3M Transcript for the following interview: Terry Gorman – Ep 65 Eye and Face Protection

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This is the 3M Science of Safety podcast presented by 3M Australia and New Zealand Personal Safety Division. This is a 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 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 are a user of safety products or maybe you are a bit of a safety nerd who finds this stuff really interesting, then this is a podcast for you.

(R) Now this is part 2 of the chat that I had with Terry Gorman following on from last week's episode on head protection. Today, we're talking all about eye and face protection. Enjoy. Welcome back, Terry.

(R) So, let's move onto eye and face protection. And most workplaces, we wear safety glasses and goggles, but from a hazard assessment point of view, what are the things or tasks that workplaces may be considering may need eye and face protection?

(G) Right, so, you're looking at let's say hazards that are going to impact with your eye and face one way or another, and you want to protect. So, we're talking about impact, things hitting your eye or eye hazards into your eyes or onto your face, depending on what they are and how fast they're going. That can be dust. That can be larger particles, flying bits of metal. Each workplace will have its own issues. We can be looking at thermal hazards. We talked about thermal hazards with helmets, but we also need to protect the face if we are working with a radiant heat source. We can have significant levels hitting our face, which can be a problem. Chemical and biological hazards; we can be splashing a liquid around. We can be working with a material that has a biological component. We do not want that in our face. Then, we can look for protection from that. Radiation, ultraviolet, UV; again, it depends on the specifics, but there can be eye issues. We can be looking at skin issues in terms of burning. All of those things come into play, and electrical hazards again if our protection is going to potentially be exposed to some sort of connection or shock or whatever, then we need to take that into account.

(R) So, looking at the hierarchy of control, we know we've alluded to PPE being down the bottom. From a hierarchy of control, what are some things workplaces should be considering to try and control those particular range of hazards you've just mentioned but from a more confidence point of view, i.e. elimination, substitution, potentially isolation?

(G) Obviously, elimination's always the way to go. That solves the problem full stop, but not commonly available. We can certainly substitute with a material that does not have an eye or a face hazard, if that's possible. Isolation is a common one. This is where you're putting the operation in a place where there is no people to be exposed, so in a separate plant room or something appropriate like that. If not a separate place, you can put up screens, barriers, so that again the workers are shielded from potential flying fragments or whatever it might be, radiation etcetera. We can look at ventilation, extractor to remove dust, to remove gases and vapours

maybe if they're a problem in terms of getting to the eyes and causing a problem with that.

(R) It's probably more commonly thought about, exhaust from the respiratory hazard point of view, but still has an effect from an eye impact point of view, or eye irritation point of view. So, interesting point, yeah.

(G) Absolutely. In fact, we sell ventilated helmet systems, respirator systems to places that initially were looking at the respiratory hazard but they found as a secondary effect that their eye injuries and eye issues dropped significantly because the protection given to them by that helmet was protecting their eye and face better than the systems they had in place which may have been poor. But it's giving you another level of protection in that sense. We could also look at water spraying to reduce dust, where that makes sense. Again, it won't work in all places but it will keep down dust levels in those places where it's an issue. Windbreaks; if you're outside, again, you can get some sort of protection from the wind, which again will stop that turbulence and exposures. And like any type of exposure, if you can increase the distance or reduce the time of exposure to people, you are controlling your hazard that way. It obviously can be done to some degree in some workplaces. It's all a case of those local issues and what can work.

(R) But you've got to go through hierarchy of controls and consider all of those rather than jumping straight down to the bottom and go, "Let's just give our workers a face shield or safety glasses."

(G) Absolutely, although at least PPE gives you an immediate response and you can you can put in your exhaust systems or put in your screens or put in your appropriate response controls, which usually takes some time. You've got to get it done and get the money and all that sort of thing. PPE at least gets you one step down that track and protects people at the moment, let's say.

(R) What are some other factors that workplaces should be considering when it comes to selecting eye and face protection?

