



Forensic Analytical Consulting Services

# Protecting Workers from Silica: Australia's Bold Approach

Presented By:

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# Agenda

- Why we're here
- Australia's approach
- Engineered stone
- Tunnelling
- How do we move forward
- Initiatives



# Why we're here

- Silica exposure: a global occupational health crisis
- Preventable, but historically overlooked
- Resurgence of silicosis cases globally and in Australia

## National data:

**1,451**

Australians who died from lung diseases caused by exposure to dust between 2011 and 2020

**90%**

Percentage of those who died that were male

**80%**

Percentage of deaths attributable to pneumoconiosis from exposure to asbestos and other mineral fibres

Source | ABS (Australian Bureau of Statistics) (2021a), Underlying Cause of Death (Australia)

# How did we get here?

- 2009 – First reported outbreak in Spain (3 cases)
- 2011 – Two further Spanish studies
- 2012 – Pivotal study in Israel
- 2012 – 7 cases in Italy
- 2014 – Large outbreak in Spain (44 affected workers)
- 2015 – Israel reports increase in cases from 3 in 1996 to 63 in 2014
- 2015 – First case reported in Australia

## Emergence in the United States

- 2014 – CDC blog
- 2014 – First US case in Texas
- 2015 – OSHA issued Hazard Alert Warning



# Australia's "Call to action"



## In 2017...

The screenshot shows the NSW Government website interface. At the top, there is a navigation bar with the NSW logo, 'Select language', 'Home', 'About us', 'Contact us', and a search box. Below this is a menu with categories: 'Health & safety', 'Licences & registrations', 'Law & policy', 'Roadmap', and 'Safety starts with you'. The main content area features a 'SILICA FACT SHEET' section. The text includes:
 

- Silica dioxide, also known as silica, is one of the most abundant compounds in the earth's crust. It is commonly found in rocks, sand, soil and in some living organisms.**
- As well as being used in glass manufacture and ceramics, silica is frequently found as a dust during mining, construction and excavation.
- Silica can be found in many forms, including crystalline silica such as quartz. This has an arranged molecular structure that can pose a serious health hazard if the particles are inhaled.
- WHEN IS SILICA DANGEROUS?**
- The effects of a single short-term exposure to dust containing a high concentration of silica are usually minor and rarely cause permanent injury. As with exposure to most forms of dust, symptoms can include irritated eyes, nose, throat and lungs.
- Repeated and prolonged exposure to low to high concentrations of respirable crystalline silica, however, can cause permanent injury and lead to serious lung disease such as silicosis.
- Silicosis can result from breathing respirable crystalline silica over a period of years, or following short-term exposure to extremely high concentrations. An example of this is when rocks containing the substance are ground up during mining or quarrying operations.
- Such exposure is extremely unlikely nowadays, given modern work practices.
- Silicosis occurs when crystalline silica is deposited in the air sacs of the lungs. This causes inflammation, which can result in scarring and calcification, and eventually reduced lung capacity.
- The risk and the severity of damage varies greatly and depends on the size and shape of the particles, the concentration of particles and the length of time that the person is exposed.

 A red arrow points to the 'WHEN IS SILICA DANGEROUS?' section. On the right side of the page, there are contact details for 'Contact Us' (Email: contact@work.nsw.gov.au, Telephone: 13 13 50) and social media icons for 'Share this page'.



*"Mr White had industrially-related silica injury to his lungs, in the form of interstitial fibrosis, small airways disease and emphysema, giving rise to mainly fixed airflow obstruction"*

*Senate Inquiry Into Toxic Dust - 2005*

# The Catalyst – Australia's Silica Crisis

- Spike in silicosis cases (2018 onwards)
- Queensland audit program findings
- Media and union advocacy
- 'New asbestos' narrative



# Audit findings



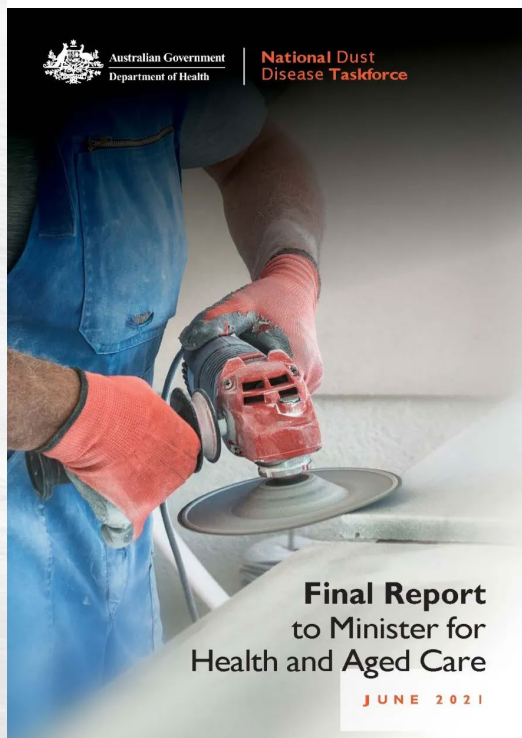
Third in a series of audit campaigns undertaken

