

Personal protective equipment when handling plant protection products

Guideline for the requirements for personal
protective equipment in plant protection

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In order to be able to use the BVL Guideline internationally and to support harmonisation efforts, it has been translated into English. The German original version of the BVL Guideline is relevant for the German regulations in plant protection.

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1 Introduction

The authorisation of plant protection products is addressed in Regulation (EC) No 1107/2009¹ and in the German Plant Protection Act. Plant protection products are authorised when they have no immediate or delayed harmful effect on human health. For this purpose, the risk arising from the use of the plant protection product in the applications applied for is assessed. An examination is made to find out whether risk mitigation measures are needed to provide sufficient protection for people using plant protection products, carrying out follow-up work on a previously treated field or when handling treated harvest.

When authorising a plant protection product, the BVL may prescribe the obligatory use of personal protective equipment (PPE) individually for each plant protection product. When the user does not wear the mandatory PPE or uses a PPE which is not appropriate or no more suitable due to damages, contaminations or ageing processes, the necessary level of protection cannot be ensured. An unacceptable health risk is then not excluded.

This BVL Guideline summarises the minimum requirements for the PPE for users and workers in plant protection. Compliance with the BVL Guideline is prescribed as a labelling requirement in the authorisation certificate for plant protection products.

A list of certified working clothes, protective suits against plant protection products, long-sleeved aprons and protective gloves (plant protection) which comply with the requirements of the BVL Guideline can be found on the website of the BVL www.bvl.bund.de/psa.

Rules for the PPE apply, on the one hand, for the *handling of plant protection products*, which means activities involving potential contact with (concentrated and diluted) plant protection products and usually during the application. In addition, PPE can be mandatory for *follow-up work* on previously treated crops as a result of the risk assessment for the contact with dried residues.

Handling plant protection products comprises the following activities:

- Handling of concentrated products for preparing an application (for example mixing / loading of the spray dilution, filling the tank of the plant protection application device),
- Handling ready-to-use products (e.g. granules for application, baits, pheromone dispensers),
- Treatment of seeds and use of freshly treated seeds,
- Treatment of harvested crops and handling of freshly treated harvested crops (e.g. potato storage),
- application of the plant protection product with all sorts of application techniques,
- Contact with freshly treated crops and surfaces on the cultivated area during application,
- Cleaning of the used plant protection devices including facilities for treating seeds or harvesting goods, containers and tractors.

¹ Regulation (EC) No 1107/2009 of the European Parliament and of the Council of 21 October 2009 concerning the placing of plant protection products on the market and repealing Council Directives 79/117/EEC and 91/414/EEC.

- Disposal of empty plant protection packaging,
- Disposal of plant protection products and their rests that are no longer authorised and subject to disposal.

Follow-up work on treated crops as well as the handling of seed and harvesting goods do not constitute handling of plant protection products within the meaning of this guidance. These are activities for which the treated area must be entered in order to carry out manual work on the crop or where there is usually contact with treated seeds and crops. These include, for instance, inspections, activities related to irrigating, maintenance work, storing, moving or sowing. These activities are carried out independently of the application of the plant protection product and may only be done when the deposit of plant protection products has dried on the plants or the seeds and harvest products. These activities are characterised by contact with dried residues.

Plant protection products usually consist of mixtures of chemicals, that can still be combined with other plant protection products and/or adjuvants. Active ingredients from a number of successive treatments can be found on the treated plant surface. The suitability testing of the protective equipment described in the BVL Guideline is based on standards which stipulate the tests under controlled laboratory conditions and with defined test substances. For this reason, the PPE described in this document can only be generally adequate for the level of protection necessary for the handling of plant protection products or follow-up work. If this is not the case in certain cases, it is the responsibility of the distributors of plant protection products to provide appropriate information. For every plant protection product a description of the appropriate protective equipment is provided in the Material Safety Data Sheet. The requirements for this are set out in Regulation (EC) No 1907/2006 (REACH)² and the ECHA "Guidance on the compilation of safety data sheets".

