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PERSONAL PROTECTIVE EQUIPMENT
(PPE)

CONTENTS

Preliminary remarks

Title III, Chapter II of Legislative Decree 81/08, "Use of personal protective equipment", covers the minimum health and safety requirements for personal protective equipment to be used by workers at the workplace.
Specific obligations regarding the selection, conditions of use, hygiene, maintenance and user instructions are placed on both employers and workers, thus engaging everyone in the safety process.
The criteria for identifying and using PPE are based on the best available technology – the aforementioned Legislative Decree (Article 79, paragraph 2-*bis*) specifically refers to the most up-to-date edition of technical standards.
The purpose of this document is to clarify the tasks of the roles involved, assist them in the choice of equipment and provide guidance on how to best use it. The third part of the document includes a list of the most commonly used items of equipment at the University, grouped by exposure scenarios. Given the variety of tasks, such list cannot be exhaustive, and specific use should always be checked, possibly seeking guidance from the Prevention and Protection Service.

Part I – Personal Protective Equipment (PPE)

1.1 What PPE is

PPE includes all equipment designed to be worn or held by workers to protect them against one or more hazards likely to endanger their safety and health at work, and any addition or accessory designed to meet this objective.
This definition excludes:

- ordinary working clothes and uniforms not specifically designed to protect the safety and health of the worker;
- equipment used by emergency and rescue services;
- personal protective equipment worn or used by the armed forces, the police, etc.;
- personal protective equipment for means of road transport;
- sports equipment;
- self-defence or deterrent equipment;
- portable devices for detecting and signalling risks and nuisances.

1.2 When PPE is needed

PPE should only be used after assessing and implementing any forms of collective protection available. The first thing to be done is therefore to consider whether a risk can be removed or contained by technical prevention measures and/or organisational procedures, or by separating environments to avoid workers' exposure.
Where a residual risk remains that cannot be avoided or sufficiently reduced, then individual protection is required.

1.3 PPE requirements

When selecting PPE, in addition to meeting essential health and safety requirements, consideration should be given to the characteristics of the specific workplace and user. PPE should not increase the risk it aims to prevent; it should be appropriate to the existing conditions at the workplace, taking account of ergonomic requirements and the worker's state of health, and fitting the wearer correctly after any necessary adjustment.
Where the presence of multiple risks makes it necessary for a worker to wear more than one item of PPE at the same time, such equipment must be compatible and continue to be effective against the risk or risks in question also during simultaneous use.
Consideration should also be given to any factors that make an item of PPE comfortable and acceptable for the worker, who will then be more likely to use it. For this purpose, PPE:

- Should not impair the user's ability to work
- Should be adjustable, comfortable and well tolerated
- Should be as durable and cost-effective as possible
- Should not have any dangerous parts
- Should be easy to put on and take off in the event of an emergency
- Should be easy to maintain and resistant to maintenance
- Should be compatible with the skin, if it comes into contact with it.

1.4 How to choose PPE

The general procedure for PPE selection is as follows:

1. Risk analysis: Identification of risk factors and critical aspects of the process
2. Residual risk analysis and assessment: Identification of risks that cannot be removed using forms of collective protection, assessment of type and modes of exposure
3. Identification and application of risk-specific regulations: Knowledge of general and special legal provisions governing the risk at issue (e.g. BSE, asbestos)
4. Identification of the necessary PPE
5. Identification of best practice standards for the PPE: Establishing any requirements with which the PPE must comply. These are normally UNI EN standards leading to CE marking, which is the essential requirement in the choice of PPE
6. Identification of the specific characteristics, taking account of any risks the PPE can pose: In addition to the essential requirements allowing PPE to perform the function it is designed for, there could be other features, e.g. for making it more comfortable. Always consider any discomfort that using PPE may cause (limiting vision, movements or the ability to hear alarms, heat, etc.)
7. Comparison with other products on the market
8. Purchase of some items and collection of information: In order to make an informed choice, if possible, some of the future users should be able to try the PPE
9. Final choice
10. Regular checks on PPE: The selection should be updated not only based on any changes in working conditions, but also in light of technical progress in materials and possible regulatory developments.

1.5 Who chooses PPE

Accident prevention regulations are mainly aimed at employers, heads of structure, supervisors, and, within universities, heads of teaching and research, who are therefore responsible for choosing PPE.

The people in these roles are not only responsible for selecting PPE, but also for the following important surveillance duties, to be performed on a continuous basis:

- Keep PPE efficient
- Ensure that PPE is used for its intended purpose
- Provide instructions and information to workers
- Provide training to workers
- Assign each item of PPE to a worker
- If the same item of PPE is to be used by more than one person, take appropriate measures to prevent health and other risks
- Arrange specific training on the correct and practical use of PPE, as necessary. Training is mandatory for Category III PPE and for hearing protection equipment.

1.6 Worker's obligations

Workers have certain obligations too, and specifically:

- Participate in the training and instruction programme organised by the employer;
- Use the PPE supplied in accordance with the information, training and instruction received;
- Properly look after their PPE and avoid making any unapproved changes to it;
- Comply with the organisational procedure for returning PPE after use;
- Immediately report any defects or issues in the PPE supplied.

1.7 General rules for using PPE

1.7.1 Storage

- Comply with the manufacturer's instructions during both storage and operation (temperature, humidity, etc.)
- The user must be trained on how to store protective equipment, with a distinction between personal and collective equipment
- PPE for occasional or emergency use must be stored in a dedicated location
- Check obsolescence, if applicable

1.7.2 Maintenance

- This goes from visual inspection to washing, decontamination, sterilisation, etc.
- The user must be trained and follow the manufacturer's instructions
- Use original spare parts
- Preventive maintenance is required on some PPE (self-contained breathing apparatus, gas mask, etc.)
- Warranty is void if maintenance is not done properly or is not authorised by the manufacturer

1.7.3 Training, information, instruction

The goal is for workers to use PPE for as long as they are exposed to risk. So:

- While information can be implemented even though the person providing it is not physically present (paper, audiovisual materials, etc.), training and instruction require both trainer and user to be actively involved, in order to develop a culture of safety
- Regular refresher courses must be provided
- Training, which is mandatory for Category III PPE and for ear protectors, must aim to familiarise with the equipment and simulate all risk scenarios
- Training must be documented and assessed

1.7.4 Safety signs

The obligation to use PPE is signposted near the area where the risk is present. If the risk generally involves the room, the sign may be posted at the entrance, while if only a specific area is affected, the sign must be posted in its vicinity – e.g. near a machine. These signs must consist of a white pictogram surrounded by a blue background. Here are two examples:

1.8 PPE marking

Compliance with the essential health and safety requirements for PPE is certified by the CE marking.

Depending on the severity of the risks against which the PPE is intended to protect users, three categories are identified, which follow different CE marking rules.

Category I	Risk of negligible physical damage, with the PPE user being able to progressively realise that an injury is occurring	Negligible injury by metal tools Negligible injury by cleaning products Contact or impact with hot surfaces not exceeding 50 °C Ordinary weather event during work Negligible impact and vibration unable to reach vital organs and cause permanent damage Damage due to exposure to sunlight	CE marking (EU declaration of conformity of the manufacturer or authorised representative)
Category II	All risks other than those included in Categories I and III		CE marking (EU type-examination certificate issued by a notified body after checking the prototype)
Category III	Risk of death or serious and permanent damage to health, with the PPE user not being able to timely realise that an injury is occurring	Atmospheres with oxygen deficiency or contaminated atmospheres Chemical damage and ionising radiation Air temperature of 100 °C or more or -50 °C or less Falls from height Hazardous electrical voltage	CE marking + identification number of the notified body that issued the certificate or carried out the annual assessment of the manufacturer's quality system (EU type-examination certificate)

In addition to CE marking, unless otherwise specified by the applicable technical standard, the following must be displayed on each item of PPE:

- Manufacturer's identification
- PPE model
- Any characteristics of the PPE, as appropriate

Where a reference standard was used for design and construction, this must be applied in its entirety and indicated.

Marking must be easy to find and read; the explanation of marking and its positioning, if necessary, must be included in the information to be supplied with the PPE. This information is given in Italian and must contain the name and address of the manufacturer or its authorised representative in the EU, as well as:

- Instructions for storage, use, cleaning, maintenance, servicing and disinfection. Recommended cleaning, maintenance or disinfectant products must have no adverse effect on the PPE or the user;
- Performance as recorded during relevant technical tests to check the levels or classes of protection provided by the PPE;
- Accessories that may be used with the PPE and the characteristics of appropriate spare parts;
- The classes of protection appropriate to different levels of risk and the corresponding limits of use;
- The date or period of obsolescence of the PPE or of certain of its components;
- The type of packaging suitable for transport of the PPE;
- The significance of any markings;
- References to the relevant directives;
- The name, address and identification number of the notified bodies involved in the certification of the PPE.

Part II – PPE User Guide

2.1 Introduction

This guide aims to provide assistance in the choice of the right PPE among the wide range of options available on the market. In particular, the sections on CE marking and the definition of characteristics are essential to understand what vendors offer you and what you can ask from them.

The characteristics of PPE are usually regulated by EN standards, whose application ensures compliance with essential product safety requirements. For each type of protection, a regulatory framework is included at the end of the relevant paragraph, which, while not exhaustive, could provide clarification.

Please note that the following instructions are not intended to replace the information provided by the manufacturer, which both PPE suppliers and end users must carefully read and comply with at all times.

No instructions are provided in connection with protection from radioactive contamination and ionising radiation, as such PPE must be selected in agreement with the Radiation Protection Expert (Legislative Decree 101/2020).

