



THE ESSENTIALS IN BONE GRAFTING



KYERON

BRIDGING MEDICAL GAPS



FAST FACTS

- Clean and sterile, free of human, animal and chemical material.
 - Products can be custom ordered, ranging from pastes and cements to granulations and wedges.
 - No harvesting, so less risk of infections or complications.
-

BONE GRAFTING AND BEYOND

Kyeron believes in the future of bone grafting. We develop our products from a mineral basis. This will give you equal to superior results, comparable with the [human and synthetic] alternatives. Human when necessary, Kyeron when possible. This brochure will show you why.



FAST FACTS

- Worldwide distribution network.
 - Materials with superior handling.
 - Products can be custom ordered per unit.
-



THE NEW GOLD STANDARD

Kyeron performs in line with your expectations of a young independent player in the world of biomaterials. We develop products with added value for surgery, with ample scope for our ideas and initiatives. For science has not reached its current level by being conservative. Together with our researchers we regularly succeed in launching innovative products that merit their place in the operating theatre. Technically distinctive with a sound clinical basis.

RESORPTIE AT THE CORE

Our products do not take over functions. On the contrary, we want to activate the body and stimulate it to create bone cells itself. This places resorption at the centre of our broad spectrum. We develop granules, cylinders, cements, pastes and powders, available per item and in custom orders. Various surgical specialisations benefit from our flexibility and inventive materials; bone substitutes that enable you as surgeon to perform a successful intervention. Without harvesting autologous bone, purely with products on a mineral basis where necessary combined with human material.



FAST FACTS

- The University of Twente employs 3,000 academic researchers, a number of which are working fulltime on Kyeron projects.
 - We are established in the most entrepreneurial high-tech region of the Netherlands, close to one of the world's leading nanotechnology laboratories.
 - Kyeron has an excellent quality assurance system in place and is ISO 13485 certified by BSI.
-

AT THE CUTTING EDGE

We consider the development of our resorbable innovations from the surgeon's perspective. Kyeron operates a network of distributors, who are present at surgeries in hospitals all over the globe. Any obstacles a physician may face in practice, will be reported back as input for our research and development facilities. Based on this feedback, our Dutch researchers - experts in biomedical nanotechnology and (bio)polymers - determine the lines for improving and expanding our product range.

Our number one condition for any research and product, is that it has to produce added value. In practice this means that they must possess the ideal scaffold for cell development and that our minerals have the highest level of purity. As a modern enterprise, we firmly believe in knowledge sharing and cooperation ties. We want to be a leading organisation and maintain good connections with universities and businesses on all continents.

THE FUTURE OF BONE GRAFTING.

What sets Kyeron apart, is the way we approach the composition of a granulate, paste or cement.

We have for example introduced synergy between minerals, such as hydroxyapatite [HA], collagens, biopolymers and tricalcium phosphate [TCP]. And even with these high standards, our products are three to four times more cost-effective than human material.

The development of our material is a continuous process. Thanks to a highly controlled production, we have already realised a stabile porosity of 83% for instance, producing the ultimate scaffold for cell formation. What started as the sustainable restoration of bone structure, developed into a method to induce ossification and vascularisation. There is nothing in our way to help develop bone grafting as the new global standard.

FAST FACTS

- Since 2007, hundreds of thousands of procedures have been carried out with our products on mineral basis.
- The number of recalls of our products is zero.
- Kyeron contributes worldwide to affordable and improved healthcare.

BRIDGING MEDICAL GAPS





HA/TCP GRANULES[®]

With HA/TCP GRANULES[®], Kyeron offers a substantiated alternative for autograft and allograft. It provides you with a biocompatible and osteoconductive material, without the need of harvesting or the use expensive donor material - with all related risks of rejection. HA/TCP GRANULES[®] is composed of (40%) b-tricalcium phosphate and of (60%) hydroxyapatite. This composition is comparable to the mineral component in human bone tissue, making it the ideal environment for bone growth.

