1. Pentamix 2
   3M ESPE
2. MixStar
   DMG/Zenith
Cartridge-based products, which are mixed and dispensed using a manual gun, are now typical for impression materials. Although dispensing equal lengths of base and catalyst of an impression material from conventional squeeze tubes onto a mixing pad and then mixing by hand with a spatula is still being used by some traditionalists, these holdouts are definitely in the minority. However, the manual guns used for the cartridge-based products look like they could have been purchased from a hardware store. An alternative, especially with tray materials, is a countertop electronic motorized device.

Impression Material Mixers/Dispensers

<table>
<thead>
<tr>
<th>Product</th>
<th>Cost</th>
<th>Warranty</th>
<th>Loaner Program</th>
<th>Built-in Timer</th>
<th>Weight</th>
<th>Height</th>
<th>Width</th>
<th>Depth</th>
<th>Honigum Tray Wt/Vol of material after 40 seconds of activation</th>
<th>Aquasil Ultra Heavy Wt/Vol of material after 40 seconds of activation</th>
<th>Available Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentamix 2</td>
<td>$1,057.40</td>
<td>2 years</td>
<td>No</td>
<td>No</td>
<td>21.0lb/ 9.5kg</td>
<td>12.0in/ 30.4cm</td>
<td>9.6in/ 24.4cm</td>
<td>15.0in/ 38.1cm</td>
<td>72g/ 62ml</td>
<td>66g/ 57ml</td>
<td>All 3M ESPE products including Impregum, Impregum Soft, Permadyne, Dimension, Ramitec, Imprint II, and Position Quick, plus Aquasil Ultra DECA, Honigum, Status Blue, Exajet, Flexitime, AFFINIS System 360, StandOut</td>
</tr>
<tr>
<td>MixStar</td>
<td>$1,795.83</td>
<td>1 year</td>
<td>Yes</td>
<td>Yes</td>
<td>24.0lb/ 10.9kg</td>
<td>15.5in/ 39.4cm</td>
<td>6.0in/ 15.2cm</td>
<td>18.75in/ 47.6cm</td>
<td>36g/ 31ml</td>
<td>33g/ 28.5ml</td>
<td>All 3M ESPE products including Impregum, Impregum Soft, Permadyne, Dimension, Ramitec, Imprint II and Position plus Aquasil Ultra DECA, Honigum, and AFFINIS System 360</td>
</tr>
</tbody>
</table>

The two machines currently rated in this category are rather large and heavy. Since neither one comes with a handle, transporting them becomes an unpleasant chore. You will probably want to place them in a central location or purchase a machine for each treatment room. A central location will work if you are only using the machine to mix tray material. However, this approach is not feasible if you are using a medium viscosity material and only one assistant, since the assistant would have to mix, load, and bring you the syringe, then go back to the machine to mix and load the tray. This assistant would need roller blades to accomplish that task.

Therefore, if you have only one assistant, it would be better to have the unit in the treatment room in which you would be taking the impression. With two assistants, of course, the problem would be solved, since one assistant could bring you the syringe while the other stays at the unit, fills, and brings you the tray. If you prefer light body/heavy body materials, you would mix the syringe material, fill the syringe, and then change cartridges quickly, mix the tray material and fill the tray.

**ADVANTAGES**

+ Arguably better mixes
+ Less hand fatigue
+ Faster than manual
+ More aseptic

**DISADVANTAGES**

- Cost
- Size
- May not accept all brands
- May still need syringe or manual gun for intraoral use
Description
Contemporary off-white plastic with an attractive high-tech appearance. The main body sits on its base ergonomically at about 45°. Even though it is reasonably compact, it still takes up precious counter space, which means you may want to mount it on the wall.

The bottom half of the front of the unit has the door that swings open to reveal the cartridge chamber. Immediately to the left of this door is the round activation button. There is a red linear gauge on the top left half of the front of the unit to tell you at a glance how much material is remaining in the machine. The right side has a large gray rotary dial, which is turned to retract and engage the plungers.

