Disposable Protection Clothing
Guide to standards and products

**PPE Regulation EU 2016/425**

The conditions for the sale of personal protective equipment (PPE) and the fundamental safety requirements that this PPE must meet are regulated in the PPE Regulation EU 2016/425. If the requirements set out in the directive are met, the product is eligible for CE marking and can be offered for sale on the European internal market.

Depending on the level of risk that protective clothing is designed to protect against, PPE is assigned to one of three categories:

**Category I:** Simple protective equipment, low risk
**Category II:** Protective clothing that protects the wearer against hazards; PPE that does not fall into category 1 or category 3
**Category III:** Protective clothing that protects the wearer against potentially fatal hazards or serious and irreversible damage to health, high risk

To simplify the process of selecting appropriate protective clothing, the European Union has defined harmonised standards for different protection classes (also called types) for chemical protection – Category III. The protection type is confirmed by certification and indicates the kind of exposure (dust, liquid, gas) for which the suit is suitable.

The attainment of the individual types only ensures the minimum requirements necessary for certification. Please refer to our technical datasheets for details of the individual tests.

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**DIN EN ISO 13688 Protective clothing – general requirements**

DIN EN ISO 13688 defines the general requirements that apply to protective clothing in terms of ergonomics, innocuousness, ageing, size designation, compatibility and marking, as well as the information to be supplied by the manufacturer with the protective clothing. This European standard is a reference standard that is referred to in all other specific protective clothing standards. It can therefore only be applied in conjunction with a specific standard.

Detailed information on the standards can be found at [uvex-safety.com](http://uvex-safety.com).

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Chemical protection is always classified as category III.
## Disposable Protection Clothing

Guide to standards and products

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For more detailed information, please see the relevant certificates, technical data sheets or the endorsement on the product!

### Defining environmental conditions

Are you exposed to dusty, damp or wet conditions during your work?
To make it easier for you to select the right clothing for the job, we’ve categorised our overalls depending on their suitability for these environments. The bars indicate how suitable the product is for each setting.

We also provide information on breathability so that you can take wearer comfort into account in your decision.

### Identifying additional characteristics

In some work environments, there are additional requirements that you will need to take into account. These symbols indicate whether the items are free from silicone and paint wetting impairment substances.
Areas of application:
- handling organic and inorganic chemicals
- cleaning and maintenance work
- chemical and pharmaceutical industries
- food industry
- remediation of soil contamination and dismantling
- industrial cleaning and maintenance
- tank cleaning
- work with paints and varnishes
- disposal of hazardous materials
- agricultural industry
- waste water treatment and drainage construction
- waste management
- disaster response and emergency services
- veterinary medicine and disease control
- oil and petrochemicals
uvex 3B chem classic
Disposable coverall chemical protection Type 3B

General features:
• highly durable material combined with ultrasonically welded and taped seams ensure an barrier and maximum safety
• extremely lightweight and durable material
• skin-friendly textile grip on inside

Protection features:
• offers protection against a wide range of chemicals
• optimal protection thanks to self-adhesive zipper flap

Comfort features:
• elasticsearched waistband, elasticsearched bands on hood, arms and legs for a perfect fit
• middle finger loops prevent sleeves sliding up the arm

Certified in acc. with:
- EN 14126
- EN 14605
- ISO 13982-1
- EN 1149-5

Material Composition
The extremely light and tight spunbond-polypropylene-laminate provides an effective barrier against many organic and inorganic liquid chemicals. The mechanical strength of the material and the sealed, taped seams allow the uvex 3B classic to provide protection against the highest strains without reducing comfort.
uvex 3B chem light
Disposable coverall chemical protection Type 3B

**uvex 3B chem light**

General features:
- light and highly flexible material for high wearer comfort with skin-friendly non-woven material inside

Protection features:
- ideal for cleaning work
- optimal protection thanks to self-adhesive zipper flap

Comfort features:
- elasticated waistband, elasticated bands on hood, arms and legs for optimal fit
- middle finger loops for securing the sleeves

Areas of application:
- handling low-concentration chemicals
- industrial and building cleaning
- ship building and automobile manufacture
- chemical and pharmaceutical industries
- handling paints and varnishes
- electronics
- handling and dismantling of asbestos
- remediation of contaminated sites
- livestock breeding and veterinary medicine
- waste management

**Material Composition**
The incredibly light and flexible spunbond film laminate is ideal for cleaning work and tasks involving the handling of low-concentration chemicals. The taped seams provide additional protection without sacrificing comfort.

