



**NACWA**

# **Amalgam Separator 101 & Maintenance**

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# What is an Amalgam Separator?

First: The Amalgam Separator name is incomplete.

**THESE ARE SOLIDS COLLECTORS**

Separate amalgam and every other solid material  
suctioned down the vacuum line.

Second: Mercury is not the target, solids are.



# What do they do?

Treat contamination at its source

Most from just before the Vacuum Pump

Separate suspended solid and water from air flow

Capture the solids.

Captured solids can be recycled or disposed of properly



# Mercury removal systems?

Amalgam Separators capture “Mercury”  
by default not by design

Designed to meet an ISO particle standard.

Designed to capture 99% of solids by weight not  
total mercury



# ISO 11143 Certification

International Standards Organization

A protocol for testing systems in a laboratory environment

It is a particle standard by weight (Not mercury)

- Weigh at the start

- Weigh after drying

- Results based on a % of solids removal

Standard is 95%

All but one in the US 99% ISO

ISO Standard reissued in 2008 with not significant changes (ADA, SolmeteX on committee)



# What does that mean?

1 ppm equates to 10 ppb at 99% capture rate if it were dissolved mercury.



# **Types of Amalgam Separators**

**Sedimentation**

**Centrifugal**

**Mechanical**

**Chemical**

**Combination**

Rebec



Rasch



The Guardian



DRNA



Metasys



M.A.R.S.





## R & D Services



## SolmeteX

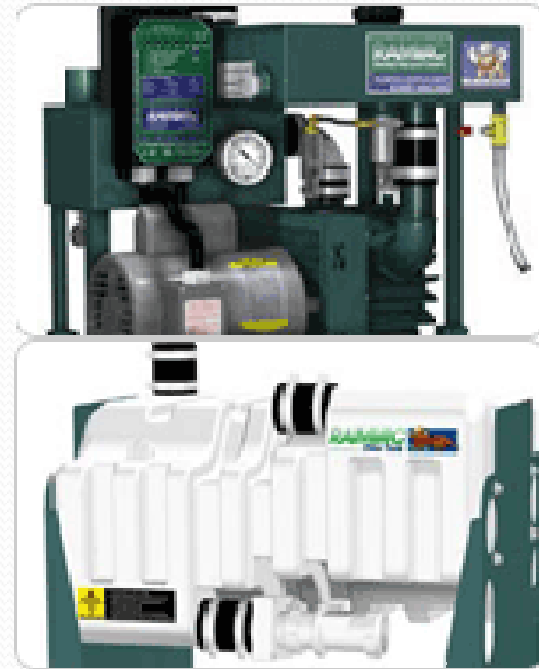


# Vacuum Systems

**Wet System**



**Dry System**



# Installations





# **System easy to install**

Generally installed by dealers or plumbers

Systems costs from as little as \$330 - \$1200 for 90% of the dental industry.

# Dental Vacuum reality

System can clog

Flow under vacuum is not the  
positive pressure



# Vacuum Flow

Flow under vacuum is not the same as flow under positive pressure





# Line Cleaners

There are approximately 35 vacuum line cleaners used in dental facilities

Line cleaners have different pH ranges from 1 – 11.5

Some line cleaners have oxidizers

Oxidation will break down an amalgam release mercury. Chlorine





# Line Cleaners

Non oxidizing cleaners

Discharge to Publicly Owner Treatment Works (POTW's) require neutral pH between 5 – 10.5. A dentist could be out of compliance for discharge to sewer.

In Massachusetts the regulation requires the use of neutral pH line cleaners 6.5 - 9





# What is there to maintain?

Separators capture Solids

Maintenance is to remove the collected solids and responsibly recycle or dispose of the waste

Amalgam Separator waste can be sent by common carrier



# Disposal Logistics

Some companies have developed simple and easy packaging, transportation, tracking, recycling, and waste characterization to dispose of the waste properly.