Weight
21.0lbs/9.5kg

Size
- Height: 12.0in/30.4cm
- Width: 9.6in/24.4cm
- Depth: 15.0in/38.1cm

Use
The actual impression materials come in PentaMatic sausage-shaped sealed foil bags with attached plastic caps featuring an automatic opening system. First, you release the securing lever and take the caps off the ends of the plastic cartridge, which is color-coded to the actual impression material you are using. This color-coding is merely to help you identify what you have loaded in the cartridge — they are all the same size. Then you insert the base and catalyst foil bags into their respective chambers and lock the securing lever back into place. The hinged door on the top of the machine is then opened, the plungers are retracted by turning the knob on the side of the unit, and the cartridge is placed into the recess.

Once the cartridge is in place, tighten the plungers to engage them, open the securing lever again to expose the open ends of the cartridge, attach a mixing tip by merely pushing it on the cartridge, lock the securing lever again, and close the door. Push the button on the top of the unit and the Pentamix 2 does the rest. You need to keep the button depressed the entire mixing time. To change cartridges, manually retract the plungers and the used cartridge can be removed. This procedure may sound complicated, but it is not difficult to learn and can actually be done very quickly.

If you are using monophase impression technique with a medium viscosity material for both the syringe and tray, you merely hold the open end of the clear plastic autoclavable impression syringe chamber under the mixing tip and load the syringe to any level you desire. Then continue to hold the button, thus mixing material for the tray, again loaded straight from the mixing tip.

RAVES & RANTS
- Fast
- Started the trend
- Need to manually engage cartridge
- No timer

WHAT'S NEW?
- Red mixing tips

Pentamix 2
3M ESPE
www.3mespe.com

Cost: $1,057.40
Warranty: 2 years

What if it needs repairs? Contact Technical Hotline @ 800-634-2249 or Service Department @ 800-292-6298, ext. 4 to arrange to ship the unit for repair.

Is there a loaner program? No official one. Local representative may be able to provide a unit.
Contemporary off-white plastic, it has an industrial appearance with its exposed plunger mechanism. The main body sits on its base ergonomically at about 45°. Even though it is quite narrow, it still takes up precious counter space.

The top half of the front surface has the soft touch control panel. There is an orange light at the top that blinks when a cartridge is not in the machine. Once the cartridge is loaded, there is a beep followed by the light glowing a steady orange. Immediately below this light is the plunger retraction button. Below that is a green power indicator light. Immediately under that light is the LCD display for the built-in electric timer. Under this display are two squares, one with a “+” and one with a “-”. When you want to increase the timer setting, push the “+” and when you want to decrease, push the “-”. Maximum time is nine minutes, 59 seconds.

The bottom of the control panel has the activation/deactivation button and another light, this time blinking orange when there is only enough material left in the cartridge to fill one tray. Finally, there is a vertical gauge along the left side of the control.

Materials that can be mixed in this machine
All from 3M ESPE including Impregum, Impregum Soft, Permadyne, Dimension, Ramitec, Imprint II, and Position Quick, plus Aquasil Ultra DECA (Dentsply/Caulk), Honigum and Status Blue (DMG/Zenith), Affinis System 360 (Coltene/Whaledent), Exajet (GC), Flexitime Magnum 360 (Heraeus Kulzer), and StandOut (sds/Kerr).

Asepsis
Activation button can be covered with a disposable adhesive barrier.

Directions
Booklet, printed in 12 languages, is detailed and uses a number of simple line drawings for illustrations. We prefer color, or at least black and white photos of the actual machine rather than the drawings. The full directions wisely advise to have a second cartridge ready to go just in case you run out of material in the middle of loading the tray.

There are new mixing tips that are being packaged with 3M ESPE products. These tips are identified by their red spiral mixing lattice, while the previous version has a white lattice. The new red lattice has only five spirals compared to six for the white version. In addition, the orifice of the new version is 6.7mm in diameter, whereas the diameter of the white version is 5.9mm. As this new tip just became available at press time, we were only to test it in a preliminary manner, but it appears it will allow you to mix 14% more impression material in the same amount of time.

