

M2-EN.6 MATTER AND MATERIAL

M2-EN.6.1 Introduction

M2-EN.6.2 Common Regulations

M2-EN.6.3 Paint

M2-EN.6.4 Organic Solvents

M2-EN.6.5 Epoxy and Isocyanate

M2-EN.6.7 Asphalt

M2-EN.6.7 Mineral Wool

M2-EN.6.8 Quartz Dust

M2-EN.6.9 Impregnated Wood

M2-EN.6.10 Wood Dust, Fly Ash, Cement

M2-EN.6.11 Asbestos

M2-EN.6.12 Lead

M2-EN.6.13 Silica

M2-EN.6.14 Earth Polluted with Oil and Chemicals



M2-EN.6.1 Introduction

In this chapter, the typical risk factors when working with different types of hazardous matters and materials are described. The aim of this chapter is to:

- Identify the most common risk factors
- Describe the constitution of the risk
- Make proposals on how to reduce these risk factors

The employer has to make sure that hazardous matters and materials are removed, substituted or reduced to a minimum. Technical and economic consequences of a substitution must be counterbalanced with safety and health interests.

M2-EN.6.2 Common Regulations

Hazardous matters mean matter and material, which are hazardous to breathe in, swallow, contact with the skin and eyes, or are flammable or explosive. The supplier of hazardous matters and materials must provide easily understood safety instructions, which describe:

- The composition of the matter, its physical and chemical characteristics and the type of hazard
- Means of personal protection, first aid and fire-fighting
- Transportation, handling, storing and removal of the matter

The employer carries the responsibility that work place instructions are drawn up where people work with hazardous matters and materials. The instructions must be based on the information from the supplier and adjusted according to the local conditions at the enterprise. The employees must receive the latest drawn up instructions.

Risk Factors

- Synergy effects of different hazardous materials being used on site
- Air pollution is worse when it is combined with hard physical work
- Dust may exacerbate the injurious impact from certain solvents

Impact on Human Health

- Pulmonary diseases like asthma, bronchitis, silicosis and asbestosis. It often takes years from the impact to the break-out of the disease, and these diseases are often chronic
- Organic solvents are absorbed through skin and lungs and may lead to injuries of the internal organs, including brain damage
- Certain matters may cause allergy and eczema
- Several matters are carcinogenic even in very small doses
- Risk of congenital malformation

Safety Measures

- Follow carefully the handling instructions for hazardous materials
- Dust may often be seen in the air or on shelves and landings. One can often see, smell or taste steam and gas. However, be aware of the fact that not all matters send out warnings like smell etc.
- Isolate the dangerous matter by e.g. encapsulating the working process
- Make sure the ventilation is effective
- Use the relevant means of personal protection

M2-EN.6.3 Paint

Paint may contain unhealthy metalliferous pigments e.g. compounds of lead, chromium or nickel. Paint may contain irritating or allergenic matters. (M2.6.1.jpg)

Risk Factors

- Risk of breathing in aerosol and solvents
- Risk of fire and explosion

Impact on Human Health

- The same as for organic solvents

Safety Measures

- Avoid skin contact-Use gloves and glasses
- Personal hygiene is very important. Always wash the hands carefully before eating
- Make sure that water, soap and clean and dry towels are available at the work place
- Use water diluted paints where possible

M2-EN.6.4 Organic Solvents

Organic solvents dissolve oil, grease, paint, plastic etc. They are used as means of degreasing and detergents and are components of paint, glue etc. White spirit is the mostly used organic solvent.

Risk Factors

- Risk of absorption through skin or lungs
- Risk of fire or explosion

Impact on Human Health

- Organic solvents may cause acute or chronic injuries on several organs
- Irritation of the mucous membranes of the eyes, the nose and the throat
- Nervous system and brain injuries. Lapse of memory, frayed temper and depression are typical symptoms

Safety Measures

- Reduce the use of organic solvents and follow the instructions on how to handle the solvents carefully
- Smoking and open fire are forbidden
- Make sure the ventilation is effective and use breathing masks
- Protect the skin with gloves or other suitable means of protection
- Do not leave cloths with solvents in the open, in open containers

M2-EN.6.5 Epoxy and Isocyanate

Epoxy is a highly allergenic matter. Allergy may occur even after a short time impact.

