



## Novel syringes and concepts for homogeneous injection of bone cements

Novel syringes and concepts useful for homogeneous injection of ceramic bone cements have been patented and developed. These new designs solve the current problems related to the press-filtering that limit the clinical applications. Partners to further develop the technology and/or to establish commercial agreements along with technical cooperation are sought.

### The Challenge

Calcium phosphate bone cements (CPCs) are used in Dentistry and Orthopedic to fill bone cavities to restore the biological and the mechanical properties of the implantation site. CPCs should be injectable through minimally invasive surgery techniques. Unfortunately, CPCs injected through standard syringes are affected by press-filtering. The consequences are: inhomogeneous injection, incomplete filling of the bone cavity, lack of mechanical properties for the injected part of material, partial or total blocking of the cement into the syringe or injection device and very high hand-injection pressures. These problems limit the clinical applications of CPCs. The challenge is to solve these problems and to extend the use of CPCs to the treatment of vertebral compression fractures.

### The Technology

The present invention uses concepts of helicoidally transport and continuous shear-deformation movement. These concepts linked together into proper injection devices put the problems of press-filtering, blocking and the like to a minimum. The new concepts ease the homogeneous mixing of the cement during its injection, avoids press-filtering and blocking of the cement into the syringe and consequently, the hand-pressure to be applied by the surgeon in the operation theatre is kept optimum.

### Innovative advantages

- Cement homogeneity is assured during injection.
- Cement press-filtering and blocking is avoided during injection.
- Cement injection pressure do not increase during injection.
- Allows the CPC injection in any clinical applications.

### Current stage of development

Several prototypes have been manufactured and tested. Experiments are on the way to assure statistic significance.

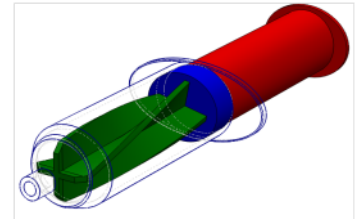
### Applications and Target Market

Multiple applications are possible; all related to the homogeneous injection of slurry-like, semisolid and/or viscous materials. Several target markets are possible; preference is given to Dentistry and Orthopedics. Manufacturing Medical Devices Companies (consumables) should be interested.

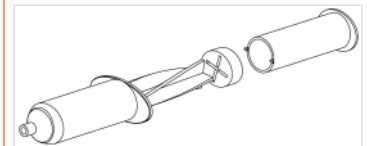
#### Reference number

MKT2012/0107\_H

**Novel syringes for homogeneous injection of bone cements for dentistry and orthopedic use**



**Bone cements injected under the new concept do not suffer from press-filtering and blocking**



**The new concept does not limit further optimization of cement properties**

#### Business Opportunity

Technology available for licensing with technical cooperation

#### Patent Status

2 Priority patents application

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