In general, the following is clarified:

- Short description of the PPE
- CE marking and category
- Reference EN standard, if any, and performance levels or classes
- Additional characteristics that could improve usage

Example

- Short description of the PPE: Protective gloves against chemical/microbiological risks
- CE marking and category: CE marking, Cat. III
- Reference EN standard, if any, and performance levels or classes: EN 420, EN 388 (levels 4123), EN 374-1/-2
- Additional characteristics: Type of chemical resistance (agents and type of contact)
- Other specific characteristics that could improve usage: No powder

2.2 Protection of the upper limbs

The protection of the upper limbs is achieved through gloves and forearm protectors. Since the types of risks to protect against are manifold, there are multiple types of gloves, each of which must undergo specific tests. For each of the categories presented below, the most suitable level of protection for the work to be carried out must be identified. Please note that, especially for chemical work, several types of gloves are likely to be required to achieve adequate protection. All gloves, except for electrician's gloves and medical gloves, must meet certain general requirements for ergonomics (sizes and dexterity achievable), innocuousness (neutral pH and absence of known allergens), comfort and efficiency, as defined by a general standard (**EN 21420**). Some common rules concerning marking and the type of instruction to be mandatorily provided are also in place.
The specific risk against which a glove provides protection is identified by a pictogram, whose positioning and related performance levels are strictly regulated. No pictograms are provided for Category I equipment.

2.2.1 Protective gloves against mechanical risks (e.g. in workshops)

They are used for protection against physical and mechanical damage from abrasion, blade cut, tear, puncture and impact. They are not effective against vibration.
These gloves come in a variety of types and materials (leather, textiles, synthetic materials) to best fit the specific use. Making a choice thus requires identifying the essential characteristics of the PPE depending on the work to be carried out, and check the performance level table to determine the exact level of protection. While performance levels that are too low fail to ensure sufficient protection, overprotection may lead to the selection of gloves that are inadequate in other respects – e.g. limited grip, reduced flexibility, etc. – making them more uncomfortable and less acceptable and, ultimately, less used by the worker.
Standard and symbol:
This type of glove is governed by standard **EN 388** and identified by a pictogram followed by a four-number and one-letter code.

The meaning of the four numbers is presented in the table; 'X' means that the test was not carried out; '0' means that the minimum performance level was not achieved.

Position	Type of test	Performance level				
		1	2	3	4	5
First number	Abrasion resistance (number of cycles required to abrade the glove)	100	500	2000	8000	--
Second number	Blade cut resistance (number of rubs required to cut the glove)	1.2	2.5	5.0	10	20
Third number	Tear resistance (one tear)	10	25	50	75	--
Fourth number	Puncture resistance (N)	20	60	100	150	--

The fifth character is a letter representing cut resistance

	A	B	C	D	E	F
Cut resistance (N)	2	5	10	15	22	30

Finally, letter P for impact protection may be added. In accordance with EN 13594:2015, this test can either be passed or failed (finger protection is never tested, given the test method).

2.2.2 Protective gloves against dangerous chemicals and micro-organisms

In order to select the right glove, it is crucial that your read the information mandatorily provided with all PPE to learn which substances a glove has been tested for, and at which concentrations. The most commonly used materials include latex, nitrile, butyl and PVC; when no lining is present, a fabric liner may be inserted inside the glove to avoid direct skin contact. Please note that the number of those who are allergic to latex is significant, and it is therefore important to clarify this condition before supplying a worker with latex gloves. In these cases, the Occupational Health Physician should be consulted.

Information about the mechanical tests covered by EN 388 should be provided for these gloves as well.

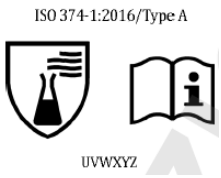
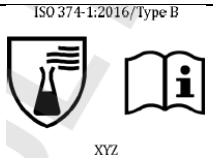
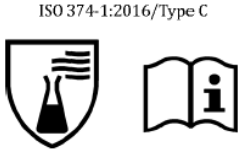
In making a choice, consideration should be given to the permeation rate, i.e. the time in minutes that a hazardous chemical takes to saturate the glove. Also in this case, the selection should be based on the actual risk of contact with the substance, in order to avoid choosing gloves whose protection level is too high, which may be much less comfortable. The permeation rate varies according to the substance tested.

Protection level	Permeation time (min)
1	>10
2	>30
3	>60
4	>120
5	>240
6	>480

Standard EN 374-1 includes a list of 18 chemicals marked with letters:

Code letter	Chemical agent	Class
A	Methanol	Primary alcohol
B	Acetone	Ketone
C	Acetonitrile	Nitrile compound
D	Dichloromethane	Chlorinated hydrocarbon
E	Carbon disulphide	Sulphur containing organic compound
F	Toluene	Aromatic hydrocarbon
G	Diethylamine	Amine
H	Tetrahydrofuran	Heterocyclic and ether compound
I	Ethyl acetate	Ester
J	n-Heptane	Saturated hydrocarbon
K	Sodium hydroxide 40%	Inorganic base
L	Sulphuric acid 96%	Inorganic mineral acid
M	Nitric acid 65%	Inorganic mineral acid
N	Acetic acid 99%	Organic acid
O	Ammonium hydroxide 25%	Organic base
P	Hydrogen peroxide 30%	Peroxide
S	Hydrofluoric acid 40%	Inorganic mineral acid
T	Formaldehyde 37%	Aldehyde

Three types of gloves are identified, as shown in the table; the letters under the pictograms refer to the substances tested.

Glove type	Resistance to penetration (EN 374-2)	Marking
A	Minimum performance level 2 for at least six substances	
B	Minimum performance level 2 for at least three substances	
C	Minimum performance level 1 for at least one substance	

The biohazard pictogram is displayed if the glove achieves at least performance level 2 (Acceptable Quality Level – AQL) during a penetration test, to be carried out in accordance with standard UNI EN ISO 21420, and complies with the requirements of UNI EN 374-5 for air and water leak tests. To be certified for virus protection, as indicated directly under the pictogram, gloves must pass a specific test in accordance with ISO 16604 (procedure B).

2.2.2.1 User instructions

In choosing the appropriate type of glove, consideration must be given to:

- Type of material, depending on the contaminant
- Thickness
- Permeation rate

It is essential that you read the table supplied by the glove manufacturer, stating which products have been tested, and at which concentrations.

- Never reuse disposable gloves.
- Gloves are effective only in the short term. Over time, all gloves allow for most organic compounds to seep through, to a different extent that is proportional to their thickness.
- Gloves must be worn at all times when there is a risk of potential skin contact.
- Refer to the tables for choosing the material. If the risk is unknown, at least nitrile rubber gloves are recommended. The glove type to be used should in any case be specified in the standard operating procedure.
- Gloves must be removed before touching any surface that must not be contaminated (handles, telephone, etc.).
- Special gloves must be worn for handling hot or abrasive materials (e.g. broken glass) – these are not suitable for chemicals.
- Before using gloves, inspect them for damage or contamination (cuts, punctures, decolouration, etc.). Apply a barrier cream for additional protection.
- Remove gloves by turning them inside out before disposing of them among special waste.

- Non-disposable gloves must be periodically replaced depending on their resistance to substances and frequency of use. Chemical permeation may become a source of chronic exposure. Washes and non-polar solvents remove plastic agents and rapidly deteriorate your gloves.
- Always wash your hands after removing gloves.
- In the event of a spill on your gloves, remove them and wash your hands immediately.
- Wear two pairs of gloves for handling carcinogens or antiblastic drugs.

2.2.3 Protective gloves against heat or fire

They protect the wearer's hands against heat and/or fire in one or more of the following forms: flame, contact heat, convective heat, radiant heat, small or large splashes of molten metal.
These gloves must achieve at least performance level 1 for abrasion and tear as defined in EN 388.

Standard and symbol:
This type of glove is governed by standard **EN 407** and identified by a pictogram followed by a six-number code, with the meaning explained in the table. This also applies to arm protection and gloves for domestic use. The higher the number, the better the performance:

Position	Resistance type	Levels	Description
First number	Burning behaviour (limited flame spread)	1 to 4	Based on the length of time the material continues to burn and glow after the source of ignition is removed
Second number	Contact heat	1 to 4	Based on the temperature, 100 to 500 °C, at which the user will feel no pain for at least 15 seconds
Third number	Convective heat	1 to 4	Based on the length of time the glove is able to delay the transfer of heat from a flame
Fourth number	Radiant heat	1 to 4	Based on the length of time required to reach a certain temperature
Fifth number	Small splashes of molten metal	1 to 4	Based on the amount of splashes of molten metal required to heat the glove sample to 40 °C
Sixth number	Large splashes of molten metal	1 to 4	Based on the amount of splashes of molten metal required to deteriorate a simulate skin placed inside the sample

Please note: 'X' means that the test was not carried out; '0' means that the minimum performance level was not achieved.

Two different pictograms may be displayed, though never at the same time.

	If the limited flame spread level (position 1) is present
	If the limited flame spread level is not present; position 1 is occupied by an X

2.2.4 Protective gloves against cold

They provide protection against convective or contact cold linked to climatic conditions or an industrial activity, down to -50 °C. Performance level values depend on the specific requirements for each risk class and area of application – preference will be given to high resistance to convective cold for work in cold environments, while good protection against contact cold will be preferred for handling cold objects.
These gloves must achieve at least performance level 1 for abrasion and tear as defined in EN 388.

Standard and symbol:
This type of glove is governed by standard EN 511 and identified by a pictogram followed by 3 numbers, as follows:

Position	Levels	Description
First number	1 to 4	Convective cold protection
Second number	1 to 4	Contact cold protection
Third number	0 or 1	Water permeability (1 = no penetration)

2.2.5 Electrical insulating gloves

They protect from accidental contact with live parts, always covering the forearm too, and are therefore to be worn in electrical substations and control rooms and for working on medium and high-voltage panels. They are selected based on the maximum use voltage, as shown in the table. This type of glove is governed by standard **EN 60903** and identified by a double-triangle pictogram.

