ETH zürich

Information Sheet
Personal Protective Equipment
Protective Gloves

Personal protective equipment (PPE) is a pillar of the so-called STOP Principle. PPE must be worn whenever a risk cannot be prevented by means of Substitution, Technical measures or Organizational measures (in this order).

Legal basis

The employer has to provide the necessary PPE free of charge by law, and the employees have to use it.

- ArG Art. 6 and ArGV 3 Art. 27
- BauAV
- OR Art. 328 and 362
- UVG Art. 82
- Verfügung des Eidgenössischen Departementes des Innern über die technischen Massnahmen zur Verhütung von Berufskrankheiten, die durch chemische Stoffe verursacht werden.
- VUV Art. 5 and 90

General information on protective gloves

Protective gloves are always required when the risk of injury to hands (due to heat/cold, sharp objects, chemical or biological effects, etc.) cannot be excluded. Depending on the hazard, different types of protective gloves must be used. The mandatory sign is the same for all protective gloves, but the protective gloves are marked with the corresponding pictogram for the respective purpose.

Fig. 1: Mandatory sign: “Use protective gloves”

Table 1: Pictogram overview (Source: SUVA 44091.d)

Pictogram	Meaning and norm	Pictogram	Meaning and norm
	Protection against dangerous chemicals (EN 374-1)		Low protection against chemical dangers (EN 374-1)
	Protection against micro-organisms (EN 374-5)		Protection against mechanical risks (EN 388)
	Protection against cold (EN 511)		Protection against heat and fire (EN 407)
	Protection against ionizing radiation (EN 421)		Protection against radioactive contamination through particles (EN 421)
	Protection against chainsaws (EN 381-7)		Gloves and arm guards protecting against cuts and stabs by hand knives (EN 1082)

Important note

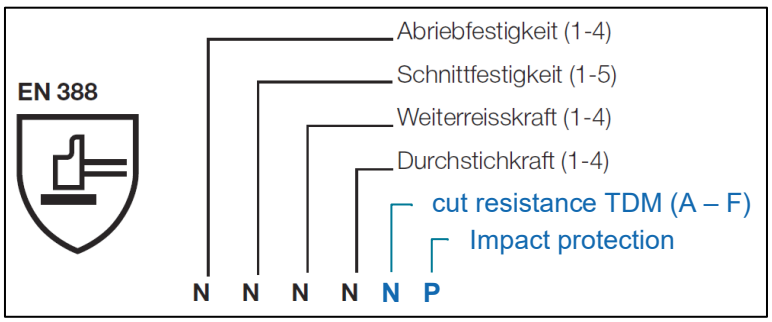
- Prior to use, check that the protective gloves comply with work requirements.
- Defective gloves (brittle, torn, etc.) must not be used.
- Certain protective gloves (e.g. chemical gloves) can only be used for a limited period of time. Disposable gloves must not be reused. Reusable gloves must be replaced periodically.
- Protective gloves must fit and be neither too large nor too tight.

Where can I get protective gloves?

Protective gloves for diverse hazards can be obtained in the HCI-Shop, for instance.

Protective gloves against mechanical risks (norm EN 388)

The norm EN 388 was revised and newly published in January 2017. The previous specifications for abrasion resistance, cut resistance (Coupe test), tear resistance and puncture resistance remain applicable. In addition, the newly published norm includes another cut resistance test (TDM test) and an optional impact protection test. The Coupe test uses a counter rotating circular blade to slice repeatedly back and forth on the sample. The TDM test cuts the sample with a razor blade. A new blade is used with each cut. The statement “the higher the level, the better the resistance” remains applicable for all numbers and letters beneath the hammer icon.



abrasion resistance

cut resistance

tear resistance

puncture resistance

Fig. 2: Protective gloves against mechanical risks (Source: SUVA 44091.d with complements by ETH SGU)

Safety, Security, Health and Environment

Protective gloves against dangerous chemicals and micro-organisms (norm EN 374)

The previous norm EN 374-1:2003 was revised and newly published in March 2017 as norm EN 374-1:2016.

Previous norm EN 374-1:2003	New norm EN 374-1:2016
Labeling	
EN 374-1  AJL Protective glove with a break-through time ≥ 30 minutes for at least three test chemicals (A, J, L). **EN 374-1**  The ”beaker and question mark” pictogram labels protective gloves that only provide a limited protection against chemical hazards.	ISO 374-1:2016/**Type A**  AJKLMP Protective glove with a break-through time ≥ 30 minutes for at least six test chemicals (A, J, K, L, M, P). ISO 374-1:2016/**Type B**  AJL Protective glove with a break-through time ≥ 30 minutes for at least three test chemicals (A, J, L). ISO 374-1:2016/**Type C**  Protective glove with a break-through time ≥ 10 minutes for at least one test chemical.  The ”beaker and question mark” pictogram is no longer valid.