Workplaces assessed against COP which commenced in October 2019

233 site visits – 368 enforcement actions:

- 302 improvement notices
- 27 infringement notices (totally \$79,920 in fines)
- 24 prohibition notices
- 12 immediate compliances (issues resolved during the inspection)
- two electrical safety notices
- one notice to produce documents.

# National Dust Disease Taskforce

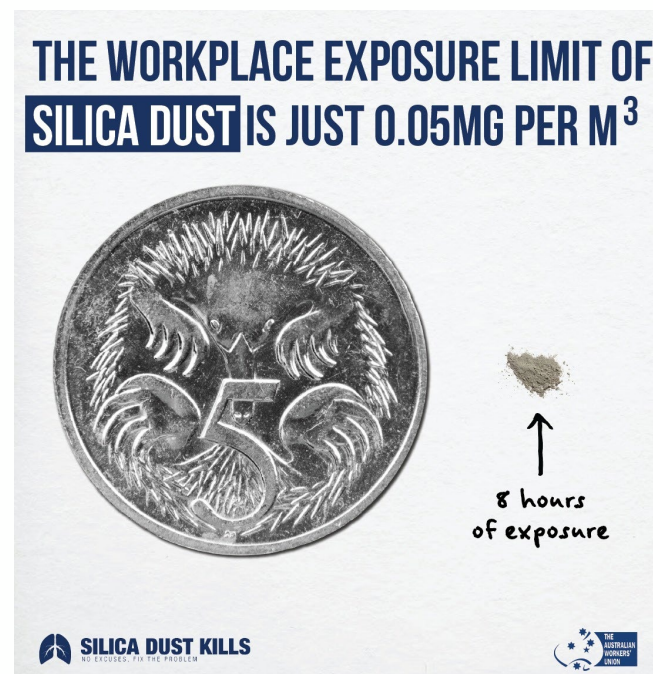


## Recommendations:

- Strengthen health & safety measures
- Give greater priority to WHS monitoring & compliance activities
- Conduct a Regulatory Impact Analysis to decide on the implementation of measures that provide the highest protections to workers
- Commence the process to implement a full ban on the importation of engineered stone
- Improve the quality, frequency and coverage of health screening
- Finalize & implement the National Silicosis Prevention Strategy
- Development of a national registry
- Establish a cross-jurisdictional governance mechanism to improve comms and info sharing

# Australia's Silica Exposure Standard

- 0.05 mg/m<sup>3</sup> TWA WES
- Review process for lower limits
- Real-world implementation challenges
- Emphasis on elimination & engineering controls



