THE BOTTOM LINE
David C. Sarrett, DMD, MS: Editor

Dental Amalgam Separators
Amalgam Collector CE24, Hg5, Hg5 HV, and CatchHg 1000 were the only products that dentists identified in our evaluation survey. As reported by its manufacturer, each unit in our review meets ISO standard No. 11434 for effective removal of amalgam particles (95 percent or better removal efficiency). Our survey of ACE Panel members shows that relatively few practitioners own an amalgam separator or plan to purchase one. Still, as this article will explain, it is important for dentists to start learning about the key issues related to this technology before they purchase an amalgam separator.

Desensitizing Agents
Based on our survey results, more dentists used Gluma Desensitizer and Duraphat than other products (n=120 to 249 versus n=15 to 45). Microprime B, notable for its acceptance among patients, was rated as the best overall product; however, overall, a low number of dentists rated this product. In terms of performance, Vanish 5% NaF was the second highest-rated product.

Surface Disinfectants
According to the Centers for Disease Control and Infection noncritical surfaces visibly contaminated with blood, saliva or other potentially infectious material should be disinfected with an intermediate-level germicide that claims tuberculocidal activity. Ten intermediate-level disinfectants, including a household bleach, were tested. Two of these products failed to meet the performance standard as set by the Environmental Protection Agency for tuberculocidal activity. When shopping for surface disinfectants, be sure to scrutinize their label ingredients to avoid confusion; some products are remarkably similar in packaging, but offer significantly different active ingredients.

DENTAL AMALGAM SEPARATORS
Product Review
In this review, we’ll discuss the issues that you should consider when shopping for an amalgam separator. The type of amalgam separator that’s right for your practice depends on factors such as the plumbing continued on next page
configuration of the office, the physical space required for installation, monitoring and maintenance issues, legal requirements (if any) for the types of separators required, as well as proper disposal practices for collected amalgam waste. In addition, you’ll have to consider costs like the unit purchase price and expenses associated with its installation, maintenance and waste disposal requirements.

Why This Product Category Matters to You
For dentists who place or remove amalgams, the trend requiring them to install amalgam separators continues. Presently, eight states require separators by law or regulation. These are the six New England states, plus New York and Oregon. Similar legislation has been filed or is pending in several other states. Several cities require dentists to install separators—among them, Seattle, Milwaukee and San Francisco. The local wastewater treatment authority in Green Bay, Wisc., has received a $50,000 grant from the state’s department of natural resources to reimburse dentists who voluntarily purchase and install separators.

Each unit in this review removes 95 percent or more of amalgam particles (as reported by the product’s manufacturer), which meets and/or exceeds the minimum level established by the International Organization for Standardization (ISO). We’ll provide you with the pertinent information you’ll need to make an informed purchase decision.

Box 1. Amalgam Separator Buyer’s Checklist.