(G) Well, with any PPE, the crucial elements are always fit and comfort. You want it to fit the individual as needed and it must be comfortable. If it fits and it hurts the worker to wear it, he will not wear it as a general rule. It will be taken off at every opportunity. So, we need to find the best solution in terms of worker acceptance; they are happy with the product, they will wear it. Then you've got some confidence that will go forwards. The other issues are, does the product allow them to do their job? If you start creating issues in terms of their vision, cramping their field of view, they need to hear something, they need to see something and they can't with whatever your approach is, the screen covers it up, whatever controls you put in place, the system has to work for the worker. So, that is clearly part of the assessment. Look at whatever PPE, make sure it does not take them backwards in some areas which is going to cause a problem. There's always a question of the design of the product, the look of the product, the style in some cases if you're talking eyewear. So, all of those things again are a part of that acceptance scenario that people quite rightly should have some input into what they're going to be using and is it acceptable in the big picture?

(R) That's consultation and stakeholder input.

(G) Yes. It certainly is and commonly the supervisor or the boss don't get the full picture. It's not until the worker is involved and says, "If I wear this, I can't do that," or, "It takes me twice as long," or whatever the problem is. Those things should be addressed as part of the, "Let's find the solution," part of the discussion early and then, hopefully you get to the right answer.

(R) Now, you've mentioned a wide range of hazards, and a wide range of workplaces, but what are some of those tests that an Australian Standard approved eyewear, face shield actually gets put through to provide a level of confidence that it will work in certain applications?

(G) Yeah, sure. Well, there's a whole lot of testing. The big one in terms of eye and face is optical, so you want a product that you can see through without distortion, without any visual issues. You do not want to degrade somebody's vision of the

work or vision around them, anything like that. So, optical quality is obviously very important and has to be right. Other things is the impact, so one of the eye protection issues is that you might get hit in the face or the eye by a flying piece of something, depending on the workplace. So, you need an appropriate product that is going to protect you from that flying material and you select your product accordingly. Low impact obviously is for the less chunky, less velocity type products that might be produced or by-products that might be produced. As you go up the scale to the high impact, you're starting to get significant speeds and high speed of bigger particles. So, again, there's a continuum there. Each place needs to assess where they fit into that and get the appropriate protection for that job.

(R) So, you mentioned low impact, medium impact and high impact. Can you get high impact safety glasses?

(G) No. You cannot under the Standard. If you have a high impact environment workplace, then by definition, you've now got particles of a size and a velocity that are a hazard to your face and skin as well.

(R) As opposed to just eye only, it's the whole thing.

(G) Sure, you certainly want to protect your eyes. That's still the issue but now you're talking about significant impact of flying bits of metal. You don't want to get them in your mouth and your nose and your forehead, whatever. They'll cause damage, simple as that. So, at that level, the Standard says if you've got a high impact hazard, you need to cover not just your eyes. You need to cover your whole face. So, they require the use of a visor or a helmet or an appropriate product to do that. So, you cannot get high impact safety glasses.

(R) It comes back to that assessment of the workplace and what are the hazards and so forth.

(G) Absolutely.

(R) So, can I pick up a face shield? Can I pick up safety glasses and know that it meets the Standard, because I know in my past life, they'll buy a pair of sunglasses from the servo, bring it to work and say, "Hey, this is Standards approved." Is there a way that a safety professional or a manager or a supervisor can look at these particular products and go, "Yes, I know that has met the Standard at a certain level?"

(G) Yes, well, usually in an industrial type scenario, you are getting product from an appropriate source, a distributor who's selling you glasses that have met the Australian Standard. The packet or the packaging would be marked that it does, usually written down that it does meet Australian Standard 1337.1 for example. But if you just find the product in isolation, again, the Standard requires marking on the product, the pair of glasses or let's say the face shield product, and there's a number of indicators on that that show what the rating of that product is. So, there's a number of letters. We won't go into them all here, but let's say for medium impact, for example, the letter I on the lens would indicate that that lens has been tested to meet the medium impact requirements of the Standard.

