

SPINNING MYTHS AND PROPAGATING LIES: APOLOGIZING FOR FORMALDEHYDE AND PLAYING THE PRETEND GAME IN EMBALMING.

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

In my current article, I list, expose and debunk the most popular myths and lies that are making the rounds about formaldehyde and the fact that it is a dangerous, toxic and carcinogenic chemical in embalming. The myths are many and I will address each and every one of them, in depth. Most of this is perpetrated by embalming fluid makers that have everything to lose if formaldehyde falls into disfavor and eventually becomes unnecessary and obsolete in embalming, because they have nothing else to sell to the embalming industry, except maybe pet urns and miscellaneous household hygienic paper products (i.e., toilet paper). How sad.

The myth spinning is manifested, mostly, by travelling formaldehyde embalming fluid sellers that plant the seeds of doubt and fear at dog-and-pony style "educational" seminars and how-to embalming clinics. With the evidence heavily weighing in against formaldehyde in embalming, the fear and loathing in the funeral industry is palpable and you can literally cut it with a knife. The fear is totally ridiculous and unfounded. It will not be the end of the world as we know it, instead it will be a new and enlightened beginning with endless new possibilities and horizons for the funeral industry. I, for one, can't wait. With that said, let's debunk these myths that are obscuring the truth and confusing the real issues about formaldehyde embalming. I occasionally, in the article, get pretty sarcastic at times, but these myths are so unfounded and ludicrous that it's difficult to not be. I therefore, warn you, what you are about to read is the truth, brutal as it may be, and nothing but the truth.

What goes up must come down
Spinning wheel got to go round
Talking about your troubles it's a crying sin
Ride a painted pony
Let the spinning wheel spin

Spinning Wheel, lyrics
Blood, Sweat and Tears

Tell me lies, tell me lies,
Tell me sweet little lies.

Little Lies, lyrics
Stevie Nicks, Fleetwood Mac

The spinning wheel is in overdrive and the lies are literally flying off the loom about formaldehyde and embalming. That's very unfortunate for our industry because it makes us look ridiculous to modern, informed society and diminishes us, in the eyes of many, to just recalcitrant denialists that will refuse to modernize or change. At any rate, let's look at the lies/myths and put each one of them to rest, no pun intended. As an aside, I do apologize for the length of the article, I guess it's the old problem of "so many myths so little time". That said, we shall begin.

MYTH: NO PROOF FORMALDEHYDE CAUSES CANCER OR IS EVEN THAT DANGEROUS. Wow, this one is just so far out there that it could easily get sucked into a black hole at the edge of the universe any minute now. This is just preposterous and shameful that anyone in the industry would even espouse this myth. The verdict is in, worldwide — formaldehyde causes and is implicated in numerous cancers in humans and animals both epidemiologically and through voluminous lab studies. Thousands of pages of scientific documentation confirm these facts and lamely pretending that the "verdict is still out" because of differing technical rating criteria by multiple worldwide agencies and authorities is like saying the forest is not really on fire because one particular tree hasn't completely burnt up yet. This is nothing more than feel good preaching to the choir and won't change the facts on the ground. I have written numerous articles in the past with voluminous bibliographies for you to peruse, that brutally, and in depth, lay bare the harsh realities of formaldehyde as a real and present exposure hazard in embalming.

Even if you are hoping and praying for a Black Swan event in the EU, where somebody, somehow manages to register a simplistic bathtub recipe formaldehyde/methanol/water formulation in Product Class 22 (embalming/taxidermy) of the Biocide Directive, that won't change one bit the inherent toxicity, carcinogenicity, exposure/disposal hazards, enviro-impacts, OEL ceiling limits, and the overwhelming EU regulatory multiplexities that will control and restrict formaldehyde, literally, from "cradle to grave", no pun intended. For formaldehyde, there is no silver-lined happy ending, in Europe or anywhere else on earth, for that matter. These are just the pragmatic and scientific facts, ignore them or pretend they are all false, but do so at your own risk.

