



Amalgam Separation 2007/2008 Quick Reference Guide.

While the ADA maintains that dentistry contributes only 1% of the mercury load to the environment, the real concern is that dentistry contributes 80% of the mercury load entering the sewer systems, and flowing through to the food chain.

This Resource contains information for the dealer about the reasons for the use of amalgam separators, the Rasch product line, installation tips, specifications, and insights on evaluating competitive equipment.

PRESENTED BY

 **AB Dental Trends**
We make problems go away

Why would a dentist want to separate and recycle amalgam?

Amalgam contains about 50% mercury, and mercury is ranked third in the US Government list of hazardous substances. Mercury comes after arsenic and lead, but ahead of all the organic toxins such as PCBs and pesticides. The World Health Organization (WHO) has identified mercury as the number one environmental poison.

Symptoms of mercury toxicity cover a wide range, including respiratory, immunological, neurological, reproductive, developmental, genotoxic, and carcinogenic. Some individuals also exhibit a hypersensitivity to mercury.

Mercury from many sources is appearing in our air, water, food, and sewer sludge.

Sewer sludge is usually sold as fertilizer to agriculture and tree farms. Sludge with a high content of mercury cannot be sold or even given away, it is a toxic waste, which must be properly disposed. The best characterization of mercury entering the sewer system was done by the city of Palo Alto, California in the US. Their results are as follows:

47%	Dental Offices
36%	Human Waste (Amalgam)
7%	Permitted Industry and schools
6%	Human Waste (Food)
3%	Storm water
0.1%	Residential products
1.6%	Other

With as much as 80% of the mercury entering the sewer system being from dental amalgam, all levels of government are moving towards regulation.

Air emissions of mercury are also a major area of concern. Mercury is a volatile liquid that changes to a vapor

over time, or rapidly with the addition of heat. Sources as estimated by the US EPA are as follows:

26.7%	Medical Waste incinerators (includes amalgam from traps)
22.7%	Municipal Waste Combustors (includes amalgam from traps tossed in garbage)
34.7%	Boilers-Utility, Commercial, & Residential, primarily from coal
0.9%	Crematories and sludge incinerators
13.2%	Manufacturing sources
1.8%	Fluorescent lamps, labs, dental preparations, landfills, paint and misc.

Regulations are removing mercury from many products. Paint contained mercury as a mold inhibitor until a few years ago. The energy industry is facing EPA regulations on coal fired boilers. Air emissions from dental mercury can be greatly reduced by recycling amalgam from traps instead of throwing it in the garbage and medical waste, or flushing it.

Dental amalgam that enters garbage landfills will contaminate ground water and volatilize into the air.

Mercury levels are increasing in our food supply. Sewer sludge is used as fertilizer for our food. Mercury in the air eventually gets into water and the food chain. Living tissue accumulates mercury, and this becomes more concentrated at the top of the food chain. Fish have been found to accumulate very high levels of mercury.

The bottom line for dentists is avoidance of liabilities and anticipating or meeting regulations. Canada sup-

ports a national program for dental mercury, and the EPA is enforcing a similar program in the United States. Mercury accumulating in vacuum and sewer lines may very well be considered a hazardous waste site liability when the doctor sells his practice or demolishes the building. Recycling both used and unused amalgam can eliminate a potential liability for the doctor, and help maintain a measure of safety in our food chain.

Government agencies use two procedures for detecting mercury in the sewer system. If local regulations require amalgam separators, then spot checks at the dental clinics are done to verify compliance. The second and less known procedure is used when a sewer treatment facility identifies high levels of a specific contaminant. They first test every sewer line flowing into the facility to see which ones have high levels. Next they go upstream on the offending line and sample at each divide until they can pinpoint the building or office creating the contamination. In the case of some private dental offices and one US Government dental facility, this has resulted in work stoppage and a requirement for the clinics to collect and dispose of all liquid waste as hazardous.

Most municipalities or sewer districts in North America already have regulations which place upper limits on the parts per million of various elements that can be in the waste stream entering the sewer. Keep in mind that agencies will measure total mercury, both particulate and dissolved compounds.

