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During a meeting with Mr. Malcolm Meyer on this subject, the attached booklets were given to me for distribution. This is the European approach to the cancer scare and considered confidential information. For your information and file I have also included the flyleaf published by Asbestos Information Committee, 10 Wardour Street, London, W.1.

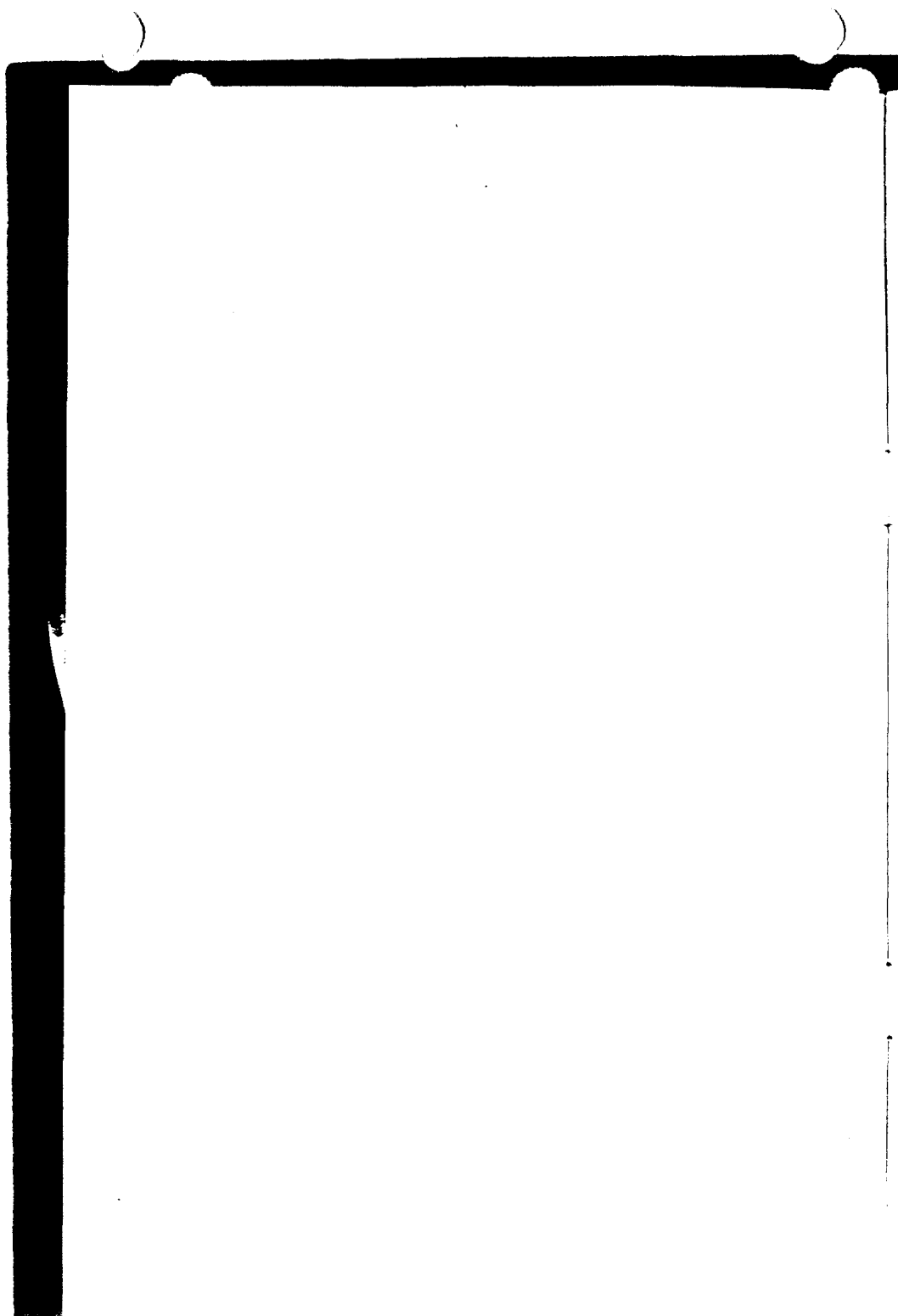
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GENERAL SALES & CO. PIPE

APR 15 1968

ASBESTOS- SAFETY AND CONTROL

ASBESTOS INFORMATION COMMITTEE



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Introduction

This booklet has been prepared for the management and staff of the asbestos industry to help them answer questions which they may be asked in relation to the possible risks associated with asbestos and health.

