American Glovebox Society
ENCLOSURE
FALL/ WINTER 2022

Capacitor Discharge Welding Studs, Production Issues and Process Corrections

Article by: Chad Malnar and Mason Geyer, Premier Technology, Inc. – Page 8

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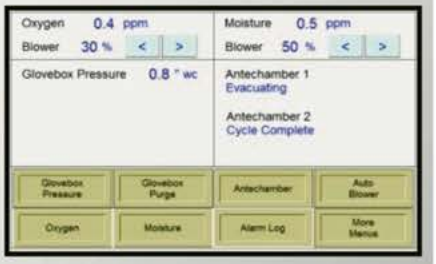

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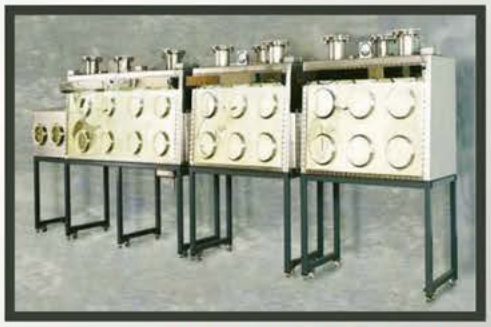

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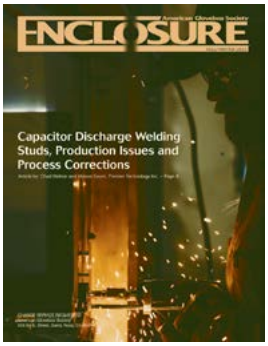

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President's Message

By: Paul Contreras

What a great Conference we had in Nashville, Tennessee 2022! We couldn't have asked for a better venue or location, not to mention that we had the highest attendance of any other AGS Conference. I want to thank all those who had the opportunity to attend and participate in this year's conference. Your participation is what made it such a success.

American Glovebox Society (AGS) prides itself in the mission to promote the safety and quality of glovebox systems, promote communication, and disseminate knowledge in glovebox technology. This year's Conference delivered on the goals and mission of the AGS. The Conference provided valuable education including focused and fundamental training, technical presentations, informational posters, hands-on training demos, and leak testing training. The Conference program provided the opportunity for attendees to learn and the ability to network, sharing knowledge and expertise within the industry. This helps AGS, as a Society, to grow and for AGS members to build networking relationships beyond their own company or lab.

As this year's AGS President, my focus is to continue to support the Standards Development Committee (SDC). The AGS SDC provides the industry with the most updated Standards and Guidelines, helping to ensure quality and safety. I also look forward to exploring the opportunity to offer AGS Standards and Guidelines as digital publications. I offer a sincere thank you to AGS SDC Members, both past and present, for volunteering their time, knowledge, and expertise. If you're interested in joining the AGS SDC, please contact the AGS Executive Office at ags@gloveboxsociety.org.

Working with today's growing missions in the nuclear industry, the demand is increasing for glovebox fabrication. As many of us are closer to retirement, myself included with 30 years at Los Alamos National Laboratory, the attrition rate continues to increase, and AGS is looking to expand outreach opportunities to meet increased demand. We will continue to reach out to colleges and universities and encourage students to explore the glovebox industry as a career path. AGS will also continue to outreach and support our liaison counterparts in the UK and Canada. Their participation and contributions to AGS have been great.

In between meetings and conferences, I encourage you to stay up-to-date using other AGS resources. This includes the Enclosure magazine, AGS Membership Directory, Products & Service Listing, and valuable resources such as Guidline for Gloveboxes Gap Analysis and formula tools which are all located on the AGS website - GloveboxSociety.org. In addition, AGS social media is alive and well. Be sure to follow us on Instagram, Facebook, LinkedIn, and Twitter. If you have industry-related news you would like to share with the membership, let us know by emailing ags@gloveboxsociety.org

It's an honor to serve as your elected President for my second term with my soon-to-be patented "Me Again" slogan. I would like to take this opportunity to offer my gratitude. First, I would like to thank YOU, our AGS members, for your continued participation. AGS is fortunate to have a diverse membership with participation from users and vendors. Within our membership are consultants, design and fabrication engineers, installation experts, and providers of parts and accessories. Without you, we would not be the Society we are today. A special thanks to Martyn Page, our longtime UK Liaison for gracing us with another year, and possibly another year, maybe? I would also like to thank our Board of Directors, the Standards Development Committee, and Dorothy and Crissy, for their continued support. To our Immediate Past President Justin Dexter, thank you for your leadership in 2021-2022 and the dedication that you give to the Society. Job well done.

