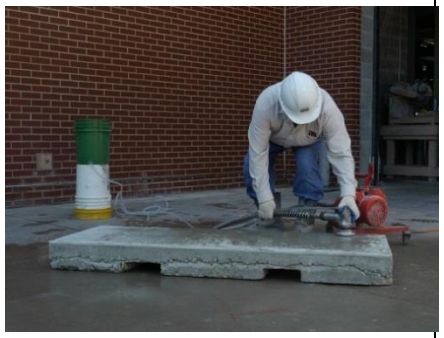
Table 1 – Equipment Names and Best Practice Tips – Update September 2018

- Includes equipment terms commonly used by different trades and in different geographic areas.
- 'Best practice' tips are intended to help employers and their employees operate the equipment-control options effectively and are based on 1) OSHA's Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction; 2) OSHA's Frequently Asked Questions ("FAQs") for the Construction Industry; 3) silica standard's Table 1; 4) manufacturer specifications; and 5) craft worker/contractor input based on experience in the field.

Equipment/ Control	Photos & Video	Engineering, Work Practice Control Methods & Required Respiratory Protection	Best Practice Tips
(xii) Handheld grinders for uses other than mortar removal Other names: Surface Grinder Sander Polisher	 (vacuum)  (water) *Photos courtesy of the International Masonry Institute & OSHA*  *Video courtesy of OSHA (https://www.youtube.com/watch?v=q2u7u2nsTeA)* English & Spanish subtitle options included.	**CONTROL: water** For tasks performed outdoor only: • Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. **Required Respiratory Protection:** Outdoors • ≤4 hours/shift: NONE • >4 hours/shift: NONE OR CONTROL: ventilation (local exhaust ventilation or LEV) + respirators[3] (see next page)	OSHA[1] requires, for **water controls**, that the employer ensure that: • An integrated water system is provided that continuously feeds water to the grinding surface • An adequate supply of water for dust suppression is used • The spray nozzle is working properly and produces a pattern that applies water at the point of dust generation • The spray nozzle is not clogged or damaged • All hoses and connections are intact Other tips: • Visually inspect the water attachment to ensure it is properly connected to the water source and the tool, and for missing or damaged parts • Check the hose and water flow rate regularly to ensure it is sufficient to control the dust generated so that no visible dust[2] is emitted from the process once the grinder is flush with the cutting/work surface • Prevent wet slurry from accumulating and drying • Use the smallest wheel and least aggressive tool necessary to complete task • Use a static pressure gauge, where available, to monitor performance

Equipment/ Control	Photos & Video	Engineering, Work Practice Control Methods & Required Respiratory Protection	Best Practice Tips
xii) Handheld grinders for uses other than mortar removal Other names: Surface Grinder Sander Polisher	 (vacuum)  (water) *Photos courtesy of the International Masonry Institute & OSHA*  *Video courtesy of OSHA (https://www.youtube.com/watch?v=q2u7u2nsTeA)* English & Spanish subtitle options included.	**CONTROL: ventilation (local exhaust ventilation or LEV) + respirators[3]** • Use grinder equipped with commercially available shroud and dust collection system. • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions. • Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism. **Required Respiratory Protection:** Outdoors • ≤4 hours/shift: NONE • >4 hours/shift: NONE Indoors or in an enclosed area: • ≤4 hours/shift: NONE • >4 hours/shift: APF 10 OR CONTROL: water (see previous page)	OSHA[1] requires, for **dust collection controls**, that the employer ensure that: • The system provides at least 25 CFM of air flow per inch of wheel diameter, a filter with 99% efficiency or greater, and either a cyclonic pre-separator or a filter-cleaning mechanism • The shroud or cowling is intact and is installed in accordance with the manufacturer's instructions • The hose connecting the tool to the vacuum is intact and without kinks or tight bends • The filter(s) on the vacuum are cleaned or changed in accordance with the manufacturer's instructions • The dust collection bags are emptied to avoid overfilling • Additional exhaust is provided as needed to minimize the accumulation of visible airborne dust when operating indoors or in an enclosed space • Additional means of exhaust could include: portable fans (e.g. box fans, floor fans, axial fans, oscillating fans), portable ventilation systems, or other systems that increase air movement and assist in the removal and dispersion of airborne dust[4] • "Indoors or in enclosed areas" refer to any areas where, without the assistance of forced ventilation, the dispersal of airborne dust can be impeded and concentrations can build up. Parking garages, pits, trenches, empty swimming pools, open-top structures with 3 walls, or other structures with limited air movement could be considered enclosed[4] • Employers may rely on statements made by the manufacturer of equipment to determine dust collection systems function at the air flow level required. However, employers must properly select, use, maintain, and replace dust collection systems in order to ensure they function as designed[4] Tips for this tool continued on next page.

