Science AMA Series: We are Jack Ingraham, Jevon Truesdale, and Richard Matt of Qico and we are looking to transform cremation technology from Fire to Water. AUA!

Qico$_c remation^{1} and r/ScienceAMAs^{1}$

[1]Affiliation not available

April 17, 2023

Abstract

Hello Reddit. As mentioned above, we are Jack, Jevon and Richard. We are Qico. While we aim to transition the funeral services industry to our water based cremation service, what brought us together is the goal to bring sustainability and innovation into an otherwise overlooked industry. Current fire based cremation is responsible for the incineration of Millions of BTUs of Natural Gas and thousands of pounds of Mercury every year. Our water based process, scientifically known as alkaline hydrolysis, looks to put an end to this. Wondering just how we are going to build the darn things led us into the world of IoT technology. Using robots to build robots and extending the IoT benefits to the end product. The result is replacing the current old world technology hooked up to a gas line with a future ready, ecologically friendly technology wirelessly hooked up to the cloud. We have found that when people understand the ecological benefits of water cremation they prefer it to fire. But most people don't know much about it, if anything at all. We want to expose water based cremation to the public, and give you all a chance to ask whatever questions you have. Qicoinc.com *We are finished. Thanks to those who asked questions. Everything has been answered within our responses below. If anyone has further questions feel free to send us a message. *

the WINNOWER

REDDIT

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QICO_CREMATION R/SCIENCE

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CORRESPONDENCE:

DATE RECEIVED:
August 20, 2016

DOI:
10.15200/winn.147160.07443

ARCHIVED:
August 19, 2016

CITATION:
Qico_cremation , r/Science , Science AMA Series: We are Jack Ingraham, Jevon Truesdale, and Richard Matt of Qico and we are looking to transform cremation technology from Fire to Water. AUA!, *The Winnower* 3:e147160.07443 , 2016 , DOI: 10.15200/winn.147160.07443

I looked over the website, and didn't find any real good explanation of how it works. Can you explain like I'm five?

Also, cloud-based OS? So this cremation machine requires an internet connection? Interesting.

doubled822

ELI5: Using heated water with a combination of Earth Metal Salts to reduce the body to ashes.

ELIolder: The underlying technology behind water cremation is known as alkaline hydrolysis, which has been used in agricultural, veterinary, and medical school settings for decades. Alkaline hydrolysis is a biomimicrial process that replicates what occurs naturally in the soil but in an accelerated manner and in a controlled environment over the course of several hours rather than years.

Water and Earth Metal Salts (sodium and potassium) create a reaction that reduces the body down into its basic elements of oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus.

Cloud Based OS: In terms of the chicken and the egg, the interest in water cremation came first. When the company made its mission to globally transition cremation from fire to water we knew we would

need to have serious manufacturing capabilities. The United States and Japan alone represents potential need for over 5000 Systems. Digital Manufacturing Robotics was a pure necessity. We are lucky to be working with some of the finest Robotics/Digital Manufacturing people available in order to develop a fully automated plant. Comments below were asking about why the 'robots building robots' line. It is because the final product is to be produced without the human hand. Having a product manufactured in an IoT environment allows us to extend the benefits to the end product itself. Each System in the field will be able to talk back to the plant, automating the renewal of supplies and running maintenance checks.

Is there a cost benefit to WC vs FC? I can understand the ecological benefits, but there is some comfort in having ashes.

What happens to the bones? it would be a bit unsettling to have a bag of bits handed back to you.

grndzro4645

We understand the comfort in the family receiving inurned ashes. In WC, the family will still receive inurned ashes. Ashes from FC are not supposed to be scattered due to the remaining toxicity. Because there are no toxicity issues with WC, it reopens the option of public scattering services.

What we think of as ashes are actually the bones that have been cremulated. For both WC and FC, the cremains remain the same.

Here's the wikipedia article on the subject

It sounds like there are some significant legal hurdles to overcome before this can be widespread. Are you working on that aspect as well, or only the technological aspects?

NinjaAmbush

There are currently 13 states where water cremation is authorized. We are actively pursuing the legislative aspects in other states that don't currently offer water cremation as an option. Essentially, it comes down to creating a viable legislative draft which will be picked up and 'authored' by a representative in the state.

When we started Qico, eight states had water cremation as a legal option. Five others approved it through no work of our own in the last three years. Several other states are considering water cremation outside of any work we have done. Given this momentum, we know there will be legal hurdles, but don't think there will be any hurdles we aren't able to clear.