The Rasch 890 Amalgam Separator removes fine amalgam particles and dissolved mercury from the dental office waste stream, providing the doctor with peace of mind.

What processes are available?

There are three distinct types of amalgam separators designed to remove amalgam from the waste-stream. They are sedimentation, centrifuge, and ion exchange. Each has benefits. Some have drawbacks. Levels of performance and reliability differ.

Sedimentation

Sedimentation units rely only on the rudimentary principle of gravity to catch and stop the heavy particles of amalgam as the wastewater runs through the catch chamber. This works well for the larger pieces, but the small particles and dissolved organic mercury will flow right through and into the sewer. To be effective, sedimentation units are usually rather large and cumbersome. Handling of contaminated fluids may be required. Some inexpensive units require daily maintenance.

Centrifuge

Rarely sold in North America, a centrifuge is a precision, delicate, highly sophisticated mechanical device that spins fluids at high speeds, separating suspended materials by weight. This is really a form of sedimentation with centrifugal force taking the place of gravity. Heavy amalgam is drawn into and collected in the catch chamber. Dissolved mercury is not removed. Air is a centrifuge's enemy, and chemicals are required to avoid foaming. Foaming disrupts the sedimentation and can shut down the system. Capital costs are high, and maintenance, repairs, and chemical costs are higher than with other systems.

Filtration

Filtration is a mechanical process to restrain large masses that might float through the separator while carrying some amalgam particles. This is important in the real world where prophylaxis paste and organic debris are present in significant quantities. There may be growth of algae and bacteria during the weekend shutdown that will form clumps or crusts. Flat screens and filters will plug up. The Rasch 890 canister uses compartments filled with granules to create a three-dimensional filter that does not plug.

Ion exchange

Ion exchange is a process that bonds small particles and dissolved metal compounds to a charged substrate (or specially treated material) inside the catch chamber. The use of a cation exchanger plus an anion exchanger will capture both negatively and positively charged particles and dissolved compounds. However, ion exchange is not effective alone.

Combination

With the combination of sedimentation, filtration, and ion exchange, the Rasch System 890 is the most cost-effective method of reliable separation of particulate and dissolved amalgam. Only the Rasch process uses this unique group of systems including our patented method of ion exchange.

Each Rasch 890 amalgam separator is divided into 8 compartments. In compartments 1-2, sedimentation of the coarsest particles takes place. In compartments 3-6, filtration removes particles down to 20 microns in size. In Compartments 7 and 8 the patented ion exchange process attracts any particles smaller than 20 microns and the dissolved mercury compounds.

RASCH SYSTEMS - The Lineup

OFFERING THE BROADEST COVERAGE

AB Dental Trends recognizes that you cannot be expected to make just one model fit all possible vacuum configurations, so in an effort to facilitate installations we offer four primary versions.

890-1000 - Used where only an installation on the outlet of a wet-pump is feasible. Drain and vent needed.

890-1500 - Most popular, mounted in the main suction-line between the operatories and the pump. No drain or venting required.

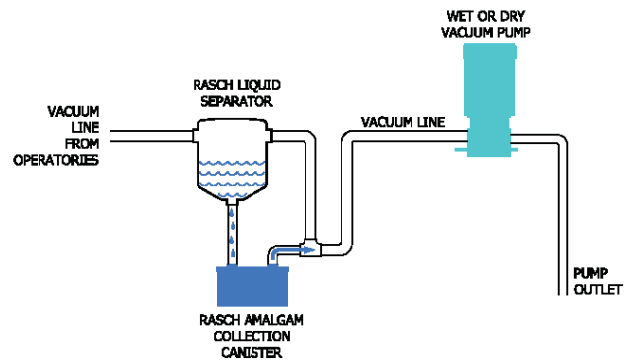
890-6000 - This unit connects to the outlet from a dry pumps collector tank and drains to the city sewer. Ideal and economical for small clinics to large clinics.

890-7000 - A fully portable desktop system designed for remote clinics or multi-use facilities, it incorporates a drain hose that can easily be draped into a sink.

To simplify stocking of replacement canisters, all Rasch separators use the same canister.