Class	Test voltage (V)	Maximum use voltage (V)	Single-wall thickness (mm)
00	2500	500	0.5
0	5000	1000	1.0
1	10000	7500	1.5
2	20000	17000	2.3
3	30000	26500	2.9
4	36000	40000	3.6

Inflate the gloves before use to make sure they are intact, and take great care when storing them. These gloves must be subjected to periodic electrical tests, and attention must be paid to the validity date for such tests.
They may meet additional requirements: H Oil resistance, A Acid resistance, Z Ozone resistance, C Extremely low temperature resistance, R covering H+A+Z.
Reference is also made to the following standards:

- EN 16350:2014, concerning ESD or antistatic gloves designed to dissipate static electricity to protect electronic devices from electrostatic damage and static charges and to prevent explosions.
- EN 61482-1-2, concerning gloves for electric arc protection, ensuring insulation from electrical discharges in the air, with extremely high temperatures (es. use of intense light for metal cutting, laser cutting, arc phenomena).

2.2.6 Chain mail gloves and arm guards

They are to be worn when using hand knives, especially in slaughterhouses and in the meat, fish and shellfish processing industries. The gloves must fit the wearer properly – if they are too small, they are uncomfortable and restrict movement, while if they are too large, they can pose a risk. Additional gloves made of vinyl or vinyl and cotton may be required for greater hygiene and sometimes for thermal insulation. The compatibility of any additional gloves and sleeves must be ensured. After adjusting the PPE to the wearer, any loose parts must be cut off and secured.
The maximum cleaning temperature is indicated only if <82 °C.

Standard and symbol:
This type of glove is governed by standard **EN 1082-1** (chain mail) and **-2** (other than chain mail) and identified by the corresponding pictogram.

2.2.7 Medical gloves

Medical gloves for protection of patient and user against cross-contamination (complying with standards UNI 455-1, -2 and -3) may be sterile or non-sterile, latex or vinyl gloves, while rubber gloves are intended for cleaning only.
Medical gloves for single use are intended for medical use and protect patient and user against cross-contamination, while *medical examination gloves* are anatomical or non-anatomical, sterile or non-sterile medical gloves worn to conduct medical examinations, diagnostic and therapeutic procedures, or to handle contaminated medical material.

2.2.7.1 User instructions

Gloves must be worn when:

- Handling containers with biological fluids
- Handling decontaminated instruments and equipment
- Your hand skin is damaged
- Contact with mucous membranes or damaged skin is likely
- There is a risk of contact with blood, biological fluids or tissues
- Handling contaminated equipment (e.g. evacuation, drainage, hygienic equipment, etc.)

In selecting and using gloves, follow these rules:

- Choose gloves of the appropriate size and resistance for the work
- Put on your gloves immediately before carrying out any procedures involving risk
- Take off your gloves immediately after completing any procedures involving risk and wash your hands
- Never reuse gloves
- Replace your gloves immediately in case of damage or breakage
- Change your gloves after each patient
- Dispose of gloves immediately in the event of decolouration, deterioration or damage
- Never wash disposable gloves, as they lose their protective capacity

Please note that gloves are effective in preventing hand contamination, but offer no protection against cuts or punctures. Cream or foams cannot effectively replace gloves, as they do not protect against pathogens.

2.2.8 Technical standards

EN 21420:2024	General standard: sizes, pictograms, etc.
EN 388:2019	Protective gloves against mechanical risks
EN 374-1:2018	Protective gloves against dangerous chemicals and micro-organisms: Terminology and performance requirements
EN 374-2:2020	Protective gloves against dangerous chemicals and micro-organisms: Determination of resistance to penetration
EN 16523-1:2019	Permeation by potentially hazardous liquid chemicals under conditions of continuous contact (replaces 347-3)
EN 374-4:2019 + A1:2018	Test method for the determination of the resistance of protective glove materials to degradation by dangerous chemicals with continuous contact
EN ISO 374-5:2016 + A1:2018 (+ ISO 16604 / Procedure B)	Protective gloves against bacteria, fungi and viruses
EN 407:2020	Protective gloves against heat or fire
EN 421:2010	Protective gloves against ionising radiation
EN 511:2006	Protective gloves against cold
EN 455-1:2024	Medical gloves: Used for protection of patient and user against cross-contamination (freedom of holes)
EN 455-2:2024	Medical gloves: Definitions of types of gloves and sizes and resistance before and after ageing (physical properties)
EN 455-3:2023	Medical gloves: Requirements and testing for biological evaluation
EN 1082-1:1998	Chain mail gloves and arm guards
EN 1082-2:2001	Gloves and arm guards made of material other than chain mail
CEI EN 60903:2005	Electrical insulating gloves

2.3 Eye and face protection

Standards in red in the "Technical standards" section will be withdrawn on 11/11/2025 and replaced by standards 16321-1, -2 and -3, to which reference is made in this document. For past standards, please refer to the previous version of this guide.
Guidance on eye and face protection selection is published by UNI as standard 19734:2021.

Eye protection from damage or vision loss can be achieved by various means, depending on the need to protect the entire face as well:

- Safety glasses with or without side shields
- Safety goggles
- Face shields (usually incorporating a headband, front protection, helmet, protective hood or other suitable support)
- Hand-held welding shields (hand-held equipment that protects the eyes, face and neck)
- Welding helmets (head-worn equipment that protects the eyes, face, neck and top of the head, fully or in part)

The selection criteria based on which a certain equipment may be preferred over another are presented in the table:

Risk type or characteristics	Level of protection			
	Safety glasses	Safety glasses with side shields	Safety goggles	Face shields
Front splash	Good	Good	Excellent	Excellent
Side splash	Poor	Good	Excellent	Good or Excellent
Front impact with flying fragments	Excellent	Good	Excellent	Excellent if thick enough
Side impact	Poor	Fair	Excellent	Depending on the length
Neck and face protection	Poor	Poor	Poor	Fair
Wearability	Good or very good	Good	Fair	Good for a short period of time
Acceptability for users	Very good	Good	Poor	Fair
Continued use	Very good	Very good	Fair	Fair

From ANSI Z87 (1979)

Special emphasis is placed on the lens, which can be made of the following materials:

- Mineral (glass) – can be chemically tempered, heat tempered or otherwise treated to ensure greater impact resistance compared to a non-tempered mineral lens
- Organic (plastic)
- Laminated (made from multiple layers bonded by an adhesive)

Lenses can be further classified according to their risk-specific filtration type, and can also be prescription lenses. In some cases, surface coatings provide additional characteristics.

2.3.1 Protector selection

The marking summarises the characteristics of the PPE; knowing its meaning is crucial to make an informed choice among the wide variety of protectors available. Positioning and symbols are governed by standard **EN 16321**, and are included in this document for each type of protector.
Both the frame and lens must be marked. The marking is an alphanumeric code, as shown below; optional requirements are only indicated if present.

LENSES:

- Manufacturer's code
- Filter action code (UV, IR, sunglare filters for occupational use)
- Impact level
- Optional markings

FRAME:

- Number of standard (16321) also to be displayed on welding filters
- Manufacturer's code
- Impact level
- Optional markings
- Head size: 1-M, unless otherwise indicated

Filter action

Filters	**Code letter**	**Scale number**	**Detection of colour/signal lights**	**IR absorption**	**Enhanced IR reflectance**
UV filter	U	1.2 to 5	L (optional)	Not applicable	Not applicable
IR filter	R	1.1 to 10	L (optional)	Not needed	R
Sunglare filters for occupational use	G	0 to 3 4	L L (optional)	R	Not applicable

Impact level

Code letter	**Meaning**
C (T)	Impact level at 45 m/s
D (T)	Impact level at 80 m/s
E (T)	Impact level at 120 m/s
HM (T)	High mass impact level (approximately 25 mm)

Letter 'T' after a code letter means that the frame provides impact protection at extreme temperatures (-2 to +55 °C ± 2).

Optional requirements

Code letter	**Meaning**
1	Enhanced optical performance
3	Protection against droplets
4	Protection against large dust particles
5	Protection against gases and fine dust
6	Protection against streams of liquids
7	Protection against radiant heat
9	Protection against molten metals and hot solids
CH	Chemical resistance
K	Resistance to surface damage due to flying fine particles
N	Resistance to fogging
T	Impact resistance at extreme temperatures

2.3.1.1 Chemical risk protection instructions

Eye protection must be selected based on the wearer's physical state and work, as well as on the toxicity level of the substances being used:

- Safety glasses with side shields are required for working in a laboratory.
- Safety glasses protect the eyes from solid materials (flying fragments), but are less effective against splashes.
- Safety goggles are to be used when splashing is likely or when prescription glasses must be worn. They must be equipped with openings to prevent fogging.
- Face shields are required when pouring corrosive or hazardous liquids, especially in large quantities. Face shields do not replace eye protectors – they must be worn together.
- Contact lens wearers must be informed of the risks that these, and especially gas permeable contact lenses, involve (e.g. absorption of airborne chemicals). Gases and vapours may condense between the lens and the eye and cause permanent damage. Splashes that reach behind the lens may be difficult to remove with eye washers. Additionally, some types of solvents 'dissolve' polymer contact lenses.
- Before wearing safety glasses or goggles or face shields, inspected them for damage or deterioration.

2.3.2 Eye protection: laser

Suitable eye protectors are often supplied when purchasing laser equipment. If not, it is recommended that you request them at that time. In any case, the following instructions should be followed for making a choice.

Specifications differ depending on the scenario:

- Adjustment work on lasers and laser systems where hazardous radiation occurs in the visible spectral range of 400 nm to 700 nm. In this case, filters reduce radiation to values defined for class 2 lasers, i.e. where aversion responses including the blink reflex contribute to eye protection (**EN 208**);
- Protection against accidental exposure to laser radiation (where aversion responses including the blink reflex are not stipulated) in the spectral range 180 nm to 1000 µm (**EN 207**).