Risk Factors

- Risk when breathing it in or when in contact with the skin

Impact on Human Health

- Contact with or breathing in epoxy and isocyanates may cause allergy, eczema or allergic asthma

Safety Measures

- Persons who suffer from heavy perspiration from the hands, eczema, allergy or pulmonary diseases may not work with these matters
- It is normally prohibited to spray with these matters outside special spray sheds
- Special training is demanded for personnel working with epoxy or isocyanates
- Follow the handling instructions carefully – also according to removal of waste
- In the work place there must be access to wash-hand basins with running hot water. The taps must not be hand-operated
- There must be access to showers with hot and cold water, means of cleaning, soap, towels and suitable skin cream
- Be very careful with the personal hygiene
- Necessary first aid kit must be available on the work place

M2-EN.6.6 Asphalt

Work with asphalt includes laying out different types of road asphalt and asphalt mastic, roofing with bitumen products, insulation of bridges and damp proofing with bitumen products. (M2.6.2.jpg, M2.6.3.jpg) If the contents of the asphalt material cause safety or health problems, the material must be replaced with less dangerous one. Work place instructions must be drawn up for work with asphalt and bitumen materials.

Risk Factors

- Risk of air pollution injurious to health
- Risk when in contact with the skin
- Risk of burning

Impact on Human Health

- Contact with the skin may cause eczema and burns

Safety Measures

- Work with asphalt may only be carried out by persons who have gone through special training, or have been instructed accordingly

- Always work at the lowest temperature possible. Do observe the maximum work temperatures
- Use breathing masks, high boots , proper gloves and other means of personal protection
- Have always be access to water and cleaning articles

M2-EN.6.7 Mineral Wool

Mineral wool consists of synthetic mineral fibres which are bound with plastic resin. Mineral wool is extensively used for insulation. (M2.6.4.jpg)

Risk Factors

- When managing mineral wool products, mineral fibres of different sizes are liberated creating little scratches in the skin and in the mucous membranes of the eyes

Impact on human Health

- Mineral fibres may cause watery eyes, itch and skin eruption
- There is an increased risk of bronchitis and pneumoconiosis

Safety Measures

- Organize the work so that least possible part of it is carried out above the head and most of it is done before rooms and constructions are closed and completed
- Avoid dust
- Use dust repellent clothes without pockets and turn-ups. Wear headgear with a peak
- Gloves, safety spectacles and breathing masks must be available at the work place
- When cleaning: vacuum-clean and wash. No sweeping with a dry broom

M2-EN.6.8 Quartz Dust

Several construction materials produced of sand, clay, granite, flint, arenaceous quartz etc. contain crystalline silicon dioxide (quartz). So do certain types of paint, hard stopping, glue etc.

Risk Factors

- Quartz dust may reach deep down in the lungs or the alveolus during inhalation

Impact on Human Health

- Quartz dust may be accumulated in the lungs and cause silicosis (grinder's disease)
- Quartz dust is carcinogenic

Safety Measures

- Use the least dusting working methods possible
- Use exhaust, and if the dust cannot be removed that way use water
- Cleaning: vacuum-clean and sweep with water, no use of a dry broom only
- Use means of personal protection when necessary

M2-EN.6.9 Impregnated Wood

Pressure treating of wood is done with means containing copper and boron combinations. Combinations with chrome and phosphorus are also found. Vacuum treating of wood is done with means containing organic solvents and e.g. tributyltin combinations. (M2.6.5.jpg)

Risk Factors

- If you get it on your skin or breathe it in

Impact on Human Health

- Boron combinations may have an impact on men's reproductive organs and cause congenital malformation
- Chrome is allergenic and carcinogenic
- Tributyltin combinations are highly exasperating when it gets on your skin or in your eyes

Safety Measures

- Only use pressure-treated wood when it its necessary to prevent attack from fungus and insects
- Avoid contact with the skin. Use if possible gloves and apron e.g. if the wood gets wet in the rain
- Use breathing masks if the wood generates dust during the work

M2-EN.6.10 Wood Dust, Fly Ash, Cement

Wood dust is produced when processing the wood. (M2.6.6.jpg)

Fly ash is used as rubble in connection with road construction and in cement, concrete and gas concrete. Fly ash consists of fine particles which are liberated from the waste gas from coal-fired power stations.

It is prohibited to use cement and non-hardened cement-containing products if it contains water-soluble chromate of more than 2 mg per kilo dry cement, or if the content is not stated on the packaging. (M2.6.7.jpg)

Risk Factors

- Wood dust may dry the skin and the mucous membranes and irritate the respiratory passages
- Fly ash may irritate the skin and the mucous membranes

- Cement may irritate the skin

Impact on Human Health

- Wood dust may cause nasal cancer and allergies
- Fly ash may cause allergy during a long period of time
- Chromate may cause eczema when in contact with the skin

Safety Measures

- Use an exhaust system when the process may cause wood dust
- Use means of personal protection
- Do follow the instructions carefully
- Apply particle filters at the air supply system in the cab of the contractor is machine

M2-EN.6.11 Asbestos (M2.6.8.jpg)

It is prohibited to use asbestos or asbestos-containing material. High-pressure flushing of asbestos-containing material including eternit roofs is prohibited. Asbestos-containing material which is temporary taken down, dismantled or in any other way removed from its original position, may not be re-erected or reused – also when the material is still intact.

