

M3-EN.8 SAFE USE OF EQUIPMENT

M3-EN.8.1 Hazard sources and regulations for work equipment

M3-EN.8.2 Operation systems – Control instruments

M3-EN.8.3 Barriers

M3-EN.8.4 Housekeeping

M3-EN.8.5 Rotating equipment

Description of chapter

In this chapter, the way in which a person can use equipment with safety (mainly mechanical equipment) is developed. Beyond the introduction that concerns danger causes and the training of workers, checklists for the machine and its supplier are presented.

The aim of this chapter is to familiarize all parties involved with Occupational Health and Safety in metal processing with safety use of work equipment.

M3-EN.8.1 Dangers arising from equipment

- Wrong equipment
- Use of equipment from unqualified personnel
- Lack of inspections from qualified personnel
- Lack of training and information
- Lack of proper control instruments
- Lack of safety barriers
- Poor space and time management
- Poor maintenance

M3-EN.8.2 Operation systems – Control instruments

- They should be visible and properly labelled
- Unless necessary they must be located out of dangerous zone so that:
 - Their handling does not create dangerous situation
 - To avoid unintended operation
 - Handling and control to produce the least possible musculoskeletal strain
- Operator's position must provide visibility to ensure that there is no personnel in dangerous zones. If that is impossible, there must be a visual or a sound signal before the start and efficient time and means to the worker to move away
- Control systems must be safe. Damage, pressure or restrictions that can occur and cause dangerous situations must be prevented

- Start or restart must be only feasible intentionally (except from normal production cycles or if there is no hazard at all)
- Examples of widely used barriers
 - Two handed control system (M3.08.01)
 - Dangerous areas control with photocells
 - Protective caps with interlock system
 - General block Pushbutton
 - Anti-shock relay
 - Weight sensors –resistance sensors (M3.08.02)
 - Grabbers, pincers dyers “gloves”
 - Isolated control rooms– cameras, PLC systems (M3.08.03)

M3-EN.8.3 Barriers

Many fatal accidents happened because of workers’ caught up in rotating shafts like those in lathes, drillers, and boring.

Work equipment involving risk of fall or dashing of parts or objects must have safety barriers (M3.08.04)

- Work equipment involving risk of exhalation or emissions must be provided with proper devices to hold or abduct them close to their source
- Preventive measures must be taken against the cracking or breakage of equipment
- Stable barriers (M3.08.05) should be preferred in order to require tools to be released Protective measures must be taken in case of fracture or crack of equipment
- If workers must have frequent access an interlock or photocell system must be used
- Choose the proper materials (e.g. plastic is transparent but fragile) and structures (diameter of grid openings) for barriers
- Barriers must allow operation and maintenance
- Where barriers cannot fully protect workers special measures must be taken (e.g. pincers)
- Proper lighting where work is performed
- Protection of equipment of low or high temperature
- Maintenance must be take place when the equipment is out of order or special precautions must be taken

M3-EN.8.4 Housekeeping

- There must be provided enough empty space near machines in order to allow workers and materials easily and safely move. If possible the space should be marked
- Benches and wheeled closets should be provided for the tools and parts required
- Useless material should be piled in special cans and spaces
- Operator must not lie in a passageway and must be protected with a bar if required so as not to be accidentally pushed from behind to the machine
- Avoid using unfit structures for sitting
- Mounting of machines should minimize static (strength) and dynamic (vibrations) strain
- Prescribed procedures for function and maintenance must be strictly followed
- If gasses are produced of during the use of equipment, systems of absorption should be inquired

M3-EN.8.5 Rotating equipment

- Proper barriers should always be set around thee rotating part. Proper chucks and prevention devices to prevent from rotator's release should be provided.
- Operators should:
 - Tie their hair if long
 - Wear tight and whole body clothes
 - Remove rings, gloves, chains, etc
 - Wear protective glasses to avoid swarf
 - Check barriers and report any malfunction directly
- Scramble of energy transmission systems (wheels, tracks, air or fluid ducts, and cables) with other objects should be avoided if dangerous. When this is not possible prevention measures against scramble should be taken.
- Mount energy transmission systems to avoid damage or dirt by lying on the floor.