890-1500 In-line for any Vacuum System

Our most popular unit, the 890-1500 is easy to install, requires no drain or venting, and feeds clean fluids back into the suction system automatically. No need for daily maintenance or checks. Flexible to allow for in-line installation directly between the operatories and the suction pump, and may be either floor or wall mounted.



890-1500

INSTALLED IN THE VACUUM LINE WITH NO DRAIN OR VENTING REQUIRED



- Circular design facilitates flow
- Durable molded Polymer withstands impact and extreme temperature fluctuations



- Large 1-1/2" ports help ensure restriction-free flow
- Threaded fittings allow for on-the-spot customizing

Are there even more features and benefits to Rasch?

ALWAYS LOOK BEYOND THE CAPITAL COSTS

Hidden costs seem to be a way of life, and so we have worked hard to present pricing that is truly simple and the best investment for your clients.

Initial unit costs are very competitive with the lowest monthly AND 5 year cost on the market

Replacement canister costs include recycling and return shipping.

No 5-year contracts or liabilities with Rasch systems

Our ISO 11143 test is at a realistic full-flow of 4 liters/minute (1 gal), unlike others as low as 50ml/minute (1 oz) and ours is tested by accredited labs only.

Rasch units have no moving parts and no electrical requirements making for an easy and trouble-free installation. And the 18 month canister life makes for a very low monthly cost - and recycling and return shipping is free!

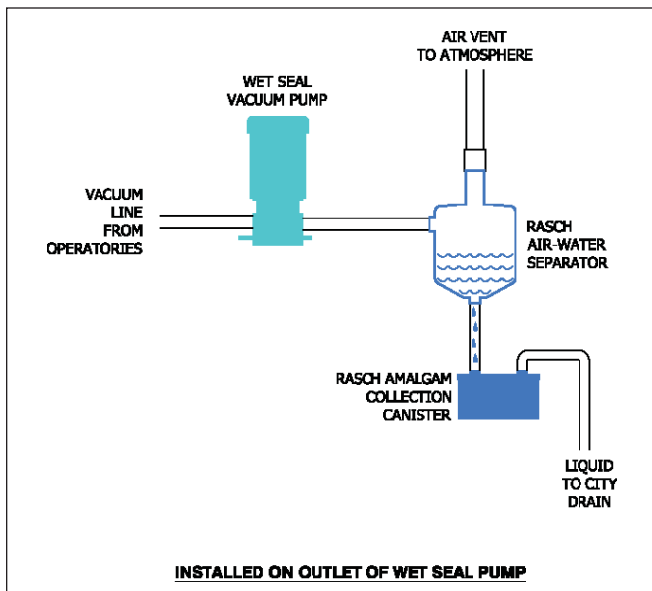
Rasch has been manufacturing Amalgam Separation systems since 1987. When choosing a manufacturer, be sure that they have been in business for at least as long as many newcomers last only a year or two.

Unlike other Ion-exchange units on the market that can prematurely solidify and clog, the Rasch is unaffected by fluid PH levels and our Ion-exchange material remains porous.

Avoid units with timers, pumps, or requirements for manually draining fluid. They can be subject to nasty spills and shutdowns. All Rasch units continuously and automatically drain while they process.

890-1000 Wet-Pump Outlet Installation

This package is for use only where access requires installation on the outlet of wet seal vacuum pumps. The integrated air/water separator will accommodate up to two vacuum pumps. The small footprint and the integral rack make floor or wall mounting simple. An air vent is provided so exhaust may be vented to the exterior of the building with hard pipe or flex hose in an effort to keep pump exhaust from re-entering the compressed air system. Use the 890-1000 when the city drain is at or near floor level.



890-1000

What other issues should I be aware of?

Rasch units require no daily monitoring, fluid bleed-off or adjustments other than ensuring adherence to daily suction line flushing protocol.

With an 18 month life per full-time doctor, the Rasch is the most economical replacement canister available.

A certified 99.3 % efficiency at 2 liters/min, and 96.7% at 4 liters/min. These are real-world flow-rates, not low flow-rates required to get through a certification test.

