

**3M Transcript for the following interview: Episode 77 Engineered Stone & Silica - Part 1**

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(R) Welcome to the 3M Science of Safety Podcast presented by 3M Australia & New Zealand Personal Safety Division. This is the podcast that is curious about the science and systems of all things work, health and safety, to 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're 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 are a bit of a safety nerd who finds this stuff really interesting, then this is the podcast for you.

Today, we're talking all about engineered stone and silica with Carolyn Topping. Welcome, Carolyn.

(T) Morning, Mark. How are you?

(R) I'm doing very well. Thank you for joining us. Can you please introduce yourself? Who are you? Where are you from and what do you do?

(T) So, my name's Carolyn Topping. I'm the acting Director for Occupational Health and Hygiene with Workplace Health and Safety, Queensland. So, we're the state government regulator for health and safety, except mining and quarrying, which is looked after by another department. My team's been doing work in engineered

stone with stone benchtop manufacturers and fabricators, and we've been out looking at exposures of workers. And, we're here to talk about that today.

(R) Now I do want to start right from the beginning. Just to highlight we're going to talk some very specific requirements in Queensland. Now most of the states and territories in Australia and New Zealand will have very similar requirements, but there are some differences. So please, wherever you are listening, do make sure you are aware of your local obligations because we're going to talk some very specific Queensland details here, but as we'll find out, Queensland definitely have been leading the way with some of these changes. So very well, a lot of what your requirements are will be the same, if not, will be the same in the near future, potentially. So, let's get right into it. So, Carolyn, in the past two years, there's been a lot of focus from various regulators, and people may have seen things in the news about engineered stone bench tops. What's been happening the last couple of years?

(T) So, in 2017 Queensland had a parliamentary inquiry into the re-emergence of black lung from coal dust. So, this inquiry was also then expanded to look at other contaminants such as crystalline silica. And also, around this time, there were the first cases of accelerated silicosis due to exposure to engineered stone dust, which were being identified by respiratory scientists. So, as a result of the inquiry, my team went out and tested the air in 10 bench top fabrication workshops to find out what levels of crystalline silica workers were being exposed to when they were working with engineered stone. We found that all workers were at significant risk of getting respiratory diseases like silicosis. As a result of this work, our inspectors visited all the stone bench top fabricators in Queensland to ensure the correct dust control measures were in place and that health checks were given to workers. WorkCover Queensland, as an aside, they provided free health screening to all of these workers. So, as a result of that work, we've now discovered quite a number of cases of silicosis in Queensland. So, at the end of January this year, WorkCover Queensland had screened, 1017 stonemasons, 199 workers have been diagnosed

with a work-related condition from that health screening. So, we've had 163 cases of silicosis diagnosed; 26 who have progressive, massive fibrosis – and that's the most serious form of the disease –and also 10 others have been diagnosed with other respiratory conditions, such as emphysema or bronchitis.

(R) That's some very concerning numbers. A lot of workers that are going to work and not appreciating what they've been exposed to and what's actually caused some of these diseases. So, we're talking about silica and engineered benchtops. How much silica is in engineered stone? Because obviously, silica is a very common material found in many types of products, on construction sites as an example. What's the go with silica and engineered stone?

(T) So, as you say silica is one of the most common minerals on the planet, but it's found in natural stones as well as these engineered stones. And because the engineered stones are actually made from natural stones, it's all sort of crushed up and resins added together. But depending on the brand of product, they can contain up to 95% crystalline silica in them. There are some products that have a lower level of crystalline silica in them that is similar to some of the natural stones, like granite, which has 30 to 40% crystalline silica. But some of the natural stones, like marble, is really low, so it has about 2 to 3% of crystalline silica. But there's also some other natural stones, like sandstone. Also, quartzite that have crystalline silica content similar to engineered stone. It just has a very high level of crystalline silica.

(R) So, when we're talking these high percentages when people like cutting them, disturbing, and that's where we're going to get a high percentage of that respirable crystalline silica, which is the stuff that's going to get deep into workers lungs and is going to cause the silicosis that you've mentioned before, which is what we're trying to avoid in the first place is do what we've got to do in the workplace, but not put these workers at health and harm. So, you mentioned a couple different types of silicosis. What's the difference between these different types there?

