

## Technical Rules for Hazardous Substances (TRGS 521)

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<b>Technical Rules for Hazardous Substances</b>	<b>Fiber Dusts</b>	<b>TRGS 521</b>
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The Technical Rules for Hazardous Substances (TRGS) represent the safety, work medicine, hygiene and ergonomics state of the art regarding requirements for handling and bringing hazardous substances into circulation. They are established by the **Ausschuss fuer Gefahrstoffe (AGS) [Hazardous Substances Committee]** and adjusted by the committee to reflect developments.

The TRGS are announced by the Federal Ministry for Work and Social Order in the Bundesarbeitsblatt (BArbBl.).

Regulations of the Ordinance for the Protection Against Hazardous Substances (GefStoffV) are incorporated and indicated by vertical margin lines (*Marking omitted in this format*).

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### Part 1 Inorganic Fiber Dusts

This part contains protective measures for the handling of materials, preparations and products if carcinogenic (category K1 and K2) or suspected carcinogenic (category K3) inorganic fiber dusts can be result or be released.

Further, this part contains general principals for occupational hygiene. These are to be taken into account when such handling can result in the production or release of not yet classified inorganic fiber dusts or fibers with diameters of > 3 microns.

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## **1 Area of applicability**

(1) TRGS 521 Part 1 is applicable to materials, preparations and products if their handling can result in the production or release of inorganic fiber dusts which are, taking into account TRGS 905, categorized as carcinogenic or potentially carcinogenic.

(2) Number 5 "Work hygiene" is also applicable to the handling of materials, preparations and products if unclassified inorganic fiber dusts or fibers with diameters greater than 3 microns can be produced or released.

(3) TRGS 521 is not applicable to the handling of asbestos and asbestos-containing hazardous substances. For the handling of asbestos and asbestos-containing hazardous substances during demolition, renovations or maintenance work (ASI work) and the waste disposal required in conjunction with such work, TRGS 519 must be complied with.

## **2 Definition of terms**

As defined in TRGS 521, Part 1,

1. fiber dusts are dusts that contain artificial or natural inorganic mineral fibers, asbestos excepted, with a length greater than 5 microns, a diameter of less than 3 microns, and a length to diameter ratio of greater than 3 to 1,

2. artificial mineral fibers (KMF) are filaments, mineral wools, ceramic fibers, superfine fibers, whiskers and polycrystalline fibers,

3. products are materials, preparations and products,

4. handling is the production and use of products that can release fiber dusts,

5. use is the utilization, using up, warehousing, storage, processing, incorporation, filling, transferring, mixing, removing, destroying and in-house moving of products that can release fiber dusts,

6. removal is the de-installation and the demolition of products that can release fiber dusts,

7. de-installation is the primarily non-destructive removal of products that can release fiber dusts, particularly within the framework of maintenance work,

8. demolition is the destructive removal of products that can release fiber dusts, with subsequent disposal,

9. work of minor scope is given in cases of the use, including de-installation, of products that can release fiber dusts, so long as the work being carried out does not individually take longer than 4 hours per shift and do not exceed 40 hours total annually. Demolition work and fiber spraying work, as well as all activities in which the already determined threshold values in accordance with TRGS 900 are not complied with, are not considered to be work of minor scope.

10. thermal stress of products made of artificial mineral fibers is given if these fibers were exposed to a temperature that has a negative influence on dust generation:

- For mineral wool insulating materials, this effect generally occurs starting at a thermal stress of 200° Celsius.

- In the case of the removal of high temperature insulation that has been exposed to temperatures above 900° C, the potential danger of silica-laden dust must also be taken into account in the case of some fiber types (such as glassy ceramic fibers, SiO<sub>2</sub> fibers, and calcium-silicate fibers).

11. Dust generation property is the property of products as regards the possible release of fiber dusts.

### **3 General regulations for handling**

#### *3.1 Obligation to ascertain*

(1) The employer must ascertain if products are being produced or used that can release fiber dusts with dangerous properties. In this regard it must be kept in mind that these products are, in many cases, not subject to labeling requirements.

(2) If, during the ascertainment, doubts remain regarding the endangerment, the manufacturer or introducer must, on demand, provide to the employer the dangerous ingredients of the products as well as the dangers arising from them and the measures to be taken. The employer can demand information at least corresponding to the European Community safety data sheet. If no information is available, the worst case - referencing the fiber type - must be assumed.

