

PURPOSE/APPLICATION

To provide guidance to workers on the safe use, operation, and maintenance of all grinders. All grinders and abrasive wheels must comply with manufacturer's recommendations and specifications.

PPE

- Canadian Plains Energy Services (CPES) minimum requirements, incl gloves
- Safety glasses and face shield
- Respiratory protection (as necessary)
- Hearing protection

TRAINING

- On the job instruction from a competent worker

HAZARDS Sources & CONCERNS

- Serious personal injury
- Property damage
- Flying debris
- Noise levels
- Rotating parts
- Electrical



GENERAL PRECAUTIONS

- Keep work area clean and free of combustible materials
- Always use hearing, eye and face protection (double eye protection)
- Conduct a pre-use inspection on all tools before using
- Set up barriers to contain sparks and protect workers in the area
- Position work so that sparks are directed at the ground and away from other workers

ANGLE GRINDERS:

THE DO's

- **DO** Examine wheels for cracks and chips before installing grinding wheels
- **DO** Use an extension cord designed for outdoor use when using a grinder outdoors
- **DO** Remove all strings from "hoodies" before using a grinder
- **DO** Use only grinders which will stop when the trigger is released
- **DO** Follow manufacturer's specifications for storage, installation and use of grinding disks and grinders
- **DO** Run a newly mounted grinding disk at operating speed to check for vibrations before starting to grind
- **DO** Verify that the grinder is unplugged before changing the wheel or guards
- **DO** Start the grinder before touching it to the work piece.
- **DO** Keep the grinder on a 20-30° angle from the workpiece
- **DO** Remove the grinder from the work piece before you release the trigger and allow the wheel to fully stop before you set the tool down
- **DO** support the work piece when cutting to prevent the piece cutting/pinching the wheel as you cut through it
- **DO** Release the trigger and wait for the wheel to stop before removing it from the cut; if the wheel binds then the cut must be stopped

- **DO** Check the operation of the wheel brush by running it away from the work piece to dislodge any loose wires
- **DO** Use gloves whenever you handle the brush as the wires can be sharp
- **DO** Follow manufacturer's requirements for the use of handles

THE DON'Ts

- **DON'T** Grind while wearing loose or frayed clothing
- **DON'T** Use grinding or cutting disks which have become wet. These should be discarded as this can weaken their integrity (unless they have been designed to withstand water)
- **DON'T** Grind with the side of a cutting wheel as this can cause the wheel to shatter
- **DON'T** put excessive pressure on wheels
- **DON'T** restart the wheel in the cut, bring the wheel up to speed before returning it to the cut

GUARDS

THE DO's

- **DO** Verify all grinders have a guard while being used
- **DO** Use a minimum 120° guard however a 180° provides additional coverage and is preferred.



120° minimum requirement

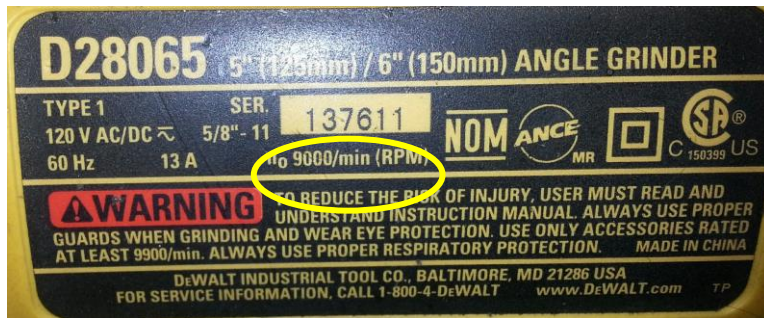


180° should be used whenever possible

- **DO** Use only wheels that fit within the guard
- **DO** Use guards with all types of wheels (including buffing)

ABRASIVE DISKS

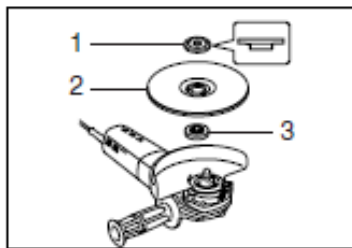
- **DO** Check that the RPM of the wheel is higher than the grinder being used



- **DO** Keep in mind grinding disks may be designed for grinding only or for grinding and cutting
- **DO** Check that you are using the proper style of hardware (nuts and plates) for the wheel; be sure that you follow the manufacturer's specifications for installation. If in doubt, ask your supervisor.