Others separator companies following procedures or having waste haulers pick them up.

Recycle or Land Fill

# What to do with the waste?

**Recycling / Retorting**



**Landfill**



# Questionnaire

## Questionnaire Dental Amalgam Separator

State:

Date of Legislation:

1. Number of practicing dentists:
2. Data source for the number of dentists:
3. Do the dentists have to certify with the State?
4. Who has oversight of this?
5. Who has enforcement of this?
6. Are best management practices required?
7. Are best management practices enforced?
8. Number of dentists that have certified they have installed an amalgam separator:



9. Number of dentists that have certified they are in compliance with the State law:

10. Number of dentists that have not complied with the regulation:

11. Overall compliance % rate:

12. Number of Dental certifications submitted by year

Prior to date of legislation:

Each year after:

Comments:

Date information collected:

Certifying contact from State:





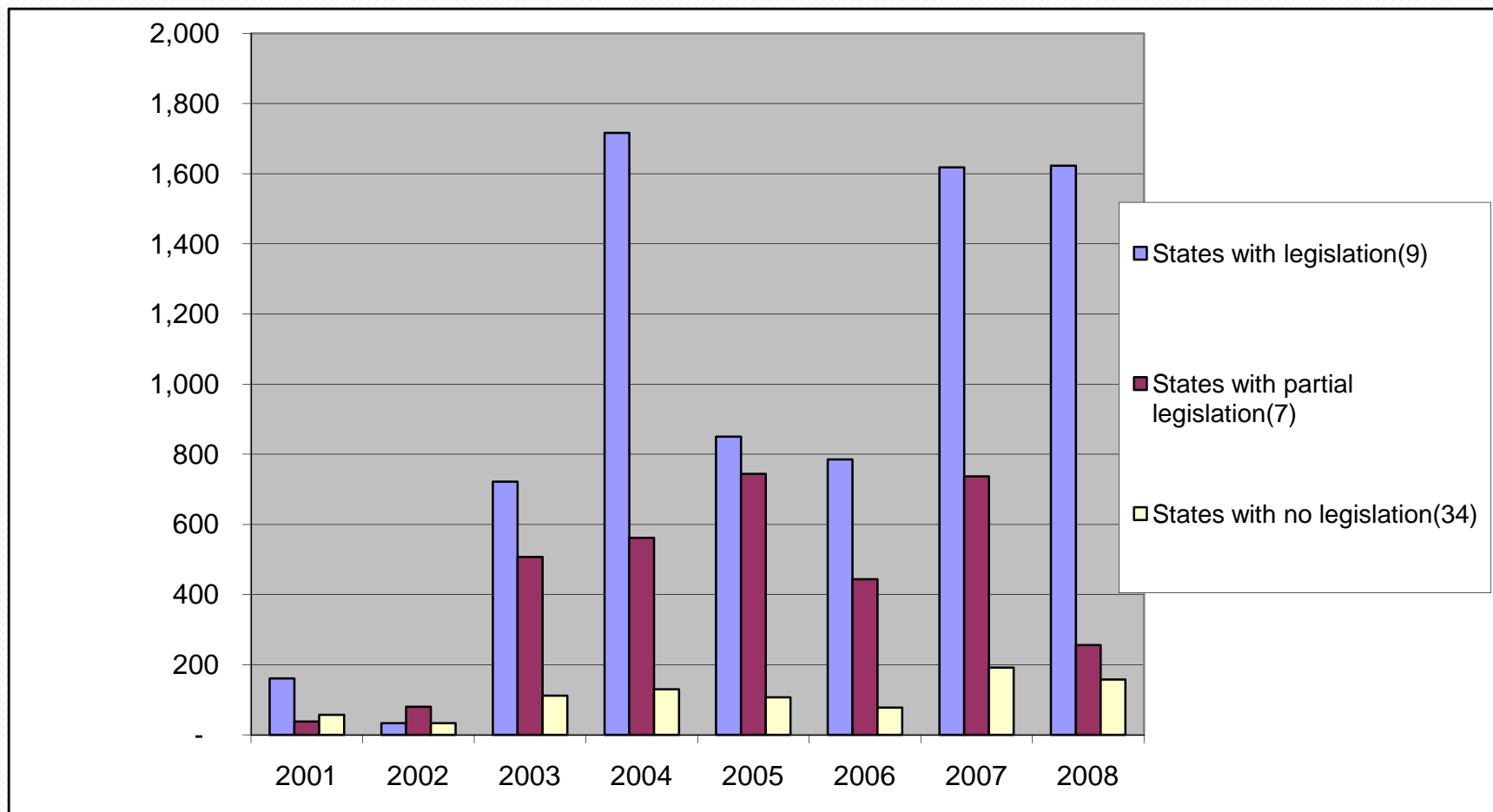
# Survey of Regulated States

Data showed that 92% of all dentists within five of the six New England States have complied with the legislation and 94% of dentists required to install a separator have done so. Furthermore, Maine and Vermont have installation rates of 100 % and 99 % respectively.

These numbers prove that a mandatory amalgam separator program provides effective

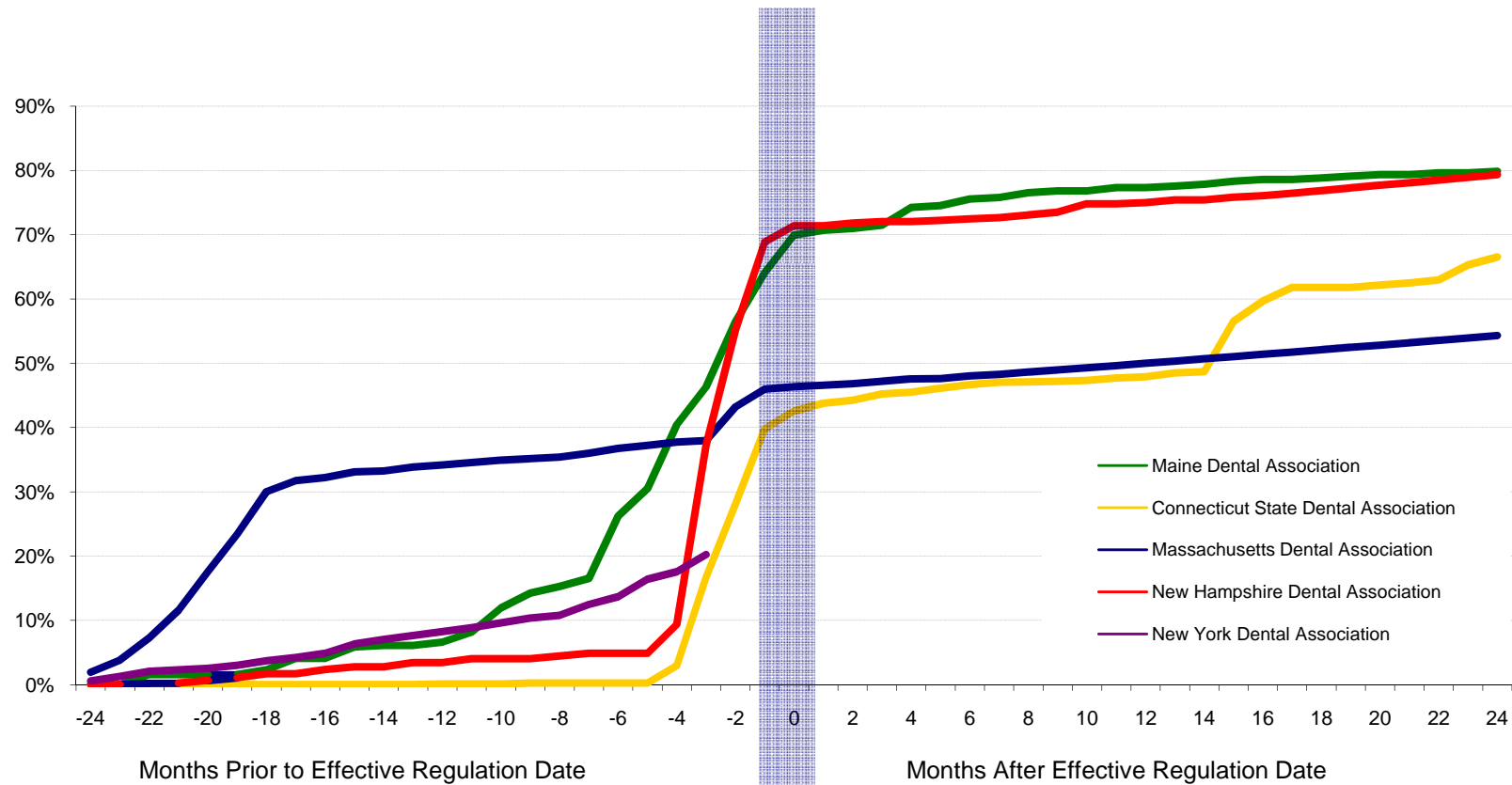
RI did not provided sufficient enough data to be included in this study