(R) And we can provide all of that information if you are interested in getting all those markings. There are a fair bit there, but just trying to let people know that you should be able to pick up a product and see a marking that will indicate where it's actually rated to. Now, for many safety glasses, they can come all different colours and coatings. What are some of the more common ones that you'll see in the workplace, from a grey one to a clear one. They might have a nice pretty blue mirror. They may have an amber one. What are the performance of some of these lenses and where they may be used in a higher-level point of view, because there's a whole world of optics we can potentially go down here? But yeah, where should workplaces start?

(G) Yeah, so, the colour or the tint in the lens is, if you like, an added extra. So, clear lenses are as described, just the straight, clear optics you can see through that should be high quality, good vision, and it's letting through almost all of the light

that's coming to your eyes. If we've got too much light, then clearly, we can follow the darker tint pathway. So, you can get grey lenses. You can get brown type coloured lenses. These are knocking the transmission of the visible light down. You're getting down to something in the order of 20, 30% of the light will be getting through. So, you're reducing the amount of light. Mirror glasses are the same. This is where you've got that mirror finish on the outside of the lens. It's reflecting a deal of that visible light, and again, you can be getting down to 20% or thereabouts transmitted of light through the lens to your eyes. So, clearly, they're outdoor type applications. You don't want that in a dark room. It will be too dark. We find lenses that are called indoor-outdoor. These have got a semi-mirror finish, a slight reflective finish, let's call it. They are bumping at ... it varies something from 80% down to 50 or even lower, depending on the products. There's polarised lenses which again control the glare and then, yellow lenses are used sometimes for places where visual acuity is needed, where you're doing a very high detailed visual task. Those yellow lenses can pick out the detail and give you a better view. So, it's a case of looking at the options and again, looking at the task and matching those.

(R) What about eye and face protection for ultraviolet light and infrared radiation? Is this just a case of picking one of those lenses and that'll cover those types of hazards?

(G) Those lenses will certainly give a level of protection against UV and infrared, so most polycarbonate lenses, which is common safety glass type lenses, are giving you protection from UV at over 99%. If you've got a particular high UV or high infrared environment where you need extra protection, there is an Australian Standard applying to those, 1337.2 and 1337.3, I believe it is. Those will give you a grading or a code performance on the different levels of protection against UV and IR. So, the short answer there is seek more information from the manufacturer to make sure you know what the product can do and if it's suitable.

(R) Is that a similar approach to laser eye protection? That's a question that comes up every now and again in our travels.

(G) Yes, absolutely. There is a Standard for laser protection. With lasers, you've got to match the product to the laser. There's different types of lasers of different power and you need to wear the appropriate eyewear with the appropriate performance for those different products. So again, a case of matching the right product for your application.

(R) One of the biggest bugbears I hear about, and it is an issue, is the fogging of safety glasses when wearing other PPE or just in the work environment. How do these products combat that, or how should workplaces approach trying to reduce the fogging, because that is very annoying when you're trying to do a task?

(G) Yes, fogging is absolutely an issue. We run into this routinely. Many manufacturers sell anti-fog products. Those are coated with some sort of treatment which tries to prevent the build up of that fogging process. They work to a degree. Even the best anti-fogs that I've seen out there have limits. You can take them into worse and worse environments in terms of that heat and water vapour at levels.

(R) And those temperature differences.

(G) Exactly. Eventually, they will all fog at that extreme end. So, let's say normal fogging can be controlled by antifog type products. There is a limit and the antifog performance will vary depending on the manufacturer and their treatment. We can't go into the details because there's a whole lot of different elements in that. But you really come down to the case of if you think you've got a product you want to trial for an anti-fog, that's the trick. Trial it. Find out that it does work in your world or that it doesn't. We have had a number of people try our products over the years. Many of them are happy. There's always people who are doing extreme work that say, "It's better than the one before, but can it get better again?" And we

obviously try to make it as good as we can, but there is a limit, still a limit in the performance that you'll find.

