Best Practice

Title: Silica Data Analysis Chart
Issue No.: CSDA-BP-016
Effective Date: Mar 13, 2014

Introduction

The CSDA Silica Data Analysis Chart is based on extremely thorough data collection from member jobsites and from the National Institute for Occupational Safety and Health (NIOSH). It has been developed for operators to use on jobsites to determine if respiratory protection is needed and, if so, what type of protection is recommended. The aim of the chart is to simplify procedures and help protect workers.

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply/ slurry clean up	None	enclosed area	0.04	7:17	
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply/ slurry clean up	None	enclosed area; 3rd floor of building	0.068	7:24	
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply/ slurry clean up	None	enclosed area	0.159	6:50	N100 Disposable respirators
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply/ slurry clean up	None	enclosed area	0.109	7:30	N100 Disposable respirators
Indoor Wall Sawing	wall saw	saw equipped with water supply	None	Indoors	.06-.22	4:54	N100 Disposable respirators
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply	None	Indoors	0.09	8:00	N100 Disposable respirators
Indoor Wall Sawing	hydraulic wall saw	saw equipped with water supply	None	Indoors	0.066	1:17	
Wall Sawing	hydraulic wall saw	saw equipped with water supply / N95 disposable respirator	Natural	Open Air	0.029	8:00	
Wall Sawing	hydraulic wall saw	saw equipped with water supply / remote control	Natural	Open Air	Not Detectable	8:01	
Task	**Tool**	**Controls**	**Ventilation**	**Environment**	**Results**	**Sample time HH:MM**	**NIOSH Recommendations**
Indoor Core Drilling	Core drill	drill equipped with water supply	None	Indoors	0.02	4:21	
Core Drilling	two-speed coring rig	drill equipped with water supply	None	Indoors	0.04	2:00	
Core Drilling	Core drill	drill equipped with water supply	Natural	Open Air	0.01	8:00	
Core Drilling	Core drill	drill equipped with water supply / N95 disposable respirator	Natural	Open Air	0.029	8:00	
Core Drilling	Core drill	drill equipped with water supply	Natural	Open Air	0.015	5:52	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Rock Drilling	Air rock drill	N95 disposable respirator	Natural	Open Air	0.066	8:00	
Rock Drilling	Track driven chassis with an attached boom and drilling rig	Rain & drilling rig equipped with water supply	Natural	Open Air	0.031	4:30	
Task	**Tool**	**Controls**	**Ventilation**	**Environment**	**Results**	**Sample time HH:MM**	**NIOSH Recommendations**
Indoor Slab Sawing	Slab Saw	Saw equipped with water supply	None	Indoors	.13-.71	4:57	N100 Disposable respirators
DRY: Slab Sawing	Slab Saw	None	Natural	Open Air	6>PEL	No Data	1/2 face air purifying respirators with P-100 filters
Slab Sawing	Slab Saw	Saw equipped with water supply	Natural	Open Air	.05<LOD	4:00	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	4:00	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	4:02	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	3:58	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:40	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:40	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	9:00	
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	9:00	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Green Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	8:51	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:56	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:54	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.01	2:50	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.01	4:35	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	4:31	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.05	3:50	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	(.02): result between LOD & LOQ	3:51	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.03	4:21	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	(.02): result between LOD & LOQ	1:52	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	(.02): result between LOD & LOQ	6:09	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.01	6:23	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	6:21	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:58	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	ND	2:54	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.02	2:50	
Slab Sawing	Slab Saw	saw equipped with water supply,	Natural	Open Air	0.065	5:55	
Slab Sawing	Slab Saw	saw equipped with water supply	Natural	Open Air	0.04	7:40	
Slab Sawing and concrete breaking	Slab Saw & hydra hammer	saw equipped with water supply	Natural	Open Air	<.02	8:00	
Slab Sawing and concrete breaking	Slab saw and skid steer breaker and loader	saw equipped with water supply	Natural	Open Air	0.0092	8:38	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Indoor Hand Sawing	Cut off saw	saw equipped with water supply, disposable respirators	None	Indoors	.24-.26	2:10	NIOSH recommends 1/2 face respirators if other operations are present
Indoor Hand Sawing - DRY	Handheld concrete saw	A floor stand fan directed toward an open window, disposable respirators	Open window	Indoor restroom	10.0000	TWA=8:00	NIOSH recommends 1/2 face respirators if other operations are present
