



Environmental Hygiene 36 (October 1984)

These Guidance Notes are published under five subject headings: Medical, Environmental Hygiene, Chemical Safety, Plant and Machinery and General.

INTRODUCTION

- 1 This Guidance Note provides information on the risks of exposure to asbestos dust when working with asbestos cement and on the precautions required for personal protection.
- 2 It does not deal with the physical dangers to workers who are particularly at risk during the construction, maintenance or demolition of asbestos cement roofing. Falls from, and through, fragile roofs are a major source of deaths in construction work and precautions to prevent such accidents should be given priority. Advice is contained in Guidance Note GS10 *Roofwork: prevention of falls*.

COMPOSITION, PROPERTIES AND USES

- 3 Asbestos cement products have been widely used for many years in the construction industry, most commonly as flat or corrugated roofing or cladding sheets, tiles, pipes and guttering etc. It remains a major material in new construction work.
- 4 Asbestos cement is a grey, hard, very brittle material containing 10–15% asbestos fibre, usually chrysotile (white asbestos). Some crocidolite (blue asbestos) and amosite (brown asbestos) has been used occasionally in the past, particularly in underground asbestos cement pipes. Some asbestos cement products (e.g. cladding sheets, tiles etc.) are painted or coated either before they are sold, or at a later stage.
- 5 The main uses of asbestos cement are in:
 - (a) corrugated sheets (i.e. roofing and cladding of farm buildings, factories, warehouses etc.);
 - (b) accessories for corrugated sheeting (i.e. ridge cappings, eaves and fillers for roofs);
 - (c) flat sheeting, partitioning, cladding, door facings;
 - (d) rainwater goods (i.e. gutters, pipes, troughs);
 - (e) roofing tiles and slates;
 - (f) other products (flute pipes, decking tiles, cisterns and sumps).

IDENTIFICATION

- 6 Asbestos cement products can generally be identified by their appearance, but you can never be sure from colour alone if asbestos is present or of the type involved, particularly as many newer non-asbestos products look similar to asbestos cement. A voluntary labelling scheme was introduced in 1976 using an 'a' logo to indicate the presence of asbestos, but it is unlikely that any such markers will be on products found in situ. Building plans or specifications are another source of information and the original supplier or importer should be able to give details about the presence, quantity and type of asbestos in a given product.
- 7 If in doubt, the only satisfactory way of determining if asbestos is present in cement is by bulk sampling and laboratory analysis. But even the sampling operation can put people at risk so it should only be done when the above alternatives have been tried and when there is a specific need to confirm the presence of asbestos. Sampling should only be carried out by someone with suitable training and experience.
- 8 The composition of cement is normally uniform so there should be little difficulty in selecting a representative site. The site should be readily accessible and easily cleaned and repaired after sampling. The removal of samples must not compromise the functions of other products.
- 9 Where old asbestos cement is involved, it is important to confirm the type by sampling and analysis so that appropriate precautions can be taken.
- 10 HM Factory Inspectorate (HMF1) must be given 28 days notice before any work can start on materials containing crocidolite (blue asbestos). If there is any doubt of the type of asbestos, then it should be assumed that it is blue asbestos and HMF1 should be notified.
- 11 The following precautions should be taken during sampling:
 - (a) ensure a safe means of access if working at heights, (e.g. on roof or wall claddings);
 - (b) only the people doing the sampling should be in the immediate area;
 - (c) take care to minimise damage to the asbestos cement from which the sample is taken. Use a small hand tool and place the sample in a suitably labelled small sealable container (e.g. self sealing polythene bag);

- (d) clean any surfaces contaminated during sampling. Use a dustless method such as a damp cloth which should be disposed of in a labelled, sealed container while still damp. If extensive contamination is likely, particularly indoors, use a suitable vacuum cleaner with a high efficiency filter. Where furnishings may be contaminated or if cleaning dust and debris is a problem, cover the threatened surfaces with an impervious sheet;
- (e) seal any surfaces damaged when the sample is taken.

RISK OF EXPOSURE

12 The hardness and structure of asbestos cement and its relatively low asbestos content mean it is less likely to generate dust than many other products. But the risk of fibre release is high there, either through accidental abrasion or in the normal course of work.

13 The extent of dust release depends on the nature of the work. Simple tasks with hand tools on new asbestos will, if done carefully, usually create dust levels below the Control Limit. But more extensive work on worn, crumbly or damaged cement can cause high concentrations of dust. Particularly dusty processes include machine sawing, grinding or cutting without exhaust ventilation equipment and cleaning old or weathered cement, particularly if the surface is dry. Some machine sawing and cutting operations without exhaust ventilation can produce asbestos in air levels of 10 fibre/ml or more. Handling of new asbestos cement sheet will not normally give rise to asbestos dust levels above the Control Limit. However, contamination of clothing is likely if the work is continuous or prolonged so suitable protective clothing should be provided and worn under these circumstances. Guidance Note EH35 *Probable dust concentrations at construction processes* gives details of likely dust concentrations at work activities involving asbestos cement.

