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IN REPLY QUOTE No. 24/2/25

COMMONWEALTH OF AUSTRALIA

TELEPHONE: MW 2211
TELEGRAPHIC ADDRESS: "NAVYDOCK, MELBOURNE"

H.M.A. NAVAL DOCKYARD,
WILLIAMSTOWN, W.16.
P.O. BOX 8

330

9 - FEB 1944

Secretary,
Public Health Department,
295 Queen Street,
MELBOURNE, C.1.

7110
10 FEB 1944

Dear Sir,

Receipt is acknowledged of your letter of the 5th February, 1944, enclosing report of test taken on the use of Asbestos Panelling and the use of Zinc Chromate (Yellow) Primer and Fire Retardant White.

Thanking you for this information,

Yours faithfully,

E. C. MACKEY,
ENGR. CMDR.
GENERAL MANAGER.

According to

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A number of dust counts of the air in the breathing zone of men engaged on different activities in the Table Room and the Cinema Room (a ship being refilled were made on January 15th.

The results showed that the concentration of asbestos dust in the air in certain cases was above that which is regarded as a safe limit for continuous exposure.

By continuous exposure is meant daily exposure during working hours of each day throughout the year (holidays excepted).

In considering the hazard to health caused by asbestos dust the following facts should be borne in mind.

1. The most important harmful effect of asbestos dust is on the lungs.

Inhalation of sufficient concentration of dust for a considerable period will cause asbestosis which is characterized by a fibrosis of the lungs which causes disability (breathlessness etc.) and may ultimately cause death.

Asbestosis, according to some authorities, predisposes to tuberculosis though this is denied by others. In any case its effect in this regard is less than with silicosis.

2. The important factors in producing asbestosis apart from the original condition of the worker concerned are the concentration of dust and the length of exposure to it.

Exposure to a dense concentration of dust even for a comparatively short time will produce fibrosis, conversely below a certain concentration of dust a disabling degree of fibrosis will not occur within the space of an average working lifetime.

3. The period of exposure to asbestos dust which elapses before asbestosis is caused may in rare instances be less than 2 years, but (1) only cases of definite asbestosis are not discovered on examination within five years of commencing work, although a few are found.

The incidence rate among those who have been working in the absence of preventive measures for between five and ten years is appreciable. The incidence rates among 1512 workers examined by The British Silicosis & Asbestos Medical Board who had been working for the periods of employment, 0-4 years, 5-9 years, 10-19 years, 20 years and over were proportional to the figures, 1, 5.6, 30.4, 53.2.

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(1) According to Gloyne and Merewether.

"Particulars of cases seem to show that with exposure to high concentrations of dust the minimum period of time which must elapse between the commencement of exposure and the production of a serious degree of asbestosis is approximately seven years, made up of the period of exposure during which the fibrosis producing amount of dust is taken into the lungs and the maturation period during which the fibrosis develops. These periods, of course, overlap.

The period may be regarded as the minimum and few cases mature in this period. In the more dusty processes in the absence of adequate preventive methods the asbestosis production period is commonly eleven years."

4. The relationship of dust concentrations to the incidence of asbesto-

According to Lanza the dust given off from asbestos in the

carying from 30-70 percent.

6. The United States Public Health Service recently carried out an elaborate investigation into Asbestosis in the Asbestos Textile Industry.

In this industry 6-15% by weight of all Asbestos textiles in U.S.A. is cotton.

In the dust counts it was found to be impossible to distinguish with certainty the cotton dust for the asbestos dusts and the counts therefore include cotton dust except for those concerned with the raw asbestos.

As a result of these investigations the authors suggest that five million particles per cubic foot may be regarded as a tent[ative] standard, clear-cut cases being found only in dust concentrations exce[eding] five million per cubic foot.

The following table showing the relation between asbestosis and total dust exposure is expressed in million particle years, i.e. the number of million particles per cubic foot multiplied by the years of exposure.

Diagnosis.	Million particle years.			
	Less than 25	25-49	50-99	More than 100
Essentially normal	191	81	43	52
Asbestosis of various degrees of severity.	5	3	13	55
Cases as percent of total exposed.	2.5	3.6	23.2	50

It is considered by some authorities that the asbestos fibres are more important from the point of view of producing asbestos than the nonfibrous particles.

If this is so then the total counts which have been used in the above table could not be regarded as completly satisfactory measure of the fibrosis producing power of the dust. However, this point is still not decided.

The dust counts found in the investigation at the Naval Dockyards on 5/1/44 are set out in the following Table 2.

Position Activity	Table Room. Total Count	Fibres	% of Fibres	Cinema Room Total Count	Fi[bres]	% of Fibres
General air of room.	15.2	5.04	33	21.8	5.36	25
				14.6	4.70	32
Sawing	11.89	3.0	25	13.7	5.21	38
	35	16.5	47			
	15.04	7.45	49			
	13.75	3.5	18			
Hammering	8.8	3.98	45	9.06	3.2	35

(3c)

The dust counted includes fibres of asbestos and other nonfibrous dust from asbestos, dust from the filler, and ordinary atmospheric dust. The latter in this case can be neglected. The filler might amount to 15% of the weight of the board. The actual dust counts due to this as distinct from the asbestos could not be determined, but it is reasonable to assume that the greater part of the total count was due to asbestos. The counts recorded in this table indicate that there would be a distinct asbestosis hazard for people working in these places where these tests were made if the exposure were continuous. By "Continuous" is meant throughout the working day, and throughout the working year.

On the basis of the American report one might expect that a small percentage would show signs of asbestos after working continuously in such atmospheres for two or three years.

If the exposure is only of the order of 2-3 weeks in a year it is not considered that the hazard is of such order as to require preventive methods except such as are suggested below.

Conditions could be improved by sawing the sheets in the open air where this is practicable, and by ensuring that all portholes are open.

In certain circumstances such as work in cabin or space which has no direct opening to the open air, it is not unlikely that dust concentrations might be such as to require the use of respirators even though the work lasted only a short period. Furhter tests could be done to determine this point, should the circumstances arise. All the above observations apply to healthy workers who have not, previous to this type of work, been engaged on work involving exposure to asbestos dust. If there are any who have worked for some years in the asbestos industry, or have worked for long periods, with this type of material, they may require dust respirators to prevent further exposure.

D. O. SHIELS.

Medical Officer of Industrial Hygiene.

References.

1. Asbestosis Occupation & Health (Supplement 1938) International Labour Office.

2. Silicosis & Asbestos. Manza p. 387.

3. A Study of Asbestosis in the Asbestos Textile Industry, U.S.P.H. Bulletin, No.241, 1938.