Regulatory bodies who have put their stamp of approval include state EPA, air and water zoning authorities, the licensing board that oversees the professional regulation of embalmers and morticians, and each states Funeral Directors Association.

Why does your website appear to clearly promote financial investment data points (suggested price point, potential lease ROI, operating savings, etc) in what appears to be more focus on start-up funding than than the stated environmental benefits mentioned above?

In fact with an - admittedly cursory - mobile review I could find no environmental data other than the estimated regional energy usage and release maps or compelling comparative scientific data - other than a table of basic operating pressures, temperatures, etc. yet this AMA highlights the environmental science as a key element for consideration. However again lease references and throughput numbers

were readily available throughout the website.

Is this intentional and if so why? Frankly speaking I'm left wondering if the environmental science aspects make for a convenient added benefit up-sell. I am left with the impression that this is really an alternative funeral industry capitalisation and marketing effort focused on selling the idea of potential of increased profits through reduced operating expense. My apologies in advance if I have misperceived the material presented in some way.

ObtuseMoose

No apology necessary. You are 100% correct when you say we are selling the idea of increased profits through reduced operating expenses. Fundamentally, we do not believe that business and ecological responsibly are at odds with each other.

Most visitors to our website, at least up until today, are funeral home operators who may have an interest in our Fire to Water System. Suggested Price point, operational savings, etc. are to designed help them see the benefits of running water cremation. As great as any idea may be, you can't ask people to operate at a loss.

We stress the environmental benefits of water cremation to the public at large because we believe this is what an actual person making the choice should know about. We wanted to do this AMA given the scientific nature of this relatively unknown alternative.

That being said, we are not just advocates for water cremation. Qico is a business. We don't want to appear to hide this fact. Qico was started by Jevon and Jack (who is typing this). We were complete outsiders to the funeral industry when this began.

Is there any difference in the end remains pertaining to toxicity. Does one method give more environmentally safe end results than the other pertaining to what the family receives?

My concern is that it's all well and good to have the process be more environmentally safe but if the ashes are worse then you've got a bunch of people spreading grandma in a lake and harming the fish...

eak125

Inurned remains from water cremation have no toxicity. There would be no separate environmental issues involved in the scatter.

It seems like being Cloud Connected makes the process overly complex. Most of the guys I know who work funeral homes are either really young or really old. Most of the are really old. Is the cloud concept really a necessity here or is it just a business decision to make the business profitable long term? Do you think that being Cloud connected will scare off some potential customers who don't want to deal with the hassle?

dontgetaddicted

The complexities of being cloud connected are more present in the product development stage. By time the product was to reach the customer, the cloud connection makes for ease of use and peace of mind. The System's smart capabilities allow for table functionality (operating it from a tablet or phone), automated supply reloads, and in-field maintenance checks.

While designed to be as easy to use as possible, the product might scare off some customers at first. But like any new product if it is quality it will win people over. I don't believe age to be an issue.

On the wiki it mentions disposing of the remaining liquid in the sewer system. What effects does the alkaline substances have on our water system? If this is widely adopted could it skew ph?

Wildkarrde_

Keep in mind that alkaline hydrolysis generates two different results, i.e. both calcium phosphate (bones) and hydrolysate. As previously mentioned in a different comment, the bones resulting from a water cremation are cremulated (powdered) into cremains (“ashes”) that are inurned and returned to the family just as in a traditional fire based cremation.

We don’t have anything going down the drain. This is specifically how we differ from the current alkaline hydrolysis installations where the municipal sewage system is in fact utilized for disposal of hydrolysate. Instead, we contain this ecologically beneficial and micronutrient solution of sugars, salts, peptides, amino acids for conversion into bio-energy offsite.

My question is how much energy (watts) in total (rough estimate will do) does it take to use your process? Thanks, and good luck!

4444Taco

70kWh of electricity and 75 gallons of water are needed to cremate with water. This compares to 1758 kWh of energy consumed by the incineration of a body at 1800 degrees Fahrenheit with 6000 cubic feet of natural gas combusted per process.

What has the reaction to your process been so far by people you've explained it to?

I_molm

Always takes people a second. "Wait...you do what"

Soon after the reactions are surprising normal. Once people have had a chance to work it out in their heads and have a conversation about it they understand the process and what we are trying to do.

