

# Audio-HA Hydroxylapatite Grains for Bone Reconstruction

CODE  
TPL 18.00/10

HA: Biactive calcium hydroxylapatite ceramic

Audio-HA<sup>®</sup> hydroxylapatite ceramic ( $Ca_{10}(PO_4)_6(OH)_2$ ) is a biocompatible and bioactive material.

**Biocompatibility** means the absence of any tissue reaction or rejection phenomenon.

**Bioactivity** means the development of a bond (deep penetration) between the implant and the bone.

The bond between Audio-HA<sup>®</sup> implant and bone develops in a period ranging from one to six months, and it has also occurred on the interface between hydroxylapatite and soft tissue (tympanic membrane).

Audio-HA<sup>®</sup> can be molded by mixing it with fibrin glue and/or bone paste, bond chips, autologous blood or normal saline solution. Hydroxylapatite forms a chemical bond with the bone.

The Audio-HA<sup>®</sup> granules are not reabsorbable and prevent the new bone structure from changing with time.

## Indications

### OTORHINOLARYNGOLOGY

Reconstruction of mastoid and posterior wall of the external auditory canal.

### NEUROSURGERY

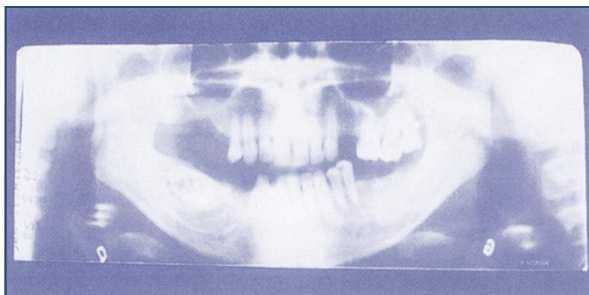
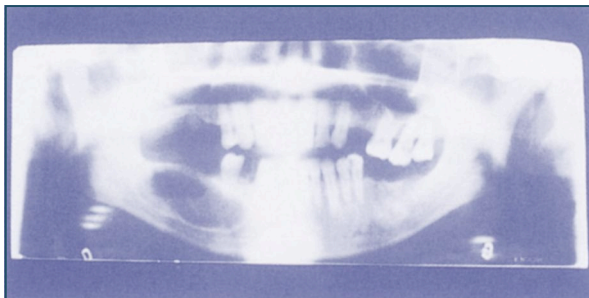
Reconstruction of skull sections.

### DENTAL SURGERY

Alveolar filling and maintenance. Correction of periodontal defects.

### MAXILLOFACIAL SURGERY

Correction of congenital and traumatic defects of the jaw. Filling of peri-implants.



Audio-HA<sup>®</sup> filling of cavity resulting from the removal of jaw neoplasm (Maxillofacial Surgical Department - Spedali Civili di Brescia - Italy - Head Physician: Prof. G. Ferrari Parabita).



Granular HA reconstruction of radical cavity in a 7 years old child. CAT scan one year after surgery. Radiopaque prosthesis is visible (Catalog Number TPL 07.05 - Permission from Dr. Franco Beoni).

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The bond developing between hydroxylapatite and bone is the strongest bond among those obtainable with biomaterials.

A block measuring 4x4x1.4 mm. of the same hydroxylapatite used in prostheses and granular elements was put in contact with the bone of a guinea pig for six months.

The force needed for the extraction was equal to 30 N (Newton), in an hydroxylapatite interface of 6 mm<sup>2</sup>.

Therefore, the implant can bear a pressure of 5 N/mm<sup>2</sup> = 5x10<sup>6</sup> Pa/mm<sup>2</sup>.

This pressure is equal to the safety pressure required for the surface of a prosthetic hip implant.

In order to find stronger adhesive strength we must leave the field of biomaterial-tissue interface and search in the field of strong chemical-physical materials.

