Impact Analysis Statement (IAS)

Summary IAS

Details

Lead department	Office of Industrial Relations
Name of the proposal	Prohibition of engineered stone
Submission type (*Summary IAS*)	Summary Impact Analysis Statement
Title of related legislative or regulatory instrument	Work Health and Safety (Engineered Stone) Amendment Regulation (2024
Date of issue	13 June 2024

This Summary IAS addresses the nationally agreed prohibition on the use, supply, installation and manufacturing of engineered stone benchtops, slabs and panels. The Summary IAS is aligned with the findings of Safe Work Australia's *Decision Regulation Impact Statement: Prohibition on the use of engineered stone* (Decision RIS).

What is the nature, size and scope of the problem? What are the objectives of government action?

The nature of the policy problem

Engineered stone is an artificial product that is manufactured by combining crushed natural stone materials (such as quartz) with resins and chemical binders to form a slab. These natural stone materials can contain high levels of crystalline silica, a naturally occurring mineral found in stone, sands, and clays. Engineered stone itself contains varying levels of crystalline silica by weight (as high as 95 per cent), depends on the stone materials used and the manufacturing process.

Subjecting any material that contains crystalline silica to high-energy processing (using mechanical plant or power tools to cut, saw, drill, grind, trim, sand or abrasive polish) generates very fine crystalline silica dust particles – referred to as respirable crystalline silica (RCS). RCS is not visible to the naked eye and can stay airborne for long periods of time (over 24 hours, when there is no wind or ventilation). The particle size means that RCS can be easily inhaled deep into the lung.

Silicosis is an occupational respiratory disease caused by inhalation of RCS. Exposure to RCS is also linked to an increased risk of several other diseases, such as lung cancer, chronic renal disease, autoimmune disorders (as well as an increased risk of activating latent tuberculosis).

Silicosis affects the lungs by damaging the lining of lung air sacs and small airways adjacent to or supplying them. It is a form of fibrosis (scarring) of the lungs that may result in the progressive loss of lung function. The lung tissue scarring stops oxygen being absorbed and can lead to respiratory failure, disability, or death. In the early stages of silicosis, the affected person may not experience symptoms. It is possible to have silicosis and not realise it. The first symptoms are often shortness of breath, a cough, occasional chest pain, loss of appetite and tiredness. As the disease progresses, the shortness of breath gets worse; this can become persistent and irreversible. In time, the cough becomes more severe and frequent, the chest pain can worsen, weight loss can occur, and night sweats can be experienced. In severe cases, respiratory failure may cause or result in death.

There are three types of silicosis: *acute silicosis* is very rare and results from short-term exposure to very large amounts of RCS (e.g., less than 1 year, may be weeks or months); *accelerated silicosis* results from short term exposure to large amounts of RCS (1 to 10 years of exposure); *chronic silicosis* results from long term exposure (10+ years) to low levels of RCS.

There is currently no proven cure for silicosis, though there are management strategies that may help reduce symptoms and slow progression. These include inhaled medications, oxygen therapy, a whole-lung lavage (flushing litres of a salt-water solution through each lung, under general anaesthetic, to 'wash out' silica particles) and lung transplantation. However, silicosis can be prevented by eliminating or minimising the generation and inhalation of RCS in the first place.

Whilst RCS is generated by processing any material containing crystalline silica, recent scientific testing of the dust generated by high-energy processing of resin-based engineered stone, natural stone and sintered stone identified significantly higher levels of RCS content and submicron particles in the dust generated from the resin-based engineered stone [Carrieri et al. 2022. "Characterization of Silica Exposure during Manufacturing of Artificial Stone Countertops; Hall et al. 2022. "Characterizing and Comparing Emissions of Dust, Respirable Crystalline Silica, and Volatile Organic Compounds from Natural and Artificial Stones].

Additional studies have also identified that the RCS particles generated from this product has a higher level of reactivity due to surface characteristics, resin and elemental composition, and particle size distribution [Hall, et al. 2022 Characterizing and Comparing Emissions of Dust, Respirable Crystalline Silica, and Volatile Organic Compounds from Natural and Artificial Stones; León-Jiménez, et al. 2021 "Compositional and structural analysis of engineered stones and inorganic particles in silicotic nodules of exposed workers"; Pavan, Polimeni, et al. 2016 "Editor's Highlight: Abrasion of Artificial Stones as a New Cause of an Ancient Disease. Physicochemical Features and Cellular Responses"; Ramkissoon, C, et al. 2022 "Characterisation of dust emissions from machined engineered stones to understand the hazard for accelerated silicosis"; ; Ramkissoon, et al. 2023 "Engineered Stone Fabrication Work Releases Volatile Organic Compounds Classified as Lung Irritants"], which is associated with lung tissue scarring. This could be due to the presence of resin on RCS particles, affecting how the body responds to the inhaled RCS.

