PRODUCT BROCHURE
Personal protective equipment and consumables
The reason behind the comprehensive range of standards and laws on the subject of personal protective equipment (PPE) is the safety of the user. PPE is divided into 3 categories:

<table>
<thead>
<tr>
<th>Category</th>
<th>Protection</th>
<th>EC-Quality assurance</th>
<th>EC-Type testing</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>against minimal risks</td>
<td>-</td>
<td>-</td>
<td>CE</td>
</tr>
<tr>
<td>II</td>
<td>against medium risks</td>
<td>-</td>
<td>✓</td>
<td>CE</td>
</tr>
<tr>
<td>III</td>
<td>against deadly hazards or serious irreversible damage to health</td>
<td>✓</td>
<td>✓</td>
<td>CE + identification no.</td>
</tr>
</tbody>
</table>

1 Number of notified body: http://europa.eu.int

The necessary PPE category for each case is determined as part of a risk analysis. For chemicals, CMR pharmaceuticals and biological agents it is the highest category III.

**PPE-USER REGULATIONS**

The German PPE user regulations (PSA-BV) are the implementation of the EU-directive 89/686/EEC.

§1 The law regulates the supply of personal protective equipment (PPE) by the employer as well as stating their use by the employees.

§2 describes the basic requirements which the employer has to adhere to for the acquisition, maintenance and storage of the PPE.

§3 contains information on how to instruct and train the employees in the use of PPE.

In Europe all PPE which is brought into circulation has to be tested to the harmonised European EN standards. Tests based on the American ASTM standards are not permissible according to European law. The adherence to the specific standards is intended to provide safety for the user. Values such as permeation times (for chemicals – breakthrough times on a molecular level) can only be compared if they were all tested to the same standard.

**LEGAL PROVISIONS WITHIN THE EU**

1. EU – PPE directive (89/686/EEC)
2. General EN standards for specific PPE (e.g. EN 340 for protective clothing, EN 420 for protective gloves)
3. Test standards for specific applications (e.g. EN 374 part 1-3 for chemical protective gloves)
4. Implementation into national law (Laws regarding the availability of personal protective equipment on the market)
5. PPE-User regulations (e.g. PSA-BV in Germany)

**OVERVIEW OF LEGAL FOUNDATIONS**

Important European test standards for: Protective clothing (only type 3 and 4) against chemical and infective agents

- EN 340 – Protective clothing for general requirements
- EN 14126 – Performance requirements and tests methods for protective clothing against infective agents
- EN 14325 – Protective clothing against chemicals - Test methods and performance classification of materials, seams, joins and assemblies
- EN 14605 – Protective clothing against liquid chemicals - Performance requirements for clothing with liquid-tight (type 3) or spray-tight (type 4) connections
- EN ISO 6529 – Protective clothing - Protection against chemicals - Determination of resistance of protective clothing materials to permeation by liquids and gases
- EN ISO 6530 – Protective clothing - Protection against liquid chemicals - Test method for resistance of materials to penetration by liquids
- EN ISO 17491-3 – Protective clothing - Test methods for clothing providing protection against chemicals - Part 3: Determination of resistance to penetration by a jet of liquid (jet test)
- EN ISO 17491-4 – Protective clothing - Test methods for clothing providing protection against chemicals - Part 4: Determination of resistance to penetration by a spray of liquid (spray test)
- EN 13921 – Personal protective equipment - Ergonomic principles
- EN ISO 16604 - Clothing for protection against contact with blood and body fluids. Determination of resistance of protective clothing materials to penetration by blood-borne pathogens. Test method using Phi-X 174 bacteriophage

**Protective gloves against chemicals and infective agents**

- EN 420 – Protective gloves - General requirements and test methods
- EN 374-1 – Protective gloves against chemicals and micro-organisms - Part 1: Terminology and performance requirements
- EN 374-2 – Protective gloves against chemicals and micro-organisms - Part 2: Determination of resistance to penetration (breakthrough due to micro holes)
- EN 374-4 – Protective gloves against chemicals and micro-organisms - Part 4: Determination of the resistance against degradation by chemicals
- EN 388 – Protective gloves against mechanical risks

**Eye protection**

- EN 166 – Personal eye protection - requirements

**Particle filtering masks**

- EN 149 – Respiratory protective devices - Filtering half masks to protect against particles - requirements, testing, marking
- EN 136 – Respiratory protective devices - Full face masks - requirements, testing, marking

**Tests to the American standard ASTM**

(e.g. ASTM F 1671, ASTM D 6978-05, ...)**
The right glove should not just fit – it should also be easy to change and above all, provide reliable protection against hazardous substances. In accordance with the relevant regulations in the EU, the employer is required to provide his employees with suitable protective gloves of the correct category when handling dangerous materials. Berner International offers certified gloves of premium quality - safe and comfortable. Therefore you should pay attention to the quality of your personal protective equipment.

Your safety is at stake.
COMPLETE DOCUMENTATION

For the GMP-compliant manufacturing of e.g. cytotoxic drugs sterile single use protective gloves which are suitable for cleanroom use are an absolute must. On request Berner International can automatically send you the appropriate sterility certificates for every batch.

PROTECTION AGAINST CHEMICALS AND CMR DRUGS

For many years, permeation tests in Europe were carried out in accordance with the directive 89/686/EEC (PPE) to EN 374-3. In 2015, the standard EN 374-3 was replaced by EN 16523-1 and EN 16523-2. At the same time, a draft version of EN 374-1 was published which also has an effect on permeation testing. What is the significance? European standards are harmonised to ensure comparability of the protective properties. However, some products can always be found on the market which have either only been tested to the American standard ASTM F739 or ASTM 6978, or which comply solely with the directive for medical gloves (EN 455). Whether these gloves offer sufficient protection against hazardous substances needs to be assessed in each case. From a legal perspective, the European standards are binding.

PROTECTION AGAINST VIRUSES AND BIOLOGICAL AGENTS

Penetration tests (breakthrough through microholes) are tested throughout the EU in accordance to EN 374-2. Unfortunately the test to EN 374-2 does not include a virus test. For this reason, Berner International always makes sure that all protective gloves are additionally tested to the American standard ASTM F 1671. This is in the process of being changed, as there is now a draft standard available - EN 374-5. This additional European standard for protective gloves against dangerous chemicals and microorganisms also contains a viral protection test similar to ISO 16604 which is similar to the ASTM F 1671 test.
Dermagrip Ultra LT*
Protective glove with innovative SafeDon-dispensing system

Short nitrile protective glove for working in non-sterile areas (e.g. preparatory work in the cytostatic laboratory, biology laboratory, oncology ward, veterinary practice, etc.). With the new SafeDon dispenser system contaminations have been shown to be greatly reduced. At the same time the size of the packaging has been reduced. Available as a 250 dispenser box (suitable dispensing system available) or 50 dispenser box for mobile applications.

Permeation list: Tested for various substances. Detailed information available at www.berner-safety.de/safedon_gb

Certified safety
+ AQL = 1.5 (water test)
+ Additionally tested as medical gloves according to 93/42/EEC (CE class 1) EN 455.

Material
+ Special nitrile mix
+ Non-sterile
+ No detectable allergens
+ Especially resistant against many chemicals

To order Dermagrip Ultra LT – colour light blue

<table>
<thead>
<tr>
<th>Size</th>
<th>S (6)</th>
<th>M (7)</th>
<th>L (8)</th>
<th>XL (9)</th>
</tr>
</thead>
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<td>5015</td>
<td>5020</td>
<td>5025*</td>
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<td>5016</td>
<td>5021</td>
<td>5026</td>
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</tbody>
</table>

* Size XL 240 box

Manu N
Nitrile protective glove – the marathon glove

N stands for nitrile, a synthetic copolymer with a special composition. To guarantee the highest level of protection of nitrile protective gloves, many years of experience and various permeation tests have been necessary. The Berner protective glove Manu N sets new standards when handling chemicals, CMR drugs (e.g. cytostatics) and biological agents.

A comprehensive permeation list: Tested for numerous substances. Detailed information available at www.berner-safety.de/manu_n_gb

Certified safety
+ AQL = 1.5 (water test)
+ Ideal for e.g. the GMP-compliant production of cytostatics
+ Suitable for cleanrooms up to ISO class 5 to EN ISO 14644-1:1999
+ Sterile poly/poly bag packaging
+ Viral protection in accordance to ASTM F 1671

Material
+ Special nitrile mixture
+ Sterile and non-sterile
+ No detectable allergens
+ Extra long: 300 mm
+ 15 cytostatics tested
+ Special stainless steel dispensing system available

To order Manu N Z+B+® – colour light blue

<table>
<thead>
<tr>
<th>Size</th>
<th>XS (6)</th>
<th>S (7)</th>
<th>M (8)</th>
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<tr>
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<td>3016</td>
<td>3021</td>
<td>3026</td>
<td>3031</td>
</tr>
</tbody>
</table>
Manu Prene XP
Latex-free neoprene glove – not just for allergy sufferers

Neoprene protective gloves made from especially high quality polychloroprene and protect the user from CMR substances e.g. cytostatics, various chemicals, biological agents and viruses. Due to the material composition these gloves are to be particularly recommended for existing latex allergies.

