



< Risk identification and safety >

Skin Protection



IAMC Toolkit

Innovative approaches for the Sound Management of Chemicals
and Chemical Waste



Introduction

Skin diseases are widely spread among the chemical handling personnel. This presentation provides an introduction to skin protection methods through the description of harmful substances, their physical actions and the skin reaction they can induce.

The presentation explains the potential harm of substances and presents a summary of measures to be implemented to ensure skin protection.

The user will read about skin protection measures, such as substitution, as well as technical, organizational and behavioral measures.

Hazard Management

1. Risk identification and safety

11. Chemical classification and labelling

12. Risk assessment

13. Safety rules

14. Personal protective equipment

15. Skin protection

16. Emergency escape routes

17. Handling of solvents, acids and bases

18. Safety in gas tank handling

2. Transport and storage

21. Internal transport of chemicals

22. Internal pedestrian routes

23. Storage

3. Fire and explosion protection

31. Fire protection

32. Fire protection in welding and cutting operations

33. Explosion protection

34. Container cleaning

4. Emergency response

41. Emergency response plan

Contents

1. Introduction

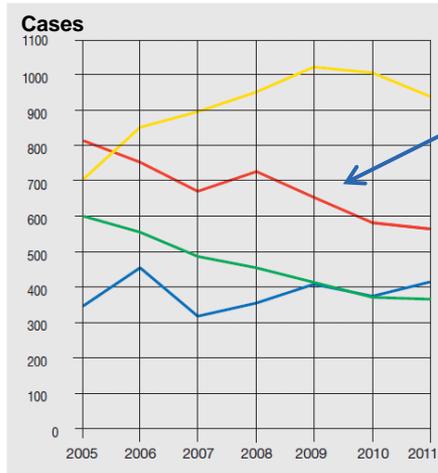
- Context
- Functions of the skin
- Risks and causes of skin diseases
- Effects of harmful substances

2. Protective Measures

3. Sources

Introduction

Context



Source: Suva

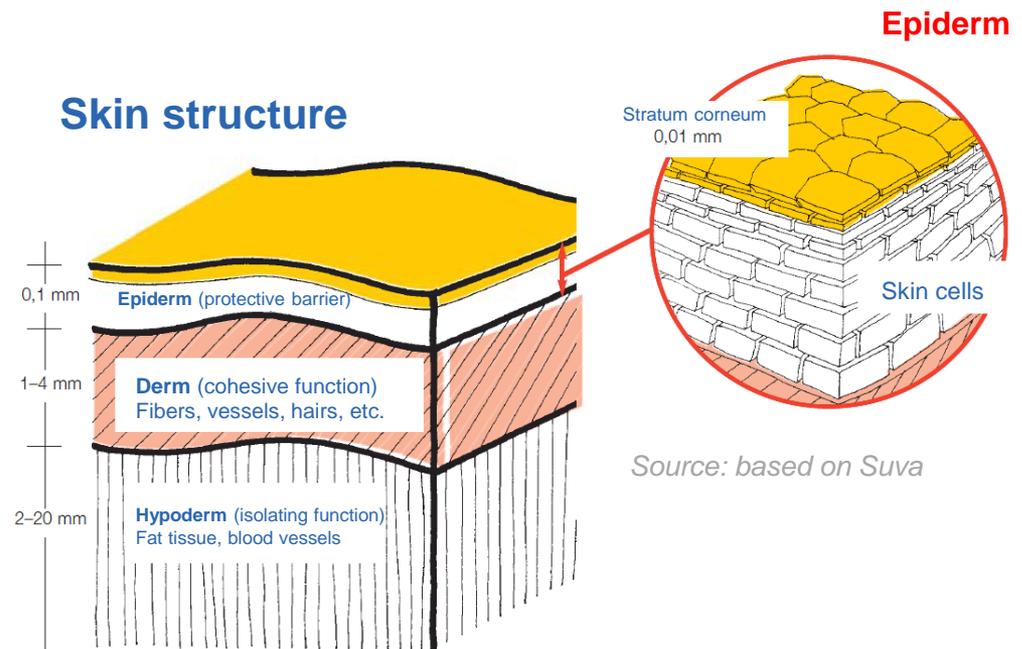
In Switzerland, the number of cases of skin diseases per year is still at a high level when compared to other diseases.

- Severe skin diseases entail significant costs because of long-term treatments and prolonged work disabilities.
- The costs of protective measures, however, are minimal.

Therefore, skin protection is worthwhile!