(3) If the information ascertained indicates that products being ordered or used release fiber dusts with hazardous qualities, these products are to be included in the hazardous substances listing of the operation. This must include at least the following information:

1. Product or substance designation.
2. Information on which hazardous qualities the released fiber dust has (carcinogen, suspected carcinogen, or other hazardous qualities).
3. Amount of the product that is processed in the operation over the course of an average year (if applicable, planned amounts).
4. Work areas in which the product is used (such as production area, construction site, construction yard).

(4) The employer must check if materials, preparations or products can be obtained that pose less of a health hazard than those materials, preparations or products planned on by the employer.

(5) Thus, for example, it must be checked if products that release fiber dusts with dangerous properties can be

- replaced by products that, based on current knowledge, contain harmless or less harmful fibers, or
- can be replaced by low-emission products.

(6) If the use of these materials, preparations and products is reasonable for the employer, and the substitution is required for the protection of employee life and health, the employer may use only these.

(7) The decision of whether alternative products have a lesser health risk depends primarily on their health hazard (toxicological) properties. Further, the emission potential must be taken into account. The

properties of auxiliary substances and additives, such as for fire protection, must be included in this decision.

(8) Whether the essential demand for less dangerous products is applicable in each individual case depends not only from the toxicological evaluation. Also to be considered are

- if an alternative material is technically suitable, and
- if the health of the employees due to lower exposure levels (such as for low concentrations of fiber dust, work of minor scope) can be secured through other suitable protective measures.

(9) It must be considered which protection strategy is appropriate and acceptable given the current state of the art. The technical suitability also includes fire protection properties and requirements of public law.

(10) Further, it must be examined if work processes and products were so selected that the release of fiber dusts is minimized as far as possible.

(11) Suitable work processes and products are, for instance:

- work processes recognized by trade associations and public authorities,
  - wet processes (such as wetting during demolition work),
  - the use of processing tools and procedures generating low levels of dust
- and/or

- prefabricated products
- clad products
- preformed parts
- products with favorable dust generation properties.

Processes for the evaluation of the dust generation properties of mineral wool and ceramic fiber products are under preparation.

(12) The results of the inspections in accordance with paragraphs 4, 5 and 10 are to be recorded in writing, and are to be provided to the responsible authority and the responsible trade association on demand.

(13) If an employer is contractually required to employ certain products, the contract issuer must be notified by the contractor of the ascertainment requirements in accordance with number 3.1.

### *3.2 Monitoring Requirement*

(1) If the appearance of fiber dusts in the air at the workplace can not be safely ruled out, it must be ascertained if the values fall below the air threshold limit values in accordance with TRGS 9000.

(2) Measurements are generally not required if

- work processes (such as process or substance-specific criteria in accordance with TRGS 420 or BIA/BG recommendations) approved by professional trade associations or public authorities,
- work tools approved by professional trade associations or public authorities are employed,
- representative measurement results of comparable work areas and activities can be presented, or

- work of minor scope is being carried out.

(3) The results of the ascertainment in accordance with paragraph 1 are to be recorded and stored for at least 30 years. They are to be provided to the responsible authority on demand. In the case of closures, the documentation is to be turned over to the responsible accident insurance carrier.

### *3.3 Technical Protective Measures*

(1) Insofar as the current state of the art allows, fiber dusts should not be released. In particular, it must be assured that work processes as well as equipment and machines are selected and constructed accordingly.

(2) The tools and machines used must provide processing with low dust generation. Suitable would, for instance, be:

- knives,
- scissors,
- hand saws (open-handle straight-back saw, coping saw)
- circular or saber saws with suction,
- low-speed separator hobs,
- rotation hoop knives.

(3) Fiber spray masses may only be processed using wet conveyor processes. This does not apply to thermal insulation in power plant areas. Using personal protective equipment, the dry conveyor process is permissible.

(4) The use of fiber spray masses for the purpose of anti-condensation coatings and decorative construction features is not necessary based on the state of the art.

(5) The use of fiber spray masses for the purpose of sound absorption or reduction of sound reflection is not necessary based on the state of the art. This does not apply to acoustic measures in old construction (such as domes), if the use of fiber spray masses is necessary for technical reasons (such as structural considerations).