Comprehensive permeation list: Tested for numerous substances. Detailed information available at www.berner-safety.de/manuprene_gb

Certified safety
+ AQL = 1.0 (water test)
+ Ideal for e.g. the GMP-compliant production of cytostatics
+ Suitable for cleanrooms up to ISO class 5 to EN ISO 14644-1:1999
+ Sterile plastic packaging
+ Viral protection in accordance to ASTM F 1671
+ Additionally tested as medical gloves in accordance to EN 455

Material
+ Sterile and non-sterile
+ No detectable allergens
+ Polymer-coating for easy donning and removal
+ Anatomical shape
+ Length: 295 mm
+ Special stainless steel dispenser system available

To order Manu Prene XP Z+B+® – colour latte macchiato

<table>
<thead>
<tr>
<th>Size</th>
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<th>S (6 ½)</th>
<th>SM (7)</th>
<th>M (7 ½)</th>
<th>ML (8)</th>
<th>L (8 ½)</th>
<th>XL (9)</th>
</tr>
</thead>
</table>

Manu L
Latex protective glove – the tough standard

L stands for „Latex“, a natural product, which is made from the sap of the rubber tree. The protective gloves' distinguishing features are their special elasticity, high wearing comfort and extra protective properties for cytostatic substances, many chemicals and biological agents. A special virus protection test provides additional safety.

Comprehensive permeation list: Tested for numerous substances. Detailed information available at unter www.berner-safety.de/manu_l_gb

Certified safety
+ AQL = 1.0 (water test)
+ Ideal for e.g. the GMP-compliant production of cytostatics
+ Suitable for cleanrooms up to ISO class 5 to EN ISO 14644-1:1999
+ Sterile polythene packaging
+ Viral protection in accordance to ASTM F 1671
+ Additionally tested as medical gloves in accordance to EN 455

Material
+ Sterile and non-sterile
+ Powder-free
+ Low in protein: 17 µg/g
+ Very low allergenic: 0.5 µg/g
+ Anatomical shape
+ Length: 295 mm
+ High material thickness
+ Special stainless steel dispenser system available

To order Manu L Z+B+® – colour dark blue

<table>
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<tr>
<th>Size</th>
<th>S (6 ½)</th>
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Profeel NR*
Latex glove - low material thickness with good protection

New, top quality chemical protective glove (Erlenmeyer flask) with optimised fit for long, fatigue-free working. Due to the low wall thickness the glove also offers good tactile sensitivity and is suitable for double-gloving. The inner coating makes it easier to change the gloves, the rolled cuff edge fixes the glove shaft to the coverall or oversleeve. Also suitable for use with isolator rings.

Certified safety
+ AQL = 1.0 (water test)
+ Optimal for GMP-compliant production of cytostatics
+ Suitable for cleanrooms up to ISO class 5 to EN ISO 14644-1:1999
+ Poly/poly sterile packaging
+ Viral protection in accordance to ASTM F 1671
+ Additionally tested as medical gloves in accordance to EN 455

Material
+ Sterile
+ Powder-free
+ Low in protein: 12 µg/g
+ Very low allergenic: 0.3 µg/g
+ Anatomical shape
+ Length: 290 mm

To order Profeel NR – colour vanilla

<table>
<thead>
<tr>
<th>Size</th>
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<th>SM (7)</th>
<th>M (7 ½)</th>
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<tbody>
<tr>
<td>Order No.</td>
<td>100004</td>
<td>100005</td>
<td>100006</td>
</tr>
</tbody>
</table>

Dermagrip-D*
The non-sterile version of the Profeel NR

New, top quality chemical protective glove (Erlenmeyer flask) with optimised fit for long, fatigue-free working. Due to the low wall thickness offers the protective glove offers "double-gloving" good texture. The inner coating makes it easier to change the gloves, the rolled edge fixed the glove shaft to the coverall or oversleeve. Also suitable for use with isolator rings. The protective glove has also been tested to EN 455 as medical gloves and also the virus protection test in accordance to ASTM F1671.

Certified safety
+ AQL = 1.5 (water test)
+ Dispenser box with 25 pairs
+ Viral protection in accordance to ASTM F 1671
+ Additionally tested as medical gloves in accordance to 93/42/EEC (CE class 1) EN 455

Material
+ Sterile
+ Powder-free
+ Low in protein: 12 µg/g
+ Very low allergenic: 0.3 µg/g
+ Anatomical shape
+ Length: 290 mm

To order Dermagrip-D – colour vanilla

<table>
<thead>
<tr>
<th>Size</th>
<th>XS (6)</th>
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<th>SM (7)</th>
<th>M (7 ½)</th>
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<th>L (8 ½)</th>
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</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>100011</td>
<td>100012</td>
<td>100013</td>
</tr>
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</table>

*Not available in all countries.
**Expert knowledge safety gloves**

**DIFFERENCE BETWEEN PENETRATION AND PERMEATION**

**Penetration** is defined as the passage of material through micro-holes!

These can be caused during manufacture, or incorrect packaging or storage.

**Permeation** is the passage of substances on a molecular level in undamaged material!

Depending on the protective barrier or chemical, this process can take from a few seconds to many hours/days.

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**Isolator-Glove Changing System**

Changing gloves safely during normal operation

When handling cytostatic substances and CMR drugs, but also chemicals, there are recommendations set out by the German Federal Association for Health and Welfare (BGW), which states that protective gloves should be changed at least every 30 minutes. The reason for this is the breakthrough on a molecular level (permeation), which is the movement of a chemical through the unbroken protective material. The innovative glove changing system makes it easy and safe to keep to the recommended changing times for protective gloves. The complete glove changing system can also be installed at other commercially available isolators and glove boxes. Should you already have a double ring system- our gloves will very likely fit your system, too.

+ Keeping to the recommended glove changing frequency is easily achieved even when working at an isolator
+ Changing gloves safely while in use due to multiple sealing system
+ Cost-effective: Expensive special gloves are unnecessary
+ Perfect protection: Tested and certified protective gloves

**To order** Isolator-glove-changing system Z+B®

<table>
<thead>
<tr>
<th>Item</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locking ring</td>
<td>014690</td>
<td>Isolator sleeve covers (vinyl)</td>
</tr>
<tr>
<td>Glove inner ring</td>
<td>014691</td>
<td></td>
</tr>
<tr>
<td>Retaining ring 85 mm</td>
<td>014902</td>
<td>Double seal for inner ring</td>
</tr>
<tr>
<td>Retaining ring 300 mm</td>
<td>014665</td>
<td>Sleeve covers Isolator 6451</td>
</tr>
</tbody>
</table>

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**INFO**

**Penetration is defined as the passage of material through micro-holes!**

**Permeation is the passage of substances on a molecular level in undamaged material!**
Ultranitril 492*
Thin reusable long-lasting protective glove

Nitrile protective gloves for working in pathology, anatomy, crematories and laboratories. Anatomical shape and flock-lining on the inside makes the gloves comfortable to wear.

Permeation list: Tested for various substances. Detailed information available at www.berner-safety.de

Certified safety
+ Personal protective equipment (PPE) of the highest category III
+ Type tested and certified
+ Protection against chemical risks in accordance to EN 374-3:2003
+ Good protection against diluted chemicals
+ Multiple use (please see product information)

Material
+ Non-sterile
+ Exterior finish: embossed texture
+ Straight cuff
+ Anatomical shape
+ Interior finish: flock-lining
+ Length: 320 mm

To order Ultranitril 492 – Colour green

<table>
<thead>
<tr>
<th>Size</th>
<th>S (6)</th>
<th>SM (7)</th>
<th>M (8)</th>
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<td>100030</td>
<td>100031</td>
<td>100032</td>
<td>100033</td>
<td>100034</td>
</tr>
</tbody>
</table>

* 20 pairs

Ultranitril 480*
Particularly long chemical protection glove

Chemical protective nitrile protective gloves for long, optimized use. Due to the excellent resistance this glove is also highly resistant to abrasion and perforation. The nitrile glove offers a good grip due to the embossed texture. With its 460 mm cuff the glove reaches up to the elbow. Chlorinated for easy donning and taking off.

