

The Meaning of Acceptable Concentrations

It is generally recognized that there are concentrations of air contaminants to which a person may be exposed without discomfort or ill effects. This standard defines such concentrations in light of best present day knowledge.

The immediate use of a ASI Standard for acceptable concentrations is for guidance in establishing engineering procedures to prevent objectionable concentrations of materials in the air of work places. These concentrations in themselves do not represent a scale of relative toxicity, they represent concentrations below which ill effects are unlikely under the specified conditions.

The term, acceptable concentration, is not defined as a single concept but is related to the duration and pattern of the exposure as set forth in the ASI Standard for the individual substance.

In the application of an acceptable concentration established as a ASI Standard, it is important to understand the criteria upon which the standard is established. These criteria are avoidance of

(1) Undesirable changes in body structures or biochemistry

(2) Undesirable functional reactions that may have no discernible effects on health

(3) Irritation or other adverse sensory effects

A purpose for establishing acceptable concentrations is to provide a basis for interpretation of the results of air analysis as an indication of the severity of potential exposure, but not as a means of establishing the presence of occupational disease. Comparison of air analysis results with acceptable concentrations indicates either acceptable conditions or otherwise the need, extent, and urgency of control measures.

Sampling and analysis should be performed by competent personnel using a standard method if available, and one that will provide a reliable indication of potential exposure.

It should be kept in mind that

(1) The acceptable concentrations are the highest concentrations which can currently be justified consistent with the objective of maintaining unimpaired health or comfort of workers or both. It is good practice to maintain lower concentrations when this does not render industrial operations inefficient.

(2) Acceptable concentrations are not precise values sharply dividing what is hazardous from what is safe under the particular circumstances and therefore are not appropriate for use as legal requirements.

(3) These standards are considered to be guides for good industrial hygiene practices and should be applied and interpreted by persons with a full understanding of the basis and limitations of the information from which the standard has been developed.

(4) The levels are applicable only to a single substance and to the exposure pattern as detailed in the standard.

(5) Exposure to mixtures is the rule. When more than one of the components is of hygienic significance, acceptable concentrations of the components should be based on the given mixture and situation.

(6) Routes of absorption other than inhalation, such as through the skin, should be considered in the evaluation of the exposure.

(7) These standards do not apply to community atmospheric pollution as related to general populations.

FIG 42-2 - The definition of acceptable concentrations of air contaminants as developed by the American Standards Institute Z-37 Committee (1967)

fore, multiple boundaries are needed. As the boundaries are not sharp lines between what is and what is not healthful, an explanation of the basis and significance of each of these boundaries is needed. These different acceptable concentrations for the same material follow:

1 An acceptable ceiling concentration for protection of health, assuming an eight-hour work day (This is equivalent to the old maximum allowable concentration)

2 An acceptable time-weighted average for protection of health, assuming an eight-hour work day (This is within the limits of the previous specified ceiling and defined peaks beyond this ceiling)

3 An acceptable maximum for peaks above the acceptable ceiling for an eight-hour work day

In a particular operation there may be a
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