



Guidance Note EH 35  
from the  
Health and Safety  
Executive

Probable asbestos dust  
concentrations at  
construction processes



Environmental Hygiene 35 (October 1984)

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

risks to health or safety arising out of or in connection with the activities of persons at work.

INTRODUCTION

1 This Guidance Note replaces Technical Data Note 42, also entitled *Probable asbestos dust concentrations at construction processes*. It is intended as a guide on likely dust concentrations at various construction processes involving building products containing asbestos.

2 Most are short duration processes, often interspersed with other work. The tables refer to samples taken for the duration of the process.

3 The figures are based on experience within the Health and Safety Executive (HSE) and show dust levels in the workers' breathing zones. They are only a guide and are intended to help in such things as selecting suitable respiratory protective equipment. Results are affected by individual circumstances and anyone carrying out the work must ensure that the precautions taken are suitable. If there is any doubt about likely exposure to asbestos dust then precautions must be adequate to meet the worst possible cases. They should remain in force until sampling results indicate otherwise.

6 The Approved Code of Practice and Guidance Note *Work with asbestos insulation and asbestos coating* provides detailed guidance on the Asbestos Regulations 1969 and the HSW Act as they apply to many construction processes where asbestos may be present.

CONTROL LIMITS

7 The Control Limits for the different forms of 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.

8 Further information and advice on the measurement of asbestos dust levels and the application of the Control Limits is given in HSE Guidance Note EH10: *Asbestos Control Limits, measurement of airborne dust concentrations and assessment of control measures*.

LEGISLATION

4 The Asbestos Regulations 1969 apply to all factories and to other premises covered in Part VII of the Factories Act 1961. These include construction sites, electrical stations and ship building and repair. They apply to all processes involving asbestos except where asbestos dust cannot be given off. 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'. Tests to determine whether 'asbestos dust cannot be given off' should be carried out before precautions are taken.

5 Where the Asbestos Regulations do not apply, there is a duty under the Health and Safety at Work etc Act 1974 (HSW Act) to ensure, so far as is reasonably practicable, the health, safety and welfare of persons at work. Similar standards to the Asbestos Regulations should be adopted. There is also a duty to protect persons not at work against

ASBESTOS TYPES

9 There are three types of asbestos found in construction processes:

**Crocidolite (blue asbestos).** No longer used in Britain but once common, particularly sprayed coatings on structural steelwork for fire protection and for heat or noise insulation. It is often found when existing insulation is stripped or disturbed during repair or demolition work on buildings. Blue asbestos is liable to produce particularly high dust levels. In premises where the Asbestos Regulations 1969 apply, HSE should be notified in writing at least 28 days before any work involving blue asbestos starts. Blue asbestos cannot always be identified by colour. The absence of blue does not guarantee the absence of blue asbestos. Specialist identification is necessary.



**Amosite (brown asbestos).** Used to give structural strength to some asbestos cement products, such as pipes. Also found in insulating boards and ceiling tiles. Boards containing brown asbestos are no longer made in the UK but it may be found in existing installations and imported boards. Brown asbestos has also been used in sprayed coatings.

**Chrysotile (white asbestos).** The most common asbestos. Found in insulation, asbestos cement sheet, roofing and decking tiles, insulation boards and a wide range of lesser applications.

## DUST CONCENTRATIONS

10. The following dust concentrations represent the various processes:

PROCESS	CONCENTRATION Fibre/ml
<b>ASBESTOS STRIPPING OPERATION</b>	
(a) De-lagging	
(i) With thorough soaking	1-5
(ii) With water sprays	5-40
(iii) Carried out dry (except crocidolite)	>20
(iv) Dry stripping of crocidolite	100-1,000
(b) Removal of insulating board and tiles	
(i) Breaking and ripping out	5-20
(ii) Unscrewing and careful removal	<2

## USE OF ASBESTOS CEMENT SHEETS AND PIPES

(a) Machine drilling	<1
(b) Hand sawing	<4
	*(usually <0.5)
(c) Machine sawing without exhaust ventilation	
(i) Jig saw	2-10
(ii) Circular saw	10-20
(iii) Abrasive disc cutting	<25
(d) Machine sawing with exhaust ventilation	<2
(e) Reciprocating saw	<2
	*(usually <0.5)

## USE OF ASBESTOS INSULATION BOARD AND TILES

(a) Drilling vertical structures e.g. column casing	2-5
(b) Drilling overhead	4-10
(c) Sanding and surforming	6-20

\* Dust levels may exceed the control limit due to bad handling practices.