<table>
<thead>
<tr>
<th>FACTOR</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operatories (number of chairs)</td>
<td>Offices with four or more chairs should consider central, not chairside, units</td>
</tr>
<tr>
<td>Number of amalgam restorations placed or removed per day</td>
<td>Offices that perform more than 40 amalgam-related activities per week* may need a unit with a large storage capacity</td>
</tr>
<tr>
<td>Office operations (number of days per week)</td>
<td>Consider combining similar flows with other offices if possible to share or reduce costs</td>
</tr>
<tr>
<td>Number and type of dental practices located in your building</td>
<td>Confirm that plumbing system modifications are consistent with lease provisions</td>
</tr>
<tr>
<td>Do you own or lease your space?</td>
<td>Wet cuspidors should be plumbed to a separate line if possible (and if permissible under applicable law); if not, separator should have a holding or surge tank with sufficient capacity</td>
</tr>
<tr>
<td>Would lease stipulations affect installation of a separator?</td>
<td>Certain separators rely on gravity flow and require adequate space from the air/water separator line to connect to the drain system</td>
</tr>
<tr>
<td>What terms are included for utilities maintenance?</td>
<td>Check the power supply needs for each model under consideration</td>
</tr>
<tr>
<td>Is sufficient space available to the air/water separator drain-line and sewer-line connection?</td>
<td>Separator installation should not constrict existing vacuum or drain-line requirements</td>
</tr>
<tr>
<td>Access to electrical power (voltage)</td>
<td>Wet-ring vacuum pumps generate additional water flow that will require greater storage capacity</td>
</tr>
<tr>
<td>Size and material of existing sewer connection</td>
<td>Some warranties may be invalidated if parts of the system are modified by third parties</td>
</tr>
<tr>
<td>Do you operate a wet or dry vacuum system?</td>
<td>Group practices that share vacuum systems may want to replumb or split costs associated with amalgam separator</td>
</tr>
<tr>
<td>Will any warranty be affected by third-party installations?</td>
<td>Office-level systems may require smaller units.</td>
</tr>
<tr>
<td>Is the vacuum system dedicated to your office?</td>
<td>Vacuum systems should be vented to outside air.</td>
</tr>
<tr>
<td>Location of the vacuum system</td>
<td>Access to upstream piping is critical for maintenance and inspection of systems</td>
</tr>
<tr>
<td>Basement or office?</td>
<td>Evaluate model information against the specific conditions for the practice (such as space, plumbing, access, workload, regulatory considerations)</td>
</tr>
<tr>
<td>Space available adjacent to vacuum system (height, length and width)</td>
<td>Group practices that share vacuum lines may need to discuss how the addition of an amalgam separator will affect allocation of cost and responsibilities, as well as make arrangements for access to the unit</td>
</tr>
</tbody>
</table>


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Prepurchase Considerations

Installation Location. Generally, amalgam separators are installed within the vacuum system piping (in-line) at or near individual operatory chairs; in-line at a central location upstream of the vacuum pump; or at the outlet side of the air/water separator. According to manufacturer recommendations, the units listed in Table 1 should be centrally installed, except for the Serfilco (Serfilco, Ltd.) and ASDEX System AS-9 (Capsule Technologies) products. The Rasch 6000 and 7000 are compatible with dry systems only. All other units work with both wet or dry vacuum systems.

Reader Tip: Install the amalgam separator as near as possible to the vacuum pump to minimize the effect on vacuum pressure. The addition of a hose to an existing vacuum piping system generally means more bends or angles in the length of that hose, which can compromise vacuum. Also, the addition of more than four feet of new hose can weaken vacuum performance.

Building and Office Configuration. If your office building has a basement level, consider putting your amalgam separator there. It’s likely where you’ve installed the vacuum systems and air/water separators, anyway. The basement location not only will conserve valuable office space, but also will provide enough space upstream of the vacuum system to collect flow. Alternatively, if you don’t have a basement, space upstream will be limited if your existing systems are installed behind a closet and/or cabinet doors or in utility spaces. As a result, you may have to install chairside amalgam separators.

Monitoring, Ease of Maintenance and Associated Costs

It can happen—you’re in the middle of a dental procedure and suddenly the vacuum s-l-o-w-l-y loses power because the canister in the basement has become full. To avoid practice interruptions like this from happening, understand the maintenance requirements and schedules of your separator before you buy any unit.

Collected amalgam has to be removed from every unit; but what varies is how and when. Some separators will need to be decanted daily; others will require that you replace or recycle the entire unit or canister every three to 18 months, depending on your practice volume. The needs, capacities and constraints of your practice will determine the separator that’s right for you.

Reader Tip: Before you purchase any unit, determine who will be responsible for monitoring and maintaining your amalgam separator—you, someone from your office, or a vendor technician. Well-meaning practitioners often will assume the tasks of monitoring and maintaining the unit to avoid paying for the services of an outside technician. But in some cases, this arrangement can become problematic and, in the long run, cost you money instead. To aid monitoring, some units have an audio alarm to signal when the container should be replaced or recycled, as well as to indicate operation malfunction. Other units have transparent collector housing units to aid visual identification.

The expert panel (see Panel Discussion) agreed that the right package for you should include a thorough understanding of monitoring and maintenance services, whether your office staff or a vendor technician performs them.

Clean Your System Regularly

Keep an eye out (and ear, too) for warning signs such as loss of suction power or increased mechanical noise from the vacuum pump; either may suggest that clogs have developed in the line, which can occur over time with use.