**Certified in acc. with**
- EN 14126
- EN 14605
- ISO 13982-1
- EN 1149-5
- EN 1073-2

**89843**

**Material**
- polypropylene spunbond laminated with polyethylene film

**Colour**
- white, yellow

**Sizes**
- S to 3XL

**Order unit**
- PC

**Outer packaging**
- 40 PC per CT

**uvex-safety.com/en/overalls**
Type 3B disposable protective clothing

Performance parameters

The chemicals included in this list are examples only.

For a full overview for each individual garment, please consult the technical datasheets.

You can also search our Chemical Expert System (see page 190).

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS no.</th>
<th>89843 Class</th>
<th>89880 Class</th>
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<td>Acetonitrile</td>
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<tr>
<td>Hydrofluoric acid (aq., 71 to 75%)</td>
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<tr>
<td>Hydrofluoric acid in urea (62 to 64%)</td>
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<td>Formaldehyde (aq., 10%)</td>
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<td>Isopropanol</td>
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<td>Hydrogen peroxide</td>
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</table>

The information provided in the table was obtained in tests conducted under laboratory conditions (at temperatures of 21 ± 2°C).

As additional stresses, such as higher temperatures and mechanical influences, are often present in practice, these values serve as a guide only. The information is provided without obligation and is not intended to replace your own suitability tests.
In farming and forestry applications, workers are repeatedly exposed to hazardous chemical and biological substances. Depending on the type of application, the duration of the exposure and the specific effects of the hazardous substance, it may be necessary to wear personal protective equipment. In addition to respiratory protection and gloves, appropriate chemical protection clothing is an important component of the wearer’s protective equipment.

The performance requirements for chemical protection clothing worn when handling or applying diluted pesticide solutions are set out in DIN 32781. As part of the certification process, the garments are tested for their resistance to specific substances; physical material properties and wearer comfort are also important considerations.

When uvex 4B garments were spray-tested with the five pesticides listed in the standard, the clothing showed no signs of penetration by the substances.

Typical applications that may require chemical protection clothing include:

- the mixing and filling of undiluted concentrates
- spraying heavily diluted mixtures
- exposure due to drift during fine particle aerosol application
- exposure due to intensive contact with treated foliage
uvex 4B
Disposable coverall chemical protection type 4B

uvex 4B
General features:
• light and highly flexible material for high wearer comfort lined with skin-friendly non-woven material inside

Protection features:
• taped seams for optimal protection
• self-adhesive zipper flap for optimal protection

Comfort features:
• elasticated waistband, elasticated bands on hood, arms and legs for optimal fit
• middle finger loops prevent sleeves sliding up the arm

Areas of application:
• low-pressure industrial cleaning and building cleaning
• ship building and automobile manufacture
• chemical and pharmaceutical industries
• handling paints and varnishes
• agriculture and horticulture
• pest control
• electronics
• work with asbestos and dismantling
• remediation of contaminated sites
• pharmaceutical industry and laboratories
• sampling
• livestock breeding and veterinary medicine
• waste management

Certified in acc. with:
- EN 14126
- EN 14605
- ISO 13982-1
- EN 13034
- EN 1073-2
- EN 1149-5
- DIN 32781

uvex 4B Material Composition
The microporous spray-tight spunbond-polyethylene-laminate enables the uvex 4B to provide both protection and breathability. The taped seams provide outstanding protection against liquid aerosols and solid particles while the spunbond material inside makes it comfortable to wear.

