

WORKING WITH ASBESTOS CEMENT PRODUCTS

By Tony Hutchinson, Director General of the Asbestos Information Centre Ltd

Working with asbestos containing materials (ACMs) is controlled by the 'Control of Asbestos at Work Regulations 2002', which came into force on the 21st November 2002, except for regulation 4 concerning the management of asbestos in non-domestic premises and regulation 20 about the accreditation of people who analyse materials to identify asbestos, which will come in to force on 21st May 2004 and 21st November 2004 respectively.

In my last article in the previous issue of Countryside Building I set out the bare bones of the regulations. In this article I will provide advice on working with asbestos cement products where a licence is not normally required. I will not cover working with low-density ACMs where a license is usually required. There are very few situations in working farm buildings where low density ACMs would have been used.

In the next issue of Countryside Building due for publication in June I will cover the management of ACMs in non-domestic buildings, this is Regulation 4 of the regulations and will come into force on 21st May 2004.

The following article is only a brief guide; it is not a complete guide to Health and Safety responsibilities when working with asbestos containing products nor is it a complete guide to health and safety responsibilities when on a construction site. Anyone working with asbestos cement products should read and understand the Approved Code of Practice L27 'Work with asbestos which does not normally require a licence (Fourth edition) and the guidance 'Working with Asbestos Cement' available from HSE Books

Asbestos Cement

Asbestos Cement is primarily a cement-based product where about 10% to 15% w/w asbestos fibres are added to reinforce the cement. Asbestos cement is weatherproof in that although it will absorb moisture, the water does not pass through the product. It was used for corrugated sheets, slates, flat sheets for animal pens, claddings, moulded fittings, soffits and undercloak, water cisterns, rainwater gutters, down pipes, pressure pipes, underground drainage and sewer pipes, sills, copings, chalkboards, fascias, infill panels, etc.

How to recognise Asbestos Cement ACMs

It is sometimes difficult to tell the difference between an asbestos cement product and a low-density insulation board, but there are a few rules that can be followed. The ACM will be asbestos cement if:

- the product has been used as a roofing or cladding product, open to the weather. Manufacture of all low density products was stopped in the late 70's and since they were not weather resistant, if they had been fixed outside they would have broken down long before now.
- the product is moulded as low-density products were not moulded, except as half rounds for pipe lagging.
- the product is in sheet form and has been used as animal pens or in wet areas. Low density products were not robust enough to be used as animal housing nor could they withstand wet conditions without breaking down.

When cementitious products like asbestos cement were manufactured, they had a cement-rich surface. The asbestos fibres were encapsulated within. Thus, occupants of buildings with asbestos cement sheet or slate roofs are unlikely to be at any greater risk than people outside in the fresh air. The small quantities of fibres released during natural weathering are unlikely to be dangerous but significant and possibly dangerous amounts of fibre can be released if the products are subject to any abrasive cleaning or working. It is therefore important to use the correct techniques and working practices when handling asbestos cement ACMs.

Non-asbestos alternatives to asbestos cement began to be introduced to the UK market in 1984, but asbestos cement products continued to be supplied into the UK market until 1999. So any product that looks like asbestos cement that was supplied prior to 1984 will contain asbestos, any product supplied after 1984 until 1999 could be an ACM. Unless one can find an identification mark on the product it is not possible for the layman to look at a sheet and tell whether it contains asbestos or not and in many cases even an expert can not tell without finding the mark or having a sample analysed. The manufacturers' mark on profiled sheets is indented into the overlap of the side lap roll, it will normally, in code form, give the name of the manufacturer, the date of manufacture, the shift and possibly the machine it was made on. If it contains asbestos it will contain the letters AC if it is non-asbestos it will contain the letters NT. With slates the mark was ink jetted on to the back of approximately one in twenty products, with the same letters denoting whether they contain asbestos or not.

Finding these marks can be a problem, with slates a quantity will need to be removed before the mark is found and so unless you have good reason to believe that they are non-asbestos they should be treated as an asbestos cement ACM. For roofs fixed after 1984, when the slates could be asbestos cement or non-asbestos, looking at the original specification may help but a number of specifications were changed by the roofing contractor because asbestos cement slates were cheaper than their non-asbestos alternatives, and the client and designer were not necessarily notified of the change. It may therefore be necessary if one has to work on these products to either treat them as ACMs or arrange for a sample to be removed and analysed by a competent laboratory.

With Profiled sheets identification is not a lot easier, although the sheets should have carried the indent on the overlap roll this did not always happen or the imprint is too vague to be read. There is also the problem that unless the roof is relatively recent it will be dirty and covered in moss and lichens, which will once again make the marks harder to read. It should of course be remembered when accessing the roof to check for the mark that both asbestos cement and unreinforced fibre cement sheets are very fragile and so protection must be provided to the operative to ensure that he cannot fall through the product, a far more immediate and serious risk than the risk of catching an asbestos related disease.

