



CORPORATE PROCEDURE FOR
**HAZARDOUS AIRBORNE FIBRE MANAGEMENT – SMF
INSTALLATION AND REMOVAL
CS-OHS-3**

Responsible Officer: Principal Adviser Health and Safety

Approved: General Manager Operations

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Issue Date	Nature of Changes
05/10/2010	Amended issue references exposure levels and action chart for air monitoring

1. Purpose

To provide a procedure for the management and control of synthetic mineral fibre (SMF) and glass fibre based substances.

To ensure a safe working environment in relation to the use and handling of synthetic mineral fibre (SMF) based materials and products at CS Energy workplaces.

To ensure compliance with the relevant requirements of:

- The Workplace Health and Safety Regulations in regard to hazardous substances, and
- The NOHSC compliance standards and Codes of Practice.

2. Scope

This procedure applies to CS Energy workplaces where:

- synthetic mineral fibres are present,
- activities involve their installation or removal,
- any related handling or other work may disturb the fibres.

This procedure covers all work and processes involving the installation, removal or handling of any material or article comprised wholly or partly of:

- Synthetic Mineral Fibres - mineral wool (rockwool and slagwool),
- glasswool (including superfine glass fibre) and,
- ceramic fibres, by which a SMF dust can be given off.

Where this procedure does not adequately control the exposure risks for particular situations, then additional site-specific procedures are to be developed and included into the job safety and environmental analysis (JSEA), or the project health and safety plan and safe work method statement.

Note: This procedure does not apply to the use of continuous glass filament, which is used as a reinforcing agent in resins. The safe working practices for the use of this material requires a different approach due to the effects associated with the use of materials such as catalysts and resins. Safe work practices are to adhere to the manufacturers recommendations for hazard controls in the relevant Material Safety Data Sheet (MSDS) for that product.

3. Responsibilities

3.1 Site Managers

- Ensure that appropriate training and supervision is provided to enable workers to safely perform work associated with synthetic mineral fibres (SMF).
- Action is taken to apply control strategies on a continuing basis to reduce exposure to SMF to the lowest workable levels.
- Ensure procurement, operating and maintenance procedures adopted for the use of SMF at the workplace are appropriately managed.
- That the duties and authorities for the management of SMF are allocated to competent personnel within the organisation.

- Ensure sufficient resources and budget control strategies are implemented for exposure monitoring, health assessments and the provision of personal protective equipment.
- A primary point of contact is nominated for addressing site related SMF issues.

3.2 Supervisors/Contractors

- Provide adequate instruction and supervision to enable workers to safely perform SMF tasks. The extent of the instruction and training is to be appropriate to the duties of the workers and sufficient detail given so they understand the procedural safety requirements and the reasons for those requirements.
- Select materials or product-forms for the SMF work so as to minimise the release of fibres and or dust.
- Ensure personal protective equipment is supplied and worn when SMF work is being undertaken.
- Arrange for monitoring of the work area during SMF removal and review results to below the set action and exposure levels.
- Ensure work party /team members follow proper procedures to minimise the creation and spread of fibres and or dusts.
- Ensure that the disposal of SMF waste is carried out in accordance with the requirements of the local waste disposal authority.

3.3 Workers

- Shall take care, to the degree to which the employee is capable, that their safety and the safety of others is not affected by the way SMF is used at work.
- Ensure that SMF work is carried out in accordance with this procedure and any safe work methods and as instructed.
- Shall wear, when required, and in the manner instructed any personal protective equipment which is supplied for use with SMF.
- Shall report, any observed unhealthy or unsafe work practices or behaviours, associated with SMF to their supervisor or the CS Energy site Health and Safety Coordinator or Health and Safety Representative.
- Participate in any instruction, risk assessment, JSEA development or training program provided for the safe use of SMF.