(6) Examples of further emission-reducing measures for fiber spraying are

- the use of foam spray processes,
- the use of suction systems when filling and switch filling sacked goods,
- the use of sealed filling facilities,
- the use of closed supply containers on the sprayer,
- the minimizing of the use of compressed air.

(7) If the release of fiber dusts can not be prevented, they must be captured at the release or creation point and disposed of harmlessly, insofar as the state of the art allows this.

(8) Evacuated air may only be re-introduced into work rooms or workplaces if it is sufficiently cleaned. This is, for instance, given if

- the re-introduced air has, in the case of ventilation and air conditioning systems, a concentration of fiber dusts in the re-introduced air of less than a fifth of the air threshold limit value, and the volume of

the re-introduced air is no more than 70% of the introduced air volume (measurements are to be carried out in accordance with VDI 3861, Blatt 2),

- de-dusters are used that correspond to at least utilization category C, and that have been subjected to a construction type test at an authorized location.

(9) If the catching of fiber dusts at the point of release or creation is not possible or is insufficient, ventilation measures are to be implemented in accordance with the state of the art.

(10) Evacuated air must be so directed, or ventilation measures are to be so arranged, that third parties are not endangered. Thus, for instance, the air may not be directed into other work areas.

(11) Machines and equipment, including the mechanical protective systems, must be maintained in functional state. In particular, systems for the catching and precipitation of the dust must be inspected and maintained regularly in accordance with the manufacturer's specifications, so that their effectiveness is maintained. Malfunctions are to be reported to supervisors immediately.

### *3.4 Organizational Protective Measures*

(1) If the employer subcontracts work to other firms, the employer must, insofar as this is required to avoid possible mutual endangerment, appoint a coordinator to coordinate the work. The employer must ensure that the coordinator has the authority to issue orders to the employer's employees and subcontractors.

(2) If the employer takes on contracts whose implementation times and locations coincide with the contracts of other employers, the employer is required to coordinate with the other employers, the construction supervision, or the coordinator appointed by the contract issuer, insofar as this is necessary in order to avoid mutual endangerment of employees.

(3) Trash, cuttings and loose packaging are to be immediately collected in containers, with the release of fiber dusts to be kept as small as possible.

(4) The employer must provide change rooms with separate storage for street and work clothes, unless the work is small scope. The employer must, at minimum, provide wash-up facilities and skin protectants. Further, shower facilities are recommended.

### *3.5 Personal Protective Equipment*

(1) If the threshold limit value per TRGS 900 is exceeded, and technical or organizational protective measures in accordance with numbers 3.3 and 3.4 are impossible or insufficient, the employer must

1. provide effective and, based on their wear properties, suitable personal protective equipment, and maintain this in a usable and hygienic state, and
2. ensure that the employees are only used for such periods as are absolutely required by the work process and are in accordance with health protection.

(2) The employees must use the personal protective equipment provided. The wearing of respiratory protection and full-body protective suits can not be a constant measure.

#### *3.5.1 Respiratory protection devices*

(1) The employer must provide suitable respiratory protection devices if

- air quality standards in accordance with TRGS 900 are not met,

- fiber spray processes are implemented,
- thermally stressed insulation is being demolished,
- thermally stressed insulation is being de-installed and the work is not of minor scope.

(2) If there is not oxygen deficiency, and the fiber concentration is less than ten times the air threshold limit value in accordance with TRGS 900, the following are suitable as respiratory protection devices:

- Half and quarter masks with P2 filters,
- particle-filtering half masks FFP2,
- filter devices with blower TM 1P.

Suitable for up to twenty times the air threshold limit value are:

- filter devices with blower and helmet or hood TH2P, if these have a warning device for the failure of the blower.

(3) For work in which the fiber concentration is greater than ten times but less than thirty times the threshold limit value in accordance with TRGS 900, the following are suitable as respiratory protection devices:

- Half and quarter masks with P3 filters,
- particle filtering half masks FFP3.

(4) Filter devices with blower TM2P and filter devices with blower and helmet or hood TH3P are also suitable for higher fiber concentrations. Compared to filter devices without blowers, they have less inhalation resistance/strain.

(5) In cases of oxygen deficiency, respiratory protection devices independent of the surrounding atmosphere are required.

### 3.5.2 Protective suits

(1) For work in which respiratory protection is required in accordance with number 3.5.1, paragraph 1, suitable protective suits are also to be provided. The wearing of protective suits prevents the contamination of the work clothes, and thus the tracking of the fiber dusts into uncontaminated areas, and protects against skin irritation (itching).

