clinically proven material.

advanced porous technology.

REGENEREX™ RINGLOC®+
Modular Acetabular System
RINGLOC®+: NEXT GENERATION CUP FEATURES

Building on the success of unparalleled RingLoc® technology, the new RingLoc®+ shell design offers next generation cup features paired with advanced Regenerex™ porous titanium construct.

Extended rim
Designed to prevent soft tissue entrapment between shell and liner

Regenerex™ Porous Titanium Construct
Unites clinical history of titanium with an enhanced interconnecting pore structure for rapid bone ingrowth.
Large dome hole
Designed for ease of insertion

Un-lock/re-lock mechanism
Allows for easy disassembly without damaging the liner**

Solid
Limited hole
Multi-hole

**Any time the liner is removed, it is recommended that the locking ring be removed and replaced with a new one. If the liner is damaged in any way, a new liner should be utilized.
Biomet’s RingLoc® acetabular components have redefined the standard of acetabular technology. Testing by independent laboratories has rated RingLoc® technology among the highest in terms of push-out, lever-out and congruity of the implant as well as the lowest in micromotion.²⁻⁵

**RINGLOC®: UNPARALLELED LOCKING TECHNOLOGY**

Unparalleled RingLoc® locking technology
Achieves maximum push-out and lever-out strength with lowest micromotion of independently tested competitive systems²⁻⁵

Fully congruent design
Maximizes congruency at the liner-to-shell interface to help minimize micromotion
Ultra-low wear with large heads
Combine with E-Poly™ HXLPE for the optimal combination of fixation and low wear. 40mm E-Poly™ liners demonstrated 95% lower wear than 36mm clinically proven ArCom® liners.

Anti-rotational tabs
Six or eight tabs create an interference fit with the notches on the liner to provide for maximum rotational stability and minimum micromotion.

Volumetric Wear
5 million cycles on a hip simulator 28mm head size

<table>
<thead>
<tr>
<th>Material</th>
<th>Volumetric Wear Rate mm³/10⁶ Cycles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-HXLPE</td>
<td>53.3</td>
</tr>
<tr>
<td>ArCom® HXLPE</td>
<td>29.4</td>
</tr>
<tr>
<td>E-Poly™ HXLPE</td>
<td>0.24</td>
</tr>
</tbody>
</table>
VERSATILE MODULAR DESIGN FEATURING REGENEREX™ POROUS TITANIUM CONSTRUCT

Regenerex™ Porous Titanium Construct is a revolutionary technology engineered for rapid bone ingrowth by uniting the proven clinical history of titanium with an enhanced interconnecting pore structure. Integrated with Biomet’s unparalleled RingLoc® technology, only the Regenerex™ RingLoc®+ Modular Shell offers new next generation RingLoc®+ cup features, which have been engineered to meet the needs of the orthopedic community.

Rapid bone integration
- Two weeks after insertion, Regenerex™ implants displayed bony integration and vascularization.
- In similar canine studies, Regenerex™ material demonstrated more rapid ingrowth than Zimmer’s Trabecular Metal™.

Initial stability
- 16% rougher than Trabecular Metal™, the initial scratch-fit, stability and fixation of Regenerex™ implants is well-suited for acetabular reconstruction.

Bone ingrowth

<table>
<thead>
<tr>
<th>Time</th>
<th>Regenerex™</th>
<th>Trabecular Metal™</th>
<th>No testing data available</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Weeks</td>
<td>80%</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>4 Weeks</td>
<td>90%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>16 Weeks</td>
<td>100%</td>
<td>60%</td>
<td></td>
</tr>
<tr>
<td>26 Weeks</td>
<td>110%</td>
<td>70%</td>
<td></td>
</tr>
<tr>
<td>52 Weeks</td>
<td>120%</td>
<td>80%</td>
<td></td>
</tr>
</tbody>
</table>

Average roughness (Ra)

- Regenerex™: 2485.6 μm
- Trabecular Metal™: 2079.2 μm

No testing data available
Strong, yet flexible

- 300% stronger than Trabecular Metal™ under compressive loads¹, which reduces the risk of material failure.
- Maintains a compressive modulus similar to cancellous bone.

