

PLAINTIFF'S EXHIBIT

SH-3446



Recommendations for the safe handling of asbestos and materials containing asbestos

ABS-028904

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The terms Group and Shell are used in this publication as a matter of convenience to refer to one or more companies of the Royal Dutch/Shell Group, as the context may require.

Foreword

These recommendations are intended as a general guide to operating companies on the safe handling of asbestos and materials containing asbestos. They may serve as a basis for the drafting of detailed rules and regulations and it will be at the discretion of each company to adapt them as local conditions and circumstances require. The precautionary measures recommended should be taken as *minimum* requirements. In those countries where statutory regulations concerning asbestos apply, they must of course be observed, and should be read in conjunction with the recommendations made herein.

Additional information concerning the handling of asbestos may be obtained from the publications listed at the end of the text.

Introduction

There are four common forms of asbestos:—

1. Crocidolite (blue asbestos)
2. Chrysotile (white asbestos)
3. Amosite
4. Anthophyllite

Long exposure to the fibre dust of these may cause serious and irreversible lung disease (asbestosis/lung cancer). One form of cancer though still rare may affect either the lungs or the abdominal cavity. It may develop many years after relatively slight or intermittent exposure to crocidolite and possibly other varieties of asbestos.

Recommendations

(In this context 'asbestos' refers to raw material — both virgin and waste — and also to all other materials containing it).

A. General

1. In no circumstances should crocidolite (blue asbestos) be used. When insulation or packing materials which contain or are suspected of containing crocidolite are removed full precautions should be observed. (as described hereafter).

2. Whenever possible, suitable substitute materials which do not contain asbestos should be used (See Appendices). In the event that asbestos material is used, but is not readily recognisable as such, the work should be clearly marked as a warning to maintenance/demolition personnel for the future.

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3. All persons handling asbestos should be fully trained in safe methods of use and in personal and plant hygiene practices to be observed during use. Local regulations should be drafted to cover safe methods of handling asbestos materials, (including application, removal and disposal,) the safety of others working nearby, and particularly details of personal protection and hygiene. A copy of the regulations should be given to each employee engaged on this work.

4. A Register should be kept of all personnel who handle asbestos, or who are known to have handled asbestos regularly in the past (e.g. ladders) or who have had any exposure to crocidolite. It should be the responsibility of a designated person, on behalf of the location manager, to initiate and maintain this Register of names, length of exposure, and brief details of personal precautions used. The Safety Officer and Company-nominated Medical Officer should regularly inspect this Register and advise as necessary.

All persons previously and currently exposed should be expected to submit to periodic medical examinations as determined by the Medical Officer. All persons who will be engaged in such work on a regular basis should, as a condition of service, agree to a) an initial medical examination to determine fitness for this type of work, b) periodic medical examinations (including chest X-ray) as required by the Management on the advice of its Medical Officer, and c) use the personal protection provided.

5. Where Contractor employees are engaged on asbestos work in Company plants, a condition of the contract should be that the contractor shall observe both statutory and Company regulations concerning asbestos. Whilst ultimate responsibility for the health of the Contractor's employees should rest with the Contractor, unless the applicable law states otherwise, the Company engineer supervising the contract should ensure that the contractor fulfills his obligations. If the contractor does not so comply, he should be advised of a breach of contract.

B. Operational

1. Whenever possible, handling and manipulation of asbestos should be out of doors and the work area isolated to prevent contamination of the area, and from other persons working nearby, by the use of warning notices, suspended plastic sheeting and roping off. Preferably the work should be carried out in the still hours.

2. Whenever possible all operations should be carried out 'wet'.

3. Each package of asbestos should be separately labelled 'DANGER - ASBESTOS - DO NOT INHALE DUST - HANDLE WITH CARE'. It should be transported sealed in plastic bags or sheeting. Plastic ground sheets should be used beneath the work place.