4. Actions

4.1 SMF Exposure Register

Each site will established and maintain an SMF Exposure Register, to record all persons who have been potentially exposed to airborne SMF levels in excess of the exposure standard at the site (typically for personnel engaged in SMF installation or removal activities - < 0.5 f/ml or < 2mg/m³ inspirable dust). The details of individuals' exposures will be recorded and entered onto the site Exposure Register and the individual is to be notified of the record.

The Forms and Exposure Register will be filed and retained for a minimum of 30 years.

4.2 Procurement

The procurement of SMF is to be undertaken to ensure that the lowest workable amount of fibres become airborne when the SMF is selected. Preference is to be given to suppliers, their products and the form of SMF material so that it minimises the release of

fibres or dust – especially during handling, cutting, and application, shaping or spraying when on site.

Packaged SMF is to be supplied and packaged in a form that minimises release of fibres and is clearly labelled. Material Safety Data Sheets (MSDS) are to be provided with the supply of SMF from the manufacturer.

4.3 Work methods – general

Work practices that are **to be avoided when working with SMF** include:

- Work practices in the vicinity of asbestos materials that may disturb or, damage the asbestos material, cladding, enclosure, sealant or containment barrier,
- Workers using a power tool to clean an SMF product,
- Workers using a high pressure water process to clean an SMF product or to clean up debris from an SMF product,
- Workers using compressed air to clean an SMF product or a surface where debris from an SMF product is present.

Workers working with SMF in proximity to asbestos materials (where there is a likelihood they may come into contact with the material) are to:

- wear personal protective equipment appropriate for the work being performed,
- wear a particulate respirator (P2), and
- disposable coveralls as a precautionary measure.

This requirement is to be included in the JSEA and risk assessment for the works.

A CS Energy Permit to Work (PTW) or Access Permit must be obtained prior to the removal of SMF products or materials associated with plant. All SMF removal work must be checked (prior to commencing work) with the Site Asbestos Officer to ensure the work and location are compared against the site Building and Plant Asbestos register and do not contain asbestos products.

4.4 Pre-planning for SMF Removal

For all SMF removal, the CS Energy Supervisor or Contractor Supervisor shall ensure that a Job Safety and Environment Analysis (JSEA) or “work method statement” is prepared. The JSEA is to include the following: -

- the presence of asbestos is excluded by reference to the Building and Plant Asbestos Material and Products Register or by obtaining identification via laboratory analysis of fibre samples,
- the establishment of clearly defined, signed and barricaded zones for SMF removal – designation of work areas using barricade tape and signs is to be utilised for all work involving SMF. Employees not engaged in SMF work should not be within 3 metres of the work area.
- the JSEA is to be discussed with the workers involved and they understand and are able to comply,
- how the work will be supervised,
- regular work area inspections by the site
- arrangements for training the workers involved in the work,
- any circumstances at the workplace that will, or are likely to effect the way the work is performed

- clean areas and dirty areas,
- spray equipment, vacuum cleaning equipment, cutting tools,
- general hygiene and health requirements,
- that personal air sampling monitors may be worn by workers within the work area to ensure/check that the removal process has adequate features to minimise exposure to SMF fibres,
- the specific methods of removal, containment and disposal;
- the types of personal protective equipment to be worn; and
- the requirements for an air monitoring program to ensure that controls have been adequate
- the results of any sample testing, air monitoring results and its location/date/contact name.

4.5 Disposal

All SMF materials and products removed from site shall be disposed of to a licensed waste depot (Local Authority) in the approved manner. All disposals shall be recorded (date, quantity, disposal contract etc) in an appropriate register (eg within the sites waste management plans for disposal of regulated wastes).

Where any buildings or essential plant are disposed of (offered for sale or lease, dismantled or demolished) and contain SMF materials or products, the new owner/buyer is to be advised.

4.6 Inspection

All SMF materials and products are to be inspected by an appropriately qualified person:

- a. prior to work commencing in the immediate area,
- b. after removal or repair works are performed, and
- c. on an annual basis.

The results of these inspections are to be recorded and any necessary actions taken to minimise the release of fibres.

