

**3M Transcript for the following interview: Episode 78 Engineered Stone & Silica - Part 2**

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(R) Welcome to the 3M Science of Safety Podcast presented by 3M Australia and New Zealand Personal Safety Division. This is the podcast that is curious about the science and systems of all things work, health and safety that keep workers safe and protect their health. I'm Mark Reggers an Occupational Hygienist who likes to ask the questions. Why? How? And please explain. Whether you are a safety professional, occupational hygienist, someone with any level of WHS responsibility in the workplace. Maybe you're a user of safety equipment, or maybe you're a bit of a safety nerd who finds this stuff really interesting. Then this is the podcast for you. Today. We're talking about engineered stone and silica with Carolyn Topping. And this is the second episode we're doing in this topic. Welcome back, Carolyn.

(T) Thanks, Mark.

(R) Well, thanks for coming back, but for those that may not have listened to the first part, and I do highly encourage everyone to go and do that if they haven't had the chance to do that so far. But can you please introduce yourself? Who are you? Where are you from and what do you do?

(T) I'm Carolyn Topping, I'm the acting Director for Occupational Health and Hygiene with Workplace Health and Safety Queensland. So, we're the safety regulator in Queensland, excluding mining and quarrying. I work in the

Occupational Health and Hygiene team. So, my team is looking into silicosis in Queensland.

(R) Like we did last episode just to start off just to highlight the fact that you are from Workplace Health and Safety Queensland. So, what we may be talking about may be very specific requirements to Queensland and may be slightly different in other states and territories and in New Zealand. So please do check wherever you are, you are aware of your local obligations. So, the last time we spoke a lot about what is silica, silicosis, the different levels. And in this particular working environment being engineered stone fabricator shops and quite high exposure levels from previous monitoring. But today we're going to get right into the controls – the bit that actually makes the difference to protect the workers. So, if we could go through the hierarchy of control, where should engineered stone workplaces be beginning when looking and thinking about controls?

(T) So, what I'm going to talk about comes from the Code of Practice that was released in October last year by Workplace Health and Safety Queensland. And it goes into the control measures that must be taken in Queensland. So, what we're talking about is using a combination of methods. So, one method is not going to prevent all exposure to crystalline silica. And that's come through in the exposure monitoring that my team has done over the last few years that you definitely need that combination of controls to protect workers. So, generally speaking, in this industry, they use water to suppress dust so they're applying water onto tools so that the dust doesn't become airborne. But one of the things is a lot of the tools used in this particular industry are hand tools, so especially grinders. So, while it does apply water and does prevent or minimise exposure to some extent, it also flings around a lot of water particles that contain the crystalline silica dust particles in that water, and the water particles are small enough to be breathed in. So, as part of the controls is, you need to look out doing the water suppression, but also a range of other things. And can I just make a note or just mention about water

suppression? So, you need to do that with tools that are designed for that purpose. You can't just take an electrical, say hand grinder and whack a...

(R) Like a garden hose on the end of it

(T) ...hose onto it. No, so it does have to be, you know, rated. So, the equipment has to be rated for using with water, and you have to consider how it's going to apply the water onto the surface. So, the ideal is for it to sort of flow over the surface, but when you're using grinders and things, you just need to ensure that you have a consistent and adequate water flow behind that. Can I also add that guards or brush guards, plastic flaps, skirts can also be added on to machinery such as the CNC routers, etcetera, to minimize the water spray that leaves the tool, because it's that movement of the water spray that contains the silica that is also an issue as well.

(R) Another potential control you mentioned last time was local exhaust ventilation on tools. Could you explain what that is and how that's different to the water control?

(T) Okay, so there is on-tool dust extraction. So, it applies a vacuum attachment onto a tool that draws the contaminated air or the contaminants straight away from the tool before it becomes airborne and a worker can breathe it in. So, it will extract it into a filter and a container. So, places that use a mobile system, they need to make sure that it is properly rated to contain small particles. So, if you're using a dust extractor, it needs to be H-class.

