PLAINTIFF'S EXHIBIT

CAP-1414

A S B E S T O S B U L L E T I N

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C O N T E N T S

		Page
PART 1.	MINING	30
PART 2.	ASBESTOS-CEMENT	34
PART 3.	ASBESTOS TEXTILES	42
PART 4.	ASBESTOS FRICTION MATERIALS	43
PART 5.	REINFORCED PLASTICS	44
PART 6.	ASBESTOS JOINTINGS, SEALING AND COATING COMPOSITIONS	46
PART 7.	PLASTIC MATERIALS AND PIPES	48
PART 8.	ASBESTOS PAPER AND INSULATING MATERIALS ...	50
PART 9.	REFRACTORY FIBRES	52
PART 10.	MISCELLANEOUS	54
PART 11.	REVIEW OF JOURNALS	55

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CAP-1415

TOEH 1157

THE ASBESTOSIS RESEARCH COUNCIL

Asbestos Based Friction Materials and Asbestos Reinforced Resinous Moulded Materials

CONTROL AND SAFETY GUIDE—No. 8

Note

These Guides are the recommendations of the Environmental Control Committee (ECC) of the Asbestosis Research Council (ARC) concerning steps necessary to fulfil the requirements of the Asbestos Regulations 1969.

The Committee wishes to acknowledge the advice and helpful comments it has received in the preparation of this Guide from members of the staff of H.M. Factory Inspectorate.

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THE ASBESTOSIS RESEARCH COUNCIL

CONTROL AND SAFETY GUIDE—No. 8

Asbestos Based Friction Materials and Asbestos Reinforced Resinous Moulded Materials

Contents

		Page
PART I	CONTROL AND SAFETY	
Section 1	Introduction	2
2	Products Covered by this Guide	2
3	When Special Precautions may be Required	2
4	Operations to which the Regulations may Apply	3
5	Recommended Procedures	3
	5.1 Work Under Factory Conditions	3
	5.2 Servicing of Brakes or Clutches in Garages and Workshops	4
PART II	CONSIDERATION OF THE ASBESTOS REGULATIONS 1969	
Section 6	Asbestos Dust	4
7	Requirements of the Regulations	5
	7.1 General	5
	7.2 Exhaust Ventilation and Protective Equipment	6
	7.3 Cleanliness of Premises and Plant	7
	7.4 Storage and Distribution	7
8	Precautions to be Taken	7
	8.1 Protective Clothing	7
	8.2 Respiratory Equipment	7
	8.3 Dust Exhaust	8
	8.4 Cleanliness of Premises and Plant	8
	8.5 General Standards of Hygiene	8
	8.6 Disposal of Waste	8

ASARCO ALV 0007292

Under the new Asbestos Regulations, in force from May 1970, the protection of workers from industrial disease which might arise from the inhalation of asbestos dust becomes a statutory obligation wherever asbestos materials are used in such a way as to give rise to the emission of dust dangerous to the health of employees.

The Asbestosis Research Council and the major companies of the U.K. asbestos manufacturing industry have had considerable experience in devising safer methods of production and processing of asbestos materials, as the record of improvement in their own factories testifies.

For the assistance of those who are now similarly concerned with the control of working conditions in accordance with the Asbestos Regulations 1969, the Environmental Control Committee has prepared a series of Guides, based on the experience of its members in many different sections of the asbestos industry.

PART I

CONTROL AND SAFETY

1 Introduction

For the majority of users of asbestos based friction materials or asbestos reinforced resin bonded materials it is unlikely that asbestos dust will occur in sufficient quantity to call for the application of the Asbestos Regulations 1969. Nevertheless, users of these materials, knowing that they contain asbestos as an essential ingredient, may be concerned as to whether or not the Asbestos Regulations affect them. They may also find themselves faced with enquiries by others as to the need for special precautions. This Guide has been produced to clarify the position by indicating where such consideration is warranted and, in such cases, what steps should be taken.

2 Products Covered by this Guide

2.1 Asbestos based friction materials both moulded and woven which are available in:

(a) roll, sheet or pad form
(b) liners or facings (drilled and undrilled)
(c) as above, bonded or rivetted to components.

2.2 Asbestos reinforced resinous moulded materials which are available in:

(a) sheet, rod or tube form
(b) machined components which are produced to customers' requirements
(c) moulded components to customers' requirements.

3 When Special Precautions may be Required

Normal handling is not expected to come under the Regulations, neither is relining shoes in reasonable quantities as long as no grinding or finishing operation is carried out. Similarly, if brake drums are cleaned out with a vacuum cleaner the amount of dust produced will not bring this operation within the scope of the Regulations, whereas blowing out with an air line can produce enough dust to bring the Regulations into effect.

