

# **A FAILURE TO EVOLVE: FORMALDEHYDE-DRIVEN ARCHAISM AND OBSOLESCENCE IN EMBALMING.**

**By James H. Bedino, Chemist/Director of Research  
The Champion Company**

In our current article, we examine formaldehyde-driven archaism and the resultant generalized obsolescence in word, product and deed that is spawned by the century-old adoption of formaldehyde as the end-all-and-be-all of embalming. The result being a patchwork quilt of fix-it products, partial solutions and attempted cover-up chemicals of the modern (I use the term loosely) embalming industry. This road leads to nowhere and generally precludes, eliminates or restricts true formulation advancement and virtually any attempt by the forward thinkers in the industry to adapt and evolve into modern sophisticated alternative technologies of preservation and embalming. As always, brutal honesty and sarcastic humor abounds, I therefore warn you and invite you to read on.

An embalmer haffa do what an embalmer haffa do.

- Mortimer, "Morty" Tician, CE, CFD, CFA, COCSP  
Certified Embalmologist  
Certified Funeral Directologist  
Certified Formaldehyde Apologist  
Certified OSHA Consultologist Self Proclaimed

And, of course, we haffa have formaldehyde, or at least, we are convinced that we do. And the result is a mind set of archaism and obsolescence that verily drives the embalming/funeral industry. Formaldehyde, after all, is the progenitor and enabler of, essentially, the entirety of product and profit of the embalming industry from day one. By the enabling of formaldehyde as the irreplaceable centerpiece of the universe of embalming — The Formaldaverse? — we have fostered persistent obsolescence and archaism in all aspects of embalming and the embalming/funeral industry. This has been to our great detriment and has hindered technological advance and modernization for nearly a century. The problem with the Formaldaverse of Embalming is that it's Ptolemaic. With formaldehyde as the end-all-and-be-all of embalming, formalin, and it's many concoctions are the center of the embalming universe and all else revolves around and is secondary to formaldehyde — the true center of the universe.

If Copernicus had showed up at embalming school, he would have been labelled a troublemaker and laughed out of class in the first week. The absurdist and Ptolemaic explanation of the embalming world is rock solid — formaldehyde (Earth) is at the center and, of course, is flat and the Sun and all other celestial orbs and heavenly stars encircle and rotate the known center of the Universe — formaldehyde. This mind set allows all sorts of undesirable effects that must, therefore, be corrected, covered up, modified or just simply apologized for. Among these, of course, the toxicity of formaldehyde and cancer-causing potential, in addition to allergenic/asthmatic reactions of embalmers, difficulties of ventilation and adequate chemical protection, untoward and undesirable tissue reactions in embalming (dehydration, discoloration, etc.),

and generally all of the so-called modern signs of embalming, which are nothing more than rephrased and restated explanations for the originally untoward, undesirable and unwanted side effects of formaldehyde infusion and application during embalming. Well, sadly, that's the way it is in the embalming industry, and we are the lesser for it.

Therefore, let us take a drive through the debris field of formaldehyde embalming and observe all that has been wrought. With the advent of formaldehyde, soon came the necessary correction chemicals, technique modifications, cover up products and general fix-it solutions, chemical or otherwise and the formaldehyde apology industry was off and running. Formaldehyde, being the one-trick pony that it is — harsh and rapid rock hard dehydration action — literally created out of thin air an entire Formaldaverse of embalming repair products. By failing to evolve through improved, alternative technologies, the embalming industry, instead, devolved by embracing confusing, confounding, and needless repair complexity and has, essentially, never recovered. Following, then, is a laundry list of many of these products with commentary and humorous discussion interwoven.

**Pre-Injection Chemicals:** These rapidly became necessary in formaldehyde embalming because of poorly embalmed corpses from over rapid reaction, formaldehyde burn, blood gravelling, and the formaldehyde walling-off effect. The results were horrible discolorations, blood pooling, spotty distribution and a generally unacceptable appearance of the formaldehyde embalmed body. The solution was to wash-out the circulatory system before the formaldehyde hit and hopefully minimize the formaldehyde effect when the formaldehyde embalming was done later. The result was an improved appearance to the body, sometimes, but additional problems also resulted, namely the likelihood of waterlogging and diluting out the formaldehyde injection later. For better or worse, the formaldehyde repair industry was off and running.

**Co-Injection Chemicals:** It was logical, therefore, to try and put the brakes on the runaway train and buffering chemicals to mix with formaldehyde itself sprang into being. The idea being to slow down, control and modify the too-fast reaction of formaldehyde with tissue and hopefully generate a better embalmed body. The results were far from perfect, as formaldehyde was usually shut down in the process, but some improvement was noted and another fix-it chemical came into being.

