MIXIGUN® Bone Cement Mixing and Dispensing System

The Combination of Mixing and Delivery
Vacuum Mixing of Bone Cement

Since the introduction of bone cement to orthopedics, many advancements have been made in terms of improving the quality of the cement mantle surrounding the implant.

**Improved Cement Quality**
Studies\(^1, 2, 3\) have shown that bone cement failure in a total joint replacement most often results from cracks propagating from pores in the cement mantle. Therefore, major effort has been dedicated to the reduction of bone cement porosity.

Through their documented ability to reduce bone cement porosity, vacuum mixing systems are today recognized as a means to increase the longevity of the cement mantle.\(^4, 5\)

**Improved Working Environment**
By eliminating the amount of methyl-methacrylate fumes that are released into the OR,\(^5\) the use of vacuum mixing systems provides a safer working environment for OR staff.

The Combination of Mixing and Delivery

While traditional vacuum mixing systems rely on the re-processing of metal cement guns, MIXIGUN Bone Cement Mixing and Dispensing System introduces a unique two-in-one design. MIXIGUN Bone Cement Mixing and Dispensing System combines the clinical benefits of vacuum mixing with the convenience of one single use, fully disposable product.

This new mixing/injecting design concept helps reduce both time and cost. With MIXIGUN Bone Cement Mixing and Dispensing System there is no time and cost associated with the handling, cleaning and sterile re-processing of a reusable metal cement gun after the procedure. Furthermore, the logistical organization prior to surgery to ensure the availability of the reusable gun as well as cement gun maintenance are eliminated.

The MIXIGUN Bone Cement Mixing and Dispensing System is designed to mix acrylic bone cements under vacuum. The vacuum hose is connected and vacuum pump activated prior to the insertion of the cement components into the system. The suction created draws the methyl-methacrylate fumes into the active carbon filter rather than released into the operating theatre.
Design Rationale

At a Glance

Vacuum Mixing System
- Suction applied prior to introduction of both bone cement components (powder and liquid)

Provides flexibility in choice of bone cement
- Mixes high, medium and low viscosity bone cement
- Up to 80g of bone cement

Ergonomic
- Lightweight design
- Metal mixing handle provides a high stability during mixing
- High cement injection pressure achieved with low effort

Fully Disposable
- Unique Mixing/Injection Design
- No logistical handling of separate metal gun
- No sterile processing required (reduced costs)

Adaptable to various application areas
- Available in 3 configurations: Hip, Knee and Hybrid
- Separate nozzles available: Short, Long and Slim

Limited environmental impact
- Made entirely of recyclable materials
- No detergents needed for cleaning of a metal reusable gun
Instructions for Use

Step 1: Start – Position
Pull out the mixing rod 5cm–7cm. Set the mixing rod into the base and lock into position using the support. Unscrew the top plug and set aside for later use.
Caution: Make sure that the base rests on a flat and steady surface.

Step 2: Funnel – Vacuum Tubing:
Put the dual funnel into place.
Connect the vacuum tube fitting to the top of the cylinder.
Caution: Make sure that the outer funnel is securely seated into the cylinder top.

Step 3: Monomer – Filling:
Start the vacuum pump. Fill the monomer.
Caution: Use vacuum during filling monomer. This significantly reduces exposure to monomer fumes.

Step 4: Powder – Filling:
Detach the inner funnel. Fill the cylinder with bone cement powder.

Step 5: Powder – Filling
Detach and dispose the funnel. Thread the plug into cylinder top until tight.
Caution: Ensure the plug is tight.

Step 6: Mixing – Start
Detach MIXIGUN System from the base.
Using the mixing handle, move the mixing rod back and forth with rotating action.

Step 7: Nozzle – Select
Stop the vacuum pump and remove the vacuum tube fitting. Unscrew and dispose the plug.

Step 8: Nozzle – Select
Select nozzle and screw firmly in place.

Step 9: Dispense Mode – Engage
Pull the mixing rod to its rearmost position. Remove and dispose piston release pin.

Step 10: Dispense Mode – Engage
While holding the Mixigun, rotate the cylinder (either direction) to a full stop.

Step 11: Dispensing – Ready
Remove and dispose the locking pin.
Caution: Make sure that the mixing rod is parked at its rearmost position before removing the locking pin.

Step 12: Dispensing – Ready
The gun is now ready for dispensing.
Caution: The bone cement must be extruded well within the working phase period. Injection of bone cement at or near set time may cause cartridge to fracture.
Product Family
Mixigun Sets

Contents
- 2 mixing/dispensing systems
- 2 dual funnels
- 1 short nozzle
- 1 long nozzle
- 1 femoral pressurizer
- 1 obturator
- 1 base
- 1 vacuum tubing set with charcoal filter

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Separate Nozzles
MIXIGUN Nozzles are packaged sterile individually and sold in boxes of 5 nozzles. Available in Short, Long, Slim

Short
Length: 80 mm
Ø: 11.9 mm

Long
Length: 210 mm
Ø: 12 mm

Slim
Length: 130 mm
Ø: 8.5 mm

Vacuum Pumps
MIXIGUN Bone Cement Mixing and Dispensing System is designed to be used with the Zimmer II Vacuum Foot Pump.