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Mercury Life Cycle in the Dental Office

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Amalgam is the primary source of mercury entering the aqueous environment. According to the US EPA 46% of the total mercury entering the environment. The US EPA has established a regulatory category for dental discharge (40 CFR 441). It focuses on amalgam separators and ISO 11143 standard as the primary process for amalgam removal as a solid. The ISO standard does not address the more serious issue of dissolved mercury.

Amalgam dissolves slowly in the separator generating soluble mercury levels up to part per million concentrations which are difficult to remove. This process defeats the purpose of the separator. The US regulation is seriously flawed as it does not address this issue by establishing a total mercury discharge limit or allow innovation to develop to reduce total mercury by allowing Best Available Technology.

Removal of amalgam from the dental waste stream can be done as a pretreatment process at the dental chair. All dental chairs have a feature called a chair side trap. This trap is designed to capture large particles to protect the vacuum system lines from clogging. A proper trap design can be the most effective pretreatment step in the overall amalgam removal process and mercury reduction.

The new chair side trap design removes up to 99% of the amalgam solids at the chair as compared to <5% with current traps. This trap simply replaces the old design and requires no change in dental office operation or equipment. Removal of amalgam solids before the separator effectively reduces the concentration of both solid and dissolved mercury entering the environment. The trap along with an activated carbon style separator have seen reductions of as much as 99.9%. This paper addresses the problem and provides real time data proving the effectiveness of the system.