



Skin sensitisers



Introduction

Occupational skin diseases are estimated to cost the EU EUR 600 million each year, resulting in around 3 million lost working days. They affect virtually all industry and business sectors and force many workers to change jobs.

The Agency is producing a series of factsheets on occupational safety and health information about dangerous substances for the European Week for Safety and Health at Work 2003. This factsheet contains information on skin sensitisers as well as preventive measures for skin exposure.

What causes occupational skin problems?

Occupational skin problems are caused by contact with certain substances at work. They usually affect the hands and forearms, most likely to touch the substance, but may spread to other parts of the body. Early signs include dryness, redness and itching of the skin. The skin may become swollen, cracked, scaly and thickened and blisters may develop.

How quickly a skin reaction develops depends on the strength or potency of the substance and how long and how often it touches the skin. These skin changes often improve when the worker is away from work, such as during weekends and holidays.

Workers regularly exposed to liquids and using water, which can break down the skin's natural defence barrier, are most at risk. Exposure of the skin to extreme temperature and solar radiation and biological risks also contribute.

What are allergic skin diseases?

The human immune system is built to defend the body against infectious and other harmful outside invaders. Sensitisation is a specific form of immunisation; such over-reactivity is called allergy. The agents that cause allergy in skin are skin allergens.

What are skin sensitisers?

There are two different kinds of skin sensitisers, chemicals and proteins in natural materials. Chemical allergy in skin usually develops over time, while protein allergy can occur very quickly.

In some cases allergens can cause skin symptoms when inhaled or ingested. It is also possible for skin contact with chemicals to cause respiratory allergic symptoms. Some dangerous substances, e.g. from plants and some pharmaceuticals, may cause photoallergic reactions in combination with exposure to sunlight.

Examples of sensitisers and occupations at risk

Chemical	Source	Occupation
Metals, incl. dust and fumes		
Nickel	Metals, soldering, nickel-containing equipment such as scissors, coins	Platers, electronics industry, metalworkers, hairdressers, cashiers
Chromium	Cement, leather gloves, metals, tanning materials	Construction workers, metal industry, leather tanning
Cobalt		Metal smelting
Resins and plastics		
Colophony	Resins, electronic solder flux, adhesives	Resin industry, musicians, dancers, electronics industry
Epoxy resins	Paints and varnishes	Painters, electronics industry, manufacturing, construction
Isocyanates	Insulation foams, paints and varnishes	Construction, painters, manufacturing
Acrylates/methacrylates	Paint plasticisers, dental materials, synthetic nails, plastics, adhesives	Dental workers, beauticians, metal workers
Formaldehyde	Cosmetics, plastics, resins	Hairdressers, health care, manufacturing, textile finishing, embalming
Colorants/dyes		
Paraphenylenediamine	Oxidative hair colorants	Hairdressers
Textile dyes and pigments		Textile workers
Disinfectants		
Glutaraldehyde		Health care, cleaners, papermaking, offshore
Fragrances	Cleaning agents	Cleaning personnel, hairdressers
Pharmaceuticals		
Antibiotics		Health care
Preservatives	Metal cutting fluids, cosmetics, wood preservatives, water-based paints, glues	Metal workers, beauticians, masseurs, hairdressers, wood workers
Rubber chemicals	Thiuram accelerators, phenylenediamine derivatives	Health care workers, hairdressers, rubber industry
Solvents	d-Limonene, Ethylene diamine	Metal workers, painters, assembly line workers, mechanics, printers
Industrial enzymes	Amylases in flour, proteases in detergents, etc	Food and detergents industry, cleaners
Proteins from natural materials		
Natural rubber latex proteins	Protective gloves, medical instruments	Health care workers, hairdressers
Animal proteins	Animal dander, epithelia and urine	Farmers, laboratory animal handlers
Foodstuff	Vegetables, plants	Farmers, florists, kitchen workers, cooks, food industry, bakers
Decorative plants	Flour	
	Spices	

Preventing exposure

Assess the jobs where exposure is likely

Assess substances used at work including any new substances introduced. The agents at risk of being skin sensitisers should be known and the exposure amount assessed.

Some chemical skin sensitisers are classified and listed in EU regulations. They are labelled ⁽¹⁾ with R-phrases R 43 "May cause sensitisation by skin contact" or R 42/43 "May cause sensitisation by inhalation and skin contact".

Lists of occupational exposure limits also provide indications of sensitising potential, ⁽²⁾ and the potential to penetrate the skin, the "skin notation" ⁽³⁾. Very small amounts of a substance, which can be far below the concentration limits for labelling and the occupational exposure limit, can provoke an allergic reaction in sensitive persons.