Cuspidors should usually be connected to the vacuum system using a simple kit available from AB Dental Trends as Rasch Amalgam Separators have abundant flow capacity to accept cuspidor fluids. A simple kit is also available to convert continuous rinse to timed rinse should the need arise.

As with all separators, a daily protocol of flushing vacuum lines with a cleanser should still be used, with attention paid to using non-foaming detergents.

890-6000 Dry Vacuum

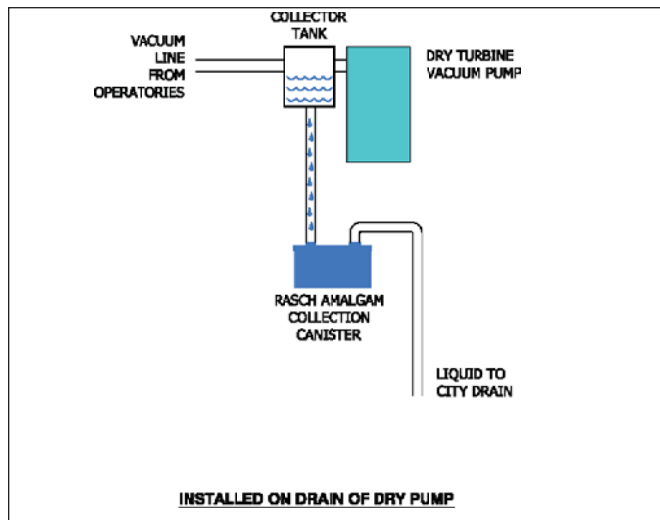
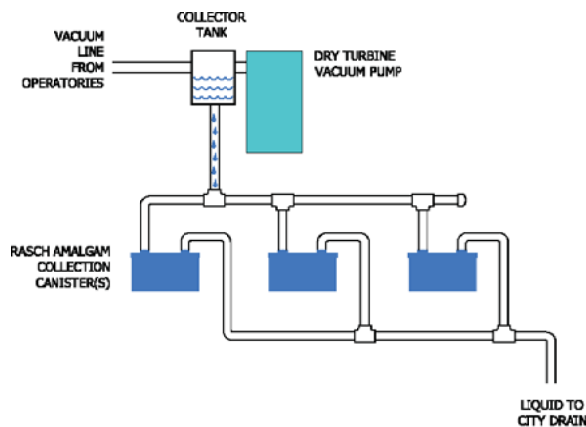
This basic system is used for dry vacuum setups, and includes the separation canister and a hook-up kit. Simply route fluids from the Dry Turbine collector tank into the Amalgam Separator, and then out to a floor drain.



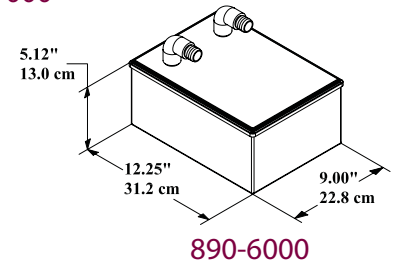
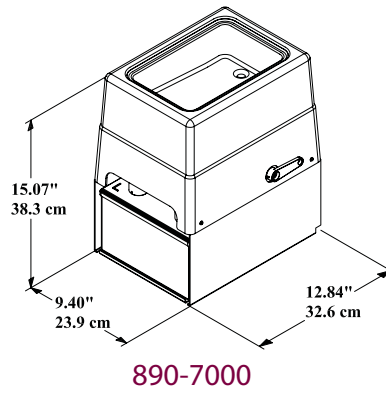
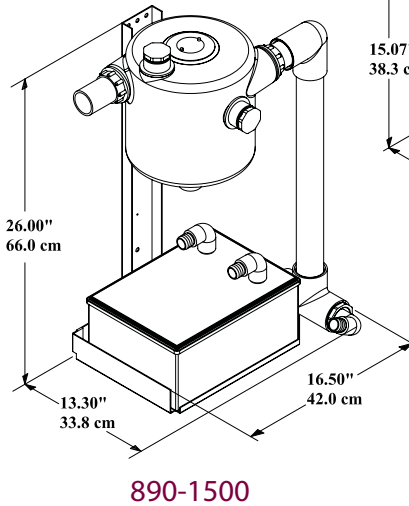
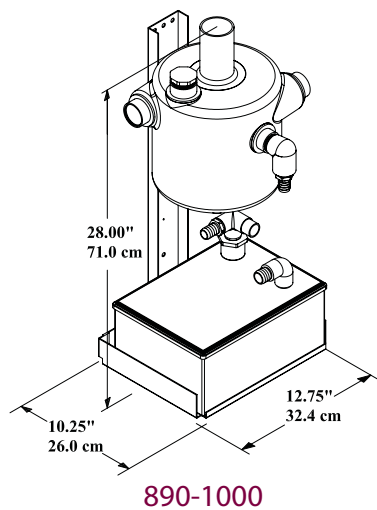
Large or Institutional Installations