(2) Protective suits should be breathable. If reusable protective suits are used, the employer must secure to their regular cleaning and care.

### 3.6 Operating Instructions and Training

(1) The employer must set up operating instructions that detail the dangers arising when handling the products that can release fiber dusts, as well as the required protective measures and behaviors. The operating instructions must be compiled in understandable form and in the language of the employees, and must publicize it at a suitable location at the place of work.

(2) Using the operating instructions, the employees are to be made aware of possible hazards when handling products that can release fiber dusts, and comprehensively instructed in the protective measures

to be taken. The instruction must be carried out prior to begin of the employment, and at least once annually thereafter, orally and specifically focusing on the workplace. Contents and time of the instruction are to be recorded in writing, and are to be confirmed by the signature of the person receiving instruction.

### *3.7 Storage, Transport and Cleaning*

(1) Workplaces, including storage rooms, are to be built so that dust deposits can be avoided as far as possible, and floors and horizontal surfaces can be easily cleaned with as little agitation of dust as possible.

(2) Products are to be so stored or transported that the release of fiber dusts is avoided as far as is possible. This is, for instance, achieved when

- products are stored or transported in packaging,
- the packaging or product is not damaged in transport,
- manufacturer's packaging, insofar as is technically possible, is not opened until at the site of use.

(3) Cleaning work is to be carried out in such a manner that the release of fiber dusts is minimized as much as possible. This is, for instance, achieved when

- stationary vacuum cleaning systems or type-inspected dust elimination machines and devices (minimum category C) are used for the cleaning of workrooms, workplaces, storage rooms, traffic paths, machines and equipment,
- floor coverings are cleaned wet,
- the spraying of water is used to adequately bind the fibers during sweeping (no dry sweeping).

The use of compressed to blow dust away is prohibited.

### *3.8 Employment limitations*

The employer may not employ adolescents in work involving products that can release fiber dusts. This does not apply if

1. the handling of these hazardous substances is required to achieve the training goal and
2. the adolescents are supervised by an expert and
3. the atmospheric threshold limit values are not equaled or exceeded
4. the adolescents are at least 15 years old.

## **4 Additional regulations for carcinogenic fiber dusts**

### *4.1 Additional ascertainment duties and protective measures*

(1) Carcinogenic hazardous substances must, insofar as this is reasonable and is possible based on the state of the art, be replaced by materials, preparations or products that present less of a health risk, even if this involves a change of the production or handling process. The production and handling process must, insofar as is reasonable and possible based on the state of the art, be changed if this allows the non-use of the carcinogenic hazardous substance, or the occurrence of the carcinogenic hazardous

substance at the workplace can be prevented. No requirement for remediation for already installed products can be derived from this.

(2) There are already alternative products available for a number of products that can release carcinogenic fiber dusts, the alternative products being technically suitable and posing a lower health risk.

(3) The use of spray processes is essentially unnecessary based on the state of the art. Deviation from this is only allowed if a process is used that is approved by the authorities or a professional trade association. This must secure, through suitable technical means (such as closed systems), that the requirement of § 36 paragraph 3 GefStoffV (Regulation for Hazardous Substances), that employees not be exposed to carcinogenic fiber dusts, is adequately addressed. The lasting use of personal protective equipment in these processes is not permissible.

(4) If an exposure to carcinogenic fiber dusts is unavoidable, the employer must ensure that the technically recommended concentration will not be equaled or exceeded.

(5) Work areas in which products are handled that can release carcinogenic fiber dusts are to be separated from other work areas and marked with the prohibition sign P 06 "Zutritt für Unbefugte verboten" ("No access for unauthorized personnel").

(6) It must be ensured that the number of exposed employees is kept as low as possible.

(7) The affected work areas are to be so laid out that they can be cleaned at any time. For work in interior rooms, furnishings, wall-to-wall carpets, grates are, as appropriate, to be covered with sheeting.

(8) Measures must be taken in storage and transport to prevent the release of carcinogenic fiber dusts. This can, for instance, be ensured by the use of a completely enclosing foil packaging.

(9) Trash, cuttings and loose packaging are to be collected at the point of use in suitable containers (such as sealable containers or tear-resistant and dustproof sacks). The containers must either have the contents marked, or the information must be provided to the disposal/processing firm in accordance with TRGS 201.