# Initial Improvements

Implementation of WES  
of 0.05 mg/m<sup>3</sup>

Regulatory ban on  
uncontrolled dry cutting  
of engineered stone

Licensing scheme for  
engineered stone

Code of practice /  
compliance code  
targeting engineered  
stone

New state lung disease  
register

Low-dose High CT scan  
instead of Chest X-rays

New amendments of  
regulation

Health screening of  
workers in manufactured  
stone

Regulatory workplace  
inspection campaigns

Awareness campaigns



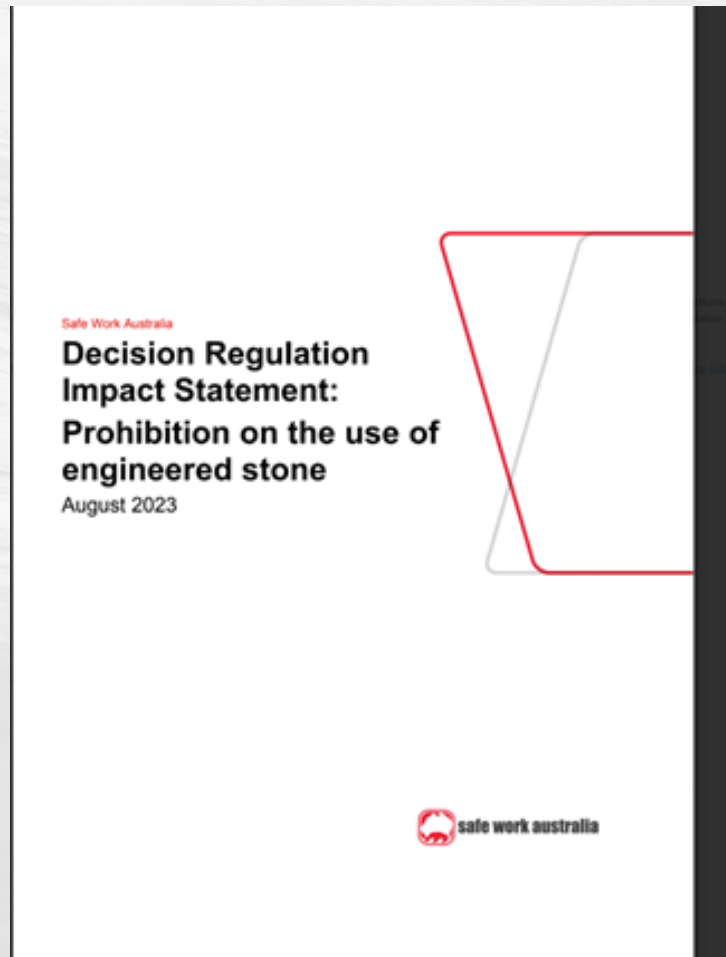
# WorkSafe Queensland Audit Findings

## Key non-compliant findings

Inspectors identified the following key non-compliance issues:

Area of non-compliance	Issue
Air monitoring	<ul style="list-style-type: none"> <li>Failure to conduct air monitoring</li> <li>Frequency of air monitoring not in line with the Code</li> <li>Air monitoring report not in line with the Code</li> </ul>
Health monitoring	<ul style="list-style-type: none"> <li>Failure to provide health monitoring to workers</li> <li>Employee reluctance to attend health monitoring</li> </ul>
Respiratory protective equipment	<ul style="list-style-type: none"> <li>Failure to conduct fit testing for workers wearing tight-fitting respirators.</li> <li>Failure to provide powered air-purifying respirators (PAPR)</li> <li>PAPR not worn correctly by workers</li> </ul>
House keeping	<ul style="list-style-type: none"> <li>Inadequate housekeeping</li> <li>Inadequate cleaning methods</li> </ul>
Water suppression	<ul style="list-style-type: none"> <li>Inadequate use of water suppression</li> <li>Failure to contain overspray</li> </ul>
Cutting	<ul style="list-style-type: none"> <li>Uncontrolled dry cutting of materials</li> </ul>

# Safe Work Australia RIS



# What policy options were considered?

**Option 1:** Prohibition on the use of all engineered stone

**Option 2:** Prohibition on the use of engineered stone containing 40% or more crystalline silica

**Option 3:** As for option 2, with an accompanying licensing scheme for PCBUs working with engineered stone containing less than 40% crystalline silica

# Safe Work Australia RIS

**Table 1** Comparison of the estimated cost for prohibition options over the appraisal period (\$m), by component

	Option 1 – complete prohibition		Option 2 – prohibition ≥ 40% crystalline silica		Option 3 – prohibition ≥ 40% + licence for < 40%	
	Cost – licensing framework for work with legacy products	Other costs	Cost – licensing framework for work with legacy products	Other costs	Cost – licensing framework for work with legacy products	Other costs
Cost to PCBUs	\$133.0	\$6.9	\$133.0	\$0	\$133.0	\$4.2
Cost to government	\$107.5	\$0.7	\$107.5	\$0	\$107.5	\$3.8
Cost to workers	nil	\$3.1	nil	\$0	nil	\$1.5
Sub total (component)	\$240.5	\$10.8	\$240.5	\$0	\$240.5	\$9.3
<b>Total</b>	<b>\$251.1</b>		<b>\$240.5</b>		<b>\$249.7</b>	
% Total option costs	90%	4%	100%	0%	90%	4%

**Table 2** Estimated breakeven analysis results over appraisal period

Option	Total cost (\$m)	Estimated number of cases prevented required to breakeven over the period – total
Option 1	\$251.1	51
Option 2	\$240.5	49
Option 3	\$249.7	51

