

Respirable quartz: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA metal/nonmetal mine district and state, MSHA samples, 1979–2003 (page 1 of 2)

MSHA Metal/Nonmetal Mine District	All years			1979–1988			1989–1992			1993–2003					
	No. of Samples	GM (mg/m ³)	% > REL	No. of Samples	GM (mg/m ³)	% > REL	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > PEL	No. of Samples	GM (mg/m ³)	% > REL
Northeast	33,331	0.011	12.4	8,979	0.016	19.4	6,060	0.011	9.9	18,292	0.009	6.2	18,292	0.009	6.2
Connecticut	904	0.012	26.3	285	0.027	38.2	156	0.013	13.5	463	0.007	1.7	463	0.007	1.7
Delaware	114	0.005	0.0	17	0.006	0.0	33	0.005	0.0	64	0.004	3.1	64	0.004	3.1
District of Columbia	0	-	-	0	-	-	0	-	-	0	-	-	0	-	-
Maine	940	0.012	16.6	199	0.025	24.6	169	0.009	3.0	572	0.011	5.4	572	0.011	5.4
Maryland	1,736	0.008	4.2	518	0.009	8.1	314	0.007	2.9	904	0.008	2.8	904	0.008	2.8
Massachusetts	1,669	0.013	17.4	476	0.026	28.6	250	0.010	9.6	943	0.009	5.1	943	0.009	5.1
New Hampshire	738	0.012	15.3	131	0.029	33.6	133	0.010	7.5	474	0.010	5.7	474	0.010	5.7
New Jersey	2,780	0.012	17.5	992	0.021	27.5	623	0.012	12.4	1,165	0.008	4.2	1,165	0.008	4.2
New York	7,618	0.010	11.4	1,875	0.014	17.0	1,649	0.009	6.2	4,094	0.009	5.2	4,094	0.009	5.2
Pennsylvania	7,918	0.012	9.3	2,324	0.014	15.2	1,212	0.014	13.8	4,382	0.011	7.6	4,382	0.011	7.6
Rhode Island	262	0.016	22.8	57	0.030	36.8	35	0.014	8.6	170	0.014	12.4	170	0.014	12.4
Vermont	1,859	0.016	22.3	372	0.020	31.5	334	0.013	19.2	1,153	0.016	16.7	1,153	0.016	16.7
Virginia	5,012	0.009	6.6	1,126	0.011	12.0	808	0.009	8.5	3,078	0.008	4.0	3,078	0.008	4.0
West Virginia	1,781	0.014	17.6	607	0.018	24.4	344	0.015	13.7	830	0.010	7.0	830	0.010	7.0
Southeast	43,316	0.008	7.5	13,902	0.010	12.4	9,250	0.008	8.2	20,164	0.007	4.9	20,164	0.007	4.9
Alabama	3,736	0.007	4.2	1,034	0.007	6.6	876	0.007	8.0	1,826	0.007	5.5	1,826	0.007	5.5
Florida	3,938	0.005	3.7	830	0.006	7.1	827	0.005	2.2	2,281	0.004	1.8	2,281	0.004	1.8
Georgia	6,815	0.010	11.1	2,464	0.015	19.6	1,567	0.010	10.6	2,784	0.008	6.3	2,784	0.008	6.3
Kentucky	2,905	0.008	7.5	943	0.009	10.4	480	0.008	9.4	1,482	0.007	4.4	1,482	0.007	4.4
Mississippi	2,058	0.007	4.4	273	0.007	6.6	476	0.007	5.5	1,309	0.008	5.8	1,309	0.008	5.8
North Carolina	9,183	0.008	6.5	3,347	0.010	11.4	2,166	0.008	6.7	3,670	0.007	4.6	3,670	0.007	4.6
Puerto Rico	1,380	0.005	0.9	586	0.004	0.2	29	0.007	3.4	765	0.005	3.1	765	0.005	3.1
South Carolina	4,549	0.010	17.3	1,054	0.017	27.6	1,130	0.010	9.7	2,365	0.007	3.8	2,365	0.007	3.8
Tennessee	8,663	0.009	6.4	3,327	0.009	9.9	1,698	0.010	10.5	3,638	0.009	6.9	3,638	0.009	6.9
Virgin Islands	89	0.006	0.0	44	0.004	0.0	1	0.010	0.0	44	0.010	2.3	44	0.010	2.3
North Central	40,993	0.010	9.3	12,515	0.011	13.8	8,549	0.011	10.8	19,929	0.009	5.4	19,929	0.009	5.4
Illinois	7,193	0.011	16.4	2,796	0.014	21.0	1,387	0.011	13.0	3,010	0.008	5.2	3,010	0.008	5.2
Indiana	4,440	0.007	2.9	1,174	0.007	3.3	917	0.007	4.5	2,349	0.007	3.1	2,349	0.007	3.1
Iowa	2,498	0.006	4.9	675	0.007	5.0	570	0.006	5.3	1,253	0.006	2.6	1,253	0.006	2.6
Michigan	5,746	0.011	8.4	1,397	0.012	15.3	1,459	0.014	14.3	2,890	0.010	6.8	2,890	0.010	6.8
Minnesota	7,915	0.010	5.7	3,402	0.010	10.6	1,475	0.012	10.5	3,038	0.009	5.5	3,038	0.009	5.5
Ohio	7,638	0.010	13.2	1,361	0.013	19.2	1,710	0.010	9.1	4,567	0.009	6.3	4,567	0.009	6.3
Wisconsin	5,563	0.011	8.9	1,710	0.012	13.3	1,031	0.013	15.1	2,822	0.009	5.7	2,822	0.009	5.7

