

Table 3-17. Respirable quartz: Number of samples, geometric mean exposures, and percent exceeding designated occupational exposure limits by industries with elevated silicosis mortality, MSHA inspector and mine operator and OSHA samples, 1990-1999

Silicosis Mortality, Selected States and Years, 1990-1999				Number of Samples	GM (mg/m ³)	% > PEL	% > REL
CIC	Industries with elevated PMRs and most frequently recorded on death certificates	Number of Deaths	PMR				
040	Metal mining	86	41.70	8,382	0.013	12.4	19.4
262	Miscellaneous nonmetallic mineral and stone products	44	30.72	391	0.041	30.2	47.3
050	Nonmetallic mining and quarrying, except fuel	48	29.27	99,529	0.008	7.0	11.1
271	Iron and steel foundries	48	21.14	1,766	0.047	29.3	50.8
252	Structural clay products	20	19.72	213	0.045	32.9	51.6
041	Coal mining	69	6.17	80,642	0.052*	30.1	- [†]
270	Blast furnaces, steelworks, rolling and finishing mills	51	3.19	44	0.011	2.3	6.8
331	Machinery, except electrical, n.e.c.	23	2.48	204	0.046	32.4	48.0
392	Not specified manufacturing industries	33	1.55	0	-	-	-
060	Construction	118	1.26	687	0.070	40.6	53.0
	All other industries	317		2,562	0.026	19.9	30.2
	TOTAL (excluding CIC 041)			113,778	0.009	8.4	13.2

- indicates incalculable field

* MRE equivalent

[†] The MSHA respirable coal mine quartz exposure data and the NIOSH REL for respirable quartz cannot be compared to each other because they are based on different sampling criteria.

CIC - Census Industry Code

GM - geometric mean

classified

NOTE: Before March 1, 1989 and after March 22, 1993, the OSHA PEL is [(10 mg/m³) / (% quartz + 2)], for respirable dust containing at least 1 percent quartz. From March 1, 1989 to March 22, 1993, the OSHA PEL was 0.1 mg/m³ for respirable quartz. For coal mining, the MSHA PEL is [(10 mg/m³ MRE) / (% quartz)] for respirable dust containing greater than 5 percent quartz; for metal/nonmetal mining, the MSHA PEL is [(10 mg/m³) / (% quartz + 2)] for respirable dust containing at least 1 percent quartz. The NIOSH REL is 0.05 mg/m³. See appendices for source description, methods, ICD codes, industry codes, agents, and list of selected states and years for which usual industry has been reported.

SOURCE: Mine Safety and Health Administration (MSHA) metal/nonmetal and coal mine inspector and mine operator quartz data. Occupational Safety and Health Administration (OSHA) Integrated Management Information System. National Center for Health Statistics: multiple cause of death data.

REL - recommended exposure limit
MRE - Mining Research Establishment

PMR - proportionate mortality ratio
n.e.c. - not elsewhere