Consequently, processing resin-based engineered stone is strongly associated with a shorter duration of exposure prior to the development of silicosis symptoms and diagnosis, as well as more rapid disease progression and a higher mortality rate. [Fazio, Gandhi and Flattery 2023 "Silicosis Among Immigrant Engineered Stone (Quartz) Countertop Fabrication Workers in California"; Hoy, et al. 2023 "Prevalence and risk factors for silicosis among a large cohort of stone benchtop industry workers"; Wu, Xue and Yu 2020 "Artificial stone-associated silicosis in China: a prospective comparison with natural stone-associated silicosis"]

The size and scope of the policy problem

In Queensland, there are 152 known stone benchtop fabrication businesses (the primary employers who use engineered stone) – these have been identified through audit campaigns of stone benchtop workshops by Workplace Health and Safety Queensland in 2017-2021. These businesses are present in all regions of the state:

Region	**Employers**
Cairns	14
Central Queensland	6
Gold Coast	42
Ipswich	4
Logan	21
Mackay	6
Brisbane	29
Sunshine Coast	23
Toowoomba	6
Townsville	1

Total	**152**

There is no precise data for the number of workers in this industry, but an estimated figure of 1308 workers can be calculated by applying the average number of workers in each business type (varied for sole traders, small businesses and medium businesses), and the proportion of businesses in the national industry that are of each business type.

The following table from Queensland's Notifiable Dust Lung Disease Register Annual Report 2022-2023 outlines the total number and type of confirmed cases of silicosis recorded in the Register by year of diagnosis:

Type of silicosis	**Year of diagnosis**					
	Legacy	2019-20	2020-21	2021-22	2022-23	Total (%)
Silicosis (acute)	2	0	1	0	0	3 (1%)
Silicosis (accelerated)	15	7	1	1	0	24 (6%)
Silicosis (chronic)	40	19	25	16	8	108 (28%)
Silicosis (type not reported)	135	43	42	14	11	245 (65%)
Totals	192	69	69	31	19	380 (100%)

The following table provides a breakdown of the 386 accepted silicosis workers' compensation claims in Queensland by year and industry (2023/24 is a partial result, up to and including 31 March 2024):

Industry	Year accepted							Total
	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	
Manufacturing	3	155	58	57	18	6	13	310
Mining	5	4	9	6	10	11	9	54
Construction	0	1	3	3	3	1	4	15
Other	0	0	0	2	3	2	0	7
Totals	8	160	70	68	34	20	26	361

Safe Work Australia's (SWA) assessment of accepted silicosis compensation claims across Australia identifies that 80% of accepted silicosis claims are from workers in the manufacturing industry – with labour market breakdowns indicating that most of these are likely to be from the benchtop manufacturing industry. This is despite stone benchtop manufacturing workers being estimated to represent less than 2% of all workers who are exposed to respirable crystalline silica at work.

Objectives of government action

Government action is required to reduce and prevent the currently high levels of incidence of silicosis in the stone benchtop industry. The options under consideration seek to achieve this objective by prohibiting the use of engineered stone (and resin-based engineered stone in particular).

To date, the Queensland Government has taken significant action to deliver on this objective, including the development and introduction of the *Managing respirable crystalline silica dust exposure in the stone benchtop industry Code of Practice 2019* (Stone Benchtop Code) – a legally enforceable approved code of practice that establishes the standard of health and safety that must be achieved or exceeded for managing the risks associated with exposure to RCS in the stone benchtop industry. This includes work to fabricate, process, install, maintain, or remove engineered and natural stone benchtops.

Since 2017, Workplace Health and Safety Queensland (WHSQ) has undertaken 3 state-wide compliance campaigns focused on the stone benchtop industry – with later campaigns seeing WHSQ inspectors audit all 158 known stone benchtop fabrication workplaces in Queensland against the requirements of the Stone Benchtop Code. As a result of these campaigns, enforcement notices against employers were issued to address unsafe practices, including a total of $79,920 in fines. Inspectors conducted 72 follow-up visits to make sure enforcement notices had been complied with and to address any ongoing issues. Overall, WHSQ identified positive change in the stone benchtop industry as a result of the safety standards outlined in the Stone Benchtop Code as well as the supporting compliance activities.

