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Smith & Nephew thanks the following surgeons for their participation as part of the REDAPT™ Revision Acetabular System design team:

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**REDAPT™**
**Fully Porous Revision Shell**

Our pioneering approach to the design of our products is vividly displayed through the REDAPT Fully Porous Cup, developed for use in revision cases where compromised bone makes implant fixation and stability more difficult. To allow ingrowth, an additive, or 3D, manufacturing process is used to produce an entirely porous implant that is intended to mimic the structure of cancellous bone. Additionally, new variable-angle locking screws can be used to enhance implant stability and minimize micromotion after surgery.

**CONCELOC™**
**Advanced Porous Titanium**

**Material composition:** Titanium Alloy
CONCELOC is made from Ti-6Al-4V and meets the ASTM and ISO standards for that alloy, which has been shown to be biocompatible and has a good clinical history with over 40 years of use in medical devices.¹

**Porosity:** Up to 80%
CONCELOC Advanced Porous Titanium has an interconnected network of pores with a porosity of up to 80% in the near-surface regions, where the initial fixation will occur and an overall porosity of up to about 67%.² These porosities are similar to the wide range of 60-80% porosity reported for other advanced porous structures currently on the market.³⁻⁷

**Pore size:** 202μm to 934μm
The literature suggests that pore sizes greater than about 100μm benefit biological fixation.⁸,⁹ CONCELOC Advanced Porous Titanium has an average pore size that ranges from 202 to 342μm overall and from 484 to 934μm at the surfaces of the porous structure.²,¹⁰
Stability

Variable angle locking screws

For bone ingrowth to occur, it is critical that implants remain stable. It has been reported that as little as 150 microns of motion can interrupt the process of bone ingrowth.¹¹

Screws have historically been used as a means to provide adjunctive fixation. The introduction of REDAPT Variable Angle Locking Screws gives the surgeon the option to further enhance the rigidity of the construct. Our internal testing has shown that REDAPT Variable Angle Locking Screws create a construct with greater than 7x the rigidity of a construct using non-locking screws.¹²

- Variable angle lock up to 12° (included angle)
- Increased stiffness in static bending compared to non-locking screws
- 6.5mm cancellous thread
- Lengths: 15mm – 50mm

Bending stiffness data for locking and non-locking screws. REDAPT Locking Screws tightened at a 6° angle to 35 and 50 in-lbf (4.0 and 5.6 N-m) were significantly stiffer than non-locking screws (p < 0.05). The error bars represent the standard deviations.¹²

*Represents significant difference from non-locking screws.

High friction surface

The high friction surface of the CONCELOC Advanced Porous Titanium is designed to aid in achieving the initial stability needed to hold the implant in place upon insertion.

- Topographically mapped “bumps” on all bone-interfacing surfaces
- Patented design feature
- Benefit of additive manufacturing

Three dimensional model before and after application of friction bumps.
Adaptability

**Optimized screw hole pattern**

- 9-Hole (48mm-58mm)
- 12-Hole (60mm-80mm)
- Designed to reduce the risk of “drill through”

**Cemented liners**

- Multiple size options
- Self aligning flange built into rim
- Uniform 1.5mm cement mantle

Reproducibility

**Solid reinforcement features internalized**

- Balances demand between solid support features and porous ingrowth surfaces
- High-demand areas bolstered for added strength

**Threaded Apex Hole**

- Designed to simplify technique through compatibility with standard shell impactor instrumentation
- Designed to enhance visualization
- Consistent joint stability assessment using available screw-in trial liners
Implant overview

REDAPT°
Fully Porous Shell

Cemented XLPE Liners

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Locking Screws
15 – 50mm

Porous Cup Hole Cover
References:
2. Smith & Nephew Research report. OR-14-091A.

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