

## **M3-EN.10 SAFE USE OF CLEANING AGENTS**

M3-EN.10.1 Introduction

M3-EN.10.2 Use of chemical cleaners and protective measures

M3-EN.10.3 Personal protective equipment

M3-EN.10.4 Hygiene

M3-EN.10.5 Protection of public

M3-EN.10.6 First Aid

### **Description of chapter**

The specific chapter includes a reference to the chemical substances used at metal processing installations as well as the safety measures, which a worker should take in order to protect himself from possible fatal accidents.

The objective of this chapter is to familiarize all personnel involved in occupational health and safety, with the basic safety rules and practices, which concern handling of chemicals in metal processing workshops.

### **M3-EN.10.1 Introduction**

A wide variety of chemical compounds is used as cleaners. Chemical cleaners may cause health problems like:

- Skin contact: Acids and alkalia can cause skin burns, which often take a long time to heal.
- Inhalation of vapours or aerosols: Chemical solutions having a high concentration in acids or alkalia may give off toxic and corrosive vapours. The use of sprays produces an aerosol cloud, which may also be toxic or corrosive. Dense chemical compounds from which custom weaker solutions are produced are considered as most hazardous.

However, weaker solutions are not harmless either. The latter goes particularly for hydrofluoric acid (HF), where skin contact, even with a weak solution, can cause severe and painful burns which may appear 24 hours after exposure.

### **M3-EN.10.2 Use of chemical cleaners and protective measures**

- Reduce exposure
  - Reconsider the purpose of using a particular corrosive chemical. However if the use of such a chemical is necessary, the least hazardous should be chosen. Preferably use a solution that is as weak as possible.
  - Always use chemical solutions which have already been treated by a reliable manufacturer. The final user should never attempt to dissolve the product himself.
- Control of exposure

- In case dissolution or another task involving dense acids or alkalia has to be performed, it should take place in a well-ventilated area preferably outdoors (e.g. taking all necessary precautions in a warehouse). Furthermore, dense acids or alkalia must be transported inside sealed containers. During dissolution process always pour the chemical substance in water and never the opposite.
- Each chemical compound should be transported in suitable closed containers having proper chemical info labels.
- If dissolution of a chemical compound indoors cannot be avoided, it should at least be performed at ground level.
- Avoid use of chemicals by means of spraying.
- The cleaning agent should be used along with a brush or a roller having spillage protection.

### **M3-EN.10.3 Personal protective equipment**

Always use suitable protective equipment for skin, eye and face protection by corrosive chemicals:

- Protective glasses
- Gloves, properly selected for a particular use.
- Protective clothing or a lap when mixing of chemicals takes place. Also chemical-proof protective boots.
- Certified respiratory system protective equipment, required when handling dense acids or alkalia or spray cleaning. Always consult the user's manual provided by the supplier, in order to check whether the protective equipment is suitable for use with a particular chemical agent. In case respiratory protection is required, the equipment users should receive training concerning proper use and restrictions.
- Personal protective equipment should be stored in a safe, clean and dry place away of chemicals.
- Keep personal protective equipment clean and well maintained.

### **M3-EN.10.4 Hygiene**

- Ensure that the protective equipment has been thoroughly cleaned with water after use and examined for damage (e.g. pin holes, torn gloves especially regarding the area of finger covers).
- All contaminated clothing must be cleaned in professional washing machines before next use.
- Extremely contaminated clothing must be immediately removed and washed separately.
- Clothing contaminated by Hydrofluoric acid (HF) or other dense acids has to be neutralized by means of a Sodium carbonate solution (NaHCO<sub>3</sub>) before washing. The particular solution should always be available at workplace when Hydrofluoric acid is used.

- Employees should avoid any contact whatsoever with the contaminated equipment, for example they must never place their respiratory protection together with their gloves thus risking facial burns.
- Employees should wash their hands thoroughly before they eat, smoke, drink, or go to the toilet.

### **M3-EN.10.5 Protection of public**

- Employees who are not involved in cleaning procedures must be protected against exposure to chemicals. For this purpose, the following measures have to be taken: Make sure that all windows, doors, etc in areas where mixing of chemicals takes place, are closed.
- Avoid working with sprays or air draughts, which may form an aerosol cloud travelling through workplace. Restrict access to the vicinity of the area where cleaning procedures take place, providing however an alternative route. Warning signs and labels should be installed. All chemicals containers should be closed and protected.
- If an overflow occurs, it should be treated safely
- Cleaning fluids should be stored in hardly accessible and safe areas. Acid and alkali based compounds should always be separately stored. Cleaning equipment, including containers used for dissolution, must be thoroughly washed after each use.

### **Leaks**

- Unless hydrofluoric acid or some other dense acid is involved, cleaning of acid or alkali leaks should be performed by means of water.
- In case a dense acid is present, neutralization with lime (calcium hydroxide  $\text{Ca}(\text{OH})_2$ ) is advisable.
- Hand tools and other equipment, which may have been contaminated, should be treated accordingly.
- If a dense acid or an alkali or hydrofluoric acid contaminates a porous material, such as wood or packing paper, they should be burned or buried in a safe place.

### **M3-EN.10.6 First aid**

Anyone affected by a chemical cleaning agent should be immediately transferred to a clean air area in order to receive first aid and medical care. In most cases, this includes washing contaminated tissue, (skin, eyes etc) with plenty of clean cold water.

- Skin burns caused by hydrofluoric acid require special first aid care, which includes an anti-burn antidote. In case this antidote is available at workplace, there should be someone adequately trained for purposes of administering the antidote to contaminated persons.
- In case eyes are affected, immediate washing with large quantities of water and transport of patient to the nearest hospital is required.

- For this purpose, there should always be a way of urgent transport to the nearest hospital, available (for instance by means of a company vehicle), as well as a list of emergency health centres in the area.
- In any other incident, no one should take any action without consulting a medical doctor first.
- In case of an emergency transport to the hospital, along with the victim, the chemical's container label, the material safety data sheet, or any other documentation useful to the identification of contaminant substance should be available. The time required for the identification of a chemical agent may be crucial. For this purpose, the manufacturer or the supplier of a chemical product has the legal obligation to provide together with the substance container the corresponding chemical info label and the material safety data sheet.