Easy to manifold, the 890-6000 may be used to treat the effluent from virtually any size of collection tank.

Simple PVC manifolds can be created on the fly from hardware store fittings, or custom ordered from AB Dental Trends and shipped with your order.



Just how compact are Rasch systems?



890-7000 Portable Units

Don't look any further for a portable unit, because Rasch is the first and only. Our same time-proven system has been mated to a handy table-top chassis to allow for on-demand Amalgam Separation in your remote location, or multi-use clinic.

Inlet and outlet shut-off valves are included, with integrated odour-locks. Simply pour fluids collected from an air-vac system into the top of the 890-7000. A 6' flexible drain line routes treated effluent to a sink and directly into the sewer system.

Small size allows storage inside a cabinet while facility is being used for other activities.



890-5000 Alarm System with Test Switch.

Some jurisdictions require a bypass alarm. Don't other manufacturers have them? Our simple modular alarm works on an internal 9 Volt battery. The control may be mounted in a prominent location of choice and emits an audible alarm much like a smoke detector. Retrofits to an 890-1000 and 890-1500 in minutes.

Why else would you recommend the Rasch?

Field Proven

Rasch has been designing and building Amalgam Separation Systems since 1987, and has placed thousands of units worldwide. The Rasch 890 system in its various forms exceeds ISO standards at 99.3%. Initially developed in Denmark to satisfy stringent European regulations, today's Rasch 890 is time tested as opposed to many which were imagined yesterday to take advantage of today's legislation. Ask other manufacturers how long they have been in production and how many units are installed worldwide for a clearer picture.

The American Dental Association (ADA) compared 12 amalgam separators for removal of both particulate and digested (liquid) mercury. The Rasch system achieved excellent results on both parts of the research. The results of the dissolved mercury test had a very wide range between brands of equipment. Results are available on request.

Performance

The average separation is 96.7% at 4-liters/minute, 99.3% at 2-liters/minute and 99.9% with the scrubber attachment. Performance actually increases at the lower flow rates commonly associated with today's newer pumps. This is significantly better than the 95% minimum of the ISO 11143 standard.

Priced Right

THE RASCH 890 SYSTEMS ARE THE LOWEST PRICED PROVEN SYSTEM AVAILABLE TODAY. Only one system is needed to treat up to 12 dental units. The amalgam is collected in safe, strong, economical canisters (replacement cost even includes recycling and return shipping), and a single canister lasts one doctor an entire 18 months. Competitive brands typically last 1 to 12 months. Is the doctor's practice likely to grow? The system is easily expandable, and off the shelf systems are available for even the largest institutional dry turbine pumps and collection tanks.

Value-added features

No outside service contract or monitoring is required. This keeps you in control of managing your customer base. As Rasch replacement canisters are sold only through dealers, a simple calendar reminder system keeps you and the doctor on top of when his canister is due for replacement, affording you the opportunity to offer the best possible service to your clients. Some Amalgam Separator manufacturers deal direct on replacements, while others sell through hazardous waste haulers creating an opportunity for missed replacements.

A service tech or salesman can replace canisters when full in under 5 minutes without the use of tools, and then simply UPS it away to the recycling center in the packaging provided. No recycling charges, no shipping costs, no maintenance between canister changes, and no problems.

