Arthrex Quickset is available in the U.S. as a convenience kit containing Arthrex Quickset, cannula and a delivering gun.

Injectable Macroporous Calcium Phosphate
Features and Benefits

Arthrex Quickset is a macroporous, injectable, hardening, resorbable bone cement provided in an easy-to-use, closed mixing system.

Composition:

• The mixing system is a dual-chambered syringe containing a powder and mixing liquid
• The powder chamber contains a mixture of calcium phosphates and an organic polysaccharide polymer
  – The polysaccharide is a highly biocompatible polymer that optimizes the viscosity, cohesiveness, and macroporosity
• The mixing liquid consists of a sodium phosphate solution which facilitates the setting time (crystallization) of the cement
• The end product is a calcium-deficient apatite very similar to the mineral phase of bone

Physical and Chemical Properties:

• Global porosity of 70%
  – Microporosity (<10 µm): 88%
  – Mesoporosity (10-100 µm): 2%
  – Macroporosity (>100 µm): 10%
• Porosity is present by the time it reaches complete hardening (24 hours after implantation)
• Mechanical compressive strength of 24 MPa (24 hours after implantation)
• Excellent cohesiveness, which prevents wash out by biological fluids
• No shrinkage during crystallization
• Nonexothermic reaction
• Radio-opaque

Preparation:

• Mixing time (room temperature): 2 minutes
• Injection time (room temperature): 2 minutes
• Initial setting time (body temperature): 8 minutes (manipulation during this time period is not recommended as it will affect the crystallization process and final strength characteristics)
• Complete hardening (body temperature): 24 hours
Preclinical Scientific Support for Arthrex Quickset

A critical-sized femoral defect was created in a rabbit model and filled with Quickset. At four weeks, these defects were evaluated with scanning electron microscopy (SEM) and histologic assessments. The SEM images demonstrated significant porosity within the implant, along with bone remodeling (Figure 1). The histological staining identified new bone deposition around and within the Quickset (Figure 2).

Clinical Case Report Supporting Arthrex Quickset*

A complex tibial plateau fracture was treated with ORIF; then Quickset was used to fill in the bone voids that remained (Figure 3 & 4). At four months, the wires and a screw were removed and a biopsy was taken. Histological analysis demonstrated good osteointegration of the Quickset in direct contact with new bone trabeculae (no fibrous interface). An intertwining network developed as the biomaterial resors and mineralized lamellar bone is laid down. Osteoblastic cells (cuboid) were along the osteoid borders going through mineralization; osteoclastic cells (multinuclear cells) were along the borders of the biomaterial representing the resorption process. In addition, numerous blood vessels had been established through the implant (Figure 5). At eight months, fracture healing, along with osteointegration of Quickset, was noted via x-ray evaluation (Figure 6).

Calcium phosphate bone cements have been demonstrated to play a significant role within orthopaedic surgery. A meta-analysis of randomized trials demonstrated the following: “Patients managed with calcium phosphate had a significantly lower prevalence of loss of fracture reduction in comparison with autograft... and had less pain at the fracture site in comparison with controls managed with no graft...”¹ This study helps to establish the effectiveness calcium phosphate bone cements have within fracture management.

When deciding to use a resorbable bone cement, it is important to understand its incorporation capabilities. Arthrex Quickset has been shown to have good osteointegration qualities on the periphery and within the biomaterial due to its unique presence of porosity.

Reference:

*Surgery performed by Sébastien Paratte, MD, PhD
Ste Marguerite University Hospital, Marseille, FRANCE
**Directions For Use**

1. Assemble the gun. Lift up on the release lever and insert the flat end of the dispenser piston (teeth facing down) through the front of the Delivering Gun. Guide the piston through the gun until the dispensing, circular part is flush against the Delivering Gun. Set the Delivering Gun to the side until needed for delivery of Arthrex Quickset.

2. Place the syringe selector on “transfer” by rotating the collar clockwise. Hold the syringe with the luer tip facing upwards, connect the Pushrod to the piston within the liquid chamber and advance it until all the liquid has passed into the powder chamber. Remove the Pushrod.
Directions For Use Continued

To mix the powder and liquid phases together, push and pull the mixing element back and forth while rotating it in a repeated left-to-right motion. This process of mixing should continue for 2 minutes.

After the 2 minutes of mixing is complete, pull the mixing element as far back as possible out of the chamber. Bend the mixing element so that it breaks at its base.

Rotate the collar clockwise to “inject”. Insert the dual-chambered syringe into the keyed syringe slot on the Delivering Gun with the markings on the syringe facing upwards. Compress the trigger in order to push the piston forward and expel any excess air.

Connect the 7G Cannula (if needed) to the luer tip portion of the syringe. Dispense the Arthrex Quickset resorbable bone cement by compressing the trigger and handle together. To inject a second dose, press up on the release lever, pull back the piston to its starting point, remove the first dual-chambered syringe and insert a second dual-chambered syringe.

Optional Use Without Delivering Gun

Pull the mixing element out of the mixing chamber but do not break it off. Use the Pushrod from the liquid chamber and clip it onto the rod associated with the mixing element.

Rotate the collar to inject, slowly apply pressure to the pushrod to expel any excess air, connect the 7G Cannula to the luer tip, then apply additional pressure to the Pushrod in order to dispense the Arthrex Quickset resorbable bone cement.
Surgical Applications

Arthrex Quickset can be used to help stabilize bone fragments within highly comminuted fractures

Important suggestions to keep in mind when using Quickset:
- Use to fill bony voids after initial rigid fixation is obtained; the Quickset cement is not intended to be used as a load-bearing device
- Prevent unnecessary manipulation during the initial setting time to avoid disruption of the crystallization process

* These devices are not cleared by the FDA for distribution in the United States
Quickset is intended for bony voids or defects that are not intrinsic to the stability of the bony structure. Quickset is intended to be placed or injected into bony voids or gaps of the skeletal system (i.e., the extremities and pelvis). These defects may be surgically created osseous defects or osseous defects created from traumatic injury to the bone. The product provides bone void filler that resorbs and is replaced with bone during the healing process.

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Ordering Information:

- Arthrex Quickset 5 cc: ABS-3005
- Arthrex Quickset 8 cc: ABS-3008
- Arthrex Quickset 16 cc: ABS-3016

This description of technique is provided as an educational tool and clinical aid to assist properly licensed medical professionals in the usage of specific Arthrex products. As part of this professional usage, the medical professional must use their professional judgment in making any final determinations in product usage and technique. In doing so, the medical professional should rely on their own training and experience and should conduct a thorough review of pertinent medical literature and the product's Directions For Use.

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