All waste should be dampened and enclosed in plastic bags. These should be sealed, labelled 'DANGER - ASBESTOS - HANDLE WITH CARE - DO NOT OPEN' and disposed of by deep burial at a clearly marked place or by Local Authorities advised on the dangers of such wastes.

4. If it is necessary to handle or manipulate asbestos indoors, the area must be isolated, all waste collected and disposed of as described in B.3 above. At the end of the work the area including contaminated plant structures should be vacuum

cleaned, using a fine filtration method (preferably down to 0.5 micron particle size) to contain the collected dust, and then, if feasible, washed down. For disposal of the collected dust see B.3 above.

5. Non-asbestos workers must be excluded from the area. Persons who are temporarily required to enter or approach the area should wear the stipulated protective clothing and respirator.

C. Protective Equipment and measures

1. Should it be necessary to carry out regular work or prolonged operations involving asbestos within a building:—

a) exhaust ventilation with fine filtration (preferably down to 0.5 micron particle size) should be installed, if feasible, at all operational points where asbestos dust may be evolved. The exhaust dust should be collected and disposed of as described in B.3 above.

(N.B. The purpose of exhaust ventilation is not only to protect the operators from exposure to asbestos dust but also to reduce the contamination of the work place with asbestos dust.)

b) provided such ventilation is feasible and effective, the operators should wear approved dust masks (e.g. Siebe Gorman Filtasafe Dust Respirator with fine dust filter MESC 96.58.30.102.1/96.58.30.310.1 or equivalent) which should be close fitting.

(N.B. Cartridge dustfilters should be changed after each 7 day period of use, or earlier if clogged with dust. Pre-filter pads should be changed daily.)

c) in the event that exhaust ventilation is not feasible, or, if feasible, not fully effective in removing the dust evolved, then positive pressure air line masks or enclosed breathing apparatus should be worn by all operators.

d) the work place should be designed or modified to eliminate structures and equipment which might collect dust or waste. All surfaces should be impervious as far as this is practicable. In particular the floor should be impervious or plastic-sheet lined, kept damp at all times and periodically washed down. A water point should be available to permit this.

e) non-asbestos workers should be excluded from the work place.

f) showers should be provided and all operators should take a shower at the end of the working day.

2. Where asbestos handling or manipulation is infrequent, ad hoc or out of doors, approved masks should be worn by asbestos workers, but exhaust ventilation would not normally be necessary. If the work is in confined spaces or involves high concentrations of dusts, positive pressure air line masks or enclosed breathing apparatus should be worn. In addition exhaust ventilation should be used whenever feasible to reduce the contamination of the work place.

3. Overalls and headgear of closely woven terylene/cotton mixture, close-fitting at the neck, ankles and wrists, should be worn at all times when working with asbestos. Alternatively, plastic coveralls which can be washed down before removal may be worn.

4. A special decontamination room or portable unit, adjoining an existing locker/wash room should be provided for the exclusive use of asbestos workers.

This decontamination room/unit should contain its own W.C., urinal, showers, washing facilities, water point, vacuum cleaner, and individual lockers exclusive for the protective equipment and clothing used by asbestos workers.

5. Contaminated work clothing and footwear should be vacuum cleaned using a fine filtration apparatus before removal, and stored in the 'dirty' lockers provided. Collected dust should be disposed of as described in 8.3 above. Clothing must be clearly marked 'ASBESTOS CONTAMINATED - WET BEFORE HANDLING' when sent for laundering.

6. The decontamination room should be kept clean and orderly at all times and washed down at frequent intervals during an asbestos handling operation.

7. No asbestos worker should smoke, eat or drink whilst working with asbestos, or in areas where asbestos is handled or manipulated, or until decontamination. Before meals and at the end of the working day, the asbestos worker should remove, clean and store protective clothing (in the appropriate locker) and wash himself thoroughly, preferably by shower.

Additional references

'Recommendations for Handling Asbestos' -

E.E.U.A. Handbook No.33
Engineering Equipment
Users Association,
20 Grosvenor Place,
London, S.W.1.