4.7 SMF spills/contamination

Where suspected spills or damage has occurred to SMF material, lagging, covers etc. the following is to be implemented:

- The location of the potential contamination is to be reported to the Site Asbestos Officer.
- CS Energy trained workers are to respond (they are to wear suitable respiratory protection, gloves and disposable coveralls), assess the risks associated with the spill and secure the affected area, plant or equipment using warning tape and signs,
- Ensure any exhaust extraction, air conditioning systems, fans, wind sources are controlled to prevent further spread of the contamination,
- The areas below and adjacent or above are secured to prevent materials dropping or passing into those areas – (attention is to be paid to ledges, tops of ducts/pipes, cracks in the floor, folds in the cladding, crevices and material in the grid mesh flooring),
- Use surface soaking sprays to wet down the material

- Use plastic sheeting and adhesive tape to seal or encapsulate the affected area or plant,
- Use materials such as plastic drop sheets, bunding material and or suitable adsorbent material to contain the water spray and run off,
- Clean up the affected areas using suitable tools (soft brushes, mops, dust pans etc.) and if necessary vacuum using HEPA filters,
- Apply sealant or repairs to the damaged areas to prevent further contamination,
- Inspect the work to ensure all suspect materials have been removed,
- All contaminated articles and clothing are to be bagged in suitable disposal bags and be disposed off as SMF waste,
- Set up an air monitor in the work area to monitor airborne fibre concentrations and secure the work area until the results are obtained,
- Send the sample off for testing and determine the exposure level,
- Undertake further SMF removal work to make the area safe using a JSEA or safe work method statement,
- Provide details of the material sample results and monitoring results to the workers involved that may have been exposed,
- Maintain records of the incident reporting, investigation and health assessments with the SMF Exposure Register

5.0 Installation and removal of Synthetic Mineral Fibres (SMF)

5.1 The Installation and Removal of SMF Materials

The installation and removal of SMF shall be conducted in accordance with the requirements for hazardous substances as specified in the Queensland WH&S Regulations and 'Hazardous Substances Advisory Standard', the Glasswool and Rockwool Industry Code of Practice and the NOHSC National Code of Practice for the Safe Use of Synthetic Mineral Fibres

- a. Packaging and transport of materials shall be done so as to minimise the release of fibres and or dust.
- b. All packages will be clearly labelled to identify the presence of SMF contained within the package.
- c. SMF shall be stored inside appropriately sealed packages and located in a secure, clean and low traffic area. Partially used lots shall be resealed for storage.
- d. Where possible, SMF material should be ordered in a form and shape that requires a minimum of cutting and handling on site.
- e. Work practices must comply with the manufacturer's recommendations in the relevant Material Safety Data Sheet (MSDS) for hazard control and must minimise the release of, and exposure to, fibres and/or dust.
- f. All installed SMF material will be appropriately encapsulated, enclosed and/or sealed as far as is practical to minimise the release of airborne fibres into the workplace atmosphere. The integrity of this containment will be maintained for the duration of its application.
- g. Correct tools must be used for the task. Where required, manual tools should be used to trim or cut SMF materials.

- h. SMF dust shall be minimised by dampening or wetting of the material where practical during removal or handling.
- i. Cleaning shall be by industrial vacuum cleaner (with HEPA filtration), but wet mopping and wiping is acceptable if vacuuming is not workable.
- j. Removed SMF materials are to be placed directly into sealed (industrial strength) plastic bags and/or covered disposal bins and disposed of as an industrial waste. (It should not be confused with asbestos through the use of "Asbestos" labelled bags.) Where cross-contamination occurs and SMF cannot be distinguished from asbestos, the material will be treated as asbestos, unless otherwise confirmed by laboratory analysis.
- k. Work areas where SMF has been handled or the material has been exposed to the workplace, are to be cleaned regularly to remove any build up of fibres and/or dust. Visible waste material should be removed promptly to avoid being trampled and spread about.
- l. At the completion of the removal and/or installation process the worksite must be made free of debris and visible waste material and thoroughly cleaned by either vacuuming or washing.
- m. For SMF applications where there is likely to be exposure to fibres, airborne monitoring will be conducted to confirm that exposures do not exceed recommended exposure limits (<0.5 f/ml or < 2mg/m³ inspirable dust).
- n. Where monitoring identifies exposure levels are exceeded work is to be stopped and suitable controls adopted to ensure the SMF work is managed to be below these levels. Persons exposed to those levels are to have their names recorded on the SMF exposure register.