AIR MONITORING AND CONTROL LIMITS

14 The only way to determine actual exposure levels on a job is by air monitoring. Guidance Note EH10 gives information on air monitoring techniques and Control Limits for asbestos dust. Control Limits for asbestos are:

- (a) for dust consisting of or containing any crocidolite (blue asbestos) or amosite (brown asbestos);
 - 0.2 fibre/ml when measured or calculated in relation to a 4 hour reference period.
- (b) for dust consisting of or containing other types of asbestos but not crocidolite or amosite;
 - 0.5 fibre/ml when measured or calculated in relation to a 4 hour reference period.

15 All work on asbestos cement should be planned to avoid generating asbestos dust. Where this is not possible

precautions should be taken to ensure that any exposure is as low as reasonably practicable and that workers are adequately protected.

16 Precautions taken will depend on the type, place and duration of the work, the probability of significant dust release and whether anyone other than asbestos workers are liable to be exposed. For example, stricter precautions are needed for work done inside a building than for work in the open air where only the worker is liable to be exposed.

17 But for roof or high level work, the priority is to safeguard the worker from the danger of falling.

GENERAL PRECAUTIONS

18 The following precautions should be taken for all work with asbestos cement, even where exposure to dust is likely to be low:

- (a) instruct all workers involved in the methods of work and the precautions to be taken to prevent or minimise dust generation (e.g. prevention of breakage);
- (b) keep the work area clean and tidy. Take care to prevent the accumulation and spread of dust and debris. When the work is over, clean up using an appropriate dustless method (see paragraph 29).
- 19 Certain tasks create substantial releases of dust or put workers under a greater risk of contamination. These include:
 - (a) work on cement products containing crocidolite or amosite;
 - (b) work on cement which is brittle, liable to break or disintegrate or whose surface has become powdery;
 - (c) work with power tools;
 - (d) any other work which may involve breakage of the material (e.g. demolition, stripping out);
 - (e) any other work where significant asbestos dust is liable to be generated.

In these cases the following extra precautions should be taken:

Planning and preparation

20 Plan the work to minimise operations on asbestos cement which may create dust or break the product.

21 If possible, carry out high risk operations such as cutting and machining at a central point to make supervision and control easier.

22 Mark the work area with warning signs and, where possible, rope or fence off the danger zone to prevent non asbestos workers approaching.

Work methods

23 Choose work methods which do not create unnecessary dust. For instance:

- (a) do not use cutting and grinding discs, circular power saws and jig saws to cut or mitre asbestos cement. Use a hand or reciprocating saw or scribe and break flat sheets or slates;
- (b) do not use any dry abrasive process such as sanding or wire brushing. If these methods are unavoidable, then soak the work surface and keep it wet;
- (c) do not clean asbestos cement by high pressure water jetting. Treat the surface first with a fungicide and, at a later date, remove it using a brush with a constant stream of water across the surface of the cement. Put any sweepings of plant growth etc. in a strong plastic bag for safe disposal. If water jetting is unavoidable make sure the asbestos cement is well enclosed and that all openings are sealed to prevent slurry contaminating other surfaces. Provide a safe way of handling and disposing of the slurry;
- (d) do use exhaust ventilation equipment wherever reasonably practicable;
- (e) do keep the material wet wherever reasonably practicable.

Personal protective equipment

24 Respirators should be worn if it is not possible to keep personal exposure levels below the Control Limits. The equipment provided should be approved by the Health and Safety Executive, as listed in the Schedule to the Current Certificate of Approval (Respiratory Protective Equipment) Form 2486. It should give adequate protection against likely dust levels and should be suitable for the job. Respirators which rely on a good face seal to be effective (e.g. orinasal and some high efficiency types), are not likely to be suitable for people with beards or spectacles.

25 Workers should be well trained in how to use respirators. The equipment should be maintained in good working order, cleaned and disinfected after use and stored in a suitable locker or container.

26 Workers at risk from contamination should be provided with and wear suitable protective clothing, which may include boots and head covering. Contaminated clothing should be stored in a secure place away from changing facilities. No-one should enter communal changing or wash rooms wearing protective clothing.

27 On completing the work, asbestos workers should wash thoroughly. Where significant (i.e. visible) bodily contamination is possible, it may be necessary to provide separate decontamination units including showers.

28 Contaminated overalls should never be taken home for cleaning. They should be sealed in suitably labelled impervious bags and sent to a laundry equipped and able to deal with asbestos contaminated clothing or, where appropriate, disposed of.