Limiting the biological growth within the system will keep things humming along nicely. Your vendor’s recommendations will depend on the amount of biological material introduced into the system, the length of vacuum lines, and the type of separator.

Reader Tip: Do not use bleach or other chlorine-containing solutions to clean the lines. They can remobilize bound mercury and release it into the waste stream, thereby compromising the efficacy of your separator.

Remember to consider the cost of replacement parts when budgeting for your system. Ask your vendor about how often you’ll have to replace the unit. Again, this will partly depend on your patient load and the number of amalgam restorations performed. The vendor can estimate these figures, but your practice has its own particular set of factors that should be considered when predicting the cost of a system. With some units, especially with sedimentation separators, the entire product is replaced instead of any cartridge. Check with your supplier to determine replacement costs for your separator.

Warning Signal Feature. Remember that dreaded scenario, losing vacuum power because the container has reached maximum capacity? To minimize that prospect, consider a product with an early warning signal feature that indicates when its container needs to be changed or the unit is malfunctioning. Ask the manufacturer if the warning feature is visual, audible, or both, and where it is located so it can be easily detected. Also, find out when the alarm will activate in advance of the unit actually becoming full. Our panel experts suggest an appropriate lead time of about three to four days, which should allow routine maintenance that won’t interrupt your practice.

Regulatory Issues

The effort to reduce amalgam waste discharge from the dental office is the result of increasing pressure facing local wastewater treatment plants to reduce the concentration of mercury in effluent from their plants and the concentration of mercury in sludge. Although there is no national regulation requiring the installation of amalgam separators in U.S. dental offices, state and local requirements exist in some areas. Currently, eight states and a number of localities lawfully require dentists to install amalgam separators. Where mandatory controls do exist, the requirement generally applies to dentists who place or remove amalgams. Check with your state or local dental society to see if any requirements exist in your area.

To ensure proper disposal of amalgam waste, you should contract with a vendor-sponsored program or make disposal arrangements with an independent recycler.

Many amalgam separator manufacturers offer recycling programs as part of their sales package, which generally allows spent or full cartridges/separators to be shipped to recycling facilities for a service fee or as part of a lease. Ask your vendor about the available recycling services in your area (Box 2).

There’s More on PPR Online

For a detailed look at survey responses about these products, visit PPR online at “www.ada.org/goto/ppr.”
### Table 1. Summary Comparison of Product Features and Cost