(R) So that's those vacuum cleaners you may see like HEPA, but obviously specifically designed and rated. And they need to be serviced to a very specific standard to capture and contain this very hazardous material, so that's an important point there. If you are doing that mobile stuff to make sure that the appropriately rated H-class HEPA vacuum there. Have you found Carolyn between water suppression and LEV, being local exhaust ventilation, that one captures more than the other? Or they're similar from the monitoring that you've done?

(T) Pretty much this particular industry is water. There are some new tools on the market, though now, but we haven't actually done air monitoring with people using them. But there are ones now on the market that combine water suppression and on-tool extraction. So, it creates a slurry and that slurry is drawn away. So, there are tools and better tools coming on the market. But we haven't monitored any of those as such.

(R) Is it practical to isolate workers at these types of workshops? I personally haven't spent too much time in them. But is that a practical consideration for these types of industries?

(T) Sure, we have seen, especially with the machines, so the CNC type machines. Some of those come in a type of enclosure. We've seen from monitoring that we've conducted that where you have workers working with the power tools, hand power tools side by side, that the water that flicks around off these tools can then go and affect the worker in the next pod. So, separating workers with screens, so separating to prevent that spray from going into another worker's area is also a good idea. So, it just really depends on how particular workshops are set up. But there are ways that you can enclose or separate those workers from each other or from a process.

(R) Like a design and planning point of view, if you're starting a new workshop, you'd be able to put a lot of things in place right from the start. But if you're trying to retrofit a workshop may not be as straightforward and easy, but certainly things that workplaces should be absolutely considering. What about the decontamination of workers clothes? Is that a big concern with this water splashing back?

(T) So, we do see that even with wet methods in place that workers do tend to get very wet, and some people like it in summer because it is a bit cool.

(R) True, very true...

(T) So, people need to wear an apron so that they can take that off because that will get quite wet, and then they can remove that. And as it dries out, silica dust will come off that clothing. So, what the code requires, is that people do take some care with their clothing and their PPE, so that they can vacuum off dust, wash their aprons and boots and that type of thing before they go home. We've had enquiries about whether people need to put in a laundry or launder workers clothes. So, with crystalline silica, we're not requiring that of workplaces. We do that with other contaminants, like lead, but not with crystalline silica.

(R) It's one of those common stories back in the day with asbestos, where the workers would take home the asbestos and the contaminants on the clothing. And maybe their wives and partners and their family members had high exposures. So, we certainly need to be encouraging workplaces to be aware of that potential transfer of the silica to the home, if this isn't being managed appropriately. So definitely needs to be considered, if that's your working environment. How much, Carolyn, is housekeeping potentially impact workers' exposures.

(T) It's really important in these types of workplaces. We've definitely seen that as a result. So, we did air monitoring in 2017 and we've just gone back and done another round of air sampling. So, we still haven't quite finalized all the analysis yet. But what we're tending to see is that exposures are lower this round. And I would think that a lot of that is to do with not only with the engineering controls that are put in place, but a lot is to do with housekeeping, because the wet slurry that is in a lot of these workplaces, it's very important to clean that up and clean it regularly. So, they need to do that daily. Some places tend to want to do it a little bit, leave it a bit longer, so do a big clean up at the end of the week, but people really need to do it at least daily, if not, during the day, and some of that might depend on how busy they are, so how often they need to clean up. But there is such a significant potential for the dust to come out of the wet slurry if it's allowed to dry

(R) Especially in the warmer months across Australia and across the world that water is going to dry overnight. So, if you're leaving it more than a day, it's going to

be a very high potential disturbing that kind of dust. So, it's really important that workplaces are doing that frequent housekeeping and multiple times a day is going to put themselves in a really good position to control that potential exposure.

(T) One thing I did want to add about housekeeping is using wet methods and when you're using a wet clean-up is that it's low pressure water and not high-pressure water, just to prevent the dust from being put back into the air with the water particles.

(R) That makes a lot of sense. Someone coming in with a high-pressure hose is going to be spreading the contaminant, not being removed in that time, because we know that the smaller the particle the smaller the aerosol, the longer it's going to hang into the air. So that's a very important point that you've highlighted Carolyn. What are your recommendations as far as training and information that workers should be told about silica and these different controls that maybe in their workplace?