The guidelines and standards mentioned in this document concern not only plant protection, but also other fields of application. In this document the mentioned standards include only the phyto-sanitary conditions. Links to directives and regulations are always referring to the currently valid version. The version in the annex applies for the standards.

The requirements for personal protective equipment described here are to be understood in the sense of "application-specific features" as a supplement to the existing harmonisation regulations from Regulation (EC) No. 2016/425³ (PPE Regulation).

On the date of publication of this guideline, the BVL Guideline (2017) will be repealed in a BVL technical notification and replaced by this updated guideline. Personal protective equipment that complied with the requirements of the 2017 BVL Guideline up to that date may further be used in accordance with the manufacturer's instructions.

² REGULATION (EC) No 1907/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL | of 18 December 2006 | concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

³ REGULATION (EU) 2016/425 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2016 on personal protective equipment and repealing Council Directive 89/686/EEC
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2 Work clothing for the handling of plant protection products and for follow-up work on treated crops

2.1 Basics

When *handling and applying plant protection products* (definition, see introduction), suitable and intact work clothing must always be worn.

In the authorisation procedure for plant protection products, wearing appropriate work clothing is a basic assumption in the EU-harmonised guideline for exposure estimation for professional users⁴. Consequently, the exposure-reducing effect of long work clothing is taken into account when assessing whether toxicological limit values are complied with. Work clothing is therefore always required when handling plant protection products and is the minimum standard of personal protection.

Wearing suitable work clothing when *handling/applying plant protection products* can only be dispensed if a protective suit is worn.

In the authorisation procedure, follow-up work in treated crops is also evaluated according to an EU-harmonised exposure model. In particular, it is considered whether the contact of a worker with plant protection deposits will lead to an exceedance of the appropriate exposure limit value. Wearing work clothing and sturdy footwear, where appropriate, in conjunction with protective gloves will be made mandatory only if it is necessary for personal protection. In those cases, work clothing is part of the personal protective equipment.

If no personal protective equipment for *follow-up work* is specified in the authorisation, long work clothing is not necessary. However, even in such cases, the BVL recommends to wear long work clothing as a precautionary measure to minimise the contact with plant protection products.

2.2 Requirements concerning appropriate work clothing

Two categories of work clothing are appropriate:

- Certified work clothing of protection levels C1 or C2 according to EN ISO 27065 „Protective clothing. Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers“ is suitable. The protection category C2 provides a higher protection level and category C1 a similar level of protection as the uncertified work clothing mentioned below. Specific requirements for the strength or thickness of the material, specified in g/m² (grammage) do not exist in this standard.
- Protective clothing certified according to standard EN ISO 27065 can be marked with the pictogram “Protection against agricultural pesticides” (symbol 3126 from ISO 7000).
- Uncertified work clothing consisting of a long sleeve jacket and long trousers or an overall is also suitable, provided the material is made of a blended fabric of cotton and polyester with a minimum polyester content of 65 % and a grammage of at least 245 g/m²⁵.



⁴ This requirement is justified by the work clothing used in exposure studies, on which the model for estimating exposure during the handling of plant protection products is based, and is thereby in line with "Good Agricultural Practice" with regard to hygiene at work: EFSA Guidance on the assessment of exposure of operators, workers, residents and bystanders in risk assessment for plant protection products (EFSA GD - EFSA Journal 2014;12(10):3874) and BfR Wissenschaft - Joint development of a new Agricultural Operator Exposure Model, Project Report and Großkopf et al. (2013), ISBN: 3-938163-03-8, ISSN: 1614-3841, 1614-3841.
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3 Protective suit against pesticides

If, as a result of the risk assessment, a "protective suit against pesticides" or a "liquid-tight (chemical) protective suit" is required when handling plant protection products in order to reduce the identified risk to an acceptable level, corresponding regulations are laid down with the authorisation of the plant protection product. Protective suits for operators of plant protection products can be designed as suits (jacket and trousers) or overalls. They must comply with at least one of the following standards:

- Protective clothing level C3 according to EN ISO 27065 "Protective clothing - Performance requirements for protective clothing for operators of plant protection products and persons for follow-up work".
- DIN 32781 "Protective clothing - Protective suits against plant protection products".
- Protective clothing type 3 or 4 according to EN 14605 "Protective clothing against liquid chemicals - Performance requirements for clothing with liquid-tight (type 3) or spray-tight (type 4) connections".



