FILE NAME: Asbestos Sacks and Bags (ASB)

DATE: 1949

DOC#: ASB007

DOCUMENT DESCRIPTION: Annual Report of the Chief Inspector of Factories - Presented in 1951

s/jute shipping sacks

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FACTORIES

ANNUAL REPORT OF THE CHIEF INSPECTOR OF FACTORIES

FOR THE YEAR

1949

Presented by the Minister of Labour and National Service to Parliament
by Command of His Majesty
February 1951

LONDON
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Even in the home of this staple industry there are hardly any unoccupied weaving sheds, and what premises have been available have not complied with either the whole or parts of Regulation 7 of the Cotton Cloth Factories Regulations. The main difficulty has been in complying with Regulation 7(*a*), which prescribes that the average height of a shed shall not be less than 14½ feet and Regulation 7(*b*), which prescribes that the lights shall face between north-east and north-north-west. In a number of suitable cases exemptions from parts of Regulation 7 have been granted, but there have been several cases where applications from firms to use unsuitable premises for weaving have been rejected on the grounds that the premises have been so patently at fault from the viewpoint of the Regulations that District Inspectors have unhesitatingly advised the people concerned to seek alternative premises.

Inspectors report that the number of "dry" sheds, i.e., those in which no steps are taken to humidify the atmosphere by artificial methods, is undoubtedly increasing, due in part to changes in the type of cloth woven, better sizing and the introduction of rayon yarns into cotton sheds. Where artificial humidity is used, it is reported as a great deal less on the whole than was the custom at the time of the introduction of the Regulations.

The long warm summer last year gave ample opportunity for observing conditions in weaving sheds when outside temperatures were high, and it was interesting to find that in only very few cases did the Inspectors in cotton districts find contraventions. These cases were mainly among firms weaving very fine cloths where 75 per cent relative humidity was stated to be required to avoid warp breakages. As the temperature rose, readings in excess of ½° F. were found on the wet bulb, whilst humidity was still required to obtain 75 per cent relative humidity. Complete air conditioning plant which would entail the installation of refrigerating plants to deal with the very few hot dry days on which such conditions occur in the normal English summer, whilst a possible solution of the problem, is not a practical one from the financial and economic standpoint.

Another marked change over recent years is the fact that temperatures are rarely found too low on cold mornings — the use of unit heaters and air conditioning plants and combined heating and ventilating plants has materially improved conditions in the sheds, and temperatures can now be raised much more quickly than by former methods. Far more cotton-weaving factories have now installed plant whereby the temperature can be automatically controlled.

Asbestos Regulations

The Code of Regulations dealing with the dangers arising in the handling of asbestos has been in force since 1931, and reports show that constant vigilance is necessary in order to ensure that there is no slackening in the fulfilment of the precautionary measures laid down. In factories where processes scheduled under the Regulations are carried on, the maintenance of dust control, particularly adequate exhaust ventilation at all possible points where dust may be evolved, is of the utmost importance. Those firms which have had long experience with the product and realize how the incidence of asbestosis arises are fully alive to the many problems involved, and from the inspection point of view, it is very necessary to keep an ever watchful eye on the new use of asbestos in some manufacturing or other process, for example, on ships or buildings where the work may be undertaken by some-one not fully realizing the necessity of preventing as far as possible the dissipation of asbestos fibre and dust.

It is well known in this industry as in others where there is a dust hazard, that there is scope for research and experiment in the effective application of exhaust ventilation to a variety of processes and machines. The weaving of asbestos is one such process, and reference is made to one weaving factory where it had been the practice to wet the asbestos before weaving and it was realized that there would be certain advantages if this wetting could be dispensed with. The local application of exhaust ventilation above and below the warp, behind the heald and at the "beat up" have been tried with only partial success and it was thought that it might be possible to place each loom in an exhausted enclosure so that the weaver remained outside and all the dust produced at various parts of the loom thus extracted without entering the air of the shed. This was tried experimentally on a pair of looms. The enclosures were built up of light hardboard panels some hinged and some removable to give access to the loom when necessary. Panels of transparent plastic material were fitted in the top of the enclosures and artificial lighting provided inside. The enclosures were exhausted from the top. It was found that this was an effective way of dealing with the dust, but there were so many other difficulties with regard to lighting, heating and handling to overcome that the firm decided not to extend the idea. It was finally considered that reorganization involved in filling a weaving shed with large box-type enclosures was too complicated to make the idea worth-while. Other methods of exhaust ventilation are now being considered.

