

pact[®] 3D METAL MONOCER

HEMISPHERICAL CEMENTLESS CUP SYSTEM

EVOLVING SAFETY



Brochure

Joint

Spine

Sports Med



As part of the comprehensive Mpac System, **Mpac 3D Metal Monocer** is Medacta's hemispherical cementless **monoblock** cup, featuring a **3D-printed shell** with a **built-in ceramic liner**.

The optimized ceramic liner design offers an improved shell-to-head ratio, allowing for the use of **large-diameter heads** with a **low-wear ceramic-on-ceramic bearing surface**. This type of systems provides an **increased range of motion** and **enhanced stability**^[1], making the Mpac 3D Metal Monocer cup an ideal solution for promoting the restoration of an active lifestyle in patients.

Mpac 3D Metal Monocer features a **3D-printed shell** with a **high-friction porous structure**, providing effective treatment for demanding patients while promoting both **primary stability** and **secondary fixation**.

VERY PROMISING PRELIMINARY CLINICAL RESULTS

99.8% survival rate at 3.5y for any reason for revision.^[2]
Compared to 97.5% for other total conventional hips.

1

ENHANCED SHELL-TO-HEAD RATIO

2

FUNCTIONAL CONNECTION WITH BONE

3

INHERENT LINER STABILITY

1

ENHANCED SHELL-TO-HEAD RATIO

The Mpac 3D Metal Monocer cup features a **10 mm shell-to-head clearance**, allowing it to be paired with large ceramic femoral heads. Larger diameter heads provide **enhanced stability**^[1] by increasing the **jumping distance** and offering a greater **range of motion** compared to the articulation of conventional small diameter heads. This leads to **improved functionality** and **stability**^[1], while also reducing the risk of dislocation.

RANGE OF MOTION



JUMPING DISTANCE



Ø42-44

Ø46-48

Ø50-52

Ø54-56-58-60-62-64-66

Ø58-60-62-64-66

*On demand

SIZE RANGE from 42 to 66

2

FUNCTIONAL CONNECTION WITH BONE

Mpac 3D Metal Monocer combines **advanced materials** and **manufacturing technologies**. The 3D Metal Monocer shell features an **advanced biomaterial structure** that is **finely engineered for the bone**. It is made from a titanium alloy (Ti6Al4V) and produced using **3D printing technology**.

3D Metal enables the design and manufacture of implants with a **high coefficient of friction (μ)**, enhancing grip at the bone interface and providing **superior primary stability**^[3,4]. Additionally, key parameters of the 3D Metal's porous structure, such as **pore size** and **porosity**, can be precisely designed and controlled. These factors are essential for achieving an **efficient biological fixation**^[5]. The efficient connection with the bone has been validated through an animal study^[4].



Courtesy of Mr. Lachlan Milne

3D Metal

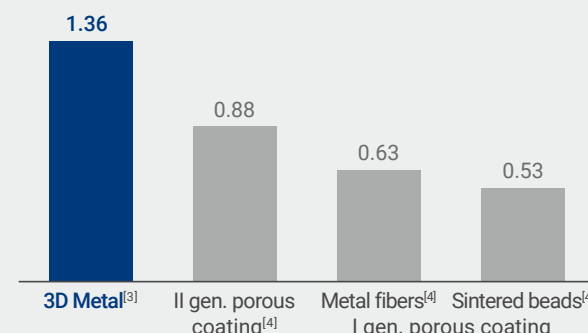
μ = 1.36

Depending on specific net structure and analyzed device region

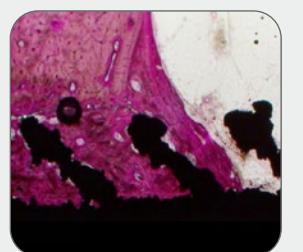
Porosity **65 - 80%**

Pore size **450 - 900 μm**

Significantly **higher friction coefficient** than the competitors' solutions.



Roughened surfaced



Porous structures

3

INHERENT LINER STABILITY

Mpac 3D Metal Monocer features a **built-in ceramic liner**. The shell/liner assembly is performed in a white chamber through a **proprietary in-house process***, which involves a hydraulic press capable of applying a precisely **controlled force**. The pre-assembled ceramic liner has the advantage of **avoiding intraoperative shell/liner misalignment** and **assembling-related issues**.

*The pressing process is actively monitored and adjusted to maintain a specific force level, ensuring precise and consistent assembly results.



▲pact® 3D METAL MONOCER

PERSONALIZED SOLUTIONS IN HIP REPLACEMENT

Mpact 3D Metal Monocer is part of the **Mpact System**, a comprehensive hemispherical cup platform featuring different shell and liner designs and materials, allowing for efficiently treating the majority of the clinical cases from primary to revision surgeries, according to patients' needs.

The Medacta offering embraces a **Personalized Medicine Vision** with a comprehensive platform for a personalized care experience with a **Holistic Approach**. Innovative implants, minimally invasive surgical techniques and technologies bring value throughout the entire patient journey.

INNOVATIVE IMPLANTS



MINIMALLY INVASIVE SURGICAL TECHNIQUES



PERSONALIZED TECHNOLOGIES



REFERENCES

[1] Cooper HJ, Della Valle CJ. Large diameter femoral heads. *Bone Joint J.* 2014;96-B(11_Supple_A):23-26. doi:10.1302/0301-620X.96B11.34342. [2] Australian Orthopaedic Association National Joint Replacement Registry - Automated Industry Report 15755, Medacta Australia, Mpact Total Conventional Hip - Report Generated: 27 August 2024, Data Period: 1 September 1999 - 26 August 2024. [3] T. R. Shultz, J. D. Blaha, T. A. Gruen, T. L. Norman. Cortical Bone Viscoelasticity and Fixation Strength of Press-Fit Femoral Stems: A Finite Element Model. *Journal of Biomechanical Engineering* 2006; 128: 7-12. [4] Medacta: Data on file. [5] L. Dall'Ava, H. Hothi, A. Di Laura, J. Henckel, A. Hart. 3D Printed Acetabular Cups for Total Hip Arthroplasty: A Review Article. *Metals* 2019, 9, 729.

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