Other government actions delivered by the Queensland Government to reduce and prevent silicosis include:

- funding an initial health screen for current and former stonemasons, which supported nearly 1100 workers to underdo health screening;
- establishment of Queensland's Notifiable Dust Lung Disease Register, which allows Queensland Health to monitor and analyse the incidence of notifiable dust lung diseases (commenced on 1 July 2019);
- commissioning of a $5 million international research project for medical research to improve the health and wellbeing of workers suffering from occupational dust lung disease; and
- improvements to workers' compensation entitlements and support for workers diagnosed with pneumoconiosis and other forms of occupational dust-related lung disease.

In the March 2022 *All of governments' response to the National Dust Disease Taskforce final report*, all Australian Governments supported a commitment to commence the processes required to implement a full ban on the importation of some or all engineered stone products if, by July 2024:

- there is no measurable and acceptable improvement in regulatory compliance rates for the engineered stone sector as reported by jurisdictions; and
- evidence indicates preventative measures are not effectively protecting those working with engineered stone from silicosis and silica-associated diseases.

While there is evidence to indicate that the Queensland Government's actions to date have been effective at improving regulatory compliance rates in the state, the findings of Safe Work Australia's Decision Regulation Impact Statement (Decision RIS): *Prohibition on the use of engineered stone* dated August 2023 made clear that this progress did not meet the above standards agreed to by Australian Governments.

What options were considered?

The following three options (in addition to the base case) were considered in SWA's Decision Regulation Impact Statement: *Prohibition on the use of engineered stone*:

- Option 1: Prohibition on the use of all engineered stone – Under this option, a person conducting a business or undertaking (PCBU) would be prohibited from carrying out, or directing or allowing a worker to carry out, work on engineered stone, including manufacture, supply, fabrication (cutting, shaping, polishing), installation or use.
    - Under this option, there would be limited exemptions to the prohibition for specific work on legacy products (removal, repair and minor modification of engineered stone products installed prior to the commencement of the prohibition).
    - PCBUs wanting to undertake exempt work with engineered stone will be required to obtain a licence from Workplace Health and Safety Queensland. The licencing framework would be administrative in nature; meaning that PCBUs would be required to provide the regulator with information that identifies their business, but there would be no other associated requirements in order to be granted a licence.

- Option 2: Prohibition on the use of engineered stone containing 40% or more crystalline silica – Under this option, a PCBU would be prohibited from carrying out, or directing or allowing a worker to carry out, work on engineered stone that contains 40% or more crystalline silica, including manufacture, supply, fabrication (cutting, shaping, polishing), installation or use.
    - Under this option, there would be limited exemptions to the prohibition for specific work on legacy products (removal, repair and minor modification of engineered stone products that contain 40% or more crystalline silica installed prior to the commencement of the prohibition).
- Option 3: Prohibition on the use of engineered stone containing 40% or more crystalline silica, with an accompanying licensing scheme for PCBUs working with engineered stone containing less than 40% crystalline silica – Under this option, a PCBU would be prohibited from carrying out, or directing or allowing a worker to carry out, work on engineered stone that contains 40% or more crystalline silica, including manufacture, supply, fabrication (cutting, shaping, polishing), installation or use.
    - Under this option, there would be limited exemptions to the prohibition for specific work on legacy products (removal, repair and minor modification of engineered stone products that contain 40% or more crystalline silica installed prior to the commencement of the prohibition).

  PCBUs wanting to undertake exempt work with engineered stone that contains 40% or more crystalline silica will be required to obtain a licence from Workplace Health and Safety Queensland. The licencing framework would be administrative in nature; meaning that PCBUs would be required to provide the regulator with information that identifies their business, but there would be no other associated requirements in order to be granted a licence.

  In addition, PCBUs wanting to fabricate (cut, shape, polish) and/or install engineered stone products that contain less than 40% crystalline silica will also be required to obtain a licence from Workplace Health and Safety Queensland. The licencing framework would be administrative in nature; meaning that PCBUs would be required to provide the regulator with information that identifies their business, but there would be no other associated requirements in order to be granted a licence.