The main method of preventing the escape of dust into the air of another weaving shed consists of a combination of an extensive exhaust ventilation system and wet processes. The weft pirns are steamed in cabinets situated alongside the looms and the warp is damped as it passes over a roller which revolves in a trough of water mounted in front of the warp beam. Exhaust ventilation is also applied above and in front of the shuttle race and beneath the reeds and healds. Blending for the textile product at this works is at present carried out by hand on the floor of one workroom, mechanical exhaust ventilation being provided in this room by means of a duct at a height of 7 ft. 6 in. on the walls with many openings fitted with slides which can be opened or closed as required. Experiments are in hand, however, with a mechanical drum blender in which an oil spray is injected as the drum rotates and the whole plant installed in an enclosure provided with exhaust ventilation.

One large asbestos factory has instituted a scheme for replanning and reorganizing part of the works where opening and mixing processes are carried on, because they were dissatisfied with the existing methods of dust suppression and realized that having regard to the old premises in which these particular processes were housed nothing short of re-siting and reconstruction would solve their difficulties. At the same time, on the medical side, the firm has started a new scheme of medical examinations, and has appointed a part-time works' doctor who has a thoroughly good knowledge of the asbestos industry and the risks of working therein. The new scheme includes an initial clinical examination and X-ray screening, followed by a clinical and/or X-ray examination every year of workers employed in scheduled areas. Arrangements have been made to buy screening apparatus and to have X-ray films taken. It is proposed to alternate clinical examinations carried out by the works' doctor with those carried out by the Pneumoconiosis Medical Panel and for this purpose the firm is anxious to work closely with this Panel and have made a request to the local doctor in charge. The scheme should be well under way in 1950 and its development will be watched with the greatest interest.

Portable asbestos spraying plants are used to an increasing extent by contractors on buildings, ships, etc., for insulation purposes. Asbestos is fed into

he spraying machine by hand, and conveyed by means of a small spiked ıand to a small card cylinder which takes the fibre from the travelling band nd feeds it in a flocculent condition to a fan by which it is blown to a spray un where it is ejected by means of compressed air. The spray gun consists of centre jet for asbestos, surrounded by four jets of water which converge on ıe asbestos spray at about 1 foot from the end of the gun. Also a fine ɔray of water is provided over the spike band conveyor in the actual ıachine. The control, by means of a valve on the spray gun, is so arranged ıat the water jets must be in operation before asbestos can be delivered to ıe gun. If the water supply fails the supply of asbestos is automatically opped.

In view of the risks to health unless proper precautions are taken in ıe spraying of asbestos by means of these portable plants, the firm from hich they are hired runs a school where employees of various insulation ɔntractors are given a course of training in their proper use and manipulation, sting about 14 days, and representatives attend these courses from overseas ; well as from the British Isles.

Several Inspectors refer to the unsatisfactory practice of packing raw ıbestos fibre into unlined hessian or jute bags (frequently it is shipped at the ɔuntry of origin, and delivered to a factory in this manner) which renders orkers handling them liable to considerable exposure to dust and fibre. The egulations prohibit the use of such sacks or bags for transport of the material ithin the factory — for which purpose only containers constructed of ıpermeable material kept in good repair are permitted. In handling packages hich are not impermeable, the use of an approved type of respirator by all ɔrkers concerned is very important.

Clay Works (Welfare) Special Regulations, 1948

These Regulations have now been in force for over a year and it is possible give a better assessment of the degree of compliance than was possible last ar. It appears that this is variable from works to works ; on the whole a rious attempt to fulfil the requirements is being made in the larger works, ıt much remains to be done in the smaller places. These small works are ɔed with their own special problems; many of them work only intermittently d some have remained closed for long periods. Demand varies and they are ıt always able to compete with the larger firms ; they are often situated in mote areas without sewerage or piped water supply. In some localities it ɛms that employers have decided not to act unless pressed, particularly on ɛ provision of protective clothing, and several Inspectors suggest that legal ɔceedings may be necessary before this attitude is changed. In one District ɔmpletely non-co-operative firm was prosecuted and fined, and now shows ɪns of improvement. In another, a firm fined for breaches of the safety ɛtions of the Act has had a general change of attitude and is now setting out the provision of amenities.

The best progress is reported in the provision of washing facilities, some- ıes in the face of very real difficulties of water supply and drainage. Many ɔorts tell of new basins with hot water laid on ; some works have shower- ths and a number of ablutions blocks are approaching completion. Where ɛ provision is of good standard and well placed, it is found to be well tronized and abuse is rare. Poor provision rapidly becomes worse as there no incentive to treat it well.