Asbestos is a vital raw material with a unique combination of properties. It is an essential ingredient in brake and clutch linings and gaskets in the motor industry because it imparts efficiency at high temperatures. In fact, safety on the road depends on asbestos. Because of its fire resistance, asbestos is used in the boards which line ships' cabins, to isolate fires and prevent their spread. Safety at sea depends on it, and there is no efficient substitute. It is also used for heat insulation and fire prevention in schools and other buildings where large numbers of people have to congregate; countless lives have been saved because asbestos-based partitions have contained fires or asbestos protection of steelwork has delayed the collapse of a burning building. Its high mechanical strength and stability lead to its use as a reinforcing material for asbestos-cement and insulation. It is spun and woven to make cloth for protective uses. There are thousands of essential products in which asbestos plays an indispensable role.

The problem

There are three principal types of asbestos: white (chrysotile), amosite (grey or fawn in colour) and blue (crocidolite). Medical evidence has shown that there are two diseases which may be associated with occupational exposure to asbestos dust. One of them, asbestosis, is a lung condition caused by the inhalation of substantial concentrations of airborne asbestos dust over a period of time, usually a good many years. For this reason it is mainly an industrial hazard. People with asbestosis have an increased liability to lung cancer, particularly in old age.

Mesothelioma, the other disease, is an extremely rare form of cancer (there are fewer than 50 cases recorded a year in this country, not all of which have an association with asbestos). It is thought to be mainly associated with blue asbestos (crocidolite), although medical experts have not made up their minds about this. Blue represents only 1% of total UK asbestos imports. Since mesothelioma can take as long as 40 years to show itself, most of the cases occurring today are of people whose exposure took place before the war when controls were not as efficient as they are now.

Overcoming the problem

The asbestos industry, deeply conscious of its responsibility to safeguard those who may come into contact with asbestos, annually spends £500,000 on prevention and medical research. It has, in addition, allocated another £100,000 to the Asbestosis Research Council for an expanded programme of research. This body was set up by the industry in 1958 and has been responsible for important advances in medical and scientific knowledge relating to the effects of asbestos dust, and in methods of dust control. Codes of Practice for the safe handling and working of asbestos and asbestos-based products have already been issued by the Asbestosis Research Council for the building, insulation and shipbuilding industries, and similar Codes are at present in preparation for other industries. The Code for the building industry will also be a useful guide for other industries which need to cut and machine products containing asbestos. A summary of these Codes forms an appendix on pages 15-19. The Asbestosis Research Council is always willing to give advice on all medical and technical matters concerned with the safe use of asbestos.

Environmental exposure

Is there a health risk for the occupants of buildings where asbestos materials have been used?

There is no evidence whatever that the incorporation of asbestos in a building or its services has ever impaired the health of the occupants.

Building and industrial products:

Occupational exposure

Is there any danger in cutting, drilling or machining asbestos and asbestos-cement products?

Provided the recommended Code of Practice is followed, it is considered that there is no danger to health involved in these operations.

What precautions should be taken when handling and machining asbestos and asbestos-cement products in factories and confined spaces?

Obviously in a confined space greater care needs to be taken, but again the relevant Code should be followed.

How can I avoid dangerous levels of dust?

Dust extraction equipment should be provided for all mechanical work, or efficient respirators should be worn. Hand cutting and working are safe without a respirator when in the open air or when carried out intermittently in large, well-ventilated spaces.

