

The new EN ISO 374:2016 – Summary of key changes

Standard for protective gloves against dangerous chemicals and microorganisms



A new standard to reflect industry changes

The European standard for gloves intended to protect against chemicals and microorganisms has been revised and updated. The new standard was published in 2017 and supersedes EN374-1:2003.

For the consumer, the change will only be seen as a new label on products. Note that it is still important to consult the manufacturer regarding the application of the gloves. A risk assessment of the workplace activity must always be carried out, taking specific working conditions into account in order to identify the exact protection requirements.

THE CHANGES IN BRIEF

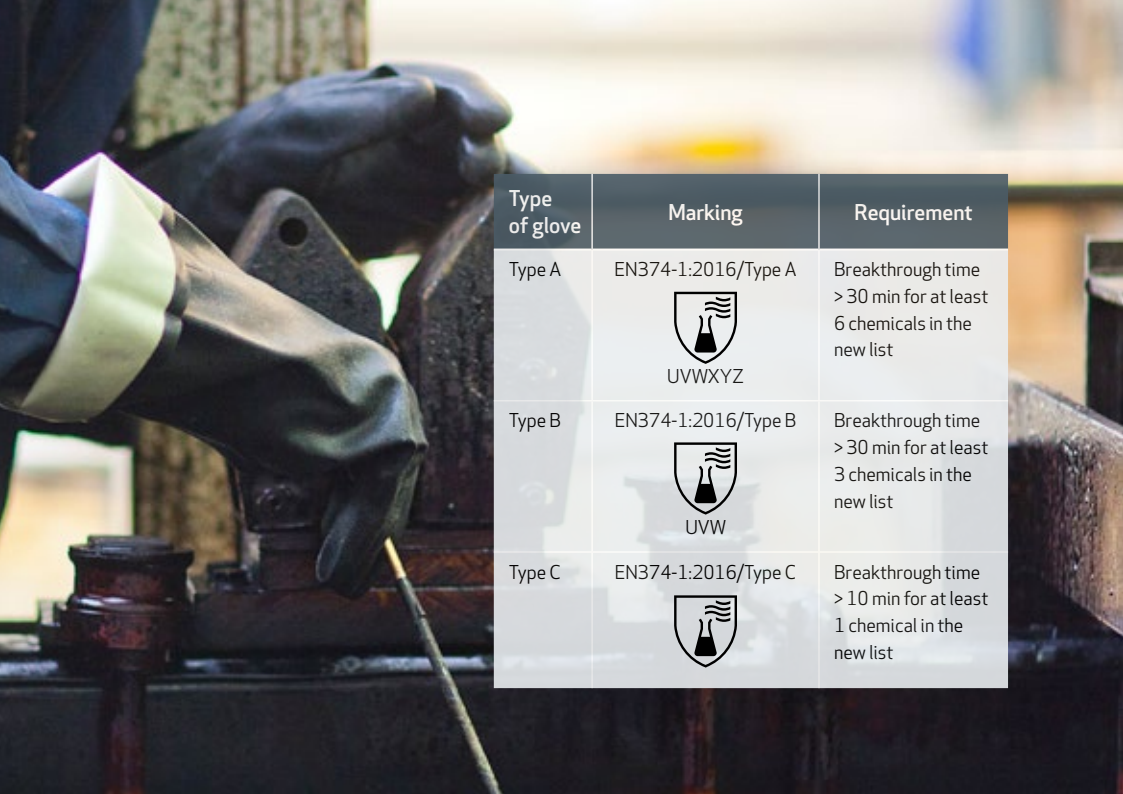
- There are now three levels of protection for gloves: Type A, B and C. Gloves will be labelled accordingly with new pictograms.
- A further six chemicals have been added to the existing chemical list.
- If virus protection is claimed, an additional test is required: ISO 374-5:2016.
- The permeation method has changed from EN374-3:2004 to EN 16523-1:2015.
- Degradation testing (EN374-4:2013) is now required for each tested chemical in the permeation test.
- Gloves that do not provide mechanical protection are no longer required to be tested according to EN388.






NEW MARKINGS

The beaker pictogram with the question mark has been removed from the new standard. This in combination with the extended chemical list will provide better knowledge of the gloves protection capacity. It will add to customer benefit as it will be easier to select the right chemical protection.