ASARCO ALV 0007293

When machining or similar operations are carried out regularly and for continuous periods then the Asbestos Regulations are likely to apply, although the amount of asbestos in the dust produced by the operation is likely to be such that the precautions required are comparatively simple and readily applied.

The Regulations are considered only to apply when the amount of asbestos dust in the atmosphere exceeds 2 fibres per cubic centimetre except when the asbestos is of the blue variety, crocidolite (see Section 6). Friction materials do not normally contain crocidolite. Some specialised resinous moulded materials, intended for chemical engineering applications where the high degree of acid resistance is essential, contain crocidolite. These may subsequently require machining and/or fabricating. In this case the precautions to be taken during machining and fabricating will need to be of a high order and it is recommended that enquiry as to the appropriate measures should be made to the supplier.

4 Operations to which the Regulations may Apply

4.1 Cutting, grinding, linishing, drilling, milling, sawing, turning, routing and other dust producing operations by hand or machine.

4.2 Cleaning out brake drums if performed by blowing or dry brushing.

5 Recommended Procedures

The processing of asbestos based materials may sometimes, as in the operations referred to above, give rise to dust as defined in the Regulations. Where such a situation is likely to occur, the Regulations should be consulted. In Part II of this Guide the Regulations are considered in detail for the guidance of those who are concerned. The manufacturers of the materials covered by this Guide will be pleased to give advice on problems connected with the Regulations, to render practical assistance on dust measurement and to suggest methods for dust suppression should this prove necessary. The following notes are recommended general procedures for your guidance in working with the materials listed in Section 2.

5.1 ***Work under factory conditions***

The following procedures should be adopted to minimise dust emission during processing:

(a) when cutting, grinding or machining operations are of short duration a portable dust extraction unit may be suitable. Vacuum cleaning equipment may sometimes be adapted for this purpose, provided that the filter system is of the requisite standard of efficiency;

ASARCO ALV 0007294

(b) in the case of large workshops with fixed working points or machines, suitable dust extraction equipment should be installed. High velocity/low volume systems are recommended where high speeds occur and where effective nozzles can be designed (see A.R.C. Guide No. 7);

(c) there may be exceptional cases where it is mechanically impracticable to provide an exhaust system to achieve the standard indicated in Section 6. In this event, approved respirators and protective clothing must be worn;

(d) the manufacturers of materials covered by this Guide are often able to help by supplying parts cut, machined and/or drilled to your requirements;

(e) swarf and dust from machining, drilling and similar operations should be regularly cleared, preferably by vacuum cleaner, and disposed of in accordance with recommendations described in Section 8.6. Similar measures should be taken in disposing of the contents of vacuum cleaner collecting bags and dust collected in exhaust systems.

(f) When rivetting linings, particularly large ones, continuously, wiping the lining with a damp, not wet, cloth will prevent any dust emission and therefore no other precautions will be necessary.

5.2 ***Servicing of brakes or clutches in garages and workshops***

When servicing work on brakes or clutches is being carried out, any dust residue should not be blown out (e.g. by compressed air line) or dry brushed. The recommended method is for the dust to be removed by vacuum cleaner with a brush head attachment. Extensive tests have shown that when this method is employed, the amount of dust produced is below that at which the Asbestos Regulations apply.

Alternatively, where occasional cleaning is carried out, the method of wiping out the dust with a damp, not wet, rag may be employed.

PART II

CONSIDERATION OF THE ASBESTOS REGULATIONS 1969

6 Asbestos Dust

6.1 The application of the Regulations is based on the amount of asbestos dust in the work place, together with the duration of the exposure. (See D.E.P. Technical Data Note 13—Standards of Asbestos Dust Concentration for use with the Asbestos Regulations 1969.) For this purpose threshold limit values have been set. The action required, related to these standards, is summarised in the following table:

ASARCO ALV 0007295

Asbestos Dust Concentration Fibres/cc	*Interpretation*
Less than 2 (Average concentration over 10 mins. sampling period)	The substantive provision of the Regulations will not be enforced.
2 to 12 (Average concentration over 4 hour sampling period)	The extent to which improvement in the standard of control will be required will depend on the amount by which the average concentration exceeds the 2 f/cc or 0.1 mg/m³ standard, and on the duration of exposure.
Above 12 (Average concentration over 10 mins. sampling period)	The provision of exhaust ventilation or the wearing of protective equipment, whichever is appropriate, will be enforced.