Speed (After 40 seconds of activation)

<table>
<thead>
<tr>
<th>Material</th>
<th>Weight (g)</th>
<th>Volume (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquasil Ultra Heavy</td>
<td>66</td>
<td>57</td>
</tr>
<tr>
<td>Honigum</td>
<td>72</td>
<td>62</td>
</tr>
</tbody>
</table>

MixStar
DMG/Zenith
www.zenithdmg.com

Cost: $1,795.83
Optional Footpedal Cost: $136.10
Warranty: 1 year.

What if it needs repairs? Return to Zenith or DMG for repair.
Is there a loaner program? Yes.

RAVES & RANTS

- Timer is very convenient
- Cartridge comes already loaded
- Most expensive by far
- Slowest

2

Asepsis
Activation button can be covered with a disposable adhesive barrier.
panel letting you know at a glance how much material is still remaining in the cartridge. However, you can also merely glance at the cartridge itself, since it is semi-translucent plastic and there is no cover over it. The bottom half of the machine has the support mechanism for the cartridge. This part of the machine is totally exposed. The rear of the machine has the power switch and the connector for the optional footpedal.

**Weight**
24.0lbs/10.9kg

**Size**
- **Height**: 15.5in/39.4cm
- **Width**: 6.0in/15.2cm
- **Depth**: 18.75in/47.6cm

**Use**
The actual impression materials come in plastic cartridges. Take the cardboard protective covers off the back of the cartridge and slide the white plastic locking mechanism on the end of the cartridge into the open position. This allows you to remove the cartridge cap. The orifices for the base and catalyst are now exposed. You then attach a mixing tip merely by pushing it down over the orifices and slide the locking mechanism into the closed position to hold the mixing tip securely in place. The activated cartridge is then easily positioned in the MixStar.

Then you set the timer and push the start/stop button on the top of the unit and mixing begins. You do not need to hold the button for mixing to proceed, but you do need to hit the start/stop button again when you want to end mixing. If you are using the optional footpedal, constant pressure must be used to keep mixing. The control panel button works fine — we suggest forgetting about the footpedal.

If you want to change the cartridge, retract the plungers by pushing the motorized retractor button. The plungers will then retract to the start position.

**Speed (After 40 seconds of activation)**

<table>
<thead>
<tr>
<th>Material</th>
<th>Aquasil Ultra Heavy</th>
<th>Honigum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>33</td>
<td>36</td>
</tr>
<tr>
<td>Volume (ml)</td>
<td>28.5</td>
<td>31</td>
</tr>
</tbody>
</table>

**Materials that can be mixed in this machine**
All from 3M ESPE including Impregum, Impregum Soft, Permadyne, Dimension, Ramitec, Imprint II, and Position Quick, plus Aquasil Ultra DECA (Dentsply/Caulk), Honigum and Status Blue (DMG/Zenith), Affinis System 360 (Coltene/Whaledent), Exajet (GC), Flexitime Magnum 360 (Heraeus Kulzer), StandOut (sds/Kerr).

**Asepsis**
Control panel can be easily covered with adhesive barrier.

**Directions**
Coated paper booklet, 11 languages, with a few drawings. Information is easy to understand, but photos would be better than the drawings.

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**REALITY**

The **Pentamix 2** tops this category primarily due to the fact that it is faster, has a lower cost, and has a more finished appearance. With the PentaMatic foil bags, its operation is quite easy. The new red mixing tips, supplied with 3M ESPE products, make it even faster.

The **MixStar** has more high-tech electronics (one-touch activation, motorized plunger retraction, low material warning light), prefilled cartridges that virtually snap into the machine, and a very convenient built-in timer. The exposed cartridges, however, give it a less-than-finished look, its cost is much higher, and it is slower.

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**OTHER PRODUCTS IN THIS CATEGORY**

**Virtual Automatic Cartridge Dispenser**
Ivoclar Vivadent
The Techniques: volume 1
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