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## **Information for employees and students working at the Faculty of Science**

*This AMD information sheet describes the method to arrive at a proper glove choice, based on a risk assessment, and how to effectively apply gloves to prevent exposure of hands to chemicals. Specific information sheets regarding gloves are available for those who order and approve gloves, as well as for managers and supervisors (RhL020b and RhL020c). Please refer to information sheet RhL020 for more information on safety devices in general.*

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## **1 Introduction**





Work safety regulations in The Netherlands require that the university, in its role as employer, must provide proper protection equipment, but as an employee/student of the university you yourself are required to perform a risk assessment of your activities in advance (!) to take suitable and effective measures. The role of a manager or (student) supervisor is to monitor the proper use of the protection equipment. Gloves are often used to protect hands against exposure to (hazardous) chemicals. It appears that in practice wrong choices that specifically lead to exposure, while in the mean time providing a false sense of safety, are made quite often. A glove is a safety measure which, just like other protection equipment, should be suitable for the risk taken. In this case it is the exposure of the skin to a substance. However, this works only when the proper gloves are used (suitable for a specific substance and pertaining to specific activities). The choice of a glove should be based on a proper risk assessment and never on financial grounds.

## **2 What types of gloves may be used**

There are 4 types of gloves that may be used in chemical and biological work, each with a specific, recognizable color. The glove types that are allowed and their suitability are shown in table 1 below: Glove type summary.

It may happen that someone is about to start working with chemicals that require a glove type different from those shown in table 1. For this kind of special activities, a deviation from the 4 standard gloves is allowed. This choice must be made based on the data from the material safety data sheet (MSDS) and the glove specifications. If you are in doubt whether a colleague or student is sufficiently aware of proper glove use, do not hesitate to make it a subject of discussion. If you are uncertain or confused, or if you have any questions regarding glove types or ranges of application, please feel free to contact the AMD: [amd@science.leidenuniv.nl](mailto:amd@science.leidenuniv.nl).

**Table 1; Glove type summary**

Glove	Identification	Application
<p><b>Patron Safety: Soft nitril –powder free</b> Material: nitrile 2.5mils/3.5g</p>	 <p><b>Glove color: blue</b></p>	<p>No or hardly any personal protection, meant for protecting a product. <b>Offers no chemical protection at all.</b></p>
<p><b>Shieldskin ecoSHIELD eco nitrile 250</b> Material: polychloroprene/nitrile category III PPE, AQL 0.65 G1 Extensively tested for chemical permeation (EN 16523-1:2015 supersedes EN 374-3:2003)</p>	 <p><b>Glove color: green</b></p>	<p><b>Chemically resistant.</b> Permeation times vary depending on the substance. <a href="#">Please look here for permeation times of substances tested by Shieldskin</a></p>
<p><b>Shieldskin Orange Nitrile 260</b> Material: nitrile/polychloroprene category III PPE, AQL 0.65</p>	 <p><b>Glove color: orange</b></p>	<p><b>Limited chemical resistance;</b> not suitable for solvents, suitable for some acids and bases. <a href="#">Please look here for permeation times of substances tested by Shieldskin</a></p>
<p><b>Microflex 93-260</b> Material: nitrile/neoprene composite, 0.19mm SATISFIES ASTM D 3577, TYPE II, PBM 89/686, EN 420, 388 &amp; 374 Category III PPE</p>	 <p><b>Glove color: green/blue</b></p>	<p><b>High chemical resistance.</b> Permeation times vary depending on the substance. See permeation times: <a href="#">Microflex 93-260</a></p>

### 3 Glove use in practice

Depending on the substance, a certain type of glove is needed to protect against exposure. A type of glove provides protection against a substance for a limited time. This is called the permeation time. The permeation time for a glove is not the same for all substances.

If a substance is spilled on your glove, the glove should offer you protection for a time long enough to bring your activities safely to a closure.

Before you take measures, you must first know the risk. Prior to your practical work you *must* take these steps first:

1) Recognize the hazards (hazard symbols of the substance).

What are the risks? Consider the activities: What are the hazardous actions? Where/when might actual exposure occur? Read the H sentences in section 2 of the MSDS, and check the exposure route. In itself, the MSDS does not tell you anything about the risks regarding your activities. Enter the data from the MSDS into COSHH (tip: Use the [COSHH e-tool](#)) or NIOSH.

If you are unsure about what a MSDS means, or if you have never heard of COSHH or NIOSH, please feel free to contact the AMD: [AMD@science.leidenuniv.nl](mailto:AMD@science.leidenuniv.nl). We will gladly help you.

2) Take measures that match the risk.

Follow the hierarchy of (hazard) controls (legal obligation!): First, source approach (Is it possible to replace a hazardous substance by something less hazardous?), then collective and technical measures (such as working in a fumehood), and finally personal protection equipment (PBMs), such as gloves. If there is a real risk of exposure to the skin and it regards a toxic or CMR substance, put on gloves. Furthermore, work with CMR substances is performed in a fumehood only.

Do not put on gloves out of fear, or because you don't trust your colleagues or students to work safely, but put on gloves because your risk assessment shows you need them for your activities.

3) Do you arrive at the conclusion that you need gloves? Section 8 of the MSDS states what kind of protection is required. It also states the material and the required thickness of the glove.

The MSDS is not sufficiently specific in its information about gloves for all cases.

If it is not, please refer to the information provided by the gloves' supplier.

Permeation times of gloves that may be used, can be found in table 1: Glove type summary (see the links to permeation times in table 1). Based on these data, you determine if a type of glove provides a sufficient period of protection for your activities.

More information about risk assessment regarding research can be found in the information pdf sheet RhL010; Research risk

- 4) Use these gloves the right way:
- a. Do not use gloves unnecessarily.
  - b. Whenever possible, use a single glove (one hand) instead of two. This prevents contamination, stimulates conscious work, and decreases glove use (risk of skin irritation, costs) by a factor of two.
  - c. Remove gloves that are spilled upon.
  - d. Do not use gloves beyond the permeation times.
  - e. No gloves outside the lab.
  - f. Use gloves one time only.