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J.W. Roberts Limited
"Limpet" Asbestos Spray Machines

The object of this series of dust estimations was to determine the health hazard arising from the use of the asbestos cement spray and to estimate the improvement obtained by the present modifications introduced by the firm.

The work was carried out on the 4th of October, 1949.

A room, in which no other process except the spraying of asbestos was carried out, was put at our disposal. This resulted in very clean slides from the thermal precipitator, only particles of asbestos and cement were obtained on the samples.

The same area of ceiling was sprayed for each sample in the series. The operator stood on a working platform supported by trestles. For each run the sampling head of one thermal precipitator was strapped on the chest of the man operating the spray gun. For each run except one a sample was taken at floor level just below the working platform in order to get an idea of the risk to which other workers in the vicinity might be exposed. In the case of sample TP 102/744 the second sampling head was strapped on the chest of the man who fed the dry asbestos to the pre-damping machine and then fed the opening machine.

Each sample was incinerated for half an hour before counting in order to destroy any carbonaceous dust which might have been present. The sample was then counted on the Vickers projection microscope using a 2 mm. apo. objective and x10 compensating eye piece. Each sample showed a low concentration of asbestos fibre relative to the amount of cement dust. The asbestos fibres could readily be distinguished from the cement dust, and in the table of results attached, the count of asbestos fibres in particles per cubic centimeter is given separately from the particles of cement per cubic centimeter. A photograph of a typical sample is attached, this illustrates the low proportion of fibrous asbestos particles.

Three main sets of conditions were tested:

1. The spraying of dry asbestos cement. In this case the asbestos cement was opened by brushes and spiked roller in an opening machine and fed by compressed air to the gun. Round the circumference of the gun were four water sprays which impinged with the asbestos cement on the area of ceiling sprayed by asbestos.
2. The spraying of asbestos cement fed dry to the opening machine but damped during opening. In this case five sprays of water were applied to the asbestos cement in the opening machine itself. This damped asbestos cement was fed to the gun and the four water sprays applied from the circumference as under (1).
3. Pre-damped asbestos was fed to the opening machine. The asbestos mixture was fed into a horizontal drum which was rotated and the asbestos was damped during rotation. This predamped asbestos was then fed into the opening machine and thence to the gun provided with four spray nozzles.

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RESULTS

1. Spraying dry asbestos cement

<u>Sample No.</u>	<u>Position</u>	<u>Dust Count</u>		<u>Median Size</u>
		<u>Asbestos Cement</u> <u>After Incineration</u> <u>at 500°C.</u>		
TP.101/745	On Chest of man operating spray	483	11,866	Asbestos 3.3/u Cement 0.57/u
TP.102/746	On Floor below scaffold	234	3,324	Asbestos 4.0/u Cement 0.64/u
TP.101/747	On chest of man operating spray	364	6,602	Asbestos 4.0/u Cement 0.56/u
	Repeat of 101/745 after cleaning room with fans.			

2. Spraying asbestos cement damped during opening

<u>Sample No.</u>	<u>Position</u>	<u>Dust Count</u>		<u>Median Size</u>
		<u>Asbestos Cement</u> <u>After Incineration</u> <u>at 500°C.</u>		
TP.101/739	On chest of man operating spray	111	2,489	Asbestos 3.2/u Cement 0.6/u
TP.102/740	On floor below scaffold	102	2,330	Asbestos 4.0/u Cement 0.7/u
TP.101/741	Repeat of 101/739 after clearing air for 10 minutes with fan	123	3,464	Asbestos 3.2/u Cement 0.7/u
TP.102/742	Repeat of TP.102/740	264	3,453	Asbestos 3.0/ Cement 0.8/u

3. Spraying with asbestos predamped in the drum
before feeding to the opening machine

<u>Sample No.</u>	<u>Position</u>	<u>Dust Count</u>		<u>Median Size</u>
		<u>Asbestos Cement</u> <u>After Incineration</u> <u>at 500°C.</u>		
TP.101/743	On chest of man operating spray	49	1,085	Asbestos 4.0/ Cement 0.6/u
TP.102/744	On chest of man feeding drum and opening machine	54	982	Asbestos 3.0/ Cement 0.65/u

The sampling in each case was done over a period of half an hour, spray was carried on continuously during this period. In the case of TP.101/739 and TP.102/740 there were a number of short stoppages for blockages in the gun and this probably accounted for the results being lower than TP.101/741 and TP.102/742.

In order to assess the health hazard the results should be considered in conjunction with those obtained in the spinning room of J.W. Roberts Ltd. on July 20th, 1938 with the thermal precipitator.

In the "Report on Conference between Employers and Inspectors concerning Methods of Suppressing Dust in Asbestos Textile Factories" published in 1931, the Committee agreed that for practical purposes the conditions arising from flyer spinning carried on without exhaust under good general conditions should be taken as the "dust datum".

In Mr. Goodall's report on samples taken in 1938 he obtained counts of asbestos fibre between 410 particles per c.c. and 165 particles per c.c. in a good flyer spinning room.

Therefore it can be said that for the latest machine with predamping in the opening machine the exposure to asbestos fibre is about that of a good flyer spinning room and for asbestos predamped in a cylinder the exposure to asbestos is substantially below that in a flyer spinning room.

It must be emphasised that the object of the measurements was to compare the three methods of spraying and the measurements show conclusively that the predamped method exposes the workers to the lowest concentration of dust.

The measurements were carried out in a room in which no ventilation was provided during spraying. At the end of each period of sampling the dust was cleared by means of fans before the next determination was carried out.

In actual practice higher concentrations would be found in confined spaces and in similar rooms where spraying was carried on for a longer period.

(Sgd) J.S. EVANS.