Appendix 1/17

Minutes of the 19th meeting of the ALG Technical Working Group, 17 October 2017

Asbestos Enclosure Ventilation Research

Appendices are attached to Technical Working Group minutes when the nature and extent of discussions (or the complexity of the subject) warrants further explanation and clarification. The following is a summary of research work carried out on the ventilation of asbestos enclosures.

BACKGROUND AND SUMMARY

Background

1. HSE research work carried out in 2012/13 investigated the airflow characteristics of ventilated asbestos enclosures and the factors which affect their containment potential, in order to provide the information and data on which new ventilation guidance would be based. A revised ventilation rate of 1000m^3/hr for asbestos enclosures less than 120m^3 in size was subsequently introduced in December 2013 in the asbestos Approved Code of Practice (ACOP)(L143 Second Edition).

2. Subsequently some concern was raised by industry regarding the implications of moving to a standard volume flow ventilation rate particularly regarding the stability of very small enclosures and the potential effect on airlock door flap displacement. The purpose of the new research was to address the issues raised by industry. The research was also designed to provide further information on the supply, management and measurement of airflow within asbestos enclosures in order to ensure a better understanding of the factors which influence airflow and containment. This document summarises the findings of the research. The full report on the research can be obtained at www.hse.gov.uk/asbestos.

Summary

3. The research work concluded the following:

(i) For standard timber/polythene asbestos enclosures, negative pressure (NP) within the enclosure, and airlock door flap displacement distance are directly proportional to the air extraction rate. Therefore door flap deflection can be used to indicate the air extraction rate and the extent of NP within the enclosure.

(ii) An air extraction rate of 1000m^3/hr will produce a differential pressure of about -5Pa and a door flap deflection of between 200-250mm in the middle sections of the 3-stage airlock (with the baglock closed). These conditions were created in all enclosures tested (size range 6-120 m^3) irrespective of enclosure size.

(iii) A door flap deflection of 200-250mm will demonstrate that the required extraction volume of 1000m^3/hr is being achieved for enclosures <120m^3.

(iv) Standard enclosure construction of timber and polythene provides a sufficiently robust, strong and stable unit to withstand the new air extraction rate and significantly higher air flows. An air extraction rate of 1000m^3/hr has no adverse effects on the stability and integrity of very small enclosures (eg 6m^3).

(v) Sufficient airlock space is required to enable asbestos operatives to carry out changing and decontamination procedures. The research concluded that there should be sufficient changing space in the airlock up to an extraction volume flow of about 1500m^3/hr (door flap deflection will be ~300mm). Where larger extraction volume flows are employed, then additional simple actions will be required to ensure sufficient airlock space: the actions will include doubling the airlock door flap weight and opening up the second airlock (ie baglock).

(vi) At very high flow rates eg about 4000m^3/hr or above (required for larger enclosures), additional make-up air will need to be provided. The air can be delivered through single chamber airlocks ("cubes"). Further cubes will also be required for each additional 4000m^3/hr of air extracted. A photograph of a "cube" is shown in Photo 1.

(vii) The desired minimum air extraction volume flow (1000m^3/hr) can be obtained by using a combination of negative pressure units (NPUs) eg 2 x "500s".

(viii) Variable speed controls fitted on NPUs enable much greater control over airflow. The devices allow adjustment of airflow to take account of airflow losses (eg through the use of roving heads or filter loading) and to reduce "excessive" door flap displacement. Many NPUs are already supplied with these devices fitted. Variable speed controls can also be fitted retrospectively to existing NPUs.

(ix) Airflow rates of NPUs should also be measured at the start of each job to confirm that the required airflow is achieved.

Photo 1: Photograph of a "cube" attached to an enclosure. The cube is a single stage airlock measuring 1m x 1m x 2m fitted with door openings and flaps identical to one stage of a 3-stage airlock. Photo shows the door flap with full scale deflection.