

# Portable Electric Tools

## Types

Portable electric tools commonly used in industry are: drills, saws, sanders, buffers, grinders, impact wrenches, planers, etc.

## Hazards

The hazards associated with portable electric tools include:

- electric shock, electrocution, burns;
- heat, sparks (fire);
- cuts, abrasions, punctures;
- dust/flying particles (eyes);
- entrapment of clothing, etc.;
- sprains and strains (wrist, hand, arm, shoulder);
- noise (hearing);
- vibration (“white fingers”).

## Safe Use Of Tools

Some of the hazards associated with these tools can be controlled through their proper use and care.

Establish safe practices and rules for the use of portable electric tools. Train employees in these and make sure they are followed.

See page 3 for some “Do’s” and “Don’ts” that should be observed when using portable electric tools.

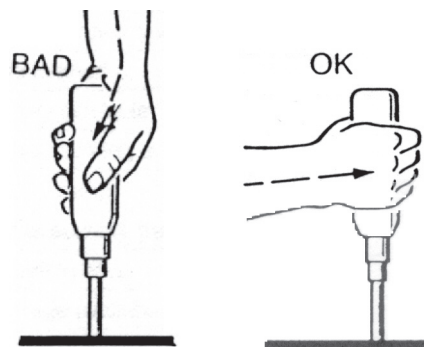
## Ergonomic Considerations

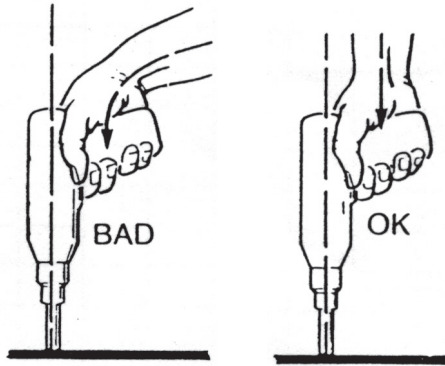
Ensure that workers do not have to bend their wrists when using tools, by:

- purchasing tools that have handles designed to keep the wrist straight, and
- designing workstations that allow workers to operate the tool properly.

The handle of a tool should:

- have grips that allow the hand to wrap around the handle easily;
- be long enough so all fingers can grip the handle;
- be rounded to prevent any pressure points;
- have triggers large enough for gripping with 2-3 fingers;
- have no grooves.





Provide lightweight tools that can be easily supported by one hand, or provide tools with two handles to permit better handling.

If the tool weighs more than 0.5 kg (1 lb), support it with a counter balanced harness.

Provide tools with handles covered with cork, rubber or plastic to reduce vibration transmitted to the hand.

Instruct workers to:

- hold the tool so that its centre of gravity is located close to the body;
- minimize kickback from the tool;
- rest their hands by laying the tool down or inserting it in a holster when it is not being used.

## Training

Ontario's *Occupational Health and Safety Act* requires that every precaution be taken to ensure the safety of workers (s.25). Where portable electric tools are concerned, there are pitfalls for the inexperienced and the uninformed. Because accidents involving electrical tools can result in fatalities, electrical hazards should be emphasized during training.

Using a tool in a flammable atmosphere can cause an explosion and is perhaps the second most dangerous hazard.

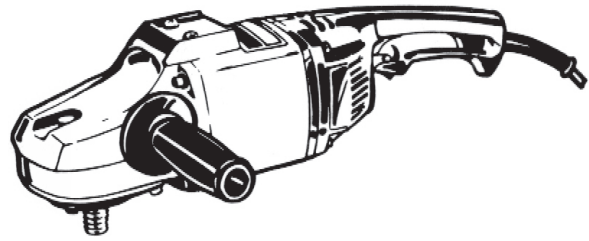
To help avoid serious injury, include the following in any training program.

- What to use the tool for and how to hold and operate it
- Hazards of improper use
- Manufacturer's directions
- Protective equipment to be used
- Operating problems that could happen (i.e., binding, seizing, breakage)
- Pre-use checks to be carried out
- How to evaluate possible environmental hazards (i.e., flammability of substances, lighting, water)
- Use of attachments – proper selection (size, speed) and installation
- Inspection procedures
- Health effects of noise and vibration and what is being done to control the noise and vibration produced by tools used in the workplace
- How to transport and store the tools

## Use Tools Safely

### Follow These Rules

- Always review the manufacturer's instructions before use.
- Know the hazards.
- Know the personal protective equipment needs.
- Inspect the tool before use.



