

All power tools can be dangerous if both general and tool specific safety instructions are not followed carefully. General safety instructions apply to all power tools, both corded and cordless.

## Start with a Safe Work Area



Keep your work area clean and well lit. Cluttered benches and dark areas invite accidents.



Do not operate power tools in explosive atmospheres, near flammable liquids, gases, or dust. Power tools create sparks, which may ignite the dust or fumes.

- Keep bystanders, children, and visitors away when using a power tool. Distractions can cause you to lose control.



## Electricity can be Dangerous

Grounded tools (three pronged cords) must be plugged into a properly grounded installed outlet. Never remove or cut off the grounding prong or modify the plug in any way. Do not use any adapter plugs.



Double Insulated tools have a polarized plug (one blade is wider than the other.) This plug will fit into an outlet only one way. Do not change the plug in any way.



Do not use AC only rated tools with a DC power supply.



Store battery packs away from other metal objects like paper clips, coins, keys, nails, screws, or other small metal objects. These things can make a connection from one terminal to the other, shorting the battery terminals together and causing burns or fire.



- When using a power tool, don't touch grounded surfaces such as pipes, radiators, ranges and refrigerators. There is a higher risk of electric shock if your body is grounded.

## GFCI

In damp locations, only plug your tool into a Ground Fault Circuit Interrupter (GFCI). If the work area does not have a permanent GFCI on the outlet, use a plug-in GFCI. Wear rubber gloves and footwear.



Don't use or leave power tools in the rain or wet conditions.



Do not abuse the cord, carry the tool by its cord, or pull the cord to unplug it. Keep the cord away from heat, oil, sharp edges or moving parts. Replace damaged cords immediately.



Always hold the tool by the insulated gripping surfaces. Contact with hidden wiring or its own cord will make exposed metal parts of the tool "live" and shock the operator.

## Rules about Extension Cords

- When using a power tool outside, use an extension cord marked for outdoor use with "W-A" or "W". These cords are made for outdoor use.
- Extension cords with 3-prong grounding plugs must be plugged into 3-prong outlets when using grounded tools.
- Replace damaged or worn cords immediately.

## Amps

The wire gauge and length of the extension cord must be able to handle the amps of the tool. Find the Amps (A) on the tool's nameplate and use the chart to determine the necessary wire gauge for your extension cord length.

Nameplate Amps	Extension Cord Gauge			
	Cord Length in Feet			
	25'	50'	100'	150'
0-6	18	16	16	14
6-10	18	16	14	12
10-12	16	16	14	12
12-16	14	12	Not Recommended	

## Good Personal Safety is a Must

Following good safety practices when using all power tools is a must. Make a habit of including safety in all of your activities.



Always read and understand the tool's operator's manual, tool markings and the instructions packaged with the accessory before starting any work.

- Stay alert, watch what you are doing and use common sense when using a power tool.



Do not use tools when you are tired or under the influence of drugs, alcohol, or medication.

- Dress right. Do not wear gloves, loose clothes or jewelry. Contain long hair. Loose clothes, gloves, jewelry, or long hair can be caught in moving parts.
- Keep handles dry, clean and free from oil and grease.
- Be sure the power tool's switch is OFF before plugging it in or inserting a battery pack. Do not carry tools with your finger on the switch.



Remove adjusting keys and wrenches before turning the tool ON.

- Always keep a firm footing when using power tools. Be sure you have balance and control before you start the job.



Use safety equipment. Always wear eye protection. A dust mask, non-skid safety shoes, hard hat, or hearing protection must be used when needed. The reference to “safety goggles” or “safety glasses” in product specific sections provides potential options - always refer to the tool’s operator’s manual for the specific eye protection recommended, which should be marked as complying with current national standards.

- Unplug tool/remove battery before changing accessories.



Keep hands away from rotating or moving parts.

### Do the Job Safely

- Use the power tool accessories only for the jobs for which they were designed.



Secure and support the workpiece. Use clamps and a stable work surface. Do not hold the work by hand or against your body.

- Keep guards in place and working properly.
- Do not force the tool. Use the right tool for your job. It will do the job better and safer.
- Use only accessories recommended by the tool manufacturer. Accessories that may be suitable for one tool may become hazardous when used on another tool.



Do not touch the drill bit, blade, cutter or the workpiece immediately after operation; they may be very hot and may burn you.

- If a method of dust collection is available with the power tool, it should be used to reduce the risk of dust-related hazards.

### Maintenance Keeps Tools Working Safely and Effectively

- Do not use a tool if the switch does not turn it on and off. It must be repaired.



Look at the tool before using it. Are moving parts misaligned or binding? Is anything broken? Damaged tools must be fixed before using them. Develop a maintenance schedule for your tool.

- Maintain accessories carefully. Keep blades and bits sharp and clean.
- Take your tool to be serviced by qualified repair people. Service or maintenance performed by unqualified personnel could result in a risk of injury. For example: internal wires may be misplaced or pinched, safety guard return springs may be improperly mounted.
- When servicing a tool, use only identical replacement parts. Follow instructions regarding maintenance in the tool’s operator’s manual. Use of unauthorized parts or failure to follow the maintenance instructions may create a risk of electric shock or injury.
- Clean and lubricate a tool only as directed in its operator’s manuals. Certain cleaning agents such as gasoline, carbon tetrachloride, ammonia, etc. may damage plastic parts.
- Maintain labels and nameplates. These carry important information. If unreadable or missing, contact the manufacturer for a replacement.

### When Done, Store the Tools out of Harm’s Way



To avoid accidental starting, unplug the cord, remove batteries or lock off the switch when the tool is not being used, when changing accessories, and when adjusting or cleaning tools.