5.2 Personal Hygiene

Adequate washing facilities shall be available, on site, to wash and treat both eye and skin irritation.

General hand washing facilities shall be available.

Amenity rooms shall be kept free of any fibres and/or dust as far as is workable.

5.3 Air monitoring and sampling

To meet the requirements of the exposure levels set out in the Codes of Practice air sampling and monitoring is to be conducted. This will confirm that the work practices are being followed to minimise the release of airborne fibres.

- While any issues relating to establishing respirable fibre concentrations are being conducted, respirators are to be worn in the SMF work area.
- Air sampling is to be undertaken by adequately trained personnel in accordance with the SMF membrane filter method.
- The supervisor for the SMF work area is to ensure that each employee who works with SMF is kept informed of the results of all monitoring and assessment of exposure levels. Air monitoring results are to be kept with the JSEA or PTW.

SMF AIR MONITORING ACTION CHART	
Air monitoring results	Actions
Levels > 0.5 f/mL	Stop work. Exposure levels exceeded. Immediately clean up SMF work. List persons exposed to SMF in the site exposure register. Provide medical support and checks as necessary. Modify work practices and controls – conduct

	continuous monitoring to reduce levels to below exposure levels and target level of 0.05 f/mL.
0.05 to < 0.5 f/mL	Stop work and modify controls to ensure airborne fibres are minimised to below 0.05 f/mL. Clean up work area and implement continuous air monitoring.
0.01 to < 0.05 f/mL	Monitor controls and maintain SMF work practices – conduct air monitoring at regular intervals – minimum once per shift.
0.00 to < 0.01 f/mL	Continue SMF work with existing controls in place.

6.0 Personal Protective Equipment

For all SMF jobs, information on the relevant MSDS for hazard control must be adhered to (eg. particularly the type of respiratory protection devices that may be required). The minimum requirement for respiratory protection is an approved disposable particulate respirator or half face respirator fitted with particulate cartridges (with P2 filtration) to be worn. The level of protection (filtration) may be increased where a greater risk of exposure has been identified. Employees who are not clean-shaven should use a full-face respirator or positive air-purifying respirator (PAPR) with P2 filtration.

6.1 Inspection/Preparation Work

All other work involving inspection or preparation work (where there is less exposure risk) will be required to wear as a minimum an approved disposable particulate respirator or half face respirator fitted with particulate cartridges (with P2 filtration). The level of protection (filtration) may be increased where a greater risk of exposure has been identified or determined by the air monitoring.

6.2 PPE – General Issues

Employees are to be trained in the correct use of respiratory protection and other forms of personal protective equipment.

- Respirators shall be correctly fitted, maintained in good condition and kept in clean storage when not in use.
- Replaceable filters, cartridges and disposable respirators shall be replaced regularly, in accordance with guidelines issued by the manufacturer.
- All respirators shall comply with the provisions of Australian Standards AS1715 and AS 1716.
- Safety goggles or face shields shall be worn to avoid eye irritation or injury, especially when performing overhead work.
- Skin irritation is to be minimised by the use of gloves and loose fitting long garments which includes high visibility clothing (long sleeves and long pants) or with disposable coveralls.
- Disposable coveralls as issued are to be worn if fibre release is expected during the work. These disposable garments should be disposed of in the plastic bags with the other wastes associated with the job.