Permeation list: Tested for various substances. Detailed information available at www.berner-safety.de

Certified safety
+ Personal protective equipment (PPE) of the highest category III
+ Type tested and certified
+ Protection against chemical risks in accordance to EN 374-3:2003 and ASTM F 739
+ Good protection against diluted chemicals
+ Multiple use (please see product information)

Material
+ Nitrile mixture
+ Non-sterile
+ Straight cuff
+ Anatomical shape
+ Good grip due to embossed texture
+ Length: 460 mm

To order Ultranitril 480 – Colour green

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<th>L (10)</th>
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<td>100025</td>
<td>100026</td>
<td>100027</td>
<td>100028</td>
</tr>
</tbody>
</table>

* 12 pairs

*Not available in all countries.
**Stansolv AK 22 381***

Multi-layer protective glove for reliable protection

The Stansolv AK 22 381 protective glove offers reliable protection against many liquids and chemicals. The combination of the nitrile glove with cotton knit lining for more wearing comfort and thermal insulation. Embossed texture for gripping wet objects.

Comprehensive permeation list: Numerous substances tested.
For further information: www.berner-safety.de

<table>
<thead>
<tr>
<th>Certified safety</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>+ Personal protective equipment of the highest category III</td>
<td>+ Non-sterile</td>
</tr>
<tr>
<td>+ Excellent protection against concentrated chemicals</td>
<td>+ Exterior finish: embossed texture</td>
</tr>
<tr>
<td>+ Type-tested and certified</td>
<td>+ Scalloped cuff</td>
</tr>
<tr>
<td>+ Comprehensive permeation list</td>
<td>+ Interior finish: cotton-knit lining</td>
</tr>
<tr>
<td>+ Multiple use (see product information)</td>
<td>+ Length: 355 mm</td>
</tr>
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**To order** Stansolv AK-22 381 – Colour Green

<table>
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<th>Size</th>
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<tr>
<td>To order (non-sterile)*</td>
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<td>100017</td>
<td>100018</td>
<td>100019</td>
<td>100020</td>
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</tbody>
</table>

* 12 pairs

**Trionic 517***

Suitable for cleanrooms up to ISO class 5

The chemical protective glove Trionic 517 is suitable use in cleanrooms up to ISO Class 5. Consisting of tri-polymer blend of natural latex, neoprene and nitrile, the glove provides increased comfort while protecting optimally against mechanical and chemical risks. The wide cuff supports the double-gloving procedure.

<table>
<thead>
<tr>
<th>Certified safety</th>
<th>Material</th>
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<tbody>
<tr>
<td>+ Personal protective equipment of the highest category III</td>
<td>+ Non-sterile</td>
</tr>
<tr>
<td>+ Very good protection against concentrated chemicals</td>
<td>+ Made of tri-polymer</td>
</tr>
<tr>
<td>+ Type-tested and certified</td>
<td>+ Straight cuff</td>
</tr>
<tr>
<td>+ Very comprehensive permeation list</td>
<td>+ Exterior finish: embossed texture</td>
</tr>
<tr>
<td>+ Multiple use (see product information)</td>
<td>+ Interior finish: chlorinated</td>
</tr>
<tr>
<td></td>
<td>+ Length: 360 mm</td>
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**To order** Trionic 517 – Colour yellow

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* 12 pairs
Butoflex 651
Butyl-protective glove for handling many different chemicals

The gloves Butoflex 651 offers maximum chemical resistance against highly caustic acids, ketones, esters and amine derivatives. Due to the unique flexibility and dexterity the protective gloves can be used for a wide range of tasks.

Certified safety
- Personal protective equipment (PPE) of the highest category III
- Protection against chemical risks in accordance to EN 374-3-2003 and ASTM F 739
- Protective gloves with electrostatic properties in accordance to EN 16350
- Electrostatic properties: <1,0 10E5

Material
- Non-sterile
- Butyl rubber
- Rolled cuff edge
- Palm with profile
- Anatomical shape
- Material thickness: 0,5 mm
- Length: 350 mm

To order Butoflex 651 – Colour black

<table>
<thead>
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<th>Size</th>
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</tbody>
</table>

Kronit-Proof 395
Cut-resistant protective glove combined with good chemical protection

The Kronit-Proof 395 protective gloves offer a complete hand protection against cuts (level 5), good protection against thermal risks and is particularly resistant to mechanical stress. Through multilayer technology, the glove is liquid-tight and facilitates secure handling of wet and slippery objects. Characterized by long-lasting performance: the Kronit-Proof 395 retains its properties unchanged for up to 5 washes.

Certified safety
- Personal protective equipment (PPE) of the highest category III
- Type tested and certified
- Protection against chemical risks in accordance to EN 374-3-2003 and ASTM F 739
- Highest cut resistance class 5
- Electrostatic properties: <1.0 10E5

Material
- Non-sterile
- Nitrile / Cotton - Multi-layer technology
- Anatomically shaped
- Straight cuff
- Interior finish: cotton knit
- Length: 320 mm

To order Cut resistant gloves Kronit-Proof 395 – Colour green

<table>
<thead>
<tr>
<th>Size</th>
<th>M (8)</th>
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</thead>
<tbody>
<tr>
<td>Order No. (non-sterile - 1 pair)</td>
<td>100022</td>
<td>100023</td>
<td>100024</td>
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</table>
Coming into contact with chemicals can alter or even damage protective gloves.

This change in physical material properties is called degradation. It can vary from differences in colour to hardening or softening up to dissolving the material. Some changes may be reversible, other forms of degradation are however irreversible and/or accumulate during the lifetime of the gloves. In both cases the protective functions of the gloves can have a lasting negative effect.

To be able to determine and compare the degradation resistance of protective gloves against chemicals and microorganisms, these are tested in accordance to the standard EN 374-4. Here the puncture resistance of the material is determined after a defined contact period with the test chemical and compared to the untreated material.

The test set-up only takes into account liquid chemicals. Also, the test is only valid for gloves made from natural or synthetic polymers.

Single-use gloves should generally be worn for a short period of time and should only be used once. Therefore the degradation problem normally plays a less important role. The resulting reduction of the protective effect for permeable substances is generally more suitable when carried out as part of the permeation testing procedure (see expert know-how penetration/permeation).

This is different for reusable chemical protective gloves. The material changes can still be present after cleaning and drying. For this reason the reusable glove degradation results have to be given for each tested chemical. These are measured using differences of the puncture resistance (residual force) of the glove material and can be given as four levels. Number 1 stands for a low residual force, 4 for a high one.

In addition visual differences and weight changes (e.g. swelling of the material) have to be specified. The relevant details can be found in the product information for each type of glove.
Protective coverall & partial protection

Protective coveralls and partial body protection clothing for the laboratory in Europe, just like gloves, have to comply with the PPE directive 89/686/EEC. Depending on the individual risk assessment suitable protective clothing has to be selected. We would be pleased to advise you to determine the appropriate protective clothing suitable for your specific needs.

It’s all about your safety.

You want to know more? Simply use your smartphone or tablet to access www.berner-safety.de/ppe
**PROTECTIVE CLOTHING PYRAMID**

The safety pyramid gives an overview over the various protection levels. Within these protection levels different materials and seam finishes offer, in conjunction with the other PPE components, advantages for protective functions.

![Pyramid Diagram](image)

**CATEGORISATION & DIFFERENCES OF PPE IN ACCORDANCE TO EU-DIRECTIVE 89/86/EEC**

<table>
<thead>
<tr>
<th>Category</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>against minimal risks</td>
<td>against medium risks</td>
<td>against deadly hazards or serious irreversible damage to health</td>
</tr>
<tr>
<td>EC-quality assurance</td>
<td>–</td>
<td>–</td>
<td>✓</td>
</tr>
<tr>
<td>EC- type test</td>
<td>–</td>
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<td>✓</td>
</tr>
<tr>
<td>Marking</td>
<td>CE</td>
<td>CE</td>
<td>CE + Mark ¹</td>
</tr>
</tbody>
</table>

¹ Number of the certificated notified body: [http://europa.eu.int](http://europa.eu.int)

The necessary PPE category for each case is determined with the aid of a hazard analysis. For CMR pharmaceuticals, for example, it is the highest category III. This also applies to reusable cleanroom overalls, which are used for handling cytostatics. These also have to be tested to the highest PPE category III and have a corresponding type test certificate.
Protective coverall Active Breath Z+B+®

Certified type PB4 breathable personal protection against chemicals and CMR-drugs

Category III protective coverall offers optimum protection against hazardous substances such as chemicals, CMR drugs (e.g. cytostatics) and biological agents. However, this is usually at the expense of breathability and wearing comfort. For this reason cleanroom overalls tend to be worn instead. These offer breathability and protection for the cleanroom, but they are not classed as certified personal protection equipment (in accordance to the PPE directive 89/686/EEC certified PPE must be worn when handling hazardous substances).

The protective coverall BERNER Active Breath Z+B+® unites personal protection and breathability in a unique way. In the vulnerable areas (at the front, shoulder and leg region) the protective coverall contains tested and certified personal protective material. The back part of the coverall is made from breathable material and guarantees a controlled air exchange for maximum comfort.