Plans for next year's Conference are underway. The Call for Papers for technical papers and posters is open and available on the AGS website - GloveboxSociety.org. Mark your calendar and make plans to join us July 24-27, 2023, in Las Vegas, Nevada! See you all there!

Sincerely,
Paul Contreras, AGS President 2022-23. ❖

The Enclosure

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Capacitor Discharge Welding Studs, Production Issues and Process Corrections

By: Chad Malnar and Mason Geyer, Premier Technology, Inc.

Introduction

Capacitor Discharge (CD) welding studs are used on almost every glovebox designed today. While a seemingly inconspicuous component, CD studs are vitally important to the end user to ensure the glovebox will perform its intended function. As detailed in this article, CD studs are unfortunately prone to failures during production, testing, and service. These failures can have a ripple effect through all aspects of manufacturing and ultimately affect the end user and overall quality of the glovebox.

As one of the major glovebox fabricators in the United States, Premier Technology, Inc. (PTI) prides itself on the quality, consistency, and repeatability of the CD stud welding process, similar to any other weld process PTI uses for fabricating gloveboxes. Finding success with quality, consistency, and repeatability certainly came with its challenges. With this in mind, PTI conducted a study to investigate the inconsistencies between how the welding process should work in theory and how the welding process actually works in real practice. PTI evaluated multiple aspects of welding CD studs, including code application, stud selection, material size, pre-production testing, post-production testing, and the use of anti-spatter to evaluate how these variables related to the end stud weld condition on a glovebox.

With considerable resources being spent to repair and/or re-apply CD studs, PTI started down the path of self-inspection of its own processes. It was originally intended to be an internal development, but PTI opted to share it with the industry after recognizing this to be a topic of common interest among fabricators and end users. Lessons learned from previous projects involving CD stud welding were used as a guide to our success for this study.

Initial Evaluation

The first step was to evaluate the welding codes and other applicable guidance material available to the industry. Currently, there is no welding code directly applicable to CD studs for gloveboxes. In fact, there is no specific reference to CD studs in any code outside of American Society of Mechanical Engineers (ASME) Section III. The typical welding code specified for gloveboxes is either ASME Section IX or American Welding Society (AWS) D1.6. These specifications were designed around drawn arc studs and applying these codes to CD studs leaves the majority of the process decisions up to the manufacturer. The codes allow for variable ranges that may permit studs to be shot with unsatisfactory results. PTI focused this study on three main variables that could be a factor in the failure of the CD studs: voltage range, material thickness, and pre-production testing. The study also evaluated other variables that could affect the quality of the weld, such as the use of anti-spatter and stud selection.

Voltage Range and Stud Selection

The first variable, voltage range, is not addressed anywhere in either ASME Section IX or AWS D1.6, which is problematic, due to voltage being one of the primary variables. Instead, the code attempts to control amperage and arc timing, neither of which are applicable to CD studs. By using the derivation for the capacitor energy equation of U=1/2CV^2 (U=Total Energy C= Capacitance, V=Voltage) to calculate the total energy discharged at the time of welding, PTI is able to calculate an acceptable voltage range of +/- 5%. This is not a direct correlation to amperage, as would be applied to a drawn arc stud; however, PTI has used this method in the past as a justification to try and meet a non-applicable standard.

PTI performed a round of testing with 3/8" non-threaded studs. This size and type of stud was selected because it was easier to evaluate the strength and quality of the weld in lieu of a threaded stud that had a smaller minor diameter. Results from multiple test shots, combined with past experience, demonstrated 143 volts to be the optimal voltage setting. By applying the +/-5%, this established a usable range of 135-150 volts. Test studs shot at the lowest end, 135 volts, failed bend testing (Figure 1) about 40% of the time. The minimum consistently acceptable voltage was 139 volts. Studs shot at 150 volts did pass the bend

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test (Figure 2); however, there was excessive flash that would require post weld cleanup. The use of the derivation for the capacitor energy equation gives an approximate voltage setting; however, this test demonstrated it would be better suited to perform high/low testing to determine the actual usable range for a given size and machine set-up. This method would remove some of the risk of failures, but it would also give a much narrower Welding Procedure Specification (WPS) range. This would also require more testing to determine what the WPS ranges should be.

Figure 1, Low settings (135 volts)

Figure 2, High settings (150 volts)

In order for PTI to evaluate what a high/low Procedure Qualification Record (PQR) would look like, multiple sizes of CD studs were tested. During this testing, PTI quickly learned that there was a marked difference between stud types. The allowable range for a non-flanged stud was fairly narrow, while the allowable range for a flanged stud was much more forgiving.