DO	DON'T
<ul style="list-style-type: none"><li>☑ Check the nameplate to ensure that the power source is correct for the tool.</li><li>☑ Test tools before starting work.</li><li>☑ Make sure the tool is in safe condition – cleaned, repaired, oiled.</li><li>☑ Make sure the ground pin is in place and that there are no cuts in the cord.</li><li>☑ Test the ground connection on 3 wire system or check that tool is double insulated.</li><li>☑ Make sure switch is operating freely. Keep finger off switch when carrying a tool.</li><li>☑ Ensure that guards (e.g., on saws, etc.) are in place and that they are functioning properly.</li><li>☑ If brushes are sparking excessively, obtain a replacement tool.</li><li>☑ Wear suitable eye and foot protection.</li><li>☑ Avoid accidental starting.</li><li>☑ Remove adjusting keys/wrenches before turning tool on or plugging it in.</li><li>☑ Pull out power plug before adjusting or making changes, or when the tool is not in use.</li><li>☑ Always hold the tool firmly.</li><li>☑ Hoist tools up a ladder instead of carrying them.</li><li>☑ Store tool where it won't be damaged.</li></ul>	<ul style="list-style-type: none"><li>☒ Work where floor is wet or damp without extreme precautions.</li><li>☒ Carry tools up a ladder.</li><li>☒ Operate grinding wheels at speeds beyond their rating.</li><li>☒ Use the cord to pull out plugs or lift tools.</li><li>☒ Use tools where flammable gases or vapours may be present.</li><li>☒ Make improvised repairs.</li><li>☒ Work on makeshift platforms.</li><li>☒ Use tools with defective guards.</li><li>☒ Hang cord over sharp edges, through water, where they can be run over by vehicles or tripped over.</li><li>☒ Tape cords to repair them.</li><li>☒ Wear loose clothing or gloves.</li></ul>

## Maintenance

Review manufacturer's instructions before establishing maintenance procedures. A planned program of maintenance will include the following:

- Regular inspection, cleaning and oiling of tools
- Check of grounding protection or double installation
- Inspection of extension cords and plugs
- Check for damage to frame, motor or parts
- Motor inspection and parts replacement
- Verification of guards. Movable guards that operate freely (e.g., on saws, etc.) will be part of the check
- Checking with operators if any unusual situation is suspected
- Inspection of switches
- Test for short circuits
- After inspecting and reassembling the tool, test it for "ground" before releasing it
- Adjustments as recommended by manufacturers
- Re-sharpen blades, bits, etc., in accordance with manufacturer's instructions
- Check chucks, collets, etc.
- A final visual check
- Tag and record

THE INSPECTION REPORT ON THE NEXT PAGE MAY BE USED AS A BULLETIN ITEM

## Applicable Legislation

Regulation for Industrial Establishments made under the *Occupational Health and Safety Act*:

- s.40 Electrical Equipment Certification
- s.43 Tools type, near live conductors
- s.44 Grounding connection for electric tools
  - s.44.1 For tools used outdoors or in wet locations – Requirement for ground fault circuit interrupters
  - s.44.2 Investigation and removal of ground faults that pose a hazard
- s.139 Noise

## References

Canadian Standards Association (CSA) Standards:

- C22.2 No. 71.1-M89 (R 2004): Portable Electric Tools
- CAN/CSA-Z94.3-07: Eye and Face Protection
- CAN/CSA-Z195-02: Protective Footwear

## Inspection Report

The checklist below is a sample which you may modify in keeping with your own needs. Although primarily for a maintenance or department check, it may be useful for a pre-shift check as well.

Tool No:	Type:	Dates of Inspection									
Location:	Material:										
Date Purchased:	Length:										
<input checked="" type="checkbox"/> Acceptable	<input checked="" type="checkbox"/> Unacceptable										
Grounding/double insulation OK											
Plug and cord free from defects											
Switch operates freely											
Guard in good repair and operates correctly											
No wobble in shaft											
Adjusting key available											
Brushes not sparking excessively											
No burrs on casing											
Attachments suitable (re speed, size)											
Flexible shaft in good condition											
Proper storage available											
Tool shaft turns freely											
No grease, metallic dust on tool											
Ventilating slots are clean											
Certification:											
INITIALS OF PERSON MAKING INSPECTION											

**Notes:**

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Toll-free: 1-800-406-IAPA (4272)

Website: [www.iapa.ca](http://www.iapa.ca)