March 11, 1952

REPORT OF ANALYSES OF DUST AND OTHER MATERIAL

FROM

SAYREVILLE, NEW JERSEY, PLANT OF OWENS-ILLINOIS GLASS COMPANY

The following samples from the Kaylo plant at Sayreville, New Jersey, were received at The Saranac Laboratory on January 18, 1952:

Samples of atmospheric dust:

#1 At asbestos fiberizer. 2 1/3 hrs. on December 4-5, 1951.
2 On B finishing line - turnover position. 7½ hrs. on November 15, 1951.
3 At end of B finishing line - offbearer's position. 3 hrs. on November 16, 1951.
4 At machine where low-density billets were being routed to make pipe coverings. 10¼ hrs. on November 19-20 and December 1, 1951.
5 Inside freight car being loaded with roof tile. 4 hrs. on December 3, 1951.

Samples of other materials:

6 Bulk sample of amosite.
7 Core material.
8 Roof tile.
9 Billets.

Estimation of Dust Concentration

The material comprising samples #1 to 5, inclusive, is atmospheric dust collected on pleated filter papers with a suction fan that drew in about 40 cubic feet of air per minute. The material collected was shaken off the filter paper and weighed and from this weight the concentration of the atmospheric dust was calculated.

Estimation of Dust Concentration (Cont'd)

Sample number	1	2	3	4	5
Weight of dust shaken off filter, grams.	1.3	13.7	6.8	1.7	9.2
Sampling time, hours	2.3	7.5	3	10.3	4
Volume of air sampled, cubic feet	5600	18000	7200	24800	9600
Approximate concentration of dust, mg. per cubic foot of air	0.2	0.8	0.9	0.07	1.0

It should be noted that, owing to several possible errors, the values for the concentration of dust must be regarded as only approximate estimates. By basing the calculations on the weight of dust shaken off the filter, thereby neglecting the small amount retained by the fibers of the filter, some error was introduced. Also, the quantity of air tested may have differed somewhat from the assumed value of 40 cubic feet per minute.

Composition of Samples of Dust and Other Materials

The composition of the various samples based upon petrographic examination supplemented, when necessary, by chemical analysis and X-ray diffraction examination is as follows:

Sample number	1	2	3	4	5
Quartz	22%	3%	2-4%	1-2%	5%
Amosite	70-75	trace	trace	2-4	5-10
Chrysotile	—	5-15	5-15	1-2	5-15
Kaylo	—	55-65	70-80	70-80	50-60
Carbonates	1-2	20-30	10-20	10-20	15-25
Limonite	2-4	—	—	—	—
Hematite	trace	—	—	?	—
Opaque	trace	—	trace	trace	1-2
Starch	trace	—	—	—	1-2
Glue (?)	—	—	—	4-8	—
Chlorite	trace	trace	trace	trace	trace

Sample number	6	7	8	9
Quartz	23%	13%	4-8%	2-4%
Amosite	70-75	6-8	3-6	2-4
Chrysotile	—	5-15	2-4	5-15
Kaylo	—	50-60	70-80	70-80
Carbonates	trace	10-20	10-20	5-10
Limonite	3-5	trace	trace	—
Hematite	trace	—	—	—
Opaque	—	trace	trace	trace
Starch	trace	—	—	—
Glue (?)	—	—	—	—
Chlorite	trace	trace	trace	trace

Comment

The values of 22 and 23 per cent for the quartz content of atmospheric asbestos dust at the fiberizer and of bulk amosite, respectively, are in substantial agreement with the corresponding values of 19 and 21 per cent for similar samples collected at the Sayreville plant on January 30, 1951. After treating the samples chemically to remove the fibrous components it was noted that the quartz particles were mostly less than 5 microns in size, with particles occasionally up to 30 microns and rarely up to 50 microns in diameter. Present also were splinters of quartz, some being 100 microns long and 10 microns wide, which evidently represented a replacement of the amosite fibers by quartz. Ordinary petrographic examination of the untreated samples will not reveal the bulk of the quartz present, and for a quantitative estimate X-ray diffraction analysis or chemical treatment should be employed.

In determining the amount of asbestos in the samples chemical, petrographic, and X-ray diffraction procedures were utilized. The iron content of the bulk sample of amosite, reported as Fe_2O_3, was 37.9 per cent, and by comparing this value with the percentage of Fe_2O_3 for a given sample, an estimate of the amount of amosite in that sample could be made. It should be noted that the bulk sample of amosite was only about 73 per cent pure, since 23 per cent was quartz, and other contaminants also were present. The determination of the chrysotile component was based upon petrographic study or X-ray diffraction examination or both. The lines of the diffraction pattern of chrysotile are weak and quantitative values for that mineral obtained by the X-ray diffraction method are more or less approximate.

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