

## THE AUTHOR

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Feature: **Health & Safety**

# Hand in glove

**With so many different types of gloves on the market, how do you pick the right glove for your needs?**

**Gloves** in a galaxy of colours are everywhere in the laboratory. Indeed if we think about it, there are few applications in the laboratory that don't entail the wearing of gloves. With this rising demand for gloves, comes increasing variability in quality. In addition to this vast diversity, users all appear to have different expectations. And yes, every individual is different, with different hands and therefore different needs. Never before has selecting laboratory gloves seemingly been so complex!

The good news is that by taking into account the following four criteria, those involved in selecting gloves can cut through this complexity and hopefully make the correct choice.

## The regulations

This is the starting point. Unfortunately users, distributors and even the manufacturers themselves may fail to interpret the legislation correctly. Taking into account the risks within the laboratory (primarily chemical and biological), only a glove that is registered according to Personal Protective Equipment Directive (89/686/EEC) as Category III (Complex Design) is likely to be suitable. These gloves are designed for irreversible or mortal risk and will ideally have been tested against the latest version of the standards (EN420:2003, EN374-1/2 & 3: 2003 etc.). However there are many traps and to find out more, please refer to "Are you all fingers and thumbs?" (*Laboratory News*, September 2007). Making the correct choice in terms of the regulations is the minimum that needs to be achieved.

## Protection

We must not forget that the primary function of the glove may be to protect the wearer and as such it is not a fashion accessory! Here we must not lose sight of three basic elements:

- Glove materials (whether they be nitrile, latex, neoprene etc.) behave in different ways and each one of them offers advantages and disadvantages.
- The length – the longer the glove the better it will protect the wearer. In this respect it is worth remembering the minimum liquid proof length requirement (EN374-1:2003) that specifies that a Category III PPE glove must have a length of 24cm, 25cm and 26cm for respectively sizes 8 (M), 9 (L) and 10 (X-L).

EN374-3:2003 Chemical permeation test	ecoSHIELD Eco Nitrile PF 250 (palm thickness=0.10mm).	SHIELDskin ORANGE NITRILE 260 (palm thickness=0.13mm)
Hydrochloric acid 37% (CAS No: 7647-01-0)	65mins	130mins
Isopropanol 70% (CAS No: 67-63-0)	43mins	72mins
Ethanol 70% (CAS No: 64-17-5)	26mins	34mins
Ammonium hydroxide 25% (CAS No: 1336-21-6)	15mins	22mins
Acetic Acid (CAS No: 64-19-7)	4mins	6mins
Xylene 98.5% (CAS No: 1330-20-7)	2mins	4mins

Source: <http://www.shieldscientific.com/index.php?language=1&menu=chemical-resistance-guide>

- The thickness – this is what provides the protective layer on the hand. Whatever the glove material used, the thicker the film the higher the level of protection afforded to the hand. A difference of just two or three hundredth of a centimetre can have a significant impact.

These three elements can affect seriously glove performances. If you're not persuaded, then see how chemical permeation can vary with gauge thickness by comparing two disposable nitrile gloves with different gauge thickness (see Table below).

## Comfort

Wearing gloves all day long is by no means an easy task! The notion of comfort is both very personal and highly subjective, making it difficult for glove manufacturers. Sometimes they will prioritise comfort before personal protection, as they know users will be very sensitive to this issue. Once again, different materials offer advantages and disadvantages. Latex is undoubtedly the most comfortable material thanks to its superior elasticity, even if nitrile is making great strides in this area. However be careful as in the majority of cases in order to make nitrile more comfortable, you reduce the thickness! Whilst the result is an undeniable gain in comfort, there is also a significant loss in protection.

Whilst considering the question of comfort, we should also not forget the risk of allergies and irritation as these may be more prevalent with low quality gloves. High concentrations of chemical residues by virtue of the gloves undergoing reduced washing or insufficient chlorination can contribute to increased risk of potential occupational dermatitis.

## Price

Whilst important, this remains the final part of the selection criteria. Let us not forget that a glove may be worn primarily for personal protection. It is worth pointing out that as much as 60% of the manufacturing costs of a glove are based on the raw materials – hence the very large price fluctuations in recent years especially on latex. Faced with this rather turbulent operating environment, manufacturers may quickly opt to reduce the length or thickness of the gloves to the extent that there could be as much as a 100% difference in the amount of raw material between two gloves. Therefore the glove will be less expensive and more comfortable, but unfortunately less effective in terms of its primary function of personal protection. So what price do you put on your personal safety?

**As you will** have already appreciated, choosing a glove is difficult when there is such a vast jungle of available products. Glove choice may well have become over-simplified, so that you just purchase on the basis of it being latex or nitrile, powdered or powder-free and depending on price. For practical and economic reasons, often the users select just one glove. A better strategy might be to use two or three different gloves to cover all the needs you are likely to encounter in the laboratory. This approach is likely to better optimise the balance between protection and cost or comfort and cost. **LN**

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