Respirable Crystalline Silica | Mirvac Minimum Requirements

1. Purpose & Scope

This Mirvac Minimum Requirement Document provides details and information in relation to managing the risk of exposure to airborne contaminants containing crystalline silica specifically and should be read in conjunction with the associated Occupational Exposures Mirvac Minimum Requirements.

This document applies to all workplaces under the management or control of a Mirvac entity.

2. Minimum Requirements

Mirvac personnel and Service Providers must have processes in place to ensure compliance with:

- The Critical Controls (refer Section 3);
- Relevant Forms (refer Section 4);
- All relevant Legislation, Codes of Practice and Standards (refer Section 7); and
- Product guidelines for installation, use or maintenance from the Original Equipment Manufacturer.

3. Critical Controls

- **Acquisition:** Prior to acquiring an asset, retained hazardous chemicals/substances and hazardous materials on site must be identified and the need for their use assessed in managing or developing the asset.
- **Hazard Identification:** A thorough examination must be made of all work processes involving crystalline silica to identify those processes which are generating dust, and whether workers are being exposed to dust containing Respirable Crystalline Silica (RCS). These work processes are to be entered in the Workplace Risk & Opportunity Register, with controls to be implemented identified. Workplaces must have in place a process to assess exposures to health hazards, verify exposure levels and identify and implement the required controls (in compliance with relevant legislation, codes, standards and health guidelines).
- **Risk Assessment:** When considering controls for the use of any substance including crystalline silica or other identified hazardous respirable particulate substance or chemical, the hierarchy of controls must be used to provide guidance, with consideration always given to elimination, substitution, isolation etc. in that order (refer examples in the Hierarchy of Controls Triangles in Section 9).

  The Workplace Risk & Opportunity Register provides a list of all known occupational exposures anticipated at Mirvac Workplaces. This list will be updated by the document owner where new exposures are identified. During the Workplace site establishment process potential health exposures relevant to the works being undertaken at the workplace, must be listed in the Workplace Risk & Opportunity Register. Workplaces must have a process in place, to assess the potential occupational exposures using the Qualitative Health Risk Assessment tab in the Workplace Risk & Opportunity Register. Once work begins, that creates the potential to expose workers to occupational exposures, the assessment should be revisited to ensure it is still reflective of the risk. Where ratings of high or extreme are identified by the qualitative risk assessment, or where there is a possibility for worker exposure to levels nearing, or in excess of the exposure standard, exposure monitoring conducted by an appropriately trained person should be arranged (refer Section:6).

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- **Risk Management**

Eliminating or Minimising Exposure to Dust Containing Crystalline Silica
Priority must always be given to eliminating exposure to Respirable Silica Dust. Where this is not practicable, onsite work practices must minimise any exposure. This is best achieved in the planning and design stages, in consultation with clients, designers, suppliers, service providers and workers.

Examples of ways to eliminate the on-site risk to workers:

- Off-site pre-fabrication of modular components in safely designed cutting rooms;
- Ordering the right size of building materials so less cutting or preparation is needed;
- Substituting products containing RCS with safer alternatives.

Examples of ways to minimise exposure to workers at site:

- Using alternative building products with lower silica content instead of traditional products
- Eliminating uncontrolled dry grinding on site;
- Using tools and equipment that generates less dust or captures the dust at source;
- Installation of cutting rooms that are insulated at doorways that have extraction units venting To an appropriate HEPA filter (refer guidelines below);
- Housekeeping:
    - wet sweeping;
    - hosing down/wiping/mopping of surfaces;
    - vacuuming up dust and debris containing silica using an M or H-class vacuum cleaner
    - using ride-on floor cleaners (HEPA filtered or water scrubbing);
    - using on-tool extraction (refer section below).

NB: dry sweeping dust and debris can generate high levels of airborne RCS and other respirable dust. Suitable respiratory protection must be used when dry sweeping. Where a large volume of dust is generated, especially in closed rooms or areas with poor ventilation, alternative methods to dry sweeping should be considered.

- Waste disposal – you can reduce dust associated with waste by:
    - bagging waste material such as debris and empty cement bags before putting them into the bin or skip
    - locating bins and skips outdoors where possible
    - using water misting systems to keep waste materials damp where possible;
- Have workers wear protective clothing suits in areas of higher exposure (e.g. work in cutting rooms)

Note: Use industrial vacuum cleaners and filters that comply with the M or H class requirements of AS/NZS 60335.2.69:2017, *Household and similar electrical appliances - Safety - Particular requirements for wet and dry vacuum cleaners, including power brush, for industrial and commercial use (IEC 60335.2.69 ED 5, MOD).*

Due to the high concentrations of crystalline silica in re-constituted stone, uncontrolled dry grinding, cutting or polishing of re-constituted stone benchtops is prohibited on Mirvac projects.

