Grinding Wheel Safety – Know the Laws of Your Province

Measures you must take to ensure the safe operation of grinding wheel machines.

Grinding wheels, whether fixed or portable, can be extremely dangerous. That's why all provinces and territories require employers to take measures to ensure safety and prevent injuries. While the rules follow the same approach, there are basic differences by jurisdiction. For instance, while Newfoundland dedicates a single sentence to grinding wheel safety, Quebec, Yukon and B.C. lay out fairly technical and elaborate requirements. Most jurisdictions fall somewhere in between these extremes. Here's a summary of the requirements in each part of Canada.

OHS Grinding Wheel Requirements

FEDERAL

(a) Abrasive wheels must be equipped with machine guards mounted between flanges that meet, and be operated in accordance with CSA B173.5-1979; and (b) Bench grinders must be equipped with a work rest or other device that: (i) prevents the work piece from jamming between the abrasive wheel and wheel guard, and (ii) doesn't make contact with the abrasive wheel at any time (COHS Regs., Secs. 13.18 and 13.19)

ALBERTA

Employer must ensure that: (a) A grinder is operated in accordance with manufacturer's specifications and equipped with a grinder guard; (b) The maximum safe operating speed of the grinder accessory in revolutions per minute is equal to or greater than the maximum speed of the grinder shaft in revolutions per minute; (c) If a hand held grinder is used, the object being ground can't move; (d) The guard of a hand held grinder covers the area of the grinder accessory contained within an arc of at least 120′ of the accessory's circumference; and (e) If a tool rest is installed on a fixed grinder, the manufacturer's specifications are followed (if they exist), or the tool rest is: (i) installed in a manner compatible with the work process, (ii) securely attached to the grinder, (iii) set at or within 3 mm of the face of the wheel, and (iv) set at or above the wheel's centre line (OHS Code, Sec. 375)

Worker must not: (a) Grind material using the side of an abrasive wheel unless the wheel has been designed for that purpose; or (b) Adjust a tool rest while a grinder accessory is in motion (OHS Code, Sec. 375)

BRITISH COLUMBIA

Equipment Standards: (a) Abrasive wheel must be guarded, used and maintained in accordance with ANSI B7.1-1988 (OHS Reg., Sec. 12.44); (b) Abrasive wheel must have a protective hood to contain fragments of the wheel should it break apart while turning, EXCEPT for (i) an abrasive wheel used for internal work, (ii) a mounted wheel of any shape or type which is 50 mm (2 in) or less in diameter, (iii) a threaded-hole, cone or plug type of wheel if the nature of the work provides protection, or (iv) a portable grinder when it’s used for grinding root passes in welded pipe, provided it has a protective hood covering at least 120ø of the wheel periphery and the operator wears adequate eye and face protection (OHS Reg., Sec. 12.45); and (c) Grinding machine for hand-held work must have an adjustable work rest with its upper edge at or above the centre line of the abrasive wheel and within 3 mm (1/8 in) of the cutting surface (OHS Reg., Sec. 12.48)

Speed: (a) The allowable arbor or shaft speed of abrasive equipment must be clearly marked on the equipment; and (b) a pneumatic grinder must have a governor that limits maximum shaft speed to speed specified by the tool manufacturer, and the maximum rated speed must be marked on the equipment (OHS Reg., Sec. 12.46)

Use: (a) The side of an abrasive wheel must not be used for grinding and non-ferrous materials must not be ground unless the wheel is designed for such use (OHS Reg., Sec. 12.47); and (b) Hazardous dust from a grinding or buffing operation must be controlled (OHS Reg., Sec. 12.49)

MANITOBA

Employer must ensure that: (a) An abrasive wheel is equipped with a safeguard and not operated in excess of the maximum speed specified by the wheel’s manufacturer; (b) The maximum speed of each grinder shaft in revolutions per minute is permanently marked on the grinder; (c) The mounting flanges for an abrasive wheel have an equal and correct diameter for the wheel; (d) A tool rest installed on a fixed grinder is: (i) installed in a manner that’s compatible with the work process, (ii) securely attached to the grinder, and (iii) set not more than 3 mm from the face of the wheel or below the wheel’s horizontal centre line; and (e) A worker doesn’t use the sides of an abrasive wheel for grinding unless the abrasive wheel is designed for that use (WSH Reg., Sec. 16.22)