<table>
<thead>
<tr>
<th>Brand Name and Manufacturer</th>
<th>Unit Cost/ Maintenance Cost</th>
<th>Chairs Served</th>
<th>Intervention Warning</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>AmalgamBOSS LibertyBOSS M.A.R.S. Bio-Med Processes, Inc.</td>
<td>$899</td>
<td>1-10</td>
<td>Alarm - container</td>
<td>Technician</td>
</tr>
<tr>
<td></td>
<td>$1549</td>
<td>4-20</td>
<td>Alarm - container</td>
<td>Technician</td>
</tr>
<tr>
<td>Amalgam Collector, CE24* R&amp;D Services, Inc.</td>
<td>$1245 for manual $1620 for automatic recycle container $150</td>
<td>1-12</td>
<td>Visual - container</td>
<td>Reusable canisters Manual - daily</td>
</tr>
<tr>
<td>Amalgam Separator BU10 Dental Recycling North America (DRNA)</td>
<td>$750</td>
<td>1-6</td>
<td>No</td>
<td>Technician</td>
</tr>
<tr>
<td>Amalgam Separator BU30 DRNA</td>
<td>$1395</td>
<td>7-12</td>
<td>No</td>
<td>Technician</td>
</tr>
<tr>
<td>Amalgam Separator MRU10 DRNA</td>
<td>$1500</td>
<td>1-6</td>
<td>No</td>
<td>Technician</td>
</tr>
<tr>
<td>ASDEX System, AS-9 Capsule Technologies</td>
<td>$229 $79 filter</td>
<td>1</td>
<td>Yes</td>
<td>Replace filter</td>
</tr>
<tr>
<td>ECO II Pure Water Pure Water Development, LLC METASYS GROUP</td>
<td>$335</td>
<td>1-6</td>
<td>Yes</td>
<td>Replace when full</td>
</tr>
<tr>
<td>Guardian Amalgam Collector Air Techniques, Inc.</td>
<td>$1725 - $3615 $850 collector replacement kit</td>
<td>1-7</td>
<td>No</td>
<td>Evac cleaning, replace collection container</td>
</tr>
<tr>
<td>Hg5-Mini SolmeteX</td>
<td>$750 $170 filter</td>
<td>1-4</td>
<td>Visual</td>
<td>Change cartridge</td>
</tr>
<tr>
<td>Hg5 SolmeteX</td>
<td>$750 $170 filter</td>
<td>1-10</td>
<td>Visual</td>
<td>Change cartridge</td>
</tr>
<tr>
<td>Hg5 HV SolmeteX</td>
<td>$2500 $170 filter Filter cartridge with recycle kit $285</td>
<td>1-20</td>
<td>Visual</td>
<td>Change cartridge</td>
</tr>
<tr>
<td>Purevac Hg Sultan Healthcare</td>
<td>$1080</td>
<td>1-6</td>
<td>No</td>
<td>Recycle, daily line cleaning</td>
</tr>
<tr>
<td>Rasch 890-1000 Wet Pump AB Dental Trends, Inc.</td>
<td>$1190 replace canister $596</td>
<td>1-12, 24 with upgrade kit</td>
<td>Alarm - optional</td>
<td>Replace canister, flush daily</td>
</tr>
<tr>
<td>Rasch 890-1500 Inline System AB Dental Trends, Inc.</td>
<td>$695, replace canister $596</td>
<td>1-12, 24 with upgrade kit</td>
<td>Alarm - optional</td>
<td>Replace canister, flush daily</td>
</tr>
<tr>
<td>Rasch 890-4000, Micro-Cleanse Scrubber Upgrade Kit (not a total system) AB Dental Trends, Inc.</td>
<td>$718, upgrades the 890-1000 or 890-1500, which must be purchased separately $596, replace scrubber canister every 144 doctor months</td>
<td>24 when used as an upgrade kit</td>
<td>See 890-1000, 890-1500 product information</td>
<td>Flush daily</td>
</tr>
<tr>
<td>Rasch 890-6000 Dry Pump AB Dental Trends, Inc.</td>
<td>$666, replace canister $597</td>
<td>12-256</td>
<td>Alarm - optional</td>
<td>Replace canister, flush daily</td>
</tr>
<tr>
<td>Rasch 890-7000 Dry Pump AB Dental Trends, Inc.</td>
<td>$1076 replace canister $596</td>
<td>1-2</td>
<td>Visual</td>
<td>Replace canister, flush daily</td>
</tr>
<tr>
<td>CatchHG 1000 (formerly RME 1000) Rebec Simple Solutions</td>
<td>$1665 replace container $445</td>
<td>1-10</td>
<td>No</td>
<td>Return container for processing</td>
</tr>
<tr>
<td>Serfilco 0.5/1.0 SERFILCO, Ltd</td>
<td>$354 filters $1.78-$2.26</td>
<td>1</td>
<td>Visual</td>
<td>Replace filter</td>
</tr>
</tbody>
</table>

* Rated by 20 PPR dentists
† Rated by 10 PPR dentists
‡ Rated by 71 PPR dentists
¶ Rated by 18 PPR dentists

It is sometimes difficult to categorize whether state or local legislative/regulatory action concerning installation of separators or adherence to Best Management Practices (BMPs) is mandatory or voluntary. Note that in a few areas, best management practices include amalgam separators. The ADA’s BMPs and many other BMPs do not include amalgam separators. The ADA strongly urges dentists to follow BMPs.

References


* Because the generator of the waste is responsible for proper disposal, dentists should obtain replies to these questions in writing from their recyclers.

† Source: American Dental Association. ADA best management practices for amalgam waste. Available at: “www.ada.org/prof/prac/issues/topics/amalgam.html#BMP”.


Reader Tip: For specific information about amalgam collection recycling services for these products, visit PPR online at “www.ada.org/goto/ppr”.

For the Practitioner Input and Web-based survey, visit the PPR online at “www.ada.org/goto/ppr”.