Like all welds, CD studs are prone to inclusions. These inclusions reduce the overall strength of a weld. Examining the stud fracture surface (Figure 3) for any bright and shiny

surface is indicative of lack of fusion. Note that even with these small defects, it is possible to get good results and have a stud that is acceptable per code and sufficient for service.

A non-flanged stud is the most difficult to weld, due to the small difference

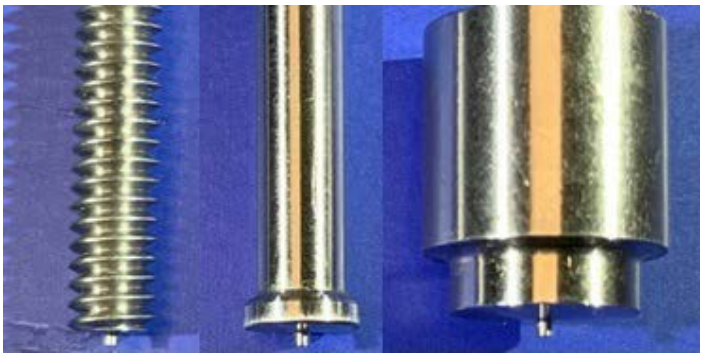

Figure 3, (Top) Fracture surface from tensile testing

Figure 4, (Above) Stud design base size for a 1/4" stud. From left to right: 1/4", 5/16", and 3/8"

between the base diameter and the minor diameter of the thread (Figure 4), where a failure is more likely to occur. Inversely, any increase to the cross section of the weld as compared to a given stud size would yield a more robust repeatable process. Simply stated: the bigger the base, the better the chance of an acceptable weld. While ASME and AWS codes do not differentiate between flanged and non-flanged studs, PTI chose to separate flanged and non-flanged studs into their own respective WPS to allow for differences in testing results.

PTI performed internal testing to prove that having a greater surface connection (flange) would yield a better weld. Test sets of twenty, 1/4" threaded studs, flanged and non-flanged, were shot at the optimal settings for their base

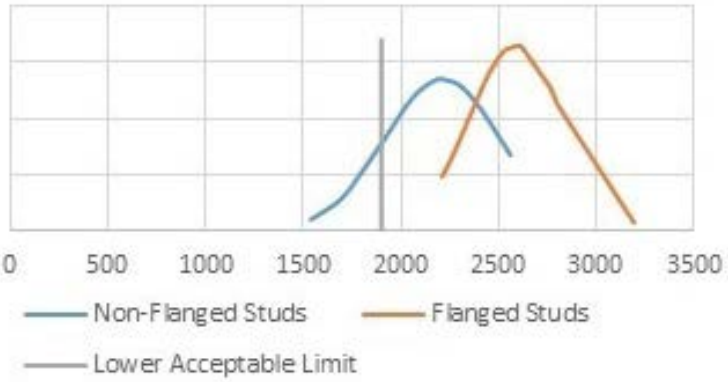

Figure 5, Tensile testing results bell curve

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size. The flanged studs performed on average, 15% better than the non-flanged studs and had no samples fall below the minimum required by AWS (Figure 5). This test shows that flanged studs provide fewer overall failures and are more resistant to small changes in set-up. Therefore, PTI has determined that when the option is available to use a flanged stud (or a stud with a bigger base), this method provides the greatest likelihood of producing acceptable stud welds.

Material Thickness

The second variable PTI evaluated was material thickness. When qualifying a WPS, there is no code requirement for base material thickness. This allows the manufacturer to shoot studs onto any material thickness with the same WPS. In PTI's testing, however, more failures were identified with an increase in the base material thicknesses (most noticeably when moving from gauge material to plate material).

PTI performed testing with 3/8″ studs at the optimal setting of 143 volts. The test involved shooting five sets of studs on each material thickness (in this instance, 7 gauge (ga) sheet and 3/8″ plate). The settings used to shoot the studs on 7ga (Figure 6) were not successful on 3/8″ material (Figure 7). This issue seems to be more problematic when increasing from gauge material (7ga and below) to plate material (3/8″and above). Small changes in material thickness did not show the same issues. For example, studs shot with the 7ga procedure had no noticeable issues when utilizing 10ga material and vise-versa. This test was repeated twice with similar results.

Figure 6, 3/8" studs on 7 gauge 304 base material

Figure 7, 3/8" studs on 3/8" 304 base material

Based on what was evaluated, a +/- 1/4″ material thickness requirement on PQRs would solve this issue for up to 1/4″ thick material. Testing was not performed on material greater than 1/4″ in thickness, and it is unknown if the same principles would apply to thicker materials. PTI believes it would be more pertinent to evaluate drawn arc studs beyond 5/16″ material thickness as the risk of distortion is typically manageable at that thickness.