The data required to identify filters and protection levels are:

- Laser type and wavelength: all cases
- Power (W): for laser adjustment work
- Power (W) and beam diameter (mm): for continuous sources
- Power (W), beam diameter (mm), energy (J) and repetition rate (Hz): for pulsed sources

2.3.2.1 Protection for laser adjustment work

The scale number required for laser adjustment work is shown in the following table:

Scale number	Spectral transmittance		Continuous wave laser and pulsed laser with pulse duration $\geq 2 \times 10^{-4}$ s Maximum laser power W	Pulsed laser with pulse duration > 10^{-9} s to 2×10^{-4} s Maximum pulse energy J
	Filter	Frame		
RB1	$10^{-2} < \tau(\lambda) \leq 10^{-1}$	$\tau(\lambda) \leq 10^{-1}$	0.01	2×10^{-6}
RB2	$10^{-3} < \tau(\lambda) \leq 10^{-2}$	$\tau(\lambda) \leq 10^{-2}$	0.1	2×10^{-5}
RB3	$10^{-4} < \tau(\lambda) \leq 10^{-3}$	$\tau(\lambda) \leq 10^{-3}$	1	2×10^{-4}
RB4	$10^{-5} < \tau(\lambda) \leq 10^{-4}$	$\tau(\lambda) \leq 10^{-4}$	10	2×10^{-3}
RB5	$10^{-6} < \tau(\lambda) \leq 10^{-5}$	$\tau(\lambda) \leq 10^{-5}$	100	2×10^{-2}

The marking of these protectors includes 6 positions plus a seventh one; the indication “Eye protectors for adjustment work” must be displayed too:

Position	Meaning
I	Maximum laser power
II	Maximum pulse energy
III	Wavelength for which the protector is prescribed*
IV	Scale number as per table
V	Manufacturer’s mark
VI	Certification mark, if any
VII	Mechanical strength symbol (optional)

* Letter ‘Y’ after this code (e.g. RB5Y) means that the protector was not tested with low repetition rate ≤ 25 Hz.

2.3.2.2 Laser protection

The following laser types, grouped by pulse duration, are considered:

D = Continuous wave laser

I = Pulsed laser (10^{-4} to 10^{-1} s)

R = Giant pulsed laser (10^{-9} to 10^{-7} s)

M = Mode-locked laser (< 10^{-9} s)

Scale number (maximum spectral transmittance and stability to laser radiation) of laser protection filters:

Scale number	Maximum spectral transmittance for laser wavelength $\tau(\lambda)$	Power density (E) and/or energy (H) for testing protection and stability to laser radiation in the wavelength range								
		180-315 nm			315-1400 nm			1400 nm-1000 µm		
		Laser type/radiation exposure time in s								
		D ≥ $3x10^4$	I, R 10^{-9}– $3x10^4$	M < 10^{-9}	D > $5x10^{-4}$	I, R 10^{-9}– $5x10^{-4}$	M < 10^{-9}	D > 0.1	I, R 10^{-9}– 0.1	M < 10^{-9}
		E_D W/m²	$H_{I,R}$ J/m²	E_M W/m²	E_D W/m²	$H_{I,R}$ J/m²	H_M J/m²	E_D W/m²	$H_{I,R}$ J/m²	E_M W/m²
LB1	10^{-1}	0.01	3 x 10^2	3 x 10^{11}	10^2	0.05	1.5 x 10^3	10^4	10^3	10^{12}
LB2	10^{-2}	0.1	3 x 10^3	3 x 10^{12}	10^3	0.5	1.5 x 10^{-2}	10^5	10^4	10^{13}
LB3	10^{-3}	1	3 x 10^4	3 x 10^{13}	10^4	5	0.15	10^6	10^5	10^{14}
LB4	10^{-4}	10	3 x 10^5	3 x 10^{14}	10^5	50	1.5	10^7	10^6	10^{15}
LB5	10^{-5}	10^2	3 x 10^6	3 x 10^{15}	10^6	5 x 10^2	15	10^8	10^7	10^{16}
LB6	10^{-6}	10^3	3 x 10^7	3 x 10^{16}	10^7	5 x 10^3	5 x 10^2	10^9	10^8	10^{17}
LB7	10^{-7}	10^4	3 x 10^8	3 x 10^{17}	10^8	5 x 10^4	5 x 10^3	10^{10}	10^9	10^{18}
LB8	10^{-8}	10^5	3 x 10^9	3 x 10^{18}	10^9	5 x 10^5	5 x 10^4	10^{11}	10^{10}	10^{19}
LB9	10^{-9}	10^6	3 x 10^{10}	3 x 10^{19}	10^{10}	5 x 10^6	5 x 10^5	10^{12}	10^{11}	10^{20}
LB10	10^{-10}	10^7	3 x 10^{11}	3 x 10^{20}	10^{11}	5 x 10^7	5 x 10^6	10^{13}	10^{12}	10^{21}

The marking of these protectors includes 5 positions plus a sixth one:

I	Wavelength for which the protector is prescribed
II	Laser type identification (D, I, R, M)
III	Scale number as per table*
IV	Manufacturer's mark
V	Mechanical strength symbol (optional)

* Letter 'Y' after this code (e.g. LB5Y) means that the protector was not tested with low repetition rate ≤ 25 Hz.

2.3.3 Ultraviolet radiation protection

The choice of filters for ultraviolet radiation protection mostly depends on luminous transmittance. These filters are governed by standard **EN 16321-1**. They are marked with letter 'U', while 'UL' means that they meet the additional requirement for detection of signal lights.

Scale number	Maximum spectral transmittance in the UV spectral range $\tau(\lambda)$			Luminous transmittance $\tau_{v,A}$
	200 nm ≤ λ ≤ 313 nm %	313 nm < λ ≤ 365 nm %	365 nm < λ ≤ 400 nm %	380 nm ≤ λ ≤ 780 nm %
U1,2	0,000 3	0,1	$\tau_{v,A}$	$100 > \tau_{v,A} \geq 74,4$
U1,4				$74,4 > \tau_{v,A} \geq 58,1$
U1,7				$58,1 > \tau_{v,A} \geq 43,2$
U2				$43,2 > \tau_{v,A} \geq 29,1$
U2,5				$29,1 > \tau_{v,A} \geq 17,8$
U3				$17,8 > \tau_{v,A} \geq 8,5$
U4				$8,5 > \tau_{v,A} \geq 3,2$
U5				$3,2 > \tau_{v,A} \geq 1,2$

2.3.4 Mesh protectors

Mesh protectors include mesh face shields for forestry and/or pruning work, gardening or park maintenance, which may or may not be attached to safety helmets.

In addition to the manufacturer's identification and number of reference standard (**EN 16321-3**), and possibly the size, the marking must display the appropriate impact level symbol from among those listed in the table, as also required under standard EN 16321-1.

The optional letter 'T' for mechanical testing at extreme temperatures may also be present.

2.3.5 Eye and face protection during welding

For welding work, in addition to the equipment itself, welding filters must also be selected.

The applicable standard is **EN 16321-2**.

Certain welding filters switch their luminous transmittance to a lower predetermined value when a welding arc is ignited (referred to as welding filters with switchable scale numbers). Scale number setting may be manual or automatic (in dependence on the illuminance generated by the welding arc).

2.3.5.1 Equipment

The equipment is designed to incorporate protective filters, with or without protective/reinforced lenses, as well as to provide protection from hazardous optical radiation and other specific risks or hazards involved in welding, cutting or similar work.

In addition to the number of standard and manufacturer's identification, the frame must display the symbols for the relevant field(s) of use, as follows:

- Standard and manufacturer's identification
- Filter scale number
- Shade number
- For automatic filters, classes V1, V2, V3, C1, C2, C3, where applicable

Optional requirements may be displayed in addition to the model, including mechanical testing at extreme temperatures, resistance to molten metals and hot solids, protection against radiant heat.

2.3.5.2 Filters

Marking for filters includes:

- Standard and manufacturer's identification
- Filter scale number
- Maximum shade number
- Impact level
- Size, where applicable

Optional requirements may be displayed in addition to the model, including mechanical and optical testing at extreme temperatures, the requirement for detection of signal lights, spectral sensitivity of automatic filters.

Scale numbers for filters depend on luminous transmittance and are marked with letter 'W', while 'WL' refers to welding filters with minimally altered detection of signal lights.
Very dark filters, i.e. filters whose scale number is too high, lead workers to lean towards the work area, thus breathing harmful fumes. In the presence of bright natural light, the immediately higher scale number should be used.

2.3.6 Sunglare filters

Standard **EN 16321-1** specifies the scale numbers and requirements for sunglare filters for industrial use.
These are identified by code letter 'G', from G0 to G4; letter 'L' is added (GL) if they allow the detection of signal lights. G4 is not suitable for use on roads and for driving.
When letter 'R' is added (GR or GLR), it means that they meet the additional requirement for infrared protection.

2.3.7 Infrared filters

These filters, identified by letter 'R', are selected based on their luminous transmittance; scale numbers are 1.2, 1.4, 1.7, 2, 2.5, 3, up to 10.

If colour detection is required, specific filters marked with letter 'L' (RL or RRL) must be selected. If significant heat is generated or extended exposure is involved, filters marked with a double 'R' (RR or RRL) must be preferred, as they ensure enhanced infrared reflection.

Standards in red will be withdrawn on 11/11/2025 and replaced by standards 16321-1, -2 and -3, to which reference is made in this document. For past standards, please refer to the previous version of this guide.
Guidance on eye and face protection selection is published by UNI as standard 19734:2021.