			Other tips: • Use the smallest wheel and least aggressive tool necessary to complete task • Visually inspect the grinder, shroud (cowl or hood) and dust collection system to ensure they are properly connected, and for missing or damaged parts • Check the grinder and dust collection system regularly to ensure the system is operating so that no visible dust[2] is emitted from the process once the grinder is flush with the work surface/substrate • If applicable, regularly check the automatic filter cleaning system to ensure it is operating properly to maintain maximum air flow and suction power and can be used in conjunction with the HEPA filter • Use a static pressure gauge, where available, to monitor performance

[1]Best practice requirements from OSHA's Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction

[2]Although many of the entries on Table 1 require employers to"[o]perate and maintain" tools "in accordance with manufacturer's instructions to minimize dust emissions," 29 C.F.R. § 1926.1153(c)(1)(i)-(vii), (x)-(xiii), (xvi), or to "[o]perate and maintain machine[s] to minimize dust emissions," 29 C.F.R. § 1926.1153(c)(1)(xiv)-(xv), the standard does not separately require employers to minimize dust emissions. An employer generating a limited amount of dust when engaging in a task listed on Table 1 would not be in violation of the standard if it is fully and properly implementing the engineering controls, work practices, and respiratory protection specified on the Table (including operating and maintaining controls so as to minimize emissions). A small amount of dust can be expected even with new equipment that is operating as intended by the manufacturer. However, a noticeable increase in dust emissions may indicate that the dust control system is not operating properly. See OSHA's Q&A's #15 at https://www.osha.gov/dsg/topics/silicacrystalline/construction_info_silica.html.

[3]Respirator use is conditional on time spent using equipment (less than or equal to 4 hours/shift or greater than 4 hours/shift) and if task is done outdoors, indoors or in an enclosed area. See Table 1 in the standard for specific requirements including the assigned protection factor (respiratory protection). The employer does not have the track the exact amount of time that employees are performing a job throughout a shift to be in compliance with Table 1. Before the task is performed, the employer must make a good-faith judgement about whether the task will take more than 4 hours based on previous experience and other available information. At the beginning of the task, the employer must provide the employee the respiratory protection required for the anticipated time the employee will be engaged in the task. However, if unforeseen difficulties or other circumstances are expected to extend the task duration beyond 4 hours, the employer must provide the appropriate respiratory protection as soon as it becomes evident. (In that situation, the 4-hour mark is still measured from the beginning of the task, not from the time the expected duration of the task changes.) See OSHA's Q&A's #14 at https://www.osha.gov/dsg/topics/silicacrystalline/construction_info_silica.html.

[4]In August 2018, OSHA released new Q&A's. These additions are based on information included in the responses. Q&A #11 addresses manufacturer air flow recommendations; #12 addresses use of additional exhaust; #13 addresses indoor and enclosed spaces; #14 addresses respirator requirements based on duration of task; #15 addresses minimizing dust emissions; #17 addresses demolition hammers with bushing tools; #18 addresses tile saws. For more information, see https://www.osha.gov/dsg/topics/silicacrystalline/construction_info_silica.html.

[5]Employees engaged in the Table 1 task means the equipment operator; helpers, laborers and other employees who are assisting with the task; or any other employee responsible for completing the task. For example, an employee operating a walk-behind saw and another employee helping the operator guide the saw are both engaged in the task. An employee operating a jackhammer would be engaged in the task, but another employee directing traffic near the employee jackhammering would not be engaged in the task. OSHA's Small Entity Compliance Guide for the Respirable Crystalline Silica Standard for Construction, page 5.