Working with demolition and repair of asbestos-containing material is permitted.

Workers under the age of 18 should not work with asbestos-containing material or be exposed to asbestos dust.

Risk Factors

- Danger of breathing in asbestos dust

Impact on Human Health

- Asbestos dust may cause asbestosis which is a chronic pulmonary disease
- Asbestos dust may furthermore cause lung cancer and pleural cancer

Safety Measures

- Prepare a plan of work
- Notify the works to the Inspector
- Use tools and work methods which cause the least possible dust formation. If necessary, moisten the material about to be demolished
- Bar the working area so that unauthorized persons are kept away
- Use effective breathing masks and dust repellent clothes without pockets preferably of single use (M2.6.9.jpg - M2.6.11.jpg)
- Make sure the cleaning is done properly after work. Vacuum-clean and wash. Sweeping with a dry broom is not allowed

- Work clothes and daily clothes must be kept separately
- Eating on the working place is not allowed
- Act in conformity with the regulations when the waste must be disposed
- Provide suitable cleaning and washing facilities
- Wash the working clothes separately or dispose them
- Do not drill asbestos products
- Only trained personnel must be working with asbestos

M2-EN.6.12 Lead

Lead combinations have earlier been used e.g. in paint. There may be a risk of impact from lead and lead combinations e.g. at demolition, especially scraping off, burning and cutting up of materials which are covered with lead-containing paint. (M2.6.12.jpg - M2.6.13.jpg)

Workers under the age of 18 are not allowed to work where they may be exposed to impact from lead.

Risk Factors

- Lead dust and lead steam may be breathed in or absorbed through the skin

Impact on Human Health

- Lead is carcinogenic
- When the exposed over a long period of time lead may cause injuries in the brain, the nervous system, the kidneys, the stomach and the intestinal canals. Lead may cause anaemia and affect the reproduction ability of both men and women. There is also a risk of congenital malformation

Safety Measures

- Development of lead dust and lead steam must be prevented effectively
- Use a breathing mask and means of personal protection if there is a risk of lead impact
- Wash the work clothes separately

M2-EN.6.13 Silica

Silica is a natural component of a variety of materials used or encountered in construction activities. Crystalline silica can be found in substantial quantities in sand, sandstone and granite, and often forms a significant proportion of clay, shale and slate. Concrete and mortar also contain crystalline silica.

Risk Factors

The health hazards of silica occur from breathing in the dust. Exposure of workers or the public can occur from the following activities:

- demolition processes

- concrete scabbling, cutting or drilling
- stone masonry
- facade renovation
- tunnelling through dry, silica-bearing rock
- blast cleaning of buildings, especially using sand

Power tools for cutting or dressing stone lead to high exposures throughout the work. Exposure often depends on the size of working space is, the existence of ventilation and the proximity of worker's breathing zone to the source of the dust.

Impact on health

- Inhalation of the very fine dust of crystalline silica can lead to the development of silicosis (resulting to breathing disorders)
- Exposure to very high concentrations over a short period can cause acute silicosis, resulting in rapidly progressive breathlessness and death within a few months of onset.
- Exposure over a longer period leads to progressive silicosis, causes fibrosis of the lung tissue, subsequently resulting in loss of lung function and finally death.

Safety measures

- Eliminate and substitute silica by using other materials (i.e. non-silica grids)
- Control dust by using dust suppression techniques (water supply) or local exhaust ventilation (exhaust ventilated tools)
- Use positive pressure or airline breathing apparatus
- Use appropriate personal protective equipment (PPE) (respirators, clothing) and have specific training on its proper use
- The protective equipment must be stored in clean, dry conditions away from chemicals
- Employers must have available facilities for washing and changing where workers wash their hands before eating, drinking, smoking and going to the toilet.
- Appoint a separate place away from the work site for eating, drinking and smoking
- Have regular health surveillance (medical examination, chest X-rays, etc)

M2-EN.6.14 Earth Polluted with Oil and Chemicals

Working with chemically polluted earth may be a health risk. If the type and extent of the pollution are not known, the kind of health risk the work implies cannot be determined.

Risk Factors

- Risk of breathing in dangerous matters and getting it on the skin

Impact on Human Health

- The impact depends on the type of pollution

Safety Measures

- The work must - if possible - take place above the excavation.
- Cabs, tents etc. must be ventilated with overpressure
- Work that produces dust must be sprinkled
- Diaphragms and pumps may prevent steam, fluids etc. from penetrating into the excavation
- Do restrict the access to the polluted area
- Use the relevant means of personal protection
- Be exceptionally careful with the personal hygiene. Wash the face, the hands and the forearms – also before going to the lavatory