(T) So, what we're seeing with the engineered stone workers in Queensland is a type of silicosis that is referred to as accelerated silicosis, and that is as a result of high levels of exposure and its exposure that happens in 1 to 10 years. So, workers who are exposed over a long longer period of time and they're doing that work every day they're at risk of getting accelerated silicosis. There's also another form of silicosis that's called chronic silicosis. That's where workers who might be exposed to lower levels of silica but over a longer period of time, say, 10 years or more. It's often referred to as a disease of retirement. So, people who are getting up to that retirement age so in their fifties, etcetera they might be, you know, start developing or showing signs of having chronic silicosis. There's also another type that's called acute silicosis. It's as a result of extremely high exposures over a short period of time, like weeks or months. But we don't see that today in modern workplaces at all, especially here in Australia.

(R) One to ten years is still a very short time. So, if you're coming into the industry as a teenager, potentially, in your mid-twenties or late twenties, you could have this life-debilitating lung disease, which is quite serious, which, unfortunately, what you guys have been seeing up in Queensland, other states and territories across the country. So, this is serious stuff here.

(T) Yes, so it is. It's not that disease of retirement that's occurring. It is relatively young men, predominantly, that are at risk of this accelerated silicosis.

(R) And quite often we talk about exposure standards here on the podcast about what workplaces need to know about what levels are in their workplace, when it comes to respirable crystalline silica and the exposure standards, I believe that's changed recently. Can you tell us a bit more about that?

(T) So currently in Queensland, the current exposure standard is 0.1 milligrams per cubic meter. But last year it was decided by the workplace relations ministers that the exposure standard would be lower, So Safe Work Australia has lowered that standard to 0.05 milligrams per cubic meter, so it's up to each state then to decide

when they're going to implement that change. And Queensland has recently announced that Queensland will introduce the lowest standard from the first of July, this year, 2020.

(R) And I believe Victoria adopted the lower exposure standard, Carolyn, straight away at the end of 2019. So, I just want to reinforce, whenever you were listening to this, please make sure that you are aware of what the current exposure standard is. But over time all the states will be moving from 0.1 milligram per cubic meter to the 0.05 milligram per cubic meter if they haven't already.

(T) Safe Work Australia is publishing the states and their implementation date on their website. So, you can always go there and check to see what's current in your state.

(R) Excellent. We'll make those are links available on our resources on the blog post for those that are interested. And when we talk about exposure standards, we're usually talking about an eight-hour exposure standard. Does that number change Carolyn, if people are working longer than eight hours in their workplace?

(T) Yeah, it sure does. So, the exposure standards are based on an eight-hour working day, 40-hour week. If you're in industries that work longer shifts – so perhaps a 12-hour shift is common in a lot of industries – the exposure standard gets what we call shift-adjusted, and that is to better reflect the longer exposure time and the shorter recovery time between work shifts. So, for example, if you work a 12-hour shift, the occupational hygienist will do a shift adjustment, so that the number is actually adjusted downwards. So, depending on where you start, it will be adjusted downwards to reflect that longer exposure time.

(R) And it can be quite hard for many people, I know for myself as a hygienist at times trying to visualize what these kind of numbers actually mean when you're thinking about it in your workplace. But some of the descriptions, from a broad description here, I've been described sort of getting one or to poppy seeds and crush them up really fine. And if you were averaging breathing in that amount – in a

cubicle – of air over the course of your day, you will be most likely exceeding the exposure standard, so, it doesn't take much, but it's of that very specific size that's going to get deep into people's lungs. So, workplaces really need to be aware of what their exposures are. But how would a workplace actually figure out what that number is for them in their environment?

(T) So that's where you call in an occupational hygienist. They're the best people to go in and develop up on air monitoring program so that you can establish what workers are being exposed to in your particular circumstances. This involves workers wearing a personal air sampler that collects air in the breathing zone of the worker. The air passes through a filter that collects the very fine crystalline silica particles. The filter is then weighed and analysed in a special laboratory, and they determine how much silica is actually in that sample of air.

(R) So, I've got a pump that sucking whatever the person may be potentially breathing in onto a filter that's getting weighed to work out the averages based on the flow rate, just to give a very broad example there. But how many samples should have workplace actually take to determine what is representative in their workplace? Could they get the hygienist to come in on one day and do six samples on that one day? Would that be enough for you as a regulator?