Am I likely to inhale asbestos dust when machining asbestos electrical insulation materials?

No, provided reasonable precautions are taken in accordance with the Asbestosis Research Council's Code of Practice, i.e. the fitting of dust extraction equipment or the wearing of approved respirators.

What precautions should be taken when removing thermal insulation?

Respirators approved by the Factory Inspectorate, suitable overalls and head gear should be worn when removing thermal insulation, and the material should be damped and placed in a container immediately. The Thermal Insulation Code should be consulted.

Is the standard dust extraction equipment used for woodworking machinery suitable for materials containing asbestos?

The standard equipment used for woodworking is not always considered suitable for materials containing asbestos because fine dust requires more powerful extraction, and special arrangements for the collection of dust will be required. Advice from a competent dust extraction engineer should be taken on this matter.

Is there a risk for stockists, distributors, wholesalers and shops distributing materials containing asbestos?

There is no risk involved in handling processed asbestos products. If they are regularly machined (e.g. in order to cut them to size for customers), then the recommended Code should be followed.

Is there any risk in handling asbestos-based materials in the formed, moulded, or finished state?

No, the materials have passed the production stage, so that there is no risk of inhaling asbestos dust when handling, but further cutting or drilling should follow the relevant Code.

When asbestos insulation is being applied, should men in the vicinity wear approved respirators?

Where insulation board or pre-formed materials are being properly applied there should be no hazard, but if unavoidable circumstances create dusty conditions, men nearby should be moved away while these conditions persist. Precautions should, however, be taken by men working near spray application, in accordance with the Thermal Insulation Code.

How soon after stripping of asbestos insulation has finished is it safe for other work to proceed without respiratory protection?

Each case will be different, depending on the area, the ventilation, the insulation material and other factors. Ideally, an employer would draw up rules for regularly recurring conditions. Generally between half an hour and an hour would be recommended after stripping, provided that this has been carried out in accordance with the recommended Code. It is best to carry out stripping overnight so that other trades are not kept waiting.

Is sprayed asbestos insulation once applied in a building safe from the point of view of health?

Yes. Where the insulation is exposed to abrasion or impact, as a result of which dust could be released into the atmosphere, it is provided with a tough, decorative coating or with a smooth, hardsetting protective rendering.

Asbestos in the motor industry

Does the braking of millions of vehicles produce a hazardous dust?

No, because the amount of dust liberated from brake linings is insignificant. Most of the dust consists of the products of wear of the metal brake drum and the resin compounds in the brake lining. The amount of free asbestos fibre in it is extremely minute, since the heat generated in braking converts most of this residue into an amorphous material which is no longer asbestos.

Is there any risk to health in handling brake and clutch linings?

No, because the asbestos fibre is embodied in the material.

Is there any risk in rivetting or bonding brake linings?

No, there is no risk if the linings are pre-drilled, in the case of rivetted linings. Exhaust ventilation should be provided at the drilling operation if this is a regular practice. No dust is generated in bonding brake linings, so there is no risk.

What precautions ought to be taken when brake linings are being ground?

Exhaust ventilation should be provided. The dust extraction plant fitted to most commercial brake lining grinding machines is adequate.

Are these precautions necessary when grinding is only done occasionally, say for eight hours a week?

Yes, in order to eliminate all possible risk, it is advisable to take these precautions.

Is the dust found in brakes and clutches when dismantling harmful?

The amount of asbestos fibre found is minute (see first answer above) but the dust is very fine and it is good practice to remove it by vacuum, rather than by an air blast.

What type of asbestos fibre is used in brake or clutch linings?

For technical reasons white asbestos (chrysotile) is the only suitable fibre.

Problems with asbestos-reinforced plastics

What precautions are necessary when machining (including cutting and sawing) and grinding asbestos-reinforced plastics?