(10) The marking must provide information on the type of waste, and the notice "Inhalt kann krebserzeugende Faserstäube freisetzen" ("Contents can release carcinogenic fiber dusts").

(11) If products are handled from which fiber dusts can be released, rooms, facilities and equipment are to be cleaned regularly (see also number 3.3, paragraph 8, and number 3.7, paragraph 3).

(12) In work areas in which carcinogenic hazardous substances are handled, evacuated air may not be re-introduced. In deviation from sentence 1, the air evacuated from a work area can be re-introduced into the work area if it is sufficiently cleaned of carcinogenic substances, using processes or devices approved by the authorities or professional trade associations. The air must be so directed or cleaned that carcinogenic substances do not enter the breathing air of other employees.

(13) As regards the re-introduction of air, the determinations of TRGS 560 must be observed. In deviation from TRGS 560, measurements of the re-introduced air are to be carried out in accordance with VDI 3861 Blatt 2 (see also BIA-Arbeitsmappe [Work folder] "Messung von Gefahrstoffen" ["Measurement of Hazardous Substances"]).

#### 4.2 Notice

(1) The responsible authority and the responsible professional trade association must be given notice of the following without delay, no later than 14 days prior to begin of the first use/handling:

1. the production process in which carcinogenic fiber dusts can occur, be created or released, as well as
2. the use or removal of products that can release carcinogenic fiber dusts.

This does not apply to work of minor scope.

(2) The notice must contain the following information in particular:

1. Product designation or material designation,
2. information on which dangerous properties the released fiber dust has (carcinogenic, other dangerous properties),
3. annual average amount of the product that is processed in the operation (if appropriate, planned amounts),
4. work areas in which the product is used (such as production area, construction site, construction yard),
5. the protective measures taken and, if planned, type and level of protection of the personal protective equipment to be used,
6. justification information as to why no alternative material or process is possible,
7. number of employees handling the hazardous substance,
8. type and extent of the exposure to the hazardous substance, particularly measurement results if they are on hand.

(3) The notice in accordance with paragraph 2 is to be repeated when significant changes are made to

1. the production process or the use,
2. the protective measures,
3. the number of employees handling the hazardous substance.

(4) The employer must provide the affected employees or the works council or personnel council, if present, with copies of the notices, in accordance with paragraphs 1 to 3, for their information.

(5) Paragraphs 1 to 4 do not apply if carcinogenic hazardous substances are used

1. for the purpose of checking their properties or composition, or
2. as a comparison substance for analytic testing.

#### *4.3 Employment prohibitions and limitations as well as use prohibitions for work at home*

(1) If the technically recommended concentration (TRK) is not complied with, employees may not be employed for more than 8 hours daily and not more than 40 hours weekly - for 4-shift operations, 42 hours per week in the average of four consecutive weeks.

(2) Products that can release carcinogenic fiber dusts can not be provided for work at home.

#### *4.4 Medical check-ups and additional hygiene measures*

(1) If medical check-ups are required, employees may only be employed to work with products that can release carcinogenic fiber dusts for which the minimum triggering level is exceeded if

1. occupational medical initial examinations are carried out prior to begin of employment

and

2. occupational medical follow-up examinations during this employment

are carried out by an authorized physician. The employer must initiate the examinations at the employer's own expense.

(2) On demand, the employer must provide the necessary information for the carrying out of the initial medical examinations regarding workplace conditions, and must make possible a viewing of the workplace.

(3) The use of respiratory protective devices does not provide release from the requirement to perform occupational medical initial examinations.

(4) Employees handling products that can release carcinogenic fiber dusts may not smoke or take snuff tobacco at their workplaces (smoking prohibition).

(5) Employees handling products that can release carcinogenic fiber dusts must be provided with washrooms, as well as rooms with separate storage for street and work clothes. If required for health reasons, change rooms for street and work clothes are to be provided, separated by a washroom with showers.

(6) Work and protective clothing must be cleaned by the employer. As necessary, it is to be disposed of in an orderly manner and replaced by the employer.

#### **5 Work Hygiene**

(1) Coarser fibers and fiber fragments can lead to mechanical effects on the eyes, upper respiratory tract and skin. To avoid such temporary, reversible effects, the general basic principles of work hygiene must be observed, as in the handling of non-fibrous dusts. This principles apply both to fiber dusts as defined in number 2.3 of TRGS 905 as well as non-classified fiber dusts or fibers with a diameter of >3 microns.

