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## WATCH COMMITTEE

### Assessment of the potential extent of exposure to asbestos (chrysotile) during the removal of asbestos-containing textured decorative coatings

#### Issue

1. The extent of occupational exposure to chrysotile asbestos that could arise from work to remove asbestos-containing textured decorative coatings.

#### Timing considerations

2. HSE's current opinion on this issue has been used in support of proposals in the current HSC consultation paper Proposals for Revised Asbestos Regulations and an Approved Code of Practice (CD205). Consultation finishes on 31 January 2006. The position of WATCH is needed at this time so that it can be considered alongside the outcome of the consultation exercise.

#### Recommendation

3. WATCH is invited to note the issues in the cover paper and annexes and respond to the actions in paragraph 25.

#### Background

4. The Health and Safety Commission is currently consulting on revised draft Regulations and an Approved Code of Practice (ACoP) primarily to implement amendments to the European Asbestos Worker Protection Directive (AWPD).

There are currently three sets of regulations in Great Britain:

- (a) The Control of Asbestos at Work Regulations 2002 (CAW), which govern the way all work with asbestos is done, to ensure it is done safely<sup>1</sup>.
- (b) The Asbestos (Licensing) Regulations 1983 (ASLIC), as amended, which require work with all the more hazardous asbestos-containing materials to be done by a contractor licensed by HSE<sup>2</sup>.
- (c) The Asbestos (Prohibitions) Regulations 1992 (Prohibitions Regulations), as amended, which ban the importation, supply and use of raw asbestos and asbestos-containing materials<sup>3</sup>.

<sup>1</sup> Control of Asbestos at Work Regulations 2002 SI N° 2675

<sup>2</sup> Asbestos (Licensing) Regulations 1983 SI N° 1649 as amended in 1998 SI N° 3233

<sup>3</sup> Asbestos (Prohibitions) Regulations 1992 SI N° 3068 as amended in 1999 SI N° 2373 and in 2003 SI N° 1889

5. All work with asbestos must be properly assessed and controlled. Additionally, work with materials deemed to pose a particularly high risk must be undertaken by a contractor licensed by HSE. A licence is currently required for work with: asbestos insulation, **asbestos coatings** and asbestos insulation board. Under ASLIC 'asbestos coatings' describes the various mixes containing asbestos that were widely used as a surface coating for fire protection purposes or as both heat and sound insulation. However, the term asbestos coating has also been applied to asbestos-containing textured decorative finishes, which range from paints and ceiling plasters to coatings used to produce special finishes. Only the chrysotile form of asbestos was used for this purpose.
6. Categories of asbestos products that don't require a licence to work with include: asbestos cement; and materials of plastic, resins or rubber which contain asbestos, the thermal and acoustic properties of which are incidental to its main purpose.
7. The consultation document referred to above includes the proposal that work with asbestos-containing textured decorative coatings no longer needs to be done by a licensed asbestos contractor (nor will it be required to be notified to the enforcing authority, and medical records will no longer need to be maintained). The proposal is based on the findings of research undertaken by HSE's Health and Safety Laboratory (HSL) into the potential extent of occupational exposure to asbestos that could arise during the removal of such coatings (see Annexes 1 and 2).
8. The exposure assessment results have been taken forward into a risk assessment. The basis for the risk assessment is work published several years ago by two members of HSE's Epidemiology and Medical Statistics Unit (EMSU), John Hodgson and Andy Darnton. The "Hodgson and Darnton [H&D] model" (Annex 3) offers a means of calculating quantified risk estimates for different levels of exposure to different forms of asbestos. HSL has used the exposure data for the removal of asbestos-containing textured decorative coatings together with the H&D model to produce the risk assessment (see Annex 4a&b; also brief details in Annex 2); this risk assessment in turn supports the regulatory impact assessment required and is published as part of the consultative package (the full consultative package is at Annex 5).
9. In 1998 HSC consulted on taking textured decorative coatings out of the licensing regime. While the majority of respondents supported its proposal at that time, HSC decided that it should remain licensed. However, given changing knowledge and more recent evidence, HSE is now of the opinion that the arguments for de-licensing are stronger, as reflected in the consultative document. The extent of potential exposure (and the consequent risk) from asbestos in textured decorative coatings are now estimated to be several orders of magnitude below that for other licensed materials, and lower than that from work with asbestos cement which doesn't require a licence.
10. This does not mean that work with textured decorative coatings is safe: it still needs proper control measures, but as argued by HSC/E, not such

stringent controls as those required for work with other licensable materials. These are set out in the draft ACoP that is part of the consultation package. HSC/E is of the opinion that it is important that the licensing regime is focussed on high-risk materials, and remains risk-based, proportionate and reflects current evidence.