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![Graph of peak compressive stress and compressive modulus](image)

PEAK COMPRESSION STRESS

- Cortical Bone: 270 MPa
- Cancellous Bone: 21 MPa
- Regenerex™: 157 MPa
- Trabecular Metal: 50 MPa

COMPRESSION MODULUS

- Cortical Bone: 18 GPa
- Cancellous Bone: 2 GPa
- Regenerex™: 1.9 GPa
- Trabecular Metal: 1.5 GPa
RINGLOC® TECHNOLOGY: PROVEN AFTER 15 YEARS OF CLINICAL USE

Various forces including toggling, levering and rotation are present during normal acetabular kinematics. To extend acetabular component life and help reduce potential debris generation, the shell-to-liner locking mechanism must be sound. Independent labs have consistently rated Biomet’s RingLoc® cups among the best.

- Proven to be a superior locking mechanism for polyethylene liners²⁻⁵
- High strength of the locking mechanism helps prevent liner disassociation from the shell
- Fully supported liner for even stress distribution
- Lowest micromotion of all tested systems to help eliminate debris generation

### Strength of the locking mechanism to help prevent liner disassociation from the shell

<table>
<thead>
<tr>
<th>System Name</th>
<th>Initial Push-Out</th>
<th>Initial Lever-Out</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zimmer Trilogy®</td>
<td>722+</td>
<td>408+</td>
</tr>
<tr>
<td>Biomet Ringloc®</td>
<td>660+</td>
<td>660+</td>
</tr>
<tr>
<td>DePuy Duraloc®</td>
<td>663</td>
<td>647</td>
</tr>
<tr>
<td>Smith &amp; Nephew Reflection®</td>
<td>65</td>
<td>92</td>
</tr>
</tbody>
</table>

![Diagram showing comparison of initial push-out and lever-out forces for different systems.](attachment:image)

### Support of the liner leading to even stress distribution to help improve liner life

<table>
<thead>
<tr>
<th>System Name</th>
<th>Percent (%) of Unsupported Polyethylene</th>
<th>Contact Area of Supported Polyethylene (sq. cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smith &amp; Nephew Reflection®</td>
<td>13.5</td>
<td>24.1</td>
</tr>
<tr>
<td>Biomet Ringloc®</td>
<td>15.4</td>
<td>21.1</td>
</tr>
<tr>
<td>Zimmer Trilogy®</td>
<td>27.6</td>
<td>20.8</td>
</tr>
<tr>
<td>DePuy Duraloc®</td>
<td>34.1</td>
<td>19.7</td>
</tr>
</tbody>
</table>

![Diagram showing comparison of unsupported polyethylene percentages and contact areas for different systems.](attachment:image)
VERSATILITY WHEN YOU NEED IT MOST...

Multiple augment options
- Designed to help maximize acetabular stability
- Available in 12 sizes with multiple screw holes
- Augments can be stacked for complex reconstruction
- Ideal option for complicated revision surgery

Multiple liner configurations
- Available in...

Max-Rom™ Liner
10-Degree Liner
Hi-Wall Liner
+5mm Hi-Wall Liner
Ultra-low wear with large heads

- Combine with E-Poly™ HXLPE for the optimum combination of fixation and low wear
- 40mm E-Poly™ liners demonstrated 95% lower wear than 36mm ArCom® liners

Maximum resistance to dislocation

- Combine with Biomet’s Freedom® Constrained Liner for patients at high dislocation risk
- Allows for 110 degrees range of motion
- Multiple liner options
References


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Reflection® is a registered trademark of Richards Smith & Nephew, Inc.

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