Type of glove	Marking	Requirement
Type A	EN374-1:2016/Type A  UVWXYZ	Breakthrough time > 30 min for at least 6 chemicals in the new list
Type B	EN374-1:2016/Type B  UVW	Breakthrough time > 30 min for at least 3 chemicals in the new list
Type C	EN374-1:2016/Type C 	Breakthrough time > 10 min for at least 1 chemical in the new list

THREE LEVELS OF PROTECTION

The new standard specifies three levels of protection based on permeation performance. Gloves will be classified as Type A, Type B or Type C, and labelled accordingly with new pictograms. Type A gloves provide the highest protection.

Type A – At least level 2 performance (more than 30 mins) against at least 6 chemicals on the list.

Type B – At least level 2 performance (more than 30 mins) against at least 3 chemicals on the list.

Type C – At least level 1 performance (more than 10 mins) against at least 1 chemical on the list.

Note that the breakthrough times have not changed for the different levels of protection.

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

NEW CHEMICALS TESTED

The list of chemicals on which the gloves are tested has been expanded with a further six chemicals. Increasing numbers of chemicals are used in industrial applications, and some were not covered by the previous standard.

	Code letter	Chemical	CAS Number	Class
E	A	Methanol	67-56-1	Primary alcohol
	B	Acetone	67-64-1	Ketone
X	C	Acetonitrile	75-05-8	Nitrile compound
I	D	Dichloromethane	75-09-2	Chlorinated hydrocarbon
	E	Carbondisulphide	75-15-0	Sulphur containing organic compound
S	F	Toluene	108-88-3	Aromatic hydrocarbon
T	G	Diethylamine	109-89-7	Amine
	H	Tetrahydrofuran	109-99-9	Heterocyclic and ether compound
I	I	Ethylacetate	141-78-6	Ester
	J	n-Heptane	142-82-5	Saturated hydrocarbon
N	K	Sodium hydroxide 40%	1310-73-2	Inorganic base
	L	Sulphuric acid 96%	7664-93-9	Inorganic mineral acid, oxidizing
G	M	Nitric acid 65%	7697-37-2	Inorganic mineral acid, oxidizing
	N	Acetic acid 99%	64-19-7	Organic acid
E	O	Ammonium hydroxide 25%	1336-21-6	Organic base
	P	Hydrogen peroxide 30%	7722-84-1	Peroxide
W	S	Hydrofluoric acid 40%	7664-39-3	Inorganic mineral acid
	T	Formaldehyde 37%	50-00-0	Aldehyde





PROTECTION AGAINST MICROORGANISMS: ISO 374-5:2016

The new standard introduces testing for protection against viruses. The previous standard covered only fungi and bacteria.

New markings on packing will indicate whether gloves protect against bacteria and fungi only, or against bacteria, fungi and viruses. The biohazard pictogram is used to mark gloves protecting from bacteria and fungi. The pictogram will be accompanied by the word "VIRUS" if the glove meets the requirements of the virus test method.



VIRUS

*For gloves protecting against
bacteria, fungi and viruses.*



*For gloves protecting
against bacteria and fungi.*

DEGRADATION TESTING

Completely new for this standard are degradation requirements. Degradation is the change in puncture resistance after contact with the chemical in question*. During testing, the glove is perforated before and after contact with a specific chemical. Degradation will be tested for every chemical claimed in the marking.

**Reported as a percentage.*



CUFF SAMPLING FOR LONGER GLOVES

There have also been changes to the sampling requirements for gloves with protective cuffs. Three samples from the palm will be tested for all gloves. If the glove has a cuff that is 400mm or longer, then samples from the cuff will also be tested. The aim is to ensure that protective cuffs provide the same level of protection as the palm.

DEFINITION OF TERMS

Penetration

When a chemical moves through pinholes and other imperfections in the glove material at a non-molecular level.

Permeation

The absorption of a chemical through the glove material at a molecular level. Breakthrough time is how long it takes for the chemical to move through the material and come into contact with the skin.

Degradation

A negative change in the glove material after contact with a chemical. Signs of degradation include flaking, swelling, disintegration, brittleness, color change, dimensional change, change in appearance, hardening, softening, etc.

TESTING DETAILS

- Penetration test: in accordance with EN 374-2: 2014
- Permeation test: in accordance with EN 16523-1: 2015, which replaces EN 374-3
- Degradation test: in accordance with EN 374-4: 2013
- Virus protection test: in accordance with ISO 16604: 2004 (method B)





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