11. Strong concerns about this proposal have been raised by some stakeholders (including some trade unions and the Asbestos Removal Contractors' Association, ARCA). In particular, Annex 6 is an analysis by Robin Howie, of Robin Howie Associates who has prepared a report at the request of ARCA. Robin Howie will attend the February WATCH meeting to help with the debate.

## **Argument**

### **(1) Textured decorative finishes**

12. Asbestos-containing texture decorative plasters and paints were frequently applied as a finishing coat to interior ceilings and walls of gypsum plaster, plasterboard, other building boards and even cement. The product offers a durable textured finish, which is usually painted so the fibres are both encapsulated and held within a durable matrix. When applied to new surfaces it provides a means of caulking plasterboard joints but has also been widely applied to existing older ceilings and walls to cover up cracks and blemishes. Although often referred to by the most familiar trade name "Artex," there are other manufacturers of similar products.

13. The textured plaster finishes are usually a proprietary formulation of water dispersible binders combined with inert fillers, pigments and a fungicide. The main fillers and majority of the product is chalk (calcium carbonate) and gypsum plaster (calcium sulphate). Typically the dry powdered mix for trade use Artex contained about 3.8% w/w of chrysotile asbestos and the ready mixed DIY product (known as W14) contained somewhat less - 1.8% - and an emulsion binder. According to the manufacturer asbestos was added only to promote the dewatering and curing of the product, but the asbestos fibres will have a reinforcing effect on the matrix. From 1976 onwards Artex was also offered an asbestos-free form, with UK production of asbestos-containing Artex finishing in 1984, although its use was not formally prohibited by EU and UK legislation until 1992.

14. The asbestos content of textured coatings is lower than many unlicensed materials (e.g. asbestos cement 10%, asbestos-containing PVC floor tiles 7 %, asbestos containing thermoplastic floor tiles up to 25%, roofing felt 8%, brake and clutch linings 20-25%, other reinforced plastics and composites 1-10%). The asbestos is encapsulated in a resilient semi-flexible matrix that does not readily release fibres. Furthermore, nearly all textured coatings are painted, encapsulating the asbestos-containing matrix behind a non-asbestos paint layer.

15. It is important to note that only chrysotile asbestos was added by the manufactures and this has a lower risk than other types of asbestos - see the Hodgson and Darnton study (Annex 3)

## **(2) Measurement methods for asbestos**

16. As asbestos related diseases occur in the lung, the exposure is measured in terms of the concentration of airborne fibres, expressed in terms of fibres per millilitre (f/ml) of air. The current method known as the European reference method (ERM) is set out in an annex 1 of the original EU asbestos worker protection directive (AWPD). As the initial directive was focussed on asbestos manufacturing the ERM method did not discriminate between fibre types and all fibres that meet the size criteria are counted. The current European reference method (ERM, see MDHS 39/4), when used to evaluate asbestos exposure to workers against the control limits, mandates that air is sampled through a 0.8 – 1.2  $\mu\text{m}$  pore size filter held in a conductive cowl at a rate of 1 litre per minute. The filter is then prepared and analysed for countable fibres using X500 phase contrast light microscopy (PCM). All elongated particles that are  $>5 \mu\text{m}$  long and with an aspect ratio  $>3:1$ , and of  $<3 \mu\text{m}$  width are counted in the analyses, provided that they are not attached to particles of  $>3 \mu\text{m}$  diameter. All particles (regulated fibres) meeting these counting criteria are assumed to be asbestos and in many circumstances may overestimate the numbers and concentration of asbestos due to the presence of other types of fibres.

17. The amended Directive (2003 – as now being implemented) introduced a revised method known as the WHO method, which allows the laboratory to discriminate between asbestos and non-asbestos fibres, should it wish to do so. This can be particularly important for textured coatings, which both contain gypsum (calcium sulphate) and are frequently applied onto gypsum plaster or plasterboard made from gypsum plaster. Gypsum forms both fibres and non-fibrous particles and when removing the material by scraping or breaking down the plaster and plasterboard ceiling variable proportions of calcium sulphate particles and fibres are released. There are two effects:

- 1) if controlled removal is not used, large amount of dust can be released from the finish and the underlying gypsum plaster or board, which quickly coat the filter making analysis impossible by the WHO or ERM method;
- 2) Many non-asbestos fibres are released, which will often outnumber the countable asbestos fibres by many times.

