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<b>Technical rules for Hazardous substances</b>	<b>Asbestos - Demolition, renovation or maintenance work</b>	<b>TRGS 519</b>
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The Technical Rules for Hazardous Substances (TRGS) reflect the state of the art, occupational medicine and occupational hygiene, as well as other established occupational science findings for activities involving hazardous substances, including their classification and labelling.

You will be informed by the

**Committee on Hazardous Substances (AGS)**

and announced by the Federal Ministry of Labour and Social Affairs in the Joint Ministerial Gazette.

This TRGS specifies requirements of the Ordinance on Hazardous Substances within its scope of application. If the Technical Rules are complied with, the employer can assume that the corresponding requirements of the Ordinance are met. If the employer chooses a different solution, he must achieve at least the same level of safety and health protection for the employees.

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## Annex 10 to TRGS 519 Qualification module 1E - Qualification for supervisors using recognised low-emission processes according to TRGS 519 Number 2.9

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## 1 Scope of application

- (1) TRGS 519 applies to the protection of employees and other persons during activities involving asbestos and asbestos-containing materials during demolition, renovation or maintenance work (AS1 work) and during waste disposal.
- (2) This TRGS does not apply to activities involving potentially asbestos-containing mineral raw materials and mixtures and products made from them in accordance with TRGS 517.
- (3) This TRGS does not apply to activities involving other fibrous dusts. For activities involving old mineral wool, TRGS 521 "Demolition, renovation and maintenance work with old mineral wool" applies.
- (4) TRGS 519 specifies the general requirements for the protection of employees and other persons according to the Ordinance on Hazardous Substances and in particular its Annex I No. 2.4 "Supplementary regulations for protection against hazards from asbestos", taking into account the concept of the exposure-risk relationship for carcinogenic substances according to TRGS 910 "Risk-related measures concept for activities with carcinogenic hazardous substances".
- (5) TRGS 910 describes for asbestos:
  1. an acceptance concentration of 10,000 fibres/m<sup>3</sup>, which corresponds to an acceptance risk of 4 : 10,000 and which, if undershot, is associated with a low, acceptable cancer risk.
  2. a tolerance concentration of 100,000 fibres/m<sup>3</sup>, which corresponds to a tolerance risk of 4 : 1,000 and which, if exceeded, is associated with a high unacceptable cancer risk above which workers should not be exposed. The risks and the concentration values derived from them are based on a working life of 40 years with continuous exposure every working day.
- (6) Due to the special circumstances of the activities with asbestos permitted according to GefStoffV Annex II No. 1 Paragraph 1 within the framework of demolition, renovation and maintenance work and the fibre concentrations in the respiratory air to be encountered, the scope of this TRGS also includes activities in which the tolerance concentration of 100,000 F/m<sup>3</sup> is usually exceeded. For this application, too, the TRGS describes how the protection of workers can be adequately ensured by means of a graduated concept of measures and personal protective equipment.
- (7) For work on plasters, fillers and tile adhesives containing asbestos and other formerly used chemical construction products with comparable asbestos content (hereinafter referred to as PSF), Annex 9 provides guidance on risk assessment and the determination of protective measures and specifies the required qualifications.
- (8) Based on the regulations of TRGS 910, Annex 9 assigns activities on PSF to the risk areas of TRGS 910 in an exposure-risk matrix and specifies the necessary protective measures and qualification requirements. The contents of the exposure-risk matrix are continuously supplemented by further activities and procedures.



(9) If the regulations of the TRGS are deviated from, at least equivalent protective measures must be taken and their effectiveness must be proven in individual cases. The deviation must be justified in the documentation of the risk assessment.

## 2 Definitions

### 2.1 Demolition work

(1) Demolition work within the meaning of this TRGS includes the complete demolition (dismantling) of structural installations or parts thereof, the scrapping of vehicles, including ships, the dismantling of installations or equipment, etc., including the necessary ancillary work.

(2) Demolition work within the meaning of this TRGS also includes the complete removal of asbestos-containing materials from or from structural installations or parts thereof, as well as from vehicles, ships and equipment, including the necessary finishing work.

Such demolition work may concern e.g.

1. weakly bonded asbestos products,
2. Asbestos cement products,
3. asbestos-containing screeds, floor coverings, adhesives, fillers, paints, coatings.

(3) Maintenance work as defined in points 17.3 and 17.4 shall not be considered as demolition work, even if no asbestos-containing parts remain in relation to the installation under consideration after completion of the measure.

### 2.2 Redevelopment work

Remediation work within the meaning of this TRGS includes the coating and spatial separation of weakly bound asbestos products, including the necessary ancillary work, as well as preliminary construction measures within the meaning of the asbestos guidelines of the Länder.

### 2.3 Maintenance work

Maintenance work within the meaning of this TRGS includes all measures to maintain the target condition (maintenance), to determine and assess the actual condition (inspection) and to restore the target condition (repair). Maintenance work includes the ancillary work required for this purpose as well as activities in accordance with Number 17 of this TRGS.

### 2.4 Ancillary work

Secondary works are all preparatory, accompanying and final works within the scope of the ASI works covered by this TRGS where an asbestos tex- position may exist, e.g.

1. Walking in rooms contaminated with asbestos dust,

2. Sampling (material samples, air measurement),
3. Clearing out rooms contaminated with asbestos dust,
4. Setting up construction sites, insofar as the release of asbestos fibres cannot be ruled out,
5. Cleaning rooms or objects contaminated with asbestos dust,
6. operational transport and storage of materials containing asbestos.

## 2.5 Waste disposal

Waste disposal within the meaning of this TRGS includes activities involving asbestos-containing waste during treatment (e.g. solidification), packaging, in-house transport, preparation for transport, storage and activities in connection with the disposal of devices and components containing asbestos (e.g. removal of parts containing asbestos from fire doors, night storage heaters, fittings).

## 2.6 Asbestos and materials containing asbestos

(1) For the purposes of this technical rule, asbestos is defined as the following silicates with a fibrous structure:

1. Actinolite,
2. Amosite,
3. Antophyllite,
4. Chrysotile,
5. Crocidolite,
6. Tremolite.

(2) Materials containing asbestos are mixtures and products that contain asbestos and where the performance of an activity may lead to the generation or release of asbestos dusts.

## 2.7 Qualified persons

(1) According to § 2 Paragraph 14 of the Ordinance on Hazardous Substances (GefStoffV), a person is considered to be competent if he or she has extended his or her existing expertise by successfully participating in an officially recognised course of instruction in the use of materials containing asbestos.

(2) Proof of expertise for ASI work with asbestos is provided by successful participation in an officially recognised training course for work with materials containing asbestos (for course content see Annexes 3 and 4 to this TRGS). Proof of successful participation must be provided in the form of an examination.

(3) The certificates of competence shall be valid for a period of six years. By way of derogation from sentence 1, certificates of competence acquired before 1 July 2010 shall remain valid until 30 June 2016. If an officially recognised further training course is attended during the period of validity of the certificate of competence, the period of validity shall be extended by six years, calculated from the date of the certificate of completion of the further training course. The minimum requirements for the training courses are described in Annex 5.

(4) For activities with low exposure according to 2.8, at least the expertise according to Annex 4 is required. If only low-emission procedures recognised by the authorities or by the statutory accident insurance institutions are used in accordance with 2.9, the following shall be required in application of the exemption regulation in accordance with Annex I No.

2.1 sentence 3 of the Ordinance on Hazardous Substances (GefStoffV), proof of qualification in accordance with Annex 10 is sufficient for the supervising person instead of a certificate of competence.

(5) Participation in an officially recognised training course in accordance with Appendix 3 includes the acquisition of the expert knowledge in accordance with Appendix 4 and the qualification in accordance with Appendix 10.

(6) Participation in an officially recognised training course in accordance with Appendix 4 shall include proof of qualification in accordance with Appendix 10.

## 2.8 Activities with low exposure

Low-exposure activities are low-risk activities within the meaning of TRGS 910, in which the acceptance concentration of 10,000 fibres/m<sup>3</sup> is not exceeded (for determination of the asbestos fibre concentration, see 4.3 paragraph 1). If such activities are carried out inside buildings, it must be demonstrated after completion of all work that the concentration of fibres in the indoor air is below 500 F/m<sup>3</sup> and the upper Poisson value is below 1,000 F/m<sup>3</sup> (measurement according to VDI 3492).

## 2.9 Low emission processes

The term "low-emission processes" includes those activities in accordance with 2.8 that have been tested and recognised by the authorities or by the statutory accident insurance institutions. The basis for the corresponding testing is the assessment standards established by the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA). The procedures recognised by the statutory accident insurance institutions are published in BGI 664 with current supplements<sup>1</sup> (for the determination of the asbestos fibre concentration within the scope of the procedure qualification, see No. 4.3 (2)).

## 2.10 Small scale work

(1) Work with weakly bonded asbestos can be classified as minor work if it can be demonstrated in a risk assessment for the entire object (e.g. plant, building, operating site) that the following conditions are fulfilled at the same time:

1. No more than 2 workers will be employed for the work;
2. the total working time required to complete the work with asbestos, including the ancillary work to be carried out on site in accordance with Number 2.4, in particular cleaning, does not exceed four man-hours (clearance measurements in accordance with Number 14.5 do not count towards the scope of the work);
3. the fibre concentration does not exceed 100 000 fibres/m<sup>3</sup> at any time during the work.

Examples of small-scale work are given in point 14.4.

(2) Small-scale work pursuant to paragraph 1 shall not be deemed to exist if it is determined or foreseeable in the course of planning for the object as a whole that such work will have to be carried out repeatedly. This shall also apply if, in the event of repetition, the individual works are carried out by different personnel.

(3) In the case of work for the removal of asbestos cement boards in outdoor areas, work of a small scale is present if the total area is less than 100 m<sup>2</sup>.

## 2.11 Weakly bonded asbestos products

Weakly bonded asbestos products, e.g. sprayed asbestos, asbestos-containing lightweight boards, asbestos boards, sealing cords, generally have a bulk density of less than 1000

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<sup>1</sup> see [www.dguv.de](http://www.dguv.de)

kg/m<sup>3</sup>. Exceptions for building products are described in the asbestos guidelines of the federal states.

## **2.12 Asbestos cement products**

Asbestos-cement products are prefabricated, cement-bound products with an asbestos content of usually less than 15% by weight and a bulk density of more than 1400 kg/m<sup>3</sup>. They are considered as firmly bound asbestos products.

## **2.13 Other asbestos products**

In the case of other asbestos products not meeting the definitions in point 2.11 or 2.12, the fibre release potential must be assessed comparatively. For example, vinyl asbestos sheets (so-called flex sheets) and IT gaskets (rubber-asbestos gaskets) are considered to be firmly bonded products.

## **2.14 Responsible person (point 5.1)**

(1) Depending on the organisation and responsibility structure of a company carrying out activities within the meaning of this TRGS, it is not inevitable that

1. the employer must hold the expertise according to TRGS 519,
2. the "qualified person" always has the authority to plan the protective measures, to procure the necessary equipment and to ensure that it is in good working order, and to give instructions on the implementation of the protective measures when carrying out the activities.

(2) For these reasons, the employer who carries out activities within the meaning of this TRGS must appoint a responsible person who can assume these tasks and duties. Necessary prerequisites for this are expertise and the authority to issue instructions to the employees. The responsible person may also perform the tasks of the supervisor or the coordinator (see below).

## **2.15 Supervisor (point 5.2)**

When carrying out the work, at least one competent person authorised to give instructions must be active on site as a supervisor. This person must be familiar with the work, the hazards involved and the necessary protective measures. The tasks of the supervisor are described in 5.2. By way of derogation from sentence 1, proof of qualification in accordance with Annex 10 shall be sufficient for activities in which only low-emission processes recognised by the authorities or by the statutory accident insurance institutions are used.

## **2.16 Skilled personnel (point 5.3)**

Due to the high risk involved in carrying out activities within the meaning of this TRGS, employees must be able to carry out the work properly and safely and to operate the safety equipment correctly.

and to monitor them. Companies that carry out activities with weakly bound asbestos products must have a competent person who regularly checks the safety equipment to ensure that it is ready for operation and in proper condition.

## **2.17 Coordinator (Number 6 or § 15 Paragraph 4 GefStoffV)**

If an employer carrying out activities with asbestos puts employees of other employers at risk from asbestos, it is the coordinator's task to ensure that a joint risk assessment is drawn up and followed and that possible mutual risks **are** avoided. In this relationship, the coordinator must be authorised to give instructions to all parties involved. Therefore, it is necessary that the coordinator either has the expertise according to 2.7 himself, otherwise he must seek advice from such a competent person.

## **3 Approval and display**

### **3.1 Approval**

Demolition and renovation work on weakly bonded asbestos products, with the exception of the use of low-emission methods according to Number 2.9, may only be carried out by specialist companies that have been approved by the competent authority to carry out this work (GefStoffV, Annex I No. 2.4 Paragraph 4). Within the scope of the approval procedure, proof of adequate personnel and safety equipment must be provided (see No. 5).

### **3.2 Notification to the authority**

(1) The competent authority must be notified of work with materials containing asbestos at least 7 days before the start of the work. The employees and the works council or staff council shall be granted access to the notification. A copy of the notification shall be sent to the competent statutory accident insurance institution.

(2) These notifications may be company-related or object-related (for specimens see Annexes 1.1 and 1.3 to this TRGS). Company-related notifications are to be addressed to the occupational health and safety authority responsible for the place of business, object-related notifications to the occupational health and safety authority responsible for the location of the object. A copy of the company-related notification must be kept at the workplace.

(3) The advertisement must contain the following information in particular:

1. Location of the workplace,
2. Asbestos products and quantities,
3. activities to be carried out and procedures used,
4. Number of employees involved,
5. Start and duration of activities,
6. Measures to limit exposure to asbestos and other protective measures,

## 7. Measures and place of waste treatment.

If the seven-day period cannot be observed in the case of urgent work, the competent authority may agree to a shortening of the period. In this case, the works council or staff council must be involved by the employer.

(4) For changing workplaces (e.g. construction sites), an object-related notification is required. Deviating from this

1. for activities with low exposure according to point 2.8,
2. for small-scale work in accordance with Number 2.10, Paragraph 3, and
3. for maintenance work in accordance with Number 17, provided that no additional protective measures are required in accordance with Number 14,

a company-related advertisement is sufficient.

(5) In the case of small-scale work, the place and time of the work to be carried out must be notified to the occupational health and safety authority responsible for the place of the activity before the work begins, in addition to the company-specific notification. This can be done informally and at short notice by fax or e-mail (for a sample, see Annex 1.2 "Supplementary notification of place and time"). A copy of the notification must be sent to the competent statutory accident insurance institution.

(6) Company-related notifications are also made for stationary workplaces.

(7) Company-related notifications must be made again after six years at the latest and in the event of a change of competent persons or significant changes to the work process or protective measures.

(8) In the case of ASI work on materials containing asbestos, the notification must include proof that the company's personnel and safety equipment are suitable for this work. This also applies to operators of waste disposal plants. By way of derogation from this, the enclosure of the approval may suffice for approved companies.

(9) The risk assessment with work plan (see Annexes 1.4 and 1.5 of this TRGS) and the operating instructions (specimen see Annexes 1.6 and 1.7) must be submitted with the notification.

### 3.3 Commissioning of subcontractors

(1) If subcontractors are commissioned for ASI work with asbestos, the client is responsible for ensuring that only specialist companies with the necessary personnel and safety equipment are used for the work.

(2) The client must ensure that the subcontractor is informed of the other company-specific sources of danger and rules of conduct before the work begins.

(3) As employers, subcontractors are fully subject to the requirements of this TRGS. This also applies to subcontractors (sole traders) without employees.

## 4 Information gathering and risk assessment

### 4.1 Assessment of the hazards of working with asbestos

(1) In order to assess the working conditions in accordance with § 6 of the Ordinance on Hazardous Substances, the employer must first determine, before starting ASI work and the ancillary work required for it, whether the employees are carrying out activities with materials containing asbestos or whether dusts containing asbestos are released during these activities. In particular, it must be determined whether asbestos is present in weakly bound form. The employer must obtain the relevant information from the client or builder. If there is any doubt, a qualified assessment, e.g. by a competent person in accordance with section 2.7, must be carried out and, if necessary, material samples must be examined.

The information required to assess the working conditions includes

1. Type and designation of the existing asbestos-containing materials as well as
2. their mechanical condition and the corresponding effect on the fibre release behaviour (e.g. in the case of changes in the fibre bond due to damage, wear, weathering, fire exposure),
3. Presence of other hazardous substances, e.g. PAHs in asbestos-containing coatings or contamination due to use ("contaminated areas", see TRGS 524 "Protective measures for activities in contaminated areas").

(2) The risk assessment must be carried out in relation to the activity. The following points must be taken into account

1. Quantity of asbestos-containing materials,
2. Extent and duration of inhalation exposure,
3. Working conditions and working procedures, including the work equipment used,
4. necessary protective measures,
5. Specifications for checking the effectiveness of the protective measures taken.

(3) In addition to those directly involved in activities involving materials containing asbestos, other employees or other persons shall also be included in the risk assessment if their health and safety may be endangered as a direct consequence of the activity and their presence in the asbestos-contaminated working area is indispensable.

(4) The risk assessment must be documented before the start of the activity (see Annexes 1.4 and 1.5). The protective measures must be specified in the documentation. The risk assessment must be updated in the event of significant changes.

(5) For activities with PSF, the exposure-risk matrix according to Annex 9 contains an aid for risk assessment and the determination of protective measures.

### 4.2 Work plan

(1) Before commencing ASI work with asbestos and the disposal of asbestos-containing



waste, the employer must draw up a work plan on the basis of the risk assessment.

(2) The work plan shall in particular describe the following:

1. Procedures and working techniques as well as facilities for the protection and decontamination of workers and other persons working in the hazardous area,
2. Information on personal protective equipment,
3. Information on the release of the work area after completion of the work,
4. Information on waste treatment and preparation for collection at the work site.

(for further details see Annexes 1.4 and 1.5)

In the event of significant changes, the work plan shall be updated.

#### **4.3. Determination of the asbestos fibre concentration**

(1) The determination of the asbestos fibre exposure to prove compliance with the acceptance and tolerance concentration is carried out in accordance with Annex 6.1 of this TRGS with reference to TRGS 402 "Determining and assessing the hazards of activities involving hazardous substances: Inhalation exposure".

(2) For the recognition of low-emission processes according to section 2.9, the asbestos fibre concentration is determined according to the criteria specified by the AGS (see Annex 6.2).

(for the application of the different methods for determining the asbestos fibre exposure according to paragraph 1 and paragraph 2, see Appendix 6.3).