In the mid 1990s some profiled sheet manufacturers started to inkjet the underside of their sheets with the production mark. On a single skin construction this should be seen from ground level and again if there is the letters AC in the mark then it is an ACM if the letters NT are in the mark then the product does not contain asbestos.

For other moulded products the position of the mark will vary, with some having no mark, where there is a mark the same lettering applies.

Very few flat sheet products will have any marks.

Action Levels and Control Limits

- The 'Action Levels are:
 - Chrysotile (White) asbestos, 72 fibre-hours per millilitre of air
 - Any other form of asbestos, 48 fibre-hours per millilitre of air
 - With both types of asbestos occurring separately a proportionate number of fibre-hours per millilitre of air.
- The Control limits are:
 - Chrysotile
 - 0.3 fibres per millilitre of air averaged over a continuous period of 4 hours.
 - 0.9 fibres per millilitre of air averaged over a continuous period of 10 minutes.
 - For any other type of asbestos either alone or in mixtures
 - 0.2 fibres per millilitre of air averaged over a continuous period of 4 hours.
 - 0.6 fibres per millilitre of air averaged over a continuous period of 10 minutes.

The action level is calculated by multiplying the air born exposure in fibres/millilitre (f/ml) by the time in hours for which it lasts, to give exposure in fibre-hours/ml. Cumulative exposure is calculated by adding together all the individual exposures over the 12-week period.

So as a simple example an operative working on asbestos cement products containing chrysotile only, for four 4 hour shifts a week for 12 weeks, when in each 4hr shift their average f/ml is 0.2, will have an action level of:

- 4 hours X 0.2 f/ml = 0.8 fibre-hours/ml per shift
- X 4 = 3.2 fibre-hours/ml per week
- X 12 = 38.4 fibre-hours/ml or well below the control limit for Chrysotile and also below the Control limit for other fibres.

The above example of an f/ml of 0.2 is probably very high if the work is on roofing and cladding in the open air.

The vast majority of builders and contractors working on farms will not be working on ACMs full time, in fact it is probable that only a small percentage of their time will be spent working with these materials and so the Action level is not something that is likely to be exceeded but it does need to be watched. If a large job, with much of the work inside, was taken on which was going to take a considerable amount of time then it is possible that the Action level will be breached. For example if we take the above example but the operative works four 8 hour days per week in the same conditions, then he will just exceed the Chrysotile action level and of course well exceed the other fibres Action Level.

General Responsibilities where neither the Action Level nor the Control Limits are going to be exceeded

The following responsibilities on an employer to protect his employees also apply to the general public and others as far as is reasonably practicable.

Identification of the type of asbestos

There is now a responsibility to either sample the product being worked on to ascertain the type of asbestos fibre involved or to treat the asbestos as if it is either Crocidolite (blue) or Amosite (brown).

Following discussion with the HSE they have confirmed that the majority of asbestos cement products were made using chrysotile only and since the fibres are locked into the matrix of the product, if the product is handled correctly the amount of fibre release will be very low and so there is probably no good reason to ascertain the type of asbestos used.

Risk assessment and method statements

Before work starts the employer must ensure that a competent person carries out a suitable risk assessment and that a method statement is provided on how the work is to be actioned to comply with these regulations. The risk assessment and method statement shall:

- Determine the nature and degree of exposure
- Reduce the exposure to asbestos to the minimum possible. Consider ways of doing the work without disturbing the ACM, only if that is not possible should the ACM be disturbed.
- State whether the employees might be exposed to asbestos fibre levels in excess of the Control Limit or the Action Level, if they are take the steps listed below under 'Action Levels and Control Limits' must be followed.
- It is not necessary to provide a risk assessment for every individual job. Where an employer carries out work that involves very

similar jobs on a number of sites such as roofing, only one assessment for that work may be needed. When one is considering using a risk assessment written before, it is important that the job is inspected to ensure that the conditions of the ACM and the site are the same as the previous jobs. It is possible in very extreme cases for asbestos cement products to be attacked by acids or alkalis to such an extent that the cement matrix is eaten away to leave the raw asbestos. This can happen in very poorly ventilated animal housing. The fibre counts in the building are likely to be so high and the product so friable that it should be treated as a low-density product and handled by a Licensed Asbestos Contractor.

