Design Rationale
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Our pioneering approach to the design of our products is vividly displayed through the REDAPT Acetabular Augments, developed for use in revision total hip arthroplasty cases where bone voids exist that may not be able to be addressed solely through placement of an acetabular shell. Augments can aid in the restoration of the native hip center where using a cup alone may produce a “high hip center”.¹ To allow ingrowth, an additive, or 3D printing manufacturing process is used to produce an entirely porous implant that is intended to mimic the structure of cancellous bone. Bone conserving shapes designed to help mitigate the need to remove excessive native bone stock. Additionally, new variable-angle locking screws can be used in addition to standard spherical head screws 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 an excellent clinical history with over 40 years of use in medical devices.²

**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%.³ These porosities are similar to the wide range of 60 – 80% porosity reported for other advanced porous structures currently on the market.⁴-⁸

**Pore size:** 202μm to 934μm
The literature suggests that pore sizes greater than about 100μm benefit biological fixation.⁹,¹⁰ 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.³,¹¹
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.¹²

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. Traditional, spherical head screws or REDAPT Variable Angle Locking Screws can be used in any of the available screw holes on the REDAPT Acetabular Augments.

- Variable angle lock up to 12° (included angle)
- Increased stiffness in static bending compared to non-locking screws¹³
- 6.5mm cancellous thread
- Lengths: 15mm – 50mm

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
Adaptability

Two styles to address varying defects

- **Staple** – Allows the Augment to span around a screw that is placed through the cup into the acetabulum
- **Slice** – Provides additional support where defects may be present in the more medial aspects of the acetabulum

**Optimized screw hole pattern** (Slice implants only)

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**Augment Holding Forceps**

- Allows placement of REDAPT Acetabular Augments with minimal tissue interference

**Four thickness options – 8, 12, 18 and 24mm**

- Addresses wide range of defect sizes
- Helps restore anatomic hip center

**One Augment fits multiple shell diameters**

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Reproducibility

**Trials**
- Exact replica of each implant size

**Driver Platform**
- Designated surface for light impaction if necessary

**Steinmann Pin Holes** *(size permitting)*
- Allow for implants to be positioned exactly where trialing is completed

**Cement Troughs**
- Simplifies unitization of Augments to the acetabular shell
- Allows cement injection technique or traditional manual spreading of cement
Implant overview

**REDAPT® Acetabular Augments**

Staple: 8mm – 18mm thickness

Slice: 12mm – 24mm thickness

**Spherical Head Screws**

15mm – 50mm

**REDAPT Locking Screws**

15mm – 50mm

Instrument overview

**Trials**

**REDAPT® Drill Guide**

**Torque Limiting Driver**

**Straight Drills**

15mm – 35mm

**Augment Holding Forceps**
References:


3. Smith & Nephew Research report. OR-14-091A.