Effective dust extraction and collection must be provided on all machine tools or power-driven hand tools, or the work should be done wet. Grinding should be carried out wet wherever possible. Where it is impracticable to provide dust control in these ways, operators should wear approved respirators and overalls made from nylon or other synthetic material free from open pockets, etc.

Is it safe to machine asbestos-based plastics without the use of respirators and/or mechanical dust extraction?

No, but hand tools (not power-operated) can safely be used in the open air or in a well-ventilated area.

Is the dust liberated under wearing conditions from moving parts made from asbestos-reinforced plastics, such as slides, bushes and bearings, considered a health hazard?

No, because the amounts given off by normal wear are minute (these are low friction or anti-friction materials) and because the common use of lubricants would neutralise any dust that was created in the unlikely event of a bearing breaking up.

Some general questions

What exposure, in terms of dust concentrations, could produce asbestosis?

The answer to this question is not known precisely, but the experience of asbestos factories where the risk has been successfully controlled is that it has to be substantial. Dust exposure data, which are being methodically accumulated, have formed the basis of statistical calculations by a committee of the British Occupational Hygiene Society, whose report will soon be published.

Can a short exposure to asbestos dust cause asbestosis?

The asbestos industry's past medical records suggest that exposure to really dense concentrations even for a short time can overload the lung; such conditions do not exist today in asbestos factories and can be easily prevented elsewhere. Exposure to such concentrations should not be allowed in any circumstances; all the recommended precautions should be taken.

What are the signs that asbestosis may be present?

Coughing and breathlessness, without other obvious cause, coupled with clinical, radiological and functional abnormalities which an expert would recognise, are the chief signs. The important thing is to keep adequate medical records of employees working regularly with asbestos products.

Should exposure cease upon the first indication of asbestosis?

Yes.

If the industry's precautions are effective, why are more cases of disease associated with asbestos being reported?

Because cases of asbestos-associated disease occurring today are the result of exposure many years ago, mostly among workers outside asbestos factories working in trades which have only become effectively controlled comparatively recently. Better control and diagnostic techniques have also identified more cases. The number of new cases in the UK in 1966 (the latest year for which figures are available) was 114.

How much asbestos and of what type is contained in:

	% approx.	Type
asbestos-cement building products	12-15	White (chrysotile)
fire-resisting insulation boards ..	25-40	Amosite
asbestos paper	70 95	White (chrysotile)
asbestos millboard	45 98	White (chrysotile)
sprayed asbestos insulation ..	50	Amosite or blue (crocidolite)
asbestos insulation blocks and pipe sections	55	Amosite
moulded calcium silicate or magnesia, containing asbestos ..	12½-15	Amosite
brake and clutch linings	30 70	White (chrysotile)
asbestos-reinforced thermosetting plastics	55	White (chrysotile)
asbestos jointings and packings ..	25-85	White (chrysotile)
asbestos textiles	85-100	White (chrysotile)
acid-resisting textiles and packings	75-85	Blue (crocidolite)
battery boxes	7½-15	Blue (crocidolite)
asbestos-cement pressure pipes ..	12-14	White (chrysotile)

Are these proportions dangerous?

There is no risk unless the very fine airborne fibres are inhaled, which does not happen with finished products in normal use.

Where is blue asbestos (crocidolite) employed?

In the UK blue asbestos is used mainly for battery boxes, because of its acid-resisting properties, and for those packings where acid resistance is essential; use of blue for sprayed insulation is declining and amosite is now more widely used. Blue asbestos is not used in asbestos-cement building products, asbestos boards or panels manufactured in this country. Nor is it used in protective textiles, brake and clutch linings or pre-formed insulation.

Is it safe to use blue asbestos (crocidolite) in any amount where airborne dust is produced?

Blue asbestos is at present under some suspicion as being a cause of mesothelioma. Therefore special precautions should be taken, although the asbestos industry believes that only heavy exposure is dangerous. For these reasons the industry has taken voluntary steps to restrict the use of blue asbestos (crocidolite) in this country to essential applications. If the degree of protection resulting from the careful observance of the Thermal Insulation Code is provided, the use of blue asbestos may be safely permitted.