(3) The determination of the asbestos fibre concentration in accordance with paragraphs 1 and 2 shall be carried out by means of the scanning electron microscope method in accordance with BGI 505-46 suitable for monitoring workplaces.

(4) If measurements are required, they may only be carried out by measuring bodies that have the necessary expertise and the required facilities. The employer who commissions a measuring body accredited for the measurement of fibre dusts can assume that the findings determined by this measuring body are accurate<sup>2</sup>.

(5) The documentation of the measurement results according to paragraph 1 shall be carried out in accordance with TRGS 402, number 7 paragraph 3.

(6) Measurements prior to the lifting of protective measures shall be carried out in accordance with the state of the art in measurement technology, e.g. VDI 3492.

### **5 Requirements for personnel and safety equipment**

(1) ASI work with asbestos may only be carried out if it is ensured,

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<sup>2</sup> Accredited measuring points see <http://www.bua-verband.de/gefahrstoffmessstellen.html>

that the company's personnel and safety equipment are suitable for this work.

- (2) Sufficient staffing shall only be deemed to exist if the requirements under 5.1 to 5.3 are met.
- (3) Sufficient safety equipment for ASI work with As- best is present if the requirements according to Number 8 and, depending on the type of activity, the requirements according to Numbers 14 to 17 are fulfilled.
- (4) The requirements of paragraphs 1 to 3 shall also apply to waste disposal.

### **5.1 Responsible person**

The employer who carries out ASI work with asbestos or handles waste containing asbestos must appoint a competent responsible person. Establishments subject to approval in accordance with Number 3.1 must also have a competent representative. The requirements for expertise depend on the type and scope of the work (see 2.7). This responsible person must ensure that the requirements of this TRGS are already taken into account when planning work and are implemented when carrying out the work. The responsible person or his deputy may also perform the functions under 5.2 or 6.

### **5.2 Supervisor**

- (1) Before work is started, the employer must appoint in writing at least one reliable person who is familiar with the work and the hazards involved and the necessary protective measures to act as supervisor (see also § 8 DGUV Regulation 1 "Principles of prevention" and § 4 DGUV Regulation 38 or 39 "Construction work"). The supervisor must be authorised to issue instructions. For information on the requirements for expertise and qualifications, see section 2.7.
- (2) The supervisor shall make sure that the workers are
  1. have been instructed in accordance with the operating instructions,
  2. are instructed in the use of personal protective equipment.
- (3) He shall in particular ensure that
  1. work is not started until the protective measures specified in the risk assessment and the work plan have been taken,
  2. the work procedures on which the operating instructions or the work plan are based are not changed,
  3. the workers observe the protective measures provided for during work and use the personal protective equipment,
  4. the workplace is marked and, if necessary, cordoned off and unauthorised persons are kept away from the workplace,
  5. the work site is cleaned after completion of the work and remains marked and cordoned off until the work is released.

- (4) The supervisor must be present on site at all times during the work.
- (5) In the case of low-exposure work and ancillary work in accordance with section 2.4, it is sufficient for a competent person to be responsible for and supervise the individual spatially separated workplaces in order to fulfil the requirements in sections 5.1 and 5.2.

### **5.3 Specialist staff**

- (1) The enterprise must have a sufficient number of skilled workers who are able to carry out the work properly and safely and to operate and monitor the necessary safety equipment, e.g. the extraction and disposal systems and the airlock systems.
- (2) Safety equipment used for work in accordance with Number 14 must be regularly inspected by a competent person. The competent person must have sufficient knowledge of activities involving materials containing asbestos and be familiar enough with the operation and maintenance of the safety equipment to be able to safely assess the safe working condition and function of the safety equipment. The necessary specialist knowledge can be demonstrated, for example, by a certificate of participation in relevant manufacturer training.

## **6 Coordination (according to § 15 paragraph 4 GefStoffV)**

- (1) If an employer (principal) subcontracts work to other employers (contractors), he must appoint a coordinator if this is necessary to avoid possible mutual hazards. The coordinator must ensure that all parties involved cooperate and coordinate in the risk assessment. The coordinator must be authorised to give instructions on safety matters.
- (2) The coordinator in accordance with paragraph 1 shall ensure that everyone who has to enter workplaces subject to this TRGS is made aware of the risk posed by asbestos fibres and the necessary protective measures.
- (3) If the coordinator does not have the expertise according to 2.7 of this TRGS himself/herself, he/she shall seek advice from a suitably competent person.
- (4) If an employer takes on orders whose execution coincides in time and place with orders of other employers or third parties, he shall be obliged to coordinate with the other employers, the higher-level site management or third parties insofar as this is necessary to avoid mutual endangerment.

## **7 Organisational measures**

- (1) Before demolition work begins, materials containing asbestos must be removed and disposed of in an orderly manner in accordance with the state of the art.
- (2) When working with materials containing asbestos at the workplace, the following measures in particular must be taken:

1. The number of employees in the affected work areas shall be limited to the minimum necessary to carry out the intended work.
  2. Work areas in which activities involving materials containing asbestos are carried out shall be clearly demarcated from other work areas and shall be accessible only to those workers who need to enter them in order to perform their work or carry out specific tasks.
  3. Unauthorised persons are forbidden to enter by the prohibition sign  
"Entry for unauthorised persons prohibited"  
in accordance with ASR A 1.3 "Safety and Health Protection Labelling" with the additional note "Asbestos fibres" (for sample see Annex 2 a to this TRGS).
  4. Sealed-off work areas in which activities involving materials containing asbestos are carried out must be marked with suitable safety signs, in particular the signs "No smoking" and "No eating or drinking".
  5. Waste containing asbestos materials shall be collected, stored, transported and disposed of in suitable containers labelled in accordance with Annex 2b without risk to humans or the environment.
  6. As far as possible, the working areas concerned shall be designed in such a way that they can be cleaned at any time. Regular cleaning of all rooms, facilities and equipment shall be arranged.
- (3) The employer must ensure that asbestos fibres cannot reach other workplaces, asbestos-free rooms or the outside air in accordance with the following rules (see also Nos. 8, 14, 16 and 17 of this TRGS and the asbestos guidelines of the Länder).

## **8 Safety measures**

### **8.1 General requirements**

- (1) The working process must be designed in such a way that asbestos fibres are not released and the spread of asbestos dust is prevented as far as is possible according to the state of the art<sup>3</sup>.
- (2) For activities with low exposure according to Number 2.8, at least the basic measures for the protection of workers according to Number 5 of TRGS 500 shall be carried out.
- (3) If it is not possible to prevent asbestos fibres from being released by taking measures in accordance with paragraph 1, they shall be collected at the point of emission or formation and subsequently disposed of in accordance with the state of the art without risk to humans or the environment.
- (4) If it is not possible to make a complete record in accordance with paragraph 3, the data to be

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<sup>3</sup> To determine the state of the art, see TRGS 460 "Recommendation for action to determine the state of the art".

ventilation measures in accordance with the state of the art.

(5) At the end of the work, tools including suction lines, work equipment and the work area must be carefully cleaned. Objects contaminated with asbestos fibres which cannot be cleaned must be moistened and disposed of in accordance with Number 18, e.g. carpets. After cleaning, the work area must be adequately ventilated.

(6) The exposure-risk matrix in Annex 9 contains activity- and risk-related information and specifications on protective measures for activities involving PSF (for the application of the matrix, see Number 1, Paragraphs 7 and 8 in conjunction with Annex 9).

## **8.2 Special requirements for ventilation measures, ventilation systems, industrial hoovers and dust extractors**

(1) Extracted air must be guided or cleaned in such a way that asbestos fibres are not get into the breathing air of other employees. Any dust produced must be transported in dust-tight containers. Decanting is not permitted.

(2) The asbestos fibre content in the air discharged into the open air must not exceed 1000 F/m<sup>3</sup>. Type-tested industrial hoovers and dust extractors in accordance with the Appendix

7.1 fulfil this criterion. For all other ventilation systems used, compliance with this value must be verified by measurements in accordance with VDI 3861 Sheet 2.

1. during the initial commissioning of the systems,
2. at least every three years.

(3) It must be ensured that the working area is supplied with sufficient fresh air (see e.g. BGR 121).

(4) For activities involving materials containing asbestos, recirculation of purified exhaust air into workrooms is not permitted.

(5) By way of derogation from paragraph 4, recirculation of cleaned exhaust air is permissible for the following activities if the asbestos fibres are collected with industrial hoovers or local dust extractors which comply with the requirements of the installation

7.1 correspond:

1. Low-exposure activities as defined in point 2.8 in enclosed spaces or small-scale work as defined in point 2.10,
2. Cleaning work.

Recirculation of purified exhaust air is also permissible if air purifiers with filters of at least dust class M are used as an additional flanking measure during activities involving PSF in accordance with Annex 9 in order to reduce possible fibre contamination in the working area. The use of an air purifier as the sole protective measure and the removal of exhaust air from the work area are not permissible. The minimum requirements for such air cleaners are described in Appendix 7.2.

(6) Industrial hoovers and local dust extractors used for work in accordance with Paragraph 5 must be type-tested and recognised by the authorities or the statutory accident insurance institutions. The Institute for Occupational Safety and Health of  
- Committee on Hazardous Substances - AGS Management - BAuA -  
[www.baua.de/ags](http://www.baua.de/ags) -

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the

German Social Accident Insurance (IFA) publishes a list of devices recognised by the statutory accident insurance institutions. The basis of the type tests are product-specific standards in conjunction with the requirements specified in Annex 7.1 of this TRGS.

(7) By way of derogation from paragraph 6, mobile dust collectors of dust class M may be used for activities that are recognised as low-emission processes in conjunction with coordinated low-dust processing systems. The specific requirements for dust extractors are set out in the description of the low-emission process.

(8) Ventilation systems, industrial hoovers and mobile dust extractors must be serviced as required, but at least once a year, repaired if necessary and inspected by a competent person (for qualifications see 5.3 paragraph 2) or by a maintenance company. The test result must be presented on request.

(9) Industrial hoovers, dust extractors and air cleaners used in the black area may only be used in the white area after complete cleaning, including of the motor housing. For engines with bypass cooling, the cooling air ducts must also be cleaned.

(10) Electric motors must always be used to drive machines installed indoors, in confined spaces or in working pits. When using petrol- or diesel-powered machines, compliance with the limit values must be ensured, e.g. through

1. Use of exhaust filter systems or catalytic converters in consultation with the machine manufacturer,
2. Discharge of the exhaust gases into the open air,
3. sufficient cross-ventilation of the rooms.

(when operating diesel-powered machines, see TRGS 554 "Exhaust gases from diesel engines")

## **9 Personal protective equipment**

### **9.1 General requirements**

(1) The employer has

1. to provide effective and suitable personal protective equipment and to keep it in a usable and hygienic condition, and
2. to ensure that employees only work for as long as is absolutely necessary for the work process and is compatible with health protection.

(2) Before starting work, the employer must determine which personal protective equipment is to be used. The type and design of the personal protective equipment shall be selected according to the specific conditions of use.

(3) Employees must use the personal protective equipment provided.

(4) When wearing respiratory protection and protective clothing, the wearing time limits according to BGR 190 "Use of respiratory protective equipment" <sup>4</sup> must be observed.

## 9.2 Breathing protection

(1) From an asbestos fibre concentration of 10,000 F/m<sup>3</sup> up to an asbestos fibre concentration of 100,000 F/m<sup>3</sup>, the following are required as respiratory protection devices

1. Particle-filtering half masks FFP2 for short-term activities of a maximum of two hours per shift,
2. Half masks with P2 filter for longer lasting activities,
3. Mask with blower and particle filter TM1P

or higher suitable and to be used<sup>5</sup>.

(2) Respirators with particle filters P3 must be worn in areas with asbestos fibre concentrations of 100,000 F/m<sup>3</sup> to 300,000 F/m<sup>3</sup>. Suitable and to be used are

1. Particle-filtering half masks FFP3 for short-term activities of a maximum of two hours per shift,
2. Half masks with P3 filter for longer lasting activities,
3. Mask with blower and particle filter TM2P

or higher quality respirators. Due to the increased physical strain when using respirators with P3 filters, the use of TM2P fan-assisted respirators is recommended instead, with heating of the breathing air if necessary.

(3) In areas with asbestos fibre concentrations of more than 300,000 F/m<sup>3</sup>, full-face masks with blower and particle filter TM3P or higher-quality respiratory protection equipment must be used, if necessary with heating of the breathing air.

(4) When working with fibre concentrations greater than 4,000,000 F/m<sup>3</sup> (if e.g. dry removal of sprayed asbestos is unavoidable), insulating equipment must be used.

(5) The employer shall ensure that

1. respiratory protective equipment is properly stored, cleaned and maintained,
2. the employees have been instructed accordingly and are trained in the use of the respiratory protective equipment.

(6) Breathing apparatus may only be put on and taken off outside the area endangered by asbestos fibres.

(7) In principle, respiratory protection need not be worn for activities with low exposure in accordance with section 2.8. In the case of activities involving exposure to

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<sup>4</sup> BGI 693 List of certified respiratory protective devices

<sup>5</sup> The specified application limits result from the product of the acceptance concentration of 10,000 F/m<sup>3</sup> with the protection factor to be applied for the respective respirator according to BGR



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190. This ensures that the acceptance concentration is maintained in the inhaled air of the employee when using the respective respiratory protective device.

In case of peak loads (e.g. changing the filters of dust extractors), it is recommended to wear respiratory protection, e.g. P2.

### 9.3 Protective clothing

- (1) Suitable protective suits shall be provided to and worn by the workers. Category III protective suits are suitable, at least type 5-6 (at least type 4 if spray mist and moisture occur).
- (2) Exempted from paragraph 1 are activities in which it has been proven that the asbestos level is below 10 000 F/m<sup>3</sup> and that there is no contact between the asbestos-containing material and the work clothing.
- (4) Disposable protective suits shall be disposed of in accordance with point 18 after leaving the asbestos-contaminated work area.
- (5) The use of reusable protective suits is not recommended for hygienic reasons and should therefore be limited to cases where the use of disposable protective suits is not possible.

### 10 Hygiene measures

- (1) Employees who work with materials containing asbestos are not allowed to eat or drink in work rooms or at their outdoor workplaces. Areas (break areas) must be set up for these employees where they can eat food or drink without their health being affected by hazardous substances.
- (2) When working with materials containing asbestos, employees shall be provided with washing rooms and rooms with separate storage facilities for street clothes and work clothes.
- (3) When working with materials containing asbestos, a shower facility must be provided at the place of work. This requirement is fulfilled, for example, by the use of personnel locks with a wet cell in accordance with Number 14.2. The requirement in accordance with sentence 1 does not apply to activities with low exposure in accordance with Number 2.8, to small-scale work in accordance with Number 2.10 and to work on asbestos-cement products outdoors, provided that this does not last longer than three days in relation to the entire object.
- (4) Reusable protective suits must be decontaminated when leaving the black area.
- (5) Asbestos-contaminated workwear and reusable protective clothing shall be collected in closed containers marked in accordance with Annex 2b and cleaned by the employer. If necessary, it shall be disposed of and replaced by the employer.
- (6) If workwear and reusable protective clothing is handed in for laundering, the laundry must be handed over in closed containers labelled in accordance with Annex 2b and the laundry must be informed of the risk posed by asbestos.

## 11 Instruction of the employees

- (1) Taking into account the risk assessment, the employer shall draw up written workplace instructions in a comprehensible form and language and make them available to the employees.
- (2) The operating instructions must at least contain information on:
  1. the asbestos-containing materials present in the workplace and the health hazards,
  2. reasonable precautions and measures to be taken by the worker for his own protection and for the protection of other workers at the workplace. These include in particular
    - a) Hygiene measures,
    - b) Information on exposure-reducing measures,
    - c) Information on the wearing and use of personal protective equipment,
  3. Measures to be taken in the event of breakdowns, accidents and emergencies and for first aid,
  4. proper treatment and disposal of asbestos-containing waste generated.
- (3) The operating instructions must be updated whenever there is a significant change in working conditions.
- (4) The employer must ensure that the employees are instructed verbally on the basis of the operating instructions about occurring hazards and corresponding protective measures. The instruction must be carried out before the start of employment and thereafter at least once a year in relation to the workplace. It must be given in a form and language that the employees can understand. The content and time of the instruction must be recorded in writing and confirmed by the signature of the instructed person. The documentation of the instruction must be kept at least until the next instruction.
- (5) The following points in particular must be taught during the instruction:
  1. Properties of asbestos and its effects on health, including the exacerbating effect of smoking; if necessary, the company doctor must be consulted,
  2. trade-specific asbestos-containing materials,
  3. activities where asbestos exposure may occur and the importance of exposure reduction measures,
  4. proper use of safe procedures and personal protective equipment,
  5. Measures to be taken in the event of disruptions to the operating process,
  6. proper waste disposal,
  7. occupational health screening.
- (6) The operating instructions and training shall be combined with the work plan in accordance with point 4.2 (for sample operating instructions, see Annexes 1.6 and 1.7 of this TRGS).
- (7) In the case of work in accordance with number 14, the employees shall additionally be object-related

to be instructed with regard to hazards and protective measures.

## 12 Informing employees

(1) In the case of activities involving materials containing asbestos, the employer shall ensure that the employees or their representatives

1. be able to check whether the regulations of the Ordinance on Hazardous Substances and the provisions of this TRGS on risk assessment and the determination of measures - in particular on personal protective equipment - are applied,
2. Obtain access to records of exposure levels and information on their significance.

(2) The employer must inform employees immediately if they may be exposed to unusually high concentrations of hazardous substances during operating conditions that deviate from normal operation. This may be the case in particular in the event of operational disturbances, certain maintenance work or accidents.

(3) Further information rights of works or staff councils and employees are contained in § 14 of the Ordinance on Hazardous Substances.

(4) According to the Occupational Health and Safety Act, employees must immediately report to the employer or the responsible supervisor any immediate significant risk to safety and health that they detect, as well as any defect found in the protective systems.

## 13 Occupational health prevention

### 13.1 Involvement of the company doctor in the risk assessment

(1) In the case of ASI work with asbestos, occupational health prevention generally includes the participation of the company doctor in the risk assessment, general occupational health advice and occupational health screening. The main focus here is on imparting knowledge about the carcinogenic and other chronically harmful properties as well as the stresses caused by wearing personal protective equipment. The severity of the work must be included in the assessment of inhalation exposure.

### 13.2 Occupational medical toxicological counselling

(1) The aim of occupational medical toxicological counselling is to inform the employees at risk, e.g. within the framework of instruction. If possible, the instruction should be given with the participation of the company doctor and should also provide information on the benefits and scope of occupational health screening and encourage participation.