'Asbestos - Safety and Control -

Asbestos Information
Committee,
10 Wardour Street,
London, W1V 3HG

'Recommended Code of Practice -
for handling and disposal of
asbestos waste materials'

The Asbestos Research
Council,
114, Park Street,
London, W1Y 4AB

Code of Practice 46-SCC-85010 (Shell Chemicals U.K. Ltd.)

D.E.P. 30.46.00.32.9 (Shell U.K. Ltd.)

Appendix 1

Notes on materials containing asbestos

The following comments are made to cover certain items containing asbestos in common use in the petroleum industry. Where substitute materials are available every effort should be made to adopt them.

Discarded stocks of materials containing asbestos should be disposed of as recommended in Section 8.3 of the main text.

When existing stocks of those items marked * are exhausted they should not be re-ordered but replaced by the appropriate recommended alternative.

1. *Asbestos Gloves.* Permitted for occasional use only, otherwise suitable alternatives are aluminised glass fibre gloves, leather gloves, or tongs.
- *2. *Asbestos Blankets.* Suitable alternatives are mineral wool or glass fibre blankets.
3. *Fire Suits.* Suitable alternatives are aluminised fibre glass suits, although aluminised asbestos suits are also acceptable. The old style asbestos (uncovered) suits should be replaced as soon as practicable.
4. *Asbestos/cement products.* (e.g. roof sheeting, drain pipes etc.) These are acceptable provided water or masks are used during manipulation causing dust e.g. cutting, drilling etc. The same applies to asbestos bonded materials.
- *5. *Filter mats and gauzes.* There is little hazard from dust here — alternatives to gauze are open mesh metal gauzes or ceramic fibre equivalents.
6. *Asbestos packing and insulating materials.* Alternatives are ceramic and other asbestos-free materials (refer Appendix 2) and these should be used wherever technologically acceptable.
7. *Gooch crucibles.* There is no hazard if dry asbestos is handled within a fume cupboard.
8. *Gaskets and pre-formed packings.* The hazard is minimal.
9. *Asbestos rope and string.* Suitable alternatives are ceramic fibre materials. (Refer Appendix 2)

Appendix 2

Examples of substitutes for packing and insulating materials containing asbestos

MATERIAL	MESC	SUBSTITUTE	MESC
Jointing Asbestos Millboard	85.21.30.102/216.1	Ceramic Fibre Paper Ceramic Fibre Board	85.22.20* 85.22.30*
Asbestos Cloth	85.21.10.102/104.1	Glass Fibre Cloth Ceramic Fibre Cloth	85.29.xx* 85.22.10*
Insulating Blocks Magnesia Asbestos	85.62.04.063/068.1 85.62.06.062/120.1	Mineral Wool Blocks Glass Wool Slabs Ceramic Fibre Blocks	85.62.08* 85.62.xx* 85.62.01*
Insulation Pipe Sections Magnesia Asbestos	85.64.04.022/564.1 85.64.06.022/309.1	Mineral Wool Pipe Sections Glass Wool	85.64.08* 85.64.xx*
Insulation Cement Magnesia	77.22.30.150.1	Vermiculite Ceramic Fibre Cement	77.22.30* 77.22.30*
Insulation, Rope and Wrapping White Asbestos	85.70.06.016/164.1	Glass Fibre Rope Ceramic Fibre Rope	85.70.xx* 85.70.08*
Sealing Compounds based on cement and asbestos—containing aggregates		Ceramic Fibre, heat resistant compounds based on asbestos free aggregate and cement	77.22.20*

* Full MESC numbers will be introduced on revision of the relevant MESC Groups.

Note: "Ceramic Fibre" examples:—

"Fiberfax" — The Carborundum Co., U.S.A.

The Carborundum Co., U.K.

"Kaowool" — Babcock and Wilcox Co., U.S.A.

"Cerafelt" — Johns Manville, U.S.A.

"Triton Kaowool" — Morganite Ceramic Fibres Ltd., U.K.