(T) So, with training, people need to be trained on understanding what silica dust is and how it can cause harm to people. So, the health effects, so, the respiratory disease and other diseases that you can get. Also, about what control measures are in place in that workplace to minimize dust, getting airborne. So, how to use those controls, when to use those controls. The importance of them, about how the housekeeping should be done. How often. Also talk to them about the respirator requirements for the workplace, how to use the respirator, what maintenance needs to be undertaken on them and the health monitoring requirements. So, how often they will need to go to the doctor and what sort of health tests will be undertaken. And one of the other things that's in the Code of Practice to discuss with workers is about smoking and giving up smoking is a good thing for all people who smoke, but it's also not really good where you're exposed to some sort of respiratory contaminant like silica, because you don't want to damage your respiratory system and also to smoke, which is damaging respiratory system as well.

(R) You mentioned respirators there, and this podcast we've spoken many, many times about respirators and some of the elements that are required around that. What are Work Safe Health and Safety Queensland's specific requirements in this area? Because I know you've got some very detailed information in that Code of Practice you've mentioned a couple of times.

(T) Yes, so the code of practice is very specific about the respiratory protection that is required in fabrication workplaces in Queensland. So, it needs to be a powered air purifying respirator with at least a P2 filter as a minimum. So, that's for any workers who carry out fabricating or processing, cleaning or maintenance, work in a fabrication workshop or if you're doing processing tasks on site that couldn't be done back in the workshop. So it is very specific, and what's allowed us to be so specific is that the air monitoring that we have carried out over, you know a few years now has allowed us to get a better understanding about what people are exposed to in Queensland in these workplaces and then make an assessment about what respiratory protection is best.

(R) For those that may not be aware of what a powered air purifying respirator is, but it's the type of equipment that may be on your back and may be around the back of your neck, depending on the type of equipment that you may have in your workshop, but essentially there is a fan and a motor that suck in the air through the filter and blowing a positive pressure amount of air into a head top or the face piece, so it's actually providing a higher level of protection than you're disposable or half face, negative pressure respirator. So, if I've interpreted that correctly, you're setting a high minimum benchmark. And when you look at the protection factors without delving too deep into that nerdy respiratory stuff that I, really enjoy. So, you're setting that higher benchmark to make sure that all those workers are getting an adequate level of protection. Have I interpreted that correctly there, Carolyn?

(T) That's exactly right, Mark.

(R) Fantastic. And when you look at the Australian standards 1715 there's a lot of information about respiratory protection programs, which talk about some of those training elements and understanding of what your exposure levels are. So, I do recommend any of our listeners who are needing to do a bit of reading up to start there as well. And when it comes to fit testing, does powered air purifying respirators need to be fit tested?

(T) Yes, if they're tight fitting, they do. So, as a lot of your listeners know, is that there are tight fitting respirators and there are loose fitting respirators. So, if people use a powered air purifying respirator that is tight fitting, yes, it needs to be fit tested. The Code of Practice goes through that. It also talks about that you would need a quantitative fit test method.

(R) And I have done a previous episode with Terry Gorman when we did talk about qualitative vs. quantitative. Quantitative is required when you need a higher protection factor, which some of these powered air purifying respirators are as well. For those tight-fitting face pieces that may be connected to a blower unit creating that positive pressure, is the requirement also they need to be clean shaven as well?

(T) Yes, as you say, if it is a tight fitting respirator, they must be clean shaven, so that is no hair between the sealing surface of the respirator and your face, and also not hair that interferes with that seal – because it's all about the seal – or interferes with the valve.