**Reodorants/Deodorants:** Perfuming agents and chemicals were formulated into formaldehyde embalming fluids because of the atrocious and noxious smell that is generated during and after formaldehyde embalming. These were integrated into both arterial and cavity chemicals for the benefit of the embalmer in the hope that by covering up the smell, embalming with formaldehyde would not be as annoying as it was. A secondary benefit was the improved smell of the formalin-infused corpse being more acceptable to the mourners and others that came in contact with the body, as the formaldehyde stench was moderated.

**Lanolin/Humectants:** Because of the profound dehydration action of formaldehyde on bodies, sheep fat emulsions (i.e. lanolins), glycerines, or just plain oil and other moisturizer-like products were added to formaldehyde injection chemicals as a stopgap measure to minimize this very undesirable wrinkling, shrivelling and hardening effect on skin tissue. Consequently, a major and eminently popular and profitable embalming product was created and became a standard of the industry — “the pink milkshake”. Most were (and sadly still are) nothing more than rather crude lanolins or massage creams in a bottle, with or without oil for good luck, that did not disperse well and were poorly formulated. Nevertheless, some effect was noted and the action of formaldehyde was again modified and apologized for. The major downsides were capillary clogging, poor mixing, separation and rancidity and general messiness. And again, another patch for the formaldaquilt.

**Water Conditioners:** Water has never been the embalmers friend. Because of the mandatory dilution of formalin with water and formaldehyde's problems with inactivation and pH sensitivity, water fix-its were created to minimize these problems and interactions with formaldehyde fluids and attempt to smooth the embalming road. Moderate success was noted, despite the fact that most water conditioners blew the pH sky-high and pretty effectively shut down formaldehyde in the process, but the concept stuck anyway. Very little, however, is changed to this date. Welcome to the Formaldaverse.

**Jaundice Fluids:** The shockingly hideous greenish discolorations of formaldehyde embalmed jaundice corpses was enough to terrify any embalmer. The initial fix-it was a waterlogging pre-injection followed by a watered-down formaldehyde injection followed by hope and prayer. Specially concocted jaundice fluids were soon created that highly buffered and slowed down formaldehyde, and with lots of internal and external dye cosmetics, produced embalmed bodies that were at least presentable, some of the time. This is one problem that formaldehyde has no good solution for and formaldehyde apology is definitely called for in this instance. Amazingly, most formaldehyde jaundice fluids are little changed from what they were decades ago. Gee, who would have guessed that?

**Greasepaint:** Hitching a ride with formalin embalming was the putty-grey effect. This is a very unappealing ashen-greyish coloration to embalmed skin from formaldehyde fixation and is, sometimes humorously referred to as the "Night of The Living Dead Effect", as remarkably the appearance does somewhat resemble what most would perceive as Zombie-like. This Putty-Grey Effect is so common place that the joke in the industry is that a certain embalming chemical company, which shall remain nameless, literally invented "putty-grey" by the use of their harsh, fast-acting formaldehyde chemicals, very prestigious indeed. Internal dyes and colorants were added to arterial formalins and stand alone tracer dyes also came into being as products to moderate this intractable problem. The largest product market, though, was the crossing over of theatrical stage makeups and vaudeville clown makeups as mandatory cover-ups for formaldehyde embalmed bodies. The embalming cosmetic industry was thus born. Greasepaints, pancakes and oily paint or smear on creams became the standard for the embalming industry. The corpses appeared clownish and madeup, or as the Brits say — "tarted up", but gone was the formaldehyde discoloration effect. Surprisingly, or not surprisingly (according to how you look at it) little, if anything, has changed in this embalming product niche. The most ancient and archaic of greasepaints, creams and pancakes, along with their necessary petroleum oil solvents, like toluene, are still supplied to the embalming industry to this day and they are obviously being used. Kinda scary.

**Ventilation:** Ventilation, of course, is a good thing in the embalming room. However, the prime driver for the implementation of the ubiquitous bathroom exhaust fan was absolutely formaldehyde. The atrocious smell of the cavity chemicals and the noxiousness of the powdered paraformaldehydes made it virtually mandatory. The small fans made some difference and any ventilation was an improvement, but the overall impact was minimal at best. Formaldehyde was the gas bomb in the embalming room, the other chemicals being hazardous in their own way, but thankfully of low to moderate vapor pressures and not the imminent danger that formaldehyde was. Sadly, I fear that most ventilation in embalming rooms today is woefully inadequate and not much better than those first little bathroom exhaust fans installed 30-40 years ago. To this day, the persistent and overwhelming stench of formaldehyde is ever present in almost all embalming rooms despite the fact that the industry has, supposedly, modernized. And the problem persists, for the brutal truth is that if you can smell formaldehyde in the embalming room you are overexposed. When was the last time you didn't smell formaldehyde in an embalming room? That's what I thought.