(2) Within the framework of general occupational medical toxicological advice for ASI work with asbestos, it must be pointed out, among other things, that

1. Diseases caused by inorganic dusts such as asbestos can be recognised as occupational diseases under certain conditions. Specifically, the occupational diseases asbestos pulmonary disease (asbestosis), lung cancer or laryngeal cancer in connection with asbestos pulmonary disease (asbestosis) as well as "mesothelioma of the pleura, peritoneum or pericardium caused by asbestos" play a role,
2. the main route of absorption is inhalation of the dust containing asbestos fibres via the respiratory tract and after a latency period of approx. 20-30 years, severe damage to the respiratory organs and cancer can develop. (Both lung cancer and cancer of the larynx can develop after exposure to asbestos. Another typical type of tumour associated with asbestos is mesothelioma. Mesothelioma is a malignant tumour of the pleura, peritoneum or pericardium. The risk of developing cancer tends to increase with increasing doses of asbestos fibres. Malignant mesothelioma has a poor prognosis),
3. Continued inhalation cigarette smoking massively increases the adverse effects of asbestos fibre dust, especially the development of lung cancer, laryngeal cancer and chronic inflammation of the respiratory tract, as the self-cleaning mechanism of the lungs is permanently disturbed,
4. the interaction of asbestos fibre dust and polycyclic aromatic hydrocarbons or ionising radiation in the lungs increases the risk of cancer,
5. inhalable and respirable asbestos fibre dust can lead to permanent damage to the bronchi and lungs with chronic respiratory inflammation and measurable restriction of lung function, as well as to permanent lung skeleton development, which can progress even without continued exposure and is hardly accessible to medical measures,
6. the implementation of the protective measures specified in the operating instructions, including personal protective equipment and occupational hygiene, can significantly reduce health risks.

### 13.3 Occupational health care

(1) Occupational health care is governed by the Ordinance on Occupational Health Care (ArbMedVV) and the Occupational Health Rules (AMR) published for this purpose.

(2) Occupational health screening serves to assess the individual interactions between work and physical and mental health and the early detection of work-related health disorders, as well as to determine whether there is an increased risk to health when performing a particular activity (§ 2 paragraph 1 number 2 ArbMedVV). The focus here is on advising workers on exposure and the resulting risks to their health. If, from the doctor's point of view, physical or clinical examinations are not necessary to provide information and advice or are rejected by the employee, occupational health screening is limited to a counselling interview (section 2, paragraph 1, number 3 ArbMedVV). Before the

When commissioning X-ray examinations, the justifying indication according to the X-ray Ordinance must be critically examined.

(3) Occupational health screening must be arranged by the employer for the employees concerned in accordance with § 4 Paragraph 1 in conjunction with Annex Part 1 Paragraph 1 Number 1 Letter a ArbMedVV before they start work and at regular intervals thereafter (cf. AMR 2.1) (compulsory screening). For workers who (are to) carry out asbestos demolition, asbestos removal or asbestos maintenance work, repeated exposure cannot be ruled out. The employer may only allow the employees concerned to carry out the work if they have previously taken part in the compulsory preventive medical check-up (§ 4 paragraph 2 ArbMedVV). If the workers concerned have to wear group 2 or 3 respiratory protective equipment, the compulsory preventive care for this (Annex, Part 4, Paragraph 1, Number 1 ArbMedVV) should be combined with that for asbestos.

(4) After termination of the activity involving exposure to asbestos, the employer must offer the employees concerned follow-up preventive medical care at regular intervals (cf. AMR 2.1) in accordance with § 5 Paragraph 3 Sentence 1 in conjunction with Annex Part 1 Paragraph 3 Number 1 Letter a ArbMedVV. The offer of occupational health screening then serves the early detection of asbestos-related diseases. Health disorders caused by asbestos exposure are to be expected especially after longer latency periods. Refusal of an offer does not release the employer from the obligation to continue to offer regular preventive care in the form of follow-up preventive care. AMR 5.1 shows one way of making an offer. Provided that the employees have consented, the employer transfers the obligation to offer follow-up preventive care to the competent statutory accident insurance institution at the end of the employment relationship and provides it with a copy of the necessary documents (cf. section 5, paragraph 3, sentence 2 ArbMedVV).

(5) In accordance with § 6 paragraph 3 of the ArbMedVV, the doctor shall record the results and findings of the occupational health screening, including any examination carried out, in writing and advise the employee about them. At the request of the employee, he shall make the results of the preventive medical check-up available to him. The doctor shall issue a certificate to the employee and the employer confirming that occupational health screening has been carried out. The certificate shall contain information on the time and reason for the current preventive medical check-up as well as information on when further preventive occupational health care is indicated from a medical point of view (cf. AMR 6.3). This certificate shall not contain any diagnoses or other information on the employee's state of health or a medical assessment of suitability for certain activities.

(6) According to section 3, paragraph 4 of the ArbMedVV, the employer must keep a preventive medical record of the preventive medical check-ups carried out, stating when and for what reasons they were carried out for each employee.

(7) According to § 6 paragraph 4 ArbMedVV, the doctor shall evaluate the findings from occupational health screening. If there are indications that the occupational health and safety measures are not sufficient, the doctor must inform the employer and propose (supplementary) protective measures for exposed workers. This is done by anonymously passing on findings from occupational health screening with professional commentary, while preserving the following

the interests of the persons examined that are worthy of protection. If the doctor considers a change of activity to be necessary for medical reasons that lie exclusively in the person of the employee, the notification of this to the employer requires the consent of the employee. The AMR contains more specific provisions

6.4 As a consequence of a proposal by the doctor pursuant to section 8, paragraph 1 of the ArbMedVV, the employer shall review the risk assessment and take the necessary occupational health and safety measures without delay. If a change of activity is proposed, the employer shall assign the employee to another activity in accordance with the provisions of service and labour law.

## **14 Special regulations for demolition and remediation work on weakly bonded asbestos products**

(1) Demolition and remediation work on weakly bound asbestos products are e.g. removal of weakly bound asbestos products from roof trusses, walls and ceilings or similar,

Solidification and coating of weakly bonded asbestos products.

State-of-the-art working methods must be used so that as few asbestos fibres as possible are released.

(2) The safety measures must meet the following requirements. The aim of the requirements is to <sup>keep the</sup> asbestos fibre concentration below 1000 F/m<sup>3</sup> in the white areas of airlocks and the surroundings of the working area.

(3) Sprayed asbestos must be treated at the point of accumulation with suitable binding agents in such a way that fibre release is prevented. This can be done, for example, by a combined processing and filling technique in a closed system,

1. which is kept under negative pressure and
2. where material discharge is guaranteed without fibre release.

If it is not possible to work in a closed processing system, the material discharge area shall be designed as a black area with a personnel and material lock.

(4) When removing sprayed asbestos on a large scale, use a high-performance vacuum suction unit capable of generating a negative pressure of at least 35 kPa and consisting of a collecting tank, main and safety filter (clean air concentration < 1000 F/m<sup>3</sup> in accordance with Section 8.2, paragraph 2) and pump, if possible in one block.

(5) Asbestos spray plasters and other weakly bonded asbestos-containing materials should be vacuumed or removed directly from their substructure when damp. Water containing asbestos must not be discharged into the sewage system, but must be sucked up with a high-performance Hoover or a suitable industrial Hoover in accordance with Annex 7.1.

(6) Non-extractable asbestos-containing materials or materials contaminated with asbestos shall be prepared or packaged in the work area in such a way as to prevent the release of asbestos fibres during transport from the point of origin to the landfill or to a central disposal site.

processing plant is excluded. The shredding of materials containing asbestos is not permitted.

(7) Personnel and material locks must be carefully damp cleaned every working day. In cases where damp cleaning is not possible, the airlock must be carefully vacuumed with a suitable industrial Hoover in accordance with Appendix 7.1.

(8) Control measurements in the white area may be necessary, e.g.

1. in the vicinity of locks during prolonged work,
2. in the event of disruption of the planned operating procedure,
3. in the event of damage to the bulkhead.

(9) A voice connection must be available from the work area to the outside.

#### 14.1 Requirements for partitioning and ventilation measures

(1) The working area (black area) must be separated from the environment in a dust-tight manner according to the state of the art (partitioning). The partition must be stable and withstand the suction force of the negative pressure and other stresses. Reusable partitions should be used. The working area shall be kept as small as possible (see also Section 14.5). Partitions shall be installed in such a way that no fibres are released. A bulkheading plan shall be drawn up, the main features of which shall be consistent with the notification in accordance with Number 3.2 must be submitted. Air-conditioning systems installed on site must be taken out of operation during this period.

(2) The ventilation and air-conditioning systems to be installed for carrying out the activities must fulfil the following criteria:

1. they must be sufficiently dimensioned,
2. there must be an exhaust air purification system that fulfils the requirements of Number 8.2 Paragraph 2,
3. the work area must be adequately ventilated to reduce the concentration of asbestos fibres,
4. a sufficient negative pressure must be maintained.

In addition, the regulations of ASR A 3.5 "Room temperature" and ASR A 3.6 "Ventilation" must be taken into account.

(3) The air exchange is sufficient if at least eight times the air exchange rate (fresh air) per hour is achieved in the work area. The required air flow rate must be calculated from the rated output of the ventilation and air-conditioning system in relation to the room volume (without fixtures). The supply air must be routed via defined supply air openings in such a way that an effective flow through the work area is ensured. The air flow must be checked, e.g. by means of smoke tubes. The supply air openings must close automatically when the pressure drops.

(4) The negative pressure is usually sufficient if it is 20 Pa (Pascal) with respect to adjacent rooms during the work. A negative pressure of 50 Pa should not be exceeded. After the end of the shift, the ventilation and air-conditioning system must continue to be operated at the same capacity for at least one hour. After that, a



A negative pressure of 10 Pa is sufficient. The negative pressure must be measured continuously by recording. Recording strips must be kept at least until the measure has been completed.

(5) In the event of a drop in negative pressure, an optical or acoustic alarm must be triggered automatically. In individual cases, it may be necessary to connect the ventilation system to an emergency power supply.

(6) The need to change the filter must be monitored and indicated visually or acoustically.

(7) As a rule, ventilation systems must not be installed in the working area and air lines between the HEPA filter and the suction unit must not be routed through the working area.

## **14.2 Requirements for personnel decontamination facilities (personnel airlocks)**

(1) The work area must only be accessible via sufficiently dimensioned personnel decontamination. The entrance to or exit from the personnel airlocks is not permitted. Material transport through the personnel airlock is not permitted.

(2) As a rule, a multi-chamber system consisting of three chambers with an antechamber or four chambers in a modular system or as a fixed installation in the container,

z. e.g. according to Fig. 1, to be provided with the essential requirements

1. Floors, walls and ceilings of solid, washable, smooth material,
2. Wet room with automatic shower and hand shower,
3. self-closing chamber doors,
4. Directed air flow through the airlock in the direction of the black area; this can be achieved, for example, by maintaining negative pressure in chamber 3 and anteroom or chamber 4 with negative pressure measurement in chamber 3, whereby the negative pressure must not be higher than in the black area (working area),
5. Diagonal ventilation of all chambers with at least a tenfold air exchange per hour in chamber 3 and the anteroom or chamber 4; it must be ensured that there are no draughts,
6. Ensuring adequate indoor air and water temperatures,
7. Discharge of the shower water into the sewage system.

An air shower can also be used as an anteroom or chamber 4 for pre-cleaning. Air showers may only be used instead of wet showers if they have been approved by the authorities or by the employers' liability insurance association.

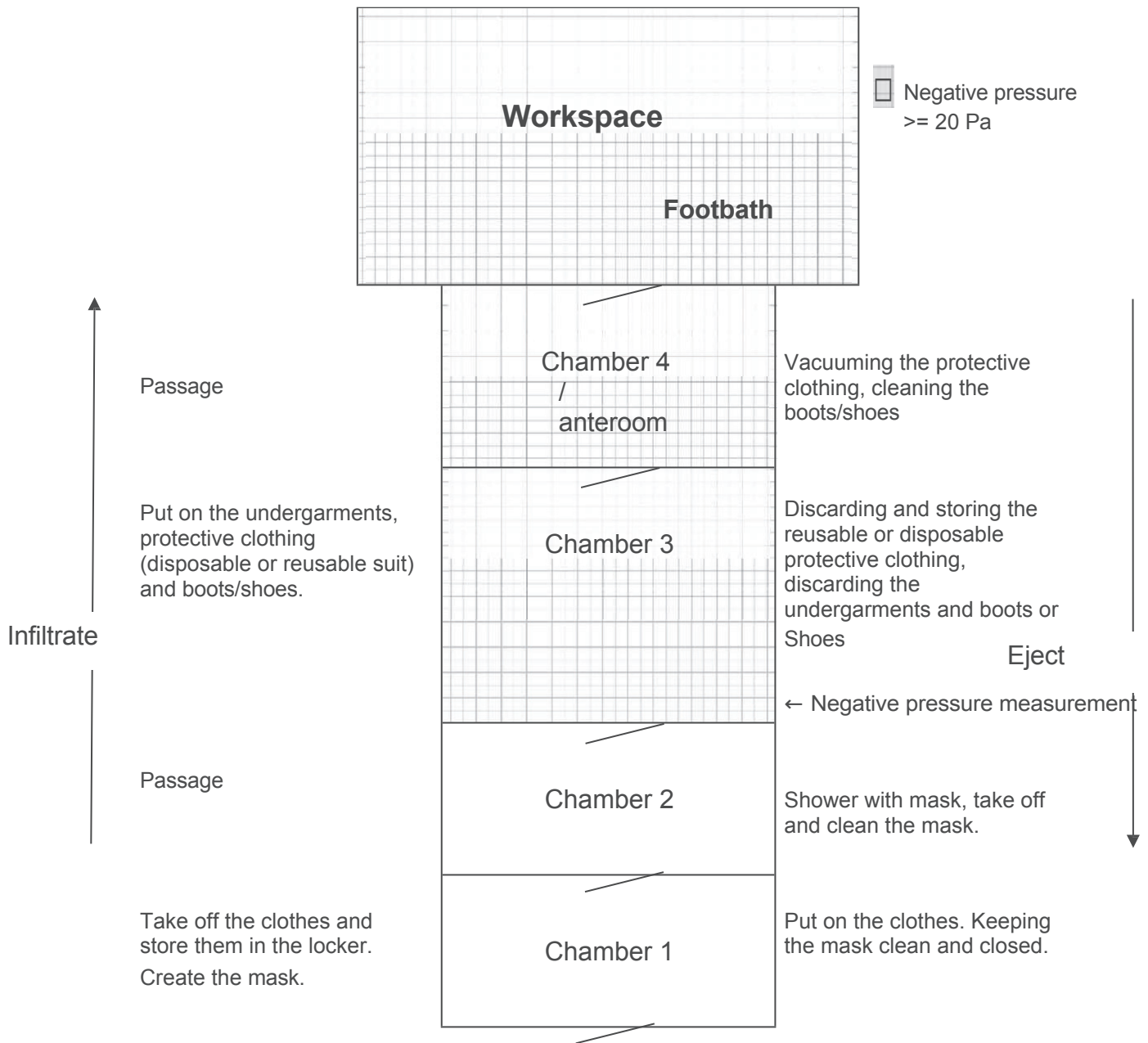


Fig. 1: Personnel lock (principle sketch)

- (3) A three-chamber airlock is sufficient if
1. the fibre concentration is less than  $100\,000\text{ F/m}^3$ ,
  2. no more than three workers are employed at a fibre concentration of more than  $100\,000\text{ F/m}^3$  and the total working time does not exceed two shifts.
- (4) If there is electrical equipment in the vicinity of the personnel airlock, so that a wet room in the airlock is not required, the employees in the airlock must be dry-extracted and a shower must be available nearby.

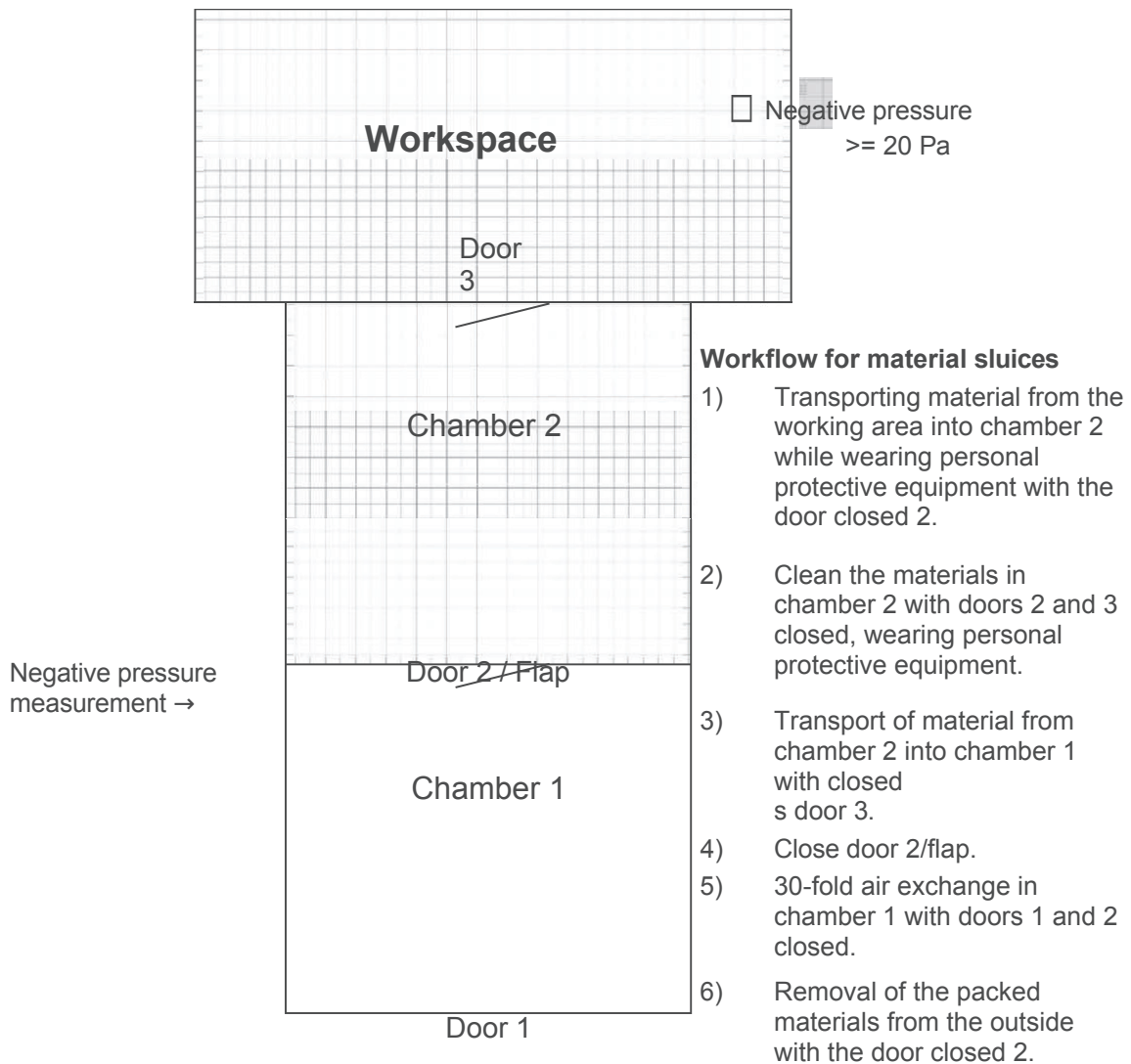


Fig. 2: Material lock (principle sketch)

### 14.3 Requirements for material locks

(1) Material decontamination facilities (material locks) must be designed in such a way that objects and materials can be transported, cleaned, packed and temporarily stored without any problems (for an example, see Fig. 2). Essential requirements for the material lock are

1. Floors, walls and ceilings of solid, washable, smooth material,
2. Controlled negative pressure in chamber 2; the negative pressure must not be higher than in the working area,
3. Ventilation of the chambers (tenfold air exchange per hour and diagonal flow in chamber 2),
4. At least 30-fold air exchange in chamber 1 before material removal,
5. self-closing chamber doors,

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6. Locking the doors so that doors 1 and 2 as well as doors 2 and 3 are not locked.

can be opened at the same time,

7. Discharge of wash water into the sewage system.
- (2) Entering and leaving the work area through the material lock is not permitted.