(R) I know that's a common question I get normally in my day to day role at 3M, is that people sort of don't appreciate that it may be a positive pressure mask, but having that facial hair also allows a higher amount of potential leakage. Meaning the positive pressure isn't going to be maintained at that level, that those higher assigned protection factors are based off. So it's quite important to ensure that if it is a tight fitting PAPR or in a positive pressure unit, that you are clean shaven and you are fit tested to that particular style to give us the highest level of confidence

that what is being worn is going to provide that level of protection. Just like any type of respirator, a PAPR still needs to have the right filter in there. It still needs to be maintained and looked after, like any bit of equipment. If it isn't looked after, it's not going to perform at the level. And we are talking PPE. We are talking respirators, which is at the lowest end of the hierarchy of controls because relying on behaviours we're relying on workers. So, I know we talk about it all the time in this podcast. But it's really, really important because you could have the right product, the right filter, the right PAPR, whatever it is. But if it isn't being used correctly or appropriately, to the manufacturer's instructions, that protection is not going to be there, so, I just really want to reinforce that point there. Another thing that comes up from time to time with those loose-fitting head tops. Wearers can't have big, bushy beards flowing out of those loose-fitting seals as well. Because that once again, that's going to allow more air to escape. Where that loose-fitting head top seal is, it can't have that hair flowing out. So, another important point that I get asked about all the time, so we really want to make sure put it out there that people are aware about that. These loose-fitting PAPRs aren't suitable for every single facial hair that's out there but will cover a fair amount of them. But once again check with the manufacturer and where you're getting your gear from. Check what may be appropriate for your very specific situation.

(T) Yes, and if you're thinking about employing anyone from ZZ Top you might want to rethink that.

(R) Yes, and those that want to be Santa Claus at Christmas time as well. But it is something that needs to be considered because it will have an impact on that protection that workplaces are going to be relying and expecting from that piece of PPE. Now a lot of these controls we spoke about in the fabricated workshop, do any of those controls also transfer to those workers that are installing the bench tops that maybe doing a little bit of that cutting on the job site on the house or the commercial property?

(T) Yes, they do. So, we do recognize that there are going to be some situations where there might be some very minor work that needs to be undertaken on site, so we need to protect workers when they're doing that. So, a lot of the times that's going to be back to that on-tool extraction. People can use water suppression, I suppose if they're doing it outside, but a lot of times, so, for example, with the waterfall ends, on the bench tops, they would be doing that inside just to get that nice finish on them. So probably the best thing would be to use that on-tool extraction. So, in the Code of Practice, it also talks about another process of using a sacrificial backer board, so that the on-tool extraction works more efficiently in some circumstances. But, yeah, have a look at the code of practice. There's also isolation techniques as well that might help in terms of minimizing exposure to others.

(R) One of the really good controls I've seen you know those pump action you may get from a Bunning's or a hardware store, but you can connect one of those to mobile tools to get that low pressure water in a mobile situation, if you don't have a mains water system or, a tap, you can actually connect to. So, there are some innovative controls out there. So, don't stop thinking about ways to improve our worker controls on the job as well. You mentioned before about health monitoring. So, is health monitoring a mandatory requirement for these workplaces?

(T) Yes, it is because of the significant risk to the health of workers in this industry, health monitoring is mandatory. It would include all the workers in the fabrication workshop area or installers. So, shapers, saw operators, finishers, machine operators, polishers, the labourers and supervisors that are involved in this work. And that's due to that significant risk to their health from doing that work. So, we have come across Mark some workers who are reluctant to do health monitoring as well. And if this podcast is getting out to people who work in the industry and you haven't had health checks, I strongly, strongly urge you to reconsider. There has been some people who have not wanted to go and have their health monitoring for fear about what the result is going to be, or that they're going to lose their job. So,

it is a stressful time for workers, but it is very important to identify any changes in your lung capacity early so that while you can't cure this disease, if you catch the disease earlier there may be some treatments available.

(R) I can certainly appreciate how confronting that would be for any worker in that situation. Earlier in the year, I did do a health monitoring episode with Julia Norris. We spoke about the benefits of health monitoring. It's better to know the situation and catch those early changes so you can have more options rather leave it till later in the piece. And your options may be a lot less limited. Or maybe no option at all, depending on how serious the situation may be. So, I really want to reinforce what you've just said there, Carolyn, to encourage those to go into health monitoring because it is better to know than not know, in my personal opinion.