# 2001-2008 Sales Analysis



# Sales of System

## Regulation Sales Trend







# **Servicing the separators:**

Containers should be replaced at least once a year

Container sales are at .8 per year.

Conclusion is not being replaced timely



# **Maintaining Amalgam Separators and BMP's**

Certification

Documentation

Education

Clarification



# Effects of amalgam separator installations

Security Water and Sanitation District,  
Colorado Springs CO

State of Colorado issued the POTW a cease and desist order. (For not meeting NPDES mercury limits)

Required the installation of amalgam separators  
Influent and Effluent total mercury number dropped  
and now they operate within the NPDES permit.

# Security Water and Sanitation District

2008 SSD Influent Mercury Data	
1/10/2008	80.0 ng/l
2/6/2008	141 ng/l
3/4/2008	91.7 ng/l
4/8/2008	113 ng/l
5/1/2008	138 ng/l
6/3/2008	782 ng/l
7/1/2008	150 ng/l
8/4/2008	87.7 ng/l
<i>polishing unit installed 8/15/08</i>	
9/3/2008	86.8 ng/l
10/1/2008	75.7 ng/l
11/3/2008	62.1 ng/l
12/3/2008	55.3 ng/l
1/7/2009	55.8 ng/l
2/4/2009	82.9 ng/l
3/3/2009	87.5 ng/l

2008 SSD Effluent Mercury Data	
1/10/2008	9.90 ng/l
2/6/2008	12.8 ng/l
2/19/2008	8.5 ng/l
3/4/2008	11.5 ng/l
4/8/2008	7.87 ng/l
5/1/2008	8.41 ng/l
6/3/2008	11.7 ng/l
6/17/2008	8.61 ng/l
7/1/2008	8.82 ng/l
8/4/2008	7.01 ng/l
<i>polishing unit installed 8/15/08</i>	
9/3/2008	6.31 ng/l
10/1/2008	5.41 ng/l
11/3/2008	4.60 ng/l
12/3/2008	6.70 ng/l
1/7/2009	6.31 ng/l
2/4/2009	7.88 ng/l
3/3/2009	6.88 ng/l



# Amalgam Separators:

10 States have mandatory Amalgam Separator regulations

(ME, NH, MA, VT, RI, CT, NY, NJ, OR, MI)

\*MN and WA have programs in place but there is no formal regulation

Several other States have local mandatory programs



# Conclusion

Regulations perpetuate installations of amalgam separators.

Certification is one way to know installations have occurred

Annual certification will assist in replacement of collection containers

Amalgam separators have an impact on both influent and effluent numbers