Following the agreement of WHS Ministers in support of Option 1 on 13 December 2023, consideration was also given to the following related measures:

- An exemptions framework for the use of engineered stone products, to be modelled on the exemption applications process currently included in Part 11.2 of the model WHS Regulations (and Queensland's *Work Health and Safety Regulation 2011*).
- Transitional arrangements to permit the continued use of engineered stone benchtops, slabs and panels following the commencement of the prohibition on 1 July 2024, so long as it the work relates to completion of a contract for installation that was entered into prior to 13 December 2023;
- New requirements to regulate exempt work with legacy engineered stone (i.e., removal, repair and minor modification of installed engineered stone benchtops, slabs or panels), including a prohibition on uncontrolled processing and a notification requirement.

While the Decision Regulation Impact Statement: *Prohibition on the use of engineered stone* detailed a licensing framework for working with legacy engineered stone, further consideration of existing licensing, authorisation, and notification frameworks identified merit for a notification framework. The proposed framework will require a PCBU who plans to undertake permitted work with legacy engineered stone to provide the regulator prescribed information. The proposed framework will:

- be commensurate with the risks of working with legacy engineered stone.
- provide regulators with oversight of PCBUs working with legacy engineered stone.
- utilise existing enforcement measures to address any non-compliance with the regulations.

On this basis, this IAS addresses the impact of the notification framework as opposed to a licensing framework.

What are the impacts?*

***Option-specific costs are based on information provided in the national decision RIS.**

Summary – Prohibition on engineered stone

The three options under consideration included considerable benefits and significant costs. Queensland's support for Option 1 depended on the benefits outweighing those costs.

Cost of each option – industry, government and worker

The following table summarises the estimated costs for Options 1, 2 and 3 over a ten-year appraisal period.

	Option 1	Option 2	Option 3
Option-specific costs			
Cost to industry	$6.9m	$0.0m	$4.2m
Cost to government	$0.7m	$0.0m	$3.6m
Cost to workers	$3.1m	$0.0m	$1.5m
Total	**$10.6m**	**$0.0m**	**$9.3m**

For **Option 1**, the option-specific monetised costs cover:

- Cost to industry: business closure costs ($0.5m), redundancy payments ($4.3m), and new equipment purchase costs ($2.1m).
- Cost to government: provision of Jobseeker payments ($0.7m) and vocational training support ($0.04m) for displaced workers.
- Cost to workers: lost income ($2.9m) and retraining costs ($0.2m)

No monetised option-specific costs are identified for **Option 2**, as PCBUs working with engineered stone would continue to operate by fabricating and installing engineered stone products with less than 40 per cent crystalline silica, noting the expected market availability of this product in 2024. Consequently, there are no associated costs to workers (lost income or retraining) or to government (provision of Jobseeker payments or vocational training support).

For **Option 3**, the option-specific monetised costs cover:

- Cost to industry: business closure costs ($0.3m), redundancy payments ($4.3m), and licensing costs for working with engineered stone products that contain 40 per cent or less engineered stone ($4.2m);
- Cost to government: provision of Jobseeker payments ($0.3m) and vocational training support ($0.02m) for displaced workers, and implementation of licensing framework for working with engineered stone products that contain 40 per cent or less engineered stone ($3.3m);
- Cost to workers: lost income ($2.9m) and retraining costs ($0.2m).

In addition, the following non-monetised costs have been identified, that apply to varying degrees for each of the proposed Options:

- Cost to PCBUs working with engineered stone – reduced revenue, additional transition costs (disposing of old stock, contractual issues around scheduled work using existing stock, marketing costs for pivot to alternative products), retraining workers (to work with alternative products), higher barrier of entry for new businesses (due to licensing costs)
- Cost to importers/distributors/whole business – transition costs (disposing of old stock, marketing costs for pivot to alternative products)
- Cost to retailers - transition costs (disposing of old stock and displays, marketing costs for pivot to alternative products)
- Change in the size of the market – no impact is anticipated on the demand for kitchen and bathroom benchtops, splashbacks and other products that currently use engineered stone.
- Cost to customers – decrease in choice of material for kitchen and bathroom benchtops and other similar products, short-term increase in purchasing price for alternative products and for any engineered

stone products not prohibited (under Options 2 and 3), increased price for exempt work with legacy products (due to licensing framework costs and decreased competition)

- Cost to the community – No negative impacts on economic growth are expected from any of the products, noting that there may be a small positive impact on GDP if locally produced alternative products replace imported engineered stone products. There may be a minimal environmental cost due to industry disposal of unsold engineered stone stock.

