FILE NAME: ICI (ICI)

DATE: 1967 Jan 17

DOC#: ICI015

DOCUMENT DESCRIPTION: Industry Report

ASBESTOS HAZARDS

INVESTIGATION INTO THE USE OF ASBESTOS-FREE LAGGING SYSTEMS AND VACUUM CLEANERS FOR REMOVING ASBESTOS DUSTS AND FIBRES.

1. INTRODUCTION

At a meeting on December 5th 1966, Dr. Piper outlined the hazards connected with the use of asbestos and recommended certain measures to minimise these hazards.

Among the actions agreed were investigations to be carried out by the writer into the implications of eliminating asbestos from future thermal insulation systems and the establishment of principles for the specification of new thermal insulation systems.

2. RECOMMENDATIONS

For reasons outlined below it is recommended that all future lagging is carried out in accordance with the following principles:-

2.1 Slag wool or glass fibre will be used, normally as preformed, canvas-backed sections or mattresses.

2.2 Protection from mechanical damage will be provided only where essential and will be carried out in galvanised steel or aluminium.

2.3 Protection from spillage of liquids will be provided where necessary by sheet metal with generous laps designed to shed the liquid.

2.4 Weatherproofing is to be carried out by covering outdoor work with two-ply roofing felt and wire netting unless there is an exceptional fire hazard necessitating the exclusion of flammable materials. In such cases metal cladding is to be used.

2.5 Asbestos-free magnesia and calcium silicate will be considered when they become readily available, as will also the asbestos free cement finish which is being developed.

2.6 Vacuum cleaners are to be provided at all major factories for dealing with asbestos dust produced during maintenance operations. These must have a filter on the exhaust with a performance at least as good as 98% efficiency at 2 microns. Legislation at present being prepared may insist that these vacuum cleaners discharge by hose to exhaust ducting or to the outside atmosphere.

INSULATION SYSTEMS IN NORMAL USE WITHIN THE DIVISION

Until recently the vast majority of lagging applied in the Division consisted of 85% Magnesia in sectional and plastic form covered with hard setting composition. Recently 85% Magnesia has been replaced with Calcium Silicate, a new material which is slightly cheaper than Magnesia and has similar properties. Both 85% Magnesia and Calcium Silicate lagging contain about 12% Asbestos as reinforcement.

The hard setting composition, which consisted of plaster, magnesia, asbestos and perhaps jute, has been replaced by asbestos cement, which has superior physical properties at roughly the same cost.

At Ore Mill the lagging of pipework, except in the boiler house was carried out in slag wool because the appearance and strength of Magnesia lagging was not considered to be worth the extra cost of about 30%.

Slag wool and glass fibre have also been used in other places such as depots and office blocks.

3. Contd:

Absorption of liquids has been a particular problem where spillage of flammable liquids can occur. Metal cladding has normally been used in such cases, with generous overlaps arranged to shed the liquid.

Weatherproofing of lagging within this Division is mainly carried out with two ply roofing felt held on with binding wire and wire netting, but cement asbestos finishes have been introduced recently at Slough because of their superior appearance and ease of painting.

4. ALTERNATIVE ASBESTOS-FREE SYSTEMS.

The main asbestos-free insulation materials commercially available are slag wool and glass fibre. These are readily available in sectional form with canvas backing. Oversize sections can be used for the lagging of flanges and valves.

The finished appearance of canvas backed slag wool or glass fibre lagging, though inferior to cement finished calcium silicate and similar materials, is adequate and has been quite satisfactory at Orb Mill.

Weatherproofing can be achieved using 2 ply roofing felt with generous laps arranged to shed liquid, all properly wired on and painted. In areas of exceptional fire risk, where flammable materials must be excluded, metal cladding can be used.

The mechanical strength of slag wool or glass fibre lagging is adequate except where it is liable to be hit by portable containers, tools etc. Lagging high level pipes with system which will allow ladders to be supported against them on rare occasions is not economically justifiable. Where necessary these softer systems can be protected with metal cladding, but this is very expensive on complex piping and must be restricted to essential locations.

Where spillage of flammable liquids is liable to occur, metal cladding should be used, with generous laps arranged to shed liquid.

High temperature applications, over about 200°C (400°F) require special attention because some of the binding materials normally used begin to fail at these temperatures. High temperature resistant slag wool and glass fibre must therefore be used above these temperatures.

5. COSTS.

The cost of canvas backed slag wool or glass fibre applied as above is about 30% less than the cost of Calcium Silicate or Magnesia lagging with cement asbestos finish.

Metal cladding costs about the same as the slag wool or glass fibre under it, depending on the complexity of the job.

The overall costs of lagging systems using asbestos free materials as above should be somewhat lower than those of comparable lagging systems using Calcium Silicate or Magnesia with cement asbestos finish, provided that the metal cladding is kept to a minimum.

6. CAPLOCK

Various suppliers are making great efforts to produce acceptable asbestos free magnesia or calcium silicate lagging materials, but so far only one appears to have succeeded and he is not in full production. The material is a fibre reinforced magnesia, but the nature of the fibre is not yet disclosed. The same supplier is said to be producing an asbestos free cement finish.

There is little doubt that before long these asbestos free materials will be available and that the prices will be close to those of the materials which

6. Contd.

they replace.

It is probable, however, that slag wool and glass fibre materials will remai more economical, and in making the selection the ease and cleanliness of application of these materials should be considered against the appearance and strength of the others.

7. VACUUM APPARATUS

Asbestos dust, such as is formed when disturbing and replacing existing lagging during maintenance operations, should be removed by vacuum cleaners havir filters sufficiently fine to prevent the emission of asbestos dusts and fibres.

No very firm information is available on the degree of filtration required, but the British Vacuum Cleaner Co. can supply industrial vacuum cleaners complete with 'absolute' filters on their exhausts, giving 98% efficiency at 2 microns. They advise that this is adequate.

The cost of such a machine, fitted with flameproof motor and starter and with an 'absolute' filter would be about £500, including all the necessary attachments.

The cost of adding an absolute filter to an existing machine would be about £100.

There are other less costly machines available, such as the Jet-Vac machine at Stowmarket which costs about £200, and is claimed by the makers to be adequate, but a careful check would have to be made of the filtration efficiency in each case.

Clearer guidance should be available when legislation, at present being prepared, is published.

It is quite possible that this legislation will insist on discharge to outside atmosphere or to mechanical extraction ventilation ducts.

In any case, respirators must be worn even when using a vacuum cleaner to clear up dusts containing asbestos, because some dust will inevitably be disturbed without being caught by the vacuum cleaner.

JAC/MSG
17th January, 1967.

/

JC 9 Panels

Very little cloth Empson on March 2nd using applic