To order Protective coverall Active Breath Z+B+®

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<thead>
<tr>
<th>Size</th>
<th>S</th>
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</table>

Protective coverall Tyvek® Classic Plus

Type 4/4-B protective coverall against cytostatics, chemicals and biological agents

The type 4 coverall DuPont™ Tyvek® Classic Plus offers good protection when handling cytostatic agents and against many chemicals and biological agents. The well-known Tyvek-material is very robust, extremely comfortable to wear and meets the requirements of EN 1149-1 being anti-statically treated. Suitable for use as a pandemic protective gown (e.g. bird flu, etc.), but not for Ebola or similar viruses.

To order Schutzoverall Tyvek® Classic Plus

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<thead>
<tr>
<th>Size</th>
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</table>
Protective coverall Tyvek® 800J
New light type 3/3-B coverall

The model Tyvek® 800J made by DuPont™ is the continuous development of the type 3 protective overall market. Just as light as a type-4 coverall, the 800J nevertheless meets the protective requirements of a type-3 coverall. Due to the new material the coverall is more breathable than other type 3-coveralls and offers good protection against inorganic chemicals at low concentrations as well as biological agents. Also suitable for use in pandemics (including Ebola and similar viruses).

To order protective coverall Tyvek® 800J

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<tr>
<th>Size</th>
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Protective coverall Tychem® C
Type 3/3-B: Perfect protection against inorganic chemicals and biological agents

The well-known type-3 protective coverall Tychem® C acts a very effective barrier against many inorganic chemicals. Stitched and overtaped seams, a special chinguard and the robust yellow surface material together with other PPE components (safety goggles, respiratory face mask, etc.) provide the perfect protection for the user. Also for a pandemic task force (e.g. Ebola, ...) the ideal choice.

To order Protective coverall Tychem® C

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</table>

* ISO 14644-1  ** GMP-Guidelines Annex 1
**Tyvek® IsoClean®**
Specially cleaned and sterilised protective coverall for cleanroom applications class B / ISO class 5

The new coverall IsoClean is specially cleaned and packed and sterilised under controlled conditions. Tested and certificated protective coverall for handling cytostatics. Especially low in particles for use in cleanrooms ISO-class 5 (as per ISO 14644-1) and GMP-class B (GMP-Guidelines Annex 1).

**To order** Protective coverall Tyvek® IsoClean®

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<thead>
<tr>
<th>Size</th>
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**Protective coverall EasySafe**
Light type 5/6 coverall for particles and light spray

The type 5/6-protective coverall from PE spun fleece offers protection against fibres, particles and light spray mist is optimally designed for cleaning and other auxiliary work in the laboratory, disposal of contaminated waste (e.g. asbestos) and inspection and overhaul work. The coverall is very comfortable to wear and is antistatically treated in accordance to EN 1149-5.

**To order** Protective coverall EasySafe®

<table>
<thead>
<tr>
<th>Size</th>
<th>M</th>
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<th>XL</th>
<th>XXL</th>
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<tbody>
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<tr>
<td>Body height (cm)</td>
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<td>125702</td>
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* ISO 14644-1  ** GMP-Guidelines Annex 1
Expert Know-How - Protective Coveralls

TEST METHODS: PARTICLE EMISSION OF STERILE PROTECTIVE CLOTHING IN CLEANROOMS

When working with toxic substances and CMR drugs protective clothing needs to be worn even under cleanroom conditions in accordance with the European PPE guidelines 89/686/EEC.

However, the type of cleanroom clothing normally worn does not provide sufficient protection here. Their use is a legal grey zone for the operator. Certified protective clothing is often regarded as unsuitable for clean areas, due to the assumption that they emit too many particles.

For this reason Berner International has a special testing chamber, where particle emissions of protective clothing can be measured under real life-like conditions.

The test chamber, also called ‘Body Box’, based on a test process of the American “Institute of Environmental Science & Technology”.

In contrast to other methods of particle measurements of clothing items (e.g. Helmke Drum testing) the emission of particles in this test scenario will be measured while the piece of clothing is being actually worn be a person.

In a mini-cleanroom, the size being similar to a telephone box, the test subject has to perform by the certain movements defined by the IEST. Such as, "straightening the arms", "walking with hand movements up to the shoulders and raised up knees", up to squats. The exhaust air flow is tested with particle counters, so that the exact number of emitted particles per m³ air can be measured in various sizes. By repeating the experiment a fixed number of times the average number of emitted particles per type of protective clothing item (e.g. protective coverall Active Breath, sterile, Tyvek Classic+, sterile, etc.) can be determined. If the procedure is adapted further to emulate the actual movements which are carried out in the laboratory, then the particle emissions will also be more realistic.

Using this body box we can specify the particle emissions of a person wearing protective clothing in a cleanroom and subsequently recommend suitable PPE. This guarantees optimal personal and also the necessary product protection in the cleanroom.

Figure left: Body Box with test subject
Protective overboots PB3-3PB
Type PB3 / PB3-B: The perfect addition for any coverall

The protective overboots type PB3 / PB3-B with a slip-resistant and a liquid tight sole offers you maximum protection against aggressive chemicals. The protective overboots have also been tested as infection protection clothing in accordance to EN 14126. The universal shape and elasticated seam at the top as well as the tie strap guarantee a comfortable fit and make them quick and easy to put on and take off.

To order Protective overboots PB-3 / PB-3BB
Size uni
Order No. (non-sterile - 15 pairs) 100044

Protective overboots Active Breath Z+B+®
Cleanroom compliant chemical protection type PB4 for your feet

For optimum protection Berner International offers protective overboots which are a useful addition to the new coverall. The protective overboots Active Breath Z+B+ are made from the same tested and certified protective material. Elasticated bands and additional ties ensure a good fit around the foot and a particle-tight connection to the overall. A slip-resistant sole makes walking easier and provides a safe grip.

To order Protective overboots Active Breath Z+B+®
Size uni
Order No. (non-sterile - 20 pairs) 125550
Order No. (sterile - 25 pairs) 125551

Protective overboots Tyvek® Isoclean®
Cleanroom overboots suitable for ISO-class 4 with slip-resistant sole

The overboots Tyvek® Isoclean® made by DuPont combine all the protective properties of Tyvek material with the requirements of controlled areas in cleanrooms. The Tyvek material has been specially cleaned and sterilised and is therefore suitable for cleanrooms up to ISO class 4.

To order Protective overboots Tyvek® Isoclean®
Size M L XL
Order No. (non-sterile - 50 pairs) 125564 125565 –
Order No. (sterile - 50 pairs) 125566 – 125567
Protective overboots Z+B+®
Cleanroom protection for your feet type PB4 / PB4-B

The Berner protective overshoe Z+B+® with a certified slip-retardant sole and liquid-tight coating offers maximum protection. The universal fit and the elastically aneled ankle guarantee a comfortable fit and are easy to put on and take off.

+ Personal protective equipment (PPE) category III
+ Very high barrier function: comprehensive permeation tests with various cytostatics
+ Low in particles

To order Protective overboots Z+B+®

<table>
<thead>
<tr>
<th>Size</th>
<th>38</th>
<th>39</th>
<th>40</th>
<th>41</th>
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<td>Order No. (non-sterile - 40 pairs)</td>
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Safety boots S5
Puncture-resistant boots for use during pandemics

These safety boots of the highest safety level S5 with a slip-resistant sole offer maximum protection for pandemics. Due to the high stability and optimal shape the work safety boots are very comfortable to wear. Additionally, the boots are certified as infective protection clothing to EN ISO 20345. The protective boots have reinforced toe caps and a steel layer and are anti-statically treated.

To order Safety boots S5 - shaft height 35 cm

<table>
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Hood Tyvek® Isoclean®
Additional particle protection in cleanrooms

The hood Tyvek® Isoclean® manufactured by DuPont combines the protective properties of the well-known Tyvek® material with the requirements of controlled areas in cleanrooms. The hood was specially cleaned and sterilised and is suitable for cleanrooms up to ISO-class 4.

To order Hood DuPont Tyvek® Isoclean®

<table>
<thead>
<tr>
<th>Size</th>
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</tr>
</thead>
<tbody>
<tr>
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</table>
Protective gown Z+B+®
The proven partial protection against chemicals, cytostatic and biological agents type PB4 / PB4-B

Partial body protection with completely closed front, extra long cut and a raised collar.

+ Liquid impermeable coating front and sleeves
+ Sleeves have ultrasonically sealed seams for high penetration protection
+ Comprehensive permeation tests
+ Breathable back
+ Neck velcro fastening
+ With ties at the waist
+ Available with elasticated or knitted cuffs
+ Optimal for cleanrooms (gown worn over the cleanroom overall)

To order Protective gown Z+B+® with knitted cuffs

<table>
<thead>
<tr>
<th>Size</th>
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To order Protective gown Z+B+® with elasticated cuffs

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<tr>
<td>Order No. (sterile - 10 pieces)</td>
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<td>6650</td>
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Apron Tyvek® Classic Plus
Additional protection as required

Partial protection version suitable, for example, with reusable clothing systems made from the well-known Tyvek® Classic Plus material. The apron has a neck loop and a tie at the waist.