Protective clothing certified according to EN ISO 27065 or DIN 32781 can be marked with the pictogram "Protection against agricultural pesticides" (symbol 3126 from ISO 7000).

Liquid-tight (chemical) protective suits may be mandatory e.g. for hand-held application of plant protection products in dense crops with intensive contact to the treated plants or for wet cleaning of seed treatment devices. Only type 3 according to EN 14605 is suitable for this.

If the "protective suit against pesticides" or the "liquid-tight (chemical) protective suit" has a permanently attached hood, this can provide the necessary head protection (see section 8).

For activities in plant protection where almost exclusively the front side of the body is exposed, a prescribed "protective suit against pesticides" can be replaced by a combination of a long-sleeved apron (see section 4) and long work clothing (see section 2).

Examples of such activities:

- preparing the spray liquid and filling the tank of the plant protection sprayer,
- filling a granulate spreader,
- handling freshly treated seed,
- cleaning plant protection equipment and tractors,
- activities outside the driver's cab during application, e.g. rectifying equipment faults, checks or measures on the treated plants,
- other activities with comparable exposure.

Also a prescribed combination of "protective suit against pesticides" and "(rubber) apron" can be replaced by the use of a long-sleeved apron and long work clothes.

4 Long-sleeved apron in plant protection

"Long-sleeved apron" means a partial body protection covering the front and side of the body from the neck to the shoes and having long sleeves.

When handling plant protection products, a long-sleeved apron temporarily protects the clothing worn underneath from drops, splashes, contaminated surfaces or dusts. After the work step, the long-sleeved apron is taken off again. This avoids the transfer of residues from the long-sleeved apron to other surfaces, such as the interior of the tractor cab.

The same material requirements apply to long-sleeved aprons as to "protective suits against pesticides". They must be certified to either EN ISO 27065 (level C3) or EN 14605 (type 3 or 4).

Long-sleeved aprons certified according to EN ISO 27065 can be marked with the pictogram "Protection against agricultural pesticides" (symbol 3126 from ISO 7000).



Instead of the "rubber apron" mentioned in existing plant protection product authorisation documents, a long-sleeved apron can also be used⁵.

⁵ see also: BVL announcement of 7 June 2019: "The long-sleeved apron as a new element of personal protective equipment for operators."

For the material properties of a sleeveless "rubber apron", the requirements of Cat. III according to EN 13034 type [PB 6] apply. Partial body protection (PB) of type 6 serves as protection against low risks when handling chemicals. It is intended for situations where protection is needed against small amounts of substances, accidental splashes or chemical sprays of alkaline and acidic liquids and solvents. Aprons that meet the requirements of C3 according to EN ISO 27065 and thus exceed the requirements of EN 13034 type 6 are also suitable.
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5 Protective gloves (Plant protection)

If protective gloves (plant protection) are prescribed for handling plant protection products or for follow-up activities, they must fulfil different requirements with regard to the penetration (permeation) of (test) chemicals and mechanical stability, depending on the conditions of use.

Protective gloves that have been tested and certified according to ISO 18889 are particularly suitable for use in plant protection:




- ISO 18889 – „Protective gloves for pesticide operators and re-entry workers – Performance requirements “.

In addition, protective gloves that meet the specific requirements of this guideline for test chemicals and intended uses and have been certified in accordance with EN 374-1, where applicable in conjunction with EN 388, are also suitable:

- EN 374-1 – “Protective gloves against hazardous chemicals and micro-organisms - part 1: Terminology and performance requirements for chemical risks”,
- EN 388 – “Protective gloves against mechanical risks”.

