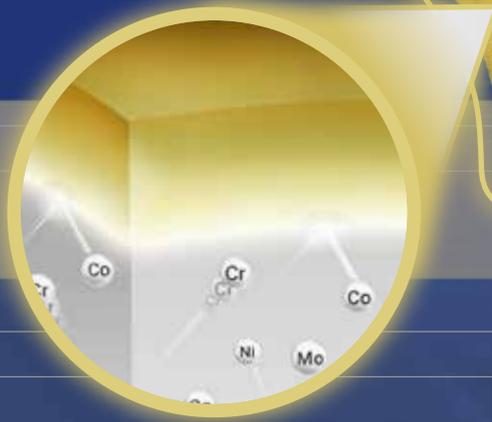


# SensiTiN™

TAKING CARE OF PATIENTS' SENSITIVITY



**Brochure**

Joint

Spine

Sports Med

## CLINICAL CHALLENGE



Materials commonly used in orthopaedics consist of metal alloys which can release metal ions<sup>[1], [2]</sup>. Metal ions might elicit hypersensitivity reactions, ranging from dermatitis to urticaria, vasculitis, excessive periprosthetic fibrosis, and muscular necrosis.<sup>[1], [3]</sup> Some metals might induce tissue inflammation or damage without resulting in a hypersensitivity reaction.<sup>[1], [3]</sup>

Adverse reactions expose the patient to the risk of implant loosening, pain, or a chronic local or systemic inflammatory state and might lead to device removal and revision surgery.<sup>[3], [4]</sup>

### **Metal hypersensitivity is affecting about 10% to 15% of the general population.<sup>[1]</sup>**

Recent studies report a more frequent incidence of metal sensitivity due to the increasing exposure to metals, either occasionally and externally through the skin (jewelry, clothing) or chronically and internally through surgically implanted devices.<sup>[3]</sup> **It is important to consider alternative solutions in orthopaedics to reduce the release of metal ions and potentially reduce the occurrence of related reactions.<sup>[5]</sup>**

# SensiTiN™

## Enhanced coating to reduce metal ion release

Surgeons' preferred choice to treat patients with metal allergy or hypersensitivity<sup>[6], [7], [8]</sup>

### KEY FACTS

- SensiTiN is a ceramic-like coating of titanium nitride, designed to reduce metal ion release from Medacta's knee implants.
- This property makes SensiTiN suitable to treat patients with metal allergy or hypersensitivity, and it is considered a valid means of reducing the likelihood of hypersensitivity onset<sup>[6], [7], [8]</sup>.
- SensiTiN is applied to GMK Sphere, GMK Primary, GMK Revision and GMK Hinge, forming a complete system that allows for treating a wide number of patients, from primary to complex revision cases.

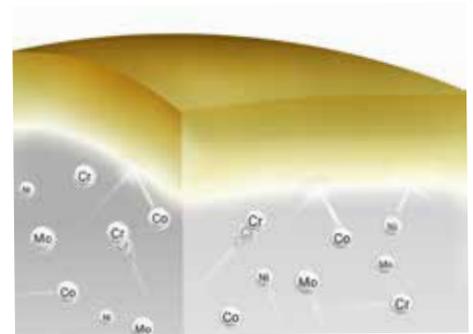


# TO REDUCE METAL ION RELEASE

## REDUCED METAL ION RELEASE

SensiTiN acts as a barrier against the potential release of metal ions, reducing the risk of hypersensitive reactions, as opposed to uncoated implants.

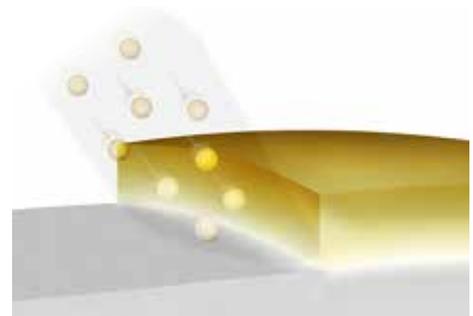
With SensiTiN, metal ion release of cobalt (Co), chromium (Cr), nickel (Ni), and molybdenum (Mo) is reduced by up to 90%.<sup>[9]</sup>



## HIGH ADHESIVE STRENGTH

SensiTiN is applied through physical vapour deposition (PVD). This process allows the formation of a strong bond between the coating and the implant.<sup>[4], [9]</sup>