+ Partial protection for the front part of the body
+ With neck loop and waist tie
+ Comprehensive documentation
+ Certified-material - apron not tested separately as PPE (type 4PB)

To order Apron DuPont Tyvek® Classic Plus

<table>
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Protective oversleeves Z+B®

Suitable protection for sleeves in cleanrooms against chemicals, cytostatics and biological agents type PB4 / PB4-B.

The low particle oversleeves can be used wherever all over body protection is not required. Due to the liquid-impermeable coating safety protection of the arms is always guaranteed. The cone-shaped cut makes donning easy, universal shape and wearing comfort.

+ Comprehensive permeation tests
+ Ultrasonic sealed seams for high penetration protection
+ Available with knitted or elasticated cuffs

To order Protetive oversleeves Z+B®

<table>
<thead>
<tr>
<th>Size</th>
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<td>Order No. (sterile - 40 / 30 pairs)</td>
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Isolator protective oversleeves Z+B®

Protection of the isolator oversleeves permeation type PB4

When working with CMR drugs (e.g. cytostatics) all exposed protective materials are subject to potential contamination by a particular substance. The protective oversleeves which are connected to the isolator also lie within the exposed area. However, to maintain a changing rhythm here is very difficult. For this reason Berner International offers a patented oversleeves system, which can be pulled over the existing isolator oversleeve system. The oversleeve system consists of tested and certified PPE and is to be replaced daily. In this way permeation in the fixed part of the isolator oversleeves can be avoided.

To order Isolator sleeve covers Z+B®

<table>
<thead>
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<tr>
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</table>
Respiratory masks can be divided into particle filtrating half masks (also called FFP masks) and respiratory face masks as partial or full face mask with replaceable filter elements for the filtration of gases and particles. For work areas with insufficient oxygen concentration the use of additional self-contained breathing apparatus is necessary.

It's all about your safety.

You would like to know more? Simply use your smartphone or tablet to access www.berner-safety.de/masks
CERTIFIED RESPIRATORY FACE MASKS

Certified, particle-filtrating respiratory face masks in accordance to EN 149 of levels FFP-2 and FFP-3 for use in the laboratory. According to the application area masks can be used for protection against particles and aerosols when handling cytostatics, working with biological agents and viruses or other hazardous substances. All masks are type-tested and certified in accordance to EU directive 89/686/EEC.

Attention - FFP-masks are unsuitable for gases!

For protection against gaseous substances use a reusable partial or full face mask with an appropriate filter.

OVERVIEW OF FFP-FILTRATION RATES

Example: For a filtration rate of 92 %, 8 % of particles go through the mask (if worn correctly).

* FFP Classification in accordance to EN 149
**FFP-3 Respiratory mask**
Protection against particles, aerosols and viruses

The pre-shaped FFP-3 respiratory mask with integrated valve and fixed mask body made by Uvex Safety. The new, optimised design of this FFP-3 moulded mask in connection with the soft sealing lip makes it very comfortable to wear while optimising the protective function. This respiratory face mask is suitable for handling with CMR drugs (e.g. cytostatics, virostatics, etc.), biological agents and viruses.

**To order** Uvex respiratory pre-shaped mask FFP-3 D

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**FFP-3 Respiratory mask**
Pre-shaped mask with high wearing comfort

The FFP-3 respiratory mask made by Moldex has an integrated valve and pre-shaped mask body. A sealing lip with elastic straps ensures maximum comfort. Donning and removing of the mask is easy due to the moulded shape and ensures a perfect fit. This face mask is suitable for handling CMR drugs (e.g. cytostatic substances, virostatics, etc.) biological agents as well as viruses.

**To order** Moldex respiratory pre-shaped mask FFP-3 D

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**FFP-3 respiratory folding mask**
Folding mask for all face shapes

The FFP-3 respiratory folded face mask with integrated valve manufactured by Uvex Safety. Due to the special design this FFP-3 mask the correct fit (and thereby ensuring the protective function) can be easily checked. The elsticasted straps at the sides ensure a tight and proper fit of the mask. Also available as a sterile version. The latex-free folding mask is also very space-savings to store.

**To order** Uvex respiratory folding mask FFP-3 D

<table>
<thead>
<tr>
<th>Size</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No. (non-sterile - 1 piece)</td>
<td>121285</td>
</tr>
<tr>
<td>Order No. (sterile - 4 pieces)</td>
<td>121286</td>
</tr>
</tbody>
</table>
**FFP-3 Respiratory folding mask**
Respiratory folding mask without exhalation valve

Developed for working in cleanrooms, in areas where potential particle emissions in the form of respiratory air are to be avoided. The very high protective functions and a perfect fit are the distinguishing features of this mask. The CoolSAFE+™ filter material offers optimum protection.

To order
Dräger X-plore 1730 respiratory folding mask FFP-3 D

<table>
<thead>
<tr>
<th>Size</th>
<th>uni</th>
</tr>
</thead>
<tbody>
<tr>
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<td>121289</td>
</tr>
<tr>
<td>Order No. (sterile 1 piece)</td>
<td>121297</td>
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</tbody>
</table>

**FFP-2 Respiratory folding mask***
Latex-free folding mask with reduced breathing resistance

FFP-2 folding mask made by Uvex for protection against dust, aerosols, and aerosol mist. The mask has passed the dolomite dust test for intense dust generation and is completely latex-free. Suitable for all applications, where FFP-2 filtration is sufficient (see risk analysis).

To order
Uvex respiratory folding mask FFP-2 D

<table>
<thead>
<tr>
<th>Size</th>
<th>uni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No. (1 piece)</td>
<td>121272</td>
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</tbody>
</table>

**Respiratory full face mask***
For professional applications for the highest demands

The Dräger X-plore® 6530 full face respiratory mask has been designed for professional applications. In combination with the appropriate X-plore respiratory filter (Rd40 thread to EN 148-1) the mask provides the perfect protection for various applications, eg. in the chemical or pharmaceutical industry but is also suitable for use in infection protection sets and for use in pathology. Filters exist for virtually all fields of application: We recommend the combi-filter type: 1140 - A2B2E2K2 Hg CO NO-P3 R D. This filter is suitable for many different applications areas and thereby reducing the sources of error as well as storage costs for many filters.

To order
Dräger X-plore® 6530 respiratory full face mask & Respiratory combi-filter for full face mask X-plore 6000-series

| Mask: Order No. (1 piece) | 121290 |
| Kombi-filter: Order No. (1 piece) | 121291 |

*Not available in all countries.
Eye protection is of major importance in the laboratory. According to the application area and risk assessment different models of eyewear are suitable. From simple laboratory glasses to safety glasses with frames to gas-tight or autoclavable safety goggles.

Your safety is at stake.

You would like to know more? Simply use your smartphone or tablet to access www.berner-safety.de/glasses
SAFETY GLASSES

Safety glasses are subject to, like the other parts of personal protective equipment (PPE) in Europe, the EU directive 89/686/EEC. Only when the requirements of the directive and the particular relevant standards are fulfilled, a manufacturer is allowed to bring this PPE to the market.

As part of the risk analysis (the key element of health and safety at work) the employer has to assess the hazard potential of individual tasks / activities and provide suitable and tested protective equipment. The employee is then required to wear this equipment for these particular tasks.

The main standard for safety goggles is EN 166 (Personal eye protection- requirements). Depending on the particular field of application which are safety glasses additional EN standards may also be relevant (EN 167 – EN 175, EN 379 and several EN ISO standards on eye optics). Further details and ordering information on the standards can be obtained from your national standards organisation.

AUTOCLAVABLE SAFETY GLASSES
FOR THE GMP-COMPLIANT PRODUCTION

Specially for sterile applications autoclavable safety glasses are now available with an anti-fog coating.
Safety glasses Super fit CR  
First autoclavable safety glasses with "Antifog"-Effect  

Professional work safety in laboratories, clinics, cleanrooms etc. For special demands Uvex has developed the first autoclavable safety goggles with anti-fog coating. The glasses are extremely light, flexible soft side arms fits all face shapes well, is very comfortable to wear with a wide field of vision and can be easily combined with further personal protective equipment (PPE). The glasses can be autoclaved repeatedly at a maximum of 121°C.