7.0 Education and Training

People who work with SMF shall be provided with adequate information, instruction and training on:

- The corporate and site-specific procedures/work method statements/JSEAs for the safe handling and disposal of SMF.
- Health risks information relating to SMF handling and or exposure.
- The importance of controlling the creation of fibrous dust in the atmosphere to the lowest workable levels.
- The probable exposure levels associated with the type of job.
- How safe work practices, such as control measures, respiratory protective equipment and protective clothing can be used effectively, and their limitations.
- The role and significance of air monitoring.
- Employer and worker responsibilities and legislative requirements.

3.5 Responsibilities

Site Manager shall ensure that for the site:

- Resources are allocated to implement this procedure
- Workers are made available for training in SMF awareness and installation and removal work processes.
- The Plant and Building Asbestos Material and Products Register is maintained for the site.
- The SMF Exposure Register is maintained for the site.

Team Leader/Supervisory Personnel shall ensure where SMF work is to be carried out that:

- Those involved attend an SMF training session
- The site Asbestos Officer is informed of any SMF work
- Legislative requirements and appropriate procedures are complied with.
- Report immediately to their supervisor any perceived SMF risk.
- Advise the site Asbestos Officer at the completion of the work.

Contract Administrator at each CS Energy worksite shall:

- Ensure adequate resources are allocated for synthetic mineral fibre (SMF) works,
- Ensure the site Asbestos Officer and Health and Safety Coordinator is advised of any SMF works.
- Ensure that contractors and workers involved in SMF works are advised of the CS Energy Corporate and Site procedures, the site Building and Plant Asbestos Materials and Products Register,
- Ensure contractors JSEAs, work method statements and SMF removal plans are in accordance with the CS Energy corporate and site procedures,
- Ensure all workers involved in SMF installation and removal works are trained,
- Monitor contract requirements for all SMF installation and removal projects to ensure compliance with CS Energy procedures, codes of practice, national standards and Legislative requirements,
- Liaise with the Site Health and Safety Coordinator and site Asbestos Officer on SMF works.

Site Health and Safety Coordinator is responsible to:

- Advise on SMF issues, site controls and actions,
- Liaise with site management team, contractors, safety representatives and Committee members,
- Conduct audits on SMF installation and removal major works.

Asbestos Officer at each CS Energy worksite shall:

- Action requirements outlined in the Asbestos Report and Register,
- Update the Building and Plant Asbestos Materials and Products Register
- Update the SMF Exposure Register,
- Ensure that a hard copy of the Building and Plant Asbestos Materials and Products Register is current, issued, available and accessible by each occupier and anyone entering the site to perform SMF work
- Ensure contractors, employers or others who propose to dismantle any part of a building or essential plant, carry out SMF work involving a part of the building or plant are given relevant details from the Building and Plant Asbestos Materials and Products Register or a copy of the register,
- Ensure that a copy of the Building and Plant Asbestos Materials and Products Register is given to the buyer of a building or essential plant,
- Ensure where a person is exposed to SMF in excess of the SMF exposure levels or to asbestos that CS Energy's procedures for SMF or asbestos management are followed.

Competent Person at each SMF installation and removal worksite shall:

- Develop, review and approve health and safety plans, site procedures, work method statements, and JSEAs,
- Supervise and consult with workers on SMF removal works,
- Ensure all workers involved in SMF works are trained
- Ensure compliance with all Legislative requirements on all SMF works
- Carry out SMF job health and safety inspections regularly,

Chemist/Asbestos Tester at each CS Energy worksite shall:

- Be responsible for organising the testing of products for SMF/asbestos content.

Workers are responsible for:

- Ensuring that no SMF is removed without prior notification to their team leader, supervisor, contract administrator or the site Asbestos Officer.
- Complying with the plans, procedures, work method statements or JSEAs developed for the work.
- Advising their supervisor of any changes to the work being done or the work environment,
- Being consulted on the development of site procedures, work method statements or JSEAs,
- Notifying their supervisor immediately where a person detects or is exposed to levels exceeding the national exposure levels (SMF < 0.5 f/ml or < 2mg/m³)

inspirable dust). The supervisor shall advise actions to ensure the situation is rendered safe and initiate appropriate measures to control and/or eliminate the hazard.