See footnotes at end of table.

Respirable quartz: Geometric mean exposures and percent exceeding designated occupational exposure limits by MSHA metal/nonmetal mine district and state, MSHA samples, 1979-2003 (page 2 of 2)

MSHA Metal/Nonmetal Mine District	All years				1979-1988				1989-1992				1993-2003						
	No. of Samples	GM (mg/m ³)	No. of Samples	GM (mg/m ³)	REL	% >	REL	% >	GM (mg/m ³)	No. of Samples	GM (mg/m ³)	REL	% >	GM (mg/m ³)	No. of Samples	GM (mg/m ³)	REL	% >	
South Central	36,806	0.009	7,465	0.013	13.0	17.6	17.6	17.6	0.010	9,403	0.010	9.5	9.5	0.007	19,938	0.007	5.4	5.4	8.4
Arkansas	2,805	0.014	544	0.039	31.6	45.8	45.8	0.018	660	0.018	16.7	28.5	28.5	0.009	1,601	0.009	8.2	8.2	14.7
Louisiana	3,019	0.006	279	0.008	7.2	11.8	11.8	0.005	716	0.005	4.2	6.3	6.3	0.006	2,024	0.006	3.9	3.9	6.9
Missouri	9,055	0.010	2,347	0.013	13.0	16.4	16.4	0.011	2,008	0.011	11.6	15.1	15.1	0.008	4,700	0.008	5.2	5.2	8.4
New Mexico	4,338	0.013	1,013	0.015	14.4	19.7	19.7	0.015	1,059	0.015	13.2	21.1	21.1	0.012	2,266	0.012	11.8	11.8	16.7
Oklahoma	5,512	0.009	1,570	0.011	9.9	13.2	13.2	0.011	1,340	0.011	10.9	16.6	16.6	0.008	2,602	0.008	4.5	4.5	8.9
Texas	12,077	0.007	1,712	0.011	10.0	14.1	14.1	0.007	3,620	0.007	6.4	8.4	8.4	0.006	6,745	0.006	3.4	3.4	4.2
Rocky Mountain	34,698	0.015	15,364	0.017	14.5	22.2	22.2	0.017	5,927	0.017	16.7	26.2	26.2	0.013	13,407	0.013	11.2	11.2	18.2
Arizona	5,644	0.017	2,380	0.023	18.0	27.1	27.1	0.019	717	0.019	18.8	29.0	29.0	0.012	2,547	0.012	10.2	10.2	16.8
Colorado	6,528	0.016	3,459	0.014	12.6	19.9	19.9	0.019	1,168	0.019	17.4	27.6	27.6	0.018	1,901	0.018	12.6	12.6	23.3
Kansas	2,970	0.011	1,280	0.013	12.4	14.1	14.1	0.011	542	0.011	9.8	12.5	12.5	0.009	1,148	0.009	7.1	7.1	8.6
Montana	3,334	0.014	1,370	0.012	10.4	15.3	15.3	0.023	667	0.023	22.5	33.7	33.7	0.013	1,297	0.013	12.1	12.1	20.9