Product highlights  
+ Large field of vision  
+ Autoclavable at 121°C  
+ Optimum fit  
+ Anti-fog  
+ Extremely light  

To order Uvex Super fit CR  
Size  
Order No. (1 piece) 121706

Safety glasses Super f OTG CR  
Safety glasses with side protection  

The glasses fit perfectly, have a wide field of vision and lateral spray protection. The special XST-temples make these safety goggles comfortable to wear and can be optimally combined with further personal protective equipment (PPE). The safety goggles is also suitable for spectacle wearers. The Super f OTG CR glasses can be autoclaved several times at 121°C.

Product highlights  
+ Very large field of vision  
+ Autoclavable at 121°C  
+ optimum fit due to XST-arms  
+ Anti-fog  
+ Can be worn over spectacles  

To order Uvex Super f OTG CR  
Size  
Order No. (1 piece) 121711
Cleanroom glasses Ultrasonic CR
Autoclavable full vision safety goggles

The full vision safety goggles Ultrasonic CR with indirect ventilation ensure comfortable and irritation-free conditions. Due to the wide field of vision, everything at the workplace is always visible at a glance. The shape of the safety glasses can be easily adjusted using the soft silicone headband and can be optimally adjusted to individual requirements and can be optimally combined with personal protective equipment (PPE). These glasses are also suitable for spectacle wearers.

**Product highlights**
+ At 121°C autoclavable
+ Anti-fog coating
+ Suitable for cleanrooms to ISO class 5 (to ISO 14644-1)
+ Or class B in accordance to GMP-guidelines annex 1
+ For spectacle wearers

**To order** Uvex Ultrasonic CR

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Order No. (1 piece)</td>
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</table>

Laboratory glasses x-trend 9177 HC-AF
Ultra-light laboratory glasses with optimum fit

The laboratory glasses x-trend with an HC-AF-coating manufactured by Uvex has a large, anatomically shaped “wrap-around” screen. The optidur NHC-coatings are extremely scratch-resistant and offer an excellent resistance against chemicals.

**Product highlights**
+ Laboratory glasses with large field of vision
+ Anti-fog coating
+ Easy to clean due to nano-coating

**To order** Uvex x-trend 9177 HC-AF

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<tr>
<th>Size</th>
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<tbody>
<tr>
<td>Order No. (1 piece)</td>
<td>121721</td>
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</table>
Safety goggles 9405
Full vision safety goggles with "anti-fog" in sterile and non-sterile

The completely enclosed full vision safety goggles made by Uvex Safety guarantee optimum protection against mechanical risks, liquids and coarse dust. The flexible soft shape and the adjustable strap offers exceptional comfort, even when worn over spectacles. Especially in combination with respiratory masks these goggles always guarantee a clear vision.

Product highlights
+ Anti fog coating
+ Indirect ventilation
+ Can be worn over glasses

To order

<table>
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<td>Order No. (non-sterile - 1</td>
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Gas-tight safety goggles Ultravision
For handling gases and airborne viruses

These full vision safety goggles made by Uvex Safety are fundamentally different from other safety goggles. While standard safety goggles have indirect ventilation, the Ultravision model is gas-tight. These goggles are ideal for working with chemical substances, which turn into the gaseous state at room temperature, but they are also suitable for working with hazardous biological agents. These safety glasses meet the specifications of the German Robert-Koch-Institute (RKI) for infection protection sets (type 1) to safeguard against epidemics such as the Ebola outbreak.

Product highlights
+ Gas-tight
+ Anti-fog coating
+ Good protection and comfortable fit

To order

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<th>Size</th>
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<tbody>
<tr>
<td>Order No. (1 piece)</td>
<td>121726</td>
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</table>
Gas-tight safety goggles Fahrenheit SA
For handling gases and airborne viruses

The 3M full vision safety goggles Fahrenheit SA is comfortable to wear and is suitable for wearing over spectacles and in combination with respiratory masks. The acetate lens gives a good field of vision, high chemical resistance and impact resistant up to 120m/s. Naturally the safety goggles are equipped with an “anti-fog”-coating and 100% UV-filtration. The “SA” version of these safety goggles is gas-tight. The application range of these safety glasses extend from working with chemical substances, which change into the gaseous phase at room temperature to working with dangerous biological agents. For example, these safety goggles correspond to the recommendations made by the German Robert-Koch-Institute (RKI) for anti-infection sets (type 1) for the protection of current epidemics such as Ebola.

To order 3M Fahrenheit SA

<table>
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<tr>
<td>Order No. (1 piece)</td>
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</tbody>
</table>

MARKINGS FOR SAFETY GLASSES

1. Protection level (filter only)
2. Manufacturer’s identification code
3. Optical class
4. Symbol for mechanical strength
5. Mark for non-adherence of molten metal and resistance to penetration of hot solids
6. Mark for abrasion resistance
7. Mark for anti-fog resistance
8. Certification mark
9. Manufacturer’s identification code
10. Number of EN standard
11. Field(s) of use (optional)
12. Symbol of resistance to high speed particles
13. Certification mark
In today's globalised world as a result of the ever-increasing mobility, diseases are also transmitted significantly faster from country to country. Infectious diseases, which used to be limited to individual regions or countries, now spread across several continents. The best known examples from the recent past are Ebola, the MERS-CoV coronavirus, bird flu, Mexico flu, but also EHEC, the noro virus and measles.

You would like further details? To access more information using your smartphone or tablet www.berner-safety.de/pandemic_sets
PROTECTION FOR HEALTH CARE WORKERS IN EPIDEMICS AND PANDEMICS

In general, one talks of an outbreak of a disease, if the number of people affected by a certain infectious disease in a specific region or over a specific time period exceeds the expected number of illnesses.

If the disease continues to spread across national borders and continents it is known as a pandemic, in the field of veterinary medicine it is called of panzootics.

For the protection of health care workers, who enter these hazardous areas, Berner International offers complete pandemic sets of different configurations. Each of these sets comprise a complete set of personal protective equipment (PPE) for one person and are in line with the recommendations of the German Robert-Koch-Institute (RKI).

On request we are also able to put individual sets together to suit any special requirements.

ANTI-INFECTION SETS

Multi-resistant pathogens are currently on the rise in numerous establishments in the health care sector. New infectious diseases and changing ways of transmission present new challenges in terms of occupational safety for hospitals, care homes, emergency services, but also laboratories.

According to the relevant biological risk group classification / biosafety levels, the infection sets by Berner International offer you safe protection in hazardous situations. Whether standard or individual sets suited to specific needs - we will be pleased to advise you.
The BERNER pandemic protection set has been developed for health care workers, who remain within the infectious area for a limited period of time (max. 8 hours). The set meets the recommendations of the German Robert-Koch-Institute (RKI) for infectious protection sets, version 1.

In line with the guidelines of the RKI, for this type of infection protection set, due to the absence of a gas filtered mask, only a limited decontamination is possible.

**To order** Pandemic protection set - type 1 - Version A

<table>
<thead>
<tr>
<th>Size</th>
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<th>XXL</th>
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</thead>
<tbody>
<tr>
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<td>4182</td>
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</table>

**Pandemic Type 1 - Version B**

The BERNER pandemic protection set has been developed for health care workers, who remain within the infectious area for a limited period of time (max. 8 hours). The set meets the recommendations of the German Robert-Koch-Institute (RKI) for infectious protection sets, version 1. This version contains a set of safety boots.

In line with the guidelines of the RKI, for this type of infection protection set, due to the absence of a gas filtered mask, only a limited decontamination is possible.

**To order** Pandemic protection set - type 1 - Version B

<table>
<thead>
<tr>
<th>Shoe size</th>
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<th>XL</th>
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<td>4186</td>
<td>4187</td>
<td>4188</td>
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</table>

Further shoe sizes available on request!
**Pandemic Type 2**

Pandemic protection set

The BERNER pandemic protection set has been developed for health care workers, who remain within the infectious area for a limited period of time (max. 8 hours). The set meets the recommendations of the German Robert-Koch-Institute (RKI) for antiprotection sets, version 2. The full face mask with the corresponding filter makes it particularly easy to breathe, and offers protection against biological pathogens and also absorbs gases which are created during decontamination.

For this type of infection protection set a standardised decontamination can be carried out in accordance with the RKI guidelines.

**To order** Pandemic protection - type 2

<table>
<thead>
<tr>
<th>Size</th>
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<th>Size XXL</th>
</tr>
</thead>
<tbody>
<tr>
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<td>4197</td>
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</tbody>
</table>

Further shoe sizes available on request!

**Pandemic Type 3**

Pandemic protection set

The BERNER pandemic protection set has been developed for health care workers who work in areas where a type 4 overall (spray-tight) is sufficient. This set is suitable, e.g. for known variations of bird flu and livestock diseases without transmission to humans, etc. Naturally the protective equipment has been tested to EN 14126.

In line with the guidelines of the RKI, for this type of infection protection set due to the absence of a gas filtered mask, only limited decontamination is possible.