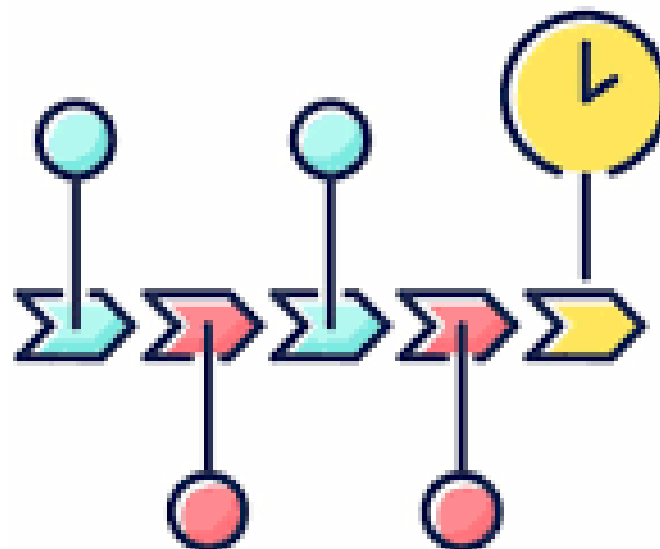


# Trade Union Support



# Timeline of Key Events

- 2018: National Dust Disease Taskforce formed
- 2020–21: National review of engineered stone
- 2023: Governments agree to ban
- 2024: Engineered stone ban implementation date



# The Engineered Stone Ban

- Ban on manufacture, supply, processing, installation
- Effective 1 July 2024
- Scope: high-silica engineered stone products
- Purpose: eliminate high-risk exposure





# Silica isn't just in Engineered Stone

The future burden of lung cancer and silicosis from occupational silica exposure in Australia: A preliminary analysis

Report commissioned by the Australian Council of Trade Unions (ACTU)

April 2022



Future burden from occupational silica exposure in Australia

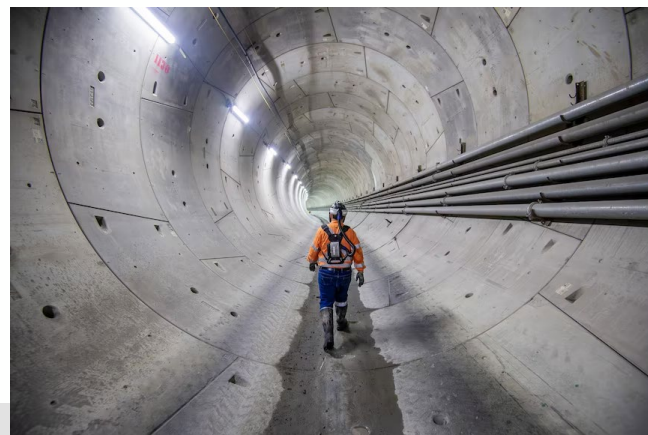
From a cohort of 18,770,982 adult Australians in 2016, it is estimated that 5.4% will develop lung cancer over their lifetime, of which 1.0% are attributable to occupational exposure to RCS.

When extrapolated to silicosis, it was estimated that between 83,090 and 103,860 cases of silicosis would result from current occupational exposure to RCS.

# Tunnelling

## Silicosis in Sydney Tunnelling Projects

- Thirteen workers—some as young as 32—have recently been diagnosed with silicosis after working on Sydney tunnelling projects, including the M6 Stage 1. These are not just isolated incidents; they are a warning signal.