Functions of the Skin

- The skin is **directly exposed to external aggressions** and naturally **protects us** from:
 - Heat and cold
 - Electric current
 - Mechanical actions
 - Pathogenic agents



Risks

- Thanks to its regenerative capacities, the skin automatically repairs minor injuries.
- Some harmful substances can cause **injuries** upon **first contact with the skin**. Others, after **repeated** or **prolonged contacts**.
- The **most exposed body parts** are:
 - Fingers
 - Hands
 - Forearms
 - Neck
 - Face

Harmful Substances and Physical Actions

Potentially harmful **substances** for the skin:

- Acids
- Bases
- Solvents
- Mineral oils
- Synthetic cutting fluids
- Wet cement
- Reactive plastic compounds
- Rubber additives
- Bituminous products
- Metallic compounds
- Soaps and other cleaning substances
- Alkyl phenols

Potentially harmful **physical actions**:

- Stings and cuts caused by sharp tools
- Rubbing and pressure
- Microscopic injuries due to rough objects
- Metal and glass shards
- Cleaning with soap containing sand or other abrasive elements
- Humidity
- Heat
- Cold
- Light beam and other radiations

Skin Reactions

Chemically or physically irritating substances

They cause skin inflammations.

- A single contact between the skin and very corrosive or irritating substances can lead to skin lesions.
- The contact with harmful substances in low concentration can only lead to skin inflammations if it is repeated or prolonged.
- A prolonged contact with ultraviolet light will lead to degenerative transformations and possibly to skin cancer.

Allergenic substances

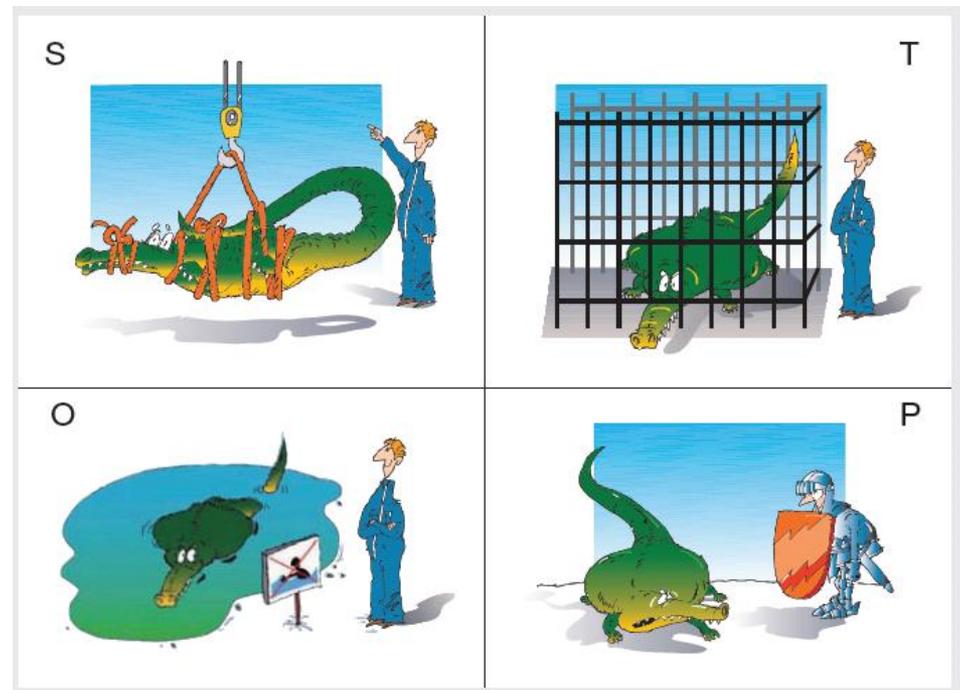
They modify the reactions of the skin.

- After prolonged contacts with a given substance, the skin can become hypersensitive and an allergy can be developed.
- Once allergic, a slight contact with the substance is sufficient to trigger the allergic reaction.
- The hypersensitivity subsists even after the healing of the skin lesion.

Protective Measures

Protective measures

- Protective measures follow the **STOP** logic:
 - **S.** Substitution of the dangerous substances, processes, installations with less harmful alternatives
 - **T.** Protection devices, safety guards, protection nets, emission control (e.g. ventilation at source)
 - **O.** Exposure time (e.g. breaks, change in activity), training, surveillance
 - **P.** Protective equipment in case of direct exposure to dangerous situations



Source: Suva

Responsibilities of the Employer

- The employer should provide workers with personal protective equipment (e.g. screens, gloves, protective clothing, skin protection products).
- The employer must ensure that the equipment is in perfect condition and ready to use.

The use of harmful substances requires an evaluation of the risks based on which technical, organizational and behavioural measures should be defined and adopted.

Risk Analysis

- For **new workplaces** and for **complex processes** in general, a **risk analysis** is essential:
 - **Evaluate** potential **contacts** between the skin and harmful substances.
 - Understand the **physical and biological effects**.
 - Take into account the **duration and intensity of the contact**.

Product Information

- **Hazard pictograms** have to be present on harmful substances.
- **Safety data sheets (SDSs)** provide information about risks and measures to protect the skin.