PROCESS	CONCENTRATION Fibre/ml
(d) Scribing and breaking	1-5
(e) Hand sawing	5-12
(f) Machine sawing without exhaust ventilation	
(i) Jig saw	5-20
(ii) Circular saw	>20
(g) Machine drilling or sawing with exhaust ventilation	2-4
(h) Handling and unloading deliveries (short term sample)	
(i) Cut pieces	<15
(ii) Standard sheets	<5

Note: The dust level is most likely to be high if amosite is present.

## PRECAUTIONS

11. The Approved Code of Practice and Guidance Note *Work with Asbestos Insulation and Asbestos Coating* describes in detail the precautions necessary when working with asbestos insulation etc.

12. Unless information is available to the contrary, it should be assumed that personal respiratory protective equipment and protective clothing will be necessary at construction operations where asbestos is present. Respiratory protective equipment should be suitable for the work being carried out and approved by HSE as published in the Schedule to the Current Certificate of Approval (Respiratory Protective Equipment). This is reviewed annually and is available from HMSO as Form 2486.

13. Release of all forms of asbestos dust into the air should be reduced to the minimum that is reasonably practicable, even where approved respiratory protective equipment is worn. This may be done by:

- (a) carefully selecting the method of work, tool or machine to be used in order to minimise the quantity of dust created;
- (b) thoroughly soaking the asbestos containing material with water before work starts, where possible, in order to suppress dust. Once airborne, dust cannot be effectively suppressed by water sprays;
- (c) using a ventilated enclosure around the dust source, where possible, to contain airborne dust;
- (d) using local exhaust ventilation. Exhaust ventilation does not always lend itself to site work but some portable machines and tools can be used with exhaust hoods or nozzles.

14. Care should be taken to ensure that people not directly involved in the process are not exposed to asbestos dust as a result of a construction process.

15 Guidance on the disposal of asbestos waste is given in the Department of Environment Waste Management Paper No 18 Asbestos Wastes, *A technical memorandum on arising and disposal including a Code of Practice*. If waste is to be removed from site, it should be in sealed, clearly marked containers. There should be effective arrangements for dealing with any spillage and, if necessary for the decontamination of any vehicle used for transport.

3 Health and Safety Executive, EH10: *Asbestos, control limits, measurement of airborne dust concentrations and assessment of control measures*, Guidance Note: revised 1984, HMSO, ISBN 0 11 883596 3, £2.75.

4 Health and Safety Executive, MS13: *Asbestos*, Guidance Note: revised 1980, HMSO, ISBN 0 18831755, 30p.

5 Health and Safety Executive, Form 2486, (*Respiratory Protective Equipment*), *Certificate of Approval*: 1983, HMSO, ISBN 0 1883709 5, £1.25.

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## REFERENCES

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1 Health and Safety Commission, *Work with asbestos insulation and asbestos coating*, Approved Code of Practice and Guidance Note: revised edition 1983, HMSO, ISBN 0 11 883687 0, £3.60.

2 Health and Safety Commission Advisory Committee on Asbestos first report: *Work on thermal and acoustic insulation and sprayed coatings (HSC 1978)*, ISBN 0 1 883083 X, 50p. Second report: *Measurement and monitoring of asbestos in air (HSC 1978)*, ISBN 0 11 883084 8, £1.00.

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## FURTHER INFORMATION

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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.



## GUIDANCE NOTES

### General Series

- GS 1 Fumigation using methyl bromide
- GS 2 Metrication of construction safety regulations
- GS 3 Fire in the storage and industrial use of cellular plastics
- GS 4 Safety in pressure testing
- GS 5 Entry into confined spaces
- GS 6 Avoidance of danger from overhead electrical lines
- GS 7 Accidents to children on construction sites
- GS 8 Articles and substances for use at work - guidance for designers, manufacturers, importers, suppliers, erectors and installers
- GS 9 Road transport in factories
- GS10 Roofwork: prevention of falls
- GS11 Whisky cask racking
- GS12 Effluent storage on farms
- GS13 Reporting of accidents to pupils and students
- GS14 Provision of sanitary conveniences and washing facilities in agriculture
- GS15 General access scaffolds
- GS16 Gaseous fire extinguishing systems: precautions for toxic and asphyxiating hazards
- GS17 Safe custody and handling of stock bulls on farms and at artificial insemination centres
- GS18 Commercial ultra-violet tanning equipment
- GS19 General precautions aboard ships being fitted out or under repair
- GS20 Fire precautions in pressurised workings
- GS21 Assessment of radio frequency ignition hazards