Indoor Hand Sawing - DRY	Handheld concrete saw	A floor stand fan directed toward an open window	Open window	Indoor restroom	2.3-3.0	TWA=8:00	NIOSH recommends 1/2 face respirators if other operations are present
Hand Sawing - DRY	Hand saw with a resin blade	particulate respirators	Natural	Open Air	0.0300	TWA=8:00	
Hand Sawing - DRY	Hand saw with a diamond blade	particulate respirators	Natural	Open Air	0.0500	TWA=8:00	
Hand Sawing - DRY	Hand saw with a resin blade	particulate respirators	Natural	Open Air	0.1500	TWA=8:00	Water to blade and/or a LEV
Hand Sawing - DRY	Hand saw with a diamond blade	particulate respirators	Natural	Open Air	0.0500	TWA=8:00	
Hand Sawing - DRY	Hand saw with a resin blade	particulate respirators	Natural	Open Air	0.0300	TWA=8:00	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Hand Sawing - DRY	Hand saw with a diamond blade	particulate respirators	Natural	Open Air	0.0100	TWA=8:00	
Hand Sawing Brick- DRY	Hand saw with a dry cutting blade	Filtering face piece respirator (3M8210)	Natural	Open Air	0.0800	7:57	
Hand Sawing Brick-	Hand saw with a wet cutting blade	Filtering face piece respirator (3M8210)	Natural	Open Air	0.0210	7:51	
Hand Sawing Brick-	Hand saw with a wet cutting blade	Filtering face piece respirator (3M8210)	Natural	Open Air	ND	8:09	
Indoor & Outdoor Hand Sawing	Handheld concrete saw	saw equipped with water supply	Natural	Open Air & Indoors	ND	7:21	
Hand Sawing	Hand saw with a resin blade	saw equipped with a pressuraized water tank system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	
Hand Sawing	Hand saw with a diamond blade	saw equipped with a pressuraized water tank system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	
Task	**Tool**	**Controls**	**Ventilation**	**Environment**	**Results**	**Sample time HH:MM**	**NIOSH Recommendations**
Hand Sawing	Hand saw with a resin blade	saw equipped with a mains supply water system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	
Hand Sawing	Hand saw with a diamond blade	saw equipped with a mains supply water system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	
Hand Sawing	Hand saw with a resin blade	saw equipped with a local exhaust ventilation system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	
Hand Sawing	Hand saw with a diamond blade	saw equipped with a local exhaust ventilation system, particulate respirators	Natural	Open Air	<.01	TWA=8:00	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Demolition: Rock Quarry	CAT 245 Excavator	Rain	Natural	Open Air	0.0130	8:00	
Demolition: Rock Quarry	CAT 245 Excavator	Rain	Natural	Open Air	ND	8:00	
Demolition: Rock Quarry	CAT 245 Excavator	Rain	Natural	Open Air	ND	8:00	
Demolition: Rock Breaker	Caterpillar Backhoe with a 7-ton attachment	Rain	Natural	Open Air	0.0140	8:00	
Demolition: Rock Breaker	Caterpillar Backhoe with a 7-ton attachment	Rain	Natural	Open Air	ND	8:00	
Demolition: load and haul of concrete	Backhoe	None	Natural	Open Air	<.02	8:00	
BROKK: Demolition: concrete breaking	Brokk with hammer attachment	1/2 face piece respirator with dual cartridges, water to suppress dust	None	Indoors	0.6100	3:00	Full face respirator, dust suppression system
Demolition: load and haul of concrete	Backhoe with bucket	NONE	Natural	Open Air	0.0100	10:00	
Task	**Tool**	**Controls**	**Ventilation**	**Environment**	**Results**	**Sample time HH:MM**	**NIOSH Recommendations**
Demolition: removal of brick	Jackhammers	3M model 6800 full facepiece air purifying respirators	Natural	Open Air	(.033)-.12	5:00	N100 disposable respirators
DRY Jackhammering: chip away concrete from rebar	Jackhammer	None	Natural	Open Air	22/25 samples>PEL	No Data	Dust suppression system, 1/2 face piece respirator with p100 cartridges
Demolition: Hand tools	hammers, scarpers, spud bars, shovels, brooms, and hand tools	N95 filtering facepiece with side shields, tyvek like suits	None	Indoors	(.04)-.05	2:02	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	NIOSH Recommendations
Wire Sawing & core drilling	Wire Saw & core drill	water, away from sawing operation, remote control	Natural	Open Air	ND	2:07	
Wire Sawing & core drilling	Wire Saw & core drill	water, away from sawing operation, remote control	Natural	Open Air	0.0120	8:08	
Wire Sawing & core drilling	Wire Saw & core drill	water, away from sawing operation, remote control	Natural	Open Air	0.0500	2:06	
Wire Sawing & core drilling	Wire Saw & core drill	water, away from sawing operation, remote control	Natural	Open Air	0.0200	8:05	

Task	Tool	Controls	Ventilation	Environment	Results	Sample time HH:MM	PPE Requirements
Concrete clean up	Compressed air	None	Natural	Open Air	2/3>PEL	No Data	N100 disposable respirator
Concrete Breaking	Jackhammer	disposable respirator	None	Indoors	0.2130	7:20	1/2 face air purifying respirators with P-100 filters
Clean up from saw operation	broom, squeegee, shovel, vacuum	None	None	enclosed area	0.18	6:15	1/2 face air purifying respirators with P-100 filters
Anchoring wall saw track to wall and clean up activities	rotohammering dry / shovel, broom, squeegee	None	None	enclosed area	0.275	7:21	1/2 face air purifying respirators with P-100 filters