2.3.8 Technical standards

UNI EN 16321-1:2022	Eye and face protection for occupational use – General requirements (including UV, IR and sunglare filters)
UNI EN 16321-2:2021	Protectors used during welding and related techniques
UNI EN 16321-3:2022	Additional requirements for mesh protectors
EN 167:2003	Optical test methods
EN 168:2003	Non-optical test methods
EN 175:1999	Equipment for eye and face protection during welding
EN 207:2017	Filters and eye protectors against laser radiation
EN 208:2010	Eye protectors for adjustment work on lasers and laser systems
EN 166:2004	Requirements that all equipment must meet
EN 169:2003	Filters for welding and related techniques
EN 170:2003	Ultraviolet filters – Transmittance requirements and recommended use
EN 171:2003	Infrared filters – Transmittance requirements and recommended use
EN 172:2003	Sunglare filters for industrial use
EN 379:2009	Automatic welding filters
EN 1731:2007	Mesh eye and face protectors

2.4 Head protection

Head protection is required in the event of risk of impact or objects falling from height, and it is always mandatory in construction sites. A difference should be made between safety helmets and bump caps, as their scope of use is different. Several optional requirements are also available for both types, which can guide your choice.

PPE	Description	Optional resistance requirements
Industrial safety helmets	Intended to provide protection to the wearer's crown area against head injuries caused by falling objects (**EN 397**)	Very low temperature -20 °C or -30 °C, depending on the case Very high temperature +150 °C Electrical insulation 440 V AC Lateral deformation LD Molten metal splash MM
Industrial bump caps	Intended to provide protection to the wearer against the effects of striking their head against hard or stationary objects with sufficient severity to cause laceration or other superficial injuries (**EN 812**)	Very low temperature -20 °C or -30 °C, depending on the case Resistance to flame F Electrical insulation 440 V (AC)

Usually, these protectors consist of a shell with an adjustable head strap that secure it to the head. In order for protection to be effective, the helmet must fit the wearer's head size.
They are frequently integrated with earmuffs, face shields, etc., for protection against multiple risks, so the possibility of adding accessories should be taken into account at the time of making the choice.
Helmets and bump caps are designed to absorb shocks through the complete or partial destruction of the shell and head strap; damage may not be immediately visible, so all protectors subjected to a severe impact must be replaced.
To protect the integrity of the PPE, do not alter or remove any of the original components, other than as instructed by the manufacturer, and do not apply paint, solvents, adhesives or self-adhesive labels, unless in accordance with the manufacturer's instructions.
Remember to check obsolescence as indicated by the manufacturer.
Each helmet or bump cap must display a printed or embossed marking with the following information:
a) Number of standard;
b) Manufacturer's name or identification mark;
c) Year and quarter of manufacture;
d) Helmet type (manufacturer's designation) on both the shell and head strap;
e) Size or range of sizes (in centimetres) on both the shell and head strap;
f) For helmets only, abbreviation of shell material (e.g. ABS, PC, HDPE).

Bump caps must bear the indication "Warning! This is not an industrial safety helmet".

2.4.1 Technical standards

EN 397:2013	Industrial safety helmets
EN 812:2012	Industrial bump caps

2.5 Hearing protection

There are three types of protectors capable of attenuating the effects of noise on the hearing system – earplugs, earmuffs and helmets. Some so-called active protectors incorporate mechanical or electronic elements; these, however, are not covered in this document.

2.5.1 Earplugs

Earplugs, to be inserted into the ear canal, are recommended for sound pressure levels below 95/100 dB(A) and for extended use during the day. Their attenuation ranges from 15 to 20 dB(A).

To wear earplugs, lift the auricle to straighten the ear canal and facilitate the introduction of the plug by rotating it slightly. Handle earplugs with clean hands, and, if they are reusable, check their hygienic conditions. Custom moulded earplugs also exist, individually moulded to fit the user's ear canal.

Type	Material	Notes	Pros	Cons
Reusable pre-shaped earplugs	Plastic, rubber, silicone, etc.	Reusable if properly cleaned; custom moulded earplugs also exist, individually moulded to fit the user's ear canal	Provide excellent attenuation and allow simultaneous use of other protective equipment (goggles, helmets, etc.). Allow verbal communication	May lose adherence and attenuation may be reduced as material ages. May cause hygiene problems if not properly maintained. Costly
Reusable user-formable earplugs	Polymeric foam	They are formed between the fingers and, once inserted into the ear canal, they expand and form a seal with it. Can be reused for 2-3 work shifts	Same cons as pre-shaped earplugs but cheaper	Incorrect placement reduces attenuation. The expansion of material can cause discomfort. Extended use or insertion with unclean hands may cause hygiene problems
Disposable earplugs	Plastic, rubber, silicone, etc.	Can be pre-shaped or user-formable. Earplugs made of silicate fibres with smooth polyethylene cover are very common, as they have good sound-absorbing properties and do not cause pressure issues	Available in dispensers at noisy workplaces. Easy to insert and well tolerated; allow simultaneous use of other protective equipment. Disposed of after use and inexpensive	Incorrect placement reduces attenuation. Less effective than other types of earplugs. Insertion with unclean hands may cause hygiene problems in the ear canal

2.5.2 Earmuffs

Earmuffs are recommended for sound pressure levels below 125 dB(A) and for short-term use during the day. Their attenuation ranges from 20 to 45 dB(A). They can be attached to safety helmets.

The cushions must adhere to the ears (check that no hair is interfering) and must be clean and intact. For effective protection, the cups must be properly adjusted over the ears.

Earmuffs do not pose hygiene problems and can be used in combination with earplugs for increased attenuation. Disadvantages include discomfort caused by pressure on the ears, the weight of the equipment and increased perspiration.

2.5.3 Helmets

Helmets are recommended for sound pressure levels below 135 dB(A) and for short-term use during the day. Their attenuation can reach up to 50 dB(A). They provide full head protection and can be equipped with a transceiver for verbal communication.

Helmets also attenuate bone-conducted noise and allow simultaneous use of other protective equipment. Disadvantages include the weight and bulkiness of the equipment itself.

2.5.4 Selection instructions

The following elements should be considered when selecting these protectors:

- Certification marking (CE marking, with or without issue year of the standard), manufacturer's identification and obsolescence.
- Minimum sound attenuation based on APV, SNR, and H, M, L values (see section 2.5.4.1). In practice, the expected attenuation is often not achieved, mostly because of personal incompatibility with the user. **Overprotection** should be avoided, as users tend to remove any equipment that hinders communication and perception by attenuating sound too much. Please note that, in extremely noisy environments, the attenuation offered by earmuffs and earplugs used together is not equal to the sum of both – in fact, under certain circumstances, noise reduction may even be less. In such cases, use equipment specifically designed for combined use.
- User's comfort: This often depends on weight, pressure and ease of use. As there are no objective ways to measure comfort, this may only be judged after use.
- Work environment and type of work:
  - As high temperatures and humidity cause perspiration under earmuffs, earplugs or earmuffs with absorbent hygiene cushion covers should be used instead (combined attenuation levels should be verified). The same applies in environments where dust may accumulate under the earmuff.
  - Exposure to repeated short-term noise: Banded earplugs should be preferred as they are easy to insert and remove.
  - Informative sounds of the working process: If these are high-frequency sounds, protectors should offer even attenuation across frequencies.
  - Warning signals and speech communication: If low-frequency noise may jeopardise them, protectors should offer even attenuation across frequencies.
  - Localisation of noise sources: This may be impaired when hearing protectors are used.
- Medical disorders: In the event of medical disorders or hearing impairment, it is advisable to seek the advice of a specialist.
- Compatibility with other PPE: When selecting a hearing protector, the simultaneous use of multiple items of PPE should be taken into account.

In addition to the above, please consider that:

- The sound attenuation declared by the manufacturer is measured on trained individuals wearing the equipment correctly; in practice, it is reasonable to expect a lower attenuation;
- If the equipment is removed or inserted in noisy environments, the user is still exposed to risk, especially where noise levels are very high.

Please note that hearing protection users must receive regular training and instruction (Legislative Decree 81/08).

2.5.4.1 Sound attenuation

The values to be used for indicating the sound attenuation achieved by a hearing protector, and to be displayed on it, are as follows:

APV	Assumed Protection Value: This is the attenuation value achieved for each frequency band and is calculated as the difference between mean attenuation and standard deviation, i.e. how attenuation varies from user to user, mostly based on wearability of the equipment
H, M, L values	Mean attenuation values at High, Medium and Low frequency
SNR	Single Number Rating: This is the mean attenuation across the frequency spectrum

Other technical standards of the same family cover active hearing protectors:

- UNI EN 352-4:2021 Level-dependent earmuffs
- UNI EN 352-5:2021 Active noise reduction earmuffs (ANR)
- UNI EN 352-6:2021 Earmuffs with safety-related audio input
- UNI EN 352-7:2021 Level-dependent earplugs
- UNI EN 352-8:2021 Entertainment audio earmuffs (with integrated radio equipment)
- UNI EN 352-9:2021 Earplugs with safety-related audio input (in addition to attenuation)
- UNI EN 352-10:2021 Entertainment audio earplugs (with integrated radio equipment)

The marking always refers to EN 352-1 or -2. Reference to the specific part of the standard is included in the manufacturer's information along with test values. Minimum requirements are specified in the standard itself.

2.5.5 Technical standards

EN 458:2016	Provides guidance for the selection, use, care and maintenance of hearing protectors	
EN 352-1:2021	Earmuffs	Specify requirements for construction, design, performance, test methods, marking and user information
EN 352-2:2024	Earplugs	
EN 352-3:2020	Earmuffs attached to head protection	

2.6 Body protection

Body protection is achieved through a wide variety of garments, either covering or replacing personal clothing, which are designed to protect against one or more risks and differ in terms of type of protection.
Protective clothing may be intended for:

- Local coverage, to be used when only a specific part of the body is at risk (e.g. aprons for protection against frontal splashes). However, when multiple items of PPE are used at the same time (e.g. gloves, boots, etc.), it is essential that all of them ensure adequate protection and that no hazardous substances can penetrate through interface areas (e.g. between the sleeve and glove);
- Limited body coverage, to be used when occurrence is unlikely and risk not severe, such as laboratory coats or jackets designed to be worn over other clothing and quickly removed in case of contamination;
- Full body coverage, from air-supplied suits to gas-tight clothing that fully isolates the wearer from the environment, to be used when a contaminant may harm the skin.