Certified protective gloves can be marked with graphic symbols (pictograms) based on the respective standards:

Table 1 Pictograms for protective gloves

Standard	Description	Pictogram
ISO 18889	"Erlenmeyer flask with leaf" Protection against plant protection products.	
EN 374-1	"Erlenmeyer flask" protection against chemical risks	
EN 388	"Hammer symbol" protection against mechanical risks	

Supplementary information on the labelling with the graphic symbols with regard to standard reference and performance or protection levels is given in the individual standards.

The ISO 18889 and EN 374-1 standards specify that protective gloves, with the exception of partially coated gloves, must be impermeable to air and water. The following standard applies to this test in the course of certification:

- EN 374-2 – “Protective gloves against hazardous chemicals and micro-organisms - part 2: Determination of resistance to penetration”

Based on the protection levels according to ISO 18889, three protection levels can be distinguished depending on the hazard situation and the conditions of use or the activity with possible contact with plant protection products:

- G2: Protective gloves tested against mechanical risks having high permeation resistance to test chemicals for handling concentrated plant protection products,
- G1: protective gloves not tested against mechanical risks having lower permeation resistance to test chemicals; not suitable for handling concentrated plant protection products,
- GR: partially coated protective gloves for follow-up activities on treated crops having dried residues.

With regard to cleaning, care and service life, the information in the glove manufacturer's product information must be observed. Even reusable gloves must be replaced regularly depending on the contamination and the conditions of use.

5.1 Requirements for the protective properties of protective gloves (plant protection)

The following sections explain which requirements apply to the individual protection levels based on ISO 18889 and which gloves certified on the basis of EN 374-1 if applicable in conjunction with EN 388 are also suitable (see Table 2).

Table 2 Overview - Suitability of protective gloves

Protection level ISO 18889	Alternatives according to BVL Guideline / EN 374-1		
	Type A/B *)	Type B	Type C
G2	X	--	--
G1	X	X	--
GR	X	X	X

*) The requirements of the BVL Guideline apply: 3 test chemicals (performance level 2 = measured permeation resistance time at least 30 min) and specifications for mechanical protective effect according to EN 388. This usually includes certified reusable gloves EN 374-1, type A.

5.1.1 Protection level G2

Protective gloves of protection level G2 according to ISO 18889 are suitable for handling concentrated and diluted plant protection products. They have a high permeation resistance to concentrated and diluted (test) chemicals and meet the standard specifications for mechanical requirements. They must have a length of at least 290 mm.

Certified gloves can be marked with the symbol "Erlenmeyer flask with leaf" in conjunction with the certified protection level.

Suitability of protective gloves certified on the basis of EN 374-1 in conjunction with EN 388:

For suitable protective gloves (plant protection), according to the present BVL Guideline for permeation testing, special requirements apply to the test chemicals to be used. These are derived from the formulations of plant protection products (Table 3). In addition to the 2017 version of the BVL Guideline, the substances listed in the column "Alternative requirements" from the "List of test chemicals" of EN 374-1 may be used.

Table 3 Test chemicals to prove their basic suitability for plant protection

Requirements 2017		Alternative requirements (from 2020)		
Test chemicals (test substance group)	CAS no.	Alternative test chemicals	CAS no.	Code letter *)
Xylene (aromatic hydrocarbon)	1330-20-7	Toluene	108-88-3	F
Isopropanol (secondary alcohol)	67-63-0	Methanol	67-56-1	AA
Cyclohexanone (Keton)	108-94-1	Acetone	67-64-1	B
*) The letter coding is taken from the "List of test chemicals" of EN 374-1.				

As a result, for all 3 test substance groups of the list (variant BVL Guideline from 2017 or from 2020), class 2 of the protection index according to EN 374-1 "Protective gloves against hazardous chemicals and microorganisms - Part 1: Terminology and performance requirements" are met.

