

Biological Exposure Indices (BEI)

The American Conference of Governmental Industrial Hygienists (ACGIH®) is a scientific professional society that establishes Threshold Limit Values (TLV®) and Biological Exposure Indices (BEI®) as guidelines to assist in the control of health hazards in the workplace. ACGIH is not a government agency, and neither TLV®s nor BEI®s are standards.

TLV®s and BEI®s are established by committees that review existing published and peer-reviewed literature in various scientific disciplines (e.g., industrial hygiene, toxicology, occupational medicine, epidemiology). Based on available information ACGIH® committees formulate a conclusion on the level of exposure the typical worker can experience without adverse health effects. TLV®s are chemical air concentrations that ACGIH® considers nearly all workers may be repeatedly exposed to without adverse health effects. BEI®s are guidance values for assessing biomonitoring results, and represent levels of determinants most likely to be observed in samples collected from healthy workers exposed to the same extent as workers with inhalation exposure at the TLV®. ACGIH® recognizes that biological levels of some determinants can change rapidly. Sample collection time is therefore very important and is specified in the BEI®.

The ACGIH® has established a TLV® for elemental mercury of 25 micrograms per cubic meter of air (mcg/m³).

The ACGIH® has established the following BEI®s and sampling times for mercury in urine and blood:

| Determinant | Sampling Time | BEI |
|--------------------------------|---------------------------------|--|
| Urine: total inorganic mercury | pre-shift | 35 micrograms per gram of creatinine (mcg/g creatinine) ² |
| Blood: total inorganic mercury | End of shift at end of workweek | 15 micrograms per liter of blood (mcg/L) |

ACGIH® cautions that these guidelines are intended for use in the practice of industrial hygiene, to be interpreted and applied only by a person trained in this discipline. Use of TLV®s or BEI®s to characterize health risk should only occur after review of written documentations which can be obtained from the ACGIH®. For more information, see:

<http://www.acgih.org/forms/store/ProductFormPublic/mercury-elemental-bei-r-7th-edition-documentation>.

² Creatinine is a metabolite normally found in urine that can be used to indicate whether a urine sample is too concentrated or dilute to be used for biomonitoring. Correcting for creatinine allows spot urine samples to be evaluated when a full 24-hour urine sample is not possible.

Reference:

ACGIH (American Conference of Governmental Industrial Hygienists). 2007. Documentation of the Biological Exposure Indices (7th Edition). Mercury – Elemental and Inorganic. ACGIH Worldwide, 1330 Kemper Meadow Drive, Cincinnati, Ohio 45240-1634.