(T) Health monitoring should be provided before a worker starts work in the industry just to set a baseline that then future health monitoring can then go back to that baseline and see if there's been any change from that. Also, periodically, so at least every 12 months. But the code of practice goes through the details of the health monitoring and you also need to work with your registered medical practitioner, who is going to be undertaking the health monitoring, and they'll talk about the past exposures of the workers. And if someone's been doing high risk work in the past, they might need follow up more regularly because one of the things with this disease of silicosis is that because it's got a long latency, so it takes some time for the disease to manifest itself. So, because you get a clear test now doesn't necessarily mean in 12 months you will get a clear test. So, that's not to be alarmist, but just to show that there is a progression in these types of diseases and that the health monitoring needs to be ongoing, and it needs to consider what exposures people have had and then how often. But you work that out with your medical professional.

(R) And we've been talking quite a bit about respiratory hazards. Airborne hazards. But what are some other hazards that may also be found in these engineered stone

fabrication workplaces that we can't forget about it and make sure workplaces looking at all this range of hazards that may be of potential risk to their workers?

(T) So, we have found that noise is quite a big issue in these places. So, as you can imagine, there's a lot of handheld tools, there's a lot of grinders and grinders make a lot of noise. There's also CNC types so there's sawing, grinding going on all day. So, they're quite noisy workplaces. So, you can't forget about protecting the workers' hearing. Another issue too is that these slabs that come in, they're quite large and heavy, so the manual tasks involved in moving those around you know, there's a lot of sophisticated equipment now for handling heavy objects. Also, in the storage of those in terms of the racking. So, whether the racking is appropriate for the weights that they're going to hold, and also how they're stored on that racking so that they don't slip and accidentally crush someone.

(R) We've spoken a lot about water controls as well, and if that water isn't being managed, there'd be quite a few slips and trips hazards in these types of workplaces as well, is that sort of what you've seen in your travels in the last few years as well?

(T) Yeah, for sure. Yeah, they are very wet workplaces and not just the water. Also, because it's sort of sludgy and it's a slurry. So, yeah, that does make for slip risks.

(R) Now we've covered a lot of information in our two episodes, we've had a chat, but to try and tie this all back together with a couple of key takeaway points, what would you want to put out to our listeners?

(T) Silicosis is a serious disease, and it is fatal. So, we've already seen one fatality here in Queensland, and I would hate to see more of that happen. So, it is a very serious condition. It needs to be prevented because it can't be cured and engineering controls – and please have the health monitoring. Some people are reluctant to go because they're afraid of the bad news. But it is the best way to find out. And to ensure that you are healthy to your retirement and you see your kids and your grandkids grow up.

(R) You mentioned at the start of this episode, it's going to be a combination of all these controls. There's not one control is the magic bullet. It's going to be a combination of all of them. And all of them are just as important as each other because they're all required to bring that exposure down to reduce, prevent these particular terrible diseases from happening to people in Australia or anywhere in the world when going to work, and that shouldn't be an outcome of just trying to make a living. So, look, thank you so much for spending the time with us Carolyn. I think we've covered a fair bit of information that these workplaces should find very, very helpful if they're still looking at what they need to do and things they can do moving forward. So, yeah thank you once again.

(T) That's my pleasure. And just if I can go back to that number, we've got our lovely advisory service who will be happy to talk to people on the phone and that's 1300 362 128 or check out our website [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au) thank you.

(R) And we've been obviously talking about Queensland here today, but for the other states and territories, please go to the relevant regulators and they will have similar information and phone numbers as well, depending on where you are to make sure you are meeting, there's very specific and local obligations. Well, thanks for listening everyone. You can get in contact with the show by sending an email to [scienceofsafetyanz@mmm.com](mailto:scienceofsafetyanz@mmm.com). If you have any questions or topic suggestions, or you like some assistance around anything in your workplace when it comes to PPE, respirators. 3M are certainly here to help. You can also visit our website [3M.com.au/sospodcast](http://3M.com.au/sospodcast) for further resources on engineered stone and respiratory protection, as well as a transcript of the chat that Carolyn and I have just had. Plus, it has information from all the other episodes we have recorded. Be sure to subscribe, rate, review and share through Apple Podcast, Spotify, Google Podcast or wherever you get this podcast from. And as Warren Buffett said, "it is not necessary to do extraordinary things to get extraordinary results." Thanks for listening and have a safe day.