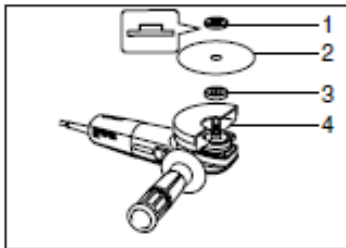
INSTALLING ABRASIVE DISKS

Grinding Disks



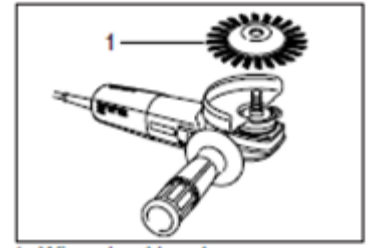
1. Lock nut
2. Depressed center grinding wheel/
Multi-disc
3. Inner flange

Cutting Disks



1. Lock nut
2. Abrasive cut-off wheel
3. Inner flange
4. Wheel guard for cut-off wheel

Buffing Wheels



1. Wire wheel brush

- Mount the inner flange first, then the wheel, screw the lock nut onto the spindle and tighten with the lock nut wrench
- Mount the inner flange first, then the wheel, screw the lock nut onto the spindle and tighten with the lock nut wrench
- Wire buffing wheels thread directly onto the spindle

CUT-OFF DISKS, aka ZIP DISKS

Note that use of zip disks is considered high risk to workers, because they have produced serious and fatal injuries to workers in industry. The use of zip disks should be restricted at all CPES shops and field work sites and should only be used when there is not a better alternative method of cutting. Before using a zip disk, observe the following:

- **DO** Consider if another tool or method is available to perform the task, e.g. using a cutting torch
- **DO** Ensure that workers using zip disks have had a competency assessment completed on them by a supervisor and have been deemed competent to use zip disks
- **DO** Check that the RPM of the disk is higher than the grinder being used
- **DO** Use the appropriate guard and handle as specified by the manufacturer
- **DO** Destroy and discard any zip disk that has become unsafe to use, i.e. cracked, frayed to prevent use by another worker
- **DO** Use only for light-duty tasks, not for cutting wide-flange steel, etc.

- **DON'T** Use grinding or cutting disks which have become wet. These should be discarded as this can weaken their integrity (unless they have been designed to withstand water)
- **DON'T** Grind with the side of a cutting wheel as this can cause the wheel to shatter
- **DON'T** Put excessive pressure on wheels
- **DON'T** restart the wheel in the cut; bring the wheel up to speed before returning it to the cut

AVOIDING GRINDER "KICKBACK"

A major hazard with the use of angle grinders is kickback. Kickback occurs when the wheel is pinched or snagged causing the tool to kick in the direction opposite to the wheel's rotation. Disks may also shatter when pinched or where side pressure is applied.

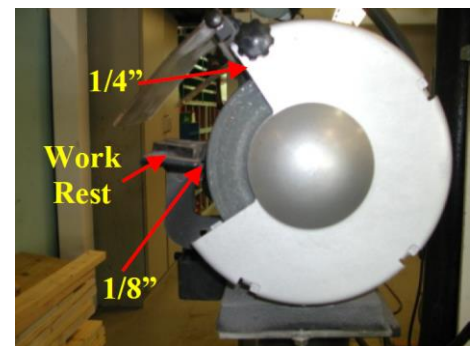
THE DO's

- **DO** Maintain a firm grip on the grinder
- **DO** Use the auxiliary handle and set up so that you can use your arms to absorb the force of the kickback
- **DO** Position your face out of the line of fire, this is especially important when cutting as the tool will kick in the opposite direction of the disk

BENCH OR PEDESTAL GRINDERS

THE DO's

- **DO** Permanently mount bench and pedestal grinders to a heavy base
- **DO** Check that the minimum RPM rating of each abrasive wheel is higher than the RPM rating on the grinder motor
- **DO** Keep the work rest adjusted to within at least 1/8 inch of the wheel
- **DO** Adjust the tongue on the topside of the grinder to keep it within 1/4 inch of the wheel. The side guards should cover the spindle, nut and flange and seventy-five percent (75%) of the wheel diameter
- **DO** Stand to one side and let the wheel run for a full minute after installing a new wheel
- **DO** Stand to one side of the grinder until the wheel reaches operating speed each time the grinder is used
- **DO** Bring work into contact with the grinding wheel slowly and smoothly
- **DO** Check that electrically operated grinders are effectively grounded
- **DO** Apply gradual pressure to the wheel and use only the pressure required to complete a job
- **DO** Move the work back and forth across the face of the wheel to prevent grooves from forming
- **DO** Unplug or lockout the grinder before changing wheels or performing any maintenance



THE DON'Ts

- **DON'T** Use a wheel that has been damaged in any way
- **DON'T** Wear loose clothing or jewelry which may become caught in the machine when operating
- **DON'T** Grind wood, plastics and non-iron metals on ordinary wheels
- **DON'T** Grind on the side of the wheel unless it has been designed for that purpose
- **DON'T** Override the grounding mechanism by using non-three prong plug adapters
- **DON'T** Apply excessive force onto the material being ground, let the machine do the work
- **DON'T** Use a grinder with a trigger lock

REFERENCES / ADDITIONAL INFORMATION

1. Central Machinery Bench Grinder – Instruction manual
2. Baldor Bench Grinder – Instruction Manual
3. Makita Angle Grinder - Instruction Manual
4. Dewalt Angle Grinder – Instruction Manual

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