Benefits of each option

The following benefits have been identified for prohibiting the use of engineered stone, that apply to varying degrees for each of the proposed options:

- Reduced rates of premature death from, and reduced numbers of people living with, silicosis and silica-related diseases.
- Reduced health expenditure related to hospitalisations, outpatient care and care in the home, due to a reduced number of cases of silicosis and silica-related diseases.
- Avoided mental health and life impacts for affected workers, family and friends;
- Improved worker productivity from reduced ill health and extended work life;
- Avoided workers' compensation claims (and associated insurance premia) due to the reduced number of cases of silicosis and silica-related diseases.

While the breakeven analysis (see *What is the recommended option and why?*) does provide a monetised value based on the national Office of Impact Analysis' guidance on the value of a statistical life and value of a disability adjusted life year, it does not predict the extent to which this benefit is achieved by each of the Options. This is due to the limitations of available data on health care costs, impact of crystalline silica content levels on health outcomes, and the time lag from exposure to diagnosis that inhibits an assessment as to when the peak of diagnosed silicosis cases in Australia will occur.

Instead, it accounts for the number silicosis cases that would need to be prevented in order for the estimated benefits to outweigh the estimated costs. Further assessment of the breakeven analysis is provided in the below section (*What is the recommended option and why?*).

Cost of each option – consumer costs

The costs will include eliminating the benefits of consumer access to engineered stone. In the absence of this product under Option 1, consumers will need to use alternative products. The below table summarises the cost of those alternative materials:

Product	**Price range (per square metre)**
Engineered stone	- $416 to $1190, plus installation fees - $600 to $1400, plus installation fees
Granite	- $700 to $2500, including installation
Marble	- $800 to $2200, including installation
Porcelain	- $1000 to $1750, including installation
Polished concrete	- $1000 to $1750, including installation
Stainless steel	- $900 to $1000
Hardwood timber	- $600 to $1200
Bamboo	- $300 to $400
Laminate	- $120 to $350

Engineered stone is currently the most commonly used benchtop material (55% of $600m annual benchtop sales), due to its niche as a popular mid-point product that has many of the utilities of higher cost natural stone.

This cost impact is significantly lower under Options 2 and 3, as consumers will still have access to an engineered stone product; the cost impact instead would reflect the frequently higher price range of lower silica engineered stone, and the more limited range of suppliers.

As noted in the above section concerning non-monetised costs, the cost to consumers can be expected to also include short-term increase in purchasing price for alternative products and for any engineered stone products not prohibited (under Options 2 and 3), and increased price for exempt work with legacy products (due to licensing framework costs and decreased competition).

Summary of impacts – Related matters

In addition to the prohibition on engineered stone, the amendment regulation includes two additional proposals with associated impacts.

Exemptions framework for the use of engineered stone products

The amendments establish a national framework for exempting engineered stone products. To grant an exemption, a WHS regulator must be satisfied that the exemption will result in a standard of health and safety that is at least equivalent to the standard that would be achieved without the exemption. There will be mutual recognition of any exemptions granted. WHS regulators will be required to assess applications against common decision-making criteria approved by Safe Work Australia, consult with other WHS regulators, and consider appropriate consultation with employee and employer representatives and technical experts. WHS regulators will also be required to publish the reasons for a decision to grant an exemption, which will support Safe Work Australia to review national consistency in decision-making.

Given the scope and intention of the ban it is not expected that many applications for an exemption will be made as manufacturers are expected to move to alternative products. Also, the mutual recognition scheme will reduce the burden on industry and the government in terms of multiple applications across jurisdictions and costs to government of assessing the exemption request.

The following costs have been identified for the framework:

- Costs to industry: Labour cost of submitting an application are estimated to be $1,880. This is based on an estimate that it would take a PCBU 40 hours to prepare the required material and participate in any consultation with regulator other relevant parties at hourly rate of $47.00[1].
- Costs to government: It is expected that reviewing an exemption application will cost $2,439.00 per application. This is based on assessment taking 36.25 hours by a PO5 level officer.

Notification framework for working with legacy engineered stone.

Businesses that plan to undertake permitted work with legacy engineered stone will be required to notify the regulator and failure to provide the required information will constitute an offence. Costs of notifications are expected to be minimal as a standardised form will be developed for PCBUs. It is expected that it will take PCBUs roughly 30 minutes to fill out the form, with no other subsequent work required. This equates to $23.50 per notification.