# More Research is needed




**BRITISH  
TUNNELLING  
SOCIETY**

An industry first collaboration on  
Silica Dust control in Tunnelling

Australian Tunnelling Society  
Working Group

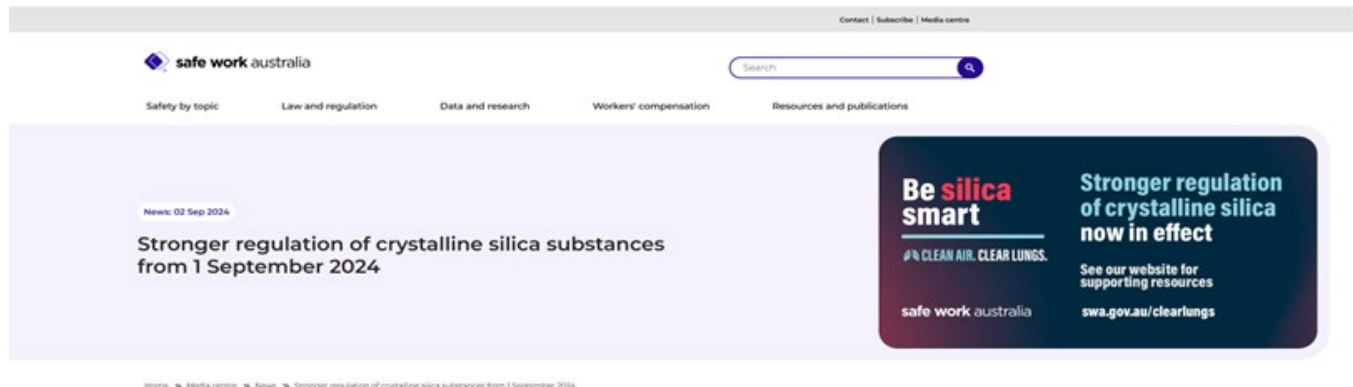

**AUSTRALIAN  
TUNNELLING  
SOCIETY**



# The path forward



# Stronger regulation for RCS



# Risk Assessment

## Preparing a crystalline silica hazard control statement for high risk crystalline silica work

### Appendix A – Sample crystalline silica hazard control statement for high risk crystalline silica work

Employer's self-employed person's name	Trading name, if different from person's name		
Workplace address	Hazard control statement date		
Hazard control statement prepared by:	Affected employees and any HSPs have been consulted in the preparation of this hazard control statement	Yes	No

High-risk crystalline silica work includes work performed in connection with a crystalline silica process that is reasonably likely to result in: • an airborne concentration of respirable crystalline silica that exceeds half the exposure standard for respirable crystalline silica, or • a risk to the health of a person at the workplace. An engineered stone process is deemed high-risk crystalline silica work.	Crystalline silica process (tick all that apply)		
	The use of a power tool or other form of mechanical action • cut, grind, polish or crush material containing crystalline silica, or • carry out any other activity involving material containing crystalline silica that generates crystalline silica dust.	The use of a masonry tool or other equipment if the material in the face contains crystalline silica.	A process that exposes a person to crystalline silica dust arising from the manufacture or handling of material that contains crystalline silica.
	The mechanical screening of crushed material containing crystalline silica.	A mixing process involving material containing crystalline silica.	A tunnelling process involving material containing crystalline silica.

Person responsible for ensuring compliance with hazard control statement	Name: Role:
Is the hazard control statement accessible and comprehensible to persons who use it?	Yes No
What measures are in place to ensure compliance with the hazard control statement? For example, direct supervision, regular spot checks.	
Date hazard control statement reviewed:	
Reason for reviewing hazard control statement: For example, post incident, ineffective risk controls.	
Who completed the review of the hazard control statement?	Name: Role:

## Preparing a crystalline silica hazard control statement for high risk crystalline silica work

### Risk controls specified by the Occupational Health and Safety Regulations 2017



Using administrative controls and PPE to reduce risk does not control the hazard at the source. Administrative controls and PPE rely on human behaviour and a decision that on that work, they tend to be the least effective in managing risks.

What are the processes involved?	What are the hazards and risks? What aspects of the work could harm workers or the public?	What are the risk control measures and how will they be implemented?
List the work processes in logical order.  A process determined by WorkSafe to be a crystalline silica process.	For example, fabrication of respirable crystalline silica dust from: • cutting a concrete footpath • cutting a hole in an engineered stone kitchen splashback • demolition of large scale structure • cutting sandstone tiles with a angle saw as part of the landscaping works, which may result in adverse health effects, such as asthma.	Describe what will be done to make the process as safe as possible?

## Preparing a crystalline silica hazard control statement for high risk crystalline silica work

Where high risk crystalline silica work involves a quarrying or tunnelling process, tick all that have been under taken)

Samples of materials to be used in the quarrying or tunnelling process have been collected.  
Analysis of the sample has been arranged by a suitably competent person to identify the proportion of crystalline silica contained in each sample.  
Results of any analysis for quarrying or tunnelling process have been retained and are attached to this hazard control statement.

