A Quick Note on Respirator Fit Testing

Safety regulations can often be confusing and jurisdictions – provincial, national, or international – can be difficult to determine. This is especially true when it comes to respirator fit testing in Canada. We've put this document together using a variety of sources, including CSA Standards, mask manufacturer guidelines, WorkSafeBC Regulations, and fit test machine manufacturers. Its purpose is to give you a high-level summary of the requirements around fit testing, and to explain why we recommend you take the conservative route, sticking to a quantitative fit testing methodology.

Quantitative Respirator Fit Testing Regulations

In work environments that utilize respirators, an accurate respirator fit test is critical to ensure employee / student respiratory protection. Students and professionals in these industries rely on respirators that fit their faces properly and create an effective seal, to protect against a variety of respiratory hazards.

The Respiratory Protection Program (Authorities, 2013), a guideline developed by a group of OHS Professionals from representing the Health Authorities in BC, requires that:

- An employee must not utilize a respirator unless she or he has first been fit-tested
- An employee must only use a respirator model to which they have been fit-tested within the past year

But did you know that Quantitative Fit Testing is now required in a variety of situations relevant to your field?

Quantitative Fit Tests involve the use of specialized equipment that measures the amount of the ambient air leaking into a mask. This test is not subjective and does not rely on the subject's ability to taste test agent, as with qualitative fit testing. A study published by the Journal of Applied Occupational and Environmental Hygiene produced results showing that up to 33% of subjects were unable to detect qualitative testing agent while wearing masks known to have leaks*1*.

According to Section 8.40 of WorkSafeBC OHS Regulations and CSA standard Z94.4-02, Quantitative Fit Tests are to be conducted when:

- The qualitative fit-test agent cannot be detected by the staff member.
- When a staff member was not successfully fit tested via qualitative testing
- Special situations arise, such as where a staff member has a health condition that prevents qualitative fit test methodology. Examples of this include when the subject is sensitive to the qualitative fit test agents or if the subject is claustrophobic.
- Quantitative Fit Tests will be utilized for any tight-fitting respirator with an assigned protection factor greater than 10.
- N95 respirators when required (i.e. after an unsuccessful/uncertain fit-testing result using qualitative fit-test methodologies). In our experience, the material used to create these N95 masks makes qualitative fit testing unreliable.

Under CSA Standard Z94.4-022, cited by WorkSafeBC, all full-faced and supplied air respirators require the use of quantitative fit test methodology. If you wish to conduct qualitative fit tests, it is your responsibility to provide proof that the protection factor is less than 10.

1 Retrieved from:
https://www.researchgate.net/publication/12465844_Capability_of_Respirator_Wearers_to_Detect_Aerosolized_Qualitative_Fit_Test_Agents_Sweetener_and_Bitrex_with_Known_Fixed_Leaks

In order to prove that the protection factor you require is 10 or less, an occupational hygienist must first visit your worksite and measure airborne contaminants to determine the Occupational Exposure Limit. This measurement is derived by measuring the airborne contaminant concentration and the hazard ratio, then applying this formula:

$$\frac{\textit{Airborne Contaminant Concentration}}{\textit{Vapour Hazard Ratio}} = \textit{Occupational Exposure Limit}$$

Using a Quantitative Fit Testing method eliminates the impractical nature and often substantial expense of hiring a hygienist to measure your airborne contaminant concentration.

Several organizations within the Regional Health Authority have already adopted Quantitative Fit Testing as a mandatory practice due to the requirement to produce a hygiene report and the use of N95 masks for their job scope.

Employing a Quantitative Fit Test method provides an additional level of protection for your organization. Risks associated with worker or student respiratory system health include litigation, lost time, increased WCB premiums, and reputation. These can be virtually eliminated by employing the best known practice of fit testing – the quantitative methodology. This can be further justified by the immediate cost-savings realized by avoiding the need to test work atmospheres.

IRWIN'S Safety is an experienced provider of Quantitative Fit Testing and offers this service throughout British Columbia, Alberta, and the Northwest and Yukon Territories.

Irwin's Quantitative Fit Test Program offers:

- Convenient, on-site testing
- Necessary equipment to test all types of respirators, including N95 filtering facepiece respirators (also known as dust masks)
- Fit-tests completed in accordance with the Occupational Health & Safety Regulation and CSA Standard Z94.4-11.
- Proof of fit-testing completion that details the fit-test date, respirator brand, model and size and name of fit-tester and company (as applicable).
- Annual Fit Test reminder program Contact Irwin's Safety today to arrange your on-site Fit Testing.

Works Cited

Administration, O. S. (2009). Assigned Protection Factors for the Revised Resporatory Protection . Washington D.C.: Occupational Safety and Health Administration U.S. Department of Labour.

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