4.0 Definitions

Asbestos Material – Those specific asbestos products defined as any ‘installed thermal or acoustic insulation materials comprising or containing asbestos’. The definition does not include all asbestos products, some of which are not specifically used for insulation purposes, such as Asbestos Cement (A-C) Sheeting.

Asbestos Officer - a nominated person at each CS Energy worksite, who has:

- specific training and knowledge in the area of hazardous fibres and their management,
- asset and plant maintenance knowledge and authority, and
- has been nominated by the Site Manager to be responsible for the maintenance of the Plant and Building Asbestos Material and Product Register and the Exposure Register.

Asbestos Product – anything that contains asbestos material (e.g. asbestos cement sheeting, galbestos etc.).

Competent Person - for SMF Installation or Removal is a person who has received specific training for SMF removal by a Registered Training Organisation (RTO).

Ceramic Fibres - are amorphous, glassy, predominantly alumino-silicate materials which are created from molten masses of either alumina and silica or naturally occurring kaolin clays. Australian materials are only made from alumina and silica melts.

Containment Barrier – means a barrier, erected around an SMF removal area,

Contract Administrator – is the CS Energy person in charge of a contract, contractor or workgroup.

Exposure Standard - means an airborne concentration of a particular substance in the workers breathing zone, exposure to which, according to current knowledge, should not cause adverse health effects nor cause undue discomfort to nearly all workers. SMF – actual exposure that exceeds 0.5 respirable f/mL.

Glass fibre - (SMF) may be reinforcing filament, glasswool or superfine glassfibre as a particle with a length to width ratio of a least 3:1.

Glasswool - (SMF) is a fibrous product formed by either blowing or spinning a molten mass of glass. The resultant fibres are subsequently collected as an entangled matt of fibrous product.

Material Safety Data Sheets - (MSDS) are documents that describe the properties and uses of a substance, that is, identity, chemical and physical properties, health hazard information, precautions for use and safe handling information.

Micrometer – (um) represents one thousandth of a millimetre.

Mineral Wool - (SMF) is a fibrous product manufactured by the process of blowing or spinning from a molten mass of raw material. The resultant fibres are subsequently collected as an entangled matt of fibrous product. Mineral wool may be either slagwool or rockwool, depending upon the raw material from which it is produced.

Plant – includes air conditioning plant, boilers, turbines, cooling towers, escalators, lifts and piping.

Reinforcing Filament - (SMF) is an extruded filament usually having a relatively large diameter, greater than 6 micrometres, and a very narrow range of diameter distribution. It is typically formed from a glass melt.

Rockwool - (SMF) is a fibrous product manufactured by a process of blowing or spinning from a molten mass of rock. In Australia it is usually basalt.

Slagwool - (SMF) is a fibrous product manufactured by a process of blowing or spinning from a molten mass of metallurgical furnace slag.

SMF - means Synthetic Mineral Fibres.

Superfine Glassfibre - (SMF) is an extremely fine fibre with a diameter less than 1 micrometre, usually made of glass for specialist applications.

Team Leader/Supervisor - is the person in charge of a workgroup or team.

Respirable fibre – is a particle with a diameter less than 3 micrometers and a length greater than 5 micrometers and a length to width ratio of greater than 3:1. These fibres can reach the deepest part of the lung.

TWA (time weighted average)

5.0 Reference Documentation

- AS 1715 Selection, Use and Maintenance of Respiratory Protective Devices.
- National Occupational Health and Safety Commission - Technical Report on Synthetic Mineral Fibres and Guidance Note on the Membrane Filter Method for the Estimation of Airborne Synthetic Mineral Fibres. 1989.
- National Occupational Health and Safety Commission - Synthetic Mineral Fibres National Standard and National Code of Practice. 1990.
- Queensland Workplace Health and Safety Act 1995.
- Workplace Health and Safety Regulation & Hazardous Substance Advisory Standard 2003.
- Glasswool and Rockwool Industry Code of Practice 2000.