#### **14.4 Special regulations for small-scale work on weakly bonded asbestos products**

- (1) Small-scale work on weakly bonded asbestos products in accordance with Number 2.10 can be e.g.
  1. Removing seals, e.g. on gas burners or on doors,
  2. Coating of bulkheads, e.g. on cable penetrations or on penetrations of ventilation ducts or smoke pipes,
  3. Coating of weakly bonded asbestos-containing boards in good condition by rolling.
- (2) The working areas must be separated dust-tight and ventilated with a ventilation device for negative pressure maintenance. If possible, work must be carried out damp.
- (3) For small work areas, in deviation from paragraph 2, the sole use of a suitable industrial vacuum cleaner/dust extractor in accordance with Annex 7.1 (dispensing with an additional ventilation device) may be sufficient if the device used is in constant operation and the exhaust air is conducted to the outside. At least eight air changes per hour must be ensured.
- (4) In indoor areas, a one-chamber airlock is generally sufficient as a connection to the work area. In this case, persons and objects must not leave the work area before the activities, including cleaning, have been completed and the air has been changed 30 times. The access must be kept dust-tight during work.
- (5) The bulkhead may only be dismantled after a visual inspection of the cleaning condition.
- (6) As a rule, a release measurement in accordance with section 14.5 can be dispensed with.
- (7) For small-scale work, washing facilities must be available on site.

#### **14.5 Removal of the protective measures (release)**

- (1) The employer may only lift the established protective measures if
  1. the activities involving asbestos and other asbestos-containing materials, including cleaning, have been completed,
  2. a visual inspection confirms that there is no visible residual soiling,

3. an asbestos fibre concentration in the room air below 500 F/m<sup>3</sup> has been determined by measurement according to VDI 3492 (for exceptions, see Sections 14.4 and 15)
  4. the upper limit of the 95% confidence interval of the asbestos fibre concentration calculated according to the Poisson distribution is less than 1000 F/m<sup>3</sup>. During this measurement, the negative pressure in the measuring area shall be removed.
- (2) If an outdoor measurement is planned, it must be ensured that the size of the working space is sufficiently dimensioned to be able to carry out an indoor air measurement in accordance with the specifications of VDI 3492.
- (3) If necessary, the measurement result can be used to check the success according to the asbestos guidelines of the federal states.

## **15 Special regulations for activities with low exposure or low-emission processes**

### **15.1 Special provisions for activities with low exposure according to point 2.8**

For activities with low exposure according to No. 2.8, the following regulations apply:

1. In order to fulfil the requirements according to Number 5.1 and Number 5.2, at least the expertise according to Annex 4 is required.
2. To meet the requirements of 5.2, the presence of a competent supervising person who is responsible for and supervises the individual workplaces that are spatially separated from each other is sufficient.
3. A company-related notification is sufficient to fulfil the obligation to notify the authority.
4. The recirculation of cleaned exhaust air is permissible if the asbestos fibres are collected with industrial hoovers or mobile dust extractors in accordance with Appendix 7.1.
5. Wearing respiratory protection is not necessary. Wearing respiratory protection, e.g. P2, is recommended for activities where exposure peaks may occur (e.g. changing filters of decongestors).
6. No shower facilities need to be provided at the place of work.
7. If partitioning of the work area is dispensed with, the entire room is to be considered a work area:
  - a) Openings to adjacent rooms must be kept closed,
  - b) Uninvolved third parties must not be able to enter the room (work area) before the work is completed (including cleaning and ventilation),
  - c) the work area is carefully cleaned with an industrial Hoover or mobile dust extractors in accordance with Appendix 7.1 and wiped with a damp cloth after work with materials containing asbestos has been completed.

8. Surfaces that cannot be wiped with a damp cloth must be masked off fibre-tight before work begins so that the masking can be cleaned after the work.

## **15.2 Special regulations for activities with recognised low-emission processes according to Number 2.9**

For activities carried out with recognised low-emission processes, the following regulations apply:

1. In order to fulfil the requirements according to Number 5.1, a qualification according to Annex 4 is required. If only low-emission processes recognised by the authorities or by the statutory accident insurance institutions are used, a qualification in accordance with Annex 10 (qualification module 1E) is sufficient for the supervising person.
2. For the requirements according to 5.2, the presence of a competent supervisor or a supervisor qualified according to Annex 10 who is responsible for and supervises the individual spatially separated workplaces shall be sufficient.
3. A company-related notification is sufficient to fulfil the obligation to notify the authority.
4. The recirculation of cleaned exhaust air is permissible if the asbestos fibres are collected with industrial hoovers or mobile dust extractors in accordance with Appendix 7.1.
5. Wearing respiratory protection is not necessary. Wearing respiratory protection, e.g. P2, is recommended for activities where exposure peaks may occur (e.g. changing filters of decongestors).
6. No shower facilities need to be provided at the place of work.
7. If the work area is not partitioned off, the entire room is to be considered a work area:
  - a) Openings to adjacent rooms must be kept closed,
  - b) Uninvolved third parties must not be able to enter the room (work area) before the work is completed (including cleaning and ventilation),
  - c) the work area is thoroughly cleaned with an industrial Hoover in accordance with Appendix 7.1 and damp wiped after completion of the activities with materials containing asbestos.
8. Surfaces that cannot be wiped with a damp cloth must be masked off fibre-tight before work begins so that the masking can be cleaned after the work.
9. A release measurement can be dispensed with.

## **16 Special regulations for demolition work on asbestos-cement products**

### **16.1 General requirements**

- (1) If, in individual cases, hand-guided, mobile machines and equipment have to be used to process asbestos-cement products and if dust is released in the process, only slow-running and extracted machines and equipment may be used for this purpose.
- (2) Before demolition work is carried out on asbestos-cement products, it must be checked whether low-emission processes in accordance with Number 2.9 are available for this purpose. If such methods are used, the exemptions in accordance with Number 15 shall apply.
- (3) Dismantled asbestos-cement products must not be reused (for exceptions in the case of maintenance measures, see section 17).
- (4) Corrugated sheet roofs containing asbestos are not fall-through-proof and, according to § 11 of the BG regulation "Construction Work" (BGV C 22), may only be accessed via load-distributing coverings or walkways. Fall protection must be provided in accordance with the regulations of ASR A 2.1 or BGV C 22.

### **16.2 Outdoor work**

- (1) Uncoated asbestos-cement products are not to be exposed on the weathered surface.
  1. Spray with dust-binding agents, e.g. stone or plaster strengthener, residual fibre binder, before removal or dismantling, or
  2. keep the surface moist during removal, dismantling and disposal. The surfaces are to be wetted by sprinkling. The water shall be drained off in the same way as rainwater.
- (2) Coated asbestos-cement products may only be removed in a dry state if the coating is still present to such an extent that increased fibre release is not to be expected.
- (3) Detachable fasteners must be removed in such a way that the asbestos-cement products are not broken, if possible. The fasteners must be collected in suitable, tight containers. Panels and boards with fasteners embedded on the back must be unhooked.
- (4) If the fastenings cannot be loosened in the case of nailed, small-format panels, the panels may be levered out individually.
- (5) Asbestos cement products must be loosened and removed from the substructure against the direction of installation, from the ridge to the eaves for roofs and from top to bottom for walls. When removing the fasteners, the products must be secured against slipping. Products to be removed must be lifted off and not broken out. They must not be pulled over edges and neighbouring products or pulled out of coverings.
- (6) If possible, asbestos cement pipes must be pulled out of the plug connections and removed by hand without destroying them. If this is not possible, the pipes must be



cut with suitable equipment (e.g. slow-running pipe saws) using spraying agents. Broken areas must be sprayed. Buried, earth-moist asbestos cement pipes may be removed by machine. If breakage cannot be avoided, dust release must be prevented by covering the pipe with earth.

(7) Uncoated asbestos-cement products shall be kept moist after removal until they are placed in containers in accordance with Number 18, unless they are treated in accordance with paragraph 1, Number 1. Asbestos-cement products shall be transported in such a way as to avoid the release of asbestos fibres. Debris chutes shall not be used. Reloading shall only be carried out by hand or with the use of lifting equipment; the material shall not be thrown.

(8) Immediately after removing the asbestos cement products, surfaces of the substructure contaminated with asbestos-containing dust, e.g. battens, rafters, purlins, formwork, must be carefully cleaned by vacuuming with industrial hoovers according to Annex 7.1 or by damp wiping. Removal of the substructure and thermal insulation is usually not necessary.

(9) When working on external wall cladding made of asbestos cement products, lay out suitable tarpaulins or sheets to catch and collect any falling fragments.

(10) During the work, it must be ensured that building openings of rooms in the immediate working area are closed.

(11) After work on roofs, gutters must be cleaned and then flushed. The rinsing water must be disposed of in the sewage system.

(12) Protective suits and respiratory masks must be taken off outdoors (see also No. 9).

### **16.3 Working indoors**

(1) When working indoors, section 16.2 shall apply mutatis mutandis. Special care shall be taken to ensure that working methods are free of breakage and dust.

(2) Asbestos cement products may be removed indoors in a dry state if they are not destroyed in the process.

(3) If, in individual cases, the breaking of asbestos-cement products cannot be avoided, special measures shall be taken to prevent the release of dust, z. E.g. by careful wetting or by applying damp cloths.

(4) The affected rooms must not be used during the work and until the cleaning has been completed. Air-conditioning systems must be shut down during this time. Work rooms must be kept closed and transport processes must be restricted.

(5) After completion of the work, all surfaces must be

1. vacuumed with industrial hoovers in accordance with Appendix 7.1 or
2. damp cleaning (e.g. tile or plastic surfaces).

Before releasing the room, a multiple air exchange must be carried out.

(6) If it is to be expected that asbestos-cement products will be destroyed (drilled, broken, cut open) during removal, the measures in accordance with number 14 shall be applied in addition to the measures in paragraphs 1 to 5.

## 17 Special regulations for maintenance work on asbestos products

(1) The following requirements describe special technical measures aimed at keeping asbestos fibre concentrations below 10,000  $F/m^3$ . If this objective is not achieved, the requirements of Number 14 must also be met for activities involving weakly bound asbestos products, e.g. for large units on ships or in power stations.

(2) When carrying out maintenance work, it shall be checked whether low-emission procedures pursuant to 2.9 are available for this purpose. If such procedures are used, the exemptions pursuant to Number 15 shall apply.

(3) Annex 9 contains guidance on risk assessment, protective measures and qualification requirements for activities involving PSF.

### 17.1 General requirements

(1) Maintenance work must be planned in such a way that the release or spread of asbestos fibres is avoided as far as possible. In principle, work must be carried out non-destructively. If this is not possible, the parts containing asbestos must be moistened as far as possible (e.g. use penetrating liquids). The use of fast-running machines, such as grinders and drills, is not permitted.

(2) During maintenance work, precautions must be taken to ensure that persons and neighbouring areas are not endangered. This can be achieved, for example, by the following measures:

1. Cover the workplace or surrounding area, e.g. with plastic sheeting; seal off if necessary,
2. Closing off openings in structures such as windows and doors in the immediate work area,
3. Keep the work area moist,
4. Remove dust at the point of origin with an industrial hoover in accordance with Appendix 7.1,
5. If possible, do not leave the workplace until the work has been completed,
6. Clean the work area carefully after finishing the work.

### 17.2 Maintenance work on asbestos cement products

(1) Maintenance work also includes the targeted removal, removal and replacement of only individual asbestos-cement products as well as minor work on asbestos-cement products. Maintenance work includes, for example

1. the removal of individual defective asbestos cement panels of a roof covering or external wall cladding and their replacement with asbestos-free products,
2. the attachment, penetration or removal of individual scaffolding anchors, fixings, lines, poles or roof supports in connection with asbestos products,
3. the non-destructive removal, disposal or reinstallation of individual asbestos cement sheets, pipes or fittings for the maintenance of underlying components, equipment, appliances or installations,
4. the wash-off and overcoating of asbestos cement products with fully intact coating on exterior wall surfaces.

(2) If the work referred to in paragraph 1 is only carried out on a case-by-case basis and the requirements set out in points 16 and 17.1 are complied with, personal protective measures may be dispensed with, subject to the provisions of the seventh paragraph of point 9.2 and the second paragraph of point 9.3. If this work is carried out more frequently, personal protective measures may be dispensed with only if the requirements of Number 16 and Number 17.1 are met and low-emission procedures are used in accordance with 2.9.

(3) Undamaged individual asbestos cement products removed in the course of this work may be reinstalled as far as this is possible without damage or processing.

(4) When removing individual asbestos-cement products, these may, if unavoidable, be pulled out of coverings in deviation from Number 16.2 paragraph 5.

(5) If large areas of asbestos cement board have to be removed as part of maintenance work, the provisions of Number 16 apply.

(6) Wall coverings made of coated asbestos-cement products may be cleaned. If cleaning methods are used that lead to a removal of the surface, only low-emission methods according to Number 2.9 may be used for this purpose. If manual cleaning is used, the surfaces shall be kept wet in sections with a non-pressurised water jet, cleaned if possible with depressurised water using soft-working equipment, e.g. a sponge, and then rinsed with a non-pressurised water jet. The water produced during the cleaning process must be collected and disposed of as waste water.

(7) Suitable equipment (slow-running asbestos cement pipe saws, pipe chain cutters) must be used when repairing pipe breaks in asbestos cement pipes by replacing pipe sections or fitting sealing clamps and when tying branches into existing asbestos cement pipes. During sawing, the interface must be sufficiently wetted with depressurised water. If necessary, spray the pipe end surfaces and broken pieces with residual fibre bonding agents.

### **17.3 Maintenance work on seals and packings**

(1) Gaskets and packings containing asbestos must be removed from the installation sites without destroying them, if possible.

(2) After a long period of installation, gaskets may stick or be burnt onto the flange surfaces of the installation points. When such gaskets are dismantled, asbestos fibres may be released if the fibres are weakly bound (e.g. gasket cords) by destroying the gasket. Asbestos fibres may also be released when packings are dismantled if they cannot be removed from the bushing in one piece. The release of fibres can be prevented by using

1. penetrating liquids (observe disposal regulations) and
2. The use of coarse cutting tools (scrapers, spittoons) can be prevented or reduced.

(3) Asbestos fibres released during the removal of gaskets and packings shall be vacuumed up with an industrial vacuum cleaner/dust extractor in accordance with Appendix 7.1.

(4) The interconnected sealing and packing parts must be packed and transported in dust-proof containers which are also to serve as transport containers. Decanting is to be avoided.

(5) The dismantled seal residues and the vacuumed dust must be packed dust-tight and disposed of.

(6) For disposal, the regulations for the binders and aggregates of the sealing materials must be observed.

(7) If gaskets and packings containing asbestos have to be reinstalled because no substitute materials are available, proceed as follows:

1. Use ready-made seals,
2. Avoid damage,
3. collect and dispose of leftovers and waste during adaptation work.

(8) If gaskets and packings (with the exception of sealing cords) are only replaced on a case-by-case basis and if the requirements of sub-section 17.3, paragraphs 1 to 5, are complied with, then, in accordance with sub-section 9.2, paragraph 7, and sub-section 17.3, paragraphs 1 to 5, the gaskets and packings may be replaced on a case-by-case basis.

9.3 (2), personal protective measures may be dispensed with. If these operations are carried out more frequently, personal protective measures may be dispensed with only if the requirements of Number 17.3 are met and low-emission processes in accordance with Number 2.9 are used.

#### **17.4 Maintenance work on brake systems and clutches**

(1) When dismantling worn friction linings, the abrasion dust must be extracted with an industrial Hoover in accordance with Appendix 7.1. Blowing off with compressed air is not permissible. Dust-binding wet cleaning is also possible if the cleaning agent does not negatively affect the braking effect.

(2) If it is necessary to work with a brush when cleaning brake shoes, calipers, discs and drums or other brake parts, use suction equipment in accordance with

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paragraph 1. Here, too, wet cleaning should be used. The cleaning agent must not have a negative effect on the braking effect.

- (3) Worn linings should be riveted off their supports as whole parts, if possible without destroying them, and suction equipment should also be used in accordance with paragraph 1.
- (4) Dismantled lining, friction lining residues and vacuumed dust must be packed dust-tight and disposed of emission-free.
- (5) When disposing of friction linings, the relevant regulations for other pollutant components of the friction materials must be observed, if applicable.
- (6) When changing linings on drum brakes, dimensional adjustment work should be carried out by machining the drum if possible. If brake linings containing asbestos have to be brought to size in their installed condition, only slow-running turning devices should be used for this purpose. Overgrinding is not permitted because of the strong release of fibres. When over-turning, use type-tested dust extractors. Stationary brake lining processing machines must be installed in rooms that are separated from other rooms in a dust-tight manner and must be kept under negative pressure during the processing time.
- (7) For maintenance work on clutches, proceed in the same way as for brake systems. Before dismantling the clutch bell, the abrasion dust must be bound with a damp cloth, if technically possible. Tools operated with compressed air must not be used.
- (8) If friction linings are only replaced in individual cases and the requirements of Number 17.4 are met, personal protective measures may be dispensed with in accordance with Number 9.2 Paragraph 7 and Number 9.3 Paragraph 2. If this work is carried out more frequently, personal protective measures may only be dispensed with if the requirements of Number 17.4 are met and low-emission processes are used in accordance with Number 2.9.