Guidance for employers

What will it cost to implement the recommendations of the Asbestosis Research Council's Codes of Practice?

Since the Factory Regulations stipulate the use of dust extraction equipment with any machinery which creates a dusty atmosphere, little additional cost should be involved on this score in factories.

Portable dust extraction units are available at various prices, depending on size, from about £100. Any additional cost in relation to sprayed insulation is the result of re-programming work in order to segregate the applicators, rather than purchasing additional equipment.

The other recommendations, for wetting dust when cleaning up, vacuum cleaning, etc., should be part of the normal practice of good factory and site hygiene.

Approved respirators cost just over £1 each at present.

Overalls made from nylon or other synthetics are quite normal now in industry.

Disposal of asbestos waste is arranged by the spray contractor in the case of sprayed insulation. For other types of work its disposal in sealed bags can be arranged with the local authority or disposal specialists, but since the amount of waste caused by machining even large amounts of asbestos-cement and asbestos boards is relatively little, this is not costly.

Why should I use asbestos materials?

Different types of asbestos-based materials possess different merits. Asbestos is used in many building products because of its outstanding fire-resistance, strength and stability, which make it indispensable for fire-resisting partitions. In asbestos-cement it combines these qualities with incorrodibility and economy. Incorrodibility and resistance to soil attack are important advantages in underground pipes. Sprayed asbestos insulation is unique in its combination of fire-protection, thermal insulation, sound deadening and corrosion resistance. Asbestos textiles and packings are irreplaceable in industry because of their resistance to heat, chemicals and humidity.

Is clothing, even slightly dusty, considered a health hazard?

There is no hazard from contact with the dust on the clothing; the hazard exists in breathing it. If, therefore, the clothing is always carefully handled so as not to release dust into the atmosphere, there is no health hazard. When it is washed or laundered, all risk can be avoided by placing it in water immediately, without shaking. Special arrangements may need to be made with a laundry if large quantities of dusty clothing are involved.

Are special precautions necessary when disposing of asbestos waste?

Asbestos dust should, as far as possible, be damped and collected by vacuum rather than brushing or positive pressure methods, and should be put into impermeable bags or containers for disposal in an appropriate disposal area. Chunky waste should be placed in a covered bin, which should be suitably marked.

When is it essential to wear respirators as a precaution against the asbestos health hazard?

If it is not possible to use mechanical dust extraction equipment and there is continuous exposure to heavy concentrations of asbestos dust, then respirators should be worn.

How can an employer assess that environmental conditions are satisfactory when processing asbestos products, and who can provide an advisory service on this?

The first criterion is the visibility of dust in the air. Is it asbestos dust? To help in establishing this, some major asbestos manufacturers and occupational hygiene departments in several universities are able to provide a dust counting service. It is important to be able to discriminate between asbestos dust and other dust particles. Advice is freely available from the Asbestosis Research Council.

What types of employee are required to undergo initial and periodical medical examinations?

People employed in occupations which come within the scope of existing Ministerial Regulations, i.e.

- (i) breaking, crushing, disintegrating, opening, or grinding of asbestos, and the mixing or sieving of asbestos, or any admixture of asbestos, and all processes involving manipulation of asbestos incidental thereto
- (ii) all processes in the manufacture of asbestos textiles including preparatory and finishing processes
- (iii) the making of mattresses composed wholly or partly of asbestos, and processes incidental thereto.

Full particulars may be found in two Stationery Office publications: "The Silicosis and Asbestosis (Medical Arrangements) Scheme 1931" and the "National Insurance (Industrial Injuries) Regulations 1959", Schedule I, part II, clause 9.

New Factory Regulations now in draft may modify this answer.

Is a Factory Inspector entitled to order the use of alternative materials to asbestos?

No. His responsibility is to see that the job is being safely executed in accordance with the Factory Regulations. Provided that the Regulations are being observed, the Inspector has no further powers.