The proposed form for notification is intended to provide an automated triaging approach within an existing IT system that will require minimal assessment and any required compliance action will be met within existing FTE. It is anticipated compliance action will not be beyond that already required to enforce Queensland's approved code of practice for the stone benchtop industry (*Managing respirable crystalline silica dust exposure in the stone benchtop industry Code of Practice 2019*). The prohibition on uncontrolled processing of legacy engineered stone in Queensland involves no additional costs to businesses when compared to the base case, as Queensland's approved codes of practice for the stone benchtop industry and construction work (*Managing respirable crystalline silica dust exposure in construction and manufacturing of construction elements Code of Practice 2022*) both outline that uncontrolled processing of engineered stone is prohibited.

Who was consulted?

Consultation – who and when

From 2 March 2023 to 2 April 2023, SWA conducted a round of public consultation to support the finalisation of the report into a prohibition on engineered stone. Submissions were accepted via Safe Work Australia's consultation platform, Engage, with late submissions also accepted where requested. 114 submissions were received from a range of stakeholders, including:

- PCBUs working with engineered stone (60, including 4 engineered stone suppliers);

[1] P91 of the Safe Work Australia DRIS states the average hourly cost for a PCBU is $47.00 per hour.

- other PCBUs, including law firms (11);
- industry groups (8);
- professional organisations and peak health bodies (6);
- commonwealth, state and territory government departments and agencies (6);
- unions (5), and;
- individuals, including WHS and medical professionals and individuals who work with stone (18).

Of these submissions, the Office of Industrial Relations has identified 7 stakeholders who are primarily based in Queensland:

- PCBUs working with engineered stone (3); Custom Stone Solutions, Whitsunday Marble and Granite, Foot's Artworks;
- Suppliers of engineered stone with offices in Queensland (2); SmartStone Australia (Brisbane office, supplier), Caesarstone (Brisbane office, supplier);
- WHS professionals (2); Opira Group, the Sustainable Minerals Institute (University of Queensland).

Of the remaining submissions, it should be noted most of the stakeholders (law firms, industry groups, professional organisations and peak health bodies, unions) represent members from multiple jurisdictions, including Queensland.

From February to June 2023, OIR representatives attended three meetings with Consentino (a multinational company that produces and distributes stone products, including engineered stone benchtops) at the company's request. At each meeting, Consentino delivered a presentation on exposure levels at the manufacturing facilities and advised of their views on the regulation of engineered stone in Australia.

Following the 13 December 2023 meeting of WHS Ministers, there were three SWA Extraordinary Members meetings (8 February 2024, 23 February 2024 and 16 April 2024) that considered the scope of the prohibition and related matters. These meetings are attended by representatives of each regulator jurisdiction, as well as the following social partners:

- Australian Industry Group
- Australian Chamber of Commerce and Industry
- Australian Council of Trade Unions

<u>Consultation – findings</u>

The main findings of SWA's public consultation round can be summarised as follows:

- Unions, professional organisations and peak health bodies supported Option 1.
- Industry groups did not support any prohibition on the use of engineered stone products (Options 1, 2 and 3), and instead proposed that the risks could be managed through the regulation of high-risk crystalline silica processes agreed by WHS Ministers in February 2023.
- A number of industry groups suggested there were evidence gaps that needed to be addressed before a prohibition on engineered stone could be supported:
    - Scientific evidence that crystalline silica in engineered stone creates a higher level of risk than crystalline silica in natural stone and other products
    - Evidence that risks associated with engineered stone cannot be appropriately controlled by additional regulation of high-risk crystalline silica processes.
- The majority of submissions acknowledged that there is not currently enough evidence to establish a threshold of crystalline silica content at which engineered stone can be safely processed.
- Around half of PCBUs working with (or supplying) engineered stone supported Option 3, advising that a licensing scheme for work with engineered stone with less than 40% crystalline silica content would enhance compliance in the sector.

