MSD 003 Procedure Manual

Asbestos Removal Procedure

Revision Status					
Rev	Issue Date	Reason for Issue	Prepared	Checked	Approved
A	02-03-2026	Issued for Comments	R. Versluis	D. Wijngaard	W. Van Lingen
1	19/05/2026	Issued for Implementation	R. Versluis	D. Wijngaard	W. van Lingen

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Revision Log

Rev.	Date	Section	Description of Change	Reason
1	**19/05/26**		Issued for Implementation	Initial Issue

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1. Purpose and Scope

The purpose of this procedure is to establish the minimum requirements for the safe management and removal of asbestos-containing materials (ACMs) during offshore and onshore operations performed under the control of Koole Offshore Operations (KOO).

This procedure defines the requirements for:

- planning and preparation of asbestos removal activities
- risk classification and work area controls
- safe removal methods, including approved wetting and suppression techniques
- use of personal protective equipment (PPE)
- prevention of exposure to asbestos fibres
- handling, packaging, storage, transport, and disposal of asbestos-containing waste
- emergency response and incident reporting
- monitoring and verification activities

This procedure applies to all KOO personnel, contractors, and subcontractors involved in asbestos-related activities performed under the operational control of KOO.

Activities involving asbestos removal shall be performed in accordance with applicable legislation, industry requirements, approved asbestos inventory information, and project-specific risk assessments.

Project-specific arrangements, workpacks, permits, notifications, and execution details shall be defined within the applicable project execution documentation.

Static and non-project-specific asbestos management requirements, work methods, and control measures are governed by this procedure.

2. Definitions and Abbreviations

ACM	Asbestos-Containing Material
DTA	Deskundig Toezichthouder Asbest
PPE	Personal Protective Equipment
RPE	Respiratory Protective Equipment
RK	Risk Classification
SIMOPS	Simultaneous Operations
LOTOTO	Lock Out / Tag Out / Try Out
EX-zone	Explosive Atmosphere Area
Batteryspray Method	Approved wet removal method for asbestos gasket removal using controlled wetting and fibre suppression techniques.
Bonded Asbestos	Asbestos-containing material where fibres are fixed within a solid matrix.

3. Roles and Responsibilities

3.1. Management

Management shall ensure that asbestos-related activities performed under the operational control of KOO are properly planned, resourced, supervised, and executed in accordance with applicable legislation, company requirements, and project-specific arrangements.

Management shall ensure that:

- competent personnel are assigned
- suitable equipment and PPE are available
- required training and certification requirements are maintained
- adequate supervision is provided
- asbestos-related risks are assessed and controlled

3.2. QHSE Department

The QHSE Department shall:

- support asbestos-related compliance activities
- provide guidance on applicable legislation and company requirements
- review applicable risk assessments and work methods where required
- support incident investigations and lessons learned
- monitor compliance with this procedure

3.3. Project Management and Supervisors

Project management and supervisors responsible for asbestos-related activities shall:

- coordinate and supervise the work activities
- ensure personnel are briefed before work starts
- verify that required equipment, PPE, and worksite controls are in place
- ensure applicable permits, risk assessments, and workpack documentation are available
- stop work where unsafe conditions or uncontrolled exposure risks exist
- ensure housekeeping standards are maintained throughout the activity
- verify completion of inspections, waste handling, and worksite clearance activities

Where required, supervisors shall ensure that asbestos-related activities are performed under the control of competent and authorised personnel.

3.4. Personnel

Personnel involved in asbestos-related activities shall:

- comply with this procedure and applicable work instructions
- use required PPE and equipment correctly
- follow approved asbestos removal methods
- report unsafe conditions, equipment defects, or uncontrolled exposure risks
- maintain good housekeeping standards
- attend required briefings and training activities
- stop work and report concerns where safe execution cannot be maintained

Personnel shall avoid unnecessary disturbance of asbestos-containing materials and shall not improvise removal methods or worksite controls.

4. Procedure Requirements

4.1. Regulatory and Inventory Requirements

Before asbestos-related activities commence, the following information shall be available where applicable:

- approved asbestos inventory information
- asbestos survey reports
- risk classification details
- applicable permits and notifications
- project-specific risk assessments
- workpack documentation
- applicable client requirements

Asbestos-related activities shall be planned based on the findings of the applicable asbestos inventory and risk assessment documentation.

Where asbestos-containing materials cannot be positively identified or classified, work shall stop until the material has been assessed by a competent person.