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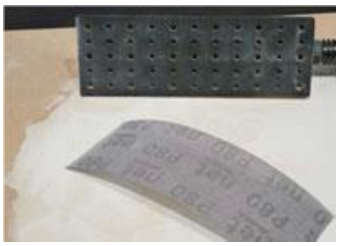
Controlling the dust
Where elimination or substitution of RCS materials or work processes is not practical, engineering controls such as dust containment, dust extraction and water suppression must be used in addition to suitable respiratory protection.

Common control options:

- Isolation: Segregated area for cutting or grinding materials containing crystalline silica. Where materials containing RCS are required to be cut or ground a process must be in place to ensure this activity occurs in a segregated area in the workplace or in an enclosed area, e.g. 'cutting room'. Where an enclosed area is established, care must be taken to ensure the dust generated is contained and that a suitable extraction fan is provided to the room. It is not adequate to extract dust from the curtained area and recirculate this dust into another area of the workplace. The provision of a segregated work area does not mitigate the need to use extraction units on tools, or the recommended PPE. Fully enclosed operator cabins, such as those found on earthmoving plant have been shown to effectively control exposure to RCS when fitted with properly designed and maintained HEPA air filtration.

- On-tool extraction: this method removes dust as it is being produced. It is a type of local exhaust ventilation (LEV) system that fits directly onto the tool. This system consists of several individual parts – the tool, capturing hood, an M or H class dust extraction unit or vacuum and tubing. Tools that provide shadow vacuuming are the most effective at vacuum extraction.






Above: Examples of on tool extraction

- Hollow-centred drilling and coring bits.
- Water suppression: Water or fine mist suppression can also be used to control RCS dust when LEV is not suitable. It is important to ensure enough water is supplied at the right levels for the whole time that the work is being done. Just wetting the material beforehand does not work. Examples for use include wet cutting methods for brick, tile, stone and concrete.

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Above: Cut-off saw with water suppression

Control options for power tools

The guide below lists common tasks along with exposure control methods and work practices:

- Hand-held power saws, chasing, core drilling, rotary hammers, chisels, breakers, hand-held grinders(cutting/grinding), walk behind floor grinders.
  Acceptable control methods:
  - Engineering control
    - Dust extraction – tool is fitted with a hollow drill or coring bit with suitable collection hood, M or H class extraction unit is used. Extraction flow rate is right for the work. Hose connections are tight and secure without obvious leaks.
    - Water suppression – tool is designed with dedicated water suppression; water supply is sufficient for task. Slurry is controlled and cleaned up before it dries out.
  - Personal protective equipment
    - Respirator with at least P2 filtration – fit-tested to worker if half or full-face mask is used.

- Stationary brick saws, walk-behind saws, quick-cut saws
  Acceptable control methods:
  - Engineering control
    - Water suppression – saw is designed with dedicated water suppression; water supply is sufficient for task. Slurry is contained and cleaned up before it dries out.
  - Personal protective equipment
    - Respirator with at least P2 filtration – fit-tested to worker if tight-fitting half or full-face mask is used.

- Hand-held drills
  Acceptable control methods:
  - Engineering control
    - Dust extraction – saw is fitted with a suitable collection hood, M or H class extraction unit is used. Extraction flow rate is right for the work. Hose connections are tight and secure without obvious leaks. Use hollow drill bits where practicable. Vacuum waste from holes if required (do not use compressed air). OR
    - On-tool dust extraction– drill is mated to powered dust removal/collector attachment with HEPA filtration. Collected material to be safely emptied from unit into waste disposal bag or use M or H class vacuum. Use hollow drill bits where practicable. Vacuum waste from holes if required (do not use compressed air).
  - Personal protective equipment

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- Respirator with at least P2 filtration – fit-tested to worker if tight-fitting half or full-face mask is used.

Respiratory Protective Equipment (RPE)

RPE does not prevent or control RCS from becoming airborne. It should not be used as the primary means of control, but rather in combination with higher order controls like LEV or water suppression. No respirator is capable of preventing all airborne RCS from being breathed in.
Selection of RPE should be undertaken in accordance with AS/NZS 1715:2009 Selection, Use and Maintenance of Respiratory Protective Devices.
It is important to choose the right respirator for the job. The fit of a respirator to a worker's face is critical. Workers must be fit tested to ensure the respirator is comfortable and capable of giving the right level of protection. The amount of time the respirator is worn also needs to be considered.
The HSE Video: Introducing & Managing RPE in the workplace provides guidance on the selection and use of RPE.