Nebraska	861	0.006	53	0.006	5.7	5.7	5.7	0.006	254	0.006	2.8	4.7	4.7	0.006	554	0.006	3.1	3.1	3.8
Nevada	4,114	0.020	1,224	0.025	24.5	33.7	33.7	0.021	1,032	0.021	20.4	31.8	31.8	0.017	1,858	0.017	15.3	15.3	25.0
North Dakota	582	0.011	194	0.014	12.9	18.6	18.6	0.009	72	0.009	1.4	11.1	11.1	0.010	316	0.010	5.7	5.7	12.3
South Dakota	2,688	0.015	1,597	0.019	13.2	23.0	23.0	0.013	281	0.013	9.3	16.0	16.0	0.011	810	0.011	9.6	9.6	15.3
Utah	4,744	0.016	2,083	0.015	12.6	20.0	20.0	0.020	889	0.020	18.2	30.4	30.4	0.015	1,772	0.015	11.5	11.5	21.9
Wyoming	3,233	0.015	1,724	0.021	15.1	26.4	26.4	0.013	305	0.013	13.8	21.0	21.0	0.010	1,204	0.010	14.1	14.1	13.6
Western	20,556	0.010	4,590	0.016	13.5	20.7	20.7	0.013	4,369	0.013	12.1	19.1	19.1	0.008	11,597	0.008	5.4	5.4	9.1
Alaska	450	0.014	88	0.025	21.6	28.4	28.4	0.054	33	0.054	24.2	39.4	39.4	0.011	329	0.011	6.4	6.4	14.6
California	9,059	0.013	2,326	0.018	15.3	23.3	23.3	0.014	2,425	0.014	12.0	21.0	21.0	0.010	4,308	0.010	7.0	7.0	11.2
Hawaii	320	0.004	11	0.005	0.0	0.0	0.0	0.005	57	0.005	3.5	1.8	1.8	0.004	252	0.004	1.2	1.2	0.8
Idaho	3,238	0.015	912	0.022	15.9	26.1	26.1	0.017	534	0.017	17.0	27.2	27.2	0.011	1,792	0.011	8.0	8.0	15.9
Oregon	3,464	0.005	413	0.007	4.1	6.3	6.3	0.007	698	0.007	7.4	8.0	8.0	0.005	2,353	0.005	1.9	1.9	1.8
Washington	4,025	0.008	840	0.011	10.1	13.8	13.8	0.011	622	0.011	13.3	17.8	17.8	0.007	2,563	0.007	4.6	4.6	7.5
TOTAL	209,700	0.010	62,815	0.013	11.4	17.3	17.3	0.011	43,558	0.011	10.8	16.5	16.5	0.009	103,327	0.009	6.2	6.2	10.6

- indicates incalculable field. PEL - permissible exposure limit GM - geometric mean mg/m³ - milligrams per cubic meter
 MSHA - Mine Safety and Health Administration REL - recommended exposure limit
 NOTE: 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 and methods.
 SOURCE: MSHA metal/nonmetal mine data.