

M3-EN.5 USE OF HAND TOOLS

M3-EN.5.1 Introduction

M3-EN.5.2 Basic tips for the use of hand tools

M3-EN.5.3 What must be avoided when using hand tools

M3-EN.5.4 Clamps

M3-EN.5.5 Cutters

M3-EN.5.6 Knives

M3-EN.5.7 Wood and metal saws

M3-EN.5.8 Pipe wrenches

M3-EN.5.9 Wrenches, screwdrivers, hammers and sledges

M3-EN.5.10 Powered hand tools

Chapter description

In this chapter, hand tools used in this sector are presented along with general tips on their use.

The aim of this chapter is to familiarize all parties involved in Occupational Health and Safety in metal processing about hand tools and their use.

M3-EN.5.1 Introduction

Frequent and serious accidents happening during use of hand tools require taking some measures about the use, maintenance and transport of them, so as to prevent risks for the user and other persons working in the same area. Injuries from hand tools include bruises, fractures, amputations, temporary or permanent eye injuries, etc.

Sorts of hand tools

There is a large variety of hand-tools for various work tasks. The most common of them are:

1. Holding tools like vises
2. Cutting tools like cutters and knives
3. Wood saws and metal saws
4. Pipe wrenches
5. Mounting tools like screwdrivers and wrenches
6. Struck tools like hammers and sledges
7. Powered hand tools like grinding wheels, cutting wheels, drills, electrical screwdrivers, etc

M3-EN.5.2 Basic tips for use of hand tools

- Choose the right tool for each task. Substitutes increase the likelihood for an accident
- Use tools that allow wrist to remain straight. Avoid using hand tools with a bent wrist
- Ensure that all employees have been properly trained in safe use of hand tools
- Use tools of good quality
- Inspect tools for defects before use. Replace worn tools
- Keep cutting tools sharp and cover their cutting edge with a proper cover so as to protect the tool and prevent injuries from unintended touch
- Replace broken, cracked or torn handles of files, hammers, screwdrivers and chisels
- Ensure that all shafts of tools such as hammers and axes are tightly fit in the head of the tool
- Replace worn out jaws of wrenches, pipe wrenches and large nippers
- Restore heads of striking tools (e.g. hammers, chisels, etc.) that have a “mushroom” shape or edges
- Sharp tools (e.g. saws, firmer chisels, knives) that lie in cases should not exceed from the top of the case
- Carefully maintain hand tools. Keep them clean and dry and carefully store after each use
- Carry hand tools in proper cases to and from workplace
- Always wear safety glasses and well fit gloves proper for the respective risk of each task
- Keep work environment clean and tight in order to avoid accidents
- Use a heavy belt or apron and hang tools in side and never behind the back

M3-EN.5.3 What must be avoided using hand tools

- Do not use tools for tasks they are not designed for. For example do not use screwdrivers as chisels or levers, wedges, gads or wrenches as hammers
- Do not exercise too much power or pressure on hand tools
- Do not cut towards your side when using cutting tools
- Do not hold the shaft of a cutting tool or screwdriver with hand
- Do not wear large gloves for the use of hand tools

- Do not throw hand tools. They must be passed by hand, handle front directly to the employees
- Do not carry tools in a way that requires use of hands when someone climbs a ladder or executes a dangerous task. If work takes place on a ladder or platform, tools must move up and down in a bucket or hand-to-hand
- Do not carry sharp tools in pockets

M3-EN.5.4 Clamps

- Ensure that the swivel in the edge of the worm screw rotates freely before use. Replace clamps with a bent frame. If possible replace any bent worm screw too
- Ensure that the pressure surface and clamp's support parts are in full touch with the stock before screwing
- Use pads in C-clamps so as to avoid squeezing marks
- Unscrew clamps after work is completed. Clamps are for temporary works and for safe clamping only
- Keep all moving parts of the clamp slightly lubricated and tools clean to avoid sliding. Ensure there is no dirt in any part that comes in contact to the stock
- C-clamps to be stored hanged in shelves, not in drawers
- Do not use large clamps for their big neck only. There are small clamps with a big neck
- Never use clamps with a bent frame or worm screw
- Do not use wrenches, pipes, hammers or nippers to screw clamps. Use wrenches only in clamps specially designed for this use
- Do not lift or drag using a C-clamp. Use special clamps for these tasks. Do not use C-clamps for scaffolding