The effectiveness of a tight-fitting respirator facepiece, such as a half-face or full-face respirator that uses straps, relies on getting a good seal with the wearer's face. If a respirator does not fit properly, the wearer will not get the expected level of protection. Use both of the following methods to make sure a respirator is a suitable fit for each worker:

- fit-test and
- fit-check.

Facial hair, including beards, moustaches, sideburns and stubble, between the sealing surface of a tight-facing facepiece and the face will stop the respirator from sealing properly. Workers must be clean shaven where the respirator facepiece comes in contact with the skin before wearing the respirator.

For instances where RCS exposure is possible, workers must only wear a half-face or full-face respirator that has been fit-tested to you. Fit-tests are important for disposable and reusable respirators. Where a worker is unable to pass the fit test, due to the contour of the face or the presence of facial hair, another type of respirator protective device must be successfully fit-tested before the worker is permitted to undertake the work. Where a fit-test is not able to be positively confirmed using a nose/mouth respiratory protective device, consideration must be given to using a full-face shield that is capable of protecting the worker from exposure.

Fit-testing
People's faces vary significantly in size and shape, so it is important that a tight-fitting respirator is a suitable fit for each worker.

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Fit testing detects if air leaks into the respirator through gaps in the seal between the respirator facepiece and face. There are two methods of fit testing:

- Qualitative fit testing - is a pass/fail test that relies on the wearer's ability to taste or smell a test agent. This type of test can be used on half-face respirators;
- Quantitative fit testing – uses specialised equipment to measure how much air leaks into the respirator. This type of test can be used on half-face and full-face respirators.

Fit-testing can be carried out in-house by a competent person, manufacturer, supplier or service provider.
Fit-testing should be carried out:

- Before the respirator is selected or used for the first time;
- At least once per year to ensure it continues to fit adequately;
- Whenever there is a change in the wearer's facial characteristics or features which may affect the facial seal e.g. large weight loss or gain.

A written record of fit tests carried out should be kept for each worker including:

- Type of test performed
- Make, model, style and size of respirators tested
- Date of the test
- Result of the test.

Fit-checking
Each time a tight-fitting respirator is put on, the wearer should carry out a fit check. A fit-check is a quick check to ensure the respirator, which has been fit-tested, has been properly positioned on the face and there is a good seal between the respirator and face. Fit-checks do not replace the need for a fit-test. The manufacturer's instructions must be followed on how to carry out a fit-check.
Refer to this guide for information about how to put on and take off a respirator.

- **Safety Data Sheets:** When crystalline silica containing products are supplied and brought into workplaces, they need to have an accompanying Safety Data Sheet (SDS). An SDS will identify the presence of silica as a hazardous chemical, and provide additional information on composition, exposure controls, appropriate personal protection, toxicological (health) information, together with other safety information and contacts. If the Safety Data Sheet (SDS) identifies the product as hazardous, a risk assessment must be undertaken by completing the Products and Hazardous Chemicals or Substances Risk Assessment or equivalent, such as risk assessment through Chemalert. All SDSs must be centrally located to enable timely access to first aid treatment information, e.g. at a first aid facility or other centralised location, on the HammerTech online HSEMS or at the storage area. The issue date of SDS must not exceed 5 years. A current SDS shall be available for any hazardous chemical or dangerous good stored and handled at the premises:

  - SDS must be available prior to when the product is first supplied or used on site;
  - If the SDS is not available, the delivery must be rejected;
  - The SDS must be readily accessible to all persons working on the premises, emergency services workers, and medical practitioners for both use and storage;
  - The SDS sheet should be provided by the supplier of the chemical. If it is not, it can be obtained from Chemalert;
  - Retain all licenses, permits, and approvals on site as required by the statutory obligations, for each type of hazardous material;
  - Record controls detailed in the SDS in the Safe Work Method Statement (SWMS) relating to the activity that involves the use of the chemical;

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- All persons using or supervising the use of hazardous substances must be trained in the requirements of the relevant SDS.

Mirvac subscribes to Chemalert to provide accurate SDSs.

- **Mirvac Supplied Substances**: All hazardous substances containing crystalline silica stored, or in use at Mirvac workplaces, must be registered by the Workplace Manager or Nominated Mirvac Representative on the Products and Hazardous Chemicals or Substances Register or equivalent (e.g. HammerTech or Chemalert).