Perfumes/Air Fresheners: These products were quickly supplied to the industry, well, because formaldehyde stinks and the same problem persists in a formaldehyde embalmed body, despite the use of reodorants/deodorants incorporated into the formaldehyde embalming fluids themselves. Therefore, more and more powerful external perfumes, rose waters and air fresheners became necessary to dull and dilute the formaldehyde stench in addition to the usual unappealing odors of death. At least, therefore, as far as the embalming industry was concerned, everything was coming up roses.

Consultants: An entire cottage industry of OSHA related consulting types literally sprung up overnight after formaldehyde took the hit as a toxic, carcinogenic exposure hazard that just happened to be used by embalmers all over the U.S. The Formaldehyde Act, then, ushered in an era of self-proclaimed OSHA know-it-all's, at least some of them, whose only credentials were embalming experience (more-or-less) and a pent up desire to read mountains of tedious government regulatory documents and jump to their own half-baked conclusions. For the record, there are definitely some very knowledgeable, trained, licensed and approved Industrial Hygienists that have the degrees and the expertise and can prove it. These companies and individuals are usually consultants to many other industries and have crossed over to the embalming/funeral industry because of need or request and the embalming industry is better for their involvement. It's all the other self-proclaimed experts and the used car salesmen out there that have fogged the mirrors. Along with the Act came, invariably, compliance gear and gizmos such as monitors, respirators, moon suits, record keeping, warning signage, particulate masks, arguments about gloves, formaldehyde cleanup chemicals, medical records, inspections, etc. etc.,. All, unfortunately, necessary because of how and what we do with formaldehyde in its many forms in embalming. We were literally asking for it and, therefore, we finally got it. And maybe that's a good thing.

I saved the best for last. The most absolute, ultimate and quintessentially absurd apology/cover-up product ever invented for the embalming industry — THE ANTI-FORMALDEHYDE SPRAY. Listen closely, this is the spray that you spray after you spray your formaldehyde spray to counteract and neutralize the formaldehyde in the formaldehyde spray that you initially sprayed. Got it? — You may need to read that again — carefully. It gets better. This is the only product, to my knowledge, in the industry that warns you that because its oily you might accidentally slip and fall flat on your butt and hurt yourself in the prep room. I am not making this up. And, of course, it contains a secret ingredient. Whatever. Many of the readily available reagent hydrazines, semicarbazides and phenylhydrazines (substituted or otherwise) are slippery, oily yellowish liquids that near quantitatively react with aldehydes and ketones to neutralize/derivatize to hydrazones/semicarbazones. So much for that secret. If it is necessary to have a spray to counteract formaldehyde fumes that probably came from spraying formaldehyde in the first place, then what hath the embalming industry wrought? Ridiculous? — I think you know the answer to that one.

Notes and Asides: I would be remiss if quick mention of the following was not made. Many secondary fallout effects and products have sprung into being due to, or commensurate with, the now century-old formaldehyde explosion in the funeral industry. Powders, some adapted from taxidermy, rapidly appeared with noxious and dangerous solid paraformaldehyde powders leading the way. Sawdust was added as filler and absorber with ground up mothballs and plaster of paris added for mold control, odor and hardening effects. Everybody, of course, remembers the infamous orange/red can with the black lid. Dust explosions, therefore, became a commonplace embalming room occurrence. Restorative art took on more importance as, aside from occasional major trauma, most restorative art ended up being post formaldehyde embalming repair due to staining, skin discoloration, features distortion, tissue shrinkage, dehydration, etc. Tissue builder, glues, lip waxes, tack compounds and others all became prevalent and necessary repair products for a formaldehyde embalmed corpse.

Sadly, in fact, in our industry it is difficult to come up with any perceived, or real, technological advance that has been embraced or accepted in total. When you think about it, other than perhaps motorized injection, and that's even a stretch, there has been no advancement in the embalming trade and the fundamental methodology employed in formaldehyde embalming for going on nearly 100 years. Even today, the gravity bowl can be found and its praises heartily sung. I wonder if future archaeologists will ponder the significance of the hole in the ceiling of the prep room and the mysterious apparatus that it contained during their excavations? Electric aspiration, despite being an improvement and major advance, is profoundly not adopted in the embalming industry and the simplistic, water wasteful and cheap alternative of hydro aspirators is immensely popular. Somehow, this is not too surprising.