- The risk assessment should be reviewed if there is any reason to believe that the original is no longer valid, such as a change in the condition of the ACM or the work required.
- The method statement should be written for the job, it is not acceptable to provide a generic method statement. It must be kept on site during the work.
- The method statement must list the place of work, the methods to be used to keep the release of asbestos to the minimum possible and the characteristics of the equipment to be used.
- The employer must ensure that as far as reasonably practicable the work is carried out in accordance with the method statement.
- Where situations occur that are not covered by the method statement such as the discovery of other ACMs or a change in the ACMs condition, work must stop until another method statement to cover the new situation is written.

Actions to be taken if an Action Level is likely to be exceeded

Where the risk assessment shows that the Action Level may be exceeded the following actions have to be taken:

- The risk assessment must be kept on the premises where the work is being carried out and should be brought to the attention of anyone carrying out a visual inspection and air clearance monitoring.
- If for the first time, you are working on your own premises using your employees to carry out work with asbestos, HSE should be informed 14 days in advance of when the work is going to start and if and when there is any change in the work, which alters the risk.
- A change to the signage of the designated asbestos areas.
- Monitoring the personal asbestos exposure of the operatives by measuring the asbestos fibres in the air, at regular intervals and when a change occurs which may affect that exposure.
 - A record should then be kept of the monitoring for at least 40 years.
- The employer must keep acceptable health records and ensure that each employee who has been exposed to asbestos fibres above the action level is under adequate medical surveillance by a relevant Doctor.
 - To include a medical prior to the work starting and periodic medical examinations at intervals of not more than 2 years, while the exposure continues.
 - These records must again be kept for at least 40 years.

There are a lot more details of the medical requirements set out in the ACOP 1.

Actions that should be taken if a Control Limit is likely to be exceeded

Where the risk assessment shows that the Control Limit may be exceeded, the following steps must be taken:

- The employer must provide his employee with suitable and approved respiratory protective equipment (RPE), which complies with the Personal Protective Equipment Regulations 2002 and ensure that the concentration of asbestos in the air inhaled by the employee is as low as possible and certainly below the Control Level.
- The fitting and wearing of RPE is a very specialist area and so it is critical that the employer ensures that his employees are suitable trained in how to use the RPE and that they carry out adequate fit tests to ensure that they are working properly and there is no leak around the seal. (See References 2 & 3)

These requirements when either the Action Level or the Control Limit may be exceeded are very onerous for a normal farmer, agricultural builder or contractor and so if the risk assessment shows that an Action Level or Control Limit may be exceeded, serious consideration should be given as to whether your company is competent to do the work. It is better to turn the work away and recommend that a firm with more expertise in handling ACMs is used than you doing the work and getting it wrong.

Methods to reduce the release of fibres to the minimum

Before starting work check whether the work is necessary, is it possible to carry out the work without disturbing the ACM? A typical example is re-roofing, a risk assessment will often show that over roofing will provide the least risk. If a building is being demolished the removal of the ACMs is required prior to demolition as far as possible to do so.

If the following methods are used to work on asbestos cement products that are not in a very friable condition the fibre counts are likely to be very low and certainly well below the Control Limits.

- Keep the material wet when working on it.
- Avoid using power tools and breaking ACMs but carefully remove or cut fixings so that the product can be removed in one piece. Carefully carry to the ground and either double wrap in polythene or place in a covered skip.
- Where it is necessary to cut or drill asbestos cement sheets, ensure the material is wet and if possible scribe and break, if this is not possible use hand tools, preferably in the open air.
- Keep the site clean and tidy at all times and clean up after work by dampening any dust and carefully placing in a polythene bag for disposal as asbestos waste.

- Unless the risk assessment shows that RPE is required, the operatives should preferably wear a disposable mask that is CE marked to EN 149 with FFP2 particulate filters and disposable overalls, which should be disposed of at the end of the shift as asbestos waste.
- When working at heights follow the advice in HSG 33 Health and safety in roof work (1998)⁴. Old asbestos cement sheets are very fragile.
- Any plant or equipment contaminated with asbestos must be thoroughly decontaminated before being removed from site.
- When the work is complete if it has been inside a building and is not of a minor nature then Clearance air sampling and a certificate of reoccupation will be required. Guidance on this can be found in ACOP Work with asbestos insulation, asbestos coating and asbestos insulation board⁵

Cleaning Asbestos Cement Roofs.

This should only be carried out if it cannot be avoided; moss and lichens although some may think them unsightly are not normally detrimental. Asbestos cement is very fragile and so the recommendations in HSG 33 Health and safety in roof work (1998) must be followed.

Do not clean by dry scrapping or by pressure washing, both can produce dangerous quantities of free asbestos fibres. Either:

- Use remote cleaning. This technique involves skilled operatives using units with enclosed rotary cleaning heads and high-pressure water jets, the filtering of the water run off and the disposal of the filter waste as asbestos waste. It should only be carried out by skilled specialist contractors.
- Cleaning with surface biocides. The biocides are applied with low-pressure sprays or as washes. The roof is then left for the moss and lichen to die, when it can be gently brushed from the roof with soft brushes. It is important that the roof is kept wet during the brushing and the waste is carefully collected placed in plastic bags and disposed of as asbestos waste.