Substitution, Technical Measures

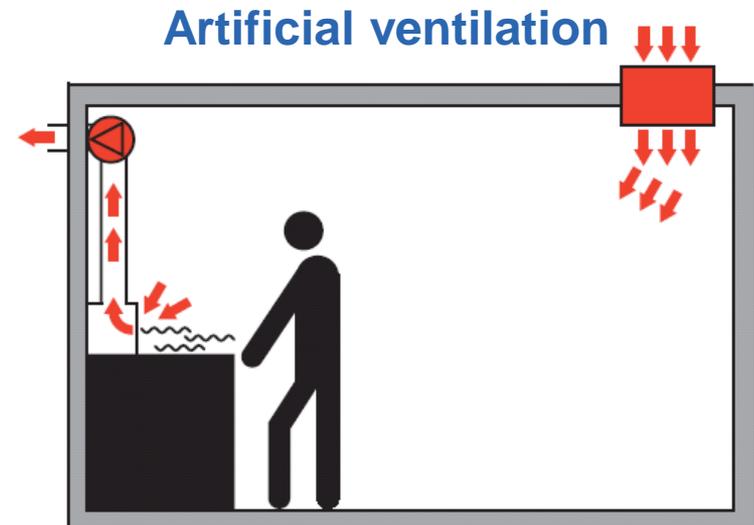
- **Substitution:**

Wherever possible, **harmful substances** should be **replaced** by less harmful ones.

- **Technical measures:**

If it is not possible to replace harmful substances, technical measures should be taken:

- Use **closed receptacles**
- Use **robots**
- Install **artificial ventilation**



Source: Suva

Organizational Measures

- The company should:
 - Draw up **internal instructions for the use of harmful substances**
 - Regularly **train employees** on risks and protection measures
 - Establish a **skin protection plan** which should be displayed at workplaces and in washing and changing rooms

Main dangers	Skin protection	Skin cleansing products	Skin care products	Protective gloves
	Before work and after breaks	After work and before breaks	After work	
Frequent hand cleaning and disinfecting	Product 1	Product 2	Product 3	
Cleaning of the installations X				Gloves type 1
Cutting fluid Y	Product 4	Product 5	Product 6	
Glue Z	Product 7	Product 8		Gloves type 2

Source: based on Suva

Behavioural Measures

- If it is not possible to prevent skin coming into contact with dangerous substances (in spite of technical and organizational measures), behavioural measures should be applied.

Protection: Avoid or limit the contacts between skin and harmful substances.

Cleaning: Clean the skin carefully.

Care: Nourish the dried skin to foster healing.

Behavioural Measures

■ Protection:

- Some activities may require **impervious clothing** (from head to toes).
- Use **cuffs** to protect the forearms.
- **Gloves** should be worn to protect hands and forearms.
 - Wear **leather or textile gloves** for work in **dry environments**.
 - Use rubber gloves for work in **humid environments** or with **aggressive chemical substances**. (*Caution: Depending on the chemical substance, different types of rubber gloves should be used!*)
 - Wear thin cotton gloves under impervious gloves or use a protective cream to avoid the accumulation of humidity.



Source: Suva

Behavioural Measures

- **Protection:**
 - Protective creams can be used for the following tasks (although they cannot replace gloves):
 - Work in humid environments in the absence of any chemical or microbial risk
 - Work with minimally irritating substances
 - Work with cutting fluids (when gloves can get caught in machines)
 - Creams should be applied to the skin before starting to work, after each hand cleaning and after each break.



Source: Suva



Behavioural Measures

- **Cleaning:**
 - Hands should be washed with **hot water** after each manual task.
 - Frequent washing can slightly damage the skin, therefore it is recommended to **wash** hands **gently**.
- **Care:**
 - **Skin care cream** can be applied after work to help the skin regenerate and **restore the natural regeneration mechanism**.
 - Reduced skin care weakens the natural defence mechanism of the skin.



Source: Suva



Source: Suva

Skin Protection – Exercise

You are handling corrosive substances and therefore need to protect your skin. What should you do to ensure your safety?

Skin Protection – Exercise

1. Read the safety data sheet of the substance used.
2. Evaluate the risk and if possible, substitute the substance with a less harmful one.
3. Based on the information of the SDS, wear the appropriate personal protective equipment.
4. Carefully and safely handle the substance (ventilation ON, close lids, etc.)
5. Clean your hands once the work is done.
6. Apply skin care cream to restore the natural regeneration mechanism.

Key messages

- The skin is directly exposed to external aggressions and naturally protects us.
- For new workplaces and for complex processes in general, a risk analysis is essential.
- According to product information and the results of the risk analysis, technical, organizational, behavioural measures should be implemented.

Sources

Sources

- CSD Engineers, Switzerland/ISSPPRO, Germany, 2015
- Suva: Protection de la peau au travail, Switzerland, 2014

Images

- Suva: Protection de la peau au travail, Switzerland, 2014

Disclaimer

This presentation was prepared with the requested diligence and with the generally accepted principles of the relevant field.

If a third party uses the contents of the presentation in order to take decisions, the authors disclaim any liability for any kind of direct or indirect (consequential) damage.