### Chemical Safety Series

- CS 1 Industrial use of flammable gas detectors
- CS 2 The storage of highly flammable liquids
- CS 3 Storage and use of sodium chlorate
- CS 4 The keeping of LPG in cylinders and similar containers
- CS 5 The storage of LPG at fixed installations
- CS 6 The storage and use of LPG on construction sites

### Plant and Machinery Series

- PM 1 Guarding of portable pipe-threading machines
- PM 2 Guards for planing machines
- PM 3 Erection and dismantling of tower cranes
- PM 4 Safety at high temperature dyeing machines
- PM 5 Automatically controlled steam and hot water boilers
- PM 6 Dough dividers
- PM 7 Lifts
- PM 8 Passenger carrying paternosters
- PM 9 Access to tower cranes
- PM10 Tripping devices for radial and heavy vertical drilling machines
- PM13 Zinc embrittlement of austenitic stainless steel
- PM14 Safety in the use of cartridge operated tools
- PM15 Safety in the use of timber pallets
- PM16 Eyebolts
- PM17 Pneumatic nailing and stapling tools
- PM18 Locomotive boilers
- PM19 Use of lasers for display purposes
- PM20 Cable-laid slings and grommets
- PM21 Safety in the use of woodworking machines
- PM22 Mounting of abrasive wheels
- PM23 Photo-electric safety systems
- PM24 Safety at rack and pinion hoists
- PM25 Vehicle finishing units: fire and explosion hazards
- PM26 Safety at lift landings
- PM27 Construction hoists
- PM28 Working platforms on fork lift trucks
- PM29 Electrical hazards from steam/water pressure cleaners etc
- PM30 Suspended access equipment
- PM31 Chain saws
- PM32 The safe use of portable electrical apparatus
- PM33 Safety of bandsaws in the food industry
- PM34 Safety in the use of escalators

### Medical Series

- MS 3 Skin tests in dermatitis and occupational chest disease
- MS 4 Organic dust surveys
- MS 5 Lung function
- MS 6 Chest x-rays in dust disease
- MS 7 Colour vision
- MS 8 Isocyanates - medical surveillance
- MS 9 Byssinosis
- MS10 Beat conditions and tenosynovitis
- MS12 Mercury - medical surveillance
- MS13 Asbestos
- MS15 Welding
- MS16 Training of offshore sick-bay attendants ('rig-medics')
- MS17 Biological monitoring of workers exposed to organophosphorous pesticides
- MS18 Health surveillance by routine procedures
- MS20 Pre-employment health screening

### Environmental Hygiene Series

- EH 2 Chromium - health and safety precautions
- EH 4 Aniline - health and safety precautions
- EH 5 Trichloroethylene - health and safety precautions
- EH 6 Chromic acid concentrations in air
- EH 7 Petroleum based adhesives in building operations
- EH 8 Arsenic - health and safety precautions
- EH 9 Spraying of highly flammable liquids
- EH10 Asbestos - Control Limits measurement of airborne dust concentrations and assessment of control measures.
- EH11 Arsine - health and safety precautions
- EH12 Stibine - health and safety precautions
- EH13 Beryllium - health and safety precautions
- EH14 Level of training for technicians making noise surveys
- EH16 Isocyanates: toxic hazards and precautions
- EH17 Mercury - health and safety precautions
- EH18 Toxic substances; a precautionary policy
- EH19 Antimony - health and safety precautions
- EH20 Phosphine - health and safety precautions
- EH21 Carbon dust - health and safety precautions
- EH22 Ventilation of buildings: fresh air requirements
- EH23 Anthrax - health hazards
- EH24 Dust accidents in malhouses
- EH25 Cotton dust sampling
- EH26 Occupational skin diseases: health and safety precautions
- EH27 Acrylonitrile: personal protective equipment
- EH28 Control of lead: air sampling techniques and strategies
- EH29 Control of lead: outside workers
- EH30 Control of lead: pottery and related industries
- EH31 Control of exposure to polyvinyl chloride dust
- EH32 Control of exposure of talc dust
- EH33 Atmospheric pollution in car parks
- EH34 Benzidine based dyes
- EH35 Ozone: health hazards and precautionary measures
- EH40 Occupational exposure limits 1984