More than 3,000 publications and over 500 clinical studies support the biocompatibility and clinical effectiveness of HA and b-TCP, as substitute for bone tissue. With this proven effectiveness, it is all about how we develop HA/TCP GRANULES[®] and what sets Kyeron apart on the market. Including:

- An ultrahigh porosity of 83% for the fast growth of bone tissue.
- A broad spectrum of sterile products (custom per unit) in a wide range of volumes.
- Natural bone density and 100% integration with the new bone tissue within twelve to fourteen weeks.

- An HA with a Ca/P ratio of 1.76, identical to human bone apatite.

We cannot fully inform you in this concise brochure. We merely want to draw your attention to the products with which we shape the future of bone grafting.

Go to Kyeron.com for all specifications of HA/TCP GRANULES[®] and our other products. Please feel free to contact us for more information. We will be happy to talk to you.



Ultrahigh porosity: 83%



Interconnection



Pore size: 100 – 1000um



High purity: 99.5%

"THE STERILE ALTERNATIVE FOR AUTOGRAFT OR ALLOGRAFT"



FAST FACTS

- HA/TCP GRANULES[®] has already been successfully implanted in more than 1,200 patients without any side-effects.
- To be mixed with blood, bone marrow or blood platelets into a firm emulsion.
- Kyeron products are worldwide certified by among others the European CE, Australian TGA and Argentinian ANMAT.

THE NEW FUTURE IS HERE

Biomaterials have become a very active area of research and development worldwide. According to the surgical uses, biomaterials with a variety of properties have become available, each with their advantages and disadvantages. The importance of ceramics is evident due to their biocompatibility and because an important part of bones themselves are mineral phases. The mineral phase of the bone is mainly made up of calcium phosphate micro-crystals, among them hydroxyapatite (HA) is the most important. Specialists realized that the porous structure plays a key role in the case of bone regeneration.

Alejandro Sáenz

Ceramic biomaterials: an introductory overview

Journal of Materials Education

Vol.21 (5-6): 297 - 306 (1999)

Syringe with open boring after cap removal.

SYRINGE USE

**Handling and processing ease with
HA/TCP GRANULES[®] in an applicator.**

A Swiss-made applicator filled with HA/TCP GRANULES[®] and fitted with a luer lock for aspirate injection of the blood or bone marrow. Fast, simple and immediately ready for use. HA/TCP GRANULES[®] absorbs the aspirate and forms a firm emulsion enabling precise and controlled application.



Completely clear
and transparent syringe.

Stable handle
with intuitive shape.

A close-up photograph of a white dental syringe with a black plunger, dispensing a thick, white, paste-like substance onto a blue surgical drape. The paste is being extruded from the nozzle and has formed a small, irregular mound on the drape. The background is slightly blurred, showing more of the surgical environment.

*“BIOTISSUE SUBSTITUTE
FROM PURE
NANOHYDROXYAPETITE”*

BIOCOMPATIBILITY

In the past decades, the elements of NANO HA PASTE[®] nanohydroxyapatite (water and hydroxyapatite) have been generally recognised for their excellent biocompatibility and bioactivity. NANO HA PASTE[®] possesses strongly-improved characteristics such as stability, natural resorption speed, good biocompatibility, improved osteogenesis and it is pH-neutral. NANO HA PASTE[®] is known for its excellent response to biological elements. Bone ingrowth and bone formation around the hydroxyapatite crystals are excellent and the hydroxyapatite crystals ensure good biological safety.

NANO HA PASTE[®]

NANO HA PASTE[®] is the ready-to-use nano bone graft substitute by Kyeron. It is an injectable paste for filling and repairing small to medium-sized bone defects.

What makes NANO HA PASTE[®] stand out, is the resorbable nanocrystalline structure. Moreover, the paste is non-load-bearing and will not harden once injected. We have succeeded in adding a unique permanent viscosity to the paste for a quick resorption by macrophages and osteoclasts.

The biocompatibility and clinical effectiveness of hydroxyapatite (HA) are recognised and acclaimed worldwide. In our NANO HA PASTE[®] nanohydroxyapatite bone grafting paste, we have managed to further improve these good HA characteristics with significant results in the area of stability, resorption, biocompatibility and osteogenesis.