MYTH: NO PROOF THAT FORMALDEHYDE DOES ANYTHING AFTER YOU BURY IT IN THE GROUND. This is a patently false statement and extensive documentation exists concerning all the chemicals that commonly occur in embalming fluids and their environmental half-lives and pathways of biodegradation and is readily accessible in the scientific literature. Formaldehyde is well investigated as a groundwater contaminant, industrial river and lake effluent, impacter at wastewater treatment plants and as a soil deposition/impact chemical. I have discussed these investigations in several of my earlier Champion Encyclopedia articles and I invite you to examine them for more indepth information. Formaldehyde is very impactful on a short term basis but has reasonable bio-degradative pathways of bio/chemical transformation and elimination. Many very toxic, carcinogenic and problematic chemicals do also, but that doesn't change anything concerning their inherent dangers and toxicities. Formaldehyde is the most troublesome of all the chemicals in embalming from a dose/quantity/concentration/toxic action aspect, but, despite this, neutralization pathways do exclude long-lasting or extreme environmental impacts. So, what? Sorry, this question has been answered and the answer is mildly interesting and slightly informative but essentially proves nothing.

Why are we even asking this question that we already know the answer to? How does it change the facts that formaldehyde is toxic, dangerous, carcinogenic and an exposure hazard in embalming and a toxic

disposal problem? The toxic exposure and carcinogenic impact of formaldehyde use starts when the cap comes off the embalming fluid bottle and it leaves a toxic, carcinogenic exposure/disposal trail from there all the way to the grave. I think the industry formaldehyde apologists are hoping that we become bogged down arguing about this technical detail or that specific fact and ignore the overall realities of the intrinsic dangers with formaldehyde. Well, as they say, the Devil's in the Details. Let's hope the formaldehyde apologists left themselves a breadcrumb trail to get out of this enchanted forest of confusion.

MYTH: FORMALDEHYDE IS ALL BOUND UP IN AN EMBALMED BODY AND THEREFORE HARMLESS. This is absolutely a false statement and unsupported by established and accepted formaldehyde reaction chemistry literature and medical/chemical investigations and studies. Multiple adducts form during formaldehyde reaction with tissues resulting in short-lived reactive intermediaries, reversible/hydrolyzable adducts and some irreversible methylene-bridged end reactants. Most end point reactants are slow to evolve and easily take hours/days/weeks to manifest. A considerable amount of formaldehyde fixation is reversible by hydrolysis, particularly when acid-catalyzed. For an extensive discussion of formaldehyde reaction chemistry, I refer you to my lengthy Champion Encyclopedia article devoted to this complex topic. Lab studies, done by me, confirm the off-gassing of formaldehyde from embalmed tissues weeks after apparent fixation. Yes, a certain amount of formaldehyde fixation is permanent crossbridging, but definitely not all, and it evolves slowly, at best. Even extremely long term formalin infused lab specimens and formaldehyde embalmed anatomical cadavers are definite formaldehyde evolvers. This is no more evident than in disinterments and re-entombments, where formaldehyde is detectable and occasionally overwhelming. I have personally witnessed these multi-faceted formalin manifestations — they are real and supported by the literature. Even if you think only 6-8 ounces of formaldehyde ends up in a typical grave, that's easily 50-75 times the maximum health advisory limits for formaldehyde as a groundwater contaminant/soil leachant in a typical grave soil displacement. This myth is so contorted and convoluted that there is even supposed to be some intrinsic difference between formaldehyde in the cavity and formaldehyde in the other tissues. With the known chemical reactivity parameters of formaldehyde how could that even be possible? This is all just a myth being used to anecdotally give formaldehyde a free pass. There is no "get-out-of-jail-free" or, should I say "get-out-of-the-grave-free" card for formaldehyde on this one.

MYTH: HEY, DON'T WORRY, WE'VE DISCOVERED A SECRET INGREDIENT — PROBLEM SOLVED! And the secret is? — tannic acid, or whatever else, in methyl alcohol? That's it? Sure, I could be all wrong, it could be Yellow Kryptonite or something else. Guess I'll have to check with Lex Luthor on that one. Hopefully, you will see the pithy double irony in my Superman allusion. At any rate, the real point is — so what? Suddenly, formaldehyde is magically no longer needed and we can jump down off that horse? If this is the solution and it's that simple — how come it wasn't done long ago? So what about the roadshow about how harmless and great and irreplaceable formaldehyde is and we better fight to the death to keep it? Over 99.9% of everything else peddled to the industry is still formaldehyde, so what gives? So, which is it — formaldehyde or the secret formula with the secret ingredient? Sounds, disingenuous to me. Most of the time secret ingredients are secret because we're too embarrassed to admit what they really are. Better to invoke an air of mystery and intrigue to baffle, bewilder and befuddle. The real problem is — the secret formulations, whatever they are, do not even come close to replacing formaldehyde in traditional cavity embalming and good luck on arterial embalming. Champion never played the secret ingredient game on any of our MSDS's and was always proud of whatever chemical we professed to be an effective embalming agent and felt we owed it to you to be an informed and knowledgeable embalmer. Champion still feels this way and will never play

this pretend game with it's valued customers. I can guarantee you that. Hide-and-Seek games with secret ingredients just embarrass the industry, make us look silly and ultimately accomplish nothing. And that nails the lid on that, uh, well, you know.