NEW BRUNSWICK

Employer must ensure that: (a) The maximum number of revolutions per minute of an abrasive wheel, as recommended for safe use in the manufacturer’s specifications, is identified on the wheel; (b) The maximum number of revolutions per minute of a grinder output shaft is identified on the grinder; (c) An abrasive wheel is: (i) checked for flaws before installation, (ii) fitted with a protective hood of sufficient strength to contain fragments of ruptured wheels, and (iii) mounted in accordance with the manufacturer’s specifications;

and (d) A tool rest is mounted on a bench grinder as close as is safely possible to the abrasive wheel. (OHS Gen. Reg., Sec. 244)

Employee: (a) MAY NOT: (i) operate an abrasive wheel above the speed set out in the manufacturer's specifications, (ii) grind on the side of an abrasive wheel unless the wheel's been designed for that purpose, or (iii) adjust a tool rest while the abrasive wheel is in motion; and (b) MUST: Run the abrasive wheel at full operating speed in accordance with the manufacturer's specifications before applying any work to the wheel (OHS Gen. Reg., Sec. 244)

NEWFOUNDLAND

An abrasive wheel must be guarded, used and maintained in accordance with ANSI B7.1-1988 (OHS Regs., Sec. 104)

NOVA SCOTIA

(a) Employer must legibly post the maximum number of revolutions per minute of an abrasive wheel and grinder; (b) Nobody may operate a grinder with an abrasive wheel unless the grinder is rated to provide a number of revolutions per minute equal to or less than the rating of the abrasive wheel; (c) Employer must ensure a competent person inspects an abrasive wheel for flaws, defects or cracks before it's installed; (d) Employer must ensure that a bench grinder is fitted with a protective hood and side shield of sufficient strength to contain fragments of a ruptured wheel; (e) If a bench or pedestal grinder is used, employer must ensure that: (i) a tool rest is mounted on the grinder no more than 3 mm from the abrasive wheel, and (ii) the grinder is secured to prevent unintended movement; (f) If a pneumatic grinder is used, employer must ensure that the governors are maintained by a competent person; and (g) Unless the manufacturer's specifications specify otherwise, employer must ensure that nobody: (i) grinds on the side of an abrasive wheel, or (ii) adjusts a tool rest while the abrasive wheel is in motion (Occ. Safety Gen. Regs., Secs. 97 to 100)

ONTARIO

A grinding wheel must be: (a) Marked with its maximum speed of use; (b) Checked for defects before mounting; (c) Mounted in accordance with the manufacturer's specifications; (d) Operated at a speed that doesn't exceed the manufacturer's recommendations; (e) Provided with protective hoods that enclose the wheel as closely as the work allows; (f) Operated only by workers with proper eye protection; and (g) Stored where it won't be subjected to extreme heat or cold, or damage from impact (Indust. Ests. Regs., Sec. 29)

A work rest for a grinding wheel must: (a) Have a maximum clearance of 3 mm from the grinding wheel; (b) Be in a position above the centre line of the grinding wheel; and (c) Not be adjusted while the grinding wheel's in motion (Indust. Ests. Regs., Sec. 30)

PRINCE EDWARD ISLAND

(a) Employer must ensure that: (i) the maximum number of revolutions per minute of an abrasive wheel or disc, as recommended for safe use in the manufacturer's specifications, is identified on the wheel or disc, and (ii) the maximum

revolutions per minute of a grinder output shaft is identified on the grinder; (b) Employer and worker must ensure that a tool rest is installed on a fixed grinder in a manner compatible with the work process; (c) Workers may not: (i) operate abrasive and grinding wheels at a speed in excess of that specified by the manufacturer, (ii) grind on the side of an abrasive wheel unless it's been designed for that purpose, or (iii) adjust a tool rest while the grinder's in motion; (d) Employer must ensure that abrasive and grinding wheels are fitted with protective hoods of sufficient strength to contain fragments or ruptured wheels; (e) Employer must ensure that abrasive or grinding wheels are checked for flaws before installation; (f) Employer must ensure that abrasive wheels are mounted in accordance with manufacturer's specifications; and (g) Worker must run abrasive and grinding wheels at full operating speed in accordance with the manufacturer's specifications before applying any work to it (OHSA Gen. Regs., Sec. 30.11)