Pre-production Testing

With the knowledge PTI gained from the previous testing, PTI evaluated the third variable: pre-production testing. PTI found that studs shot closer to the edge of the useable limits lacked consistency. For example, if ten studs were shot, there would be anywhere from two to six failures or a 20%-60% failure rate respectively. These settings would

Figure 8, First two studs used for preproduction testing

Figure 9, Next eight studs after the first two studs passed preproduction testing

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consistently pass standard pre-production testing when only evaluating the first two studs. Statistically, the chances of having the first two studs fail on the pre-production testing survey were small. However, this would result in all of the potentially under-performing studs to be used in production. Figure 8 shows the first two test studs shot for the day. These studs were shot at 136.5 volts, approximately 4.5% from the optimal setting. Both studs passed a pre-production test; however, after eight more studs were shot and tested, there was a 40% failure rate (Figure 9). Based on this information, PTI has inferred that two studs do not appear to be sufficient to adequately demonstrate a controlled process.

This further shows that using a +/- percentage allowance on voltage is not necessarily a proper methodology for determining the setting ranges. Using a greater number ofstuds during pre-production testing would be more beneficial for mitigating this issue. In every test that PTI performed where there were failures found after pre-production testing, the failure occurred by either the third or fourth stud. Based on this information, PTI has determined that a minimum of five studs should be shot to perform the pre-production testing.

Additionally, PTI is currently evaluating the implementation of post-production testing on an ongoing project. If found to be beneficial, PTI will add post-production testing as a company-wide standard practice. The post-production test involved shooting two to five studs, with testing similar to pre-production testing. This allows us to "book end" our production and gives a reasonable assurance that any studs shot during that shift are fit for service.

As a result of the high/low WPS testing, the overall failure rate of studs was reduced considerably as the allowable voltage range was narrowed, with a potential that the additional pre-production testing could be removed if the high/low ranges continue to prove satisfactory. PTI has opted to continue performing the additional pre-production testing, as the extra cost of the studs outweighs the time, effort, and cost it takes to remove and re-weld even a single production stud.

Anti-Spatter

As mentioned in the initial evaluation PTI performed during the testing of stud welding methodology, PTI also evaluated the effects of anti-spatter on the weld. Due to the extremely short weld time of a CD stud, it is especially susceptible to contamination. In an effort to further remove any variables that could cause inclusions or introduce contaminates, PTI performed testing with and without anti-

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spatter. This evaluation separated the commonly used anti-spatter into its own test cycle. It is typically recommended to avoid using anything on a weld surface; however, PTI discovered that using the water-based anti-spatter resulted in an improvement of the weld. Without any anti-spatter, there

Figure 10, Left: No anti-spatter applied. Right: Water-based anti-spatter applied

is significant clean up required around each stud that led to an unacceptable burden on production (Figure 10).

Standard welding anti-spatter is oil-based and caused significant lack of fusion utilizing known good settings. It was so difficult obtaining acceptable results using oil-based anti-spatter material that PTI wasn't able to run a good comparison study. PTI uses Dynaflux 400, a water based anti-spatter. This anti-spatter did not suffer from the same issues as the oil-based anti-spatter. Furthermore, welds would consistently pass both visual and bend tests and had very little post-weld cleanup. PTI has used this water-based anti-spatter when stud welding in the past with good results in production, as long as it is used correctly. Because it is water-based, there is a time limit for application. Once sprayed on the base material, the anti-spatter will evaporate within a few minutes; therefore, small sections should be sprayed right before welding. In addition, a very thin layer should be used, or it can have a negative effect on the weld. The main disadvantages with using the water-based anti-spatter are the extra steps involved with application, working quickly and in small sections, and the required use of earplugs due to the increased decibel level of shooting the stud. This testing was mostly utilized to ensure that PTI's current system did not directly cause any weld quality issues. All testing completed prior to this also used the same anti-spatter and there is no reason to believe that it has any negative effect on the quality of the weld.

Conclusion

At the end of this study, PTI has re-qualified all sizes and types of studs to both AWS and ASME using a high/low method. Non-flanged studs typically had a voltage range narrower than 5% while flanged studs were greater than the standard 5% used in the past. Due to this, each stud type was separated into their own procedures. As a result, PTI now requires the use of further pre-production testing, the addition of post-production testing, and the use of water-based anti-spatter.