## **18 Special requirements for activities involving asbestos-containing waste**

- (1) Waste must be made available in accordance with federal and state waste legislation and disposed of properly and harmlessly (see (KrWG - Kreislaufwirtschaftsgesetz, LAGA-Merkblatt "Entsorgung asbesthaltiger Abfälle").
- (2) Waste containing asbestos is to be classified as "hazardous waste" under waste legislation if the mass content of asbestos exceeds 0.1%.
- (3) Waste containing asbestos must be collected, stored and disposed of in suitable, securely closable and labelled containers without risk to people or the environment.
- (4) The shredding of waste containing asbestos is not permitted.

### **18.1 Waste collection and labelling**

- (1) Waste containing asbestos must be kept separate from non-asbestos waste. It shall be collected at the place of generation in suitable, securely closable and labelled containers without risk to people and the environment in such a way that any release of asbestos and asbestos-containing dusts (e.g. by decanting, tipping, throwing) is avoided.

- (2) Suitable containers are e.g.
  1. for granular, woven or lumpy waste: sufficiently strong plastic bags,
  2. for coarse or plate-shaped asbestos cement waste: e.g. big bags,
  3. for stackable asbestos cement products: Big bags, slab big bags, stacking on pallets in dust-tight packaging
  4. for waste containing spray gas: the disposal unit itself. For small quantities, one drum is sufficient.
- (3) When waste containing asbestos is received and made available for transport, the release of dust must be prevented by suitable measures in accordance with the state of the art - e.g. suction, solidification, moistening, covering. Asbestos dusts, e.g. from filter systems, shall be solidified with binding agents (e.g. cement).
- (4) Insofar as activities are carried out with them, waste containing asbestos is subject to the labelling regulations in accordance with Section 8 (2) of the Ordinance on Hazardous Substances. The collection, storage and in-house transport of asbestos-containing waste are such activities. In accordance with TRGS 201, waste containing asbestos is labelled in accordance with Annex XVII, Appendix 7 of Regulation (EC) No. 1907/2006 (REACH Regulation).
- (5) Containers with asbestos-containing waste shall be marked with the danger sign according to Annex 2b before being filled for the first time.
- (6) For further information on the classification and labelling of waste, see TRGS 201.

## 18.2 Transport

- (1) Waste containing asbestos shall be secured for transport in such a way that no asbestos fibres are released during transport and unloading.
- (2) For the transport of asbestos-containing waste, containers in accordance with section 18.1 shall be used to avoid fibre emissions. Waste containing asbestos may only be transported in compliance with the relevant legal requirements.

## 18.3 Interim storage

The temporary storage of waste containing asbestos on a company site (e.g. craftsmen's yard) is subject to the Waste Management Act (KrWG) and, if applicable, the Federal Immission Control Act (BImSchG). It depends on the type of waste and the quantity to be stored.

## 18.4 Deposit

- (1) Waste containing asbestos shall be disposed of only in approved facilities (above-ground or underground landfills, pretreatment facilities), if required by Land law and after allocation by the competent authority, in such a way that the release of asbestos fibres is avoided (details are regulated by the Landfill Ordinance (DepV), among others).

(2) The operator of the facility or landfill must fulfil all safety requirements according to the state of the art. Reference is made to the obligation to implement the organisational measures according to the Ordinance on Hazardous Substances (acquisition of expertise, notification, operating instructions and instruction).

(3) The requirement of paragraph 1 is fulfilled if the requirements according to point 18.1 are fulfilled and, in the case of deposition

1. the containers are not destroyed,
2. the asbestos-containing waste is covered before compaction in such a way that fibre release is prevented.

## 18.5 Other methods of disposal

(1) Process for eliminating the hazardous properties of asbestos fibres, e. g. The use of waste incineration plants, e.g. for chemical or thermal waste treatment, requires a plant-specific permit in accordance with the Federal Immission Control Act (Bundes-Immissionsschutzgesetz).

(2) If it cannot be ruled out that asbestos fibres will be released during these processes, the employer shall specify the appropriate protective measures required under this TRGS.

## 19 Further regulations

Regulation (EC) No 1907/2006 (REACH Regulation),

Law on Protection against Hazardous Substances

(ChemG)

Act on Protection against Harmful Effects on the Environment Caused by Air Pollution, Noise, Vibrations and Similar Processes (BImSchG - Bundes-Immissionsschutzgesetz)

Act to Promote Closed Substance Cycle Waste Management and to Ensure Environmentally Compatible Waste Disposal (Closed Substance Cycle Waste Management Act - KrWG)

Second General Administrative Regulation on the Waste Act Part 1: Technical Instructions on the Storage, Chemical/Physical, Biological Treatment, Incineration and Deposition of Waste Requiring Special Supervision - TA Abfall;

Third General Administrative Regulation on the Waste Act: Technical Instructions on the Recovery, Treatment and Other Disposal of Municipal Waste

Ordinance on Protection against Hazardous Substances (GefStoffV)

Ordinance on Safety and Health Protection in the Provision of Work Equipment and its Use at Work, on Safety in the Operation of Installations Requiring Inspection and on the Organisation of Occupational Health and Safety (Ordinance on Industrial Safety and Health - BetrSichV)".

Ordinance on Workplaces (Arbeitsstättenverordnung - ArbStättV)

Ordinance on Safety and Health Protection on Construction Sites (Baustellenverordnung - BaustellV)



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## Ordinance on Occupational Medical Precautions (ArbMedVV)

TRGS 201 - Classification and labelling for activities involving hazardous substances  
TRGS 460 - Recommendation for action to determine the state of the art  
TRGS 500 - Protective measures  
TRGS 554 - Exhaust gases from diesel engines  
TRGS 555 - Operating instructions and information for employees  
TRGS 560 - Air recirculation during activities with carcinogenic, mutagenic and fertility-endangering dusts  
TRGS 910 - Risk values and exposure-risk relationships for activities with carcinogenic hazardous substances  
ASR A 1.3 - Safety and health protection labelling  
ASR A 2.1 - Protection against falls from a height and falling objects, entering danger zones  
ASR A 3.5 - Room temperature  
ASR A 3.6 - Ventilation  
BG regulation Principles of Prevention (BGV A 1)  
BG regulation Construction Work (BGV C 22)  
BG Rule Principles of Prevention (BGR A 1)  
BG regulation on workplace ventilation - ventilation measures (BGR 121)  
BG regulation on the use of protective clothing (BGR 189)  
BG regulation Use of respiratory protective equipment (BGR/GUV-R 190)  
BG regulation Operation of work equipment (BGR 500)  
BG-Information Separate determination of the concentration of inorganic fibres in working areas - Scanning electron microscopic method (BGI 505-46)  
BG-Information Directory of certified respiratory protective devices (BGI 693)  
BG-Information Procedures with low exposure to asbestos during demolition, sanitation and maintenance work (BGI 664)  
Guideline for the Evaluation and Remediation of Weakly Bound Asbestos Products in Buildings (Asbestos Guideline); Institut für Bautechnik, Berlin, January 1996 edition.  
VDI Guideline 3492 Sheet 1 Measurement of indoor air pollution - Measurement of immissions - Measurement of inorganic fibrous particles - Scanning electron microscopic method, Edition 2013-06.  
VDI Guideline 3861 Sheet 2: Measurement of emissions - Measurement of inorganic fibrous particles in flowing clean gas - Scanning electron microscopy method Edition 2008-01  
VDI Guideline 3866 Sheet 1: Determination of asbestos in technical products-Basic sampling and sample preparation Edition 2000-12  
DIN 31051 "Maintenance, terms and measures".  
Communication of the Federal/State Working Group on Waste (LAGA) 23: Implementation Guide for the Disposal of Waste Containing Asbestos

## Annex 1.1 Company-related notification of activities involving materials containing asbestos (in accordance with Annex I No. 2.4.2 GefStoffV and No. 3.2 TRGS 519)

(Tick or complete as appropriate)

To theSender (name, address, phone, fax, e-mail)  
Occupational Health and Safety Authority

.....  
.....  
.....

### 1. The display is for:

<input type="checkbox"/> Activity with low exposure, <input type="checkbox"/> low-emission processes (if applicable, DGUV Information 201-012 No. )	<input type="checkbox"/> Stationary place of work, address of the place of work ..... .....
<input type="checkbox"/> Small-scale activity with asbestos cement according to Number 2.10 (3)	<input type="checkbox"/> other activities: ..... .....
<input type="checkbox"/> Maintenance according to number 17 TRGS 519	
<input type="checkbox"/> Activity on PSF containing asbestos according to Annex 9	

2. Job description: .....

.....

3a. name and qualification of the responsible person in the enterprise: .....

3b. Name and qualification of on-site supervisors: .....

4. Number of employees with asbestos: .....

### 5. Measures to limit exposure to asbestos

- Risk assessment with work plan according to Annex 1.4 TRGS 519 is attached.
- Operating instructions are enclosed
- Supplementary information on the work plan according to Annex 1.5 TRGS 519 are attached

### 6. Method/location of waste treatment

- Specialist disposal company is commissioned with removal
- Disposal (dumping) by the executing company takes place at the following landfill approved for asbestos: .....
- Other type of waste disposal: .....

### 7. Copies of the advertisement delivered to

- Statutory accident insurance institutions ..... am.....
- the affected employees/works council or staff council

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible manager)

## Annex 1. 2Supplementary display of place and time

on the company-related notification for small-scale activities with materials  
containing asbestos  
(according to number 3.2 paragraph 5 TRGS 519)

to be addressed to the occupational **health and safety authority responsible for the place of activity**

To  
Occupational Health and Safety Authority

theSender (name, address, tel., fax, e-mail)

.....  
.....  
.....  
.....

.....  
.....  
.....  
.....

According to the company-related notification of .....(date)

to the occupational health and safety authority:

.....  
.....  
.....

we would like to inform you that we intend to carry out work on.....(date) we intend to carry out work  
small amount of asbestos-containing materials.

The address of the place of work is: .....

.....  
.....  
.....  
.....

**Name of the on-site expert(s) (supervisor)**

.....

**Copy of this supplementary notification delivered to**

Statutory accident insurance institutions ..... am.....

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible plant manager)

### Annex 1.3 Object-related notification of activities with materials containing asbestos

(according to Annex I No. 2.4.2 GefStoffV and No. 3.2 TRGS 519)  
(Tick or complete as appropriate)

---

To (mail)Occupational health and safety authority

Sender (name, address, phone, fax, e-mail).....

.....

.....

.....

.....

.....

**1. Address of place of work:** .....

.....

**2. Type/designation and quantity (kg/m<sup>3</sup>/m<sup>2</sup>) of the asbestos-containing material** .....

.....

**3. Activity to be carried out**

Demolition/removal of fixed asbestos products

Demolition/removal of weakly bonded asbestos products

Removal  Coating  Spatial separation

Maintenance (if protective measures according to Number 14 are required)

Other activities: .....

**4. Name of the expert(s) on site (supervisor):**  
.....

**5. Number of employees with asbestos:**.....

**6. Start date:** ..... **Duration:**.....days/€02

**7. Measures to limit exposure to asbestos**

Hazard assessment/work plan according to Annex 1.4 TRGS 519 is attached

Operating instructions are enclosed

Supplementary information in accordance with Annex 1.5 TRGS 519 for AS work on weakly bonded products is enclosed (does not apply to small-scale activities in accordance with Number 14.4).

**8. Method/location of waste treatment**

Specialist disposal company is commissioned with removal

Disposal (landfilling) is carried out by the executing company on the following for asbestos approved landfill: .....

Another way of disposing of waste: ... ..

**9. Copies of the advertisement delivered to**

Statutory accident insurance institutions ..... am.....

the affected employees/works council or staff council

(Place, date)

(Responsible plant manager)

## Annex 1.4 Risk assessment with work plan

(according to § 6 and Annex I No. 2.4.4 GefStoffV)  
(Tick or complete as appropriate)

The appendix can be used to document the risk assessment and the work plan for ASI work on asbestos products in addition to the notification.

For work on weakly bound products according to No. 14.1 TRGS 519, supplementary information according to Annex 1.5 is required (does not apply to small-scale activities according to No. 14.4).

Sender: .....

..... To the company-

related advertisement from: ..... To the object-related

advertisement for the object: ..... from: .....

### 1. Type of material containing asbestos

<input type="checkbox"/> Sprayed asbestos	<input type="checkbox"/> AZ roof panels
<input type="checkbox"/> Lightweight panels	<input type="checkbox"/> AZ facade panels
<input type="checkbox"/> Sealing cords	<input type="checkbox"/> Other AZ products : .....
<input type="checkbox"/> other weakly bound products: ..... .....	<input type="checkbox"/> Plasters, fillers, tile adhesives (PSF) <input type="checkbox"/> Flex panels <input type="checkbox"/> IT seals
	<input type="checkbox"/> other firmly bound products: .....

### 2. Activity is carried out

outside buildings  inside buildings

### 3. Description of the activity

.....  
.....

### 4. Evaluation of the fibre release potential or the working quantity

<input type="checkbox"/> Activity with low exposure, <input type="checkbox"/> low-emission processes (if applicable, DGUV Infor- mation 201-012 No. )	<input type="checkbox"/> Maintenance according to number 17 TRGS 519 .....
<input type="checkbox"/> Work with weakly bound asbestos products of low volume according to No. 14.4	<input type="checkbox"/> Activities with PSF containing asbestos according to Annex 9
<input type="checkbox"/> Activity with weakly bound asbestos products	
<input type="checkbox"/> Activity with asbestos cement products	
<input type="checkbox"/> Activity with asbestos-cement products of low volume according to Number 2.10 Paragraph 3 (< 100 m <sup>2</sup> )	

### 5. Protective measures



**5.3 Personal protective measures**

**Respiratory protection:**

- Particle-filtering half mask FFP2 (short-term activities of max. 2 hours/shift)
- Half mask P2
- Full face mask P3 with blower support
- Other respiratory protection .....

**Protective clothing:**

Protective suit: Disposable  Type ..... Reusable  Type .....  
 flame retardant

Further personal protective equipment: .....

**6. Measures in the event of breakdowns, accidents and emergencies**

.....  
.....

**7. Waste treatment / waste provision at the workplace**

.....  
.....  
.....

**8. Release of the work area after completion of the work**

- After final cleaning and visual inspection
- After final cleaning, visual inspection and multiple room air changes
- after free measurement

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible plant manager)



## Annex 1.5 Supplementary information on the work plan for demolition and renovation work on weakly bonded asbestos products in accordance with Number 14 TRGS 519

(does not apply to small-scale activities as defined in point 14.4)  
(Tick or complete as appropriate)

If the risk assessment and work plan are carried out in accordance with Annex 1.4 of this TRGS, the following supplementary information on the work plan is required for work on weakly bound asbestos products in accordance with Number 14 TRGS 519:

Sender: .....

### 1. Building/Component/Activity

Details of the location of the asbestos product in the building, condition of the asbestos product, extent (attach site plan if necessary).

.....  
.....  
.....  
.....  
.....

### 2. Safety equipment provided for the protection and decontamination of workers and for the protection of third parties in the danger zone.

- Room air conditioning system with exhaust air filtration to maintain negative pressure
- Personnel decontamination plant (requirements in Number 14.2 TRGS 519)
- Material decontamination plants (requirements in Number 14.3 TRGS)
- High-performance vacuum suction unit
- Negative pressure monitor
- Sprayer for applying fibre binder
- Industrial hoover according to Annex 7.1 TRGS 519
- Other facility:.....

#### Hygiene facility:

- Facility for cleaning protective, work and undergarments
- Social and sanitary area for breaks, changing, washing and showering

Explanations:.....  
.....  
.....  
.....  
.....

### 3. Coordinator according to number 6 TRGS 519

- available, name of the coordinator:.....
- not required

### 4. Waste treatment at the workplace

- Consolidation plant (for sprayed asbestos)
- Packed dust-tight
- Treated with fibre binder and packed dust-tight Other treatment

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.....  
.....  
.....

**5. Work sequence and execution of work, description of the work sequence, possible special features, bulkheads, cleaning and release/success control**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**6. Further information if required**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible plant manager)

## Appendix 1. 6 Operating instructions (§ 14 GefStoffV) (Dismantling of façade panels) - M u s t e r -

**Note:** The model can only serve as a general and non-binding guide. In relation to the application case, the activity-related information must always be seen and determined in the individual case.

**Company:** .....

**Workplace:** changing construction sites

**Activity:** Dismantling of facade panels

### Hazardous substance designation

Asbestos (white asbestos)

### Dangers for humans and the environment

Dismantling façade panels produces dust containing asbestos, which can cause serious health problems such as asbestosis or cancer if inhaled.

### Protective measures and rules of conduct

The following measures must be observed:

- Mark work area with prohibition signs and cordon off against unauthorised entry.
- Protective suit type ..... and breathing mask.....wear.
- In case of work interruptions/breaks, first remove protective suit and then respirator outdoors; dispose of disposable protective suit and disposable mask (e.g. waste bag).
- Clean hands thoroughly during breaks.
- Keep building openings in the working area closed.
- Lay out foil along the building wall to catch fragments.
- Spray panels in sections with dust binder and then dismantle as free of breakage as possible.
- After completion of the work, vacuum surfaces and scaffold coverings, wipe down window sills with a damp cloth, pour wiping water into drains.
- Visually check the work area for residual contamination before removing the marking and cordoning off.

### Behaviour in the event of danger

- If there is an unusually high proportion of breakage, interrupt work and discuss further action with the supervisor.
- In case of other unplanned events, always inform the supervisor and keep unauthorised persons away.

### First aid

- Keep unauthorised persons away in case of accidents.
- Advise first aiders/paramedics of asbestos hazard and self-protection measures if necessary.
- In case of eye irritation, do not rub, but rinse with water.

First aider: Mr / Mrs ..... Nearest  
doctor/clinic Tel.:.....[to be announced for the site]..... Emergency phone  
no.:.....

### Proper disposal

Place dismantled panels, contaminated small parts, fixings and other waste in big bags marked with asbestos stickers according to Annex 2b TRGS 519 for collection, spray the top layer with dust binder before closing the big bags.

