

**WAC 296-62-20029 Appendix B—Industrial hygiene and medical surveillance guidelines.**

**APPENDIX B**

INDUSTRIAL HYGIENE AND MEDICAL  
SURVEILLANCE GUIDELINES

I. INDUSTRIAL HYGIENE GUIDELINES

- (1) Sampling. (Benzene-Soluble Fraction Total Particulate Matter.) Samples collected should be full shift (8-hour) samples. Sampling should be done using a personal sampling pump with pulsation damper at a flow rate of 2 liters per minute. Samples should be collected on 0.8 micrometer pore size silver membrane filters (37 mm diameter) preceded by Gelman glass fiber type A filters encased in three-piece plastic (polystyrene) field monitor cassettes. The cassette face cap should be on and the plug removed. The rotameter should be checked every hour to ensure that proper flow rates are maintained.

A minimum of three full-shift samples should be collected for each job classification on each battery, at least one from each shift. If disparate results are obtained for particular job classification, sampling should be repeated. It is advisable to sample each shift on more than one day to account for environmental variables (wind, precipitation, etc.) which may affect sampling. Differences in exposures among different work shifts may indicate a need to improve work practices on a particular shift. Sampling results from different shifts for each job classification should not be averaged. Multiple samples from same shift may be used to calculate an average exposure for a particular job classification.

- (2) Analysis.
- (a) All extraction glassware is cleaned with dichromic acid cleaning solution, rinsed with tap water, then deionized water, acetone, and allowed to dry completely. The glassware is rinsed with nanograde benzene before use. The Teflon cups are cleaned with benzene then with acetone.
  - (b) Pre-weigh the 2 ml Perkin-Elmer Teflon cups to one hundredth of a milligram on a Perkin-Elmer autobalance AD 2 Tare weight of the cups is about 50 mg.
  - (c) Place the silver membrane filter and glass fiber filter into a 15 ml test tube.
  - (d) Extract with 5 ml of benzene for five minutes in an ultrasonic cleaner.
  - (e) Filter the extract in 15 ml medium glass fritted funnels.
  - (f) Rinse test tube and filters with two 1.5 ml aliquots of benzene and filter through the fritted glass funnel.
  - (g) Collect the extract and two rinses in a 10 ml Kontes graduated evaporative concentrator.
  - (h) Evaporate down to a 1 ml while rinsing the sides with benzene.
  - (i) Pipet 0.5 ml into the Teflon cup and evaporate to dryness in a vacuum oven at 40°C for 3 hours.
  - (j) Weight the Teflon cup and the weight gain is due to the benzene soluble residue in half the sample.

II. MEDICAL SURVEILLANCE GUIDELINES

(1) General.

The minimum requirements for the medical examination for coke oven workers are given in WAC 296-62-20017.

The initial examination is to be provided to all coke oven workers who work at least thirty days in the regulated area. The examination includes a 14" x 17" posterior-anterior chest X-ray and a ILO/UC rating to assure some standardization of X-ray reading, pulmonary function tests (FVC and FEV 1.0), weight, urinalysis, skin examination and a urinary cytologic examination. These tests are to serve as the baseline for comparing the employee's future test results. Periodic exams include all the elements of the initial exams, except that the urine cytologic test is to be performed only on those employees who are forty-five years of age or older or who have worked for five or more years in the regulated area; periodic exams, with the exception of X-rays, are to be performed semiannually for this group instead of annually; for this group, X-rays will continue to be given at least annually. The examination contents are minimum requirements, additional tests such as lateral and oblique X-rays or additional pulmonary function tests may be performed if deemed necessary.

(2) Pulmonary function tests.

Pulmonary function tests should be performed in a manner which minimizes subject and operator bias. There has been shown to be learning effects with regard to the results obtained from certain tests, such as FEV 1.0. Best results can be obtained by multiple trials for each subject. The best of three trials or the average of the last three of five trials may be used in obtaining reliable results. The type of equipment used (manufacturer, model, etc.) should be recorded with the results as reliability and accuracy varies and such information may be important in the evaluation of test results. Care should be exercised to obtain the best possible testing equipment.

[Statutory Authority: RCW 49.17.010, [49.17].040 and [49.17].050. WSR 99-17-094, § 296-62-20029, filed 8/17/99, effective 12/1/99; WSR 98-02-030, § 296-62-20029, filed 12/31/97, effective 1/31/98; Order 77-14, Appendix B (codified as WAC 296-62-20029), filed 7/25/77.]