At the time of this publication, some weld repairs are still required during the CD stud application process; however, the number of studs that require repair has diminished significantly. Since PTI has yet to investigate each unique weld stud and base material size configuration, the focus of this study was on the material sizes most applicable to current projects. The results shared from PTI's study in this article may not be fully applicable to another manufacturer's process, as PTI utilized its own welding equipment, systems, and processes. There are many competing factors when determining optimal settings and production controls. Some even seem to be doubling up on requirements, like a narrower WPS range and increased pre-production testing; however, based on this study, PTI has a greater understanding of the process prior to the onset of this evaluation. PTI has implemented its findings into standard procedures that provide consistent and repeatable results now and in the future, regardless of project type or equipment. ❖

We are all getting old

By: John T. Newman, P.E.

I recently spent a rather long period of navel-gazing over the news of the recent passing of a good friend, colleague, and AGS member. Someone that I knew and worked with for quite a long time. He was such a good person, full of love and consideration for others, but he also had a good tenacity for spirited debate about life and work. Every time I visited his hometown, he would invite me over for dinner and we would explore all the finer points of cooking and barbeque. Then we'd retire to his back porch, where we would sip some fine liquor and discuss the intimate workings of the world around us. I really wish that he could have made it to our last conference and we could have had one last hurrah, but unfortunately, we can't plan for our own demise. Now that he is gone, I will miss him terribly.

When someone close to you dies, it makes you wonder about yourself and it makes you think about your own vulnerabilities. He was only 4 years older than me, and I've already lived longer than my mother and grandfather. Will I be next? Will it be tomorrow? Might as well have that piece of cheesecake then, right? Uggg, that will assure that it will be tomorrow. Ahhh…stop it!

Getting old just kind of sneaks up on you. When you are young, you feel bulletproof, and being old is the last thing on your mind. Then one day, you wake up and look in the mirror and think, holy crap, who is that old person with all the wrinkles and gray hair looking back at me. I certainly don't feel like I'm old, but then as I turn, pain shoots down my side from my shoulder. Where did that come from? You think back over the last few days, going over everything you did. Did I lift something wrong, or did I do something out of the norm? Is it the preliminary sign of a heart attack? Oh my god, could it be something worse? Settle down big boy, welcome to daily life as an old person. And let me tell you, getting old is not for the faint of heart. When you die of old age, you die because you just get tired of the struggle of being old.

When you get old, you forget things. Why did I come into this room? You're thinking, "I know I had a good reason", as you aimlessly wander around looking for clues. Or, how sometimes it takes a while to come up with a name or a word that you wanted to use during a conversation. My theory about that one is, that as you get old, you amass years of information in your brain. Then it just takes a long time to search that massive database for the desired information.

After 36 years and counting, you could say that the AGS has been pretty successful.

Old is a relative term, which I think means older than others around you. It's like, when all of your senior relatives die, which leaves you as the elder member of the family. Then you are officially old. Although, being old does come with a few new liberties that you never had before. You can openly reminisce about the past. "In the old days, we didn't have it as easy as you youngins do today, we had it sooo much harder." "When I was your age, we had to walk to school, every day, in the snow and rain, uphill, both ways." You are allowed to say stupid things and repeat stuff over and over. I hear all the time, "grampa, you already told me that a hundred times". I remember my mother used to tell the same old stories over and over, but I was always nice about it and would just smile and listen to them again and again. All of us old people are not trying to be critical. We're really just trying to share what we have learned with the younger generation, and to help prevent them from making the same mistakes that we made. I saw a quote the other day in the Epoch Times, "Employ your time in improving yourself by other men's writings so that you shall gain easily what others have labored hard for." SOCRATES. I thought that sounded pretty smart. You can get the same thing by paying attention when an old person is rambling on about the past. So, damn it, listen to me! You might learn something.

The AGS is getting old too. Or I should clarify, the people that started it and made it great are getting old. After 36 years and counting, you could say that the AGS has been pretty successful. What's that rule they say for starting a business? Most business start-ups fail within the first 5 years, so if it makes it past that 5-year mark then it is considered a success. The AGS has definitely done that. But now, in order to continue, the old guard must pass on everything to the younger generation to take over the running of the Society, or it will surely fail. And I said to pass on, not pass away, at least not yet anyway. Before we all go off and retire, it's pretty important that we don't take all of our learned experience with us. We need to share as much of that as possible.