References


2 American Dental Association, Department of State Government Affairs.


Box 2. Questions to Ask About Amalgam Recycling.* †

• What kind of amalgam waste do you accept?
• Do your services include pickup of amalgam waste from dental offices? If not, can amalgam waste be shipped to you?
• Do you provide packaging for storage, pickup or shipping of amalgam waste?
• If packaging is not provided, how should the waste be packaged?
• What types of waste can be packaged together?
• Do you accept whole filters from the vacuum pump for recycling?
• Is disinfection required for amalgam waste?
• How much do your services cost?
• Do you pay for clean non-contact amalgam (scrap)?
• Do you accept extracted teeth with amalgam restorations?
• Does your company have an EPA or applicable state license?
• Does the company use the proper forms required by the EPA and state agencies?

DENTISTS, INDUSTRY EXPERTS DISCUSS AMALGAM SEPARATORS

Moderator: Frederick Eichmiller, DDS
Vice President and Dental Director
Delta Dental of Wisconsin
Mosinee, WI

Participants: Kevin McManus, MA, MBA
Senior Program Director
EBI Consulting
Boston, MA

Tim Tuominen, BS
Chemist
Western Lake Superior Sanitary District
Duluth, MN

Connie Verhagen, DDS
Pediatric Dentist
Muskegon, MI

Eichmiller: What do you see as the chief complaints/problems encountered with today’s separator technologies or instruments?

McManus: The thing that I hear a lot is the difference in performance in the field than what was either promised or represented by the vendors, and I think the reason for that is that installation in clinical situations is always going to be very site specific. For example, there are often times when people will say, “I thought this cartridge was supposed to last for 6 months or 9 months or a year, and I’ve had to swap it out three times already, what’s going on there?” And I think it’s still early to say whether or not it’s common to all these, but I think it has to do with the fact that offices may be collecting a lot of other material, which is degrading the performance and longevity of the units, particularly the cartridge type units.

Eichmiller: Well, that’s a capacity issue, really. Things like prophylactic paste will load up a separator very quickly, so a lot of times, you’re
DESENSITIZING AGENTS

Product Review

For this review, we surveyed dentists about 12 desensitizing agents: D/Sense Crystal Desensitizer (Centrix), Duraflor Sodium Fluoride Varnish (MEDICOM), Duraphat (Colgate Oral Pharmaceuticals), Gel-Kam DentinBloc (Colgate Oral Pharmaceuticals), Gluma Comfort Bond (Heraeus Kulzer), Gluma Desensitizer (Heraeus Kulzer), Hemaseal & Cide Desensitizer (Advantage Dental Products), HurriSeal Dentin Desensitizer (Beutlich LP Pharmaceuticals), Microprime B Desensitizer (Danville Materials), Pain-Free Desensitizer (Parkell), PROTECT Desensitizing Solution (Sunstar Americas, Inc.), Vanish 5% NaF White Varnish (OMNI Preventive Care).

D/Sense Crystal Desensitizer
Centrix
(800) 235-5862
www.centrixdental.com

Duraflor Sodium Fluoride Varnish
MEDICOM
(800) 361-2862
www.medicom.com

Duraphat
Colgate Oral Pharmaceuticals
(800) 226-5428
www.colgateprofessional.com

Gel-Kam DentinBloc
Colgate Oral Pharmaceuticals
(800) 226-5428
www.colgateprofessional.com

Gluma Comfort Bond
Heraeus Kulzer
(800) 431-1785
www.heraeus-kulzer-us.com

Gluma Desensitizer
Heraeus Kulzer
(800) 431-1785
www.heraeus-kulzer-us.com

Hemaseal & Cide Desensitizer
Advantage Dental Products
(800) 388-6319
www.advantagedentalinc.com

HurriSeal Dentin Desensitizer
Beutlich LP Pharmaceuticals
(800) 238-8542
www.beutlich.com

Microprime B Desensitizer
Danville Materials
(800) 827-7940
www.danvillematerials.com

Pain-Free Desensitizer
Parkell
(800) 243-7446
www.parkell.com

PROTECT Desensitizing Solution
Sunstar Americas, Inc.
(800) 827-7940
www.sunstar.com

Vanish 5% NaF White Varnish
OMNI Preventive Care
(800) 445-3386
www.omnipreventivecare.com