Trouble Free

Adding to this value is the ease of installation. How many systems can claim the following?

No electrical. This means the cost of an electrician is avoided, install time is greatly reduced, no electrical inspection is needed, no power consumption and no electrical parts to suffer from that inevitable corrosion.

No moving parts. Imagine not having any service calls for breakdowns, false overflow signals, sticky wickets, adjustments or bulbs that won't light.

Free flowing - no restrictions to Vacuum.

No valves. Built entirely to provide low resistance free-flow, the Rasch 890 has no valves to plug, seize or accidentally be left open or closed.

No pumps or timers - how simple is that?

So simple in fact, that AB Dental Trends offers their 5 Year Replacement Warranty – a warranty we think you'll never need.

High Capacity

With the highest through-put available at 4 liters (1 gal)/min flow, the Rasch 890 system is the perfect match for practices of all sizes. Even the extended use of chairside cuspidors doesn't appreciably impact the Rasch 890 capacity. Nor do scalers or over-zealous days-end suction line flushing. And if the doctor is thinking of expanding or adding associates, the Rasch 890 expands right with him.

Fast Installation

Used with both wet and dry suction systems, the Rasch 890 is truly Plug-n-play. Simply place it in position and connect the hoses. The small footprint of 10" x 12.5" requires little floor space for placement, and it is lightweight. Most models can alternatively be easily wall mounted with no extra parts required. This also allows it to be quickly moved or relocated.

Water flow considerations

A single separator canister has a maximum flow rate of 1 gallon (4-liters) per minute so for most systems water flow is not an issue.

If installing an 890-1000 on the OUTLET of a wet-ring pump, the flow from all pumps to be serviced should be combined to determine total waste-water flow. If the total is over 1 gallon per minute, consideration should be given to adding an expansion kit #890-3000 to increase flow capacity to 2 or more gallons per minute. In the case of a dry turbine, simply add another canister. In most instances fluid volume from operatories is not significant and can be ignored, however continuous rinse cuspidors, sinks, and other equipment might add significant volume. Parts for connecting cuspidors and sinks to the vacuum line are available at www.dentalparts.com.

The table below shows the water output for some newer models of wet pumps. Note that older models may use more water; checking the I.D. plate on the pump in question is recommended. All outputs are for single pumps, so for dual units multiply the output by two.

Apollo Dental Products, Inc.
All models and horsepower ratings = 0.5 gallons per minute (gpm)
With optional Simple Solution Water Recycler = .19 gpm
DentalEZ Group CustomAir
1 horsepower = 0.5 gpm
2 horsepower = 1.0 gpm
The Water Recirculator reduces water consumption by approx. 80%
1 hp WR = 0.1 gpm
2 hp WR = 0.2 gpm
MDS Matrx Medical
MiniMizer 1 and 2 hp = 0.8 to 1.0 gpm
MaxiMizer with integrated water recycler 1 and 2 hp = 0.25 gpm
Tech West Inc.
All standard Whirlwind models and hp = 1.0 gpm
Whirlwind models with recycler = 0.25 gpm

What to watch for on competing models

Some basic sedimentation units have the benefit of low repairs, but suffer with low performance and flow capacity, while others are very complex. Check the history of problems and repairs, and beware of new models with no history. If the model you are looking at is a simple design with no moving parts like the Rasch, then repairs should be negligible.

NOTE THAT 50% OF COMPETING MODELS HAVE GONE OUT OF BUSINESS SINCE 2001!

Many brands specify the type of non-foaming vacuum line cleanser the doctor should use. Some manufacturers are also in the cleanser business and require that you use their brand as a condition of the lease or warranty. The cost of the special cleaners and chemicals can be significant. The Rasch 890 System works fine with most non-foaming detergent cleansers.

Some amalgam separators that are installed in the suction line between the pump and operatories rely on the pump to pull the liquid through the separation process. The resulting reduction of vacuum may put too great a load on a marginal pump, or reduce useable vacuum requiring a larger pump to maintain adequate suction. The Rasch system uses gravity feed and places no load on the vacuum pump.