MYTH: ALL ALDEHYDES ARE THE SAME, GLUTARALDEHYDE HAS FORMALDEHYDE IN IT AND DON'T BELIEVE ANYTHING YOU HEAR OR READ ABOUT IT AND IT DOESN'T WORK ANYWAY. This myth has been around forever and is nothing more than the Old School redux of the fear and loathing by the formaldehyde-only fluid makers and their friends that there is something better and safer than formaldehyde for embalming. Study of chemistry confirms that all aldehydes, by definition, possess the reactive aldehyde moiety, but ultimate chemical action is predicated on a myriad of other chemical and molecular factors that modifies the chemical reactivity by a complex array of chemical/structural factors, let alone other physio-chemical properties that drastically alter the toxicity, safety of use, exposure parameters and disposal impacts of any specific chemical. Saying all aldehydes are the same is just patently false. No wonder we won't know what hit us when the truth comes racing around the corner and smacks us square in the face.

The margin of error in a formaldehyde embalming seminar is plus or minus 100 percent.

-JHB

Glutaraldehyde is not and never will be formaldehyde, or anything close to it, and that's a really good thing. Exposure parameters, safety of use considerations and dose/quantity/dilution parameters all point to glutaraldehyde as an excellent, overall reduced toxic exposure alternative to Old School formaldehyde. A perfect example of the glaring differences between glutaraldehyde and formaldehyde is the fact that glutaraldehyde is an extremely low vapor pressure liquid at room temperature, while formaldehyde is a full-blown gas with a density equal to air. No wonder, then, that formaldehyde is the rapidly evolving, gaseous, carcinogenic chemical impacting your nasal passages during embalming, while glutaraldehyde (with it's intrinsic high vapor density/low vapor pressure) is very effectively eliminated/minimized during embalming and hardly even shows up on the monitors at all. The Old School trash-talking about how glutaraldehyde has lower limits than formaldehyde is thusly demonstrated to be what it really is — nothing more than a theatrical ploy and a subterfuge to confuse and bewilder the uninformed.

Now we arrive at the fear and loathing — don't believe anything you hear or read about glutaraldehyde, or anything bad about formaldehyde for that matter, and fear those websites on the internet, don't believe them, don't let your mind be poisoned by all that truth, knowledge and scientific research, it's all fear-mongering anyway and just a government regulatory plot to take over the industry, just let it all blow over and everything will be just fine. Thousands of Champion embalmers worldwide use glutaraldehyde embalming fluids on a regular basis — they are effective, safer, reduced toxic exposure impact chemicals that deliver excellent embalming results and all without the overwhelming toxic disadvantages of formaldehyde.

That brings us to the EU situation and the fact that a registration for glutaraldehyde was not sponsored. This decision, by The Champion Company, or anybody else, for that matter, to not support a registration for glutaraldehyde in Product class 22 (taxidermy/embalming) in the EU was purely a business/financial one and nothing else. There is no viable market for embalming in the EU, period, and no intrinsic value to procuring a costly registration, regardless of how easy it would have been. It's as simple as that. Embalming is unpracticed, unadopted, held in disrespect as needless and ridiculous, and illegal in most countries throughout Europe. The extensive dossier on glutaraldehyde was already available and formatted for numerous other product classes and registrations, by various companies, were done in all these other classes for numerous products, and a registration for embalming would have been easy and straight-forward. It was not done, because it made no business sense.

The myth-spinning regarding this issue is, thusly, seen as what it is — Old School fear and loathing all dressed up in new clothes. Pretending and predicting bad things might come from this in the U.S. is just “misery loves company” syndrome and a lame justification to “keep up the good fight” with formaldehyde, because, glutaraldehyde must be in the same sinking boat as formaldehyde and, hey!, formaldehyde's not really that bad, anyhow. The reality is — formaldehyde is the chemical in embalming that is falling into disfavor and being banned in its many product forms and uses in Europe and all over the rest of the world. Formaldehyde is the carcinogenic aldehyde that nobody wants and everybody hates. Formaldehyde stinks, literally. Trying to spin the formaldehyde argument by trash-talkin' glutaraldehyde just won't fly. That's just the facts. The sooner the funeral industry understands this and moves on and away from toxic, carcinogenic formaldehyde embalming, the better. If you wish to bury your head in the sand about this and pretend there will be some answer down the road, do so at your own risk, but just remember, it is cold and dark down there, and you, literally, won't even see it coming.