(T) No. So, generally, workplace exposure is not the same over a whole work shift, and it's different from day to day. So, thinking about a workshop that makes bench tops. The workers will use different products over day, over their shift. They might do when a big order comes in. You know, they might be really busy one day, a little bit slower the next. During busy times, there might be more workers working in the workshop, compared to slower times. So those factors all have to be taken into account when you're developing up a monitoring program. Because those differences, although they mightn't seem like anything just, you know, talking about it like that, but it can actually make a very big difference to the exposure of the workers. So, these differences need to be taken into account with how many samples are collected and how often the sampling should be carried out. So,

Workplace Health and Safety Queensland released a code of practice on managing respirable crystalline silica dust exposure in the stone benchtop industry in October last year. The code sets the minimum standard for Queensland, and in there it also sets the standard for how air monitoring should be carried out. So, in the stone benchtop industry code air monitoring needs to be carried out at, at least six-monthly intervals in the first two years – and that's to establish a baseline – then at least every 12 months, or when certain triggers a met. So, you can look at the code and it will tell you in detail about those triggers and it also gives you the numbers of samples that need to be taken each time a sampling run is done. So, for other industries in Queensland, such as if you work in mining or quarrying, there are other guidelines that occupational hygienists need to work with to do the sampling. But in this particular industry in Queensland, they need to refer to that code of practice.

(R) An occupational hygienist who are coming in to do this sampling there. They're also looking at the workplace and understanding the different activities and tasks. I know a few different places I've seen in my travels where the actual cutting sometimes of the benchtop gives you a certain level, but they'll have a higher exposure when they've actually finished the cutting and they're moving things around and they haven't cleaned up their dust. So, an occupational hygienist will look at all these different types of things to try and identify different tasks or activities that are contributing to the overall exposure, not just the cutting of the bench top, which most people think, as the main activity that is causing the most exposure. But that actually may not be the case.

(T) It's true. We've done some air monitoring ourselves. So, we started some in 2017 and we've also just finished a new round of sampling. And especially in this new round of sampling, I think the industry has improved a lot. But one of the things that people still don't understand and just what you said Mark about the cutting is that, people might grind off some fiberglass backing from the back of a stone slab, and they don't think about that as exposing someone to crystalline silica. But when they put a grinder onto the back, and it does grind off some of the

engineered stone and we have found some quite high exposures just to some very short-term uncontrolled processing.

(R) Are there any specific tasks and roles within an engineered stone fabrication workshop with your monitoring that are more high risk than others? And do you have any of those numbers that you've sort of seen across a few workplaces and how that compares to the exposure standard?

(T) So, the highest risk from the work that we've done is a group of workers called, what we've called 'shapers'. And what the shapers do is they cut holes in the stone slabs for taps and sinks, you know, plug holes, etcetera. And what they actually do is they use a handheld grinder and they use that to cut those holes. And they're the highest exposed. So, when we looked at them as a group across the 10 workplaces, we've monitored back in 2017, they were over seven times the workplace exposure standard. But we also found that other groups of workers, such as the saw operators, or the machine operators, polishers and finishers. They all had exposures that were over a level where there is a risk to health. We also found that labourers and supervisors were also at risk, even though they don't carry out any sort of directly do any cutting or grinding of benchtops. But they are in that back area of the workshop where this work is going on. They were also exposed to levels of concern.

(R) You mentioned that seven times exposure standard in 2017 and with lowering of the exposure standard that may have already lowered in your state of territory. That's even going to be even higher than the new exposure standard. So, there's some really high exposures there if things aren't going to be in place. And that's people in the workshop. Now did you do any work with people installing the benchtops in people's homes or in commercial properties? Is there much cutting involved at that stage of the process?

(T) So, we haven't directly monitored the installation process, but they may use the same type of techniques, so using a grinder or cutting. But under the new code of



practice, people who undertake installation of bench tops also need to put in the same controls as they do in a fabrication workshop so they can't carry out uncontrolled dry processing on site. But people who install benchtops will be exposed to probably a similar level of crystalline silica, but just over a short period of time. So, they're not carrying out for their whole shift, like the guys who were doing it in the workshops.

(R) I know for some of the things that I've seen, obviously, a lot of the focus should be to do as much cutting in the workshop where they may have put these new controls in place and haven't before then trying to rely on the cutting. So, try to eliminate the cutting on the actual job site and do as much of that in the controlled environment as possible is one of those control approaches that hopefully, these workplaces are now considering and doing where possible.

(T) Yes, Mark, if I can say under the new code of practice, they have to minimize any cutting, grinding or fabricating process on site, except if it's really necessary. For example, when they make a waterfall benchtop, they need to do a little bit of slight adjustment when they're on site. But that still needs to be controlled in either a wet process or on-tool dust extraction.