Finally, to perpetuate all this, an army of road warriors evolved in concert with the proliferation/productization of the funeral trade and, as was typical for any industry in the old days, door- to-door peddling of funeral goods, for better or worse, became the norm. The rail riders have now morphed into Cadillac-driving doorknockers bearing doughnuts and cheery gossip to convince, cajole, sway and beg the customer to purchase products only through them despite the excessive built-in commission charges, when a simple e-mail, fax or phone call would quickly and conveniently achieve the same result. Not that there were, and perhaps still are, some salesmen that were and are a credit to their profession. One, in particular, stands out in my memory that was above reproach and exhibited the highest level of professionalism during his decades-long tenure with The Champion Company in Illinois. Sadly, his example of excellence was not emulated by the vast majority of others "on the road", and the funeral industry is the lesser for it. At any rate, this obsolete sales methodology is inevitably changing in all aspects of modern commerce, including even the funeral trade, but due to the inherent archaism and lethargy built-in to the funeral industry, it will linger on in a marginalized form as a dusty reminder of the old ways. Somehow, I am not surprised. By the way, does anybody know where I can get a good rotary dial telephone?

Somewhere high in the Sierra Madre:

If you're a modern embalming industry like you say you are,  
then show us your Innovations. — Fred C. Dobbs, prospector, embalmer

Innovations? In Embalming? We ain't got no Innovations! We don't need no  
Innovations! I don't have to show you no Stinking Innovations!  
— GoldHat, Bandito, Formaldabalmer

One company never bought into the old rub that formaldehyde was the center of the Universe, that, of course, being The Champion Company. Starting with the glutaraldehyde/formaldehyde blends of the 60's/70's and proceeding to the more radical formaldehyde-free formulations of the Millenium New Era Line, under my direction in the 90's, The Champion Company single-handedly and against enormous odds, lead a Copernican Revolution of innovations in the embalming industry and literally turned the Formaldaverse on its head, and we are not done yet. More radical and innovative solutions to the embalming problem are on the horizon at the Champion Company as we continue to formulate and test effective and ultra-low exposure chemical preservatives as alternatives to formaldehyde and other toxics in embalming.

Sadly and embarrassingly though, most modern signs of embalming are now seen for what they are — excuses and rather pathetic apologies for formaldehyde's ancient shortcomings and disadvantages in embalming corpses. About the only thing left for the Flat Earth Gang to do is to chant the old mantras, read the 50 year old textbooks, listen to the formaldehyde apology choir sing some songs and dance to the beat of the formaldadrum corps. And maybe if we wish hard enough, just maybe, everything will be just like it was in the "good old days", we'll be back in Kansas and everything will be just alright. Don't bet on it, Dorothy, at least that's my opinion, and I have a bad feeling that I am right.

The situation, however, is not all bleak. Modern high tech innovation and effective alternative technologies and products are already available and in use all around the world. The Champion Company has them and you need only to ask. 90% of formaldehyde usage and exposure can be eliminated in a heartbeat and you can forever abandon the old ways and efficiently and adequately embalm with modern alternative preservatives that deliver only a fraction of the total exposure and health hazards that toxic and noxious formaldehyde products do. Again, nothing more is required of you than to just use them. Glutaraldehydes, higher molecular weight mon/di/multi aldehydes, higher molecular weight phenolics/polyphenolics/substituted phenolics in complex synergistic blends deliver excellent embalming action and drastically lowered overall exposure parameters in use. The future is here, now — you need only embrace it.

The cluttered closet of formaldehyde fix-it products can seriously be cleaned out by embracing these lower exposure/alternative embalming technologies and solutions. Formaldehyde is eliminated from cavity chemicals in a twinkling of the eye, as a totally unnecessary toxic exposure. Pre-injection becomes unnecessary, as modern alternative arterials control embalming action and eliminate the necessity of a water-logging pre-wash to formaldehyde injection. Co-injection technology now enhances overall embalming by buffering and modifying glutaraldehydes and other alternative chemicals without forcing the pH to excessive limits, as was necessary with formalin. All fluids smell better and are more user-friendly, as the overwhelmingly noxious odor of formaldehyde is eliminated.