2.6.1 Resistance to chemicals

In selecting a garment for protection against significant chemical damage, it is essential to know which products it has been tested for, and at which concentrations. A list of tested chemicals must be included in the manufacturer's instructions.
Among the various parameters relevant for chemical resistance testing, as listed in the product information sheet, permeation time is probably the most useful one for selection purposes. This defines six classes of resistance, which of course may vary depending on the specific substance involved (EN 6530 test method).

EN Class	Permeation time (min)
1	≥ 10
2	≥ 30
3	≥ 60
4	≥ 120
5	≥ 240
6	≥ 480

The following classification into six types is typically adopted, based on both clothing material and packaging:

Type 1	Gas-tight (EN 943-1/-2)	Category
Type 2	Non-gas-tight (EN 943-1)	III
Type 3	Liquid-tight (EN 14605)	III
Type 4	Spray-tight (EN 14605)	III
Type 5	Particle-tight (EN 13982-1)	III
Type 6	Limited spray-tight (EN 13034)	**II**

In laboratory practice, it is common to choose garments that do not cover the whole body or do not have tight connections, such as aprons (e.g. waterproof aprons for pouring substances) or sleeves, which are worn for short-term use and which must offer total resistance to permeation and penetration, as the user will definitely come into contact with a chemical agent. These garments are governed by standard **EN 14605**.

Standard and symbol:
These garments are governed by the standards mentioned above and identified by the following pictogram.

2.6.1.2 Instructions for clothing to be worn in the chemical laboratory

Since a regular laboratory coat made of cotton or cotton and polyester only protects from very mild risks, no technical standards apply, as **EN 13688** cannot be used alone. Special laboratory coats made of so-called 'anti-acid' materials exist, which passed the penetration tests described in **EN 6530**.

Laboratory coats must be made of permeable material suitable for preventing accidental contact. They can be worn throughout the working day, and must be worn upon entering the laboratory or when handling hazardous liquids that can be absorbed through the skin. They must be stored in the laboratory or another designated location and may not be worn outside these areas.
Clothing used in the laboratory must be cleaned regularly; if the laboratory coat or personal clothing becomes significantly contaminated, it must be decontaminated before the next use.
Garments that protect against a specific risk act as a barrier and must therefore be made of materials resistant to the chemical agent in question.

2.6.2 Clothing to be worn where there is a risk of entanglement or drawing-in

The protective function of clothing to be worn where there is a risk of entanglement or drawing-in is only retained if the garments are properly fastened and fit to the body. Ensembles of garments must be worn together, without leaving any gaps between the parts. Coveralls may be worn on their own only if the clothing underneath is fully covered.

Standard and symbol:
This type of clothing is governed by standard **EN 510** (supplementing EN 13688) and identified by the following pictogram.

2.6.3 Protective clothing for users of chainsaws

Protection is achieved by wearing clothing that protects the body parts most exposed to trauma when using string trimmers or chainsaws. The fabric of which these garments are made has a peculiar layering of fibres that blocks the blade in the event of a contact.
Resistance may be tested at four different blade speeds, resulting in the following classification:

- Class 0: 16 m/s
- Class 1: 20 m/s
- Class 2: 24 m/s
- Class 3: 28 m/s.

However, higher classes are associated with reduced freedom of movement.
For leg protection, there are three models (A, B and C), which differ in terms of size and positioning of protections.
Models A and B are intended for use e.g. in standard tree felling work by well-trained and instructed professional loggers.
Model B (over-trousers) is similar to model A, but the protection covers 50 mm of the inside portion of the left leg, where a main artery is located. When this artery is damaged, the injury can become fatal due to blood loss. Model A is considered more comfortable than model B.
Model C is intended for use e.g. in exceptional situations, such as work on trees, or by occasional chainsaw users.

Standard and symbol:
This type of clothing is governed by standards **EN 11393-2:2019** (leg protectors), **EN 11393-3:2019** (test methods for footwear), **EN 11393-4:2019** (protective gloves), **EN 11393-5:2019** (protective gaiters), **EN 11393-6:2019** (upper body protectors), and identified by the following pictogram.

2.6.4 Clothing for use in welding

The protection of workers that carry out welding or allied processes involving similar risks can be achieved by wearing aprons, jackets, gaiters, etc. These garments are capable of limiting flame spread, proving effective in the protection against small splashes of molten metal, short contact time with flame and ultraviolet radiation.
There are two classes of protection – class 1 and class 2, with class 2 providing greater protection. Class 1 is appropriate for regular welding work, e.g. at the welding bench.
Materials and seams tested for limited flame spread are identified by letter A1, which may be supplemented by an additional test marked with letter A2 (A1+A2 marking, in addition to the class).
Special-purpose leather providing adequate protection is often used.

Standard and symbol:
This type of clothing is governed by standard **EN 11611** and identified by the following pictogram.

2.6.5 High visibility clothing

High visibility garments such as jackets, coveralls, overalls, trousers, or even just straps may be worn to enhance conspicuity in daylight and under headlights.

These are grouped into three classes based on the minimum required areas of (background, retroreflective or combined performance) material they incorporate, as shown in the table; of course, class 3 provides the highest degree of conspicuity. Higher retroreflective garments ensure greater conspicuity in dark conditions, and should be preferred when this aspect is critical.

Minimum areas of material in m^2	Class 3	Class 2	Class 1
Background material	0.8	0.50	0.14
Retroreflective material	0.2	0.13	0.10
Combined performance material	--	--	0.20

Standard and symbol:

This type of clothing is governed by standard **EN 20471** and identified by the following pictogram.

The class is displayed next to the 'high visibility' symbol.

2.6.6 Protective clothing against weather conditions

The essential properties for these garments are waterproofness, measured on the outer layer, and water vapour resistance.

Some materials combine waterproofness with low water vapour resistance, which enhances sweat evaporation and significantly contributes to body cooling, thus improving comfort at high temperatures.

Standard and symbol:

This type of clothing is governed by standard **EN 343:2019** and identified by the following pictogram.

Next to the 'umbrella' symbol are two numbers – the top one indicates resistance to water penetration, the bottom one resistance to water vapour. Both range from 1 to 4, with the higher class always providing greater comfort. Class 1 is only appropriate for short-time use.

Letter 'R' under the two numbers identifies an optional test on the waterproofness of a readymade garment, which is an absorption test on the garment edges. 'X' means that the test was not carried out.

2.6.7 Protective clothing against infective agents

This type of clothing provides full or partial body protection in environments where risk assessment has identified that hazardous biological agents are present and likely to come into contact with the skin. The main requirement for this clothing is resistance against penetration by infective agents, which is achieved by means of materials and assemblies of garments.

Protective clothing against biological agents must meet additional requirements for the combinations specified in the corresponding chemical safety standards.

Standard and symbol:

This type of clothing is governed by standard **EN 14126** and identified by the following pictogram. Letter '**B**' is added after the type of protection indicated for chemical resistance.

2.6.8 Technical standards

UNI EN 13688:2022	General standard. It is only intended to be used in combination with other specific standards and not on a stand-alone basis. It specifies general performance requirements for ergonomics, ageing, sizes and marking of protective clothing and for manufacturer's information
EN 343:2019	Protection against rain
EN 11393	Protective clothing for users of hand-held chainsaws (family of standards)
EN 20471:2017	High visibility clothing
EN 510:2020	For use where there is a risk of entanglement or drawing-in by moving parts. This standard does not include protective clothing against injuries by special moving machine parts for which specific standards exist, e.g. protective clothing for users of chainsaws
EN 943-1:2019	Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles – Performance requirements for ventilated and non-ventilated gas-tight (Type 1) chemical protective suits
EN 943-2:2019	Protective clothing against liquid and gaseous chemicals, including liquid aerosols and solid particles – Performance requirements for gas-tight (Type 1) chemical protective suits for emergency teams (ET)
EN 6530:2005	Test method for resistance of materials to penetration by liquids
EN 11611:2015	Protective clothing for use in welding and allied processes involving similar risks
EN 13982-1:2011	Protective clothing for use against solid particulates – Part 1: Performance requirements for chemical protective clothing providing protection to the full body against airborne solid particulates (Type 5 clothing)
EN 13034:2009	Protective clothing against liquid chemicals – Performance requirements for chemical protective clothing offering limited protective performance against liquid chemicals (Type 6 and Type PB [6] equipment)
EN 14126:2004	Performance requirements and test methods for protective clothing against infective agents
EN 14605:2009	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])

2.7 Respiratory protection

All respiratory protective devices fall under Category III (Legislative Decree 475/92). They come in a variety of types:

- Filtering facepieces: Purify the air using filters. Include:
  - Half masks without inhalation valves and with separable filters (EN 1827)
  - Half masks and quarter masks (not covering the chin) (EN 140). Include:
    - Filtering half masks (also called filtering facepieces and marked 'FF') consisting entirely or substantially of filter material (EN 149);
    - Valved filtering half masks, with both inhalation and exhalation valves, in which the gas filter forms an inseparable part of the device and where particle filters can be replaceable (EN 405).
  - Full face masks (EN 136)
- Breathing apparatus: Supplies breathable air or gas (e.g. oxygen) from an uncontaminated source.