(R) You mentioned before about dry cutting and I just want to reinforce this, because I know this has been a practice that is now being banned but dry cutting. That's an absolute no-no these days now?

(T) Absolute no-no. It was common practice, and that's what we found when we went out to industry in 2017. That uncontrolled, dry, cutting, grinding, trimming, drilling, we call it processing was quite extensive in the industry. So, that has definitely been prohibited now. So that means that if fabrication process or in an installation setting that dust needs to be controlled either with water or on-tool dust extraction.

(R) So, what is a respirable crystalline silica dust control plan? Is that a mandatory requirement now for stone fabricator workshops?

(T) Yep. So, under the new code, each benchtop fabrication workshop needs to have a written, respirable crystalline silica dust plan. It needs to outline or identify all the tasks that can expose workers to the silica dust. The perfect example of that Mark is including those sort of incidental activities like I mentioned before about grinding off fiberglass backing on the back of a slab, which people don't really think about doing. But that can add quite a lot to an individual's exposure over a day. So, workplaces need to think about all those ways that people can be exposed and that could be even including during clean up at the end of the day or during machine maintenance. They might want to blow out something with compressed air, which is definitely a no-no under the code of practice as well.

(R) Is that how you'd recommend these workplaces start to identify these potential dust hazards in the workplaces, going through all the tasks they're actually doing and seeing what may be occurring. Is that sort of where you'd start?

(T) Yes. So, that's part of what the dust control plan is trying to get workplaces to do is to go through that process of identifying the tasks, what people do during their day and whether dust is going to be generated from that and then working out well, you know, some places might use natural stone and only do occasionally engineered stone. So just looking at all those sort of processes that they're doing and what the risk might be to the workers and then documenting it in a plan about how they're going to control that exposure with some sort of engineering control and also with the respiratory protection if that's needed.

(R) Now we have covered a lot of detail today so far, and we're going to get you back for our next episode to talk more specifically about controls. But just to sum up what we've spoken about today, what's sort of key takeaway points would you want to leave with our listeners?

(T) Silica causes a fatal disease so people can die from breathing this in. So, workplaces need to put those controls in place. You can prevent this disease, but you cannot cure it. Mark, there may be people listening to this podcast who have

been affected by silicosis from engineered stone exposure. If you have, you can access independent, confidential and free workers psychological support service on 1800 370 732 and that will give you access to various community services.

(R) So, for anyone working in this industry, this is serious stuff, and you've really got to understand what is going on. What are you doing? What are your high-risk activities? And we're going to talk about the controls in the next episode. But you need to be looking at those things because whatever the exposure standard is, whatever assessment you've done, that doesn't change anything, if you don't put any controls in place or make changes within your workplace to provide a safer, healthier environment for your workers. So really got to reinforce, this is some serious stuff here, people, and please take it seriously, if this is your working environment. For our listeners that do you want to do a bit more reading up before we chat about control next week, where could they head to find out more information?

(T) So, they could refer to the Code of Practice, which was released in October last year. That's on our website, [www.worksafe.queensland.gov.au](http://www.worksafe queensland.gov.au). You could talk to our wonderful telephone advisory service. Their number is 1300 362 128.

(R) And all the state and territory regulators across Australia and also WorkSafe New Zealand and Safe Work Australia, they would also have their equivalent information for their specific jurisdictions as well, so do a little Google and I'm sure you'll find out plenty of information, because this has been a very large area of focus for many, many people in the last two years, understandably with what's happened in the past there. Well Carolyn, thank you so much for coming in and really look forward to chatting to you in the next episode.

(T) Thanks, Mark. My pleasure.

(R) 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, topic suggestions or if you'd like some assistance in your workplace around the

appropriate selection, use of maintenance of PPE, 3M are certainly here to help and off course as well, for those working the engineered stone industry, we can also come in and help in that area as well. You can also visit our website [3m.com.au/sospodcast](https://3m.com.au/sospodcast) for further resources on engineered stone as well as the transcript of the chat that Carolyn and I have just had. Plus, it has information on all the other episodes we have previously recorded. Be sure to subscribe, rate, review and share through Apple Podcast, Spotify, Google Podcast or wherever you get this podcast from. And as Anthony J D'angelo said, "treasure your relationships, not your possessions". Thanks for listening and have a safe day.