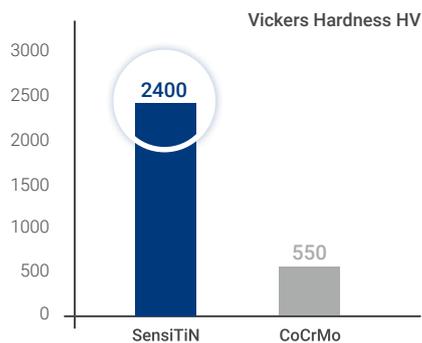
SensiTiN's high adhesive strength makes it very resistant to chipping and delamination.<sup>[9]</sup>



## ENHANCED SURFACE PROPERTIES...

### HIGHER SURFACE HARDNESS

SensiTiN increases surface hardness of CoCrMo implants up to 4 times, making it more resistant to scratches.<sup>[9]</sup>



### IMPROVED SURFACE WETTABILITY

Synovial liquids can better lubricate SensiTiN coated surfaces than uncoated CoCr. This indicates a higher wettability, which can increase the lubrication between the implant's articulating surface.<sup>[9], [10]</sup>



### LOW SURFACE ROUGHNESS

SensiTiN coated implants have very low surface roughness (less than 0.05 μm).<sup>[9]</sup>



## ...RESULTING IN WEAR RATE REDUCTION

Laboratory tests have demonstrated that surface properties provided by SensiTiN allow for low wear rates of the polyethylene even when tested in extreme conditions (e.g. in the presence of particles between the articulating surfaces).<sup>[9]</sup>

# SensiTiN™

## PRODUCT RANGE



**GAAK™ SPHERE**

Medial ball-in-socket provides high stability throughout the ROM.

Patient-specific kinematics with an unconstrained lateral compartment.

Patella-friendly design reduces patello-femoral joint pressure and potentially anterior knee pain.

Anatomical fit with 13 femoral sizes and anatomical tibial baseplate.

### E-CROSS™



GMK Sphere excellent performance in terms of wear rate can be further improved when coupling SensiTiN coated implants and tibial inserts composed of E-CROSS, vitamin E highly cross linked UHMWPE for oxidation protection.



**GAAK™ PRIMARY**



**GAAK™ REVISION**



**GAAK™ HINGE**

## SYNERGY

*Efficiency*

**KNEEPACK**

5 kg



Save time, minimise processing costs and enhance procedure accuracy: three great benefits for the growing number of TKR procedures. Medacta's innovative technologies meet the needs of surgeons and healthcare professionals through a unique and complete solution: **Efficiency KneePack**.

**GAAK™ Efficiency**

**GAAK™ SPHERE**

**MyKnee®**



Everything you need in **JUST ONE BOX, STERILE and READY TO USE**

## REFERENCES

[1] Hallab N. et al., «Metal Sensitivity in Patients with Orthopaedic Implants,» *The Journal of Bone and Joint Surgery*, vol. 83A, n. 3, pp. 428-436, 2001. [2] KEfekhary N. et al., «Metal Hypersensitivity in Total Joint Arthroplasty,» *JBJS Reviews*, vol. 6, n. 12, p. e1, 2018. [3] Haddad S. F. et al., «Exploring the Incidence, Implications and Relevance of Metal Allergy to Orthopaedic Surgeons,» *Journal of the American Academy of Orthopaedic Surgeons*, vol. 3, n. 4, p. e023, 2019. [4] Malikian R. et al., «Four Station Knee Simulator Wear Testing Comparing Titanium Niobium Nitride with Cobalt Chrome,» *J Bioengineer & Biomedical Science*, vol. 3, n. 3, 2013. [5] Thienpont E., «Titanium niobium nitride knee implants are not inferior to chrome cobalt components for primary total knee arthroplasty,» *Arch Orthop Trauma Surg*, vol. 135, pp. 1749-1754, 2015. [6] Bader R. et al., «Alternative materials and solutions in total knee arthroplasty for patients with metal allergy [article in German],» *Orthopade*, vol. 37, n. 2, pp. 136-142, 2008. [7] Thomsen M. et al., «Pain in a chromium-allergic patient with total knee arthroplasty: disappearance of symptoms after revision with a special surface coated TKA: a case report,» *Acta Orthop*, vol. 82, n. 3, pp. 386-388, 2011. [8] Thomsen M. et al., «Use of allergy implants in Germany: results of a survey [article in German],» *Orthopade*, vol. 42, n. 8, pp. 597-601, 2013. [9] Medacta: data on file. [10] Serro A. P. et al., «A comparative study of titanium nitrides, TiN, TiNbN and TiCN, as coatings for biomedical applications,» *Surface and Coatings Technology*, pp. 3701-3707, 2009.

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