According to whether or not they are dependent on the ambient air, respiratory protective devices are classified into:

- Filtering respirators: Dependent on the ambient air
  - With particle filters (EN 143)
  - With gas and vapour (gaseous form of substances that are liquid at room temperature) filters and combined particle, gas and vapour filters (EN 14387)
- Isolating breathing apparatus: Independent of the ambient air and recommended when:
  - The oxygen concentration is below 17%;
  - The contaminant concentration exceeds the exposure limits of the filtering respirator;
  - The contaminant has an olfactory threshold above the TLV.

Particle-filtering respirators, be they filtering facepieces or half masks with filters, are made of a material that captures particles both mechanically and electrostatically. They are marked with letter '**P**' and are **WHITE** in colour.

There are 3 classes of increasing filtering efficiency, normally expressed by a Workplace Protection Factor (WPF), which is the ratio between the concentration of a contaminant in the ambient air and inside the facepiece. The resulting factor, which is rounded down to the nearest whole number for safety, indicates how many times the device is able to reduce the external concentration of a contaminant.

Classification of particle-filtering respirators by filtering efficiency	Minimum overall filtering efficiency	WPF	Maximum concentration outside the facepiece
FFP1/P1 (Filtering Facepiece Particle class 1/class 1 filter)	78%	4	Up to 4 x TLV
FFP2/P2 (Filtering Facepiece Particle class 2/class 2 filter)	92%	10	Up to 10 x TLV
FFP3/P3 (Filtering Facepiece Particle class 3/class 3 filter)	98%	30	Up to 30 x TLV

Gas respirators have activated carbon filters that capture contaminants by physical or chemical adsorption. They are identified by letters and colours:

Type	Colour	Protection
A	Brown	Organic gases and vapours with a boiling point higher than 65 °C
B	Grey	Inorganic gases and vapours (excluding carbon oxide)
E	Yellow	Acidic gases
K	Green	Ammonia and organic ammonia derivatives
Hg + P3	Red-White	Mercury
NO + P3	Blue-White	Nitrogen oxide (single-use only)

AX	Brown	Organic gases and vapours with a boiling point lower than or equal to 65 °C (single-use only)
SX	Purple (Purple-White)	Specific (named) substances; P3 may be added

In addition to the colour(s) identifying the gas(es), **combined filters** (for gas and particles) must have a white band and their marking must include all applicable letters and the corresponding efficiency classes.

Letters '**NR**' for Non-Reusable or '**R**' for Reusable appear after the efficiency class for all types of filters; letter '**D**' may also appear, indicating that the filter passed the dolomite clogging test, and its filtering efficiency is therefore higher.

There are three classes of protection for each type of **gas filter**, depending on the amount of contaminant it can absorb. The choice depends on the expected concentration of the contaminant:

Class	Capacity	Usage limit
1	Low	1000 ppm
2	Medium	5000 ppm
3	High	10000 ppm

While the filtering efficiency of these devices is always 100%, their overall performance, and therefore the choice, is affected by the type of facepiece. Depending on the maximum concentration outside the facepiece, the choice will be as follows:

Device	WPF	Maximum concentration outside the facepiece
Half mask	30	Up to 30 x TLV
Full face mask	400	Up to 400 x TLV

Particle filters may also display this symbol (EN 143):

The temperature range and maximum humidity of storage conditions are also indicated, and it is specified whether the filter is to be used with a full face mask, and whether it is a multiple filter.

2 barrato: Simbolo "solo per utilizzo in un unico turno"
Durante un turno è consentito l'uso multiplo.

2.7.1 User instructions for respiratory protective devices

In order to choose the right protection, you need to know the type of contaminant, its concentration and threshold limit values (TLV-TWA), as well as how hazardous it is to the eyes and skin.

Filtering respirators

- Always check the integrity of the respirator
- Facial hair, including beards, moustaches and stubble, can interfere with the seal between the respirator and the face
- Standard eyeglasses may be incompatible with full face masks
- Never put on or remove the PPE in a contaminated atmosphere

Particle-filtering respirators

- The higher the filter efficiency, the greater the breathing resistance; overprotection causes unnecessary discomfort for the wearer
- Filters must be replaced according to the manufacturer's instructions or whenever increased breathing resistance is perceived
- Over time, the seal of facepieces deteriorates – replace the facepiece at the end of the work shift or, if it has a sealing edge, after a maximum of three shifts

- Some filtering facepieces can be damaged if folded

Gas respirators

- Replace the filter immediately if you can smell the substance even though the seal is good
- Be cautious with gases whose olfactory threshold is higher than the TLV
- Workers who are unable to detect odours must follow a strict usage procedure or use an isolating breathing apparatus
- The service life of the filter may be reduced in the event of a mixture of contaminants

Filter duration is influenced not only by the type of contaminant, but also by humidity, temperature and the breathing rate. It is also important to check obsolescence and follow the manufacturer's storage instructions.

2.7.2 Technical standards

EN 136:2000	Full face masks
EN 140:2000	Half masks and quarter masks
EN 143:2021	Particle filters
EN 149:2009	Filtering half masks to protect against particles
EN 405:2009	Valved filtering half masks to protect against gases or gases and particles
EN 529:2006	Respiratory protective devices – Recommendations for selection, use, care and maintenance – Guidance document
EN 1827:2009	Respiratory protective devices – Half masks without inhalation valves and with separable filters to protect against gases or gases and particles or particles only – Requirements, testing, marking
EN 14387:2021	Gas filters and combined filters

2.8 Protection of the lower limbs

The protection of the lower limbs can be achieved by wearing safety footwear, protective footwear or occupational footwear, which essentially differ for the characteristics of the toecap and the resistance of the outsole to fuel oil. Each type is marked with a letter (S, P, O).

Below is a summary of the main differences:

Safety footwear	Protective footwear	Occupational footwear
EN 20345	EN 20346	EN 20347
Toecap resistance 200 J	Toecap resistance 100 J	No toecap
Letter S	Letter P	Letter O

Each user should choose the model best suited to their needs – e.g. low-cut or ankle footwear, mid-calf boots, knee-high boots or thigh-high boots – based on the expected risk type and body part that may be affected.
The basic requirements (SB, PB, OB) include tear strength, abrasion resistance, water permeability, upper/outsole bond strength, outsole slip resistance and fuel oil resistance (except for occupational footwear, for which a specific requirement applies).

Two different codes are used depending on the material and manufacturing method:

Code	Classification
I	Footwear made from leather and other materials, excluding all-rubber or all-polymeric footwear
II	All-rubber (i.e. entirely vulcanised) or all-polymeric (i.e. entirely moulded) footwear

Hybrid footwear (marked SBH/PBH/OBH) also exists.

2.8.1 Safety footwear (S)

The basic requirements are supplemented with additional requirements for special applications, as follows:

Symbol	Requirement
E	Energy absorption of the seat region
WR	Water resistant (class I only)
P	Metallic perforation resistant insert
PL	Non-metallic perforation resistant insert tested with a 4.5 mm nail
PS	Non-metallic perforation resistant insert tested with a 3.0 mm nail
CI	Insulation against cold
HI	Insulation against heat
C	Conductive footwear
A	Antistatic footwear
HRO	Resistant to contact with hot surfaces
FO	Resistant to fuel oil
LG	Ladder grip
SC	Abrasion-resistant scuff cap (class I only)
SR	Slip resistant
WPA	(class I only)
M	Metatarsal protection
AN	Ankle protection
CR	Cut-resistant upper

The following categories cover some of the most common combinations of basic and additional requirements:

Category	Basic requirement	Additional requirements
SB	I or II	Basic requirements
S1	I	Closed seat region, antistatic properties, energy absorption of the seat region
S2	I	S1 + water penetration and absorption
S3	I	S2 + penetration resistance – cleated outsole
S4	II	Antistatic properties, energy absorption of the seat region
S5	II	S4 + penetration resistance – cleated outsole
S6	I	S2 + water resistance of the entire footwear
S7	I	S3 + water resistance of the entire footwear

2.8.2 Occupational footwear (O)

Occupational footwear does not require a toecap.

Categories and requirements are identified in the same way as for safety footwear. In this case, the most common combinations are marked O1 to O7.

2.8.3 Protective footwear (P)

The toecap resistance for this footwear is 100 J.

Categories and requirements are identified in the same way as for safety footwear. Combinations are marked PB and P1 to P7.

2.8.4 Footwear selection instructions

Choosing the wrong footwear may cause the user serious problems. Excessive weight, poor breathability, rigid outsoles or unsuitability for the specific type of work surface may lead the worker to stop using this PPE, thus exposing them to risk.

Particular precautions must be taken regarding the electrical properties of footwear:

- Electrically conductive footwear must be worn when electrostatic charges need to be rapidly dissipated (e.g. when handling explosives) and where no risk of electric shock from live components exists. Conductivity must be periodically tested, as wear and contamination may reduce the dissipation capacity of footwear. Ground resistance in the workplace should not impair the protective function of footwear, and no untested insulating materials should be placed between the insole and the foot.
- Antistatic footwear dissipates electrostatic charge to prevent fire risks (sparks/vapours) and must be worn where there is a risk of electric shock from live equipment or components. Please note that antistatic footwear does not provide sufficient protection against electric shock, as it only creates a resistance between the ground and the foot. Electrical resistance in the workplace must be periodically tested, as antistatic performance changes significantly with wear, dirt and humidity.

2.8.5 Technical standards

EN 20344:2024	Test methods for footwear
EN 20345:2024	Safety footwear
EN 20346:2024	Protective footwear
EN 20347:2024	Occupational footwear

2.9 Protection against falls from height

As well as carefully selecting equipment, special attention must be paid in the choice of anchorage points, which must be able to withstand the tension generated by any fall. Fall protection systems should be anchored above the user at all times, and the user instructions should indicate the correct anchorage point and minimum resistance.
This type of equipment includes:

- **Belts for work positioning or restraint** (waist belts governed by standard EN 358): They are intended to prevent the user from reaching a dangerous position or to secure the user safely in position at the point of work, with free hands. In the event of a fall, they can wrap around the wearer's body, causing damage to the spine. This type of equipment for work positioning is actually not intended for fall prevention and must be used together with a lanyard that connects it to the structure.
- **Full body harnesses**: They are equipped with a belt, as well as with straps and usually sit harnesses that make them safer (EN 361). They can also be used as descending or lifting devices. They must be employed together with components that absorb the shock of the fall (energy absorbers).