uvex-safety.com/en/overalls
uvex 5/6 classic
Disposable coverall chemical protection Type 5/6

uvex 5/6 classic

General features:
• extremely lightweight and breathable material guarantees an excellent combination of comfort and safety
• skin-friendly and soft non-woven material on the inside

Protection features:
• self-adhesive zipper flap for optimal protection

Comfort features:
• elasticated waistband, elasticated bands on hood, arms and legs for a perfect fit
• middle finger loops prevent sleeves sliding up the arm

Areas of application:
• handling chemicals in dust and powder form
• varnishing and protection against paint splashes
• fibreglass production and processing
• industrial cleaning and maintenance
• automotive industry
• grinding and polishing
• cement manufacture
• mining and quarrying
• demolition and refurbishment
• working with asbestos
• wood and metal processing
• construction industry
• pharmaceutical industry

Certified in acc. with
- EN 14126
- ISO 13982-1
- EN 13034
- EN 1149-5
- EN 1073-2

Art. no. 98449
Material polypropylene spunbond, laminated with polyethylene film
Colour white
Sizes S to 3XL
Order unit PC
Outer packaging 50 PC per CT

uvex 5/6 classic Material Composition
The uvex 5/6 classic is made of an extremely light, microporous spunbond polyethylene laminate. Wearers are comfortable due to the soft, skin-friendly material and combined with durable seams, providing a high level of protection against particles and liquid mist.

uvex-safety.com/en/overalls

Three-part hood for optimum fit and unhindered vision
Two-way zipper with adhesive placket for added safety
Elasticated waistband for a perfect fit
uvex 5/6 comfort
Disposable coverall chemical protection Type 5/6

uvex 5/6 comfort

General features:
• the combination of polyethylene laminate and a SMS back section provides a high level of moisture management, without reducing protection
• suitable for cleanroom environments Class 8 in accordance with ISO 14644-1

Protection features:
• bound seams in contrasting colour
• self-adhesive zipper flap for optimal protection

Comfort features:
• optimal fit with elasticated waistband, elasticated bands on the hood, arms and legs
• middle finger loops prevent sleeves sliding up the arm

Areas of application:
• handling chemicals in dust and powder form
• varnishing and protection against paint splashes
• fibreglass production and processing
• industrial cleaning and maintenance
• automotive industry
• grinding and polishing
• cement manufacture
• mining and quarrying
• demolition and refurbishment
• working with asbestos
• wood and metal processing
• construction industry
• cleanroom applications
• pharmaceutical industry

Material Composition
The uvex 5/6 is a very light, microporous spunbond-polyethylene-laminate that, combined with spunbond (SMS) back section, ensures high breathability. Together with the bound seams it guarantees a high level of protection against liquid mist and solid particles.

Certified in acc. with

Spunbond non-woven material
Meltblown non-woven material
Spunbond non-woven material

Bound seams, exterior in contrasting colour.
Increased protection against penetration by solid particles and liquid splashes.

Middle finger loops for firmly securing the sleeves.

Breathable polyethylene laminate combined with an air permeable SMS back section to provide a high level of moisture management and breathability.

Order unit: 40 PC per CT

Material: Main material: polypropylene spunbond, laminate with polypropylene film
back: SMS spunbond
Colour: white, lime
Sizes: S to 3XL
Order unit: PC
Outer packaging: 40 PC per CT

uvex-safety.com/en/overalls
uvex 5/6 air
Disposable coverall chemical protection Type 5/6

uvex 5/6 air

General features:
• excellent moisture management
• ideal for warm working environments and extended periods of wear

Protection features:
• optimal protection in dusty environments
• self-adhesive zipper flap for optimal protection

Comfort features:
• optimal fit with elasticated waistband, elasticated bands on hood, arms and legs
• middle finger loops prevent sleeves sliding up the arm