MYTH: BECAUSE OF THE FOLLOWING ANECDOTAL EVIDENCE, I DON'T THINK THERE IS ANY PROBLEM WITH FORMALDEHYDE, SO THERE. This is a laundry list of justifications for formaldehyde that is not based on science and research, but instead, on what we hope and want to believe is true, not what really is true. Consequently, all arguments stop here — I believe what I want to believe and all the science, facts and research is wrong and the only thing that matters is what I think based on my personal and anecdotal experiences and what my buddies in the funeral industry and the door-to-door peddlers of formaldehyde tell me. At the end of this act, logic exits stage right. So, here are the most frequently used anecdotal arguments to justify and apologize for formaldehyde in embalming.

- I'll just use a lower index fluid and get a bigger bathroom exhaust fan, then everything will be fine.
- I never heard of anybody dropping dead from breathing fumes in the embalming room.
- No embalmer I know of ever got cancer from formaldehyde.
- I know of embalmers that lived to be at least ninety and died from old age.
- My little button formaldehyde monitor says I'm just fine, and way below OSHA limits.
- I can't even smell formaldehyde in my embalming room, so I'm totally safe.
- I don't see any leaks in my latex gloves and never have a problem with them.
- I don't smell any toxic fumes when I use bleach with formaldehyde in the prep room, so I don't worry.
- I use less fluid than most embalmers, and it's a low-fuming type, so I am just fine.
- I know a supposed OSHA expert that says none of this is true anyway and don't worry about it.

Yes, that's quite a laundry list of anecdotal evidence for justifying formaldehyde in its many forms in embalming. So, here goes. If you use a lower index you'll just end up probably using more and the total exposure will be the same or maybe even worse. You can suck a little more formaldehyde out of the room but you can't suck the carcinogenicity and toxicity out of formaldehyde. It's the long term effects of repeated, continual exposure to formaldehyde over the years that causes the problem not the exposure of any one isolated embalming procedure. You might never know or meet an embalmer that got cancer, because the sampling size is too small and there are just too few embalmers in the world. Large and statistically significant exposure studies demonstrate strong correlations with cancer and formaldehyde in many multi-varied scenarios and correlated demographics. Not all embalmers live to be cancer free at ninety. Those individuals that do, will always be noted and remembered due to their uniqueness as a statistical outlier and an exception to the rule.

Monitoring is in the eyes of the beholder. Time and position in the room, length of embalming, strength of solutions used, time spent loitering in the front office and relaxed standards for legal exposure all conspire to create a false sense of safety. No monitor measures the cancer-causing potential of a chemical agent. OSHA limits, for political reasons, are much higher than they should be for many chemicals. That doesn't make it OK or right, it just makes it what it is. As an example, OSHA exposure limits for Hydrogen Cyanide is 10 PPM, over 10 TIMES higher than formaldehyde and they are both gasses. So, I guess it's OK for you to lock yourself in an embalming room and breathe Hydrogen Cyanide gas at 10 PPM? OSHA says that's more than acceptable. It's not even a carcinogen, so what's your problem? You wouldn't hesitate to do the same thing with formaldehyde gas at around 1 PPM and that's the "supposedly" safe limit. Actually, it's even less than that at 3/4 of 1 PPM. Most embalmers can't smell formaldehyde at even 1 PPM, due to constant exposure and familiarity. The exposure limits for formaldehyde in embalming is over 60 TIMES the safe limits set for a FEMA-style trailer by U.S. govt. regulatory standards. So, I guess you would have no problem occupying one of these trailers, because your comfort level with formaldehyde in the embalming room is obviously way above those silly documented government exposure levels. Bottom line, most embalmers are overexposed to formaldehyde on a repeated and regular basis, and they just don't care. If you think you are safe in a formaldehyde soaked embalming room, you are seriously deluding yourself. Your perceptions and beliefs are just hiding the facts from you. We have seen the enemy, and he is us.

