

Typical Occupational Exposures To Silica

There is good information on exposures from different types of activities. The data is often broken down by industry, by job class, by controls, etc. This information can often quickly help you determine if your situation is likely to pose a significant risk to workers.

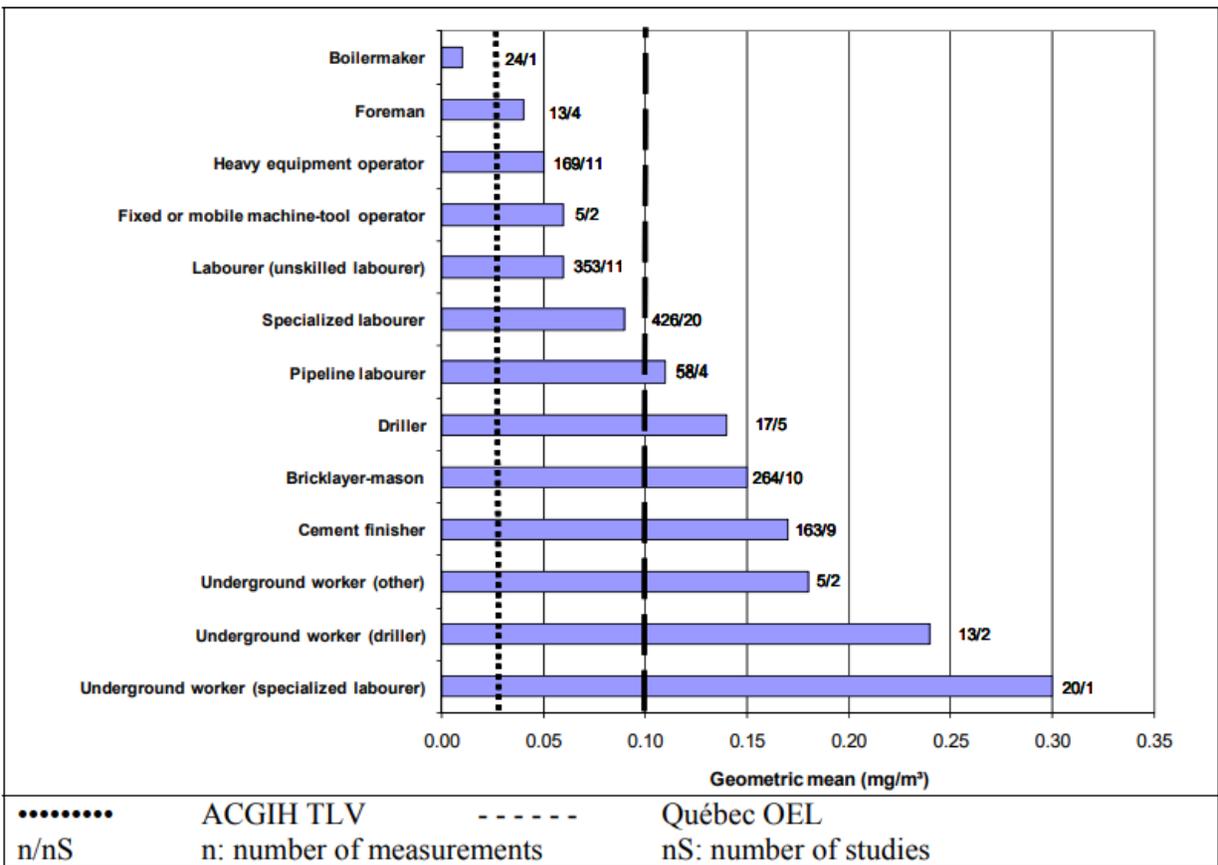
Below is a summary of silica exposures by industry. Perhaps the most telling information is the fourth column: the percent of samples that were over the Occupational Exposure Limit. For example, for building demolition, 80% of the samples showed that workers were overexposed to silica.

Industry	Work Shift Length	Number of Samples Analyzed	Percent of Samples Over the OEL	Lowest Quartz Silica Concentration (mg/m ³)	Highest Quartz Silica Concentration (mg/m ³)	Average Quartz Silica Concentration (mg/m ³)
Abrasive Blasting	8-Hour	18	77	0.0074	0.34	0.06
	9-Hour	5	100	0.054	0.12	0.14
	10-Hour	10	50	0.011	0.035	0.021
Sand and Mineral Processing	8-Hour	9	100	0.033	0.12	0.080
	10-Hour	2	100	0.046	0.094	0.070
	12-Hour	5	100	0.024	1.7	0.41
Aggregate Processing	10-Hour	10	100	0.013	0.19	0.074
Earth Moving/Road Construction	8-Hour	1	100	0.026	0.026	0.026
	10-Hour	2	50	0.0092	0.019	0.014
	12-Hour	21	48	0.0056	0.068	0.017
Mining	12-Hour	11	82	0.0059	0.13	0.041
Building Demolition	10-Hour	10	80	0.017	0.065	0.03
Building Construction	8-Hour	2	100	0.070	0.13	0.10
	10-Hour	6	66	0.015	1.0	0.19



Silica often takes a back seat to asbestos. However, this information (and the information to follow) shows that exposures to silica are much more frequently above the OEL than scenarios involving asbestos. Both asbestos and silica can cause fibrosis and lung cancer so it is a fair question as to why asbestos gets more attention than silica exposure. A government inspector would never allow a cloud of asbestos to be released like in the picture to the left.

