

— FIELD GUIDE · RETURN TO WATER

Aquamation vs. Flame Cremation

*Two ways to reduce a body. One uses fire, one uses water.
The difference is larger than you would think.*

Most people who die in the United States are now cremated, and the share keeps rising. What most people do not know is that there are two fundamentally different ways to cremate a body, and only one of them involves fire.

Flame cremation, the kind most people picture, burns a body in a gas-fired chamber at very high heat for two to three hours. The organic matter combusts, and what remains is calcium-phosphate bone, mechanically ground into the powder people call ashes. It is not, technically, ash. It is pulverised bone.

Aquamation, formally alkaline hydrolysis and also sold as water cremation, bio-cremation, or resomation, uses heated water and an alkaline solution to dissolve soft tissue over several hours. The same bone remains, processed the same way, and the powder a family receives looks and feels the same. But the chemistry, the energy, and the emissions differ in every measurable way.

How Flame Cremation Works

The process has changed little in a century and a half. The body, in a combustible container, is placed in a chamber; gas burners bring it to high heat; water evaporates and soft tissue oxidises. The process gives off carbon dioxide and other emissions, including mercury, which vaporises from dental fillings — crematories are, collectively, a meaningful source of airborne mercury, and mercury-capture equipment is not mandated everywhere in the US. The chamber cools, metal from dental work and implants is separated out, and the remaining bone is ground into fine powder. It is an energy-intensive process, burning a significant amount of natural gas for each cremation.

How Aquamation Works

Alkaline hydrolysis uses chemistry instead of combustion to reach the same endpoint. The body is placed in a stainless-steel vessel, roughly the size of a large bathtub, with a solution of water and an alkaline salt. The vessel is sealed and heated. A higher-heat, pressurised version takes two to three hours and is common for human remains; a lower-heat version runs longer, often overnight, and is more common for pets.

Chemically, the alkaline solution speeds up hydrolysis — the breaking of molecular bonds by water. The bonds holding proteins, fats, and carbohydrates come apart, and the soft tissue dissolves into amino acids, sugars, fatty-acid salts (essentially soap), and mineral salts. Bone does not dissolve; the mineral skeleton remains, softer and more porous, and is processed identically into white powder.

The effluent question. The liquid left behind is a sterile, alkaline fluid containing no DNA, no pathogens, and no recognisable biological material — chemically much like the effluent of a food-processing plant. In most places it is treated as industrial wastewater and discharged to the municipal sewer; some operators evaporate it or process it into a soil amendment. Municipal systems are built to handle organic loads far larger. The discomfort some people feel is emotional, not chemical, and that is a legitimate thing to feel even when the science says it is safe.

The Comparison

ENERGY

This is aquamation's strongest argument, and it is not close. Heating water to well below boiling uses far less energy than sustaining a combustion chamber at high heat for hours while running blowers and filtration. The most careful comparisons put aquamation lowest on energy use among the common methods.

CARBON

Flame cremation burns fossil fuel every time. Aquamation involves no combustion, so its emissions come only from the electricity used to heat the water and run the system — lower, and lower still where the grid is clean. Different studies report different absolute numbers because they measure different things, which is exactly why we avoid quoting a single tidy figure.

MERCURY AND AIR QUALITY

Flame cremation releases mercury from dental fillings into the atmosphere; aquamation releases none, and the mercury-bearing dental work is recovered intact and can be recycled.

This is an unambiguous advantage.

COST AND OUTPUT

The two methods are close in cost, and the gap is narrowing as aquamation scales. Aquamation typically yields about twenty percent more processed bone, because it has not been reduced by extreme heat, and it is whiter than the grey of flame-cremated remains.

AVAILABILITY

Flame cremation is legal and available in every state. Aquamation is legal in twenty-seven states as of 2026, but in five of those the process is legal while no licensed provider currently operates — the law is on the books, the infrastructure is not. This is the single biggest practical barrier: you may want aquamation, live where it is legal, and still have no provider nearby. Transporting the body to a neighbouring state is possible but adds cost.

The Honest Limitations

The strongest comparative data comes from European studies; US energy grids, distances, and practices differ, so the absolute numbers do not transfer cleanly. What does hold, regardless of geography, is the relative picture: aquamation uses dramatically less energy and produces far fewer emissions than flame cremation.

One more thing worth knowing, because almost no one in the industry will tell you: the activities around a funeral — guests travelling to attend, heating a venue, refrigeration, printed cards — can add up to more than the disposition method itself. A local, modest gathering can matter as much as the choice between fire and water.

Who Chooses What

People who choose aquamation tend to cite the environmental case — less energy, no mercury, no combustion — and some cite the gentleness of the process; dissolution feels different from burning, even though the endpoint is identical. People who choose flame cremation when aquamation is available tend to cite familiarity, availability, and, frankly, not knowing aquamation exists. Neither choice is wrong. Both reduce a body to mineral and avoid the material footprint of a conventional burial. The difference is one of degree, not kind.

A NOTE ON THIS GUIDE

This guide is for general information and reflects conditions as of 2026. Legal status, availability, and costs change over time; confirm current details before making arrangements. Nothing here is legal, medical, or

financial advice.