Do not transfer dust from hoovers, but dispose of it dust-free in accordance with the operating instructions for the appliance.

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible plant manager)

## Appendix 1. 7 Operating instructions (§ 14 GefStoffV) (Removal of fire protection panels) - M u s t e r -

**Note:** The model can only serve as a general and non-binding guide. In relation to the application case, the activity-related information must always be seen and determined in the individual case.

**Company:** .....

**Workplace:** **changing construction sites**

**Activity:** Removal of fire protection panels

### Hazardous substance designation

Asbestos (white asbestos)

### Dangers for humans and the environment

Fire protection panels belong to the group of weakly bonded asbestos products. Due to the low binding of the asbestos, these products can be damaged by even low mechanical stress such as e.g. high concentrations of asbestos are released into the indoor air due to impact, friction and especially during breaking.

Inhalation of asbestos fibres can lead to serious health problems such as asbestosis or cancer.

When removing the fire protection panels, care must therefore be taken to release as little dust as possible.

### Protective measures and rules of conduct

- The remediation area may only be entered when there is sufficient negative pressure and only via the personnel lock with protective clothing and the specified respiratory protection.
- When leaving the sanitation area, remove the protective clothing in the first chamber. Dispose of disposable protective suit (e.g. waste bag).
- Take off respirator only after showering and clean thoroughly.
- At least two persons must remain in the black area during the work.
- Wear time limit for respiratory protection must be observed.
- Moisten the panels and remove them as non-destructively as possible; in the black area, pack them in foil bags.
- Only release packaged asbestos via a material lock (two-chamber lock).
- Before transferring the packaged waste to chamber 1, vacuum the packaging and spray with dust binder.

- Load asbestos bags taken from the outside of chamber 2 into the marked container.
- After finishing the work, vacuum rough surfaces, wipe smooth surfaces such as window sills with a damp cloth.
- Dismantling of the bulkhead only after visual inspection and free measurement

### Behaviour in the event of danger

- If the breathing air supply fails, if breathing becomes difficult or if the negative pressure drops, leave the black area immediately. Immediately report damaged partitions to the supervisor.
- In case of other unplanned events, always inform the supervisor.

### First aid

A first aider is available.

- Injured persons who cannot leave the black area via the personnel airlock are to be transported out via the material airlock.
- If helpers coming from outside have to enter the black area, they must be equipped with protective suits and FFP3 masks.

First aider: Mr / Mrs ..... Nearest doctor/clinic Tel.:.....[will be announced for the site]..... Emergency call no. 112

### Proper disposal

Store all packed asbestos in containers. Do not decant dust from hoovers, but dispose of it dust-free in accordance with the operating instructions of the device. Keep containers closed and label them according to TRGS 519 Annex 2b.  
Transport and disposal of the waste is carried out by a specialist disposal company.

\_\_\_\_\_  
(Place, date)

\_\_\_\_\_  
(Responsible plant manager)

## Annex 2 to TRGS 519 Labelling of work areas and containers

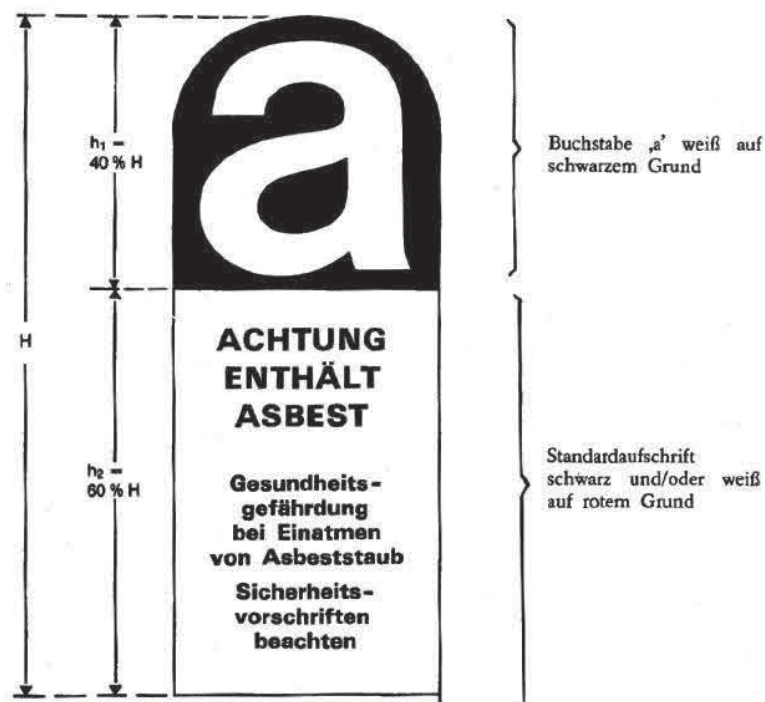
### Appendix 2 a: Marking of work areas



Prohibition sign following ASR 1.3, minimum diameter 0.4 m

### Appendix 2b Marking of containers containing asbestos-containing materials

According to Regulation (EC) No 1907/2006 (REACH-V), Annex 17, Appendix 7, containers containing asbestos-containing materials must be labelled as follows:



### **Annex 3 Course for acquiring the expertise according to number 2.7 of TRGS 519 for ASI work with asbestos**

This course serves to acquire the expert knowledge for ASI work on all asbestos-materials including asbestos cement products. Reference is made to Number 2.7 Paragraph 3 of TRGS 519.

- |  |             |
|--|-------------|
| <b>1. Properties and health hazards</b>  | <b>2 LE</b> |
| <ul style="list-style-type: none"><li>- The mineral asbestos</li><li>- Health hazards, occupational diseases due to asbestos</li></ul>   |             |
| <b>2. Use of asbestos</b>  | <b>4 LE</b> |
| <ul style="list-style-type: none"><li>- Asbestos products and their use (with demonstration)</li><li>- Recognition of asbestos including asbestos cement products</li><li>- Taking and analysing material samples</li><li>- Assessment of asbestos in buildings - Asbestos guidelines of the Länder -</li></ul>  |             |
| <b>3. Rules and regulations for activities with asbestos</b>   | <b>5 LE</b> |
| <ul style="list-style-type: none"><li>- Ban on asbestos under the REACH Regulation, Chemicals Sanctions Regulation</li><li>- Chemicals Act, Federal Immission Control Act, State Building Code, Water Resources Act, Waste Act, Hazardous goods law (overview, allocation to each other)</li><li>- Ordinance on Hazardous Substances and associated TRGS, in particular TRGS 519</li><li>- Industrial Safety Ordinance</li><li>- Construction Site Ordinance</li><li>- Personal protective equipment-BV</li><li>- ArbStättV and associated ASR</li><li>- ArbmedVV</li><li>- TRGS 910</li><li>- BG regulations BGV A 1, BGV C 22</li><li>- BG Rules BGR A 1, BGR 190, BGR 189, BGR 500</li><li>- BG information BGI 664, BGI 665, BGI 693</li><li>- Regulations on the transport and disposal of waste containing asbestos</li><li>- §§ 9 and 130 Administrative Offences Act, § 14 Criminal Code</li></ul> |             |
| <b>4. Personnel requirements</b>   | <b>1 LE</b> |
| <ul style="list-style-type: none"><li>- Responsible person</li><li>- Supervisor</li><li>- Coordinator in accordance with number 6</li><li>- TRGS 519 Qualified personnel; training and further training operational occupational safety organisation</li></ul>   |             |
| <b>5. Safety measures</b>  |             |
| <ul style="list-style-type: none"><li>- Committee on Hazardous Substances - AGS Management - BAuA - <a href="http://www.baua.de/ags">www.baua.de/ags</a> -</li></ul>   |             |



5.1	Preparatory measures	5 LE
-	Risk assessment	
-	Drawing up the work plan	
-	Operating instructions, instruction	
-	occupational-medical care	
-	Notifications and coordination with authorities and employers' liability insurance associations	
-	Fire protection	
-	First aid	
-	Behaviour in the event of disruptions	
5.2	Personal protective equipment	2 LE
-	Respiratory protection *)	
-	Protective clothing *)	
-	Foot protection	
-	Head protection	
5.3	Site equipment	2 LE
-	Cordoning off the construction site	
-	Social and sanitary rooms	
-	Storage space	
-	Partitioning to the neighbouring rooms *)	
-	Sluices *)	
-	Room air filter systems *)	
-	Emergency power systems (electricity, water, waste water)	
-	Other technical equipment, e.g. scaffolding	
5.4	Tools	1 LE
-	High-performance vacuum suction units *)	
-	Industrial hoover *)	
-	Low pressure spraying equipment *)	
-	Other implements	
-	Inspection and maintenance of implements	
5.5	Operation of ventilation and air-conditioning systems	1 LE
-	Vacuum holding	
-	Airflow in the working area	
-	Air return	
5.6	Lock operation	1 LE
5.7	Working methods	3 LE
-	when removing *)	
-	during coating *)	
-	With spatial separation	
-	during maintenance work	
5.8	Activities involving asbestos-containing waste	3 LE
-	Provision for transport (packing)	
-	Transport	
-	Deposit/landfill and other disposal methods	
6.	<b>Final work, success control, release</b>	2 LE

- Cleaning
- Residual fibre bonding
- Air exchange
- Control measurement

(\* ) a practical demonstration shall be provided for these activities

---

32 LE

## 7. Exam

The theoretical examination is to be taken in writing. In addition, oral examination questions may be asked. The examination shall be taken before a representative of the competent authority in whose area the course is conducted, in the presence of a representative of the course provider. A record shall be made of the examination result, which shall also be signed by the representative of the competent authority. The applicant shall be issued with a certificate of successful participation in the course, indicating the type of knowledge imparted.

Course duration: at least 32 teaching units (LE) of 45 minutes each with subsequent examination (2 LE), spread over at least four working days.

Number of participants: up to approx. 20 people.

Teachers: competent persons. The rules and regulations for activities with asbestos (number 3 of the course concept) should be taught by a representative of the authorities or the employers' liability insurance association.

## **Annex 4 to TRGS 519 Training course for the acquisition of expertise according to Number 2.7 TRGS 519 for demolition, renovation and maintenance work**

- on asbestos cement products
- for activities with low exposure according to number 2.8 TRGS 519
- for small-scale work in accordance with Number 2.10 TRGS 519

### **A Asbestos cement products**

#### **1. Properties and health hazards**

1 LE

- The mineral asbestos
- Health hazards, occupational diseases due to asbestos

#### **2. Use of asbestos**

1 LE

- Asbestos products and their use
- Recognition of asbestos-cement products; differentiation from weakly bound asbestos products

#### **3. Rules and regulations for activities with asbestos and asbestos cement**

2 LE

- Ban on asbestos according to the REACH Regulation, Chemicals Sanctions Regulation
- Chemicals Act, Federal Immission Control Act, State Building Code, Federal Water Act, Waste Act, Hazardous Goods Act (overview, allocation to each other)
- Ordinance on Hazardous Substances and associated TRGS, in particular TRGS 519
- Industrial Safety Ordinance
- Construction Site Ordinance
- Personal protective equipment-BV
- ArbStättV and associated ASR
- ArbmedVV
- TRGS 910
- BG regulations BGV A 1, BGV C 22
- BG rules BGR A 1, BGR 190, BGR 189, BGR 500,
- BG information BGI 664, BGI 665, BGI 693
- Regulations on the transport and disposal of waste containing asbestos
- §§ 9, 130 Administrative Offences Act, § 14 Criminal Code

#### **4. Personnel requirements**

1 LE

- Responsible person
- Supervisor
- Coordinator in accordance with number 6
- TRGS 519 Qualified personnel; training and further training operational occupational safety organisation

#### **5. Safety measures**

7 LE

- Committee on Hazardous Substances - AGS Management - BAuA - [www.baua.de/ags](http://www.baua.de/ags) -

- 5.1 Preparatory measures Risk assessment
  - Work plan, operating instructions, instruction in occupational health precautions
  - Show first aid,
  - Personal protective equipment \*) Site equipment
  - Cordoning off the construction site \*) Social and sanitary areas
- 5.2 Fall protection Requirements
  - for scaffolding Work equipment
  - Processing equipment for asbestos-cement products \*)
- 5.3 Lifting equipment
  - Vacuum equipment (dust extractors and industrial hoovers) \*)
  - Demolition work
  - Bonding of fibres on the surface non-destructive removal
- 5.4 Maintenance work
  - Collecting on the construction site
  - work
- 5.5
- 5.6 Special measures for asbestos cement in rooms
- 5.7 Checking the substructure
  - Cleaning
  - Free measurement
  -
- 6. **Activities involving asbestos-containing waste** 1 LE
  - Provision for transport (packaging)
  - Deposition/landfill
  - Other waste disposal methods
- 7. **Summary/final discussion** 1 LE

\*) for a practical demonstration shall be provided for these activities

---

14 LE

## 8. Exam

The theoretical examination is to be taken in writing. In addition, oral examination questions may be asked. The examination shall be taken before a representative of the competent authority in whose area the course is conducted, in the presence of a representative of the course provider. A record shall be made of the examination result, which shall also be signed by the representative of the competent authority. The applicant shall be issued with a certificate of successful participation in the course, indicating the type of knowledge imparted.

Course duration: at least 14 teaching units (LE) of 45 minutes each with subsequent examination (1 LE), spread over at least two working days.

Number of participants: up to approx. 20 people

Teachers: competent persons. The rules and regulations for activities with asbestos (number 3 of the course concept) should be taught by a representative of the authorities or the employers' liability insurance association.

## **B ASI work of small scale**

For small-scale work according to number 2.10 TRGS 519, courses with 14 units can also be recognised, based on the contents of course A, whereby in this case a wide range of asbestos products, but in particular weakly bonded products according to number 2.11 TRGS 519, are dealt with. Activities with low exposure according to number 2.8 or low-emission procedures according to number 2.9 of TRGS 519 with basic examples from BGI 664 must also be taken into account.

The courses can also be conducted together with regard to the contents of items 1, 2, 3, 4, 6, 7 and 8, but a differentiation is required for item 5 and the examination questions.

## **C Integrated ASI Course**

An integrated ASI course can also be conducted from the course concepts A and B.

In this case, the specific safety-related measures such as:

- compartmentalisation,
- Single chamber locks,
- Negative pressure posture,

as well as the working methods with supplementary examples from BGI 664 and waste treatment with at least 3 additional units and to take the topics into account in the examination questions (total course duration 17 units, plus examination).

## **Annex 5 Minimum requirements for further training courses for expert knowledge according to Number 2.7 TRGS 519**

The content of the training courses for experts according to TRGS 519 Annex 3 or Annex 4 shall be designed according to the requirements of the respective annexes and conducted separately.

**Prerequisite for participation:** Proof of expert knowledge according to section 2.7 of this TRGS

**Course duration:** at least eight teaching units of 45 minutes each

**Number of participants:** max. 20 people

### **Contents:**

- 1. Asbestos - Use and properties** 1  
LE
  - Asbestos products and their use ("new" sites) Health hazards and news on
  - occupational diseases
- 2. The latest from the rules and regulations, in particular** 2  
LE
  - Ban on asbestos under the REACH Regulation, Chemicals Sanctions Regulation
  - Ordinance on Hazardous Substances and TRGS 519
  - BGI 664 "Procedures with low exposure to asbestos during demolition, renovation and maintenance work" incl. presentation of new working methods (if necessary trade-specific)
- 3. Notes on restrictions of use** 1  
LE
  - Permissible and impermissible activities and working methods, innovations, examples
- 4. Technical and organisational measures** 3  
LE
  - Working methods according to TRGS 519/Site equipment
  - Tasks of the qualified person
  - Risk assessment and work plan/display of work with exercises/group work)
  - Operating instructions and instruction Occupational health precautions
- 5. Personal protective equipment** 1  
LE
  - Selection and application

---

**8 LE**

## Annex 6.1 Procedure for the determination and assessment of asbestos fibre exposure

(1) The level of asbestos fibre exposure is to be determined by workplace measurements in accordance with TRGS 402 in conjunction with DIN EN 689. This is described by the measurement result of the average asbestos fibre concentration (shift mean) related to an 8-hour working shift.

(2) For the determination of the asbestos fibre concentration, the scanning electron microscope method according to BGI 505-46 shall be used.

(3) The assessment criteria of DIN EN 689 together with further requirements specified in this Annex shall be applied to determine whether the acceptable concentration falls below 10,000 F/m<sup>3</sup>. According to this, the metrological determination of falling below 10,000 F/m<sup>3</sup> can be proven by fulfilling the conditions specified in the following paragraphs 4 to 10.

(4) Either for all measurement results (ME) of at least 3 successive measurements, the

$$ME < \frac{1}{4} \times 10,000 \text{ F/m}^3$$

or the geometric mean of the assessment indices (BI) of the measurement results (ME) of at least 3 consecutive measurements (BI1 to BI<sub>n</sub>) must be

$$\sqrt[n]{(BI1 \times \dots \times BI_n)} \leq 0.5$$

be. BI = measurement result in F/m<sup>3</sup> divided by 10,000 F/m<sup>3</sup> (acceptance concentration). Measurement results with a less-than sign (<-values) are to be included in the calculation without a less-than sign.

(5) Control measurements shall be carried out if the hazard situation has changed significantly or if the assessment according to paragraph 4 has been carried out on the basis of the geometric mean.

(6) A single measurement with a measurement result  $\leq 1/10 \times 10,000 \text{ F/m}^3$ , as allowed by DIN EN 689, is not sufficient.

(7) "Successive measurements" shall be carried out in comparable work areas during the same activities. During the measurements, the boundary conditions must be recorded in accordance with TRGS 402.

(8) The measuring conditions shall be selected in such a way that the detection limit is as low as possible. The detection limit must not exceed 10,000 F/m<sup>3</sup>. A higher detection limit is only permissible for measurement results above 10,000 F/m<sup>3</sup>.

(9) If the measurements do not allow a statement about falling below 10,000 F/m<sup>3</sup>, compliance with the acceptance concentration cannot be determined.

(10) As long as one of the above-mentioned measurement series has not been completed, or as soon as a measurement result of a measurement series exceeds 10,000 F/m<sup>3</sup>, it is not possible to determine that the value has fallen below 10,000 F/m<sup>3</sup>.

## Appendix 6.2 Determination of the asbestos fibre concentration for the approval of low-emission methods according to 2.9

The metrological determinations for the recognition of a low-emission procedure according to 2.9 are carried out according to the criteria specified by the AGS. The criteria take into account both the measurement uncertainty of the raster electronic method (increased evaluation effort) and the uncertainty of individual measurements (measurement strategy). It is not possible to evaluate activities and working procedures on the basis of individual measurements alone - the AGS criteria therefore provide for a graduated increase in the number of measurements the closer the measurement results are to the value of 10,000 F/m<sup>3</sup>.