(2) When handling products that can release fibers or fiber dusts, the soiling of the work areas is to be minimized as far as possible. This can, for instance, be achieved by

- the application of low-dust processing methods and devices in accordance with number 3.3, paragraphs 1 and 2,
- the use of prefabricated products,
- the careful handling of products and waste pieces,
- regular cleaning of the work areas

or

- ventilation and air conditioning measures at the workplace.

(3) Further general principles of work hygiene are:

- the wearing of loose-fitting, closed work clothing and, if appropriate, gloves,
- use of suitable protective creams or lotions for in cases of sensitive skin,
- the wearing of suitable protective glasses or goggles in cases of heavy dust generation or overhead work. The use of half and quarter masks with P1 filter or particle-filtering half masks FFP1 is recommended. In other cases as well, half and quarter masks with P1 filter or particle-filtering half masks FFP1 are to be provided as requested by the employee.
- washing dust off after the end of the work.

#### 6 Further regulations and leaflets

<b>Unfallverhütungsvorschrift</b> (Accident prevention regulation)	"Sicherheits- und Gesundheitsschutzkennzeichnung am Arbeitsplatz" (VBG 125) Safety and Health Protection Marking in the Workplace
<b>ZH 1/124</b>	"Betriebsanweisungen für den Umgang mit Gefahrstoffen" Directives for the Handling of Hazardous Substances
<b>ZH 1/140</b>	"Sicherheitsregeln für Anlagen zur Luftreinhaltung am Arbeitsplatz" Safety Regulations for Systems to Keep Air Clean in the Workplace
<b>ZH 1/487</b>	"Einrichtungen zum Abscheiden gesundheitsgefährlicher Stäube mit Rückführung der Reineluft in die Arbeitsräume (Kleinentstauber-Industriestaubsauger-Kehrsaugmaschine) - Anforderungen an die Wirksamkeit" Facilities for the separation of health-hazardous dusts with reintroduction of the purified air into the workrooms (small de-duster/industrial type vacuum cleaner/brushing vacuum cleaner) - Requirements for effectiveness
<b>ZH 1/606</b>	"Verzeichnis geprüfter Atemschutzgeräte" Registry of tested respiratory protective devices
<b>ZH 1/701</b>	"Regeln für den Einsatz von Atemschutzgeräten" Regulations for the use of respiratory protective devices
<b>Verordnung über Arbeitsstätten</b> <b>(Arbeitsstättenverordnung)</b> Ordinance regarding workplaces (workplace ordinance)	in particular §§ 45 to 47.
<b>TRGS 102</b>	Technically recommended concentration (TRK) for hazardous substances
<b>TRGS 201</b>	Classification and information transmission to waste when handling
<b>TRGS 555</b>	Technical regulations for hazardous substances "Directive and Instruction in accordance with §20 Gefahrstoff-Verordnung"
<b>TRGS 560</b>	"Lufrückführung beim Umgang mit krebserzeugenden Gefahrstoffen" Re-introduction of air when handling carcinogenic hazardous substances
<b>TRGS 900</b>	Threshold limit values in the air at the workplace - air threshold limit values
<b>TRGS 905</b>	Listing of hazardous substances that are carcinogenic, mutagenic or a danger to reproduction
<b>TRgA 415</b>	Technical regulations for dangerous working materials "Tragezeitbegrenzung von Atemschutzgeräten und isolierenden Schutzanzügen ohne Wärmeaustausch für Arbeit" Wear time limitations for respiratory protective equipment and

	insulating protective suits without heat exchange for work
<b>DIN 31051</b>	"Instandhaltung; Begriffe und Maßnahmen" Maintenance; Terms and Measures
<b>E VDI 2262, Blatt 3</b>	"Anforderungen an raumluftechnische Anlagen" Requirements for ventilation and air conditioning systems
<b>VDI 3469</b>	"Emissionsminderung - Faserförmige Stäube" Emissions reduction - fibrous dusts
<b>VDI 3861, Blatt 2</b>	"Messung anorganischer faserförmiger Partikel im strömenden Reingas, rasterelektronenmikroskopisches Verfahren" Measurement of inorganic fibrous particles in flowing clean gas, scanning electron microscopy process
<b>BIA/BG-Empfehlung, Bereich technische Isolierung</b> Recommendation, area of technical insulation	Insulation in shipbuilding, commercial and domestic systems, using mineral wool insulation materials
<b>BIA-Arbeitsmappe</b>	"Messung von Gefahrstoffen: Messung von faserförmigen Stäuben in der Reinluft" (in preparation) Measurement of Hazardous Substances: Measurement of Fibrous Dusts in Clean Air

