

# SAFETY AND HYGIENE REGULATIONS



Servei de Prevenció de Riscos Laborals  
UNIVERSITAT POLITÈCNICA DE CATALUNYA

## GRINDING MACHINES

CODE

**SHR 207**

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### DESCRIPTION OF A GRINDING MACHINE

A grinding machine is a tool used to perform operations of manual sharpening and surface finishing, when the workpieces are not too heavy.

The machine is fitted with an abrasive grinding wheel holding large abrasants made of a hard material. Generally, the roughness of the two grinding wheels is different. The smoother of the two is used for finishing.

The mechanical movement is produced by an electric motor that makes an axis turn. The grinding wheels are attached to the axis and turn with it. The safety of the machine depends to a large extent on whether it is in good condition and handled and assembled correctly.



### GENERAL RECOMMENDATIONS

- Grinding machines have protective casings over the wheels to stop projections of material in the case of breakage; a transparent, non-removable screen so that the work can be seen and the eyes are protected from small particles of the grinder or bits of metal from the workpiece; and a stand for tools.
- When necessary, grinding machines should have an extraction system to remove the particles produced in some grinding tasks.
- **The chips** produced during machining **must never be removed by hand**.
- To work with a grinding machine, you should wear **well-fitting clothing** with no tears or parts hanging down. Sleeves must be tightly fitting at the wrists, or rolled up inwards. When you work with grinding machines that have moving parts, as a protective measure, do not wear rings, watches, bracelets, etc. If you have long hair, you should tie it back under a cap or similar item.
- Keep your **hands as far as possible** from **the turning grinding wheels**.
- All of the operations of **cleaning, maintenance, inspection, etc.** (e.g. removing chips and checking measurements) must be carried out when the machine is switched off.
- Avoid starting up the machine accidentally.
- Never use the machine for purposes other than that for which it was designed.

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### HANDLING AND ASSEMBLY

Grinding wheels must be handled and assembled with great care, according to the following guidelines:

1. Store grinding wheels in places where they are not exposed to extreme temperatures and always keep them dry.
2. Protect grinding wheels on shelves so that they can be selected and picked up without damaging them or touching the others. Handle them carefully so that they do not fall or knock into each other.
3. Always use grinding wheels and other parts that are in good condition and have the right characteristics for the machine and the requirements of the work to be undertaken, taking into account the maximum and minimum diameters that are acceptable for the axis of the machine, the maximum working speed, the grain size, the hardness (wheel grade), binder, shape, etc.
4. Never exceed the maximum working speed acceptable for the grinding wheel, which must be clearly indicated on its label.
5. Ask the supplier for information about the grinding wheel if it is not labelled with the obligatory indications (grain size, wheel grade, maximum speed, maximum and minimum diameter, etc.).
6. Before the grinding wheel is fitted to the machine, examine it to check that it has not been damaged in transport or handling. If it is hit lightly with a non-metallic object, it should produce a clear sound. If the sound is dull or muffled, it may mean that the wheel is cracked.
7. Grinding wheels must be easy to put onto the axis of the machine. They should not have to be forced or fit too loosely.
8. All surfaces of the grinding wheels, joints and clamping chucks that are in contact must be clean and free from any foreign bodies.
9. The core of the grinding wheel (socket, lead bushing, washer), should not jut out beyond the faces of the wheel.
10. It is dangerous to replace any part of the machine with another that is not recommended by the manufacturer.
11. When the nut is tightened at the end of the axis, it must only be made tight enough to hold the grinding wheel firmly. Too much tightening force could damage the grinding wheel and its accessories.
12. All new grinding wheels must turn at the working speed and with the protective casing in place for at least a minute before they are used for work. During this time, nobody should be in line with the opening in the protective casing.

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### PERSONAL PROTECTION EQUIPMENT (PPE) TO USE

#### EYE AND FACE PROTECTORS

- Workers must wear safety goggles or shields to protect against impacts caused by particles that could fly out.
- If, despite all precautions, a foreign body enters your eye, **DO NOT** rub it: this could cause an injury. Clean your eye with abundant water, cover with gauze attached with surgical tape, and go to the nearest health centre.

#### PROTECTIVE GLOVES

- Safety gloves should be used to protect against cuts and abrasion.
- During grinding, if your hands must be close to the grinder due to the type of workpiece, gloves should not be worn as they could get caught in the grinding wheels.

#### SAFETY FOOTWEAR

- Safety footwear must be used to protect feet from heavy workpieces falling on them. The footwear must have reinforced toecaps and rubber soles with good treads to avoid slipping.

#### RESPIRATORY PROTECTION EQUIPMENT: FACE MASK

- If the grinding operation generates many particles and the machinery does not have an extraction system, use a face mask with a solid particle filter (type P2, for example).



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### BEFORE GRINDING

Before the grinding machine is switched on to start the machining work, the following checks should be made:

1. The grinding wheel is well-fitted and secured.
2. There are no obstacles that get in the way of the grinding wheel and its rotating movement.
3. The protective casing of the grinding wheel is in the right place.
4. The protective covers and guards of the drive belts and other moving parts are in the right place and attached correctly.
5. The transparent screen to protect against projections and the stool stand are in the right position.
6. There are no parts or tools left on the machine that could fall or fly out.

### DURING GRINDING

1. Before the grinding wheel is applied to the point of work, it should be left to rotate for a while with the protective casing in place, and with the user out of the range of the grinding wheel.
2. All inspection and adjustment operations must be carried out when the machine is completely shut down.
3. When you have to move away from the machine, you must switch it off and disconnect the cable.
4. Never use your hands as a brake to stop the machine.
5. Too much pressure could cause breakage and hazardous projections. If the grinding wheel appears to "burn" the piece, it is a sign that too much pressure is being applied.
6. It is very dangerous to grind a workpiece using the lateral sides of a flat grinding wheel. For this kind of grinding, cup wheels should be used.
7. It is very dangerous for coolant to fall on a non-rotating grinding wheel, as the liquid could be absorbed by the wheel and lead to it becoming unbalanced. This could cause the grinding wheel to break when it starts to turn. If in doubt, change the grinding wheel.

### MAINTENANCE, ORDER AND CLEANING

1. Grinding machine tools must be kept in good condition, clean and well-lubricated.
2. Likewise, care must be taken to keep the tools, grinders, implements and accessories clean, well-maintained and in good order. Each item must have a place and be kept in it.
3. The work area and the area around the drill press must be kept clean and free from obstacles. Any oil spills must be cleaned up with absorbent mats, which should then be deposited in a metal recipient with a lid. Objects that have fallen or are scattered on the floor could cause people to trip or slip and put them at risk. Therefore, all objects that fall on the floor must be picked up before this can happen.
4. Both raw and machined workpieces must be stacked safely and in an orderly way, and suitable containers should be used if the pieces are small. An entry and exit corridor to the grinding machine must be left free. No materials should be stacked up behind the operator.
5. During work, tools, gauges, oilcans, brushes, etc. must be placed within easy reach, without having to get your body close to the machine.
6. Tools must be kept in a suitable cupboard or place. No tools or objects should be left loose on the machine.
7. If an extraction system is used, dust tends to accumulate in its ducts, which can block them and reduce the capacity of the system. Periodically, the ducts should be inspected and cleaned.
8. Cloths or cotton that are impregnated with oil or grease, which could easily catch fire, must be deposited in suitable containers.
9. Electrical faults in the grinding machine can only be inspected and repaired by specialist staff. Whenever a fault of this type is detected, however small, the machine must be disconnected and an **"OUT OF ORDER"** sign hung on it. The electrician must then be notified.