**To order** Pandemic protection set - type 3

<table>
<thead>
<tr>
<th>Size</th>
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<th>Size XL</th>
<th>Size XXL</th>
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</thead>
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<td>100068</td>
<td>100069</td>
</tr>
</tbody>
</table>

Further shoe sizes available on request!

**Infection protection**

Anti-Infection set

Safe protection for care workers who come into contact with MRSA- and ESBL bacteria, infectious agents, respiratory pathogens etc. Individually made-to-order infection sets available on request!

**To order** Infection protection set

<table>
<thead>
<tr>
<th>Size</th>
<th>Size S</th>
<th>Size M</th>
<th>Size L</th>
<th>Size XL</th>
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<tbody>
<tr>
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<td>100083</td>
<td>100084</td>
<td>100085</td>
</tr>
</tbody>
</table>

Further shoe sizes available on request!

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*Not available in all countries.
Auxiliary material for the laboratory makes working easier or safer. Products for this area, which are intended for single use are known as disposables or consumables.

You would like further details? To access more information using your smartphone or tablet www.berner-safety.de/consumables
CONSUMABLES FOR THE LABORATORY

In a laboratory various tasks require the use of different tools. For example, prep mats offer good protection against the contamination of surfaces, withdrawal cannula make multiple extraction of liquids from vials much easier and spill kits contain the complete set of personal protective equipment for the elimination of spills.

EXPERT OPINION
Know-How Spikes
Dr. Jürgen Barth
Pharmacist StL-Studienzentrale
Justus-Liebig-University, D-Gießen

Spikes without particle filter? - An opinion

„...There are further problems with spikes containing filters in the liquid channel. Cytostatics with particulate properties (liposomal formulations, nanoparticles or albumin-bound substances) and suspensions (azacitidine), but also mono-clonal antibodies should not be drawn up using these types of spikes. A suspension remains in the vial. A solution without any active ingredient is drawn up. The same applies to liposomal preparations or the liposomes are destroyed. Also, when drawing up, the (strong) shearing forces may cause the antibodies to be physically altered, damaged or depending on the filter material- absorbed.“

The full text of this expert opinion is available on the web site of Berner International under the following address: www.berner-safety.de/spikes_without_filter
Withdrawal cannula UltraSpike II

The UltraSpike II was developed for the drip-proof and complete emptying of vials. Due to the special side fixing clips the spike is positioned close to the plug of the vial. This means that the vial can be emptied leaving virtually no residual volume without retracting the withdrawal cannula (which would disable the ventilation).

Like all UltraSpikes the UltraSpike II also has a Halkey-Roberts valve. The special valve at the Luer-Lock adapter opens automatically and closes again when disconnecting the syringe. It is non-drip, easy to sterilise and offers increased contamination protection. To provide additional safety for the user, the chemo spikes contain a large 0.1 µm PTFE Paclitaxel-resistant ventilation filter.

To order UltraSpike II – with plastic spike, without liquid filter
Order No. (50 pieces) 126217

Withdrawal cannula Spike II

The Berner Spike II was developed for the drip-proof and complete emptying of vials. Due to the special side fixing clips the spike is positioned close to the plug of the vial. This means that the vial can be emptied leaving virtually no residual volume without retracting the withdrawal cannula (which would disable the ventilation).

To protect the user the ChemoSpike contains a large 0.1 µm PTFE Paclitaxel-resistant ventilation filter.

Model without liquid filter for drawing up viscous substances and monoclonal antibodies.

To order Spike II – with plastic spike, without liquid filter
Order No. (50 pieces) 126216

Withdrawal cannula MicroSpike Z+®

The MicroSpike Z+ has been specially developed for the work with CMR-drugs such as cytostatics, virostatics and monoclonal antibodies etc. and offers maximum protection whilst being easy to handle.

Due to the extra long cannula vials with a narrow neck can also be drained completely and safely (handling similar to a cannula).

The MicroSpike has a particularly small residual “dead-volume” of only 0.17 ml.

To order MicroSpike Z+® – with extra long cannula, without liquid filter
Order No. (50 pieces) 126215
Withdrawal cannula UltraSpike Z+®

The UltraSpike Z+® are state of the art withdrawal cannula. The special valve at the Luer-Lock-adapter opens and closes automatically when connecting or disconnecting the syringe. It is non-drip, easy to disinfect and offers increased contamination protection.

To order UltraSpike Z+® – with plastic cannula and 5 μm liquid filter
Order No. (50 pieces) 126211

To order UltraSpike Z+® – with plastic cannula and 5 μm liquid filter
Order No. (50 pieces) 126212

To order UltraSpike Z+® SKoF – with metal cannula but without liquid filter
Order No. (50 pieces) 126213

Withdrawal cannula Spike Z+®

ChemoSpike for the multiple extraction and injection when handling CMR-substances.

Version with stainless steel cannula, 0.1 μm ventilation filter and 5μm liquid filter.

To order Spike Z+® – With stainless cannula and liquid filter
Order No. (50 pieces) 126214

Extra-Spike® Air SK Chemo*

Multiple withdrawal cannula suitable for chemotherapy with a stainless steel cannula, integrated ventilation and hydrophobic, fibre-free 0.2 μm filter.

Compact form with large external ventilation filter.

To order Extra-Spike® Air SK Chemo, without liquid filter
Order No. (50 pieces) 112902872

*Not available in all countries.
The **BERNER SpillKit XP** provides all necessary tools for eliminating cytostatic contaminations easily and safely. The SpillKit XP has a type test certificate issued by an external notified body and is recommended by the DGOP and the ESOP.

- Recommended by the DGOP and ESOP
- Contains personal protective equipment (PPE) of the highest category III
- Optimised for all types of cytostatic spills
- Contains a tested coverall and overboots (please note the size)
- Also available latex-free

### SpillKit XP Z+®

**Emergency and cleaning set for cytostatics**

To order SpillKit XP Z+®

<table>
<thead>
<tr>
<th>Order No. for size M</th>
<th>4104</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Order No. for size XXL</td>
<td>4115</td>
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To order SpillKit XP Z+® - Latex-free version

<table>
<thead>
<tr>
<th>Order No. for size M</th>
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<td>4133</td>
</tr>
<tr>
<td>Order No. for size XXL</td>
<td>4135</td>
</tr>
</tbody>
</table>

### SpillKit XP Duo

**Emergency set for 2 people**

The removal of spills should, if possible, be carried out by two people. The **BERNER SpillKit XP Duo** contains a complete set of protective equipment for two people as well as all necessary tools for the removal of split cytostatics.

To order SpillKit XP Duo

<table>
<thead>
<tr>
<th>Order No. for size M/M</th>
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</thead>
<tbody>
<tr>
<td>Order No. for size M/L</td>
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<td>Order No. for size M/XXL</td>
<td>100103</td>
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<tr>
<td>Order No. for size L/L</td>
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<td>Order No. for size L/XXL</td>
<td>100105</td>
</tr>
<tr>
<td>Order No. for size XXL/XXL</td>
<td>100106</td>
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</table>
SpillKit Z+®

Standard emergency and cleaning set for cytostatics

Our tried and tested BERNER SpillKit Z+® which contains a set of cytostatic protective equipment and other essential items – so that you are always well-equipped to deal with any spills relating to CMR drugs (e.g. cytostatic substances).

+ Tested and certified PPE of the highest category III
+ Version with protective gown
+ Contains all necessary tools e.g. Chemosorb-pad, cleaning cloths, ...
+ Comprehensive documentation

To order SpillKit Z+®

<table>
<thead>
<tr>
<th>Size</th>
<th>Order No.</th>
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<td>4004</td>
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</table>

SpillKit Formaldehyde

Emergency and cleaning set for Formaldehyde

The emergency set Formaldehyde offers the complete personal protective equipment and the necessary accessories, to clean up Formaldehyde spills quickly and easily.

Bestellinfo SpillKit Formaldehyde

| Order No. for size M | 100079 |
| Order No. for size L | 100080 |
| Order No. for size XXL | 100081 |

Binding agent "Formaldehyde"

For the absorption of large quantities of Formaldehyde in hospitals, pharmacies and laboratories

Fast effective tool for soaking up Formaldehyde spills. This agent binds Formaldehyde easily and quickly and facilitates disposal. Including waste bag.

To order Binding agent for Formaldehyde

| Order No. (1 piece) | 100113 |

Available as download or free with your next order!

Poster SpillKit-instructions - suitable for cleanrooms

www.berner-safety.de/spillkit_poster
When handling CMR drugs (e.g. cytostatics), unintentional cross-contamination from contaminated gloves, vials, protective clothing, shoes or wheels from transport trolleys, etc. can easily occur. Accidents or disturbances in airflow of safety cabinets can also lead to the release of cytostatic drugs. In the German MEWIP study (Monitoring-Effect Study for Wipe Sampling in Pharmacies) cytostatic drugs were found in 61% of all samples.