Crude lanolins, homogenized massage creams in-a-bottle and old-style vegetable oils are eliminated as humectants and replaced with synthetics and slick and fast aloe derivatives/additives that amplify the moisturizing effect. Water conditioners can now effectively sequester mineral ions and accurately set an embalming pH for the preservatives without knocking out the formaldehyde replacement preservatives and defeating its own purpose in the first place. Better yet, you now can virtually eliminate dilution water and all its problems, by utilizing Champion's new near-anhydrous carrier/diluent, PLASMA Injection Factor, as a substitute for all injection water during arterial embalming. Jaundice fluids become unnecessary, as jaundiced bodies can be embalmed as near normal cases without the scary proposition of formaldehyde-greening reaction. Greasepaints, pancake smear-on makeups and other "clown-style" cover-ups are completely eliminated and replaced with modern aloe/water-based alternative cosmetics that moisturize, appear natural and are simple to cleanup with only mild soap and water.

Total overall hazardous exposures to the mix of embalming chemicals is drastically reduced and effective ventilation reduces it even further to near undetectable. Gone, forever, are the "good old days" when formaldehyde exposure was overwhelming and close to intolerable in almost all embalming circumstances. Any perfumes/air fresheners will just work better, as they aren't fighting the stench of formaldehyde anymore. Anti-formaldehyde sprays become unnecessary as, thankfully, there is nothing to be anti-

about. And, as Forrest Gump might say, "Good, one less thing to slip on in the prep room". Dust storms of dangerous particulates and emanating gases from noxious powders become a thing of the past. Solid paraformaldehydes and their fumes, mothballs, finely ground plasters and talcs and finely ground sawdusts are eliminated as lower exposure glutaraldehydes and other liquid preservatives are blended with larger, granulated, particulated replacement compounds that are far less likely to become airborne and pose an inhalation hazard during embalming operations.

So, as we can see, the future is here and staring us in the eyes. Will we embrace it? I think we have no choice and the alternative technology is a true advancement anyway, so the downside of acceptance and adoptance of modern alternatives to formaldehyde is minimal. We have very little to lose, and an immensity to gain. We just have to do it. Therefore, I invite you to take that step into the future, because, whether you like it or not, the future is here now. As always, embalm smart, embalm safe.

After all this, still going to stay with the Stone Age formaldehyde embombing ways? Still think the yellow brick road looks great? Still positive the Formalda Wizard in Oz knows all and will pull it out of the hat somehow? If so, then I wish you the best of luck, lots of it, you'll need it, you really will.

Well boys and girls, there's no better way to end, than with a SONG! Hey there — All you Formaldateers — are you ready? Here goes!

Who's the toxic gas of the club  
That embalms you and me?  
F-O-R-M-A-L-De-H-Y-D-E  
Cancer here! Asthma there! Gas everywhere!  
"You're as embalmed as you can be"  
F-O-R-M-A-L-De-H-Y-D-E

Formaldehyde! Yes, it stinks!  
Formaldehyde! It comes in pink!  
Forever let us blow our monitors HIGH!  
HIGH! HIGH! HIGH!

Pour some more and gasp for breath  
And become an embalmees  
F-O-R-M-A-L-De-H-Y-D-E

(and now the ending)  
(softly and gaspingly)

Now's the time to wheeze goodbye  
To all our embalmees  
Through the years we've gassed ourselves  
Embalming you and me

F-O-R-M-A-L-De-H-Y-D-E

Formaldehyde, Formaldehyde,

Forever let us blow our monitors HIGH!

F-O-R "R" you embalmed?

M-A-L "L"? Because it smells like "L"

De-H-Y-D-E

— sung to the tune of The Mickey Mouse Club

References: Numerous of my previous Champion Encyclopedia articles address many of the issues, albeit it less humorously and sarcastically, that I allude to in this current article. The laundry list of problems with formaldehyde in embalming is long and tortuous. Historical references and ideas sprang from the archival literature of The Champion Company, old textbooks, old catalogs, old issues of The Champion Encyclopedia and ancient articles in various old journals and publications in general. You can assail my "bad" attitude, personal opinions and sardonic wit, but the facts are the facts, and the verdict on formaldehyde and the other issues addressed in the article are factual and unassailable. Formaldehyde is the big time problem in modern embalming and about everything else you can think of, in the embalming room, is there because of formaldehyde. There is no "get out of jail free" card for formaldehyde in embalming and there never will be. The future is now, it is easily within our grasp, and it will do none of us any good to pretend otherwise. The sooner the industry comes to this realization, the better off we all will be.