Avoid removing the solids collector traps as some manufacturers suggest. Large amalgam particles are sharp and will erode the vacuum lines and eventually create leaks, and that expensive gold crown which was evacuated into the suction system will be lost somewhere in the line. Traps will catch about 50% of the amalgam that can then be put in an inexpensive container for recycling.

The liquids and solids in any amalgam separator are highly contaminated with microorganisms. Examine the mechanism, plumbing, and collection canister for the possibilities of spills and contact when servicing or changing canisters. Is there an open top to the canister that must be capped or cleaned out? The Rasch System is simple, quick and safe with two special fittings on top of a stable canister and non-removable snap-on caps. We provide a disinfectant and instructions to completely sanitize the interior of the canister. This, coupled with our unique canister construction and capacity limits allows our system to use common couriers to return full canisters to our facility—fully pre-paid! How many others offer that service and convenience?

In summary, for those instances where cost is the only concern, consider this: for any other competing Amalgam Separation System, determine how much it will sell for. Add to this the cost of a lengthy installation, and five years of service/maintenance charges, recycling, and throw in a service call or three. Now add it all up. What you'll find is that the Rasch 890 is less expensive initially, and on a monthly basis. That's why we call it plug-n-play. Once you plug it in, you can play with the savings.

Points to recommend to your customers

- Field proven
- Certified to exceed ISO 11143 AT 99.3%
- Trouble free
- Sizes for every facility
- Priced right
- Easy installation and no electrical lowers cost
- Versions to fit virtually any type of installation

What role does AB Dental Trends play?

AB Dental Trends is the exclusive distributor for the Rasch Process in North America and manufactures a large percentage of the Rasch 890 system. Marketing only through the dealer body, AB Dental Trends remains in the background as a "Silent Partner" in an effort to allow the dealer/end-user relationship to strengthen. AB Dental Trends and its partner company, Parts Warehouse, have the design, implementation, production and distribution capabilities to support a broad range of projects from single office installations to complete hospital conversions. This combination of resources, customer service and quality control allow us to offer competitive pricing backed by some of the best warranties in the industry. Our mission is to fully support our customers with products and technology that allow them to build the strongest possible relationships with their clients.

This Resource is available to Dental Dealers for your reference and guidance. We also offer single sheet color literature explaining the features and benefits of each individual system. All documents are also available as PDF files on our website for you to download and e-mail. Our web site at www.amalgamseparation.com also serves as an expanding knowledge-base.

AB Dental ordering information

Ordering, warranty, sales, or technical assistance is available by phone at 800-817-6704, or by fax at 800-817-6705. You also may e-mail info@amalgamseparation.com. Hours are 8 AM to 5 PM Pacific Time.

Most shipments will be made the following business day. Please allow additional lead-time for larger orders.

Warranty

Amalgam separation equipment is warranted against defects in material and workmanship for a period of five years. We will promptly repair or replace a product returned within the five years. If you believe that the product did not perform at a satisfactory level for its intended use, then simply request authorization prior to sending it back along with a copy of the original dealer invoice. Warranty claims must be made directly to:

AB Dental Trends Inc.

211 Grover Street
 Lynden, WA
 98264
 Tel: 800-817-6704
 Fax: 800-817-6706
 Ask for "Amalgam Separation"

Rasch System 890 Technical Highlites

Certification	Exceeds ISO 11143	
Warranty	Five years against defects in material and workmanship	
Compatibility	All wet and dry vacuum systems	
Noise level	Silent	
Moving parts	None	
Electrical req.	None	
Mounting	Floor, shelf or wall mount rack	
Flow rate	Maximum 1 gallon (4 liters) per minute	
Canister Life	18 months for one full time doctor removing 5 amalgams per day - 5 days per week	
Size (WDH)	890-1500	16.5 x 13.3 x 26.0 inches (42.0 x 34.0 x 66.0 cm)
	890-1000	12.75 x 10.25 x 28.0 inches (32.0 x 26.0 x 71.0 cm)
	890-6000	12.25 x 9.0 x 9.0 inch overall ht with fittings (31.0 x 23.0 x 23.0 cm)