Previous norm EN 374-1:2003	New norm EN 374-1:2016
Test chemicals	
Twelve test chemicals (A – L)	Six additional test chemicals.

	Letter	Chemical	Class
SO FAR	A	Methanol	Primary alcohol
	B	Acetone	Ketone
	C	Acetonitrile	Nitrile
	D	Dichloromethane	Chlorinated paraffin
	E	Carbon disulfide	Sulfurous organic compounds
	F	Toluene	Aromatic hydrocarbon
	G	Diethylamine	Amine
	H	Tetrahydrofuran	Heterocycles and ether
	I	Ethyl acetate	Ester
	J	n-Heptane	Aliphatic hydrocarbon
	K	Sodium hydroxide 40%	Inorganic base
	L	Sulfuric acid 96%	Inorganic acid
NEW	M	Nitric acid 65%	Inorganic mineral acid, oxidizing
	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

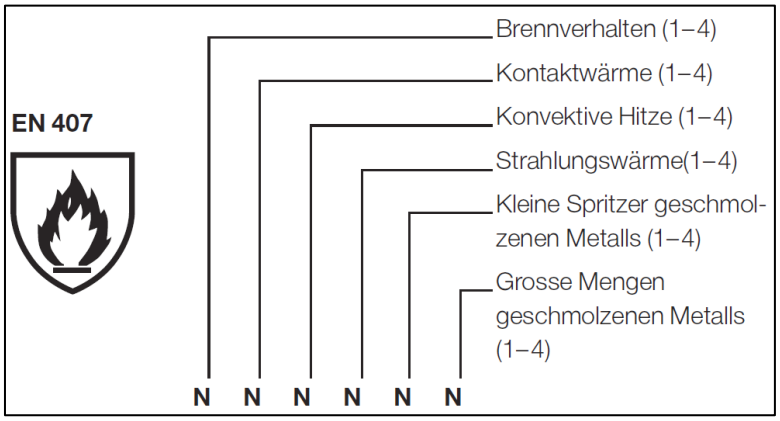
Protection index

Remains applicable.

Penetration time [min]	Protection index
> 10	1
> 30	2
> 60	3
> 120	4
> 240	5
> 480	6

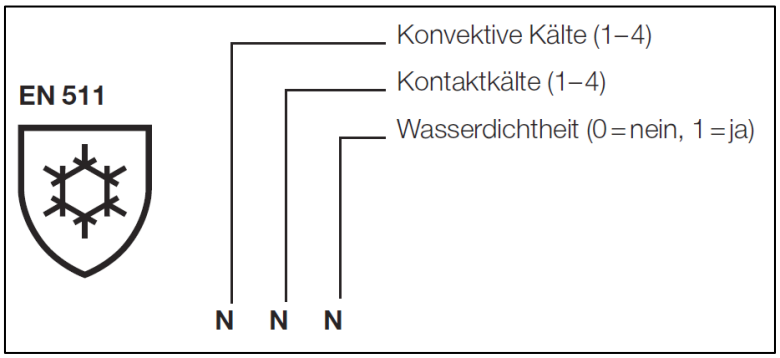
How do I know which protective gloves are suitable?
In the safety datasheets (SDS) of the chemicals used, you will find information on the required glove material and the maximum length of time they may be worn. Many manufacturers of gloves resistant to chemicals have databases in which you can find the appropriate protective glove for a specific chemical.

Protective gloves against heat/fire (norm EN 407) and cold (norm EN 511)
These two types of protective gloves are also marked respectively and categorized in a performance level:



flammability
contact heat
convective heat
radiant heat
small splashes of molten metal
large quantities of molten metal

Fig. 3: Protective gloves against heat/fire (Source: SUVA 44091.d)



convective cold
contact cold
waterproof (0=no, 1=yes)

Fig.4: Protective gloves against cold (Source: SUVA 44091.d)

In addition, these protective gloves must at least be classed in performance level 1 for abrasion and tear resistance (cf. fig. 2).

Protective gloves that are used to handle cryogenic liquefied gases (e.g. liquid nitrogen) should, if possible, fit tightly around the wrist and in the lower arm area (cuffs and/or sleeves), so that there is no risk of the cryogenic liquefied gas entering the glove.

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