Summary

We have attempted, in this booklet, to provide answers and advice on the problems which many industries, requiring asbestos in daily use, have to face. While it should not be treated as a complete statement of current regulations, it gives the best guidance at present available, based on authoritative medical opinion.

Asbestos is perfectly safe to work with and perfectly safe in use if proper control is exercised. The risks to health associated with an occupational use of asbestos can be eliminated, provided that the recommended Codes of Practice for handling and working asbestos are followed.

Appendix

THE ASBESTOSIS RESEARCH COUNCIL CODES OF PRACTICE

Introduction

The present Factory Regulations recognise asbestosis as an industrial disease which could arise from the inhalation of asbestos dust. The regulations, which stipulate rules for the protection of workpeople engaged in the manufacture of certain types of asbestos products, do not include any special requirements relating to the handling of products containing asbestos for use in thermal insulation, building construction or shipbuilding industries.

The Ministry of Labour is now considering extending the regulations which apply to the handling of asbestos and asbestos-cement products in factories so that they cover wider applications of handling and processing and, while it is not certain to what extent this change will apply to the thermal insulation, building and shipbuilding industries, it is felt that some preliminary guidance should be given.

This guidance takes the form of Recommended Codes of Practice which the Asbestosis Research Council has prepared in anticipation of the extension to the regulations.

The use and manipulation of asbestos and asbestos-cement products is very diverse and ranges from the fixing of an occasional single sheet to large scale lagging or extensive operations involving cutting or machining by power-driven equipment. While care should always be exercised, special precautions are only necessary when there is a possibility that operatives may inhale asbestos dust as a result of proximity to lagging, cutting, grinding or similar operations.

The following are relevant extracts from the Recommended Codes of Practice referred to throughout this booklet. Copies of the individual Codes are obtainable from the Asbestosis Research Council, PO Box No. 40, Rochdale, Lanes., or from the Asbestos Information Committee, 10 Wardour Street, London W.1.

*Extracts from the Recommended Code of
Practice for Thermal Insulation*

**Where asbestos products are used the following
procedures should be adopted:**

- 1) Wherever possible preformed material rather than site mixed material should be used.
- 2) Working with loose lagging material should be done in the wet state wherever practicable, rather than in the dry. Methods of transporting pre-mixed wet compounds from segregated mixing areas should be used wherever possible.
- 3) When dry mixing is being done respirators should be worn unless a machine with a properly designed ventilation system is available. Portable exhaust ventilation systems are already in use in certain shipyards. This procedure should be extended.
- 4) Where the cutting of material containing asbestos takes place it should be done whenever possible in a segregated area where there is a free circulation of air. If continuous cutting of insulation materials is being carried out a portable hopper should be used for the collection of fall-out waste. Machines are available for ensuring dust exhaust at a cutting bench.
- 5) In the case of spraying asbestos, the practice to be adopted will depend on the type of equipment used. In all cases the asbestos fibre must not be removed from the dust-proof sacks in which it is supplied until it is fed into the machines in the prescribed manner. Care should be exercised in handling the sacks in order not to damage them.
 - a) The use of effective pre-treatment reduces the concentration of dust to the level obtainable by an efficient exhaust ventilation system. Where pre-treated fibre is used, spraying with any type of machine may proceed without limitations save that the operators must, during spraying operations and for a short period thereafter, wear approved masks.

b) Self-ventilating machines without pre-treatment equipment may be used in spaces where the volume of air per spray gun in action is not less than 25,000 cu. ft., provided that operators use approved masks during spraying and for 30 minutes thereafter. Other tradesmen not supplied with masks may not enter the room until 30 minutes after spraying has ceased. Normal ventilation by open windows is permitted. Where rooms are below 25,000 cu.ft. volume per gun, mechanical ventilation must be provided to give two air changes per hour, and operators must wear approved masks during spraying and for at least 30 minutes thereafter. Other trades must not enter whilst spraying is in progress and for one hour thereafter.

c) Non-ventilated machines without pre-treatment equipment should only be used in spaces exceeding 50,000 cu.ft. volume per gun; operators and other workers approaching within 50 ft. of the machine and/or the gun must wear approved masks during spraying and for 15 minutes afterwards. Normal ventilation by open windows is permitted.