This means that the verification of a breakthrough time of at least 30 minutes for one test chemical from each line, i.e. xylene or toluene, isopropanol or methanol, cyclohexanone or acetone is sufficient.

To protect against mechanical risks, the protective gloves (plant protection) must meet the following requirements according to EN 388:

Abrasion resistance (6.1): at least performance level 1

Puncture force (6.5): at least performance level 1

Coupe test: Cut resistance (index) (6.2): at least performance level 1 and/or

TDM: Cut resistance (N) (6.3): at least performance level A

Certified protective gloves can be marked with the pictograms "Erlenmeyer flask" and "Hammer symbol".

5.1.2 Protection level G1

Protective gloves that comply with protection level G1 according to ISO 18889 do NOT have to be tested against mechanical risks in the certification process. They therefore offer only limited protection against mechanical stress. The requirements for protection against (test) chemicals are lower in this category than in protection level G2.

G1 protective gloves are suitable for handling diluted plant protection products, in case of possible contact with contaminated surfaces, e.g. of plant protection equipment, or in case of contact with treated plants. They are NOT suitable for handling concentrated plant protection products.

Certified G1 protective gloves can be marked with the symbol "Erlenmeyer flask with leaf" in conjunction with the certified protection level.

Suitability of protective gloves certified on the basis of EN 374-1:

Protective gloves certified to EN 374-1 Type B have a penetration time of at least 30 minutes (performance level 2) against three test chemicals. For the purposes of this BVL Guideline, they are suitable as an alternative to G1 protective gloves.

Protective gloves certified on the basis of EN 374-1 can be labelled with the pictogram "Erlenmeyer flask" in conjunction with the certified protection level.

5.1.3 Protection level GR

The distinctive feature of protection level GR gloves is that they are only partially coated (at least palms and fingertips) with chemical-resistant material. In the coated area, such protective gloves offer the same mechanical protection as protective gloves of protection level G2. They are tested in the certification process for penetration with caustic soda and a diluted mixture of chemicals.

Due to the lack of chemical protection on the back of the hand, GR protective gloves are only suitable for activities where contact with dried residues may occur, for example follow-up activities in treated crops.

Certified gloves can be marked with the symbol "Erlenmeyer flask with leaf" in conjunction with the certified protection level.

Suitability of protective gloves certified on the basis of EN 374-1:

For follow-up work that places special demands on the sense of touch, such as harvesting and cultivation work in treated crops, but also when handling treated seeds and harvested crops, EN 374-1/Type C or Type B certified protective gloves can be used as an alternative to GR protective gloves to protect against dried residues.

Protective gloves certified on the basis of EN 374-1 can be labelled with the pictogram "Erlenmeyer flask" in conjunction with the certified protection level.

5.2 Suitability of protective gloves (plant protection) for different usage conditions and activities

If the risk assessment of a plant protection product in the authorisation procedure shows that the wearing of protective gloves is necessary, it is stipulated in the authorisation. Reference is made to this guideline with regard to the design and level of protection of required PPE.

Not all activities involving the handling of plant protection products or contact with dried residues require the use of gloves with the maximum level of protection in terms of chemical protection and protection against mechanical risks. For certain activities, such as fruit harvesting, the use of "thick" protective gloves with high mechanical protection is neither necessary nor practical.

An overview of activities in plant protection and suitable protective gloves is published at www.bvl.bund.de/psa.

The description includes activities within the scope of usual spraying and spraying applications, but also special situations, as far as they are currently known to the BVL. The outsourcing of this information makes it possible to keep the overview up-to-date at short notice without changing the BVL Guideline.

6 Eye protection/face protection in plant protection

If eye or face protection is prescribed for handling plant protection products, this denotes - depending on the instructions for use - either tightly fitting protective goggles or a face shield/visor. This protective equipment must be tested and certified according to the requirements of EN 166 "Personal eye protection - Requirements".

According to EN 166, only basket-shaped safety goggles (full-view goggles) are suitable as tightly fitting safety goggles, which safely protect the eyes from liquid splashes and liquid drops when preparing and applying plant protection products. Temple glasses are not suitable.