(R) Any tips on care and maintenance of safety glasses? I know I've left them in my hardhat, and they scratch around, but I'm not going to get the life out of them. Any things that workplaces should be trying to put in place to get the most out of the products that they have purchased?

(G) It seems to be pretty hard. Some people can look after their glasses well. Some people will clean them, will make sure they're always in good condition and they will last longer. Other people, less so. The glasses will degrade. They'll become visually hard to see; chips and cracks or markings, whatever. It's a function again of the individual, their exposures, what sort of work, how much they're getting hit in the glasses, how much they look after them in the between times when they're not wearing them and they're rattling around in the bottom of a box somewhere, all those things.

(R) In utes or wherever they're being stored.

(G) Back of the ute, classic example. So, all of those things come into play. They can be cleaned like any set of specs and wiped down, but it will degrade because of the harshness of the environment, There's no magic answer. I think it's just the better people look after it, they'll last a bit longer. But again, you've got to balance that with making sure they can see and do what they need to, and maybe have to replace them more often.

(R) To wrap up eye and face protection, are there any takeaways you'd like to leave with our listeners when it comes to eye and face protection and the assessment and the application of these types of products?

(G) Well, be clear on the specs that you need. I mean, specs as in the glasses and specs as in the specifications. That helps you define what products are going to fit that requirement and helps you cut down the options. The other issue is make sure you get the people who are going to wear them involved. They will have their own

inputs that will need to be taken into account. And remember, this is personal protective equipment. It's got to fit the individual, not just the supervisor or the leading hand or the loudest voice. So, all people involved should come in with their opinion on that spec. It should be assessed for their fit. It's no good giving them the right specs if there's massive gaps on the sides or on the tops and that's going to lead to a potential for eye injury. They want glasses or specs that are going to fit as well as they can, minimise the gaps and get the fit as good as you can with the appropriate performance, and that's going to get the best outcome.

(R) As always, we've touched on a whole bunch of different topics but never been able to go too deep, because we could be here all day if you really delved into all of the ins and outs of all of this. But where is a good starting point that our listeners can go to get more of that information to start their journey with the assessments and appropriate selection and use of these types of products, both hard hats and safety glasses?

(G) Yes, there are Australian Standards that deal with the user side of the equation. 1800 is the Helmet Standard and 1336 is the Eye-Face Protection Standard for users, if you like, selection, use and maintenance of those products. They cover the high level, the questions that you need to think about, the issues and lets you look at that in your terms and decide what features you need in your workplaces.

(R) It gives you a bit of a process to follow and consider all those aspects. I also know Safe Work Australia have a whole bunch of high-level information around PPE in general, so that's a good starting point. And of course, you can visit the 3M website. We do have a whole bunch of information around some of the features and functions and standards that these products meet. So, please, utilise all those resources. They are there to help workplaces pick the right type of product suitable for their workers, suitable for their hazard, for them to be protected. Once again, Terry, I really appreciate your time for coming in.

(G) Thank you, Mark.

(R) Well, thanks for listening everyone. If you have any questions, comments, suggestions for future topics or guests you think would be great to get into the studio, you can shoot us an email to scienceofsafetyanz@mmm.com. You can also contact us via that email if you need any help in your workplace, when it comes to the appropriate selection of hardhats, safety glasses, face shields, all of those together, 3M are certainly here to help.

You can also visit our website, 3m.com.au/sospodcast which has a transcript of the conversation that Terry and I have just had as well as other resources and links to this episode as well as all the ones we have previously recorded in the past. Be sure to subscribe and share the podcasts through Apple Podcasts, Spotify or Google Podcasts or wherever you get this podcast from, so you don't miss any future episodes.

And as Oprah Winfrey said, "Real integrity's doing the right thing, knowing that nobody's going to know whether you did it or not." Thanks for listening and have a safe day.