6.2 It is important to bear in mind that, of necessity, the standards are provisional and may have to be reviewed from time to time. The above figures apply to chrysotile, amosite and anthophyllite but for crocidolite (blue asbestos), in general, respiratory protection will be required unless the dust concentration is considerably below the minimum level indicated above. As a guide, the figures given above should be reduced to one-tenth for crocidolite.

6.3 Experience and expertise are required if reliable information on dust concentrations is to be obtained. If in doubt, assistance can be sought from the following sources:

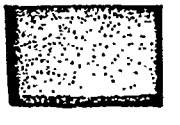
The Industrial Hygiene Division of H.M. Factory Inspectorate.
The Asbestosis Research Council (see their Technical Notes) or your supplier in the asbestos industry.

Alternatively, there are recognised consultancy services which are normally associated with a university that can help and offer a high standard of service.

7 Requirements of the Regulations

7.1 *General—Asbestos Regulations Part I and Part VI*

7.1.1 The Asbestos Regulations 1969 apply to every process involving asbestos or any article composed wholly or partly of asbestos in which asbestos dust, as defined in the Regulations, is given off in any factory, premise or place.



ASARCO ALV 0007296

7.1.2 It is the duty of every employer or contractor to comply with these Regulations in relation to himself if self-employed, and any person employed by him, any plant or material under his control, in any factory or part of a factory where he is engaged in processing materials containing asbestos. It is also the duty of every person employed to comply with the Regulations.

7.1.3 Any occupier of any factory where any processing involving asbestos material is being carried on, whether or not he is the employer as set out above, is similarly responsible under the Regulations for the provision of protective equipment and its accommodation and cleaning in relation to any person employed by him where the asbestos dust concentrations are above the acceptable level, and for the cleanliness of premises and plant.

7.1.4 The extent to which the precautions need to be taken in order to comply with the Regulations is related to the concentration of asbestos dust in the breathing zone of the operatives, together with the duration of the exposure. The specified limiting values are set out in Section 6.

7.1.5 The Chief Inspector may, in certain circumstances, by certificate in writing, issue an exemption against all or any part of the Regulations subject to his being satisfied that they are not necessary for the protection of the persons employed.

7.1.6 Where a person proposes to undertake in any factory any process involving crocidolite (blue asbestos), Regulation 6 requires that the local factory inspector be given 28 days, or less by agreement, written notice.
N.B.—Crocidolite is not normally used in the manufacture of friction materials.

7.1.7 No young person under eighteen years of age may be employed where the Regulations call for use of protective equipment.

7.2 *Exhaust ventilation and protective equipment—Asbestos Regulations Part II and Part V*

7.2.1 The Regulations require that the processing be carried on under an exhaust draught or in some other equally safe manner designed to ensure that the concentration of airborne asbestos dust entering the work place is not above the acceptable level. Where this is not practicable, approved forms of respirator and protective clothing must be provided.

7.2.2 Exhaust equipment is to be inspected once in every seven days and examined and tested by a competent person once in every 14 month period. A report on the test is to be attached to the general register and kept available for inspection for a period of 2 years.

7.2.3 Respiratory equipment and protective clothing, where necessary, shall be well maintained and cleaned, with suitable accommodation provided. No respirator is to be worn by more than one person unless it has first been thoroughly cleaned and disinfected. No person shall be employed on work where respiratory equipment is required unless he has been properly instructed in its use.

ASARCO ALV 0007297

7.3 ***Cleanliness of premises and plant—Asbestos Regulations Part III***

7.3.1 It is a duty to keep free from asbestos waste and dust, in so far as this is practicable, all plant and machinery, exhaust and ventilation equipment, and all internal surfaces of the building. Vacuum cleaning equipment or other dustless methods, such as wetting before and during sweeping, should be used for this purpose, and where this is impracticable, personnel undertaking the cleaning and any others in the close vicinity must be provided with protective equipment.

7.3.2 Vacuum cleaning equipment provided in accordance with the Regulations must be regularly maintained and cleaned.

7.3.3 Buildings used for the first time for a scheduled process (see Regulation 12 of the Asbestos Regulations 1969) for a period exceeding 8 hours per week, must satisfy these requirements:

(a) all the interior surfaces must be smooth, impervious, and with the minimum of dust-trapping surfaces; and

(b) a vacuum cleaning system shall form part of the permanent structure.