A face shield/visor protects the complete face from splashes and closes tightly at the forehead. The requirements of the EN 166 standard apply. The viewing area must therefore have a minimum vertical height of 150 mm.

For both the basket-shaped safety goggles (full-view goggles) and the face shield/visor, the standard gives "3" ("protection against liquids") as the abbreviation for the area of use. Face shields and basket-shaped safety goggles (full-view goggles) must have an increased mechanical strength according to EN 166 (level "S"). This results in the letter combination "3S" as the identification of this eye protection.

Breathing apparatus and face shields/visors cannot normally be combined. If respiratory protection is required in addition to eye or face protection, this can be provided by the combination of goggles and respirator. A respirator helmet or hood or a full face mask can also provide the required protection for the eyes/face skin.

7 Respiratory protection in plant protection

If respiratory protection is prescribed for handling plant protection products, this means at least a design such as a (particle) filtering half mask or half mask with removable filters. The required (minimum) protection against particles (at least filter class P2 according to EN 143) and gases is specified in the authorisation. Full-face masks or respirator hoods and helmets with appropriate filter equipment are also suitable.

In special cases, such as when handling certain inorganic gases and vapours or low-boiling organic compounds, specific respiratory protection (e.g. AX filter or self-contained breathing apparatus = insulation unit) may be required. This is prescribed with the authorisation and can be found in the instructions for use or the material safety data sheet for the plant protection product.

The tight fit of the breathing connection is critical for the protective effect of the respirator. It should be noted that the air-tightness of full and half masks as well as filtering respirators is impaired at the sealing lines by beard growth or sideburns. The compatibility with glasses should also be considered in this respect.

Respirators and filters suitable for use in plant protection must be certified.

The requirements for respiratory protective equipment and filters are regulated in the following standards:

- EN 136 "Respiratory protective devices; full face masks; requirements, testing",
- EN 140 "Respiratory protective devices; half masks and quarter masks; requirements, testing and marking",
- EN 143 "Respiratory protective devices; half masks and quarter masks; requirements, testing and labelling",
- EN 149 "Respiratory protective devices; filtering half masks to protect against particles; requirements, testing, labelling",
- EN 405 "Valved filtering half masks to protect against gases or gases and particles. Requirements, testing, marking",
- EN 14387 "Respiratory protective devices - Gas filter(s) and combined filter(s) - Requirements, testing, marking".

Specific respiratory protection requirements for handling a particular plant protection product are described in the material safety data sheet and/or instructions for use.

8 Head protection in plant protection

Where head protection is required when applying plant protection products, this means the permanently attached hood on "work clothing", "protective suit against plant protection products" or "liquid-tight (chemical) protective suit".

This is intended to protect the user from aerosols and possible dripping of the plant protection product, for example, during overhead application in indoor crops.

9 Foot protection in plant protection

If sturdy footwear is required when handling plant protection products, this footwear must at least meet the requirements for marking category "S2" (or higher) of EN 20345 "Personal protective equipment - Safety footwear". Footwear of the category "S2" meets basic requirements in terms of closed heel area, antistatic properties, energy absorption capacity in the heel area, fuel resistance, protection from water penetration and water absorption.

If rubber boots are required to be worn, they have to meet the requirements of shoe shape class II (solid rubber shoes or overall polymer shoes) and height D (e.g. for shoe size 37/38: Minimum height 260 mm and from shoe size 43/44: minimum height 290 mm) according to EN 20345 "Personal protective equipment - Safety footwear". Suitable rubber boots are labelled with the labelling category "S4" or "S5".

10 Use of driver's cabs with air filtration

Tightly closing cabs can effectively protect operators from exposure, especially to spray or mist, during the application of plant protection products. The protective effect depends on the technical design and handling of the different types of cabin.