Areas of application:
• handling chemicals in dust and powder form
• working with asbestos
• fibreglass, ceramic fibre and synthetic resin production and processing
• wood and metal processing
• construction industry
• automotive industry
• grinding and polishing
• cement manufacture
• mining and quarrying
• refurbishment and renovation
• pharmaceutical industry
• repair work

Certified in acc. with

- ISO 13982-1
- EN 13034
- EN 1149-5
- EN 1073-2

uvex 5/6 air Material Composition
The uvex 5/6 air is made of a very light, porous and highly breathable SMS material which ensures excellent wearer comfort through optimum climate management. It also provides a strong barrier against dust exposure and liquid mist, providing reliable wearer protection.

uvex-safety.com/en/overalls

Elasticated waistband for a perfect fit. Middle finger loops for firmly securing the sleeves. Zipper with adhesive placket for added safety.
## Disposable chemical protection

### Accessories

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Disposable chemical protection type 5/6
Material and seam technology

The optimal material for every application

What level of barrier and protective effect do you require? What kind of environmental conditions are you exposed to? With overalls providing a wide range of protection levels and made from various material combinations, uvex offers the perfect solution for every situation – for maximum safety and wearer comfort.

uvex 5/6 laminate

- soft touch
- “water-repellent” outer
- low breathability
- ideal for working in damp environments
- very good protection

Used in:
- uvex 5/6 classic
- primary material in uvex 5/6 comfort

uvex 5/6 SMS/SMMS

- exceptionally soft touch
- slightly “water-repellent” outer
- high breathability
- ideal for high-temperature environments
- good protection

Used in:
- uvex 5/6 air
- back of uvex 5/6 comfort

Exceptionally hard-wearing seams

Testing

In seam strength tests performed in accordance with EN ISO 13935-2, mechanical pulling force is applied to the material to determine the level of force required to rip the seam.

Bound seam

To maintain a perfect seal over the garment, the quilted seam is covered with a contrasting strip. This design is used in uvex 5/6 comfort disposable overalls. Covering the seam with the cover strip produces a more secure seal.

Overlock seam

The internal overlock seam is up to 50% more resistant to stress and up to 50% more elastic than quilted seams. This design is used in uvex 5/6 classic and uvex 5/6 air garments.
Climate testing of uvex coveralls

Alongside the traditional selection criterion of standard requirements, wearer comfort is playing an increasingly significant role in the decision-making process, with climate control becoming an important performance characteristic.

To determine the climate control of the coveralls, the thermoregulation process was tested – the crucial factor here is the accruing moisture, as this forms the basis for transpiration. The ambient temperatures in the climate test remain constant; only body temperature increases – depending on the breathability of the material.

Measuring the microclimate

In the test, the microclimate was measured in the layer structure of the coveralls and wearer according to the SWEATOR® test conditions: 21°C ambient temperature and 60% air humidity.

Accumulation of transpiration after 55 minutes = perceived heat build-up

How do the different materials influence wearer comfort?

- **uvex 5/6 classic**
  The completely laminated coverall permits less evaporation and therefore leads to somewhat higher moisture levels. Compared to other coveralls, the uvex 5/6 classic exhibits the lowest level of breathability.

- **uvex 5/6 comfort**
  The material combination of SMS and laminate places the uvex 5/6 comfort coverall middle of the field in terms of climate control.

- **uvex 5/6 air**
  The uvex 5/6 air coverall made from highly breathable SMS material offers the best climate control properties. It is extremely breathable and impresses in the test thanks to lower temperatures and less moisture.

Which coverall suits which application?

The uvex 5/6 air or uvex 5/6 comfort are recommended for work at high temperatures or for tasks involving heavy physical exertion. The proven uvex 5/6 classic is well-suited to all applications involving lighter activities in normal climate conditions.
Workers may come into contact with biological substances in a wide range of situations. Appropriate personal protective equipment must be used to prevent potential infection.

Clothing designed to provide protection against infectious diseases establishes a physical barrier between the wearer’s skin and the source of the infection, and prevents the disease from spreading to other people or environments.

