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

*As a manager or supervisor you bear the responsibility for the work safety of your employees and students. This responsibility includes the provision of safety equipment, such as gloves that protect against exposure to chemical and microbiological risks. In addition, you are required to monitor the use of the equipment provided. This AMD information sheet explains the Dutch Working Conditions Decree (Arbowet) background of the use of gloves for chemical and microbiological work. Specific information sheets about gloves are available for glove users, as well as employees who order or approve gloves (RhL020a and RhL020b). 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, while the employees are obligated to apply these adequately. The role of a manager or (student) supervisor is to monitor the proper use of the protection equipment. Protection equipment is meant to reduce or eliminate the exposure to a certain hazard.

Personal protection equipment, such as gloves, are the last option to be considered for the protection of employees and students against a risk. Please always first check if the substance may not be replaced by another, less risky one, and, after that, please check for other, technical or organisational options that lower the risk. Nevertheless, work with hazardous substances often requires the use of gloves. However, this makes sense only when the specifications of the gloves are satisfactory for the specific substances one is working with, but then also only when the gloves are suitable for the activities in question.

If you supervise students or AIO's (PhD students), please always verify that their choice of glove is based on a risk assessment, data from a material safety data sheet (MSDS), or information provided by the glove suppliers regarding the areas of application and the permeation times for chemicals. This is an obligation imposed by the Dutch Working Conditions Decree (Arbowet). The same Decree also imposes that the choice of a glove should be based on a proper risk assessment and never on financial grounds. The aim is to reduce the risk of (harmful) exposure to an acceptable level.

## **2 Help your employees and students to (learn how to) work safely**

As a manager or supervisor your role is to set an example. Therefore, show how 'it should be done'. Please make regular rounds and make sure that (safety) instructions are complied with. This too, is a legal obligation for a manager imposed by the Dutch Working Conditions Decree (Arbowet).

Finally, please also make sure that (safety) knowledge is retained whenever employees leave. Actively provide induction training for new personnel and students, and supply them with this and other (safety) information. Please make sure that this information is still up to date.

### 3 What are the actual risks involved?

A risk assessment prior to any activities is not just an obligation, but a means to ensure that employees and students become more aware of their activities as well. It reduces the chance of mistakes and incidents, and, thus, lowers costs as well. Please also make sure you do not lose contact with the shop floor.

A risk assessment is neither a time-consuming, nor a complicated process. When working with chemicals, in most cases it is sufficient to check the data in the MSDS in combination with the activities. For example, there may be descriptions of measures that do not apply under laboratory conditions, but are aimed at industrial amounts instead. Therefore, always adapt the measures to the risk. Please follow the next 4 steps to arrive at the proper measures:

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(s). 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.

2) Take measures that match the risk.

In doing so, follow the hierarchy of (hazard) controls (This is a legal obligation!): First, look at a source approach (Is it possible to replace a hazardous substance by something less hazardous?), then at collective and technical measures (such as working in a fumehood), and finally at personal protection equipment (PBM), 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.

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. This too, is a source for the suitability and the permeation times for many different substances. The permeation times for the Shieldskin gloves [may be found here](#) and [those of Microflex 93-260 here](#). In the Shieldskin table suitable gloves are indicated with a green color, less suitable ones yellow/orange, and unsuitable ones, that is, those with short permeation times, red. Based on these data, you can determine if a type of glove will protect you long enough when performing your activities.

- 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. Gloves are for one time use only.

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.

More information about risk assessment regarding research can be

#### 4 What types of glove may be used?

There are 4 standard glove types that may be used in chemical and biological work, each with its own recognizable color. Please guard against ordering other types, because inconsistencies in colors, brands, and types of gloves inevitably lead to mistakes and, thus, exposure to hazardous substances. Especially students that end up in different labs for various practicals, or employees that use shared facilities, run a high risk of mistakes. Admissible are the gloves shown in table 1.

It may happen that work is to be done 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 too, must be made based on the data from the MSDS combined with 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, based on this content, 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>