## Part 2 Organic Fiber Dusts

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#### **1 Area of Applicability**

TRGS 521, Part 2, applies to the handling of materials, preparations and products if organic fiber dusts will be created or released and an exposure exceeding the ubiquitous air pollution (background burden) is given. It contains general principals of work hygiene. If organic fiber dusts are to be classified in accordance with enclosure I, GefStoffV , further measures apply.

#### **2 Definition of Terms**

In accordance with TRGS 521, part 2,

1. organic fiber dusts are dusts that contain organic, inhalable fibrous particles,
2. products are materials, preparations and products,
3. handling is the production and use of products that can release organic fiber dusts,
4. use is the utilization, using up, warehousing, storage, processing, incorporation, filling, transferring, mixing, removing, destroying and in-house moving of products that can release organic fiber dusts.

### **3 Work Hygiene**

#### **3.1 General Measures of Work Hygiene**

The soiling of the workplaces is to be minimized as much as possible. Additionally, it is required that the machines and workplaces be cleaned at appropriate intervals. The intervals are to be determined based on the degree of soiling. Thus, for instance, the handling of highly dust-generating insulating materials on construction sites can make a daily cleaning of the workplace necessary. Cleaning work on machines can become necessary at batch change. Additional measures can, graduated by the generally recognized state of technology for the respective trade/respective production process, be the following, as examples:

- use of processing processes and equipment that generate low levels of dust,
- use of prefabricated products,
- use of machines and systems with dust evacuation (re-introduced air must be adequately cleaned), such as closed prep-work machines with dust evacuation at the point of production,
- ventilation and climate technology measures,
- employment of suitable vacuum cleaners or brushing vacuum cleaners,
- dust deposits are generally not to be blown away with compressed air,
- wet cleaning,
- careful handling of the products and waste parts when processing insulating materials in construction, examples being not throwing products, not unpacking insulating materials until they are at the work location, and immediately gathering up cuttings/waste.

#### **3.2 Further general concepts of work hygiene**

(1) Further general principles of work hygiene are:

- the wear of closed work clothing,
- the use of gloves<sup>1</sup> when there is a danger of mechanical irritation of the skin. If appropriate, the use of dermal protective preparations may be sufficient.
- the wearing of protective glasses/goggles in cases of strong dust generation and the danger of eye injuries, such as when carrying out overhead work,
- the use of half or quarter masks with P1 filters or particle-filtering half masks FFP1<sup>2</sup> in cases of heavy dust generation.

(2) Heavy dust generation must be expected in the following situations, for example:

- the blowing in of organic insulating materials on construction sites,
- the demolition of organic insulating materials,
- the manual cleaning of machines with compressed air to remove dust deposits, if technologically required as an exception,
- maintenance work on filters and filter systems,
- the production or processing of sanitary paper products, and
- the cutting of cement- or gypsum-bonded construction components or construction materials that were produced using organic fibers.

(3) In other cases as well, half and quarter masks with P1 filter or particle-filtering half masks FFP1 are to be provided as requested by the employee.

### **Enclosures<sup>3</sup>**

<u>Enclosure 1</u>	Advice for the determination of fibers and fiber dusts in the workplace
<u>Enclosure 2</u>	Personal protective equipment
<u>Enclosure 3</u>	Samples of a business-related notice in accordance with Part 1, Number 4.2
<u>Enclosure 4</u>	Handling of installed mineral wool products in building construction and technical insulation

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- 1) For work on machines with rotating parts and machine parts with fittings, gloves may not be worn.
  - 2) Regarding cost and comfort of wear, P1 and FFP1 filters and P2 and FFP2 filters do not differ appreciably. P2 and FFP2 filters do, however, provide a markedly higher level of protection.
  - 3) Further enclosures will be announced in the Bundesarbeitsblatt as required and after approval by the AGS. Currently the following enclosures are under deliberation: "Work with ceramic fiber products".