  Service Provider Supplied Substances: Workplaces must have a process in place to assess the risk of substances containing crystalline silica proposed to be used at any Mirvac site. The process must include an assessment of the need to use the substance, as well as the required risk assessment and Safety Data Sheet.

- **Exposure Monitoring:** Personnel engaged to conduct exposure monitoring must hold a University Occupational Hygiene Qualification and experience specific to monitoring of the identified hazard.

- **Risk Control Verification -** Construction activity has the potential to create exposures which pose a risk to human health and must be considered through risk assessment. Where identified as a risk and confirmed through exposure monitoring, controls recommended by the Occupational Hygienist and listed in the Workplace Risk & Opportunity Register, must be implemented.

- **Suppliers of RCS Containing Materials:** When procuring products with known or suspected RCS content, the Mirvac representative procuring the material must request from the supplier details of how they are managing the risk of exposure of their workers to RCS. Mirvac prefers to work with suppliers that eliminate or minimise the risk of exposure to RCS to safe working levels.

4. Mirvac Forms

Checklists and Permits are to be completed and then authorised by Mirvac representative prior to work
Community Contact Notification
Products and Hazardous Chemicals or Substances Register
Hazardous Chemicals or Substances Risk Assessment
Risk & Opportunity Register Construction - template
Safety Data Sheets are available from the Mirvac Intranet: Chem Alert
Dangerous Goods Storage Guidelines [Poster]

5. Roles and Responsibilities

The Mirvac Workplace Manager of each workplace, over which Mirvac has control, is responsible to ensure workers at the site are aware of and adhere to the performance requirements of this document and responsible to ensure workers are equipped with adequate tools, training, competency and licensing to undertake the work.

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6. Training and Competency

Minimum Training Requirements for potential exposure to Respirable Crystalline Silica	
Activity	**Required Training**
Workers that handle, store or use hazardous chemicals/substances or dangerous goods	Occupational Exposures Training (Mirvac Internal)
Personnel identifying Workplace occupational exposures and conducting the qualitative risk assessment in the Workplace Risk & Opportunity Register (HSE Lead and Workplace Manager)	Occupational Exposures Training (Mirvac Internal)
Workers likely to be exposed to any Occupational Exposure (Biological, chemical or Physical)	Occupational Exposures Training (Mirvac Internal)
Persons conducting quantitative occupational exposure monitoring	Degree qualification in Occupational Hygiene or Doctor of Medicine with a specialty in Occupational Medicine
Persons conducting qualitative fit testing	Fit-testing competent person, manufacturer, supplier or service provider.

7. Relevant Legislation, Codes of Practice and Standards

Document Title	
NSW:	Work Health and Safety Act 2011 (NSW) Work Health and Safety Regulation 2017 (NSW) (including Chapter 7 Hazardous Chemicals, and Schedules 7 – 14 inclusive)
Vic:	Occupational Health and Safety Act 2004 (Vic) Occupational Health and Safety Regulations 2017 (Vic) (including Chapter 4 Hazardous Substances and Materials and schedules 6 – 11 inclusive)
Qld:	Work Health and Safety Act 2011 (Qld) Work Health and Safety Regulation 2011 (Qld) (including Chapter 7 Hazardous Chemicals, and Schedules 7 – 14 inclusive)
ACT:	Work Health and Safety Act 2011 (ACT) Work Health and Safety Regulation 2011 (ACT) (including Chapter 7 Hazardous Chemicals, and Schedules 7 – 14 inclusive)
WA:	Occupational Safety and Health Act 1984 (WA) Occupational Safety and Health Regulations 1996 (WA) Part 5 Hazardous Substances
Note that additional specific legislation concerning dangerous substances or goods also applies in most states	
Safe Work Australia - NOHSC: Approved Criteria for Classifying Hazardous Substances - [NOHSC:1008]	
Safe Work Australia - NOHSC: National Code of Practice for the Labelling of Workplace Substances - [NOHSC: 2012].	
Safe Work Australia - National Standard - Storage and Handling of Workplace Dangerous Goods - [NOHSC: 1015]	
Safe Work Australia - Guidance Note - Placarding Stores for Dangerous Goods & Specified Hazardous Substances - [NOSHC:3009]	
Safe Work Australia - National Model Regulation for the Control of Workplace Hazardous Substances - [NOHSC:1005]	
Safe Work Australia - National Code of Practice for the Control of Workplace Hazardous Substances - [NOHSC:2007]	