Applicable notifications, permits, and regulatory requirements shall be completed before asbestos removal activities commence.

4.2. Risk Classification

Asbestos removal activities shall be classified in accordance with applicable legislation and the identified exposure risk.

The selected removal method, control measures, PPE requirements, supervision level, and waste handling arrangements shall be based on the applicable risk classification.

Additional control measures may be required for:

- non-bonded asbestos-containing materials
- degraded materials
- confined spaces
- elevated work areas
- offshore environments
- SIMOPS activities
- live process systems

4.3. Asbestos Removal Methods

Asbestos removal activities may include:

- standard removal methods
- wet removal methods
- source control measures
- glovebag techniques where applicable
- approved wetting and fibre suppression systems
- Batteryspray removal methods

The selected removal method shall be based on:

- asbestos inventory information
- risk classification

- work location
- accessibility
- environmental conditions
- exposure risk assessment
- applicable legislation and industry requirements

4.4. Work Locations and Work Environments

This procedure may apply to asbestos-related activities performed on:

- offshore installations
- process installations
- piping systems
- vessels and transport units
- industrial equipment
- temporary work locations
- decommissioning projects

Additional controls may be required for:

- live installations
- confined spaces
- elevated work areas
- offshore environments
- SIMOPS activities

4.5. Work Preparation

Before asbestos removal activities commence, the worksite shall be prepared to minimise the risk of asbestos fibre release, contamination, and uncontrolled exposure.

Preparation activities shall include:

- verification of applicable work documentation, permits, and risk assessments
- inspection of the worksite and surrounding area
- establishment of work area barriers and access controls
- verification of required PPE and equipment
- installation and testing of approved removal equipment
- confirmation of waste handling arrangements
- confirmation that applicable process systems have been isolated where required

Applicable personnel shall be instructed on:

- the scope of work
- removal methods
- exposure risks
- emergency arrangements
- waste handling requirements
- stop-work criteria

Where approved wetting or suppression systems are used, equipment shall be inspected and tested before work starts.

Additional controls may be required for:

- offshore environments
- confined spaces
- elevated work areas
- SIMOPS activities
- live process systems
- EX-zones

4.6. Asbestos Removal Methods

4.6.1 General Removal Requirements

The selected asbestos removal method shall be based on:

- asbestos inventory information
- material condition
- risk classification
- accessibility
- environmental conditions
- exposure risk assessment
- applicable legislation and industry requirements

Work shall be planned and executed to minimise the release and spread of asbestos fibres.

Dry removal techniques shall be avoided where reasonably practicable.

Where asbestos-containing materials cannot be safely removed using the planned method, work shall stop and the situation shall be reassessed.

Work areas shall remain clean and organised throughout the activity.

Asbestos-containing waste, contaminated materials, and disposable PPE shall be collected, packaged, labelled, and transferred to designated waste storage locations.

4.6.2 Batteryspray Method

The Batteryspray method may be used for the controlled removal of chrysotile-containing flange gaskets where permitted by the applicable risk assessment and asbestos inventory information.

The method shall only be used by personnel trained and authorised in the use of the Batteryspray system.

The method shall not be used where:

- equipment temperatures exceed 75°C
- freezing conditions may affect the wetting agent
- environmental conditions prevent effective wetting of the work area
- adequate fibre suppression cannot be maintained

A minimum of two persons shall be involved during removal activities using the Batteryspray method.

Before removal activities commence:

1. Inspect and prepare all required equipment.
2. Install spill containment and absorbent materials.
3. Verify the correct setup of the wetting and spray systems.
4. Confirm suitable collection arrangements for contaminated liquids and waste.
5. Test all spray nozzles and equipment connections.

During removal activities:

1. Maintain continuous wetting of the gasket surfaces.
2. Prevent dry removal or uncontrolled scraping.
3. Ensure contaminated liquids are collected and controlled.
4. Stop work immediately if adequate wetting cannot be maintained.
5. Package asbestos-containing waste in sealed and labelled packaging.

After completion of the work:

1. Inspect and clean all equipment.
2. Verify that the work area is clean and free from visible contamination.
3. Remove barriers only after the work area has been released by the responsible supervisor.
4. Transfer waste materials to the designated asbestos waste storage area.

4.7. Work Completion and Clearance

Following completion of asbestos removal activities:

- the work area shall be inspected
- visible contamination shall be removed
- waste materials shall be transferred to designated storage locations
- reusable equipment shall be inspected and cleaned where applicable
- contaminated disposable materials shall be disposed of as asbestos waste

Where required by legislation, project requirements, or risk classification, clearance inspections or verification activities shall be completed before the work area is returned to normal use.

