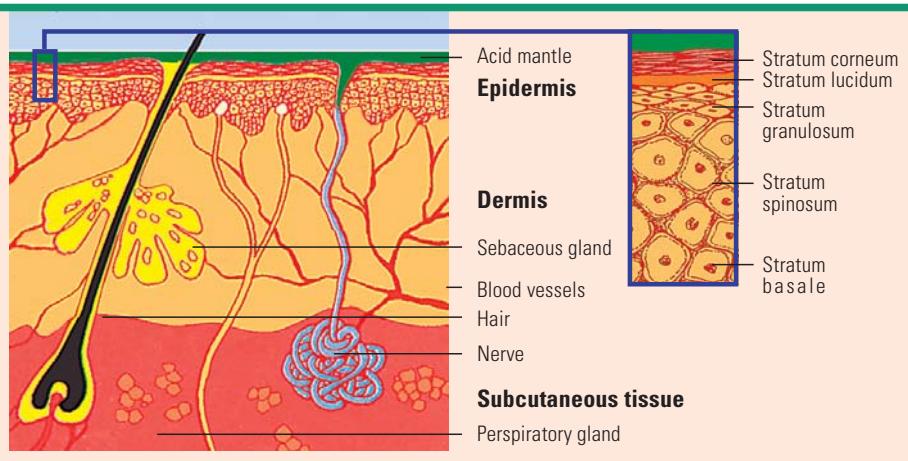




SKIN PROTECTION

Skin protection is one of the important issues of occupational safety within the chemical industry. According to information received from the DGUV (German Statutory Accident Insurance) there is quite a high number of suspected occupational skin diseases; much more than occupational illnesses due to mechanical handling or noise related hearing loss.

The skin has many vital health functions. In addition to the shield function the skin operates as heat control, regulates our water and electrolyte balance, acts as metabolism or sensory organ. Actually the skin is one of our largest organs: it covers 1,5 - 2 m², has a thickness of 1,5 - 4 mm. Its weight is approx. 3-4 kilogrammes (without adipose tissue). Below picture illustrates the set-up of the skin layers.



Warning

H312 Harmful in contact with skin

H315 Causes skin irritation

H317 May cause an allergic skin reaction



Danger

H314 Causes severe skin burns and eye damage



Danger

H373 May cause damage to skin through prolonged or repeated exposure.

SCREEN AND PAD PRINTING: POTENTIAL RISKS FOR SKIN

In section 2 of the safety data sheet you will find the hazards identification according to CLP Regulation (EC) No. 1272/2008 of the product.

Please see left for a few examples of signal words and hazard statements (H phrases) related to health hazards to skin.

A) Contact with solvent based products

If **degreasing agents**, such as organic solvents get into contact with skin, they will affect the epidermal lipids and dissolve them. Then subsequent harmful influences such as virus and bacteria can penetrate into the deeper dermal layers. Skin resorptive solvents may penetrate deeper into the dermis or even into bloodstream.

B) Contact with products, which are skin irritant or allergenic

Contact with skin irritants may cause acute or chronic skin diseases (contact eczema). Irritant contact eczema are induced by short or long-term contact with a substance, if the protective mechanism of the skin is no longer able to countervail the harmful effects. While the skin is damaged the irritant contact eczema will repeatedly develop and may even become chronic.

The allergenic contact eczema develops due to a sensitisation of the immune system to allergenic substances, which are foreign to the body. Having an allergy, the immune system is hyper-activated. Hypersensitivity reaction may damage tissue, if skin is exposed to allergenic substances. It is unpredictable, if ever or when somebody will develop an allergy. However, once acquired, an allergy will often be a lifetime problem.

C) Wearing impermeable gloves for long periods ("wash skin")

Aqueous substances swell the epidermis and dermis of the skin ("wash skin"). The tight bond of dermal cells loosens and becomes more permeable. Additionally, hydrophilic film coat of the skin is damaged, making it easier for pathogenic germs to accumulate.

Wearing impermeable gloves prevents effective evaporation and has the same effect: Epidermis and dermis of the skin swell.

EFFECTIVE SKIN PROTECTION

SKIN PROTECTION

Skin protective creams are applied to clean and dry skin prior to any potentially skin-damaging work. Skin protective creams are no substitute for chemical resistant protective gloves. Skin protective creams containing tanniferous agents provide effective protection against soaked skin when wearing impermeable gloves for extended periods of time. Skin protective creams must not interfere with the protection provided by gloves.