Cleaning up

29 At the end of the work, the work area should be cleaned of any asbestos cement dust or debris. In particular:

- (a) waste and debris must be cleaned up and taken for disposal as soon as possible. Fine debris, dust waste or waste which is liable to generate dust should be placed in suitable closed containers which prevent the escape of asbestos dust e.g. heavy duty polythene bags. When the container is full it should be effectively sealed, the outside cleaned and placed in a separate storage area for disposal. Containers should be labelled to show that asbestos is present; if crocidolite is present they should be marked "BLUE ASBESTOS - DO NOT INHALE DUST". Larger pieces of asbestos cement including whole sheets should not be broken or cut for disposal in plastic sacks. These materials should be carefully transferred to covered lorries or skips, if they are dusty or crumbly they should first be wrapped;
- (b) external surfaces of waste containers must be cleaned before removal from the work area;
- (c) all surfaces in the work area must be cleaned by a suitable dustless method. Where practicable, use a vacuum cleaner fitted with a high efficiency filter to collect dust. Where this is not appropriate, wet dust and debris thoroughly (i.e. not merely sprinkled with water) before brushing or shovelling up into strong plastic bags. Workers involved should wear suitable personal protective equipment and other non-essential personnel kept well away.

Demolition work and removal of asbestos cement sheeting

30 Removing old asbestos cement sheets presents particular health problems as it often involves dismantling or breaking large quantities of crumbly materials. Sheets in good condition should be taken down whole wherever possible. But the danger of falls should not be ignored and safe access to the working area should be provided. Where the sheets are dusty, crumbly or damaged then remote demolition techniques such as balling are acceptable if the following precautions are taken;

- (a) carry out the work before demolition of the rest of the structure;
- (b) drop the material onto a clean, hard, surface;
- (c) keep the material wet whenever practicable;
- (d) remove waste and debris from the site as soon as possible to prevent it being disturbed, e.g. by moving vehicles; and
- (e) handle and dispose of the material in the way described in paragraph 29.

LEGISLATION AND OTHER SOURCES OF GUIDANCE

31 The Asbestos Regulations 1969 apply to all factories and to certain other premises to which Part VII of the Factories Act 1961 applies including building operations, works of engineering construction, electrical stations and ships under construction or repair etc., where a process involving asbestos is undertaken, except a process in which

asbestos dust cannot be given off. 'Asbestos' is defined in Regulation 2(2) as meaning 'any of the following minerals, that is to say crocidolite, amosite, chrysotile, fibrous anthophyllite and any mixture containing of the said minerals'. 'Asbestos dust' is defined in Regulation 2 as 'dust consisting of or containing asbestos to such an extent as is liable to cause danger to the health of employed persons'.

32 Some asbestos work activities will not attract the Asbestos Regulations because the Factories Act 1961 does not apply to the premises in which the work is being carried out. Nevertheless, the Health and Safety at Work etc Act 1974 will always apply and in order to comply with the general obligations under Sections 2, 3, 4 and 7 so far as is reasonably practicable the same methods of work and the same standards of health and safety should be adopted as if the regulations applied.

33 The Approved Code of Practice and Guidance Note: *Work with asbestos insulation and asbestos coating* (Revised June 1983) provides practical guidance on the relevant legislation concerning the risk to health from asbestos during work involving thermal and acoustic insulation including structural fire protection and sprayed coating. It does not apply to work involving asbestos cement products when their thermal or acoustic properties are incidental to their main function.

34 Guidance on Control Limits, measurement of airborne dust concentrations and the assessment of control measures is given in HSE Guidance Note EH10 *Asbestos-Control Limits, measurement of airborne dust concentrations and assessment of control measures*.

35 Guidance on likely dust concentrations at construction processes involving asbestos cement products is given in HSE Guidance Note EH35.

36 Information on respiratory protective equipment approved for use with asbestos is given in the Certificate of

Approval (Respiratory Protective Equipment) 1983 (F2486 (1983) and Guidance Note EH41 Respiratory protective equipment for use against asbestos.

37 Advice on precautions to be taken for work with asbestos insulating board is given in Guidance Note EH37.

38 The Control of Pollution (Special Waste) Regulations 1980 place duties on those who produce, transport or dispose of waste containing asbestos.

39 Detailed guidance on asbestos waste disposal is contained in the Department of Environmental Waste Management Paper 18 *Asbestos Waste. A technical memorandum on Arisings and Disposal including a Code of Practice*.

40 Advice on the prevention of falls from roofs is given in HSE Guidance Note GS10.

41 Detailed advice on demolition work is given in HSE Guidance Note GS29: *Health and Safety in Demolition Work, Demolition: Preparation and planning; Part 1: Demolition: Legislation and training; Part 2: Demolition: Demolition techniques; Part 3: Demolition: Health hazards; Part 4*.

42 All of the above publications are available from Her Majesty's Stationery Office.

FURTHER INFORMATION

This Guidance Note is produced by the Health and Safety Executive. Further advice on this or any other publication produced by the Executive is obtainable from the general enquiry point, St Hugh's House, Stanley Precinct, Bootle, Merseyside L20 3QY, or from Area Office of HSE.