6) Stripping of Materials Containing Asbestos

The area in which stripping takes place should be classified as a segregated location and operatives engaged on such work should wear an approved type respirator.

a) Where site location permits, protective sheeting (dust sheets/polythene shrouding, etc.) should be used to localise or isolate the working area.

b) Wherever conditions permit, *i.e.* on inside work - power stations, ships' engine rooms, piping and ducting inside buildings, portable industrial vacuum cleaners should be used during stripping operations and for cleaning-up purposes in the working area.

c) Where the lagging is receptive to such treatment, wetting prior to and during the removal of the material should be carried out.

7) Where operations covering mixing, cutting and spraying are carried out and wherever dust can be inhaled, approved respirators should be used and properly maintained.

*Summary of extracts from the
Recommended Codes of Practice for the
Building and Shipbuilding Industries*

Products

These Codes of Practice cover asbestos and asbestos-cement products. The content of asbestos may vary, but the recommendations are the same for all products.

Handling and Working under Factory Conditions, in Workshops and in Confined Spaces

The following procedures should be adopted when working with asbestos products.

Cutting, Grinding or Turning by Mechanical Means

- 1) When mechanical cutting or machining takes place, efficient dust extraction equipment should be installed, or respirators of a type which are approved by the Factory Inspectorate should be worn.
- 2) The approved respirators should be carefully maintained and adequate servicing arrangements should be made to ensure that this is done and that employees are not without respirators during maintenance.
- 3) Waste, dust or offcuts should not be allowed to accumulate in the working area and should be disposed of in such a way as to avoid the escape of dust. Damping or wetting of waste before disposal is recommended.
- 4) Vacuum cleaning plant should be used to keep ledges, floors, trusses, etc. free from dust accumulation. Removal of dust by brushing should be avoided.

Additional Hygiene

- 1) The best standards of good factory and workshop housekeeping and hygiene should apply to mechanical cutting areas. Such areas are best segregated and used for no other purpose. In addition to dust exhaust on machines, a good standard of general room ventilation should be maintained.
- 2) Operatives should wear overalls that can be kept in a clean, dust-free condition. These overalls should be made from nylon or other synthetic material and should be free from open pockets, etc.
- 3) Where heating is necessary, radiant panel heaters should be used, rather than fan assisted heaters which tend to keep dust in suspension.

Handling and Working under Building Site Conditions, and in Ships under Construction and Repair

Where a considerable run of cut material is required in any one size, pre-cut material rather than site-cut material should be used. Some site-cutting is, however, inevitable, and the following practice should be followed in such cases:

Mechanical Cutting on Site or on Ships

- 1) In general, the same recommendations apply as for factory or workshop cutting, bearing in mind that the operation will be of a temporary nature. Where power cutting tools are used, these should have dust exhaust attachments. If the latter are not available, a portable dust extraction plant should be used.
- 2) Where it is not possible for an exhaust system to be used and where there is still a risk of inhaling asbestos dust, an approved respirator should be worn by the operative. The same steps to ensure adequate servicing arrangements should be taken as noted above.

Hand Cutting, Drilling and Working

- 1) Where hand cutting and working has to take place, a dust exhaust system will sometimes be impracticable; where there is any risk of inhaling asbestos dust, operatives should wear approved-type respirators.
- 2) Dust can be avoided by damping the material (*e.g.* by drip feeding) where the nature of the product permits.
- 3) Floors should be kept free of cutting dust, using portable industrial vacuum cleaning equipment. In the event of this not being available, a dampening agent should be applied to the dust immediately before sweeping up.