Generally, micro-organisms such as bacteria, fungi and viruses are classed as biological substances. A detailed definition is provided in EU Directive 2000/54/EC. The crucial common denominator between all of these materials is that they can cause infections, trigger allergies, or produce a toxic effect.

Biological substances are placed in one of four categories depending on the infection risk they present:

Risk group 1: Biological substances that are unlikely to cause disease in humans.

Risk group 2: Biological substances that can cause human disease and might be a hazard to workers, but are unlikely to spread to the community; there is usually effective prophylaxis or treatment available.

Risk group 3: Biological substances that can cause severe human disease and present a serious hazard to workers; they may present a risk of spreading to the community, but there is usually effective prophylaxis or treatment available.

Risk group 4: Biological substances that cause severe human disease and are a serious hazard to workers; they may present a high risk of spreading to the community, and there is usually no effective prophylaxis or treatment available.

The risk groups of each biological substance are described in detail in the annex to EU Directive 2000/54/EC.

Typical applications in which workers may be exposed to infectious substances include:
- Waste water treatment and drainage work
- Waste disposal
- Agriculture
- Food industry
- Work that involves contact with animals and/or products of animal origin
- Healthcare, hospitals, emergency services

A detailed list of all biological substances that you may be exposed to in various applications, and the potential diseases associated with these substances, can be found in a number of publications, including the BGIA Report 1/2013.

Protective clothing in accordance with EN 14126:2003

The EN 14126 standard defines the performance requirements for clothing designed to protect against infectious diseases. The defined test procedures focus on the medium that contains the micro-organisms, such as fluids, aerosols or solid dust particles. Due to the heterogeneous nature of the micro-organisms, it is not possible to define performance criteria for them.

The tests stipulated by the standard relate only to the material; seam technologies are not taken into account. Taped seams provide a higher level of protection, as the micro-organisms are small enough to penetrate through the tiny needle holes along the seam.

The entire protective suit must also be certified as chemical protection clothing (see page 170).

Wearing appropriate protective clothing does not provide complete, guaranteed protection against all chemical risks. It is also essential that you put on and remove the PPE correctly to ensure safety (see page 186). Any person who assists in the removal of the clothing is also exposed to the risk of contamination.
What is permeation?

Permeation is the process by which a chemical moves through an “impermeable” material on a molecular level. The chemicals that accumulate on the outside penetrate the material in various chemical phases and in this way permeate into the inside.

1. Adsorption
   Accumulation of the liquid chemicals on the surface of the material.

2. Absorption
   Penetration of the molecules into the material.

3. Diffusion
   Penetration of the material on a molecular level based on the concentration gradient of the outside of the material into the inside.

4. Desorption
   Leakage of molecules on the inside of the material following penetration.

Note individual factors

uvex protection clothing has undergone the required permeation tests according to ISO6529/EN 374-3.

Should the coveralls become contaminated, certain chemicals could penetrate the material – danger to the wearer cannot be ruled out.

More information on the breakthrough times of specific chemicals can be found in the technical datasheets or in the uvex Chemical Expert System (see page 190).

The breakthrough times were determined under laboratory conditions.

Following contamination, wear or damage, the coverall is to be removed immediately and properly disposed of.

For further information on the test procedure used or for questions regarding individual permeation tests, please visit uvex-safety.com or contact uvex customer services directly at 0800-66 44 893 or +49 (0) 911-97 36-0 from abroad. In the case of queries, please always provide the CAS number and concentration.

