

Table 3-18 (page 1 of 2). Respirable quartz: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA coal mine district and state, MSHA inspector and mine operator samples, 1982-1999

MSHA Coal Mine District	All years		1982 - 1988			1989 - 1992			1993 - 1999		
	No. of Samples	GM (mg/m ³)	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > PEL
District 1 (Anthracite coal mining regions in Pennsylvania)	1,274	0.027	321	0.025	41.4	184	0.024	39.7	769	0.028	26.4
District 2 (Bituminous coal mining regions in Pennsylvania)	13,802	0.043	4,123	0.043	34.7	2,564	0.041	25.7	7,115	0.044	20.8
District 3	12,214	0.036	3,867	0.032	28.8	1,923	0.040	23.5	6,424	0.036	19.6
Maryland	761	0.042	128	0.056	39.8	46	0.037	4.3	587	0.040	16.9
Ohio	4,334	0.040	1,962	0.040	33.3	823	0.040	24.5	1,549	0.042	21.8
Northern West Virginia	7,119	0.032	1,777	0.025	23.1	1,054	0.040	23.5	4,288	0.034	19.1
District 4 (Southern West Virginia)	21,177	0.060	7,130	0.053	40.3	4,338	0.058	38.1	9,709	0.068	36.9
District 5 (Virginia)	14,293	0.062	4,492	0.057	45.1	3,341	0.061	39.0	6,460	0.066	34.4
District 6 (Eastern Kentucky)	15,255	0.061	2,845	0.050	40.7	2,748	0.066	41.5	9,662	0.064	33.6
District 7	17,116	0.059	2,991	0.066	49.7	3,762	0.055	36.9	10,363	0.058	32.4
Central Kentucky	15,102	0.059	2,463	0.068	51.2	3,152	0.056	37.3	9,487	0.058	32.4
North Carolina	0	-	0	-	-	0	-	-	0	-	-
South Carolina	0	-	0	-	-	0	-	-	0	-	-
Tennessee	2,014	0.057	528	0.057	42.4	610	0.053	34.8	876	0.060	32.3
Northern Georgia	0	-	0	-	-	0	-	-	0	-	-
District 8	7,297	0.046	2,122	0.047	33.8	1,567	0.042	22.0	3,608	0.048	27.1
Illinois	6,160	0.045	1,719	0.046	32.8	1,399	0.041	20.9	3,042	0.045	24.5
Indiana	1,042	0.061	342	0.051	38.0	156	0.056	32.1	544	0.070	41.5
Iowa	54	0.024	39	0.023	38.5	9	0.027	22.2	6	0.022	0.0
Michigan	0	-	0	-	-	0	-	-	0	-	-
Minnesota	0	-	0	-	-	0	-	-	0	-	-
Northern Missouri	41	0.051	22	0.071	40.9	3	0.031	0.0	16	0.036	31.3
Wisconsin	0	-	0	-	-	0	-	-	0	-	-

See footnotes at end of table.

Table 3-18 (page 2 of 2). Respirable quartz: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA coal mine district and state, MSHA inspector and mine operator samples, 1982-1999

MSHA Coal Mine District	All years		1982 - 1988			1989 - 1992			1993 - 1999		
	No. of Samples	GM (mg/m ³)	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > PEL
District 9	5,372	0.036	1,403	0.041	42.3	1,357	0.031	33.8	2,612	0.036	23.9
Alaska	12	0.017	10	0.014	10.0	2	0.051	50.0	0	-	-
Arizona	42	0.056	6	0.023	33.3	12	0.056	41.7	24	0.070	20.8
Arkansas	9	0.082	6	0.120	66.7	1	0.009	100.0	2	0.077	50.0
California	1	0.025	0	-	-	0	-	-	1	0.025	0.0
Colorado	1,678	0.037	447	0.041	45.0	425	0.033	36.0	806	0.036	21.5
Hawaii	0	-	0	-	-	0	-	-	0	-	-
Idaho	0	-	0	-	-	0	-	-	0	-	-
Kansas	24	0.061	9	0.115	66.7	7	0.027	0.0	8	0.061	12.5
Louisiana	10	0.009	0	-	-	2	0.038	0.0	8	0.006	0.0
Southern Missouri	42	0.068	16	0.114	62.5	4	0.077	25.0	22	0.046	18.2
Montana	97	0.042	36	0.038	38.9	14	0.051	42.9	47	0.042	29.8
Nebraska	0	-	0	-	-	0	-	-	0	-	-
Nevada	0	-	0	-	-	0	-	-	0	-	-
New Mexico	299	0.048	117	0.050	34.2	48	0.050	35.4	134	0.046	23.1
North Dakota	47	0.012	29	0.012	13.8	15	0.010	20.0	3	0.026	0.0
Oklahoma	382	0.080	162	0.121	62.3	84	0.068	39.3	136	0.055	29.4
Oregon	0	-	0	-	-	0	-	-	0	-	-
Texas	133	0.041	52	0.098	57.7	25	0.016	24.0	56	0.028	23.2
Utah	2,031	0.033	338	0.033	38.8	608	0.028	32.9	1,085	0.036	25.2
Washington	21	0.028	2	0.016	0.0	9	0.019	0.0	10	0.044	20.0
Wyoming	544	0.021	173	0.017	28.3	101	0.020	31.7	270	0.025	25.2
District 10 (Western Kentucky)	4,515	0.023	1,156	0.021	26.0	951	0.023	19.6	2,408	0.025	17.4
District 11	3,917	0.056	574	0.058	40.2	863	0.063	36.8	2,480	0.053	27.5
Alabama	3,917	0.056	574	0.058	40.2	863	0.063	36.8	2,480	0.053	27.5
Central and Southern Georgia	0	-	0	-	-	0	-	-	0	-	-
Florida	0	-	0	-	-	0	-	-	0	-	-
Mississippi	0	-	0	-	-	0	-	-	0	-	-
Puerto Rico	0	-	0	-	-	0	-	-	0	-	-
Virgin Islands	0	-	0	-	-	0	-	-	0	-	-
TOTAL	116,232	0.050	31,024	0.047	38.9	23,598	0.050	33.8	61,610	0.052	29.3

- indicates incalculable field PEL - permissible exposure limit REL - recommended exposure limit GM - geometric mean mg/m³ - milligrams per cubic meter
NOTE: All geometric means are reported in MRE (Mining Research Establishment) equivalents. For coal mining, the MSHA PEL is [(10 mg/m³ MRE) / (% quartz)] for respirable dust containing greater than 5 percent quartz. 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. See appendices for source description, methods, and agents.
SOURCE: Mine Safety and Health Administration (MSHA) coal mine inspector and mine operator quartz data.