Eliminate or substitute harmful substances

Replace the skin sensitiser or modify the work process to avoid exposure, for example introduce 'no touch' techniques by designing material packages in such a way that accidental contact may be avoided.

If replacement is not possible, reduce exposure

The number of exposed workers, the time and frequency of exposure and the concentration of skin sensitiser should all be kept as low as possible. Model instructions and guidelines are available ⁽⁴⁾. If work practices are changed, changes of skin exposure should be evaluated.

Skin contact with the substances can be reduced:

- 1. Install devices in work operations**, such as local exhaust ventilation, splash guards and screens.
- 2. Provide suitable, adequate and accessible protective equipment (PPE)**. It has to comply with EU regulations ⁽⁵⁾. Make sure equipment for personal use, such as gloves, is carefully selected, worn, maintained and replaced. General selection guides for gloves ⁽⁶⁾ and clothing ⁽⁷⁾ are available. Large differences in permeability and resistance to various chemicals exist, depending on manufacturer, material, model and thickness. Therefore, review a glove-resistance chart from the manufacturer you intend to buy from. Protective gloves and boots can cause allergies themselves, especially when made of latex rubber or leather tanned with chromium-containing substances. Avoid their use.
- 3. Draw up a skin protection plan**
Include measures and instructions for:
 - skin protection before work
 - skin cleansing during and after work
 - skin care after work
 taking into account
 - type of contamination, i.e. oily, greasy or strongly clinging such as lacquer, resins, adhesives
 - moist and wet working areas: metal working fluids, water, washing and cleansing solutions
 - skin protection when wearing gloves
 - protection from UV radiation when welding and working under strong sunlight.
- 4. Provide adequate washing facilities**
- 5. Good housekeeping and personal hygiene:**
 - protect the whole body, including face and neck
 - keep skin clean
 - make sure protective clothing is clean and intact

- remember to change, especially disposable, clothing and gloves frequently, as chemicals can accumulate on and penetrate through them
- keep workplaces clean, including machinery and tools
- make sure diluted chemicals, e.g. cleaning fluids, are diluted to the correct strength – if they are over strength, they are more likely to cause skin problems.

Monitor skin problems and act on any findings

Any skin disorder which is suspected to be associated with work should be reported immediately. Medical examination should be performed. Fellow workers who do the same job may also have similar skin problems.

Inform, consult and train workers to avoid skin contact with harmful substances as far as possible.

Make sure workers

- know about the skin sensitisers they are exposed to
- have been taught safe work practices
- use the controls provided
- have been trained to use equipment for personal use
- know how to check their skin
- understand the benefits and limitations of skin protection measures such as the use of pre-work skin creams
- are consulted
 - on the results of risk assessment and monitoring
 - when substituting dangerous substances
 - on the choice of PPE.



Chromium in Cement

Water-soluble Chromium VI, which is classified as carcinogenic and sensitising, can induce painful, disabling, allergic eczema in people exposed to wet cement preparations widely used in the construction industry. A study of 5,000 builders working on the Channel Tunnel found that half had skin problems and that half of these individuals were sensitive to Chromium VI.

Reducing chromium VI by adding 0.35% ferrous sulfate to the cement is possible and has been shown to reduce the adverse health effects. In Member States where this technique has been introduced, the number of eczema cases resulting from exposure to cement has been dramatically reduced.

The European Commission is at the moment considering restricting the use of cement with high contents of Chromium VI. These cement products have had to be labelled as sensitising since 2002.

Further information

Other factsheets available in this series on dangerous substances and further information are also available at <http://osha.eu.int/ew2003/>. This source is being continually updated and developed.

⁽¹⁾ According to Directives 67/548/EEC 1999/45/EC, and amendments relating to requirements for testing, classification, packaging and labelling of dangerous substances and preparations

⁽²⁾ Mostly marked with an "S" in the OEL tables

⁽³⁾ Use of the 'Skin' notation is intended to alert employers that air sampling alone is insufficient to accurately quantitate exposure and that measures to prevent significant absorption through the skin may be required.

⁽⁴⁾ E.g. for the printing industry <http://www.hse.gov.uk/pubns/ipex11.pdf> or <http://www.druckindustrie.ch/images/d/arbeitssicherheit/Haut2.pdf>

⁽⁵⁾ Directive 89/686/EC relating to personal protective equipment

⁽⁶⁾ E.g. <http://www.hse.gov.uk/pubns/indg330.pdf>

⁽⁷⁾ E.g. http://www.osha-slc.gov/dts/osta/otm/otm_viii/otm_viii_1.htm#3