As additional stresses, such as higher temperatures and mechanical influences, are often present in practice, this information serves as a guide only. Seams and zip pullers may have shorter breakthrough times particularly in the event of damage or previous wear.
Disposable chemical protection
Guidelines for use

How to undress

In accordance with the ruling of the German Committee for Biological Agents (ABAS), the PPE should be put on and taken off as follows:

► Putting the PPE on:

- before putting the PPE on, check all parts to ensure none are missing or damaged
- remove jewellery and watches
- put on the suit and zip it up to the hips
- put on the boots
- put on the filtering face mask and check its tight fit
- put on the safety glasses
- pull the hood of the suit over your head and zip the suit until it is completely closed. To cover the chin and the zip, press the front flap into place
- put on the safety gloves and pull them over the cuff of the sleeves

► Taking the PPE off:

- disinfect the safety gloves but do not remove
- pull down the hood and pull the suit over the shoulders, turning it inside out down to the hips. At the same time, pull your arms out of the sleeves (a second person with safety gloves and a filtering face mask can help)
- take the suit completely off, removing the boots at the same time
- remove the safety gloves by pulling them inside out
- remove the glasses by drawing them forward from the back and place them in the designated place
- remove the filtering face mask in the same way
- disinfect your hands and finish off by thoroughly washing your hands, face and any other contaminated areas of skin with water and a disinfectant lotion

uvex-safety.com/en/overalls
How to make the right choice

To ensure a perfect fit and to guarantee maximum safety when working with hazardous substances, the uvex coveralls are available in a wide range of sizes. The table shows the body measurements and the corresponding uvex sizes. These size definitions are based on actual body measurements taken while wearing underwear but without wearing shoes.

These sizes differ from standard clothes sizes, so please always select uvex coveralls according to your actual body measurements and not your usual clothes sizes!

Using uvex disposable protective clothing

Prior to use it is essential to check the protective coverall for any damage e.g. broken seams, defective zipper closure or other visible defects which may impair its protection levels.

Storage

uvex disposable protective clothing must be stored in its original packaging in a dry place away from sunlight.

Disposal

The products must be disposed after use in accordance with respective rules and regulations. The products are only suitable for a single use.

Washing disposable suits

The disposable suits are only suitable for a single use and must not be washed.
In order to select appropriate chemical protection clothing for a specific application within your business, it is important to have your overalls tested by a trained safety officer. Many chemicals can cause serious or irreversible injury to workers if they are not adequately protected. For this reason, chemical protection clothing must be chosen with the greatest care.

<table>
<thead>
<tr>
<th>Application</th>
<th>uvex 5/6-air</th>
<th>uvex 5/6-classic</th>
<th>uvex 5/6-comfort</th>
<th>uvex 4B</th>
<th>uvex 3B chem-light</th>
<th>uvex 3B chem-classic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with chemicals in dust or powdered form</td>
<td>✗</td>
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<tr>
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<tr>
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<tr>
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<td>Quarrying and mining</td>
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<td>Grinding and polishing</td>
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</tbody>
</table>
Please note
It is the responsibility of the user to decide which product is most suitable for the intended application. Under no circumstances can uvex accept responsibility for the incorrect application and use of these products.

For enquiries or additional information, please visit uvex-safety.de or contact our customer service department directly on 0800 6644893 (for calls from within Germany) or +49 (0) 911 97360 (for calls from outside Germany). We will be happy to help.

This diagram is a simplification.

Potentially harmful substances?

- Category III chemical protection clothing is not required.
- No
- Yes

- Particles
  - not radioactive
  - radioactive

- Gas
  - Consider a gas-tight model

- Liquids*
  - in form of Splashes and light spray
  - Spray
  - Jets

- being worn in warm work environments and for extended periods

* Please note the permeation data (definition page 185).
As a leader of innovation, we place the highest demands on the products and services which we offer our customers. The uvex Chemical Expert System (CES) has been developed by experts for experts. It can be accessed anytime and anywhere in the world. This web-based tool helps you select the appropriate disposable safety clothing.

**Online chemicals database**

The uvex Chemical Expert System (CES) offers an extensive chemicals database for choosing the appropriate safety gloves for working with hazardous substances. As a user, you can create a personal permeation list or receive advice from our specialists. It only takes a few clicks of the mouse to find the right disposable safety clothing and chemical safety gloves to match your specific requirements.

https://ces.uvex.de