The AGS criteria are:

The asbestos fibre concentrations are determined according to the recognised procedure of BGI 505-46.

- a) The asbestos fibre concentration is below 10,000 F/m<sup>3</sup> if the following is fulfilled:
  - No measurement result may exceed 10,000 F/m<sup>3</sup>. The measurement result (ME) has the duration of exposure as its temporal reference. Periods of increased exposure shall be taken into account in the measurement. If the daily exposure is shorter than one hour, the reference time is one hour.
  - The measuring conditions shall be selected in such a way that the detection limit is as low as possible. The detection limit must not exceed 10,000 F/m<sup>3</sup>. A higher detection limit is only permissible for measurement results above 10,000 F/m<sup>3</sup>.
- b) To achieve a sufficiently low detection limit
  - the specific sample air volume must not be less than 40 l/cm<sup>2</sup>. This can be achieved by a correspondingly long sampling time or a higher volume flow (even higher than the value recommended in BGI 505-46), if circumstances permit,
  - several of these can be recorded on the same product carrier in the case of short-term work processes,
  - the filter area to be evaluated can be increased in deviation from the standard specifications of regulation BGI 505-46.
- c) If the detection limit of 10,000 F/m<sup>3</sup> cannot be reached or if the measuring filters cannot be evaluated because they are too densely covered with dust particles, it will not be possible to determine that the value has fallen below 10,000 F/m<sup>3</sup>.
- d) For the metrological determination of falling below 10,000 F/m<sup>3</sup>, the following must be done
  1. for all measurement results ME of three consecutive measurements:
    - $ME < 1/4 \times 10,000 \text{ F/m}^3$
    - or
  2. for all measurement results ME of six consecutive measurements:
    - $ME < 1/2 \times 10,000 \text{ F/m}^3$



or

3. for all measurement results ME of twelve consecutive measurements:

$$-ME < 0.9 \times 10,000 \text{ F/m}^3$$

be.

- e) Successive measurements shall be carried out on different days or may be carried out in different work areas where the specific low exposure work under investigation is carried out.
- The work process to be assessed must be described in detail.
  - As soon as a measurement result exceeds the asbestos fibre concentration of  $10,000 \text{ F/m}^3$ , the existence of work with low exposure cannot be confirmed.

### **Annex 6.3 Guidance on the use of the different methods for determining exposure to asbestos fibres according to 4.3 (1) and (2)**

The stipulation in 4.3 (1) and (2) that different assessment methods are to be used to determine the asbestos fibre concentration, depending on the objective of these determinations, is made for the following reasons:

1. In TRGS 910 Number 3.2, Paragraph 4, it is specified that the determination of compliance with the acceptance and tolerance concentration must be carried out in the sense of determining a shift mean value. Thus, in principle, the procedures of TRGS 402 are to be applied, which are specified in Annex 6.1 with regard to the activities covered by this TRGS.
2. The application of low-emission processes according to Number 2.9 is associated with considerable simplifications in the protective measures to be taken, in particular the wearing of respiratory protection and the performance of further control measurements can be dispensed with. Thus, the low-emission processes according to 2.9 are to be considered in analogy to the processes recognised according to TRGS 420 "*Process- and substance-specific criteria (VSK) for risk assessment*". For this reason, the determination of the asbestos fibre concentration to be carried out in the procedure qualification must be based on the stricter AGS criteria according to Annex 6.2, because they are based exclusively on the individual activity or the associated exposure duration and are independent of a stratification.

## **Annex 7.1 Requirements for industrial hoovers and locally variable dust extractors suitable for use in ASI work in accordance with Number 8.2 Paragraph 6 of TRGS 519**

Officially recognised or recognised by the statutory accident insurance institutions In-Industrial hoovers or mobile dust extractors for use in activities involving materials containing asbestos must meet the following requirements:

### **1. Type examination**

For the equipment, proof must be available from an accredited test centre of a successful type examination in accordance with dust class H according to DIN EN 60335-2-69, Annex AA in conjunction with the additional requirements according to this TRGS.

### **2. Nameplate**

In addition to the requirements according to DIN EN 60335-1 and DIN EN 60335-2-69, the type plate must contain the following information:

- Minimum air volume flow according to the test certificate in  $\text{m}^3\text{h}^{-1}$ , for dust extractors additionally the corresponding negative pressure in Pa.
- Electrical protection class
- Weight in kg

### **3. Labelling**

Devices must be marked with the following symbol:



### **4. Filtration and airflow**

For units with a power consumption of up to 1.2 kW, single-stage filtration is sufficient; above 1.2 kW power consumption, an additional cleanable prefilter of dust class M is required.

The filter area load of the prefilter must not exceed 200 m<sup>3</sup>m<sup>-2</sup> h<sup>-1</sup>.

Units with a power consumption above 1.2 kW must be equipped with a connection for an exhaust air hose to the outside; for units with a lower power consumption, the connection is recommended. The exhaust air hose must be dimensioned in such a way (cross-section, length, routing) that the minimum air volume flow on the suction side is not undercut. This is usually achieved if the cross-sectional area of the exhaust air hose is twice as large as that of the suction hose.

## 5. Dust collection equipment

The units must be equipped with devices for collecting the separated dust, which are designed to be stable enough to withstand foreseeable stresses, in particular external stresses. If plastic bags are used as dust collection devices in appliances, they must be protected by a dimensionally stable casing.

## 6. Filter change

When replacing filters, it must be ensured that no dust escapes. The requirement is met if the spin-on filter is closed or wrapped when it is removed and no dust is visible.

## 7. Additional electrical requirements

The equipment must be suitable for use on construction sites and meet the following additional electrical safety requirements:

- Mains cable H07RNF or equivalent
- Protection class IP 54 according to DIN 40 050; except for units with a power consumption of up to 1.2 kW and collector motor (single-phase units), which must comply with protection class IP X4
- Suitability for sucking up water-air mixtures according to DIN EN 60335 - 2 -69, section 19.101

## 8. Operating instructions

The special information and instructions regarding the hazards of asbestos required for the safe handling of the equipment must also be documented in the operating instructions. This applies in particular to all requirements according to number 8 of TRGS 519.

## 9. Older devices

- Experience has shown that the described degree of separation is also complied with for older units of use category K 1 in combination with a C-filter upstream of the unit, which passed a type examination according to ZH 1/487 in connection with the additional requirements for vacuum cleaners (edition 2.1996) before 2002. For older units

For vacuum cleaners with a power consumption of up to 1 kW, use category K 1 with single-stage filtration is sufficient. Such vacuum cleaners meet the requirements of number 4.

- For the operation of older units, the safety measures mentioned under point 7 apply accordingly.

## **Annex 7.2 Minimum requirements for air cleaners for use in activities on building components with asbestos-containing plasters, putties, fly- vertical adhesives and formerly used building chemical products with comparable asbestos contents**

Air purifiers are mobile devices for air purification. The devices draw in air with a ventilator. The dust sucked in is separated from the air in particle filters (DGUV principle 309-012).

Air cleaners used in activities with PSF to reduce possible fibre exposure in the work area must meet the following minimum requirements:

- The air purifier must be equipped with at least a two-stage filter system.
- Pre-filter and main filter must be installed in the unit housing and arranged on the suction side of the fan. A leak-free installation must be ensured for the main filter and any downstream filters.
- The main filter consists of filter materials that correspond to dust class M or of a tested filter element of dust class H. Depending on the achieved transmittance, the unit must be marked "air cleaner with M filter" or "air cleaner with H filter". The main filter must also have sufficient strength to withstand the load generated by the fan.
- The air cleaner must be equipped with a device that indicates when the volume flow falls below the minimum level (e.g. as a result of the filter becoming clogged with dust).
- It must be possible to remove filters covered with dust with a low dust level; i.e. the filter change must not endanger the operator or contaminate the room or room air in which the filter is changed.
- The air purifier must be equipped with at least one connection for an intake or exhaust air hose.
- Electrical components or their installation space in the unit must at least comply with the IP44 degree of protection. The degree of protection must be independent of the filter equipment (even with filter elements removed).
- Mains connection cables with a length of up to 4 m must be of at least H05RN-F quality or equivalent, with a length of more than 4 m of H07RN-F quality or equivalent.
- Air cleaners used must be tested in accordance with DGUV Principle 309-012 "Basic test set for dust testing of air cleaners".

## **Annex 8 Approval as a specialist company in accordance with GefStoffV, Annex I No. 2.4.2 Para4 for demolition and remediation work on weakly bonded asbestos products**

### - Requirements for the safety equipment

According to the Ordinance on Hazardous Substances, Annex II, No. 2.4, Paragraph 4, an approval as a specialist company is required for demolition and renovation work on weakly bound asbestos products with the exception of activities with low exposure according to No. 2.8. As part of the approval procedure, the company must prove that it has the equipment described below. When carrying out the activities, this equipment must be used on the construction site or kept ready for use at the depot in accordance with the requirements of this TRGS.

#### **1. Demolition and renovation work on sprayed asbestos**

- Foreclosure
- Marking of the working area
- ventilation and air-conditioning system (RLT with negative pressure monitoring)
- Measuring device for vacuum maintenance and recording/recorder
- Personnel decontamination unit; four chambers
- Sanitary/washing facilities on site
- Material decontamination plant; at least two chambers
- Packaging material for materials containing asbestos (labelling according to Annex 2 TRGS 519)
- if applicable, containers for the collection of reusable protective clothing or workwear contaminated with asbestos, labelled in accordance with Annex 2.
- Waste water collection tank, if necessary waste water filter system
- Low pressure sprayer
- Industrial vacuum cleaner/dust extractor according to Annex 7.1 TRGS 519
- High-performance vacuum suction unit HVG
- Equipment cleaning facilities at the depot (company headquarters)
- Radiotelephones

#### **2. Demolition and renovation work on weakly bonded asbestos products - without sprayed asbestos -**

- Foreclosure
- Marking of the working area
- Room air conditioning system (RLT with negative pressure monitoring)

- Measuring device for vacuum maintenance and recording/recorder
- Personnel decontamination facility; at least three chambers
- Material decontamination plant; at least two chambers
- Sanitary/washing facilities on site
- Packaging material for materials containing asbestos (labelling according to Annex 2)
- if applicable, containers for the collection of reusable protective clothing or workwear contaminated with asbestos, labelled in accordance with Annex 2.
- Waste water collection tank, if necessary waste water filter system
- Low pressure sprayer
- Industrial vacuum cleaner/dust extractor according to Annex 7.1 TRGS 519
- Equipment cleaning facilities at the depot (company headquarters)
- Radiotelephones

### **3. Demolition and small-scale renovation work on low-bonded asbestos products in interior spaces.**

- Bulkhead/film door
- Marking of the work area
- Air handling unit/ventilation unit;  
for small rooms: use of a suitable industrial hoover / dust extractor according to Annex 7.1 TRGS 519 (according to Number 14.4 Paragraph 3 TRGS 519, an eightfold air exchange per hour must be ensured)
- Personnel decontamination plant
- Sanitary/washing facilities on site
- Material decontamination plant
- Packaging material for materials containing asbestos (labelling according to Annex 2 TRGS 519)
- Containers for the collection of asbestos-contaminated reusable protective or work clothing with labelling according to Annex 2 TRGS 519
- Low pressure sprayer
- Industrial vacuum cleaner/dust extractor according to Annex 7.1 TRGS 519
- Equipment cleaning facilities at the depot (company headquarters)



## Annex 9 to TRGS 519

### **Guidance on the risk assessment and the determination of protective measures for activities involving asbestos-containing plasters, fillers, tile adhesives or other formerly used construction chemical products with comparable asbestos contents (exposure-risk matrix).**

#### **1 General notes**

1. The regulations of TRGS 519 (as of March 2015) do not provide a sufficient basis for carrying out risk assessments and determining risk-based protective measures in many cases for activities involving asbestos-containing plasters, fillers, tile adhesives or other formerly used chemical construction products<sup>6</sup> with comparable asbestos contents (abbreviated to PSF in the following). In order to ensure the safe performance of activities with PSF, further assistance for the risk assessment and the determination of the necessary protective measures is summarised in an exposure-risk matrix (number 2 of this annex). The contents of the exposure-risk matrix are continuously supplemented by further activities and procedures.

2. For the inclusion of the activities in the matrix according to No. 2 of this Annex, the respective work processes used shall be assigned to the risk areas within the meaning of TRGS 910. The assignment is made on the basis of exposure data or, if these are not available in sufficient quantity, by a risk assessment carried out by the TRGS 519 Working Group on the basis of assessment criteria decided by the AGS (see this Annex). Assignments made on the basis of a risk assessment by the TRGS 519 Working Group shall be limited to three years from the date of their inclusion in the matrix in accordance with Number 2 of this Annex and shall be verified by exposure measurements within this period. If the review has not taken place after expiry of this period, the allocation shall be discussed again in the TRGS 519 Working Group.

3. The matrix according to Number 2 of this Annex is designed in such a way that the protective measures described for the respective work processes guarantee the level of protection described in TRGS 519. The protective measures represent the minimum measures required and must be implemented. Supplementary framework conditions may be associated with the working procedures, in particular with regard to the duration of the activities.

If the described framework conditions or protective measures are deviated from, the risk classification stored in the matrix does not apply. In this case, the risk classification must be carried out by the employer himself, taking into account the local conditions within the framework of the risk assessment.

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<sup>6</sup> This term includes, among others, adhesives in general, mastics, coating materials.

4. According to GefStoffV Annex II No. 1 Para. 1 Sentence 2 No. 2, maintenance work leading to removal of the surface of asbestos products may only be carried out using recognised low-emission procedures. "Low-emission processes" according to TRGS 519 No. 2.9 are low-risk activities within the meaning of TRGS 910 that have been tested and recognised by the authorities or the statutory accident insurance institutions.

Provided that the framework conditions and protective measures described in this Annex are complied with, work processes classified as low risk in the matrix according to number 2 of this Annex offer good conditions for recognition as low-emission processes.

5. This annex serves the employer as an aid to risk assessment and describes according to the risk classification

- the protective measures and framework conditions to be provided in accordance with TRGS 519 for carrying out the activity and
- the risk- and task-related requirements to the  
Qualification of the responsible person  
in the company and the supervising person on site.

6. The qualification requirements for the activities listed in this annex are based on the system of expertise in Annexes 3 and 4 of this TRGS, whereby the assignment follows a risk and task reference.

According to Annex I, Number 2.1, Sentence 3 of the Ordinance on Hazardous Substances, it is possible to deviate from the requirements of Annex I, Number 2.4.2 for activities that only lead to low exposure<sup>7</sup>. For the purpose of defining this possibility of deviation, it is stipulated that 6 months after publication of the TRGS amendment, for activities involving recognised low-emission processes, the competent on-site supervisor may be replaced by a person who demonstrates a qualification in accordance with the qualification module 1E<sup>8</sup> described in Annex 10.

This module provides for a practice-related qualification for concrete individual procedures, but also enables a trade-specific bundling of the qualification for several individual procedures. Verification is carried out by public bodies, in particular chambers or the institutions commissioned by them (for details see Annex 10).

Appendix 10 contains the description of the qualification requirements for the Q1E qualification module.

<sup>7</sup> The term "low exposure" is quoted from the aforementioned section of the GefStoffV. A "low exposure" corresponds to the "low risk" according to TRGS 910.

<sup>8</sup> Note: The qualification module 1E is introduced as the first component of a future modular, risk- and task-related qualification system. The other modules relate to the acquisition of expertise. They will be introduced at a later date and will include an appropriate transition of the current system (Annexes 3 to 5).

## 2 Exposure-risk matrix for activities on building components with asbestos-containing plasters, fillers, tile adhesives or other formerly used building chemical products with comparable asbestos contents

Based on the currently valid acceptance concentration (AC) of 10,000 fibres/m<sup>3</sup> and tolerance concentration (TC) of 100,000 fibres/m<sup>3</sup> for asbestos, activities with PSF are assigned to the risk areas according to TRGS 910 ("traffic light model") in the matrix. It does not claim to have covered all activities with PSF and is continuously supplemented according to the state of knowledge.

Assignment to the risk areas is based on exposure data or, if these are not available in sufficient numbers, on a risk assessment carried out by AK TRGS 519 on the basis of assessment criteria decided by the AGS. If other substances are released in addition to asbestos, they must be taken into account in the risk assessment.

The following assessment criteria are used for this risk assessment and must always be considered in their entirety:

- Exposure data of comparable work processes, if available,
- the As- best content to be expected in the product to be processed according to VDI 3866 Sheet 1,
- condition of the product (fibre release potential),
- for spot machining (drilling, punching and similar): Number, size and machining depth,
- for surface treatment (grinding, milling and similar): surface to be treated and removal depth, taking into account the layer thickness of the asbestos-containing material,
- Duration and frequency of the activity to be performed per work shift,
- the layer thickness of the asbestos-containing material to be processed (e.g. plaster, filler, adhesive, etc.) in conjunction with the highest asbestos content specified in VDI 3866 Sheet 1,
- Environmental factors such as spatial conditions of the work area, working outdoors and the like,
- the question of whether there is still a fibre load in the working area after the end of the activity with the asbestos-containing material, which requires action.

This type of allocation to the risk areas is marked in the matrix by *the* designation "Assessment of AK TRGS 519" (see matrix, column "Risk allocation").

Assignments made on the basis of a risk assessment by AK TRGS 519 shall be limited to three years from the date of their inclusion in this Annex and shall be confirmed within this period by exposure measurements.

to be reviewed. If the review has not taken place after the deadline, the assignment will be discussed again in the TRGS 519 working group.

If other substances are released in addition to asbestos, these must be taken into account in the risk assessment.

The matrix also contains the classification of work on components, etc., in which asbestos is contained, but in which, due to the type of installation of the asbestos-containing material and the type of activity, no activity is carried out on the asbestos-containing material itself and thus no release of fibres occurs. In this case, the regulations of Annex I No. 2.2 and Annex II No. 1 GefStoffV and TRGS 910 do not apply.

## Legend

### Assignment to the risk areas according to TRGS 910

No activity with asbestos	low risk	medium risk	high risk
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)<sup>1</sup> **Risk assignment:** if there is no further remark in this column for the respective activity, the risk assessment is carried out by means of exposure data.