With the technical notification of the BVL⁶ of 8 January 2020, the BVL has made a classification into 4 different categories with different levels of protection in order to describe the protective effect against plant protection products. Table 4 provides a definition of the different types of cabin for the purposes of this new regulation.

⁶ BVL technical notification of 8 January 2020: Use of tightly closing driver's cabs with air filtration in plant protection
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Table 4 Categorisation of driver's cabs

Cabin type	Protection against			Technical requirements (Information regarding the suitability to replace personal protective equipment (PPE) in the closed cabin during the application of plant protection products)	Certificates
	Dust	Aerosol/ Particle	Vapours		
Category 1				no level of protection defined; Open cabin or half cabin	none
Category 2*				Tightly sealed cabin with air conditioning and air supply filtration	none
Category 3				Requirements according to EN15695-1 and -2 **	EN15695-1 and -2
Category 4				Requirements according to EN15695-1 and -2 ***	EN15695-1 and -2

* suitable for the purposes of these regulations for the replacement of PPE: certified cabins in accordance with EN15695-1 and -2, as well as cabins, which are self-classified in category 2 and which meet the technical requirements.
 ** in addition to category 2: Air exchange rate > 30m³/h, cabin overpressure display, leakage < 2%, fine dust filter (HEPA filter)
 *** in addition to category 3: Activated carbon filter with protective effect against gaseous substances
 green = suitable, yellow= only suitable with equipment according to the stated technical requirements for category 2*, red = not suitable to replace corresponding PPE

10.1 Regulations on the protective effect of driver's cabs

According to the current status, the BVL assumes that appropriately defined, closed tractor cabins that are not assigned to categories 3 or 4 also exert a sufficiently high shielding effect against spray mist. In this respect, category 2* cabins (see Table 4) can replace PPE for skin and eye protection.

The regulation applies to low and high crops application with operator cabs that meet the criteria set out in Table 4 and are used in combination with mounted, trailed and self-propelled spraying equipment.

A research project is currently being carried out to test the protective effect of category 2* cabins. As soon as the investigations have been completed, the new regulation will be reviewed and, if necessary, adjusted in the light of future data.

This extended regulation applies since the publication of the technical notification on 8 January 2020 to all authorised plant protection products where personal protective equipment (protective suit against plant protection products, protective gloves (plant protection), eye and face protection or respiratory protection) is required for the application of the product.

The omission of personal protective equipment in suitable driver's cabs is only permissible if windows, doors and other ventilation openings (except for vents where there is sufficient filtering of the air flow, see Table 4) are closed during use.












10.2 Explanations and instructions for users

In principle, users of plant protection products must observe all labelling requirements and instructions for use issued with the authorisation of a plant protection product.

Regardless of this general regulation, direct protective measures for the body can be dispensed with if suitable technical framework conditions exist. This applies to driver's cabs that have a sufficient shielding effect due to their design and are handled correctly. In this case, users in the vehicle can dispense with PPE during application depending on the type of cab.

Table 5 gives an overview of which cabin type (see Table 4) can replace which elements of personal protective equipment.

Table 5 Possible replacement of prescribed PPE with suitable driver's cabs

Cabin type	PPE that can be replaced			
	protective suit	protective gloves	eye / face protection	respiratory protection
Category 1	-	-	-	-
Category 2*				-
Category 3				
Category 4				

green = can replace PPE, yellow= category 3 cabins do not provide sufficient protection against gaseous pollutants, red = not suitable to replace corresponding PPE

- For vehicles without a defined level of protection (category 1), prescribed personal protective equipment cannot be dispensed with under any circumstances.
- Category 2* cabins as defined in the explanations of Table 4 can replace protective suits, protective gloves and eye or face protection.
- Category 3 and 4 cabins are also suitable for replacing mandatory respirators. Due to the filter design, category 3 and 4 cabins can replace particle-filtering respiratory protection. Only category 4 cabins provide sufficient protection against gaseous pollutants.
- Filters integrated in the ventilation system must be changed regularly according to the manufacturer's instructions.