Figure 1 - Respirable crystalline silica exposure by occupation title



- n: number of measurements,
- nS: number of studies from which these “n” measurements were taken,

Note: compare these exposures (relative to the TLV) vs asbestos exposures to the Asbestos TLV. Then consider the relative emphasis on program and enforcement.

Figure 2 –Respirable crystalline silica exposure by task

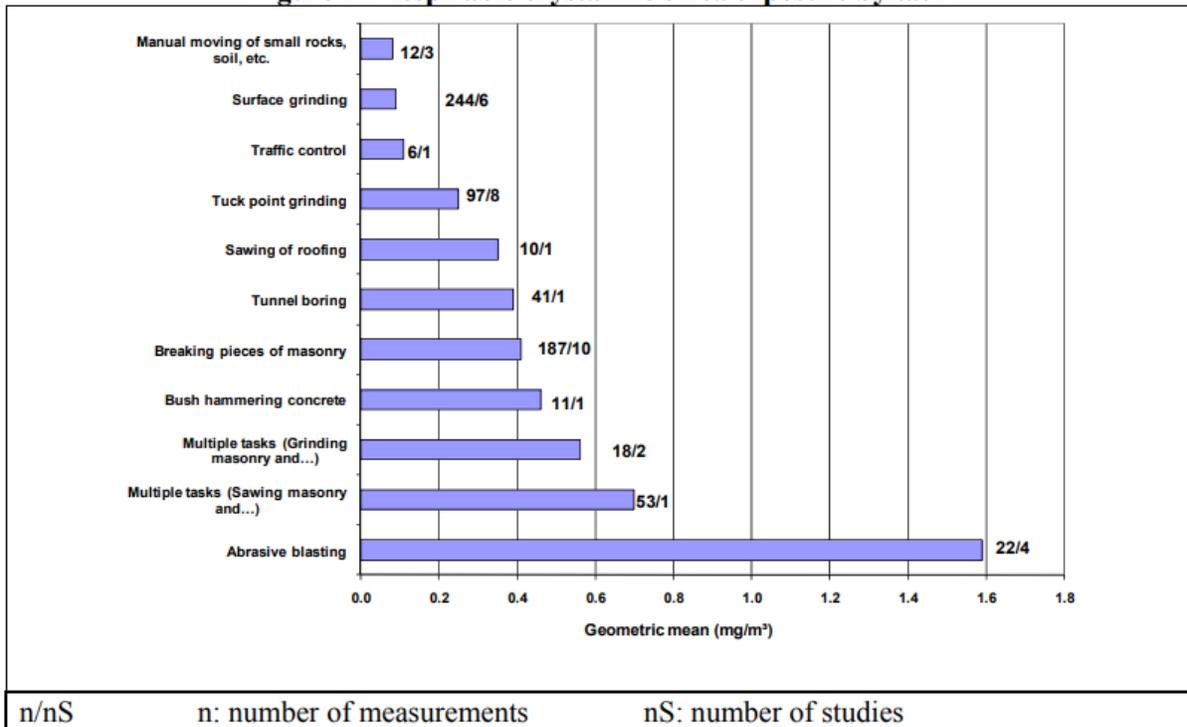
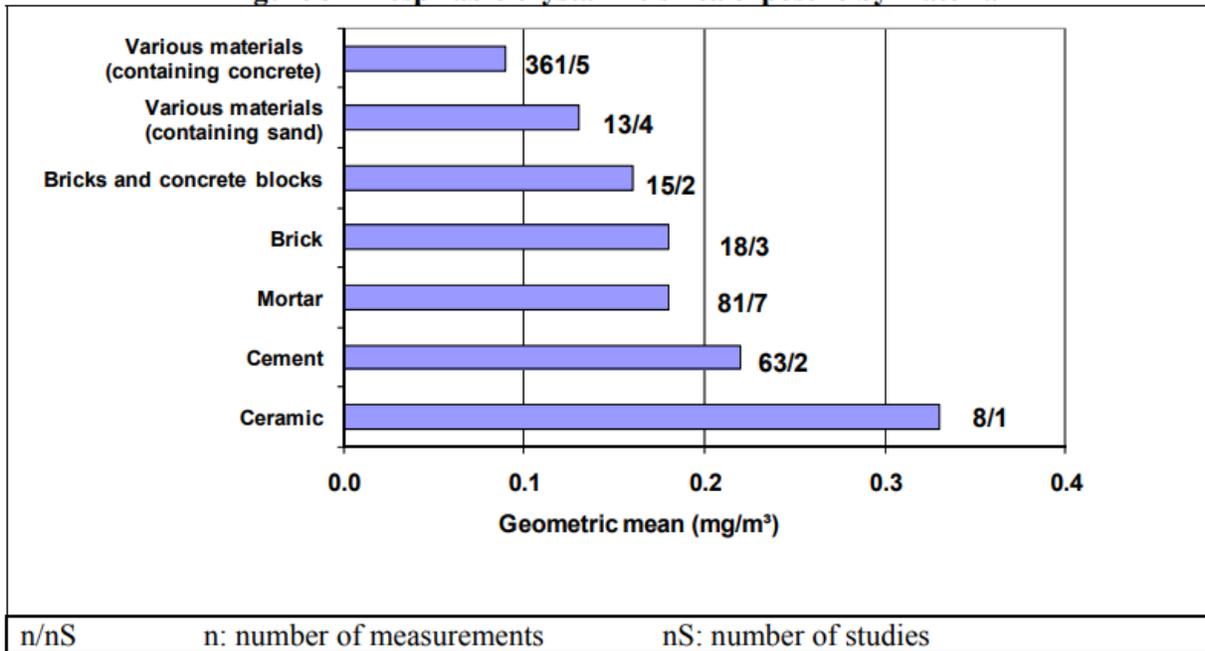
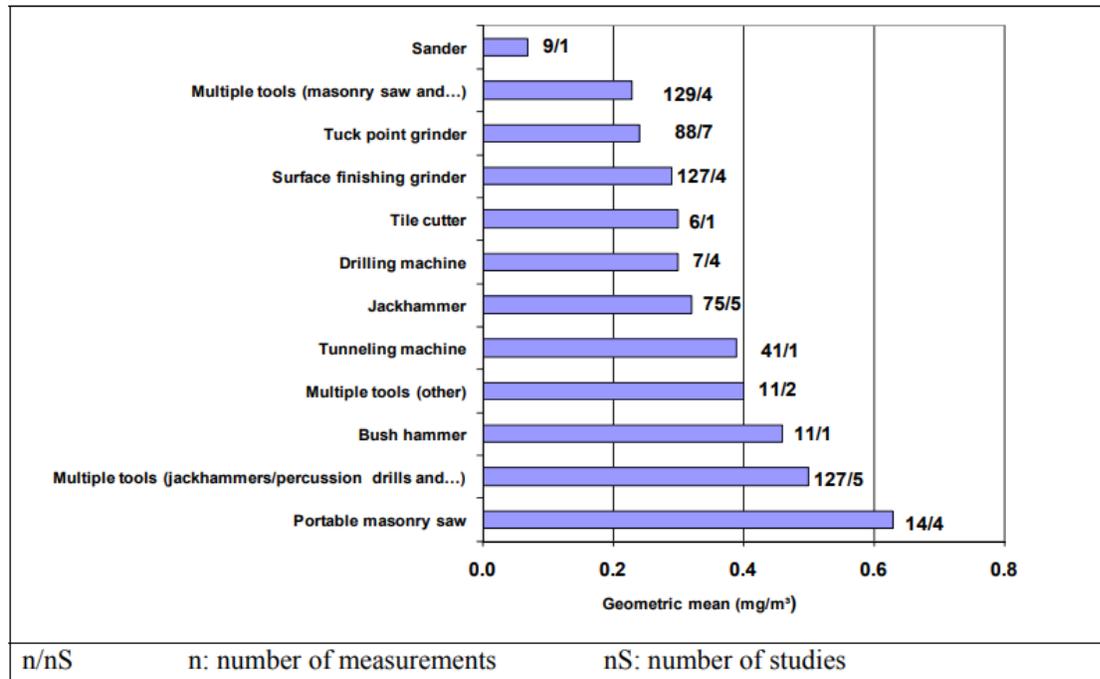


Figure 3 – Respirable crystalline silica exposure by material



Note: the ACGIH TLV = 0.025 mg/m³

Figure 4 – Respirable crystalline silica exposure by tool



Note: the ACGIH TLV = 0.025 mg/m³

Use of respirators

When the exposure data sources contained information on the wearing of respirators, 70% of the workers wore a respirator when the measurements were taken. When the level of respirator use was mentioned (841 measurements), only 63% of the workers wore it continually during the work period. When the type of respirator was specified (1140 measurements), 59% of the workers wore a filtering facepiece respirator.

Figure 5 – Impact of the use of a control method on exposure during a task