There has been steady development in the provision of canteens. In the aller works, snack meals are popular. Some messrooms have been trans- med by colour schemes.

The usual Tables have been brought up to date and are set out below.

TABLE XIV

DEATHS FROM FIBROSIS OF THE LUNG, INCLUDING SILICOSIS, ASBESTOSIS, PNEUMOCONIOSIS AND BYSSINOSIS (ENGLAND AND WALES), 1940 TO 1949

	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
SILICOSIS:—										
1. Refractories industries ...	16	12	7	7	6	9	8	10	13	13
2. Pottery, manufacture of ...	53	45	47	41	32	41	49	54	48	63
3. Sandstone quarrying and dressing	42	24	14	24	26	21	20	12	28	15
4. Sandstone masons ...	67	58	40	53	31	44	41	43	40	36
5. Metal grinding	24	13	13	11	7	11	6	9	8	14
6. Sandblasting	13	4	4	6	7	6	4	5	5	5
7. Steel dressing and cleaning of castings	4	9	9	4	10	5	22	13	13	18
8. Stone, pebble, flint and sand crushing	5	1	2	1	4	—	—	3	1	3
9. Scouring powders, manufacture of	—	2	—	1	1	1	—	—	—	1
10. Abrasive wheel manufacture	—	—	—	1	1	2	1	—	—	—
11. Glass cutting and bevelling	—	1	2	—	—	—	2	—	—	—
12. Millstone dressing ...	—	—	1	—	—	—	—	—	—	—
13. Slate quarrying and dressing	7	6	4	6	7	6	13	20	16	21
14. Granite quarrying and dressing	1	1	3	2	—	1	—	4	1	1
15. Tunnel mining (sewage works, etc.)	2	—	5	4	4	4	5	—	3	2
16. Coal mining	232	196	230	276	277	323	343	347	322	336
17. Gold mining (South Africa)	10	7	7	4	9	4	7	5	4	4
18. Tin Mining	21	17	12	14	11	19	14	12	11	20
19. Iron ore (haematite) mining	20	4	7	5	7	2	9	6	12	9
20. Lead mining	—	1	3	1	1	1	1	2	—	1
21. Copper mining	—	1	2	1	—	—	—	—	—	1
22. Barytes mining	3	3	—	4	—	2	1	1	—	3
23. Clay mining	—	—	—	1	—	1	—	—	—	1
24. Mining engineers ...	—	—	3	1	—	—	1	1	2	1
25. Miscellaneous	2	1	2	2	4	5	6	11	7	7
Total—SILICOSIS ...	522	406	417	470	445	508	553	558	534	575
ASBESTOSIS	11	17	11	8	10	11	16	15	15	17
PNEUMOCONIOSIS:—										
Coal Mining	—	—	—	—	34	64	78	230	317	420
Other Industries	—	—	—	—	3	11	5	12	19	14
BYSSINOSIS	—	—	6	7	1	10	3	4	8	7
OTHER CASES OF (NON-OCCUPATIONAL) FIBROSIS ...	650	461	443	493	531	529	568	616	651	554
GRAND TOTAL	1,183	884	877	978	1,024	1,133	1,223	1,435	1,544	1,587

TABLE XV

FATAL CASES INVESTIGATED UP TO THE END OF 1949

	Number of deaths	Average age at death	Duration of employment in years		
			Longest	Shortest	Average
SILICOSIS					
Pottery:—					
Silicosis	579	61·2	62·0	2·8	38·8
Silicosis with Tuberculosis	423	55·5	67·0	5·0	34·6
Sandstone:—					
Silicosis	206	59·2	60·0	9·0	39·4
Silicosis with Tuberculosis	209	56·7	55·0	5·0	37·2
Grinding of Metals:—					
Silicosis	102	58·7	56·0	14·0	36·4
Silicosis with Tuberculosis	196	53·7	53·0	2·8	32·9
Sandblasting:—					
Silicosis	61	48·7	28·0	1·7	12·3
Silicosis with Tuberculosis	96	46·1	46·0	2·0	13·1
Manufacture of Scouring Powders:—					
Silicosis	13	37·2	37·0	2·3	8·2
Silicosis with Tuberculosis	6	40·8	11·2	2·0	7·0
Miscellaneous:—					
Silicosis	211	54·6	57·0	1·5	23·3
Silicosis with Tuberculosis	206	51·2	50·0	0·7	25·2
Total:—					
Silicosis	1,172	58·5	62·0	1·5	34·2
Silicosis with Tuberculosis	1,136	53·8	67·0	0·7	31·1
ASBESTOS					
Asbestosis	186	48·2	48·0	0·5	15·6
Asbestosis with Tuberculosis ...	78	39·2	29·0	0·8	10·5