The 7 submissions provided by Queensland stakeholders can be summarised as follows:

- All 3 PCBUs who work with engineered stone products opposed any ban on the use of engineered stone. They cited the risks of working with other crystalline-silica materials and noted the significant industry investment made to date to achieve compliance with Queensland's Stone Benchtop Code.
- Of the 2 suppliers of engineered stone; Smartstone Australia opposed any ban on the use of engineered stone, and Caesarstone Australia supported a ban on engineered stone products with 40% or more crystalline silica and licensing requirements (Option 3).
- Of the 2 WHS Professionals; Opira Group supported licensing requirements but advised a prohibition on engineered stone could be counterproductive (causing duty holders to consider all other crystalline-silica materials to be safe), and Sustainable Minerals Institute at the University of Queensland advised that a prohibition on engineered stone was worth consideration – but did not support or oppose the options presented.

Regarding Cosentino, OIR were advised that they did not support a ban on all engineered stone (Option 1) but could support a ban on engineered stone products with 40% or more crystalline silica (Option 2). They provided a limited number of air monitoring results from manufacturing workshops that indicated that processing engineered stone with less than 40% crystalline silica did not result in the exposure standard for respirable crystalline silica being exceeded.

As the discussion at Safe Work Australia Members meetings is conducted confidentially, the contributions and issues raised cannot be identified here.

What is the recommended option and why?

Recommended option

OIR recommends that the Queensland Government support the introduction of a prohibition on the use of all engineered stone, excluding the licensing requirement for exempt work on legacy products. The reasons for recommending this option are as follows:

1. The available medical research strongly indicates that engineered stone has a higher risk profile, in relation to generation of RCS, than other materials that contain crystalline silica;
2. The available medical research does not provide sufficient evidence to establish a crystalline silica content threshold that can demarcate between engineered stone products with an acceptable or an unacceptable risk profile;
3. Prohibiting the use of all engineered stone is the option that is estimated to result in the greatest health benefits;
4. The breakeven analysis for this option indicates that the benefits (in terms of illnesses prevented and lives saved) are highly likely to exceed the cost impact (even if the business closure rates in the DRIS are a significant underestimate), though it must be acknowledged that there are significant non-monetised costs and benefits which cannot be factored into this analysis;

Reasons 1 and 2: Evidence regarding risk profile of engineered stone

To support the Decision Regulation Impact Statement: Prohibition on the use of engineered stone, SWA engaged the University of Adelaide and Monash University to undertake an independent expert-led review of the available scientific evidence regarding the risk profile of working with engineered stone. The findings include:

- processing engineered stone products generates high levels of respirable crystalline silica, and high levels of airborne respirable crystalline silica have been recorded in all areas of an engineered stone fabrication workshop – including areas that were not used for processing engineered stone.
- processing engineered stone products can produce higher levels of ultrafine respirable crystalline silica particles than are generated when processing natural stone materials; the ultrafine particles are more easily able to penetrate deep into the lungs, and so are associated with increased disease risk.
- the available evidence indicates that the dust generated from engineered stone has a higher level of reactivity (due to the forms of respirable crystalline silica present, the surface characteristics, resin and elemental composition, and particle size distribution) – this means that the particles are more likely to scar lung tissue, and so are associated with increased disease risk.
- engineered stone products with lower crystalline silica content are being manufactured with products such as amorphous silica (including glass and recycled glass) and feldspar minerals. Little is known about the risk profile of these products, though there is some evidence of increased toxicity from freshly ground amorphous silica, and of differing toxicity levels from different feldspar dusts.

- The limited available sampling evidence supports the conclusion that a stone product with lower crystalline silica content generates lower levels of respirable crystalline silica.
- However, there is no epidemiological or laboratory toxicological evidence that outlines how the risk of disease would differ for workers exposed to respirable crystalline silica generated from engineered stone at different levels of crystalline silica content, or how it compares to natural stone.

OIR supports the assessment of the higher risk profile of engineered stone (noting the extent of ultrafine particles generated) compared to other crystalline silica materials (such as natural stone) and advises that there is sufficient research to raise significant concern about the toxicity of resins and other compounds added to engineered stone products. OIR also supports the assessment that there is insufficient evidence to establish a crystalline silica content threshold that can demarcate between engineered stone products with an acceptable or an unacceptable risk profile.

Reasons 3 and 4 – Breakeven analysis

SWA's *Decision Regulation Impact Statement: Prohibition on the use of engineered stone* provides the following breakeven analysis estimating the number of associated illnesses and deaths that would need to be prevented by each option to offset the monetised costs:

	Option-specific cost ($m)	Breakeven cases	Licensing framework cost ($m)	Breakeven cases	Total cost ($m)	Breakeven cases (total)
Option 1	10.6	2	240.5	49	251.1	51
Option 2	0	0			240.5	49
Option 3	9.2	2			249.7	51

The above analysis is based on the national Office of Impact Analysis' guidance on the value of a statistical life and value of a disability adjusted life year. Appendix B.9 of the Engineered Stone DRIS outlines the calculations using these baseline figures, to then assess the monetised value of avoiding silicosis and silica-related disease.