)<sup>2</sup> **Abbreviations for protective measures:**

**Abgr** = Delimitation of the working area

**Abs** = Compartmentalisation of the work area

**Abs-F** = Partitioning of the working area with foil door

**1-KPS** = Single-chamber personal lock

**3-KPS** = Three-chamber personal lock

**4-KPS** = Four-chamber personal lock

**2-KMS** = Two-chamber material lock

**WD** = Washing and showering facilities on site, applies in the event that several activities < 2 hrs. are carried out consecutively within a facility

**LR** = Use of an air purifier - at least with filters of dust class M, at least 8-fold air exchange, suction hose close to the source of emission;

**UHG** = Negative pressure maintenance according to TRGS 519

**SK** = Chemical protective clothing EU. Cat III, type as indicated in the matrix

**HM** = Half mask

**VM** = Full face mask

**TVM** = Full face mask, blower assisted

**P2 / P3** = P2 or P3 filter

**R** = Cleaning of all surfaces in the immediate working area with hoovers / dust extractors of at least dust class M; damp cleaning of smooth surfaces.

**FR** = Fine cleaning of the working area in the sense of TRGS 519

**FG** = Release after inspection for dust-free

**FM** = Free measurement to remove the asbestos-related protective measures for subsequent trades and release for use.

)<sup>3</sup> **Safeguard packages:**

**Package of measures "high risk":** Measures according to TRGS 519 section 14.1 to 14.3 + PPE (SK + respiratory protection according to TRGS 519 No. 9.2)

)<sup>4</sup> **Required qualification**

**"Responsible person" in the company:**

**VP-Q1:** "low risk" expertise: expertise according to Annex 4 Section C **VP-Q2:**

"medium risk" expertise: expertise according to Annex 4 Section C **VP-Q3:**

"high risk" **e x p e r t i s e** : expertise according to Annex 3

**"Supervisor on site:**

**AF-Q1E:** Qualification for the application of recognised low-emission processes (basic knowledge + qualification module Q 1E according to Appendix 10).

**AF-Q1:** Expertise "low risk" (for all other activities with low exposure): Expertise according to TRGS 519 Annex 4 Section C

**AF-Q2:** Medium risk expertise: expertise according to Annex 4 Section C

**AF-Q3:** Expertise "high risk": Expertise according to Annex 3

)<sup>5</sup> **"BT process": recognised low-emission process** according to GefStoffV Annex II No. 1 Para. 1 No. 2, published in DGUV Information 201-012.

## Exposure-risk matrix

	Activity	Working procedure	Risk allocation ) <sup>1</sup>	Restrictions	Protective measures see ) <sup>2</sup> and ) <sup>3</sup>	Qualification ) <sup>4</sup>
1	Painting / bonding over asbestos-free coatings, wallpapers and other wall and ceiling coverings on asbestos Residual PSF	all activities / procedures without treatment of the asbestos-containing substrate	No activity with asbestos, therefore no requirements according to TRGS 519			
2	Application of new floor coverings on fully intact and asbestos-free floor coverings with underlying asbestos-containing floor coverings. Filling compounds / Tiling	all activities / procedures without treatment of the asbestos-containing substrate	No activity with asbestos, therefore no requirements according to TRGS 519			
3	Hammering in and pulling nails into / out of surfaces with asbestos-containing PSF	manual	low risk			
4	Set from Drill holes in components with PSF	BT 30 ) <sup>5</sup> "Drilling of boreholes in walls and ceilings with asbestos-containing cladding". Drill diameter max. 12 mm	low risk		see BT 30	VP-Q1 AF-Q1E
		Preparation of the surface with BT 31 "Punching method" or BT 32 "Mortising method" → then drilling in asbestos-free underground	low risk		see BT 31 or BT 32	VP-Q1 AF-Q1E
5	Core drilling in mineral subsoil with PSF small diameters e.g. for heavy-duty dowels, armie-connections, Component drying	Preparation of the surface with BT 32 "caulking" method → followed by drilling in asbestos-free subsoil	low risk		see BT 32	VP-Q1 AF-Q1E
6	Core drilling on metallic surfaces with asbestos-containing coatings	BT 39 - Drilling with core drill on metallic surfaces with asbestos-containing surface sealants and paints	low risk		see BT 39	VP-Q1 AF-Q1E

	Activity	Working procedure	Risk allocation ) <sup>1</sup>	Restrictions	Protective measures see ) <sup>2</sup> and ) <sup>3</sup>	Qualification ) <sup>4</sup>
7	Setting can holes with a can counterbore	Preparation of the surface with BT 32 "caulking method"; → then set the box on asbestos-free sub-ground	low risk		see BT 32	VP-Q1 AF-Q1E
8	Caulking work (up to max. 20 x 20 cm)	BT 32 "Caulking method"	low risk		see BT 32	VP-Q1
9	Caulking work (linear or small-scale) e.g. for laying cables, installing safety boxes, etc.	Preparation of the area to be mortared or chiseled out with BT 32 "Mortising method". Subsequent caulking in asbestos-free subsoil	low risk		see BT32	VP-Q1 AF-Q1E
10	Removal of asbestos-containing wall and ceiling coverings from solid mineral substrates	BT 43 Removal of asbestos-containing wall coverings (e.g. plasters, fillers) from solid mineral substrates (e.g. concrete) - ASUP-ENVIRO-milling process- for the wall and edge finishing (incl. Window soffit)	low risk		see BT 43	VP-Q1 AF-Q1E
		BT 44 Removal of ceiling coverings containing asbestos (e.g. plasters, fillers) from solid mineral substrates (clay) - ASUP-ENVIRO-milling process- Driving for ceiling and edge processing	low risk		see BT 44	VP-Q1 AF-Q1E
11	Removal of asbestos-containing mastics in glazier work	BT 42 Removal of asbestos-containing mastic in the glazing rebate by hewing and cutting with and without heating	low risk		see BT 42	VP-Q1 AF-Q1E

	Activity	Working procedure	Risk allocation ) <sup>1</sup>	Restrictions	Protective measures see ) <sup>2</sup> and ) <sup>3</sup>	Qualification ) <sup>4</sup>
12	Loosening of screws and threaded rods incl. small-surface decoating	BT 45 Loosening of screws and threaded rods as well as small-area decoating of pipelines and plant parts with asbestos-containing paint at asbestos contents of up to 5 % in the Pipeline network of water suppliers	low risk		see BT 45	VP-Q1 AF-Q1E
		BT 26 Removal of asbestos- or PAH-containing surface sealants and paints from metallic surfaces (pastes and coatings). Procedure)	low risk		see BT 26	VP-Q1 AF-Q1E
		BT 27 Blasting of as-persistent paints and coatings from metallic surfaces by means of vacuum suction. blasting process	low risk		see BT 27	VP-Q1 AF-Q1E
		BT 36 Removal of asbestos-containing surface sealer and paint from metallic surfaces (needle process). ren) under suction	low risk		see BT 36	VP-Q1 AF-Q1E
		BT 37 Loosening of screwed fasteners with asbestos-containing surface sealants and coating materials on metallic surfaces (screwing process) by means of Outdoor impact wrench	low risk		see BT 37	VP-Q1 AF-Q1E
		BT 38 Loosening of screwed fasteners with asbestos-containing surface sealants and coating materials on metallic surfaces (screwing process) by means of Impact wrench and under suction	low risk		see BT 38	VP-Q1 AF-Q1E



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	Activity	Working procedure	Risk allocation ) <sup>1</sup>	Restrictions	Protective measures see ) <sup>2</sup> and ) <sup>3</sup>	Qualification ) <sup>4</sup>
13	Core drilling	BT 50 Core drilling with 42-125 mm diameter through walls with asbestos-containing wall cladding	low risk		see BT 50	VP-Q1 AF-Q1E
		BT 51 Core drilling with 42-125 mm diameter through concrete floor slabs and false ceilings with floor structures containing asbestos	low risk		see BT 51	VP-Q1 AF-Q1E

## Annex 10 to TRGS 519

### Qualification module 1E - Qualification for supervisors in the application of recognised low-emission processes according to TRGS 519 Number 2.9

According to Annex I No. 2.1 sentence 3 of the Ordinance on Hazardous Substances, it is possible to deviate from the requirements for expert knowledge according to Annex I No. 2.4.2 for activities that only lead to low exposure. Qualification module 1E (hereinafter referred to as Q 1E) takes up this exemption option of the GefStoffV. For the supervising person who does not have expert knowledge according to at least Annex 4 of this TRGS, it describes which knowledge and skills must be demonstrated when using recognised low-emission processes.

The proof of qualification of a supervising person according to Module Q 1E applies exclusively to activities with recognised low-emission processes. For activities that are assigned to a low risk in Annex 9, but are not recognised as low-emission processes, proof of expert knowledge in accordance with Annex 4 of this TRGS is required as a minimum.

Prerequisite for the acquisition of the qualification according to module Q 1E is the proof of the acquisition of the "Basic knowledge of asbestos".

#### 1. Basic knowledge of asbestos

##### 1.1 General requirements, boundary conditions

The "Basic knowledge of asbestos" comprises the knowledge and skills described below, which can be adapted to the requirements of the respective trades.

The basic knowledge can be acquired and proven through

- Vocational training,
- Participation in a further training measure or
- in-house training (to be carried out by a competent person).

Participation in a qualification measure to acquire the basic knowledge of asbestos must be confirmed in writing by the training provider or the employer. The confirmation of participation must indicate the contents and scope of the qualification measure.

##### 1.2 Contents

###### 1 Identify products containing asbestos

- Technical properties of asbestos
- Typical areas of application (fire protection, heat protection, reinforcement ...)
- Forms of use and fibre release potential (weakly bound, firmly bound, asbestos cement, aggregate in building chemical products such as plasters, fillers)
- Products containing asbestos and their use (trade-specific presentation)

###### 2 Know the hazards of working with asbestos

- Health hazards / asbestos-related diseases
- Typical activities and resulting exposure (trade-specific presentation)

### 3 Know the requirements for working with asbestos

- Requirements for the operation: if necessary, approval, competent persons, competent personnel, suitable technical equipment.
- Preparatory measures: Work plan, risk assessment and determination of the necessary protective measures by a responsible person in the company.
- Requirements for the working procedures and the set-up of the working areas (bulkheads - airlocks, marking)
- Use of personal protective equipment
- Activity-related instruction, occupational health screening

### 4 What to do if asbestos is suspected

- Information to the superior / responsible person
- Further work only after the hazards have been identified and assessed and the necessary protective measures have been determined by a responsible person.

### 5 Practical exercises (trade specific)

- Handling of the equipment used, especially low-dust processing systems, industrial hoovers and dust extractors (changing dust bags, filters, cleaning, transport)
- Exercises on the use of PPE (respiratory protection, protective suits)
- Exercises for ejecting from the work areas
- Cleaning the work area (vacuuming / wet cleaning methods)

The time required to impart the basic knowledge is at least 10 teaching units (45 minutes per unit), of which 5 units are allocated to the theoretical content and 5 units to the practical exercises. The theoretical content can also be taught through e-learning modules.

## 2. Qualification Module 1E (Practice Module)

### 2.1 General requirements, boundary conditions

- a) The qualification is limited to the recognised low-emission process taught in the qualification measure. The relevant process shall be specified in the certificate of participation.
- b) The required time scope of qualification module 1E is determined for the respective procedure and included in the procedure description.
- c) Qualification module 1E can be prepared for specific trades. If several low-emission processes are used in a trade, the knowledge and skills necessary for the supervisor to carry out the processes can be taught together in one qualification measure. This is the case with the

the temporal scope of the qualification measure. The procedures concerned shall be indicated in the certificate of attendance.

- d) The contents of qualification module 1E can also be taught within the framework of vocational training. A separate certificate from the training provider is required as proof, in which the relevant procedure(s) is/are named.
- e) Qualification measures within the meaning of this Annex are events that are held under the responsibility of "public bodies". These are in particular chambers, guilds and comparable institutions or their training centres. The training courses may be held in cooperation with associations, manufacturers or providers of low-emission processes, providers of expert knowledge courses or accident insurance institutions. Certificates/attendance certificates may only be issued by the named bodies and must contain the following information:
- Name and date of birth of the participant,
  - Name and address of the institution under whose responsibility the qualification measure was carried out, as well as signature of a responsible representative.
  - Date of implementation.

An official recognition of the qualification measures according to qualification module 1E and a final examination are not foreseen.

- f) The course provider must notify the competent authority of the implementation of a qualification measure once before the start of the first course in each case.
- g) Within the scope of the qualification measure, instructors shall be employed who have at least expert knowledge according to TRGS 519 Annex 4 Section C as well as practical experience in the application of the low-emission process to be taught.
- h) The number of participants is limited to a maximum of 15. The participants must provide the sponsor of the qualification measure with proof that they have already acquired the basic knowledge.
- i) The qualification module 1E usually comprises 6 teaching units (45 minutes per unit), of which 2 units are devoted to theoretical content and 4 units to practical exercises. If several low-emission processes are used in a trade, the knowledge and skills necessary for the supervisor to carry out the processes can be taught together in one qualification measure. As a rule, the time required for the practical exercises is increased by 2 units per process. Deviations from the temporal scope of the practical exercises are possible under consideration of the units mentioned in the procedure description.

## 2.2 Contents

### 1 Scope of the procedure (min. 1LE)

- Products containing asbestos, installation situations, periods of use
- For which asbestos-containing products is the process generally suitable?
- What activities may be carried out with the procedure?
- Is the low-emission method applicable to the task?

### 2 Measures for low-emission processes (at least 1 LE)

- Requirements for the furnishing of the work area (partitioning, marking, etc.)
- Requirements for hygiene measures (including washing facilities)
- Requirements for the use of personal protective equipment (PPE)
- Requirements for packaging and provision of the waste
- Requirements for cleaning the work areas
- Activity-related instruction, occupational health screening

### 3 Practical exercises (number of teaching units specified in procedure-specific procedure description - see e.g. DGUV Information 201-012).

- Exercises on the working procedure, with particular attention to possible application errors that can lead to increased fibre release.
- Handling of the equipment used, especially vacuum cleaners and dust extractors:
- Change dust bag / filter / cleaning / transport
- Construction and dismantling of bulkheads (carry-over prevention)
- Cleaning the work area (vacuuming / wet cleaning methods)
- Exercises on the use of PPE (respiratory protection, protective suits).

### 3. Combination module "Basic knowledge + Q1E"

#### *Basic knowledge and qualification for supervisors when using recognised low-emission processes according to TRGS 519 No. 2.9*

The combination module Basic Knowledge + Q1E comprises the teaching of the theoretical "Basic Knowledge of Asbestos" as well as the theoretical knowledge and practical skills according to the qualification module Q1E.

#### 3.1 General requirements

- a) The qualification as a supervisor is limited to the recognised low-emission process taught in the Q1E qualification measure. The low-emission process concerned and the time scope of the qualification measure must be stated in the certificate of attendance. The certificate of attendance also serves as proof of the acquisition of basic asbestos knowledge.
- b) The time scope of the combination module, in which the knowledge for a procedure is imparted, is usually 10 teaching units (45 minutes per unit), of which 6 units are allotted to the theoretical contents and 4 units to the practical exercises.
- c) The theoretical contents of the "Basic knowledge of asbestos" are to be taught comprehensively. Time shares for the teaching of theoretical knowledge that are already included in the basic knowledge and are repeated or deepened in Q1E can be adapted or combined. The theoretical contents of the "Basic knowledge of asbestos" can also be taught through e-learning modules.
- d) The teaching of practical skills includes in particular the practical exercises according to Q1E. Deviations from the temporal scope of the practical exercises are possible under consideration of the teaching units mentioned in the procedure description.
- e) The combination module can be prepared for specific trades. If several low-emission processes are used in a trade, the knowledge and skills required for the supervisor to carry out the individual processes can be combined in a combination module. This must be taken into account in the time required for the combination module, which is generally increased by 2 LE per process. The low-emission processes concerned and the time required for the qualification measure shall be stated in the certificate of participation.
- f) Qualification measures are events that are held under the responsibility of The programme can be carried out by "public corporations". These are in particular chambers, guilds and comparable institutions or their training centres. The courses can be held in cooperation with associations, manufacturers or providers of low-emission processes, providers of expert knowledge courses or accident insurance institutions.

Certificates of participation may only be issued by the named bodies and must contain the following information:

- Name and date of birth of the participant,
- Name and address of the institution under whose responsibility the qualification measure was carried out, as well as signature of a responsible representative,

— Date of implementation.

Official recognition of the qualification measures and a final examination are not provided for.

- g) The course provider must notify the competent authority responsible for the recognition of courses of instruction of the qualification once before the start of the first course.
- h) Within the framework of the qualification measure, instructors shall be employed who have at least expert knowledge according to TRGS 519 Annex 4 Section C as well as practical experience in the application of the low-emission process to be taught.
- i) The number of participants is limited to a maximum of 15.

## 3.2 Contents

### 1. Products containing asbestos in the work area

- a) Technical properties of asbestos.
- b) Areas of application of asbestos (including fire protection, heat protection, reinforcement).
- c) Forms of use and fibre release potential (weakly bound, firmly bound, asbestos cement, construction chemical products e.g. plasters, fillers, fly adhesive, asbestos in naturally occurring mineral raw materials).
- d) asbestos-containing products and their use, taking into account periods of use and installation situations.

### 2. Hazards during work with asbestos

- a) Health hazards/asbestos-related diseases.
- b) activities and resulting exposure.

### 3. Requirements for activities with asbestos

- a) Requirements for the operation: competent persons, competent personnel, suitable technical equipment.
- b) Preparatory measures: Work plan, risk assessment and determination of protective measures by a responsible person in the company, notification of activities.
- c) Operating instructions and job-related instruction.
- d) Occupational health screening.

### 4. Scope of the procedure

- a) For which asbestos-containing products is the process generally suitable?
- b) What activities may be carried out with the procedure?
- c) Is the low-emission method applicable to the task?

## **5. Measures for low-emission processes**

- a) Requirements for the furnishing of the work area (partitioning, labelling, etc.).
- b) Requirements for hygiene measures (including washing facilities).
- c) Requirements for the use of personal protective equipment (PPE).
- d) Requirements for packaging and provision of waste.
- e) Requirements for cleaning the work areas.

## **6. Measures in case of further suspicion of asbestos or procedural deviations**

- a) Do not start or stop work, secure work area.
- b) Information to the responsible person in the company.
- c) Further work only after the hazards have been identified and assessed and the necessary protective measures have been determined by a responsible person.

## **7. Practical exercises (number of units depending on the procedure)**

- a) Exercises on the working procedure, with particular attention to possible application errors that can lead to increased fibre release.
- b) Handling of the equipment used, especially vacuum cleaners and dust extractors:
  - Change dust bag/filter/cleaning/transport
- c) Construction and dismantling of bulkheads (carry-over prevention).
- d) Cleaning the work area (vacuuming/methods of wet cleaning).
- e) Exercises on the use of PPE (respiratory protection, protective suits).