I have been involved with the AGS for a good part of my life. When it started, I was just a young man, early in my career in the containment industry. I'm not really sure why I joined, it kind of just happened. Must have been destiny. The people that I worked with were heavily involved and through osmosis, the next thing you know, I was involved. I was allowed to attend the second conference,

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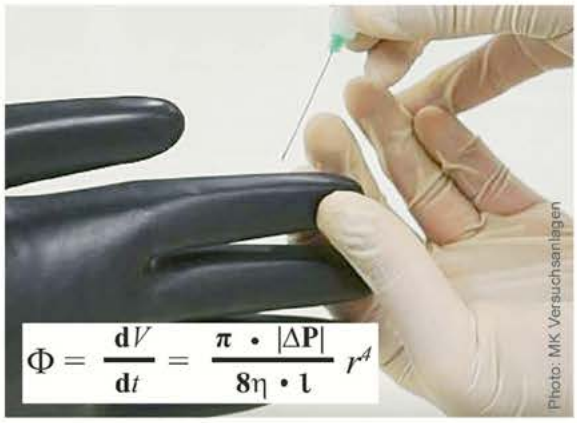
Performance Qualification of a Glove Integrity Test System: How is it properly performed?

In order to know if your Glove Integrity Testing System (GITS) is properly detecting holes in your gloves, you need to determine a hole size that is appropriate to detect within your specification requirements. However, once you select your detectable hole size, you need to validate your GITS system can actually detect that hole size. This brings to question, how do I put that exact size hole into my glove to scientifically test it?

Some have used laser drilled holes, others take a needle the size of the hole you want to detect and puncture a hole in the glove, or put a needle with an ID similar to the detectable hole size and leave it in the glove during the measurement. None of these are actually accurate in proving that a known hole size is represented in the glove at the measurement pressure. Recall a glove is a flexible polymer, thus as it is inflated it will expand, so a 150µm laser drilled hole will actually be larger depending on the measurement pressure. A hole punctured with a 150µm OD needle, will self-seal when the needle is removed until inflated to a high enough pressure which will reopen the hole, and then there is no way to validate the hole size detected. A 150µm ID needle will only represent a 150µm hole in the glove if the length of the needle is the same dimension as the thickness of the glove.

The best way to guarantee the measurement of holes down to a specific hole size is to use a physical law like Hagen-Poiseuille, which determines pressure loss in relation to hole properties, viscosity, volume, and time, to determine the proper needle ID and length to represent a required detectable hole in the specific thickness of glove being used. With the proper needle left in the glove, the exact measured hole size is known at any measurement pressure. MK, the experts in glove integrity testing use scientifically proven method to determine the correct needle size which emulates the required detectable hole size in your determined glove of choice. All MK Custom Glove Test Parameters are developed using proven scientific method, so you can be comfortable with your MK GITS scientifically undisputable results if ever questioned by a regulator. Ensure your comfort in your results by calling the experts at MK MetalFree Corp. to Performance Qualify your MK glove testing system.



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being in Denver and since I lived there, it was cheap and easy without any travel expense. I'm not remembering exactly why I didn't go to the first one in Keystone, probably because I was busy with project work and was just considered young and insignificant at that time. Besides, I wasn't really paying much attention to what those jokers, Paul and Keith were up to anyway, with all this glovebox society stuff they were doing.

My first conference was interesting and fun. Meeting people in the same industry and listening to them share their knowledge about glovebox applications was very enlightening. Vendors were there showing off their products and it was pretty cool to meet other people who designed and built gloveboxes like our company.

For the next year's conference, also in Denver, my boss went and upped the ante for me. He said, "If you want to go, you have to present a paper." I thought, how bad can it be? Papers were a little different back in those days. We didn't have PowerPoint with all of its fancy features, and even word processing software was in its infancy. A view graph projector, shining on a roll-up screen was one of the few tools we had available. Your presentation had to be printed on clear plastic sheets called transparencies and you had to stand up in front of everyone next to the projector, flipping through your deck of slides, as you gave your presentation. If you were really sophisticated and planned ahead, you could get your presentation done in those little picture slides. Then you could use a slide projector and flip through the carousal as you performed. Needless to say, my first few presentations really sucked. With the humility of really sucking in front of everyone and coupled with a ravaging case of performance anxiety, it seemed to me to be a rather high price to pay for attending a conference. But then for some reason, I kept doing it and things gradually improved over the years.

I can truly say, being an AGS member and participating year after year, has made a huge contribution to the success of my working career and my life. It allowed me to meet and interface with many outstanding people from around the world. I have developed many good lifelong friends that I would have never met if it wasn't for the AGS. My mother used to tell me, "Honey it's not what you know, it's who you know" and that certainly rings true with the AGS. Then standing up in front of people, and making those presentations, makes you look like you know what you are doing. I remember going to a bid meeting at work one time with a potential new customer, and the customer said, "Hey, I saw you presenting at the AGS". Talk about instant credibility. All good reasons for someone to join and become involved with our great society.