In cooperation with the Institute of Energy and Environmental Technology (IUTA e. V.) in Germany, Berner International has developed a wipe sample set, with which contaminations from CMR drugs can be detected quickly and safely. Through regular monitoring weaknesses in the production, handling and cleaning processes are easily detected and corrected.

+ Validation of cleaning processes
+ Detecting sources of contamination
+ Control and optimisation of work processes
+ Proof of the optimum work procedure for your customers
+ Cost-effective analysis tool
+ Suitable for use by own staff
+ Analysis of 27 single substances or as a group using different multi-methods
+ Fast and detailed report
+ Can be performed at any time
+ Improved protection for your employees

**To order** Cytostatic wipe sampling set

<table>
<thead>
<tr>
<th>Order No. Type 1</th>
<th>4155</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No. Type 2</td>
<td>4156</td>
</tr>
</tbody>
</table>

Further substances available on request!

**Detectable Substances**

- 5-Fluorouracil
- 6-Mercaptopurine
- Acemetacine
- Azathioprine
- Busulfane
- Capecitabine
- Carboplatin
- Carmustine
- Chlorambucil
- Cisplatin
- Clomiphene
- Cyclophosphamide
- Cytarabine
- Doxorubicin
- Docetaxel
- Etoposide
- Flutamide
- Gemcitabine
- Total-platinum
- Ifosfamide
- Methotrexate
- Mitomycin
- Oxaliplatin
- Paclitaxel
- Sulfamethoxazol
- Tamoxifen
- Thalidomide

**TIP**

The cost-effective multi-method (as in MEWIP) for the simultaneous analysis of various substances.

**Multi-method 1**

- 5-Fluorouracil, Cyclophosphamide, Ifosfamide, Gemcitabine, Etoposide, Methotrexate, Paclitaxel, Docetaxel.

**Multi-method 2**

- 5-Fluorouracil, Cyclophosphamide, Ifosfamide, Gemcitabine, Etoposide, Methotrexate, Paclitaxel, Docetaxel, total-platinum.

**Multi-method 3**

- 5-Fluorouracil, Cyclophosphamide, Ifosfamide, Gemcitabine, Etoposide, Methotrexate, Paclitaxel, Docetaxel as well as Cisplatin, Carboplatin, Oxaliplatin and total platinum.

**Platinum analysis**

- Cisplatin, Carboplatin, Oxaliplatin and total platinum.
 Prep mats for cytostatics and biological agents

Preventing surface contamination

Extremely absorbent prep mats with with an impermeable lower layer for use in the laboratory. Minimizes time spent on cleaning.

+ Safe absorption of liquids
+ Available sterile and non-sterile

To order Prep mats Z+B®

| Order No. (56x41 cm - non-sterile- 50 pieces) | 8100 |
| Order No. (56x41 cm - sterile- 40 pieces) | 8101 |
| Order No. (42x26 cm - non-sterile - 50 pieces) | 8000 |
| Order No. (42x26 cm - sterile- 50 pieces) | 8001 |
| Order No. (61x44 cm - non-sterile - 50 pieces) | 8700 |
| Order No. (61x44 cm - sterile - 50 pieces) | 8800 |

ChemoSorb-Pad

For the absorption of large amount of liquids in hospitals, pharmacies and laboratories

The ChemoSorb-pad reliably absorbs and binds many chemicals. The liquids (e.g. cytostatic agents) are turned into a gel-like mass and thereby guarantees safe and effective elimination.

+ Binds liquids without drips
+ Liquid absorption up to 3 l
+ Suitable for CMR-drugs (e.g. cytostatics)
+ High absorption and easy handling
+ Ideal for emergencies (spill emergencies)
+ Also for absorbing bodily fluids

To order ChemoSorb-Pad - Latex-free

| Order No. (box with 10 pieces) | 120016 |
| Order No. (box with 50 pieces) | 120014 |

Cleanroom cloths ISYSOFT, ISYSOFT II and Cleanroom 100

Highest cleaning efficiency and optimal surface cleaning

ISYSOFT, Isysoft II (latex-free) and Cleanroom 100 cleaning wipes are optimised for cleaning in the cytotoxic field and for working with biological agents. Due to its special structure the material is extremely tear-resistant and absorbent.

To order Cleaning cloths

| Order No. (Cleanroom 100 - non-sterile - 150 wipes) | 121740 |
| Order No. (Cleanroom 100 - sterile - 6 x 25 wipes) | 121741 |
| Order No. (ISYSOFT - non-sterile - 4 soft bags each incl. 25 pieces) | 121500 |
| Order No. (ISYSOFT - sterile - 50 x 2 wipes in special sterile packaging) | 121501 |
| Order No. (ISYSOFT-II - non-sterile - 4 soft bags each incl. 25 pieces) | 121507 |
| Order No. (ISYSOFT-II - sterile - 50 x 2 wipes in special sterile packaging) | 121508 |
Cleaning tool I

Easy and fast cleaning of safety cabinets for difficult to access areas

The regular cleaning and disinfection of safety cabinets is one of the standard tasks in a laboratory. However, in order to reach these hard to reach areas (e.g. rear wall, side windows), a person would have to lean the upper body into the potentially contaminated workspace. The BERNER cleaning tool for safety cabinets is ideally designed for this purpose. The device is easy to use and works well with standard cleaning wipes. These are easily fixed with the supplied clips on the cleaning tool.

Dimensions: ca. 170 x 90 mm; Length handle: 430 mm; Total length: 460 mm

Suitable cleaning wipes: ISYSOFT (Order No. non-sterile - 121500 or sterile - 121501); also ISYSOFT II (Order No. non-sterile - 121507 or sterile - 121508)

To order Cleaning tool I
Order No. 802645

Cleaning tool II

Autoclavable cleaning tool for safety cabinets and isolators

The cleaning tool II is made from stainless steel with a plastic joint. The device can be easily taken apart for cleaning and is autoclavable at 121 C.

Dimensions: 190 x 50 mm; Length handle: 580 mm; Total length: 650 mm

To order Cleaning tool II
Order No. 200662

Mop covers for the cleaning tool II

Efficient and effortless cleaning of safety cabinets and isolators

The disposable mop covers were specially developed for the cleaning tool II. They are made up of a multi-layer microfibre polyester and are available in packs of two, as sterile wrapped. Also available pre-saturated with Isopropanol.

To order Mop covers cleaning tool II
Order No. Standard (double wrapped, PU= 2 pieces) 121742
Order No. IPA (presaturated with Isopropanol, double wrapped, sterile packaging, PU = 2 pieces) 100100
Tubular foil for the SealSafe®
Liquid and aerosol-tight sealing of waste

Tubular foil for the waste disposal unit BERNER SealSafe®, BERNER SealSafe Sensor® and the older version BERNER PactoSafe®. Developed for the easy disposal of waste when dealing with waste of CMR drugs and biological agents. Comprehensive permeation tests prove the cytostatic barrier function. Sealed waste can remain in the waste disposal container up to a week. The yellow coloured version of the tubular film is recommended for handling biological agents.

To order Tubular foil SealSafe®

| Order No. (sterile, colourless, for cytotoxics, 3x tubular foil) | 1001 |
| Order No. (non-sterile, colourless, for cytotoxics, 5x tubular foil) | 1000 |
| Order No. (non-sterile, yellow, for microbiological applications, 5x tubular foil) | 1002 |

Tubular film for the PolyStar®
Tubular film for the drug sealing device PolyStar®

The colourless, highly transparent polyethylene film (special mixture) is extremely tear resistant and waterproof. Roll with a plastic core.

To order PE-tubular film

| Order No. (ca. 200 x 0.05 mm, 200 m) | 048003 |
| Order No. (ca. 220 x 0.05 mm, 200 m) | 048005 |
| Order No. (ca. 320 x 0.05 mm, 200 m) | 048015 |
| Order No. (ca. 200 x 0.10 mm, 100 m) | 048004 |
| Order No. (ca. 280 x 0.10 mm, 100 m) | 048014 |
| Order No. (ca. 320 x 0.10 mm, 100 m) | 048016 |
| Order No. (ca. 400 x 0.10 mm, 100 m) | 048018 |
| Order No. (ca. 200 x 0.20 mm, 100 m) | 048007 |

UV light protection bag
For the safe storage and transport of light sensitive substances – with UV protection

The opaque brown coloured UV light protection bags protects for example, cytostatics reliably against UV radiation and guarantees storage and transport. The resealable zip lock bags facilitate the handling. The material thickness is 50 µm.

To order UV bags

| Order No. (ca. 150x200x0.05 mm, 300 pieces) | 120150 |
| Order No. (ca. 150x200x0.05 mm, 1,000 pieces) | 12150200 |
| Order No. (ca. 230x300x0.05 mm, 300 pieces) | 120230 |
| Order No. (ca. 230x300x0.05 mm, 1,000 pieces) | 12230300 |

*Not available in all countries.