NANO HA PASTE[®] is trademark of KYERON BV

NANO HA PASTE[®] is standard available in a broad range of volumes.

We cannot fully inform you in this concise brochure. We merely want to draw your attention to the products with which we shape the future of bone grafting.

Go to Kyeron.com for all specifications of NANO HA PASTE[®] and our other products.

Please feel free to contact us for more information. We will be happy to talk to you.

FAST FACTS

- Developed with cutting edge nanotechnology.
- Can be excellently combined with HA/TCP GRANULES[®], REOS strips and/or autologous and allogenic cancellous bone.
- Kyeron products are worldwide certified by among others the European CE, Australian TGA and Argentinian ANMAT.



Premium version with luer lock to fix the adaptor. Adaptors are included in orders.



Stable handle with intuitive shape



SSA is 80-120 M2/g



Up to 39% HA particles.



2 versions available



High viscosity

AXOZ QS[®] CAP CEMENT

The three essential characteristics for an injectable bone substitute coincide in AXOZ QS[®]: a cement with resistance under compression close to cancellous bone, a composition similar to the natural bone crystals and with unique macroporous injectable patented technology.

AXOZ QS[®] consists of resorbable phosphocalcic compounds and a polymer. A convenient product to work with, developed for the optimal recovery of bone defects. A number of important figures:

- Preparations at the operating table take only two minutes, including mixing;
- The cement sets (no leakage possible) in approximately 8 minutes;
- The patient's bone growth process is well supported for some months.

We cannot fully inform you in this concise brochure. We merely want to draw your attention to the products with which we shape the future of bone grafting.

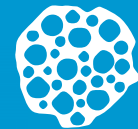
Go to Kyeron.com for all specifications of AXOZ QS[®] and our other products. Please feel free to contact us for more information. We will be happy to talk to you.



***“INJECTABLE CALCIUM
PHOSPHATE THAT HARDENS QUICKLY
AND FULLY RESORBS”***



Hardness 24MPa



Up to 70% porous



User-friendly



Visible on X-Rays & Scans



AXOZ QS[®] is manufactured by Graftys



FAST FACTS

- Full range of micro, meso and macro pore sizes to promote bone cells colonization and biological fluid penetration. Decisive for the resorption of the cement thanks to the high porosity up to 70% porous.
- Optimal processing thanks to the simple mixing process.
- Kyeron products are worldwide certified by among others the European CE, Australian TGA and Argentinian ANMAT.

THE NEW STANDARD FOR BONE GRAFTING

Since both allograft and autograft have drawbacks, a quest is out for materials that could be used in place of the transplanted bone. One day a substitute will simultaneously be able to stimulate bone healing and provide a strong and biologically compatible framework for the new bone to grow into. A newer area of bone graft substitutes use combinations of other bone grafting materials like collagen/ceramic, which closely reproduces the composition of natural bone.

North American Spine Society - Public Education Series

Bone graft alternatives - © 2004-2009 North American Spine Society

INDICATIONS

Kyeron bone substitutes are recommended as enhancement and make repairing non-load bearing bone defects unnecessary in the area of traumatology, ENT and orthopaedic, parodontal and oral surgery.

All KYERON bone substitutes can be stored at room temperature and HA/TCP GRANULES[®] and NANO HA PASTE[®] may be mixed with BMA and/or autologous bone prior to implantation.

Possible indications include:

	HA/TCP GRANULES [®]	NANO HA PASTE [®]	AXOZ QS
Fractures with loss of bone material			
Extremity fractures			
Pseudarthrosis (non-unions)			
Arthrodesis (hand, ankle, foot)			
Spondylodesis (interbody fusion)			
Tibial valgisation osteotomy			
Hip socket reconstruction			
CMF (Craniomaxillofacial) - area no larger than 25 cm ²			
Cavity filling (cysts, osteonecrosis, benign tumours)			
Knee and hip revision			
Bone Augmentation (sinus lift)			
Traumatic Bone Marrow Lesions of the knee (BML)			

