the Plunger until the key lifts out of the slot in the cup, then rotate the Bayonet Handle 90° to free it from the cup locking slot. Alternatively, the cup can be disengaged by pushing the Locking Release Trigger at the distal end of the Bayonet Handle.



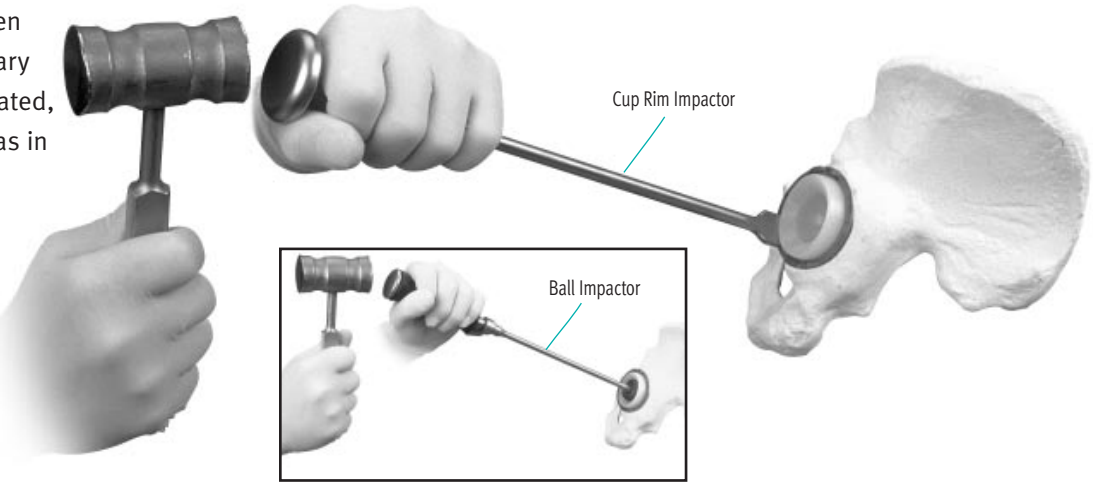






6 Final Reduction

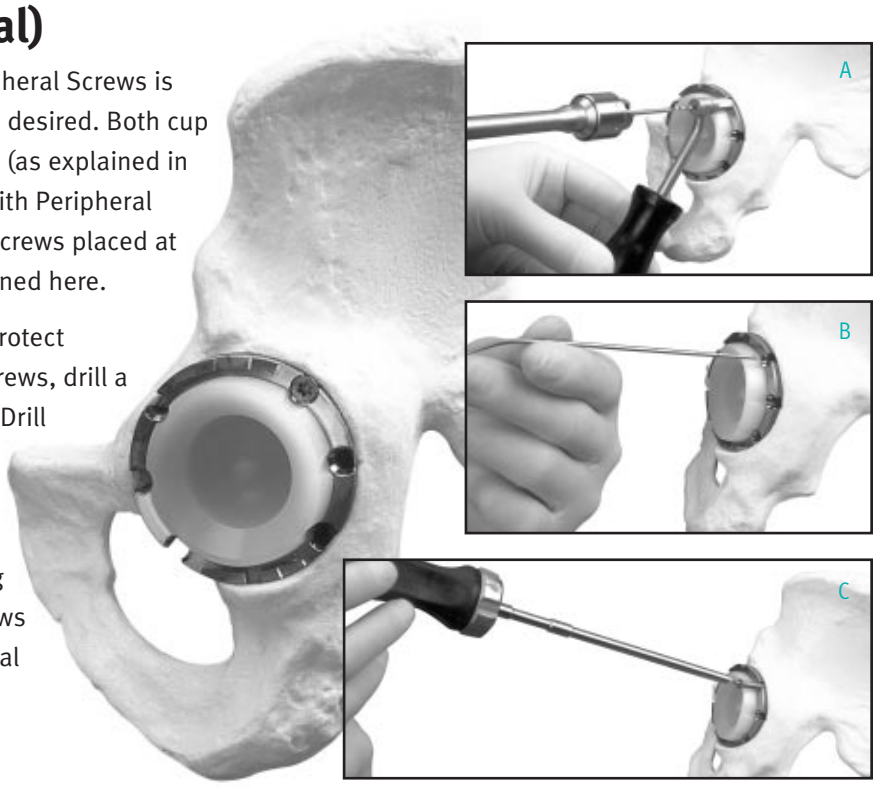
With the Acetabular Cup implanted, reduce the hip and assess range of motion, stability, and limb length. If the cup needs to be repositioned, impact the rim of the cup using the Cup Rim Impactor to adjust the face angle. After the correct position has been achieved, it may be necessary to ensure that the cup is seated, using the Bayonet Handle (as in Step 5) or the Ball Impactor (Provisional Shell Impactor Handle assembled to Acetabular Impactor Head).