7.4 ***Storage and distribution—Asbestos Regulations Part IV***

All loose asbestos fibre in a factory, both virgin and waste materials, should be stored and distributed in suitably closed receptacles to prevent the emission of dust.

8 Precautions to be taken

8.1 ***Protective clothing***

8.1.1 The wearing of overalls is recommended on any operation which entails using and processing materials containing asbestos, although this is not in all cases obligatory in order to comply with the Regulations.

8.1.2 The style of garment is to a large extent governed by the operations which are to be undertaken. Generally speaking, the standard boiler suit type is adequate for the operations listed here. Synthetic materials have been found to have least tendency to hold dust. Detailed recommendations as to the provision, accommodation and cleaning of protective clothing are set out in the A.R.C's Guide on the subject (Control and Safety Guide No. 1).

8.2 ***Respiratory equipment***

8.2.1 The phrase "respiratory protection" in Guide No. 1 is used to indicate the need for protection from asbestos dust in the atmosphere where concentrations are above the accepted level, in cases where exhaust ventilation in itself cannot be considered adequate, or it is impracticable to install. It is not, in general, a substitute for the provisions contained in the Regulations as to exhaust ventilation.

8.2.2 Approved respirators should be issued to asbestos workers on a personal basis and be the responsibility of a designated person for regular checking and maintenance. On no account must they be interchanged person to person without first cleaning and disinfecting.

ASARCO ALV 0007298

8.2.3 All employees must be given instruction in the operational use, care and maintenance of the respiratory equipment, and when not in use the equipment should be stored in dustproof containers in accommodation specified for the purpose.

8.3 ***Dust exhaust***

No single method of dust extraction can be recommended because of the widely differing operations and situations. General principles, as set down in the A.R.C's Guide No. 7, have been tried and found satisfactory in varying degrees, but it is advisable to seek assistance from qualified dust exhaust engineers or the manufacturer of the product concerned.

8.4 ***Cleanliness of premises and plant***

8.4.1 The Regulations favour the use of vacuum equipment, or other dustless method, for cleaning premises and plant. Where such methods are impracticable, approved respirators and protective clothing must be worn. Cleaning should be done at regular intervals, preferably when the plant is not working, otherwise protection will need to be given to operatives in the close vicinity.

8.4.2 Cleaning of plant and machinery may well be done daily or on a weekly basis with a vacuum cleaner or dustless method, such as damp brushing. The brush should be thoroughly wetted or impregnated with oil.

8.5 ***General standards of hygiene***

8.5.1 Processes involving the use of materials containing asbestos should be carried out under high standards of good housekeeping and every precaution should be taken to minimise dust emission and the transfer of dust and fibres to the person.

8.5.2 Care should be taken to see that accommodation for clothing not worn during working hours is such, or is so situated, that the garments are kept away from contamination.

8.6 ***Disposal of waste***

8.6.1 The detailed recommendations as to the provisions for disposal of asbestos residue and waste materials containing asbestos are set out in the A.R.C's Code of Practice for the Handling and Disposal of Asbestos Waste Materials.

8.6.2 Extractor dust and swarf should be packed and sealed in impermeable bags ready for disposal. Wherever possible dust, particularly from filter units, should be collected directly into the sealed containers so that rehandling is avoided. Hard waste should be transported in covered containers.

8.6.3 The bags should be collected frequently and care taken to avoid damage, with consequent spilling, and where company disposal facilities are not available, suitable arrangements should be made with the local authorities or waste disposal contractor.

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PUBLICATIONS BY THE ASBESTOSIS RESEARCH COUNCIL

Codes of Practice

—For Handling Consignments of Asbestos Fibre in British Ports

—For Handling and Disposal of Asbestos Waste Materials

Technical Notes—

No. 1: The Measurement of Airborne Asbestos Dust by the Membrane Filter Method

No. 2: Dust Sampling Procedures for use with the Abestos Regulations

Control and Safety Guides—

No. 1: Protective Equipment in the Asbestos Industry (Respiratory Equipment and Protective Clothing)

No. 2: The Application of Sprayed Asbestos Coatings

No. 3: Stripping and Fitting of Asbestos-containing Thermal Insulation

No. 4: Asbestos Textile Products, CAF/Asbestos Beater Jointings and Asbestos Millboard

No. 5: Asbestos-based Materials for the Building and Shipbuilding Industries and Electrical and Engineering Insulation

No. 6: Handling, Storage, Transportation and Discharging of Asbestos Fibre into Manufacturing Processes

No. 7: Control of Dust by Exhaust Ventilation

No. 8: Friction Materials, etc.

ASARCO ALV 0007301