QU□BEC

(a) Grinding machines must have a guard compatible with the work and offering the most efficient protection, EXCEPT for grinders equipped with a 50 mm diameter grindstone or more; (b) Grinders and flat grinding wheel that are non-permanently mounted on their spindle must be mounted between 2 plates whose diameter is at least 1/3 the nominal diameter of the grinding wheel by inserting a buffer of blotter paper between the wheel and the plates; (c) Grinders and grinding wheels must be stored: (i) in compliance with manufacturer's recommendations, (ii) in chests or drawers specially designed for such purpose, and (iii) in dry areas, protected from sudden temperature changes; (d) The following precautions must be taken before installing a grinder or grinding wheel: (i) the grinding wheel must be checked to ensure it's not cracked, split, chipped or unbalanced, (ii) the speed of use must not exceed the manufacturer's rated rotational speed; (e) Grinders must be equipped with: (i) a grinder casing and, if applicable, a wire brush casing, (ii) an adjustable spark shield, (ii) an adjustable workpiece support or chuck, and (iv) a transparent screen; (f) The grinding wheel housing must be built to withstand impacts and the projection of fragments if the wheel ruptures; (g) The spark shield must be designed to prevent sparks and grinding wheel fragments from being projected outside the housing; (h) The gap between the spark shield and the grinding wheel must be adjusted as the wheel wears down and can never exceed 5 mm with a 1 mm margin of error; (i) The gap between a workpiece holder or adjustable chuck and the grinding wheel must be adjusted as the grinding wheel wears down so that the gap doesn't exceed 3 mm; (j) The transparent screen must prevent particles from being projected into the operator's face and eyes and be made of a shock-resistant transparent material (OHS Reg., Secs. 197 to 206)

SASKATCHEWAN

Employer or contractor must ensure that: (a) No abrasive wheel is operated: (i) unless it's equipped with blotters installed according to the manufacturer's recommendations and a safeguard, or (ii) at a speed above the manufacturer's recommendations; (b) The maximum speed of each grinder shaft in revolutions per minute is permanently marked on the grinder; (c) The mounting flanges for an abrasive wheel have an equal and correct diameter for the wheel; (d) If a tool rest is installed on a fixed grinder, the tool rest is: (i) installed in a manner that's compatible with the work process, (ii) securely attached to the

grinder, and (iii) set not more than 3 mm from the face of the wheel or below the horizontal centre line of the wheel; (e) No worker uses the sides of an abrasive wheel for grinding unless the abrasive wheel is designed for that use; and (f) A worker who operates a grinder: (i) is provided with and uses appropriate PPE, including an industrial eye or face protector and hand or arm protection, and (ii) is instructed in the grinder's potential hazards and safe use (OHS Regs., Sec. 10-12)

NORTHWEST TERRITORIES & NUNAVUT

Employer must ensure that: (a) No abrasive wheel is operated: (i) unless it's equipped with blotters installed according to the manufacturer's recommendations and a safeguard, or (ii) at a speed above the manufacturer's recommendations; (b) The maximum speed of each grinder shaft in revolutions per minute is permanently marked on the grinder; (c) The mounting flanges for an abrasive wheel have an equal and correct diameter for the wheel; (d) If a tool rest is installed on a fixed grinder, the tool rest is: (i) installed in a manner that's compatible with the work process, (ii) securely attached to the grinder, and (iii) set not more than 3 mm from the face of the wheel or below the horizontal centre line of the wheel; (e) No worker uses the sides of an abrasive wheel for grinding unless the abrasive wheel is designed for that use; and (f) A worker who operates a grinder: (i) is provided with and uses appropriate PPE, including an industrial eye or face protector and hand or arm protection, and (ii) is instructed in the grinder's potential hazards and safe use (OHS Regs., Sec. 153)

YUKON

An abrasive wheel or grinding wheel must: (a) Be installed, guarded, maintained and operated in accordance with the manufacturer's recommendations; (b) Meet ANSI B7.1-2000, or other similar standard acceptable to the director; (c) Have a protective guard capable of containing any fragments that may break loose from the wheel, UNLESS the wheel is: (i) used for work inside the object being grounded, (ii) a mounted wheel of 0.050 m (2 in.) or less in diameter, (iii) a cone or plug type wheel and the nature of the work provides the required protection, or (iv) on a portable grinder with a protective hood covering at least 120′ of the circumference of the wheel, when grinding root passes in welded pipe and the operator wears adequate eye and face protective equipment; (d) Be marked with the maximum speed recommended by the manufacturer and never operated above that speed; (e) Be operated only by workers wearing appropriate eye and face protection; (f) If it's a pneumatic grinder, be governed by an automatic speed control governor, which doesn't allow the wheel speed to exceed the recommended limit; and (g) Have a hood or ventilation system to control dust exposure to workers (OHS Regs., Sec. 7.10)

A work rest used on a grinding wheel must: (a) Have a maximum clearance of 0.003 m (1/8 in.) from the grinding wheel; (b) Not be installed below the centre line of the wheel; and (c) Not be adjusted by a worker while the wheel's in motion (OHS Regs., Sec. 7.11)