The breakeven cases needed to support Option 1 nationally are 51 cases over a 10-year period (or 2, if the licensing framework is excluded), under this assessment.

SWA's *Decision Regulation Impact Statement: Prohibition on the use of engineered stone* identifies the 488 accepted silicosis worker compensation claims from 2010-11 to 2020-21 across Australian jurisdictions (excluding Victoria), with a significant increase in the number of accepted silicosis claims from workers in the manufacturing industry (13 claims in 2011-12 to 2017-18, 167 claims in 2018-19 to 2020/21).

As noted in the summary IAS problem definition, from 2017-2023 (6 years) there have been 297 accepted workers' compensation claims in Queensland where the reported industry of primary occupational exposure for workers was manufacturing.

The number of silicosis cases that a prohibition on engineered stone would need to prevent (nationally over 10 years) in order to breakeven with the monetised costs of Option 1 would represent significantly less than the number of accepted claims from the manufacturing industry in Queensland over the past 6 years.

By this measure, it is highly probable that the monetised benefits of Option 1 would outweigh the monetised costs. Importantly, this assessment indicates that the breakeven analysis would still support Option 1 if the monetised costs outlined in SWA's *Decision Regulation Impact Statement: Prohibition on the use of engineered stone* turned out to be a significant underestimate.

For example, Option 1's monetised cost to industry includes an assumption that 10% of sole traders (44), 10% of small businesses (42) and 5% of medium businesses (7) would exit the industry. As part of sensitivity testing of the model, costs for Option 1 were also calculated at 2 other rates of business closure:

- closures at 15% (sole traders/small business) and 7.5% (medium businesses) had a cost impact of $9.3 million to engineered stone PCBUs.
- closures at 30% (sole traders/small businesses) and 15% (medium businesses) had a cost impact of $16.49 million to engineered stone PCBUs.

If business closure rates were at the highest estimated range provided (or higher still), the number of breakeven cases would likely still be less than half of the 297 accepted workers' compensation claims in Queensland since 2017 where the reported industry of primary occupational exposure for workers was manufacturing.

It should be acknowledged that the range of non-monetised costs and benefits referenced in SWA's Decision Regulation Impact Statement: *Prohibition on the use of engineered stone* are not factored into this assessment.

SWA's Decision Regulation Impact Statement: *Prohibition on the use of engineered stone* provides further supporting evidence by referencing a 2022 study titled 'The future burden of lung cancer and silicosis from occupational silica exposure in Australia: A preliminary analysis' by R Carey and L Fritschi of Curtin University, Perth, which estimated between 83,090 and 103,860 future cases of silicosis based on the levels of occupational exposure to respirable crystalline silica in the year 2016.

This study also assessed that impact of specific policy interventions, finding that the elimination of all exposure to engineered stone (closely aligned to Option 1) was the most effective intervention, resulting in 100 lung cancers and 770-960 silicosis cases avoided.

Impact assessment

	First full year	First 10 years**
Direct costs – *Compliance costs**	Refer to Attached Decision RIS	Refer to Attached Decision RIS
Direct costs – *Government costs*	Refer to Attached Decision RIS	Refer to Attached Decision RIS

* The *direct costs calculator tool* (available at www.treasury.qld.gov.au/betterregulation) should be used to calculate direct costs of regulatory burden. If the proposal has no costs, report as zero. **Agency to note where a longer or different timeframe may be more appropriate.

Significant proposals – also complete this table and a full IAS (refer box 1 below):

	First full year	First 10 years
Total costs* **	Refer to Attached Decision RIS	Refer to Attached Decision RIS
Total benefits* **	Refer to Attached Decision RIS	Refer to Attached Decision RIS
Net present value* **	Refer to Attached Decision RIS	Refer to Attached Decision RIS

*** Detail and assumptions should be recorded in the Full IAS.

Signed

Graham Fraine
Director-General
Department of State Development
and Infrastructure
Date: 14/6/2024

Grace Grace MP
Minister for State Development and Infrastructure,
Minister for Industrial Relations and
Minister for Racing
Date: 17/6/24