Designated Areas

An employer must ensure that any area where asbestos is being worked on is cordoned off and the necessary danger signs erected. He must ensure that workers and others not involved in the work cannot enter the area. The signage will depend on the amount of fibre that the risk assessment shows is likely to be created, i.e. if the risk assessment shows that a Control Limit is likely to be exceeded the signs must state that it is a Respiratory Zone.

No eating, drinking or smoking should be allowed in the designated asbestos areas and employers must provide suitable areas outside of the designated areas for their employees to eat and drink in.

Air Monitoring

Air monitoring of an employees' exposure to asbestos will be required if the risk assessment shows that an action level is going to be exceeded. If this is the case:

- Records must be kept that gives, the type of work being carried out, the type of sample, the location, the date and time, sample duration and flow rate, the length of time the individual was exposed. The measured fibre concentrations, the fibre type and the names of the sampler and their organisation.
- The monitoring must be carried out by a competent person who is accredited to comply with the ISO 17025, and then analysed by an approved method.
- Where the action level has been exceeded the records of the air monitoring must be kept for at least 40 years, if they are not exceeded they should be kept for at least 5 years.

Washing and changing facilities

Employers must ensure that every employee who is exposed or likely to be exposed to asbestos are provided with adequate washing and changing facilities. Where the employer is required to provide protective clothing, he must also provide adequate storage for the protective clothing and the employees personal clothing. More information is available in 'Provision, use and maintenance of hygiene facilities for work with asbestos insulation and coatings 6

Information, Instruction and training

Employers must ensure that their employees have received adequate training, understand the risk assessment and know and understand the method statement. This training should include:

- All workers who are involved in maintenance should receive asbestos awareness training in case they come across ACMs of which you are unaware.
- The health risks of asbestos.
- The types, uses and likely occurrence of asbestos in buildings and plant.
- The details of how an emergency should be handled.
- How to avoid the risks from asbestos.
- The correct use of protective equipment
- Refresher training should be provided on a regular bases and at least once a year for those regularly involved in working with ACMs.
- There is a responsibility on the employer to ensure that adequate information is provided to non-employees who are on the

premises and could be affected by the work.

- The procedures for providing information, instructions and training should be clearly defined and set out in a written document.
- Records should be kept of every individuals training.

Asbestos waste

Asbestos waste is any waste, which contains more than 0.1% w/w asbestos. It is subject to the waste management controls set out in the Special Waste Regulations 1996. This states that the waste must be consigned as soon as possible by a licensed haulier to a dump licensed to take asbestos.

At the moment there is the exception that if the site being worked on is on registered agricultural land, then it is lawful for a farmer to dispose of asbestos waste originating from agriculture by burial on the originating farm. The Environment agency is unhappy that farmers are able to avoid the special waste regulations in this way and so it is expected that in the near future the regulations will be changed to ensure that agricultural waste is treated in the same way as waste from any other source.

Your local authority should have a list of licensed hauliers and waste dumps in you area.

The above is only a brief guide, it is not a complete guide to Health and Safety responsibilities when dealing with asbestos containing products, for more information obtain and understand Approved Code of Practice and Guidance L 27 'Work with asbestos which does not normally require a licence' – HSE Books

A M Hutchinson
Director General
Asbestos Information Centre Ltd
ATSS House
Station Road East
Stowmarket
Suffolk
IP14 1RQ
Phone 01449 676900
e-mail
web site

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1. Approved Code of Practice and Guidance L 27 'Work with asbestos which does not normally require a licence' – HSE Books
2. Selection of suitable respirable protective equipment for work with asbestos – HSE Books – INDG288
3. Fit testing of respiratory protective equipment face pieces – HSE Books – HSE282/28 (Rev2002).
4. HSG 33 Health and safety in roof work (1998) – HSE Books
5. ACOP Work with asbestos insulation, asbestos coating and asbestos insulation board
6. 'Provision, use and maintenance of hygiene facilities for work with asbestos insulation and coatings' EH 47 (Third Edition) – HSE Books
7. Working with asbestos cement HSG 189/2 – HSE Books

Further reading

1. Asbestos alert for building maintenance, repair and refurbishment workers: Be aware of asbestos the hidden killer – INDG1888 – HSE Books
2. Asbestos dust kills – keep your mask on; Guidance for employees on wearing respiratory protective equipment for work with asbestos – INDG2555(rev1) - HSE Books
3. Working with asbestos in buildings – INDG289 – HSE Books
4. www.aic.org.uk