■ PROTECTIVE GLOVES

Principally all risks of a work place must be assessed and evaluated before determination of suitable protective measurements. Wearing personal protective equipment (e.g. gloves) is mandatory when all other possible measurements to minimise the risks have been taken (e.g. substitution of hazardous substances, technical measures). For handling screen and pad printing inks protection against chemical hazards is required. We recommend protective gloves according to DIN EN 374.

1. Chemical Resistant Protective Gloves (DIN EN 374)

Chemical resistant protective gloves have to provide a high level of protection. They are not only impermeable to fluids (penetration) but also tested for permeability against 12 different chemicals. Penetration periods must exceed 30 minutes for a minimum of 3 test chemicals. Chemical resistant protective gloves are suitable for extensive and long-term exposition to hazardous substances (e.g. cleaning). They are mainly made of thicker materials.



2. Impermeable Protective Gloves (DIN EN 374) - simple protection against chemicals

Impermeable protective gloves have passed the penetration tests, but do not comply with the permeability requirements. In other words they did not pass the penetration test period of more than 30 minutes for at least 3 of the 12 chemicals. These gloves are mostly disposable gloves, which provide sufficient splash protection (small-area and short-term exposure). After contact with substances these gloves have to be disposed of immediately. Use a new pair. This type of gloves is quite thin and does not affect tactile sense.

Unfortunately there is no universal chemical resistant protective glove. Basically you should consider the organic solvents listed in the material safety data sheet when choosing a suitable chemical protective glove. Penetration periods for chemicals depend on the glove material. According to our experience gloves made of nitrile rubber (nitrile, NBR) show good suitability. **Gloves made of latex or PVC are not suitable.**

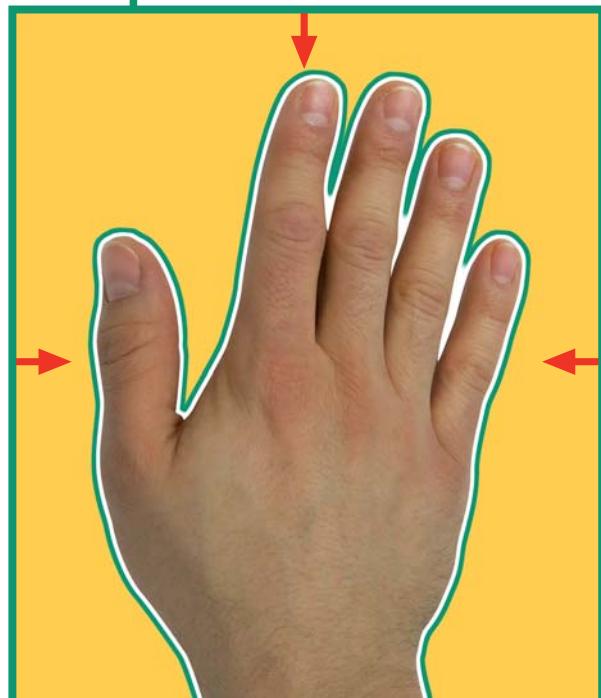
Any gloves with visible damages (cracks, holes, swellings) must be exchanged immediately. Even gloves which seem to be intact on the outside can be damaged inside, therefore a frequent exchange is recommended. Chemical protective gloves should not be worn longer than necessary to avoid soaking of the skin. Reusable gloves should always be hung up to completely dry. When working with different chemicals different pairs of gloves should be used; e.g. gloves used for working with solvent-based inks, other gloves for working with UV-inks and another pair for cleaning.



■ SKIN CARE

Skin care products feed the skin with lipid components (replenishing effect), humidity and rehydrating substances. After work skin care products should be used regularly and frequently.

When working with screen and pad printing inks you should always follow the warnings listed in the safety data sheet (H-phrases). Wearing protective gloves to protect the skin from chemical hazards is essential. A combination of the right products for skin protection, skin cleaning and skin care will help your hands stay healthy.



■ SKIN CLEANING

Skin should be cleaned as gently as possible. Skin cleaning agents should have a pH of 5,5 to protect the natural protective layer of the skin. Fluid soaps are more hygienic than bar soaps. To avoid excessive soaking of the skin water should be lukewarm, not hot. Skin cleaners for slight contaminations contain wash-active substances (surfactants). Cleaning agents for heavier contaminations often contain abrasive agents to assist in the cleaning process.

DO NOT USE: commercial soaps (alkaline effect - skin irritant), solvents (see above), brushes

Reference:
A023 hand and skin protection, BG RCI
Institution for Statutory
Accident Insurance and Prevention,
Raw Materials and Chemical Industry

Tilman Goerttler
Environment, Health, Product Safety

① +49 911 64 22-253
② +49 911 64 22-209
✉ tilman.goerttler@sunchemical.com