

4717.8600 PROCEDURE FOR DETERMINING HAZARD INDEX FOR ASSESSING SIMULTANEOUS EXPOSURE TO MULTIPLE TOXICANTS WITH NONCARCINOGENIC EFFECTS.

Subpart 1. **Hazard index.** When simultaneous exposure is evaluated for multiple toxicants with noncarcinogenic effects, a hazard index must be calculated using the procedure in this part.

Subp. 2. **HRVs for toxicants with noncarcinogenic effects.** For health risk values (HRVs) that have endpoints other than cancer, items A to D apply.

A. The chemicals or defined mixtures of chemicals detected in the air must be first grouped by endpoint of concern and by HRV type (acute, subchronic, chronic).

B. A separate hazard index is then calculated for each same endpoint of concern group within the chronic, subchronic, and acute categories.

C. When two or more chemicals or defined mixtures of chemicals have the same endpoint, a hazard index must be determined using the following equation:

$$\text{Hazard index} = \frac{E_{ST1}}{HRV_{ST1}} + \frac{E_{ST2}}{HRV_{ST2}} + \dots + \frac{E_{STn}}{HRV_{STn}}$$

Where:

(1) E_{STn} represents the measured or modeled ambient air concentration of the first, second, through the n^{th} toxicant with noncarcinogenic effects in air as expressed in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); and

(2) HRV_{STn} represents the HRV of the first, second, through the n^{th} toxicant with noncarcinogenic effects as expressed in units of micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

D. A hazard index of one or less indicates a combined concentration of chemicals unlikely to cause an adverse health effect to the general public.

E. A hazard index of one equals the cumulative HRV.

Subp. 3. **MHRVs for toxicants with noncarcinogenic effects.** For multimedia health risk values (MHRVs) that have endpoints other than cancer, items A to C apply.

A. The chemicals or defined mixtures of chemicals measured or modeled in ambient air must first be grouped by endpoint of concern.

B. When two or more chemicals or defined mixtures of chemicals have the same endpoint, a hazard index must be determined using the following equation:

$$\text{Hazard index} = \frac{D_{ST1}}{MHRV_{ST1}} + \frac{D_{ST2}}{MHRV_{ST2}} + \dots + \frac{D_{STn}}{MHRV_{STn}}$$

Where:

(1) D_{STn} represents the calculated dose of the first, second, through the n^{th} toxicant with noncarcinogenic effects as expressed in micrograms per kilogram of body weight per day ($\mu\text{g}/\text{kg}\cdot\text{d}$); and

(2) $MHRV_{STn}$ represents the MHRV of the first, second, through the n^{th} toxicant with noncarcinogenic effects as expressed in micrograms per kilogram of body weight per day ($\mu\text{g}/\text{kg}\cdot\text{d}$).

C. A hazard index of one or less indicates a combined concentration of chemicals unlikely to cause an adverse health effect to the general public.

D. A hazard index of one equals the cumulative MHRV.

Statutory Authority: *MS s 144.12*

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