This means that any count by PCM will be based on an unknown ratio of asbestos and non-asbestos fibres

18. HSL has worked with this type of problem for many years and developed simple methods for removing gypsum fibres from the sample based on their solubility in water. One method for TEM analysis has been written into the ISO method 10312.1995 (Ambient air – determination of asbestos fibres – direct transfer transmission electron microscopy method. International Standards

Organisation. Geneva. Switzerland). During recent work HSL adapted this method for PCM analysis enabling what were overloaded filters and/or contained large numbers of gypsum fibres to be examined for the number of non-soluble fibres. This figure was taken as the asbestos concentration unless more definitive analysis was carried out using analytical transmission electron microscopy (TEM) to positively identify the fibres as asbestos.

### **(3) Airborne concentration measurements due to work with textured coatings**

19. There are few published measurements of the airborne fibre releases from work with textured coatings and paints. All known measurements have been reviewed in the HSL report in Annex 2, most of these data being from previous HSL measurements. A recent joint survey was carried out by HSL with the Association of British Insurers (ABI) and the report is included as Annex 1. Due to the high dust levels produced and short duration of many of the jobs this was quite a challenging survey to do and to interpret. Most jobs were shorter than the 4 hour measurement period required for comparing to the control limit of 0.3 f/ml for chrysotile which is proposed to be reduced to 0.1 f/ml. There is also a 10 minute control limit of 0.09 f/ml that is proposed to reduce to 0.06 f/ml. Also, due to the poor control of dust emissions, many samples could not be taken for more than a few tens of minutes even at reduced flow rates before they became too overloaded to analyse by the normal method. This meant that many individual samples during the removal had a limit of quantification above the proposed new 4-hour control limit and careful appraisal of the data is needed.

**20. A conservative estimate, reached by HSL on the basis of the available data, is that the average level of asbestos fibres in the air when removing textured coatings using controlled removal is 0.08 f/ml. The evidence available suggests that uncontrolled dry hand-scraping of chrysotile-containing textured coatings is less than twice the conservative average used for the controlled removal. This is below the current control limit of 0.3 f/ml for chrysotile and the proposed new limit of 0.1 f/ml for all types of asbestos. The exposure level of 0.08 f/ml has been used in the subsequent risk assessment undertaken by HSL (Annex 4a&b).**

21. Some additional work is being undertaken to look at the effects of removal using the controls recommended in the draft ACOP, although HSE believes there will be little difference in terms of levels of asbestos fibres in the air. The work is also looking also at uncontrolled removal as the worst case for fibre release.

#### **Link to HSC Strategy**

22. This work relates directly to HSC/E's statutory responsibilities in relation to asbestos; it also has potential relevance for the asbestos strand of the Cancer Project within HSE's Disease Reduction Programme.

## **Consultation**

23. HSC is currently undertaking formal consultation on changes to the asbestos regulations; within this consultation, much of the work and arguments of this package have been put into the public domain.

## **European Context**

24. This issue arises as a result of national considerations in the context of implementing the EU AWPD.

## **Action**

25. WATCH is asked to consider the issues described in this paper and the annexes and:

**(1) Give its view on what is the most reliable estimate of the potential extent of occupational exposure that could arise during the removal of asbestos-containing textured decorative coatings**

**(2) Give its views on the robustness of the HSL work done to assess such exposure and the “conservative” estimate of the average airborne asbestos exposure level of 0.08 f/ml used in the published risk assessment in the consultative document**

## **Contact:**

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## **References / Attachments**

Annex 1 HSL Report HSL/2005/32 – An Investigation into the airborne fibre releases during the removal of textured coating from domestic premises

Annex 2 HSL report (unpublished) Airborne fibre concentration during the removal of asbestos containing textured decorative plasters and paints and the risk to workers (Report Number IFS/05/13)

Annex 3 Hodgson and Darnton (2000) The quantitative risks of mesothelioma and lung cancer in relation to asbestos exposure. *Annals of Occupational Hygiene*, 44.

Annex 4a&b Annexes D(A) & E(i) of the HSC consultation document Proposals for Revised Asbestos Regulations and an Approved Code of Practice (CD205) - HSL Risk Assessment & HSL Research into airborne fibre releases during the removal of textured decorative coatings, Executive Summary

Annex 5 HSC Consultative Document CD205 C40 10/05 (2005), Proposals for revised Asbestos Regulations and an Approved Code of Practice

Annex 6 Robin Howie, Robin Howie Associates: Assessment of the scientific validity of the Health and Safety Commission's proposal to exclude the removal of textured decorative coatings containing asbestos from licensed activities.