Work completion records and inspection findings shall be documented in accordance with applicable project and company requirements.

4.8. Equipment and Personal Protective Equipment

4.8.1 Equipment

Equipment used during asbestos-related activities shall be suitable for the work scope, inspected before use, and maintained in safe working condition.

Depending on the work scope and removal method, equipment may include:

- approved Batteryspray systems
- asbestos-rated vacuum cleaners
- ATEX-certified equipment where required
- manual and powered hand tools
- access equipment such as ladders, scaffolding, and elevated work platforms
- decontamination equipment
- spill containment equipment
- asbestos waste containers
- lifting and handling equipment
- gas detection equipment where applicable

Where required, scaffolding, lifting equipment, electrical equipment, and access systems shall be inspected and certified in accordance with applicable legislation and company requirements.

Only approved equipment suitable for asbestos-related activities shall be used.

4.8.2 Personal Protective Equipment

Personnel involved in asbestos-related activities shall use suitable PPE based on:

- the applicable risk classification
- the removal method
- exposure risk assessment
- worksite conditions
- applicable legislation and company requirements

Depending on the work scope, required PPE may include:

- respiratory protective equipment (RPE) with suitable filtration
- half-face or full-face respirators
- disposable protective coveralls
- gloves suitable for the task
- safety footwear
- eye and face protection
- flame-retardant clothing
- anti-static clothing
- hearing protection
- fall protection equipment
- lifejackets for offshore activities

Where gas or vapour exposure risks exist, additional gas detection and escape equipment may be required.

PPE and RPE shall:

- be inspected before use
- be maintained in suitable condition
- be compatible with the work environment
- be suitable for the identified hazards

Contaminated disposable PPE shall be handled and disposed of as asbestos-containing waste where applicable.

Applicable PPE requirements shall be defined within the project risk assessment, permit-to-work system, and workpack documentation.

4.8.3 Safety Equipment and Worksite Controls

Suitable safety equipment and worksite controls shall be available during asbestos-related activities where applicable.

Depending on the work scope and work environment, this may include:

- work area barriers and warning tape
- warning signage
- firefighting equipment
- first aid equipment
- eyewash facilities
- spill response equipment
- lighting arrangements
- communication equipment

- confined space rescue arrangements
- containment systems
- isolation and LOTOTO controls
- gas monitoring equipment

Worksite controls shall be established to:

- restrict unauthorised access
- minimise exposure risks
- prevent contamination spread
- support emergency response arrangements
- maintain safe working conditions throughout the activity

Additional controls may be required for offshore operations, confined spaces, elevated work areas, EX-zones, and SIMOPS activities.

4.9. Hygiene and Exposure Controls

Asbestos-related activities shall be planned and executed to minimise personnel exposure and prevent the spread of asbestos contamination.

Appropriate hygiene and exposure control measures shall be implemented based on:

- the applicable risk classification
- the removal method
- the condition of the asbestos-containing material
- the work environment
- the exposure risk assessment

Work areas shall be controlled to minimise the release and spread of asbestos fibres.

Personnel shall:

- avoid unnecessary disturbance of asbestos-containing materials
- avoid dry removal techniques where reasonably practicable
- prevent the spread of contamination outside the work area
- follow applicable decontamination and waste handling arrangements
- inspect PPE and equipment before leaving the work area

Additional hygiene and decontamination arrangements may be required for:

- higher-risk asbestos activities
- degraded or non-bonded asbestos-containing materials
- confined spaces
- offshore environments
- activities involving elevated contamination risks

Where required, entry and exit arrangements for controlled work areas shall be defined within the applicable project risk assessment or workpack documentation.

4.10. Asbestos Waste Handling and Disposal

Asbestos-containing waste shall be handled, packaged, stored, transported, and disposed of in a controlled manner to prevent the release and spread of asbestos fibres.

All asbestos-containing waste shall be:

- sealed in suitable airtight packaging

- clearly labelled with applicable asbestos warning labels
- protected against damage during handling and transport
- transferred to designated storage or disposal locations

Depending on the work scope and waste type, packaging methods may include:

- asbestos waste bags
- PE sheeting
- container bags
- glovebags
- big bags
- sealed waste containers

Contaminated disposable PPE, absorbent materials, filters, cleaning materials, and other contaminated consumables shall be treated as asbestos-containing waste where applicable.