As one of the older members of the AGS and society in general, I can certainly pull your ear with all kinds of advice on how to make it through this wonderful thing called life, besides only becoming a member of the AGS. As you probably have already figured out, life can be, and probably is hard for most of us. Have you heard the saying "Life sucks and then you die", well, that's pretty much the way it goes. Life doesn't have to be all tortuous though and there are many good things to look forward to. I'm pretty sure there is no nirvana or goal line to cross at the end, so you have to learn to enjoy life as you go. I've discovered that it's the little things along the way in the path through life that will give you the most pleasure.

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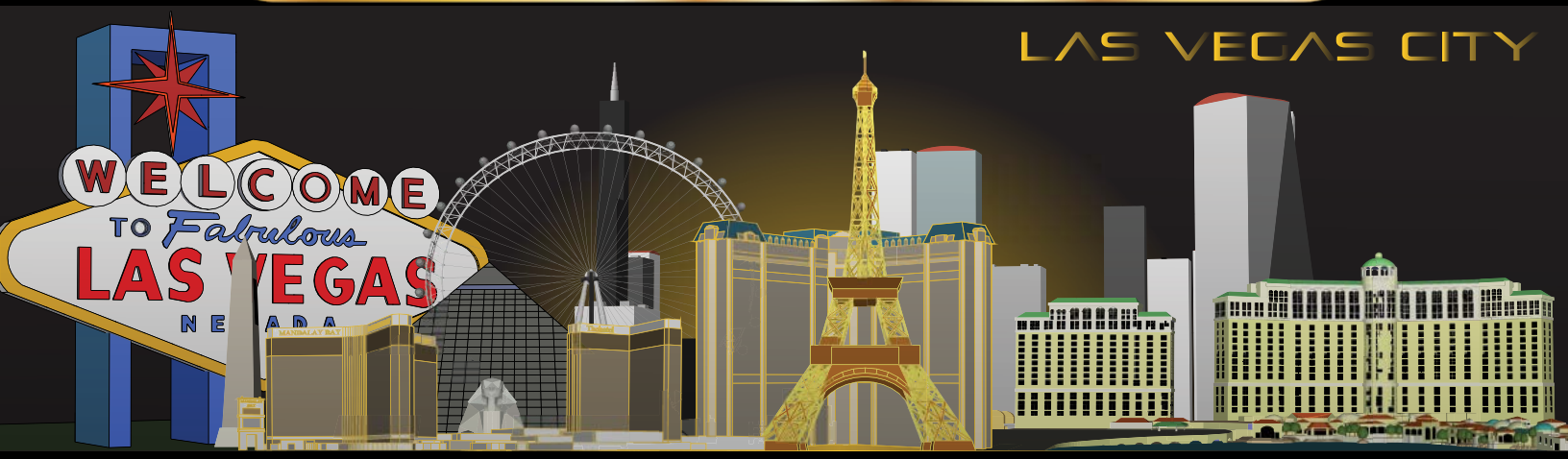

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Thoughts from Newman

We all have our careers that certainly will take its toll, but you need to slow down a bit. Enjoy a weekend doing something fun with your family, or find a hobby that you enjoy and do it regularly. Figure out what gives you pleasure and do that as much as you can. If you want to survive the long haul, you have to have some fun along the way. You never know how many trips around the sun you will get and if you save all the fun for the end, you will most certainly miss out. Besides, having lots of money won't solve all your problems, it will only change them into other problems. You should always look forward to tomorrow, it might be better or worse, but for sure it will be different from today.

Add a little improv to your life to spice things up. Do something on the spur of the moment, completely unplanned. Just go and do it, without having any idea what the outcome will be. I'm not saying to run and jump off the cliff, but don't be afraid to sometimes just "make it up as you go". It can be fun and interesting. Did you ever notice that when you plan your vacation in excruciating detail, months ahead, it never seems to be that much fun? My theory is that when you plan it in great detail, you tend to think about it a lot ahead of time. Then when you go and do it, things don't ever seem to live up to your built-up expectations, and things don't ever go right like they were supposed to. When you have few expectations, you have nothing to let you down and everything is fun.

You should strive to be good at something. But you must choose wisely what you want to be good at as early as you can in life. To become really good at something, will take most of your time. It could take up to a lifetime to achieve, and that's all the time you will get. I think that rings true with just about everything. As I used to jokingly say, "It ain't easy being a drunk, it takes practice, practice, and more practice!" And you need to believe in one's self to get there, as I also used to say, "Every man has to believe in something, and I believe I'll have another beer".