Hi I briefly did a project looking at funeral services and their impact. I have a couple questions that I am interested in your opinion on.

1. What do you think will be the biggest challenge to hydrolysis?
2. Have you any opinions on the future of promession as a viable funeral service?

Ragnaroks_descent

1) Educating the general public about the benefits of water cremation. 2) We understand that promession technology needs to be further developed but the concept, itself, appears to likewise promote environmental responsibility and to also be ecologically beneficial.

After hydrolysis can the nutrients be extracted for further use? Other than some sense of disrespect, is this method more beneficial to the world than composting our remains, or putting the body through the process of rendering?

punkdigerati

There are plenty of applications for which the hydrolosate could be used. An example would be land application. All are ecologically beneficial but our focus has been on the co-production of bio-energy via anaerobic WWTFs.

What are some of the barriers to societal acceptance of this technology, and how do you propose to overcome or mitigate them?

liedra

I believe the barrier to societal acceptance of this technology has to do with what gets referred to as 'the ick factor'. Whenever a new technology in the funeral services industry becomes available it will face this barrier. It makes us think about the point when a 'someone' becomes a 'body'. Coupled with the fact that there is no pretty way of decomposition, it can create a knee-jerk reaction.

But we as humans have been able to overlook 'the ick factor' to add greater meaning and significance to the ceremony of one's final bodily act.

We also believe given the increased interest in cremation as a whole, it won't be too far of a stretch to convince people to opt for water over fire. Much easier of a barrier than when fire cremation was introduced against traditional burial.

Could you break down the potential environmental benefits further?

A couple of areas I'm interested in: Is the mercury combustion you talk about above just from the combustion of the fossil fuels or is there another element of the cremation that I don't know about? What is the water intensity of this type of process? Obviously fresh water supplies are a concern in many places and populations may not be willing to give a lot of water to this process.

Thanks! This seems like a pretty cool idea!

BigHeadsAnonymous

For Fossil Fuel and Mercury:

As part of each the standard fire cremation, 6000 cubic feet of natural gas is burnt.

There is Mercury present in the human body. The most notable example would be from Mercury used in dental work. In Fire Cremation the combustion process vaporizes the Mercury at 1800F sending it into the atmosphere. The benefit of Water Cremation is that since it's a non-combustion process there is no mercury vapor. Following the process all medical metals can be retrieved, including Mercury from dental amalgams.

For water:

Water Concern is a specific area of interest and often one of the first questions people have, especially in California. Each process does use 75 Gallons of water, there is no getting around that. We believe the abdication of 6000 cubic feet of natural gas incineration is worth the 75 Gallons of water used.

Wait so is this a real product yet? It was unclear what stage of development you guys are in. It seems like it's not really mass produced yet? In which case I have no idea why you need robots building robots?

strongcoffee

The Fire to Water System of sustainable cremation technology is under development, with CAD/CAE/FEA/RSM metrics being ascertained in a simulated virtual environment. We anticipate units to be available by the end of 2017.

Digital manufacturing controls are being established for mass production capabilities as we intend to convert entire countries from fire to water cremation technology. Specifically, the United States, whose growing cremation rate surpassed burial in 2015, and Japan, whose cremation rate is the highest in the world at 99.97%. With that in mind, the production line must be automated to ensure that each unit is made with optimum speed and efficiency.

Fully automated digital manufacturing with robots means that we would be capable of producing multiple units per day as opposed to the fabrication/assembly process that takes several months to produce a single unit.

Current fire based cremation is responsible for the incineration of Millions of BTUs of Natural Gas

So how do you heat the water?

foofdawg

Because our Fire to Water system does not require the burning of natural gas, just grid energy, green energy derived from solar power or other alternatives could be used. Hot water is created by using an all electric, tankless (on-demand) water heater.

Electricity production and energy consumption metrics vary based on whether the power is produced inefficiently with coal, for instance, or efficiently with natural gas. Since we are already looking at natural gas related data, let's take a look at the calculations related to natural gas being used to produce the electricity that will be utilized by water cremation technology.

.01011 Mcf is needed to generate 1 kWh of electricity meaning that it would take approximately 700 cubic feet of natural gas to generate the 70 kWh of electricity needed to perform one water cremation.

In comparison, the 6000 cubic feet of natural gas from one fire cremation could be utilized to generate all of the electricity needed to perform at least 8 all electrical water based cremations.