- Keep tools out of the reach of children and people unfamiliar with the tools.

## Die Grinders

Die grinders perform a wide variety of jobs, typically in a confined space. Die grinders are a special version of end grinders to be used with mounted wheels or accessories 2" or less in diameter. Due to the small accessory diameters, die grinders are designed to work without a guard, therefore requiring a special attention while operating. You must have a thorough understanding of all procedures for each job you perform.

### Good Personal Safety is a Must

Following good safety practices when using a die grinder is a must. Make a habit of including safety in all your activities.



Always read and understand the tool's operator's manual, tool markings and the instructions packaged with the accessory before starting any work.



Always wear safety goggles or safety glasses with side shields complying with current national standards, and a full face shield when needed.



Use the appropriate mask or respirator in dusty work conditions.

Wear proper hearing protection, as needed.

- Dress right. Do not wear loose clothes or jewelry. Contain long hair. Loose clothes, jewelry, or long hair can be caught in moving parts.
- Crowded, cluttered work areas that can cause tripping or loss of balance are particularly dangerous.
- Never alter a guard or use the tool with a guard missing. Be sure all guards are in place and working properly before each use. Do not defeat guards.
- Do not operate the power tool near flammable materials. Sparks could ignite these materials.

### Choose the Right Tool and Accessory

Choosing the correct tool and the proper accessory for your application can help to reduce the risk of serious injury. When used according to the manufacturer's instructions, the proper tool and accessory will do the job safer and faster.

- Use the correct accessory for your tool. Check this carefully: Does it fit the spindle of the tool. Accessories with spindles that do not match the tool will wobble and vibrate and may cause loss of control.
- Some die grinders are designed to be used with wheel types that may require different guards. Follow the tool and accessory manufacturers' instructions for selecting guards and grinding wheels. Just because an accessory can be attached to a tool, does not mean it is safe to do so.

- Accessories must be used only for recommended jobs. For example: do not grind with the side of a cut-off wheel. It will shatter, causing a serious risk for injury.
- Be sure to properly secure all die grinder accessories that use a collet.
- Be careful not to over-tighten the spindle nut of the tool. Too much pressure will deform the flanges and stress the wheel.

### RPM

Make sure the speed marked on the accessory is at least as high as the no load RPM marked on the tool. The wrong accessory can shatter during use, possibly causing injury.

### Know your Workpiece

Take time to review your work piece and make sure that all necessary precautions have been taken before grinding.

- Use grinding wheels when working with hard materials – such as steel. Use rotary cutters for soft materials – such as aluminum, brass, copper and wood. If you use wheels on soft material, it will cause over loading, and could cause the wheel to shatter or disintegrate. Dangerous flying objects could result.



Always place the work piece securely in a vise or clamp securely. Never make freehand cuts. Holding the work piece by hand is unstable and may lead to loss of control.

- Support panels or any oversized workpiece to minimize the risk of wheel pinching and kick-back. Large workpieces tend to sag under their own weight. Supports must be placed under the workpiece near the line of cut and near the edge of the workpiece on both sides of the wheel.

### Before Grinding...

Before working with a die grinder, make sure the tool and its accessories are in proper working order. Failure to do so may increase your risk of injury.

- Be sure the switch is in the "off" position before plugging it in.
- Do not use a tool if the switch does not turn it off when returned to the "off" position after release.



Always unplug the grinder before making accessory installations.

- When installing a mounted grinding wheel, burr or cutter in the collet, keep distance between the back of the wheel and the front of the collet (overhang) at a maximum of ½ inch. This prevents spindle bending and wheel damage that could cause injury.
- Never use cracked or damaged accessories. Carefully check them before each use.
- Always check accessory for tightness on the tool before each use. A loose cutter or wheel can be thrown from the rotary grinder and can cause serious injury. If the grinder is dropped, inspect it for damage, such as a cracked accessory, broken collet, or bent mandrel. Repair or replace damaged parts to prevent further breakage and thrown objects.
- Never over-tighten a collet. It can damage the cutter or wheel.



Allow new wheels to run for a minimum of 1 minute to check for proper balancing.

- For maximum control, hold the grinder firmly with both hands.
- Always hold the accessory end of the tool away from you and co-workers to prevent possible injuries.
- Die grinders operate at high speeds. To avoid injury, be very careful not to contact the accessory end or be hit by thrown objects.
- If the die grinder vibrates during use, stop immediately and check for the grinding points. Dull grinding points could force the collet out of the tool. Replace or sharpen the grinding accessory.

## While Grinding...

- Too much pressure during use can bend or break the collet, mandrel, or accessory. If the grinder runs smoothly when not under load, but does not run smoothly under load, then too much pressure is being used.
- If the tool does not run smoothly when not under load, the accessory may be bent or out of balance. Replace the accessory.
- Never use a rotary die grinder with the cutter pointing toward you. If the grinder should slip, the accessory could cause injury.
- Never hold the workpiece by hand. Keep your hands and fingers away from the working area. Contact with the cutter or wheel will cause injury.
- When stopping a cut, switch off the tool and hold the tool motionless until the accessory comes to a complete stop. Never attempt to remove a wheel from the cut while the wheel is in motion to avoid accidental contact.

- Do not restart the cut in the work piece. Let the cutter or wheel reach full speed and then carefully re-enter the cut.

## When Done...



Unplug, clean and store the tool in a safe, dry place after use.



To avoid burns, wait before touching workpieces. Allow time to cool.

## Always Remember...

- Store tools and accessories with care. Do not drop them or subject them to excessive heat, cold or humidity.