

HYDROXYAPATITE (HA) OVERVIEW

- ▶ Physical and chemical structure similar to the mineral component of bone – apatite makes up 70% of bone mass



COMPOSITION OF BONE

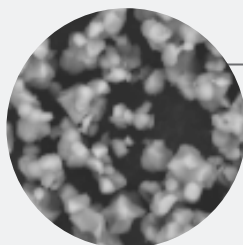
▶ **70% Inorganic**
(MINERAL – APATITE)

▶ **30% Organic**
(PREDOMINANTLY COLLAGEN)

- ▶ OSTEOCONDUCTIVE – bone chemically ‘bonds’ to it
- ▶ BIOCOMPATIBLE – lack of local or systemic toxicity
- ▶ Most common and stable of the Calcium Phosphates used in bone grafting
- ▶ Used in dental applications since the 1970’s and orthopedics since the 1980’s where it is commonly used to coat titanium implants
- ▶ Highly crystalline forms are very stable and essentially non-resorbable
- ▶ Synthetic forms carry no risk of disease transmission

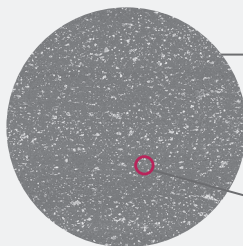
BENEFITS OF HA IN THE PEEK-OPTIMA™ MATRIX

- ▶ HA available on ALL surfaces - integrated, *not coated*
- ▶ Osteoconductive AND load-bearing – HA alone is brittle with low fracture resistance
- ▶ No delamination – the HA in PEEK-OPTIMA HA Enhanced is NOT used as a coating technology



▶ **Free HA Particles**

AT X6000
MAGNIFICATION



▶ **PEEK-OPTIMA HA Enhanced Material Surface**

AT X1800 MAGNIFICATION

▶ **Size of Osteoblast**

EXAMPLES OF HA IN CLINICAL USE¹

Bone Void Fillers

- ▶ MASTERGRAFT® (Medtronic) (60% HA/40% β TCP)
- ▶ CERAMENT® (Bonesupport) (40% HA/60% α -calcium sulphate hemi-hydrate)
- ▶ Endobon® (Biomet) (100% natural HA)

HA Coated Dental Implants

- ▶ Zimmer® MP-1® HA Technology, has been used clinically since 1996
 - Currently used on Tapered Screw-Vent® Implants

HA Coated Orthopedic Implants

- ▶ DePuy Synthes’ CORAIL® Hip System with HA coated stem
 - Over 30 years clinical history and 1.8 million patients worldwide²
 - 96.3% survivorship of the CORAIL stem at 25 years³

HA Coated Bone Screws and Pedicle Screws

- ▶ Reform® HA Coated Pedicle Screw System (Precision Spine)
- ▶ OsteoTite Bone Screws for extremity fixation and HA coated screws of the Firebird® Spinal Fixation System (Orthofix)
- ▶ SI-LOK® Sacroiliac Fixation System (Globus Medical)

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REFERENCES

1. Example products only. Invivo makes no claims or recommendations in relation to these products or their performance, clinical or otherwise.
2. CORAIL hip system clinical summary. DePuy Synthes. CA#DSEM/JRC/1015/0344(1) Issued:01/17
3. Vidalain JP. 25-year ARTRO Results: A Special Vintage from the Old World. The CORAIL Hip System: A Practical approach based on 25 years of experience. 2011:Chapter 4.2.1:94-101

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