Additional comments

# Resources & flow charts



# Training materials



English  
Chinese  
Vietnamese  
Italian  
Korean

# Regulatory notifications



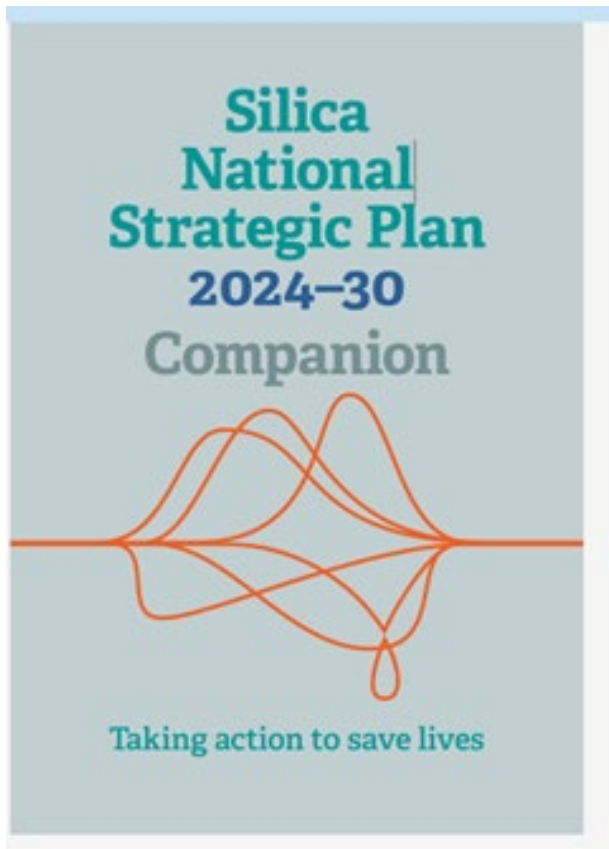
SafeWork NSW

Industry	2025						2025 Total
	Qtr1			Qtr2			
	Jan	Feb	Mar	Apr	May	Jun	
<b>Tunnelling</b>	9	9	9	8	17	8	60
Construction	9	9	9	8	17	8	60
Other Services	-	-	-	-	-	-	-
<b>Non-Tunnelling</b>	6	7	10	5	8	12	48
Construction	5	4	6	5	4	8	32
Electricity, Gas, Water and Waste Services	-	1	1	-	1	-	3
Manufacturing	-	1	-	-	2	2	5
Other Services	1	1	2	-	-	1	5
Agriculture, Forestry and Fishing	-	-	1	-	-	-	1
Public Administration and Safety	-	-	-	-	1	-	1
Transport, Postal and Warehousing	-	-	-	-	-	1	1
<b>Grand Total</b>	15	16	19	13	25	20	108



## The Silica Worker Register

Launches today, 1 October 2025



Priority 1 – Workplace risk reduction

Priority 2 – Educations and awareness

Priority 3 – Health Monitoring, Screening and Surveillance

Priority 4: Research and development



# ADDRI

Asbestos and  
Dust Diseases  
Research Institute

- [silicosis.org.au](http://silicosis.org.au)
- Independent, up-to-date information on silica exposure and health
- Resources tailored to workers, employers, GPs, and allied health professionals
- Support pathways for those diagnosed or concerned
- Updates on emerging research, policy reforms, and screening programs

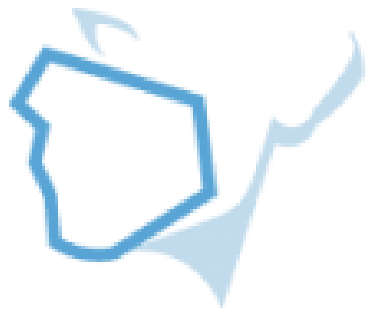
# AIOH

Welcome to the AIOH Silica Hub. Here you'll find resources to help you manage the risks associated with respirable crystalline silica. By consolidating research, guidelines, and best practices, the Silica Hub supports the prevention of silica-related diseases and promotes safer working environments.



 <p><b>What do I need to know about respirators?</b></p>	 <p><b>How do I measure silica in my materials?</b></p>	 <p><b>What materials are likely to have more than 1% silica?</b></p>	 <p><b>What are the most effective silica controls?</b></p>
 <p><b>Do I have a high risk silica process?</b></p>	 <p><b>How do I find an expert in silica?</b></p>	 <p><b>What do I need to know about air monitoring?</b></p>	





# RESP-FIT

RESPIRATOR FIT TESTING  
TRAINING & ACCREDITATION

AN AIOH  
PROGRAM

- Early detection + bold action matters
- Elimination is the most effective control
- Coordination is essential
- Worker engagement drives sustainable change



# Call to Action

- Support effective control implementation
- Advocate for vulnerable workers
- Share lessons internationally



# Thank You!

## Forensic Analytical Consulting Services, Inc.

**Right**  
People.

**Right**  
Perspective.

**Right**  
Now.