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Safe Work Australia – National Code of Practice for the Control of Scheduled Carcinogenic Substances - [NOHSC:2014]
Safe Work Australia – National Code of Practice for the Safe Use of Synthetic Mineral Fibres NOHSC:2006(1990)]
Safe Work Australia – Workplace exposure standards for Airborne Contaminants
Safe Work Australia – Guidance on the Interpretation of Workplace Exposure Standards for Airborne Contaminants
Safe Work Australia - National Standard for Synthetic Mineral Fibres [NOHSC:1004]
Safe Work Australia - Managing the Work Environment and Facilities: Code of Practice
Safe Work Australia - Managing risks of hazardous chemicals in the workplace: Code of Practice
Safe Work Australia – Managing Noise and Preventing Hearing Loss at Work: Code of Practice
Safe Work Australia – Labelling of Workplace Hazardous Chemicals: Code of Practice
Safe Work NSW - Labelling of workplace hazardous chemicals: Code of Practice
Safe Work NSW - Managing the Work Environment and Facilities - Code of Practice
Safe Work NSW - Managing Noise and Preventing Hearing Loss at Work: Code of Practice
Safe Work NSW - Managing risks of hazardous chemicals in the workplace: Code of Practice
Safe Work NSW - Spray painting and powder coating: Code of Practice
Safe Work NSW - Welding processes: Code of Practice
Work Safe QLD - Labelling of workplace hazardous chemicals: Code of Practice
Work Safe QLD - Managing risks of hazardous chemicals in the workplace: Code of Practice
Work Safe QLD - Managing noise and preventing hearing loss at work: Code of Practice
Work Safe QLD - Spray painting and powder coating: Code of Practice
Work Safe QLD - Welding processes: Code of Practice
Work Safe Vic – Hazardous Substances: Code of Practice
Work Safe Vic – Noise: Compliance Code
WorkSafe ACT - Work Health and Safety (Labelling of Workplace Hazardous Chemicals: Code of Practice) Approval
WorkSafe ACT - Work Health and Safety (Managing Noise and Preventing Hearing Loss at Work): Code of Practice
WorkSafe ACT - Work Health and Safety (Managing risks of hazardous chemicals in the workplace): Code of Practice Approval
AS 4332: *Storage and Handling of Gases in Cylinders*
AS 1319: *Safety signs for the occupational environment*
AS/NZS 60335.2.69:2017, Household and similar electrical appliances - Safety - Particular requirements for wet and dry vacuum cleaners

8. Additional Information

Asbestos Management MMR
Occupational Exposures MMR
Emergency Response Plan
Emergency Response Plan - (Construction) Template

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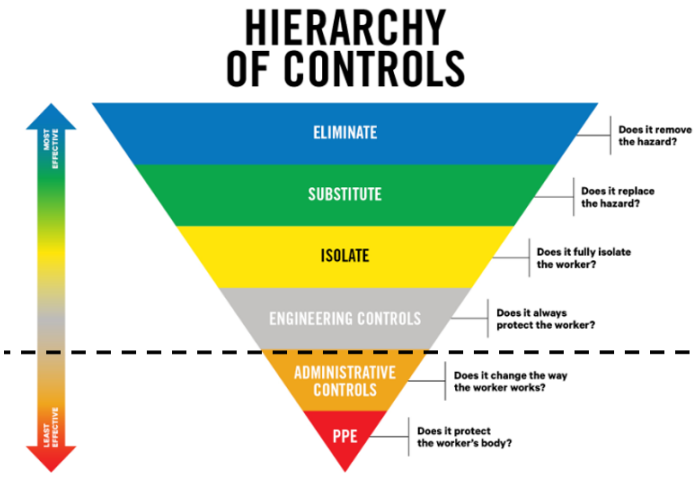
9. Hierarchy of Controls Triangle – Occupational Exposures



- Off-site pre-fabrication in safely designed cutting rooms
- Order to size to prevent need to cut respirable particles
- Utilise products that do not give off respirable particles
- Use cast-in channel systems for anchor points/brackets

- Use products that give off particles that are not hazardous
- Use direct fastening methods instead of drilling and anchoring
- Use vacuums instead of sweeping

- Establish well-ventilated, segregated work area (cutting room with adequate ventilation)
- Locate RCS area away from other workers

- HEPA filter extraction fans for fumes
- Use wet cutting to supress particles
- Use vacuum extraction on tools

- Reduce dust through good housekeeping practices:
  - Hose down and mop surfaces
  - Bag waste before placing in bin
- Exposure monitoring

- Fit-tested respiratory protective equipment (P2 minimum)
- Full body suit for cutting or grinding work

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