

A scanning electron microscope (SEM) image showing a highly porous, interconnected network of fibers or cells. The structure consists of large, irregularly shaped voids or chambers, some of which are dark, suggesting they are empty or contain a different material. The walls of these chambers are composed of a fine, fibrous mesh. The overall appearance is that of a complex, three-dimensional scaffold or lattice.

FAQ

frequently asked questions

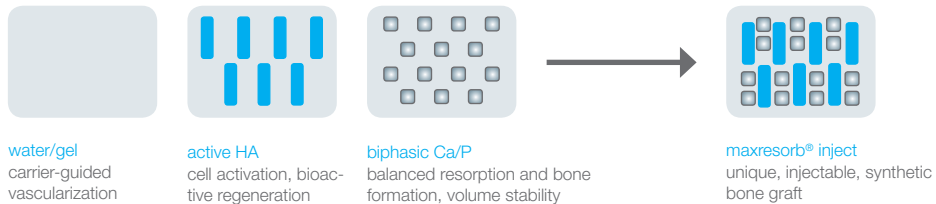
maxresorb[®] inject

botiss
biomaterials

What is maxresorb[®] inject
composed of?

maxresorb® inject is a fully synthetic bone substitute material. **The composition of maxresorb® inject is based on a nano-hydroxyapatite (HA) gel, composed of very small (nano-sized, 15-50 nm) HA particles mixed with water.** This gel makes up about 84% of the product. In addition, large biphasic HA/beta-tricalcium phosphate (TCP) granules (maxresorb® granules) are mixed with the gel. The granules are responsible for the paste-like character of maxresorb® inject. Furthermore, due to the opacity of the granules, they support x-ray control of the augmentation site.

Unique Regenerative Four-Phase Activity



Is maxresorb[®] inject hardening after application?

What are the advantages of non-hardening bone pastes compared to hardening bone cements?

Unlike other products, maxresorb® inject is not hardening in situ.

Hardening of a material following application results in the formation of a solid body that opposes the ingrowth of cells and blood vessels and therefore, may affect the integration of the material and defect regeneration.

The paste-like and porous structure of maxresorb® inject allows ingrowth of blood vessels and deposition of new bone matrix, resulting in a fast and complete osseous integration and a rapid natural remodeling of the defect. **Thus, maxresorb® inject enables a very fast vascularization of the defect while providing an osteoconductive scaffold for the migration of bone forming cells.**

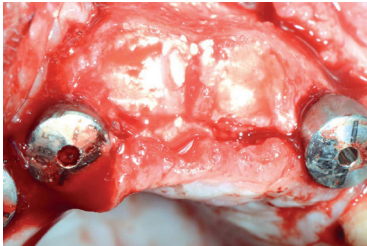
What happens with the material
after implantation?

Directly following application the water will dissolve leaving behind nano-HA particles and HA/beta-TCP granules. The nano-HA particles exhibit a high biologic activity, because of their large surface, meaning a strong interaction with bone forming cells as well as macrophages and osteoclasts. The small particles are resorbed very fast (within ~6-8 weeks), but also promote fast new bone formation by providing free spaces for bone matrix deposition. At the same time, the beta-TCP/HA granules provide volume stability and act as a scaffold for the migration of bone forming cells. Beta-TCP will resorb within ~3-6 months, HA within ~2-3 years.

What are the main clinical indications of maxresorb[®] inject?

maxresorb® inject is designed for regeneration/augmentation of smaller defects that do not require a distinct- or long-term volume stability. For smaller defects the injectable paste provides simplified handling as compared to the application of particulate materials.

maxresorb® inject is suitable for use in indications such as filling of extraction sockets for immediate or later implantation (socket preservation), augmentation of post-extraction defects (ridge preservation) and regeneration of smaller, contained horizontal defects. maxresorb® inject can also be applied in combination with allogeneic/autologous bone blocks, serving to fill remaining gaps and for contouring.



Extraction sockets grafted with maxresorb® inject
(Courtesy of Dr. Damir Jelušić, Croatia)



Internal sinus lift with maxresorb® inject
(Courtesy of Dr. Frank Kistler, Germany)

Are there limitations of the
clinical use of maxresorb[®] inject?

The main component of maxresorb® inject is a nano-HA gel (83.5%). Due to the abundance of nano-HA particles, the material offers a very large surface area that promotes cellular interactions.

On one hand this leads to enhanced binding of osteoblasts and accelerated new bone formation. But on the other hand, there is also an increased interaction with osteoclasts supporting cellular resorption of the particles. In addition, the large surface area promotes chemical dissolution of the material. Consequently, maxresorb® inject is subject to a comparatively fast resorption. The embedded maxresorb® particles help to maintain the volume to a certain extent, but due to the relatively low content of maxresorb® particles within the paste, maxresorb® inject does only provide limited stability for predictable regeneration of larger defects. **The material is better suited for the regeneration of smaller and contained defect. To increase stability, maxresorb® inject can be mixed with a slowly resorbable material such as cerabone® or maxresorb®.**

Can I use maxresorb[®] inject
for sinus floor elevations?

In sinus floor elevations the paste-like character of maxresorb® inject enables easy application to the sinus cavity. This is particularly advantageous in internal sinus lift procedures, when the material needs to be applied through the osteotomy. In this indication, the paste also offers the benefit of a lower risk for perforations of the Schneiderian Membrane, which can occur when applying particles with sharp edges.

In lateral sinus floor elevation the use might be limited due to a fast resorption of maxresorb® inject. Shrinkage should be expected, hence over-augmentation is recommended in this indication. maxresorb® inject should not be used in cases with a very low residual bone height, when a two-stage surgery is performed. In these cases the fast resorption could cause a loss of augmentation volume at the moment of the later implantation.

Why is the tip of the syringe so wide?

Due to its paste-like consistency, maxresorb® inject requires a wide tip for easy injection upon application.

A thinner nozzle would result in the paste blocking the tip. A smaller tip would only be possible by increasing the viscosity i.e. by reducing the amount of maxresorb® particles within the paste. However, the maxresorb® granules are responsible for the stability of the material and its paste-like character, which enables molding and easy adaptation to the defect contours. If the tip appears too wide for direct application into a small defect, the paste can be ejected onto a spatula before application.



Do I have to use a membrane when working with maxresorb[®] inject?

YES!

maxresorb® inject is a non-hardening bone graft paste. Therefore, it must always be covered with a barrier membrane to stabilize the material and facilitate undisturbed bony regeneration.