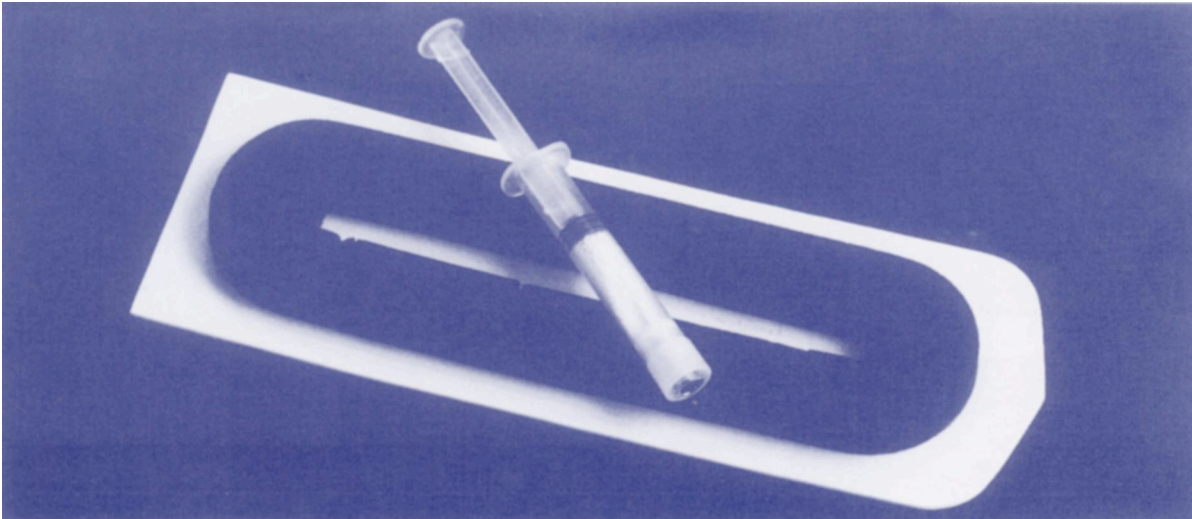
For example, the vitreous-ceramic lining on of 30 N/mm<sup>2</sup>=30x10<sup>6</sup> Pa/mm<sup>2</sup> (in short, only 6 times higher than the bonding hydroxylapatite-bone).

Other biomaterials provide much weaker bonds:

for example, biocarbons bind bone by an adhesion withstanding 10<sup>5</sup> Pa/mm<sup>2</sup>, 50 times less than hydroxylapatite-bone bonding.

### Packaging

Single box containing 1 sterile packaged mixer-syringe.



Mixer-syringe diffuser-needle and microporous plug. It allows the injection of fibrin glue, blood or a normal saline solution connected to a syringe equipped with diffuser needle. During the injection, the needle is gradually removed, homogeneously distributing the liquid injected in the hydroxylapatite without having to extract it from the syringe. The pressure microporous plug allows excess air and liquid to be squeezed from the syringe, thus forming a concentrated mixture. After the mixture has been connected, the plug is removed.

- **Easy and quick mixing in absolute sterility.**
- **Concentrated mixture with the elimination of excess air bubbles and liquid.**

Audio-HA Grains	Package	Code
Granular Suprapur 0.6 < Ø mm < 1.2	2 gr.	TPL 18.00
Microgranular Suprapur 0.3 < Ø mm < 0.6	2 gr.	TPL 18.01
Granular Suprapur 0.6 < Ø mm < 1.2	1 gr.	TPL 18.02
Microgranular Suprapur 0.3 < Ø mm < 0.6	1 gr.	TPL 18.03
Granular 0.6 < Ø mm < 1.2	2 gr.	TPL 18.04
Microgranular 0.3 < Ø mm < 0.6	2 gr.	TPL 18.05
Micronized 0.1 < Ø mm < 0.3	2 gr.	TPL 18.06
Granular 0.6 < Ø mm < 1.2	1 gr.	TPL 18.07
Microgranular 0.3 < Ø mm < 0.6	1 gr.	TPL 18.08
Micronized 0.1 < Ø mm < 0.3	1 gr.	TPL 18.09
Porous Grains 1 < Ø mm < 4	2 cc.	TPL 18.10