7 Peripheral Screw Placement (Optional)

A *Trabecular Metal* Natural Cup with Peripheral Screws is available if ancillary peripheral fixation is desired. Both cup styles use an identical surgical technique (as explained in Steps 1 through 6), except that the cup with Peripheral Screws must be impacted in Step 5 and screws placed at the conclusion of the procedure as explained here.

Avoid anteromedial screw placement to protect neurovascular structures. To place the screws, drill a pilot hole by placing the drill through the Drill Guide in the desired screw hole (A). Measure the hole's depth with the Depth Gauge (B). Select the appropriate length 5.0mm screw and seat it in the hole using the Screwdriver (C). Place additional screws as necessary. **Note:** Only 5.0mm Peripheral Bone Screws should be used with the *Trabecular Metal* Natural Cup.



Trabecular Metal Material

Ten years of ongoing clinical success for *Trabecular Metal* material is attributed to its unique combination of characteristics. The material is designed to replicate the **natural** properties of bone, including the structure, porosity, elasticity, and weight-bearing characteristics. The benefits include:

- An excellent scratch fit for proven initial fixation without screws [1-3]
- A high porosity that yields enhanced fixation through rapid and extensive bone ingrowth [4-10]
- Statistically improved gap filling to provide more bone for direct implant support [1-3,9,10]

Flexible Monoblock Construct

Polyethylene is compression molded directly into the *Trabecular Metal* material. This is possible because *Trabecular Metal* material is a highly porous, three-dimensional, self-supporting biomaterial. The benefits include:

- A more flexible construct reduces the potential for stress shielding [11, 12]
- No backside motion between the liner and shell, significantly reduces the potential for backside polyethylene wear [13]
- Elimination of pathways for debris to pass through the shell to the acetabulum since there are no dome screw holes

MIS Friendly & Time Saving

By eliminating steps in the procedure, the cup potentially saves OR time and is more MIS friendly.

- Fixation is achieved without screws, eliminating the step of drilling and inserting screws
- The monoblock design eliminates the step of inserting a liner

1 R.J. Lewis, A.S. Unger, et al. Monoblock Trabecular Metal Acetabulum – 2-to-5 Year Results. Scientific Exhibit, 2003 AAOS Annual Meeting, New Orleans, LA.

2 T. Gruen, M. Christie, et al. Radiographic Evaluation of a Non-modular Acetabular Cup – A 2-to-5 Year Multi-Center Study. Scientific Exhibit, 2004 AAOS Annual Meeting, San Francisco, CA.

3 T.A. Gruen, R.A. Poggie, et al. Radiographic Evaluation of a Monoblock Acetabular Component – A Multicenter Study with 2-to-5 Year Results. JOA, Apr. 2005; Vol. 20, No. 3.

4 J. Black, Department of Bioengineering, Clemson University. Biologic Performance of Tantalum. Clinical Materials 16 (1994)167-173 ©1994 Elsevier Science Limited.

5 J.D. Bobyn, G.J. Stackpool, et al. Characteristics of bone ingrowth and interface mechanics of a new porous tantalum biomaterial. JBJS, Sept. 1999, Vol. 81-B, No. 5.

6 J.D. Bobyn, S.A. Hacking, et al. Characterization of a new Porous Tantalum Biomaterial for Reconstructive Orthopaedics. Scientific Exhibit, 1999 AAOS Annual Meeting, Anaheim, CA.

7 S.A. Hacking, J.D. Bobyn, et al. Fibrous Tissue Ingrowth and Attachment to Porous Tantalum. Journal of Biomedical Materials Research, 2000; Vol. 51, No. 4: pp 631-638.

8 D.A. Shimko, V.F. Shimko, et al. Effect of porosity on the fluid flow characteristics and mechanical properties of tantalum scaffolds. Published online, Feb. 2005, in Wiley Interscience (www.interscience.wiley.com).

9 G.A. Macheras, P.J. Papagelopoulos, et al. Radiological evaluation of the metal-bone interface of porous tantalum monoblock acetabular component. JBJS (Br). Mar. 2006; Vol. 88, No. 3: pp 304-309.

