

the development of Cryomation ®



From a presentation by Richard Maclean (IRTL) to delegates at the ICCM Conference, Chesford Grange Hotel, Kenilworth on 27th September 2010.

I am grateful to the ICCM for this opportunity to address the conference and provide an overview and update on Cryomation and our progress to date.

Incinerator Replacement Technology Ltd (IRTL) are a research and development company that have developed a number of new cleaner processes/systems as replacements to traditional methods of incineration across various markets. One of our companies Cryomation Ltd have developed an environmentally friendly alternative to the traditional cremation and burial options that exist today, and one which we hope will start to become commercially available in 2011. We envisage seeing this adopted slowly over many years across many countries as cremation itself was introduced back in the beginning of the last century.

We do not foresee a complete replacement of existing practices in our life time but we do see a growing desire for greater choice and this is what Cryomation represents.

Last year we declined the ICCM's kind invitation to present at this conference feeling it too early to talk about our developments publicly. In the field of science and engineering it is more common to announce what you have delivered rather than what you are going to and we felt that the ICCM membership would feel the same about our topic.

The process of using liquid nitrogen to freeze the body after death is not new and was first patented in 1976 by Philip Backman in the USA before elapsing after 25 years and since then there have been many who want to see it commercialised. I want to applaud the previous speakers, Promessa, and companies like them for their work over many years publicising the benefits of using freeze drying techniques in the future as an alternative to traditional methods.

Public education is key to the adoption of any new alternatives and represents one of the biggest challenges any company faces bringing in new options to such a traditional market. A fact I imagine that is not lost on the owners of Resomation as they face the challenges put before them by journalists and public opinion turning immediately to the negative elements of their process while existing options escape similar public scrutiny.

The education and marketing efforts will be an ongoing process for many years to come and due to the subject matter will always be challenged from various sections of society, as would cremation have been if introduced today.

So we have left that debate to others up to now preferring to focus our attention on the delivery of our technology. The Cryomation system was developed over the last four and a half years in partnership with the research teams at the Micro-Biology & Life Science department University of Hertfordshire, Hosokawa Micron BV and Air Products plc. All steps in the process have now been tested and prototyped and the environmental results verified following an independent three-month study conducted on behalf of The Carbon Trust. The company, winners of a 2010 Shell Springboard Award, is now moving to the pre-production build of the first Cryomator with locations being identified for commercial deployment.

The Process – Cryomation is an automated system that uses patented technology to cryogenically freeze the body in its coffin using liquid nitrogen until brittle. The process then removes moisture, any artificial implants and crucially ALL bacteria and viruses before using freeze drying techniques and a further process (patent pending), to return the remains as a safe and sterile powder ready for burial. Alternatively if the family wanted to have the remains returned to them as with the ash in cremation then they will be able to choose an option involving a second composting process after which the remains can then be returned safe and in a composted form suitable for scattering or kept in a large urn or planter/s suitable to be used to generate and sustain life.

Environmental Advantages - Traditional cremation contributes to pollution by releasing a number of poisonous emissions including mercury. Cryomation produces NO emissions and the system has an operational CO2 footprint reduction of up to 80% compared to most traditional cremations

Completing the Ecological Circle of Life – Cryomation can also save space providing more sustainable use of burial grounds. If burial is selected by the family, Cryomated remains return to soil in 6-12 months, the burial plot needed is only one third of the normal size allowing the family to use the same burial plot again for future generations.

Solving problems for Green Burial options – Many environmentally conscious burial grounds do not accept burial requests if embalming has been used with toxic fluids. Cryomation removes this problem leaving the remains totally safe, sterile and free of all bacteria and viruses.



More than just burnt ash – Traditional cremation only returns 2½ percent of the original body as crushed calcified bone (ash). Cryomation removes only the moisture returning remains in a pure and safe powder form.

Planning consent – Cryomation's environmental credentials reduce local planning challenges commonly seen for traditional incineration.

The key areas that we have been focusing on during our recent developments have looked at what the industry are looking for these have included:-

Environmental improvements – no emissions, removes mercury, clear effluent streams, reduced energy usage

Optimised throughput – allowing for throughputs to be in line with cremators and with the ability to increase

Machine size – making sure a Cryomator can be installed into older facilities that have limited space

Automated removal of foreign materials

Sterilisation – key to environmental credentials and for legislative reviews

Accelerated composting – ensuring families are offered choice of burial or return of the remains

Operational costs and throughput – to ensure that costs of ownership are optimised

Ongoing service and support

Legal & commercial acceptance and Planning Regulations

The next steps for Cryomation:-

- Now in final fund raising stage
- Full scale testing and pre production build planned
- Joint commercial development with Yarden BV.
- Letters of intent received – UK and Europe
- Legislative reviews underway
- Target for total of first deployments in 2011
- First UK site identified and planning approved
- Pre production unit 2011 – dates subject to funding
- First commercial deployment 2011 – dates subject to funding

The key differences between Cryomation and other freeze drying methods in the market are:-

- Choice of both burial or family return of remains
- Body stays in casket throughout the process
- Completely clear effluent streams
- No operational emissions to atmosphere
- No mercury abatement required
- Buried remains require plot size 2/3rds smaller than UK standard
- No internal incineration
- Global service and support
- Independently verified
- Fully prototyped
- Lower energy usage
- Smaller footprint (to allow for fitting to existing crematoria)
- Planning approval benefits
- Costs comparable with cremator ownership

Finally, working in partnership with Yarden BV – a leading Netherlands funeral service group who operate 41 funeral centres and 22 crematoria carrying out over 25,000 cremations a year – will help us accelerate the commercial development of Cryomation and gain specialist industry support in key areas including social acceptance, market positioning and legislative approval for the Dutch market. We aim to replicate this and introduce the Cryomation process across multiple international markets, including Britain.