Temporary storage arrangements shall prevent:

- unauthorised access
- environmental exposure
- package damage
- uncontrolled release of contamination

Where required, asbestos-containing waste shall be stored in:

- designated asbestos waste containers
- sealed skips or storage units
- lockable storage areas
- approved intermediate storage locations

Transport and disposal of asbestos-containing waste shall comply with applicable:

- environmental legislation
- dangerous goods transport requirements
- waste transport requirements
- project-specific arrangements
- approved waste contractor requirements

Waste transport documentation shall be completed where required.

Asbestos-containing waste shall only be transferred to approved waste contractors or authorised disposal facilities.

4.11. Emergency Response

In the event of uncontrolled asbestos release, exposure incident, equipment failure, or other emergency situation:

- work shall stop immediately
- the affected area shall be secured
- affected personnel shall be instructed to remain under control until assessment is completed
- contaminated personnel or equipment shall be managed in accordance with applicable decontamination arrangements
- the incident shall be reported in accordance with company reporting requirements

Additional emergency arrangements may be defined within project-specific documentation.

5. Records and Documentation

The following records shall be maintained where applicable:

- asbestos inventory and survey information
- applicable permits and notifications
- risk assessments and workpack documentation
- inspection and clearance records
- training and competency records
- equipment inspection and maintenance records
- waste transport and disposal documentation
- exposure monitoring records where applicable
- incident and non-conformance reports
- worksite inspection records

Records shall be retained in accordance with applicable legal, client, and company requirements.

6. Monitoring and Review

This procedure shall be reviewed periodically to ensure continued compliance with:

- applicable legislation
- industry guidance
- operational requirements
- lessons learned from projects and incidents

The effectiveness of asbestos management controls shall be monitored through:

- inspections and audits
- project reviews
- worksite inspections
- incident investigations
- personnel feedback
- review of asbestos-related work activities

Where improvement opportunities are identified, this procedure shall be updated accordingly.

7. References

The following references may apply to this procedure where applicable:

- applicable asbestos legislation and regulations
- approved asbestos inventory reports
- NEN 2990
- company Permit to Work procedures
- company PPE procedures
- company waste management procedures
- project-specific risk assessments and workpacks
- applicable industry guidance and certification requirements

Annex I. Batteryspray Method Overview

Purpose

The Batteryspray method is an approved wet removal technique used to minimise asbestos fibre release during removal of chrysotile-containing flange gaskets.

General Requirements

- Only trained and authorised personnel may use the Batteryspray system.
- A minimum of two persons shall be present during removal activities.
- Continuous wetting shall be maintained during gasket removal.
- Work shall stop immediately if adequate wetting cannot be maintained.

Method Limitations

The method shall not be used when:

- equipment temperatures exceed 75°C
- freezing conditions affect the wetting agent
- environmental conditions prevent effective wetting
- uncontrolled fibre release may occur

Typical Work Sequence

1. Prepare and inspect equipment.
2. Install spill containment and absorbent materials.
3. Test spray nozzles and wetting system.
4. Wet gasket and flange surfaces continuously.
5. Remove bolts and separate flanges carefully.
6. Remove gasket material using controlled wet methods.
7. Package contaminated materials immediately.
8. Inspect and clean work area.

Annex II. Example Work Area Controls

Typical Work Area Controls

Depending on the work scope and risk assessment, work area controls may include:

- work area barriers
- warning signage
- restricted access zones
- spill containment arrangements
- waste collection points
- designated equipment staging areas
- exclusion zones around removal activities

Offshore Considerations

Additional controls may be required for:

- elevated work areas
- overboard exposure risks
- confined spaces
- SIMOPS activities
- EX-zones
- adverse weather conditions

Annex III. Example PPE and RPE Requirements

Activity	Minimum PPE/RPE Requirement
General asbestos gasket removal	Coveralls, gloves, safety glasses, suitable RPE
Batteryspray removal activities	FR coveralls, goggles, gloves, suitable RPE
Work in offshore process areas	Standard offshore PPE + task-specific PPE
Elevated work activities	Fall protection equipment where required
EX-zone activities	Anti-static clothing and approved equipment
Waste handling activities	Gloves, coveralls, eye protection
Contaminated liquid handling	Chemical-resistant gloves and splash protection

General Requirements

- PPE and RPE shall be inspected before use.
- Damaged PPE shall not be used.
- Contaminated disposable PPE shall be treated as asbestos waste.
- Additional PPE requirements may apply based on the risk assessment and permit-to-work requirements.