10 D.G. Lewallen, M. Meneghini, et al. Revision hip arthroplasty with porous tantalum augments and acetabular shells. Scientific Exhibition: 2006 AAOS Annual Meeting; Mar 22-26; Chicago, IL.

11 Pedersen DR, Brown TD, Poggie RA. FEA of peri-acetabular stress of cemented, metal-backed, and porous tantalum-backed acetabular components. Presented at: 45th Annual Meeting of the Orthopaedic Research Society; Feb. 1-4, 1999. Anaheim, CA.

12 Rawlinson JJ, Wright TM, Bartel DL. FEA of a porous tantalum monoblock tibia compared with a metal-backed tibial component. Presented at: 51st Annual Meeting of the Orthopaedic Research Society; Feb. 2005; Washington, D.C.

13 A.S. Lisky. Elimination of cup-liner micromotion in acetabular components.Presented at American Society for Biomaterials Annual Meeting, 1999.

Ordering Information

Implants

Non-holed Cups – 0° Liner

Prod. No.	Description
00-7255-040-22	0° Cup, 40mm OD x 22mm ID
00-7255-042-22	0° Cup, 42mm OD x 22mm ID
00-7255-044-22	0° Cup, 44mm OD x 22mm ID
00-7255-046-22	0° Cup, 46mm OD x 22mm ID
00-7255-048-28	0° Cup, 48mm OD x 28mm ID
00-7255-050-28	0° Cup, 50mm OD x 28mm ID
00-7255-052-32	0° Cup, 52mm OD x 32mm ID
00-7255-054-32	0° Cup, 54mm OD x 32mm ID
00-7255-056-32	0° Cup, 56mm OD x 32mm ID
00-7255-058-32	0° Cup, 58mm OD x 32mm ID
00-7255-060-32	0° Cup, 60mm OD x 32mm ID
00-7255-062-32	0° Cup, 62mm OD x 32mm ID
00-7255-064-32	0° Cup, 64mm OD x 32mm ID
00-7255-066-32	0° Cup, 66mm OD x 32mm ID
00-7255-068-32	0° Cup, 68mm OD x 32mm ID
00-7255-070-32	0° Cup, 70mm OD x 32mm ID

Non-holed Cups – 10° Liner

Prod. No.	Description
00-7260-040-22	10° Cup, 40mm OD x 22mm ID
00-7260-042-22	10° Cup, 42mm OD x 22mm ID
00-7260-044-22	10° Cup, 44mm OD x 22mm ID
00-7260-046-22	10° Cup, 46mm OD x 22mm ID
00-7260-048-28	10° Cup, 48mm OD x 28mm ID
00-7260-050-28	10° Cup, 50mm OD x 28mm ID
00-7260-052-32	10° Cup, 52mm OD x 32mm ID
00-7260-054-32	10° Cup, 54mm OD x 32mm ID
00-7260-056-32	10° Cup, 56mm OD x 32mm ID
00-7260-058-32	10° Cup, 58mm OD x 32mm ID
00-7260-060-32	10° Cup, 60mm OD x 32mm ID
00-7260-062-32	10° Cup, 62mm OD x 32mm ID
00-7260-064-32	10° Cup, 64mm OD x 32mm ID
00-7260-066-32	10° Cup, 66mm OD x 32mm ID
00-7260-068-32	10° Cup, 68mm OD x 32mm ID
00-7260-070-32	10° Cup, 70mm OD x 32mm ID

Screw-holed Cups – 10° Liner

Prod. No.	Description
00-7210-040-22	10° Cup, 40mm OD x 22mm ID
00-7210-042-22	10° Cup, 42mm OD x 22mm ID
00-7210-044-22	10° Cup, 44mm OD x 22mm ID
00-7210-046-22	10° Cup, 46mm OD x 22mm ID
00-7210-048-28	10° Cup, 48mm OD x 28mm ID
00-7210-050-28	10° Cup, 50mm OD x 28mm ID
00-7210-052-28	10° Cup, 52mm OD x 28mm ID
00-7210-054-28	10° Cup, 54mm OD x 28mm ID
00-7210-056-28	10° Cup, 56mm OD x 28mm ID
00-7210-058-28	10° Cup, 58mm OD x 28mm ID
00-7210-060-28	10° Cup, 60mm OD x 28mm ID
00-7210-062-28	10° Cup, 62mm OD x 28mm ID
00-7210-064-28	10° Cup, 64mm OD x 28mm ID
00-7210-066-28	10° Cup, 66mm OD x 28mm ID
00-7210-068-28	10° Cup, 68mm OD x 28mm ID
00-7210-070-28	10° Cup, 70mm OD x 28mm ID