- If suitable higher-quality filters with a retention function for aerosols and gaseous substances are available for category 2* and 3 cabs, it is recommended that these be used for plant protection applications.
- Existing tractors can partly be upgraded to the protection level of categories 3 or 4 by retrofit systems available on the market.
- For new purchases of tractors for use in plant protection, it is recommended to choose a cab type with a high level of protection. In order to ensure the best possible protection of users from spray mist when applying crop protection products, vehicles with certified pressurised cabins of categories 3 and 4 (in accordance with EN 15695-1 and -2) should be preferred for new purchases. The development of tractors and self-propelled spraying equipment with (certified) closed cabs has now progressed and suitable vehicles are increasingly available.

10.3 PPE when leaving the driver's cab

It may be necessary to interrupt the application of plant protection products, e.g. to make adjustments or repairs to the equipment or to work on the treated crops.

For all activities outside the cabin with contact to the treated crops or contaminated surfaces, the personal protective equipment prescribed for the plant protection product must be worn. To avoid contamination of the cabin interior, do not enter the cabin with contaminated personal protective equipment.

Contaminated personal protective equipment should be stored outside the cab, preferably in a designated container on the application equipment or tractor.

Contaminated reusable gloves should be washed off before removal. Generally, the use of disposable gloves (protection level G1 or type B) is recommended, which are disposed of after use. Hands should be cleaned with clean water before re-entering the cabin.

Annex

Publications, rules and standards in the order in which they are mentioned in the text:

Standard	Date of issue	Title
ECHA Guidance	respectively valid version	Guidance on the compilation of safety data sheets
ISO 7000	2008-12	Graphic symbols on equipment
EFSA model	2014	EFSA Guidance on the assessment of exposure of operators, workers, residents and bystanders in risk assessment for plant protection products (EFSA GD - EFSA Journal 2014;12(10):3874)
EN ISO 27065	2020-05	Protective clothing — Performance requirements for protective clothing worn by operators applying pesticides and for re-entry workers
DIN 32781	2010-08	Protective clothing - Protective suits against pesticides
EN 14605	2009-08	Protective clothing against liquid chemicals. Performance requirements for clothing with liquid-tight (Type 3) or spray-tight (Type 4) connections, including items providing protection to parts of the body only (Types PB [3] and PB [4])
EN 13034	2009-08	Protective clothing against liquid chemicals - Performance requirements for chemical protective clothing offering limited protective performance against liquid chemicals (Type 6 and Type PB [6])
ISO 18889	2019-04	Protective gloves for pesticide operators and re-entry workers – performance requirements
EN 374-1	2018-10	Protective gloves against hazardous chemicals and micro-organisms; part 1: Terminology and performance requirements for chemical risks
EN 374-2	2020-04	Protective gloves against hazardous chemicals and micro-organisms; part 2: Determination of resistance to penetration
EN 166	2002-04	Personal Eye Protection – Specifications
EN 136	1998-04	Respiratory protective devices - Full face masks - Requirements, testing, marking
EN 140	1998-12	Respiratory protective devices - Half masks and quarter-masks - Requirements, testing, marking.

Standard	Date of issue	Title
EN 143	2007-02	Respiratory protective devices -Particle filters - Requirements, testing, marking
EN 149	2009-08	Respiratory protective devices - Filtering half masks to protect against particles - Requirements, testing, marking
EN 405	2009-08	Valved filtering half masks to protect against gases or gases and particles. Requirements, testing, marking.
EN 14387	2008-05	Respiratory protective devices - Gas filter(s) and combined filter(s) - Requirements, testing, marking.
EN 20345	2012-04	Personal Protective Equipment – Safety Footwear
EN 15695-1	2018-03	Agricultural tractors and self-propelled sprayers - Protection of the operator (driver) against hazardous substances - part 1: Cab classification, requirements and test procedures
EN 15695-2	2018-06	Agricultural tractors and self-propelled sprayers - Protection of the operator (driver) against hazardous substances - part 2: Filters, requirements and test procedures