No one has a problem with latex until a serious reaction from latex occurs. They occur suddenly and all too frequently with habitual users of latex gloves. Yes, you could luck out and never have a reaction and use latex gloves for years and let the formaldehyde embalming fluid leak through to your skin everytime you embalm. Do you really want to take that chance? Bleach and formaldehyde are reactive and incompatible chemicals that evolve noxious, toxic gases when mixed together. You don't smell anything different, because formaldehyde and other chemicals already in the embalming room have deadened your sense of smell and overwhelmed and irritated your nasal passages. That changes nothing about the problem, just your perception of it. How much less formaldehyde do you have to use before there's no carcinogenic and toxic effect from repeated embalming use? I hope you realize what the answer to that one is.

In this industry, sadly, anybody can be a self-proclaimed expert, print up some business cards, send out some newsletters, write a few snippet articles, whine about government intervention, put on some seminars

that deliver incomplete, incorrect and unsafe ideas and recommendations and nobody knows the difference. Most have absolutely nothing but “embalming experience” with no accreditation, no recognized degree, no formal training, no recognized professional affiliations, no documented research and no licensure. The funeral industry likes these “self -proclaims” because they tell us not what we desperately need to hear but what we want to hear and that makes us feel so much better and then we all breathe a sigh of relief and relax. This comforting and false sense of security is shallow, short lived and counter-productive to the industry. This and all the other anecdotes justifying and apologizing for formaldehyde results in a dangerous and insidious elixir for embalmers and funeral directors — partake of this Purple Grape flavored KoolAid at your own risk.

The spinnin’ wheel is spinnin’, spinnin’ all around
Weaving myths and lies that we hope will most confound.

-JHB

Well, there you have it. Myths, anecdotes and out-of-context falsehoods, some old, some new, but all conspiring to cloud the judgment of the industry, confuse the facts and issues, and substitute superficial perception for reality. In the end, none of this changes the facts on the ground and just makes us look ridiculous in the eyes of modern science and well-informed society. The future is inventing itself, as we speak, and we can choose either to boldly embrace the changes the future holds for us or we can defiantly cling to the past, refuse to change and allow the future to deconstruct us and proceed forward without us. I, for one, choose the future and the enlightened changes that it will bring. I invite you to come along on the journey. I sincerely hope you will.

PostScriptum: In a past and most enjoyable literary joust, a quote by Ambrose Bierce was used as a theatrical foil against myself and my stance concerning the current and needless toxic nature of modern formaldehyde embalming. It all involved toxic thinking and toxic things, accusings, fear and loathing and the kicking of cans. Please refer to my Fear and Loathing/Toxic Thoughts, Toxic Deeds article to revisit in detail this pugilistic encounter. Having more than a passing acquaintance with A. Bierce, having basically read everything he ever wrote, I herewith offer up this devilishly lexicographical morsel from *The Devil’s Dictionary*. Alas, it seems, fear thine Compendium of Famous Quotations as it may rise up and smite thee. What, then, is to be taken from the quote? Warning signs of discontent appeared nearly a hundred years ago concerning the stylized, needlessly toxic, ritualized and constrained/contrived preparation of the dead and the complexities of the “modern” funeral industry. What has changed now? — a constellation of social, societal and environmental factors have conjoined to create a “tipping point” in thought and deed in modern society that will implement and demand enormous changes in the industry and the abandonment of needless and archaic practices. The lesson to be taken away from it all? — embrace enlightened change, willingly and gracefully adapt, and become a valuable and indispensable service provider and a welcome and essential commodity in the future. The journey will be hideously difficult, unwelcome and probably impossible for Old School formaldehyde

hardliners, but the rewards for the willing, knowledgeable, enlightened and forward-thinking in the industry will be enormous. Herewith, then, I respectfully submit to you this 100 hundred year old quote from Ambrose Bierce concerning toxic turn-of-the-century embalming, and an aside about all that Egyptian silliness. How little, shamefully, it seems, has changed.

EMBALM, v.t, To cheat vegetation by locking up the gases upon which it feeds. By embalming their dead and thereby deranging the natural balance between animal and vegetable life, the Egyptians made their once fertile and populous country barren and incapable of supporting more than a meagre crew. The modern, metallic burial casket is a step in the same direction, and many a dead man who ought now to be ornamenting his neighbor's lawn as a tree, or enriching his table as a bunch of radishes, is doomed to a long inutility. We shall get him after awhile, if we are spared, but in the meantime the violet and rose are languishing for a nibble at his gluteous maximus.

-- Ambrose Bierce
The Devil's Dictionary, 1911