Retractable type fall arresters also exist (EN 360), both with a self-locking function and an automatic lanyard tensioning and return facility. The energy absorber may be integrated into the lanyard or the equipment itself.
Instructions should be detailed enough to allow the worker to use the equipment correctly and clarify whether this is intended for personal use or for sharing. The documentation supplied must be stored together with the equipment and include an inspection checklist with the following information:

- Identification mark
- Manufacturer or supplier's name and address
- Manufacturer's serial number
- Year of manufacture
- Suitability for use in combination with other fall arrest systems
- Dates of purchase and first use
- User's name
- Dates and details of inspection and maintenance, and corresponding findings

The marking must be displayed on each component and include:

- The last two figures of the year of manufacture
- The manufacturer or supplier's identification
- The component batch number or serial number

Please note that all these devices fall under Category III, for which **training is mandatory**.
Maintenance before and after use and strict compliance with the manufacturer's instructions and inspection dates is essential; an accurate maintenance log must be kept.
After a fall has occurred and a system or component has arrested it, this must be returned to the manufacturer or repair service for further testing.
For textile materials, follow the manufacturer's washing and drying instructions to preserve the properties of the equipment.

Guidance from the Prevention and Protection Service must be sought at all times for the selection of this equipment.

2.9.1 Technical standards

EN 341:2011	Descender devices
EN 353-1:2018/-2:2025	Guided type fall arresters including a rigid or a flexible anchor line
EN 354:2010	Lanyards
EN 355:2003	Energy absorbers
EN 358:2018	Equipment for work positioning
EN 360:2024	Retractable type fall arresters
EN 361:2003	Full body harnesses
EN 362:2005	Connectors
EN 363:2019	Terminology and general requirements
EN 365:2005	General requirements for instructions for use, maintenance, periodic examination, repair, marking and packaging
EN 795:2012	Anchor devices
EN 813:2019	Sit harnesses
EN 11158:2015	Fall arrest systems – Guide for selection and use

Part III – Work Environments and PPE

This list presents some of the most commonly used items of PPE at the University, and their characteristics. The following general recommendations should be checked against the user's specific needs.
For the sake of convenience, grouping is according to the most widespread use at the University. In case of doubt or for special applications, please contact the Prevention and Protection Service.

3.1 Chemistry and biology laboratories

3.1.1 Protection of the upper limbs

Protective gloves against chemical/microbiological risks

- CE marking, Cat. III
- EN 420
- EN 388 (levels 4123)
- EN 374-1/-2 (A/B/C type depending on the substances being used)
- Important to request type of chemical resistance and permeation time

Protective gloves for handling cold objects

- CE marking, Cat. III
- EN 420
- EN 388 (levels 2331)
- EN 511 (levels 231)
- Protective sleeve

Protective gloves for handling hot objects (e.g. for stoves, muffle furnaces)

- CE marking, Cat. III
- EN 420
- EN 388 (levels 2241)
- EN 407 (levels X2XXXX)
- Protective sleeve

3.1.2 Face protection

Laboratory safety glasses or goggles

- CE marking
- EN 16321
- Mechanical strength D or E
- Optional requirements: 3 (droplets) or 6 (streams of liquid)
- Abrasion-resistant (K) and anti-fog (N) coating
- Side and front shields for safety glasses
- Adjustable temples

Laser or UV protection glasses

- Same general characteristics as laboratory safety glasses, but the appropriate filter for the specific application must be selected.
- For ultraviolet protection, UL type lenses (unaltered colour perception) must be used.

Face shield (when full face protection is required)

- Same requirements as laboratory safety glasses
- Suitable for use with safety glasses or goggles
- Soft forehead pad

3.1.3 Respiratory protection

Filtering half mask (filtering facepiece)

- CE marking, Cat. III
- EN 149
- Check the table for filtering efficiency and choose between FFP1, FFP2 or FFP3
- Nose clip and seals

- Exhalation valve

Half mask
- CE marking, Cat. III
- EN 140
- Adjustable
- Resistant to washing
- Easy filter attachment

Filters for half mask
- CE marking, Cat. III
- EN 14387 (gas filters and combined filters) EN 143 (particle filters)
- Refer to the tables for choosing the filter
- Compatibility with half mask

3.1.4 Body protection

Anti-acid coat

- CE marking, Cat. III
- EN 340
- EN 6530
- Closed cuffs

Anti-acid apron

- CE marking, Cat. III
- EN 14605
- Adjustable
- Below the knee

Disposable coat (protection against dirt)

- CE marking
- EN 340
- Request testing for specific substances
- Back-tied
- Request microbial penetration resistance, if relevant
- Non-sterile

3.2 Medical care (also veterinary medical care)

3.2.1 Protection of the upper limbs

Non-sterile medical gloves

- CE marking as class I medical device
- CE marking, Cat. III for protection against chemical and microbiological risks (EN 374-1/-2)
- EN 455-1/-2/-3
- Ambidextrous

Safety glasses and goggles

- Same requirements as chemical or microbiological protection
- Resistance to disinfection or sterilisation

3.2.2 Protection of the lower limbs

Footwear

- CE marking, Cat. II
- EN 20347 O1 AE
- Closed or equipped with rear strap
- Easy to clean

3.2.3 Body protection

Disposable coat

- CE marking
- EN 340
- Request testing for specific substances
- Back-tied
- Request microbial penetration resistance, if relevant
- Non-sterile

3.3 Agricultural work

Reference can be made to the PPE used for maintenance work, plus the following:

3.3.1 Face protection

Mesh face shield for forestry work

- CE marking
- EN 16321-3
- Mechanical strength E (medium energy impact) or HM (High Mass)

3.3.2 Body protection

Cut-resistant trousers or chaps (use of chainsaws)

- CE marking
- EN 11393
- Type A

Disposable Tyvek coveralls with hood (e.g. use of pesticides)

- CE marking, Cat. III
- EN 340
- EN 13982-1 EN 13034 type 5/6
- Elastic bands at wrists, ankles and hood

3.3.3 Respiratory protection

Full face mask + filters (e.g. use of pesticides)

- CE marking
- EN 136 (EN 14387 filters depending on the products being used)
- Wide angle of vision
- Easy filter maintenance and attachment

3.3.4 Protection of the lower limbs

Waterproof knee-high boots

- CE marking
- EN 20347
- Classification II (all-rubber)

3.4 Mechanics laboratories / Workshops / Maintenance

Please note: For hearing protection, see the noise risk assessment documents prepared by the Prevention and Protection Service.

3.4.1 Protection of the upper limbs

Protective gloves against mechanical risks

- CE marking
- EN 420
- EN 388 (levels 3122)

Latex or vinyl gloves for protection against dirt

- CE marking as class I medical device
- EN 455-1/-2/-3
- Ambidextrous
- With powder or no powder

Electrical insulating gloves

- CE marking, Cat. III
- EN 60903 (choose level according to maximum expected voltage)

3.4.2 Face protection

Safety glasses

- CE marking
- EN 16321
- Mechanical strength D or E
- Scope of use 3 (droplets), 4 (large dust particles)
- Abrasion-resistant (K) and anti-fog (N) coating
- Side and front shields for safety glasses
- Adjustable temples

Welding glasses

Usual requirements for safety glasses plus lenses with appropriate scale number

3.4.3 Respiratory protection

Filtering half mask (filtering facepiece)

- CE marking, Cat. III
- EN 149
- Check the table for filtering efficiency and choose between FFP1, FFP2 or FFP3
- Nose clip and seals
- Exhalation valve

Half mask

- CE marking, Cat. III
- EN 140
- Adjustable
- Resistant to washing
- Easy filter attachment

Filters for half mask

- CE marking, Cat. III
- EN 14387 (gas filters and combined filters) EN 143 (particle filters)
- Refer to the tables for choosing the filter
- Compatibility with half mask

3.4.4 Protection of the lower limbs

Low-cut safety footwear

- CE marking, Cat. II
- EN 20345
- Category S3 (or S1P) + choice of optional requirements

3.4.5 Body protection

Protective clothing to be worn where there is a risk of entanglement: Coveralls with sleeves/jacket and bib overalls

- CE marking
- EN 340

- EN 510
- Cotton

Welding apron

- CE marking, Cat. II
- EN 11611
- Split leather

High visibility padded jacket

- CE marking, Cat. II
- EN 20471 (levels 32)
- EN 343 (levels 32)
- Padded lining and detachable sleeves

High visibility jacket/trousers/vest

- CE marking, Cat. II
- EN 20471 (levels 32)

3.4.6 Hearing protection

Disposable earplugs

- CE marking, Cat. II
- EN 352-2
- Soft expanded polymer

Earmuffs

- CE marking, Cat. II
- EN 352-1
- Washable
- Neckband required for combined use with helmet

3.4.7 Protection against falls from height

Safety harness and energy absorber

- CE marking
- EN 361 (safety harness) and EN 355 (energy absorber)

3.4.8 Head protection

Safety helmet

- CE marking
- EN 397
- Adjustable head strap and sweatband
- Gutter rim
- Compatible with earmuffs or face shields
- Request for any dielectric properties

3.5 Work with hand knives (slaughterhouses, shellfish processing industry, etc.)

3.5.1 Protection of the upper limbs

Chain mail gloves and arm guards

- CE marking, Cat. III
- EN 1082-1