Industrial Lung Diseases of Iron and Steel Foundry Workers

A survey extending over four years of the industrial lung diseases amongst iron and steel foundry workers has been made by a team led by Dr. A. I. G. McLaughlin, one of the medical inspectors. His collaborators were Dr. E. A. Cheeseman (Department of Social and Preventive Medicine, Queens' University of Belfast), Miss Jessie Garrad (Medical Research Council), Dr. S. Roodhouse Gloyne (London Chest Hospital and the Institute of Social Medicine, Oxford), Dr. H. E. Harding (University of Sheffield), Dr. M. H. Jupe (London Hospital), Dr. K. M. A. Perry (London Hospital), Dr. C. L. Sutherland, O.B.E. Ministry of National Insurance), with Mr. K. L. Goodall, Mr. W. B. Lawrie and Mr. H. Woods (Engineering and Chemical Branch of the Factory Inspectorate). Over 3,000 foundry workers in 19 foundries were examined clinically and radiologically; analysis was made of the records of lung diseases in foundry workers in the files of the factory department and of the Pneumoconiosis Medical Board; pathological examinations were made of the lungs of 64 foundry workers and dust surveys were carried out in three foundries.

The Report, which has been published (1950) in book form by H.M. Stationery Office, shows that nearly all categories of foundry workers are liable to inhale dust which produces abnormal X-ray pictures of the lungs, some of the abnormal shadows representing actual lung fibrosis, but others indicating deposits in the lungs of iron oxide which does not cause fibrosis.

Silicosis was found to be a serious risk amongst sand and shotblasters, fettlers of steel castings, furnace bricklayers and some iron moulders. Fettlers of iron castings and steel moulders run less risk of contracting serious lung disease and in the former the histological appearances of the lungs are more often those of a "mixed dust" pneumoconiosis rather than of classical silicosis. Welders develop abnormal X-ray pictures which represent mainly siderosis which is not disabling; but if they work in a fettling shop they are liable to contract in addition, mixed dust pneumoconiosis and sometimes silicosis. Coremakers and pattern shop workers are exposed to a minimal risk of contracting lung disease. Other categories of workers are dealt with in detail. The incidence of active tuberculosis found in the survey was not high, being 3·6 cases per 1,000, which is about the incidence found in the general population.

The careful dust survey made by Mr. Goodall in an iron foundry revealed dust cloud concentrations varying between 270 and 2,800 mineral dust particles per cc. with median particle sizes between 0·5 μ and 0·8 μ. In a steel foundry he made another survey which showed that there were also widely varying concentrations of airborne dust in different foundry processes. The highest concentration was found in a shotblasting chamber.

The pathological work by Dr. S. Roodhouse Gloyne and Dr. H. E. Harding is particularly valuable, because no previous foundry survey has included a description of the pathology of the workers' lungs. There is always room for speculation about the causation of X-ray shadows, but not as a rule about histological appearances.

MISCELLANEOUS HEALTH AND WELFARE

Building (Safety, Health and Welfare) Regulations

The introduction of this comprehensive code of legal requirements in October, 1948, applying as it does to practically all building work and placing responsibility on small as well as large building contractors, coincided with an increase of building work, and the enforcement of the Regulations has taken up an appreciable amount of the time of all Inspectors during the past year. It has been a year of intensive instruction; apart from visits to individual sites a very large number of lectures have been given to all types of audiences drawn from the trade. In one instance, for example, 200 workers on a London site spent practically the whole of their lunch time questioning an Inspector on points under the Regulations.

The main impressions after a full year's working of the Code is that steady progress has been made. This, as was to be anticipated, is more marked amongst the large contractors than amongst the small, and cases where the latter appear to have no knowledge of the requirements are still being met with. One District, for example, reports the case of the builder who, having no proper hoist on a job, rigged up a platform which was raised and lowered four storeys of a tall factory building with the aid of a motor lorry moving shuttle fashion across the mill yard. In another report is the following description of a scaffold found in use in a large northern town. When seen, the working platform was one unfenced 9-inch plank some 40 feet above a city street. It was supported by means of two ladders slung from wire ropes over the parapet of the building and carrying ladder brackets which carried the plank. The support for each ladder was merely a 112 lb. weight attached to each supporting wire over the parapet. Access was by clambering over the parapet and descending one of the vertical ladders. In dead weight alone,