M3-EN.5.5 Cutters

- Cut straight and vertically and hold the material in proper angle with the tool
- Prevent injuries from dashing metal by wrapping a cloth around cutter's jaws. Swarfs can be dashed during cutting. The harder the metal the further they are dashed
- Warn everybody close for the risk of dashing swarfs
- Adjust and lubricate cutter and moving parts everyday for heavy use
- Do not use pads for tasks that require insulated handles. Pads are for comfortable not for electrical shock protection
- Do not use cracked, broken or loose (in jaws' screw) cutters
- Do not cut diagonally

- Do not twist cutters when cutting wires
- Do not hit with hammer or extend the length of the handle for better leverage
- Do not expose cutters to high temperature

M3-EN.5.6 Knives

- Fingers must not come in contact to the blade
- Workers must not move holding a knife
- Do not abstract worker's attention during execution of his/her work
- After work is completed the knife must be put back in the specified safe store
- There must be at least on person trained in first aid, especially when systematically works requiring use of knife are taking place. When this is not feasible due to limited personnel, at least someone must be trained in stopping bleeding
- Additionally, especially when knives are systematically used, all employees must know what to do in case of bleeding

M3-EN.5.7 Wood and metal saws

- Choose a saw of proper shape and size for the specific task
- Choose a saw that keeps wrist in normal position
- Choose a saw with handle opening of at least 12 cm (5 in.) in length and 6 cm (2.5 in.) in width with an angle of 15°
- Check the processed material for nails, knobs and other objects that could destroy the flexible saw
- Start cutting by placing hands behind cutting spot with the thumb upwards and pressure on the blade. Start cutting cautiously and slow to avoid up rush in the blade. Drag upwards until blade "bites". Start with partial cut and then bring the blade in the proper angle
- Clamp the processed part stable in its position
- Use a supporting part or a clamp to support any big processed part if required.
- Keep teeth and blade clean
- Protect saw's teeth when not used
- Secure blade with teeth forward. Keep blade straight and frame properly aligned
- Cut with strong and stable strikes to the opposite side of the user
- Use all the length of the blade in every strike
- Use light lubricant in the blade not to overheat and break
- Hard materials to be cut slower

M3-EN.5.8 Pipe wrenches

- Choose a pipe wrench with sufficient opening and length for each task
- Use wrenches for holding or screwing pipes but never for bent or lifting of a pipe
- Adjust the pipe wrench handle to keep a small gap between the backside of the jaw and the pipe. In this way, pressure is concentrated in the teeth of the jaws producing the top clamping force. It also helps lock in screwing
- Inspect periodically pipe wrenches for worn or unsafe parts and replace (e.g. check for worn thread in the ring and the moving jaw). Keep pipe wrench's teeth clean and sharp
- Twist pipe wrench before use so as pressure to be applied in heel jaw
- Pull rather than push pipe wrench's handle. Keep proper body position with legs close to keep balance
- Do not use pipe wrench as a hammer neither hit it with a hammer
- Do not use pipe wrenches in nuts and bolts

M3-EN.5.9 Wrenches, screwdrivers, hammers and sledges

- Replace wrenches that look worn
- Always have enough wrenches of the proper size
- Do not use pipes for extension
- Always choose a screwdriver with a proper handle to prevent sliding of hand
- Do not screw or unscrew holding parts with hand. They must always be stabilized in a stable surface
- Small parts that have to be screwed must be stabilized with a clamp
- Knives or other sharp objects must not be used to screw
- Choose the proper screwdriver head depending on the sort of screw
- Hammer's or sledge's metal be well fit on the shaft that must be in perfect condition (M3.05.01)
- Use a protective pad by rubber to protect hand

M3-EN.5.10 Powered hand tools

Risks from the use of electrical power tools mainly concern:

1. Electrical power
2. Moving parts, especially when used without safety systems
3. Use of tools with different parts from those prescribed by the producer
4. Dashing particles of material (swarf)

General advices for safe use of electrical power tools

- Keep all tools grounded
- Especially small portable tools must be grounded for more safety
- When using portable tools, use gloves and specific shoes that provide electrical shock protection
- In humid places prefer to use low voltage power
- Machines, cables and plugs must always be in good shape or else not to be used
- Avoid using them in places where there is suspicion or indication for highly flammable materials or gases because there is danger for fire or explosion
- Use no tool without its safety systems
- Use only parts and materials prescribed by the producer
- Always use personal protection equipment