Everyone should leave behind a legacy. I'm sure you heard the saying "No one gets out of here alive". Well, if you care to be remembered, you have to leave something behind that can help others. Don't just hide in the shadows, get involved in something like the AGS. Go to the meetings, participate in the standards committee, write an article for the Enclosure, make presentations at the conference and share what you have learned with others. Heck, you could always try to write a column like "Thoughts from Newman". But then that's my gig. It's one of the ways that I conceived to share some of my learnings and distorted thoughts with others before my chariot ride around the sun stops and I fade into the sunset. Bottom line, is there a point here? Or is this just the ramblings of an old person, or more accurately, the ramblings of a madman? Is it really wisdom or just senility? Ha, but you did read this till the end, right? I'll try to do better and try to actually teach something next time, I promise. ❖

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LESSONS LEARNED *Update*

By: Justin Doman
Lessons Learned Committee Member

Wow! It was so great for everyone to finally see each other in person and host the 2022 American Glovebox Society Conference in Nashville. It was my first conference, and I was blown away by the numbers in attendance, the variety of representation, as well as the number of new attendees at the event. It was reassuring to see that there is a new generation eager to learn and share under the long-established members that have helped build the society into what it is today. Sadly, there are also members who have invested many years into to the development of the AGS, who have earned the well-deserved opportunity to step away and enjoy the next chapters of their journey in life. With that being said, we need to ensure that we as the AGS, as well as the larger glovebox community, facilitate the handoff of knowledge, understanding and technical expertise that has taken so many years to develop. We must all take individual responsibility for ensuring the long-term success of every worker in our shared workforce. As a community, we are stronger when we work together and support each other.

The AGS Lessons Learned Subcommittee met in September and began developing a plan with the new members on how we can improve the lessons learned and best practices program. One significant way that we can support each other, is by sharing lessons learned and best practices. When anyone has a teachable moment whether good or bad, it is imperative that we share that experience. Often, our shares focus on a negative experience because we do not want anyone to have to experience the joys of fact-finding meetings and all that is associated with an event when "things go wrong". However, typically in life and work, we grow and learn more from our failures than our successes. Failures can painfully force us to change our learned behaviors, planned approach or human performance that ultimately led to our failure. If we capitalize on these teachable moments and constructively analyze, collaboratively discuss and most importantly share what was learned, we can all become a stronger and more dynamic workforce because of it.

Personally, I completely understand the fear of the outcome of these events. I understand no worker, manager or individual site wants the stigma associated with these events. Truthfully, I have seen the outcome of these meetings and been the person solely responsible. I personally caused a glovebox to be tagged out for an extended period, because I mounted an improperly loaded ejection tool and caused it to become jammed to the box. It was extremely embarrassing and there were many meetings as a result, and I caused a lot of frustration for my management and our Glovebox Design Authority Engineer, sorry Tim. However, through the process of developing a path forward on how to get the tool successfully removed, we all learned more about the finer nuances of the ejector tool and assembly than we ever knew before. Utilizing teachable moments like this and sharing the learned information enables others to be able to avoid making the same mistakes. Everyone wins when we work together and share from our mistakes.

Sharing best practices is also an excellent way to inform others of process improvements and streamlined approaches that can help everyone work smarter and in a safer manner. As a working body, we do not have to wait until our annual conference each year to share new best practices. We need to foster professional working relationships with peer groups across sites and be able to openly share approaches that are beneficial for everyone. We all must understand that we are not in competition with each other, and no one is gaining any professional ground by withholding new approaches. I do not believe this is a broad issue, but it is a present one. I encourage everyone to share freely and often, because we all benefit when we work together.

Please share any lessons learned, general knowledge or best practices with the AGS and OPEXShare. By sharing your experiences, you can help others who may be presented with similar challenges. https://opexshare.doe.gov/

Justin Doman
Lessons Learned Committee Member ❖



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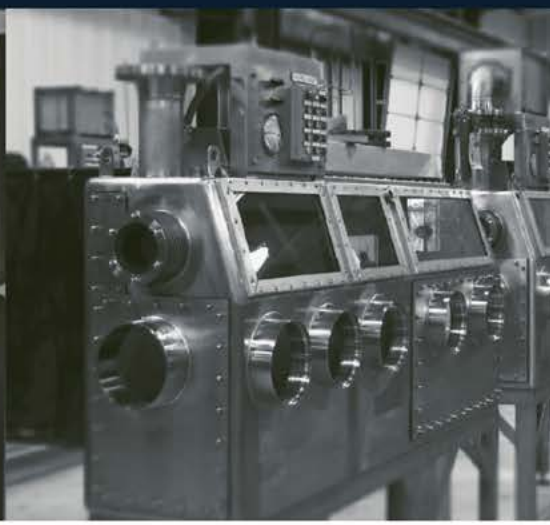

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