

M505: CONTROL OF HAZARDOUS SUBSTANCES

PRACTICAL EXERCISES

AIM:

To use a number of practical exercises to reinforce the learning's of the preceding days.

The type and depth of exercises will depend on the availability of equipment hence the exercises below are offered as suitable suggestions. The exact programme should be tailored to meet the resources available.

SUGGESTED EXERCISES:

1 - Personal Protective Equipment

a) *Fit Checking and Qualitative Fit Testing*

Use either a negative pressure fit check or a positive pressure fit check as a quick means of determining the effective fit of disposable and reusable style of half face piece respirators

NB – Ensure the participant understand the difference in the use of the two different techniques.

Use the FT 10 Fit Test Kit and follow the provided protocol to demonstrate its use in Quantitative Fit Testing of Respirators

Use isoamyl acetate to demonstrate that gases and vapours are not removed by particulate filters.

b) *Quantitative Fit Testing*

Using a TSI Portacount determine the fit factor of disposable and reusable style of half face piece respirator.

Demonstrate the use of the real time read out as a means of using the instrument in training people in how to wear a respirator correctly.

c) *Gas and Vapour Service Life Calculator*

Using the Service Life Calculator determine the service life of a number of different gas and vapour cartridges with a range of different gases and vapours (eg different organics and organics PLUS inorganic gases) under a range of different work rates.

d) *Use of fluorescein dye*

Use fluorescein dye to demonstrate how easily contamination can occur in simply putting on and removing items of protective clothing eg gloves and coveralls.

2 - Pitot Tube Traverse

Using a portable ventilation rig students should be asked to conduct pitot traverse across the duct and to calculate the air velocity in the duct. The traverse should be conducted in accordance with the guidance in section 6.4.7 of the student manual.

Attach a suitable hood to the test rig and ask students to:

- Carry out an assessment of the airflow into the hood using smoke tubes. Ask the students what are their conclusions?
- Measure the air velocity at the face of the hood and record the instrument used. The hood is to be used to control solvent vapours. What capture velocity would the students recommend?
- Carry out measurements to determine the maximum distance from the hood where this velocity can be achieved. Record the instrument used.

3 – Extraction Booth

If a suitable booth is available ask the students to:

- Carry out an assessment of the airflow at the face of the booth and inside the booth using smoke tubes and record their conclusions?
- Measure the velocity at the face of the booth. Ask them to take a series of readings and write the results on a representative diagram and calculate the average face velocity.
- Measure the hood dimensions and work out the face area.
- Calculate the volume flow through the system showing all workings.

Present the following scenario to the students and ask them to answer the questions.

A process is to be carried out inside this booth where small components are dipped in into a solvent based varnish. The coated components will then be left inside the booth to dry.

- a. What face velocity would you recommend?
- b. Given your results, will the system adequately control the solvent vapours evolved? (Give a brief explanation for their conclusions)