Instruments

Prod. No.	Description
00-7000-015-20	**Core Instrument Set**
00-7040-040-00	Provision Shells, 40mm (2mm increments)
Through ↓	Through ↓
00-7040-070-00	Provision Shells, 70mm (2mm increments)
00-7045-040-00	Bayonets, 40mm (2mm increments)
Through ↓	Through ↓
00-7045-070-00	Bayonets, 70mm (2mm increments)
00-7050-030-00	Cup Rim Impactor
00-7050-031-00	Cup Version Guide
00-7050-032-00	Provisional Liner Extractor
00-7050-033-00	Bayonet Handle & Plunger
00-7050-034-00	Provisional Shell Impactor Handle
00-7050-035-00	Medial Cup Impactor
00-7050-001-22	Acetabular Impactor Head – 22mm
00-7050-001-28	Acetabular Impactor Head – 28mm
00-7050-001-32	Acetabular Impactor Head – 32mm
00-7050-010-00	Instrument Case Assembly

With each core set, order one of the following liner trial trays.
– liner trial trays stack and assemble to core set

Prod. No.	Description
00-7000-015-25	**Non-holed Cups – 0° Liner Trial Tray**
00-7360-040-22	0° Liner Trials, 40mm OD x 22mm ID
Through ↓	Through ↓
00-7360-046-22	0° Liner Trials, 46mm OD x 22mm ID
00-7360-048-28	0° Liner Trials, 48mm OD x 28mm ID
Through ↓	Through ↓
00-7360-050-28	0° Liner Trials, 50mm OD x 28mm ID
00-7360-052-32	0° Liner Trials, 52mm OD x 32mm ID
Through ↓	Through ↓
00-7360-070-32	0° Liner Trials, 70mm OD x 32mm ID
00-7360-010-00	Instrument Tray Assembly

Prod. No.	Description
00-7000-015-26	**Non-holed Cups – 10° Liner Trial Tray**
00-7361-040-22	10° Liner Trials, 40mm OD x 22mm ID
Through ↓	Through ↓
00-7361-046-22	10° Liner Trials, 46mm OD x 22mm ID
00-7361-048-28	10° Liner Trials, 48mm OD x 28mm ID
Through ↓	Through ↓
00-7361-050-28	10° Liner Trials, 50mm OD x 28mm ID
00-7361-052-32	10° Liner Trials, 52mm OD x 32mm ID
Through ↓	Through ↓
00-7361-070-32	10° Liner Trials, 70mm OD x 32mm ID
00-7360-010-00	Instrument Tray Assembly

Prod. No.	Description
00-7000-015-27	**Screw-holed Cups – 10° Liner Trial Tray** (supplemental to Non-holed 10° liner trial tray)
00-7361-052-28	10° Liner Trials, 52mm OD x 28mm ID
Through ↓	Through ↓
00-7361-070-28	10° Liner Trials, 70mm OD x 28mm ID
00-7360-010-00	Instrument Tray Assembly

Peripheral Bone Screws

Prod. No.	Description
00-7250-050-20	Peripheral Bone Screw, 5mm x 20mm
00-7250-050-25	Peripheral Bone Screw, 5mm x 25mm
00-7250-050-30	Peripheral Bone Screw, 5mm x 30mm
00-7250-050-35	Peripheral Bone Screw, 5mm x 35mm
00-7250-050-40	Peripheral Bone Screw, 5mm x 40mm
00-7250-050-45	Peripheral Bone Screw, 5mm x 45mm
00-7250-050-50	Peripheral Bone Screw, 5mm x 50mm
00-7250-050-55	Peripheral Bone Screw, 5mm x 55mm
00-7250-050-60	Peripheral Bone Screw, 5mm x 60mm
00-7250-050-65	Peripheral Bone Screw, 5mm x 65mm

Prod. No.	Description
00-7000-016-00	**Peripheral Bone Screw Instrument Set**
00-7050-070-00	Screw Instrument Case
00-7050-040-00	Screwdriver Ratchet Handle
00-7050-041-00	Rigid Screwdriver Shaft
00-7050-042-00	Flexible Screwdriver Shaft
00-7050-043-00	Drill Guide
00-7050-044-00	Drill Bit, 2.3mm (quantity 4)
00-7050-045-00	Depth Gauge
00-7050-046-00	Drill Chuck w/shaft

Please refer to package insert for complete product information, including contraindications, warnings, precautions, and adverse effects.

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