Chemical Fact File®

Carbon monoxide — OSHA ID 210

Previous sampling methods for carbon monoxide required the use of direct-reading instruments and detector tubes. Since direct-reading instruments require constant maintenance and detector tubes only offer spot checks of the air, OSHA developed Method ID 210 as an alternative sampling methodology. This method is specific for carbon monoxide, uses an aluminized sample bag, and samples may be analyzed for other toxic gases.

Required Equipment:

1. An **air sampling pump** capable of sampling at the recommended flow rate with the sampling medium in line, such as:
   - SKC **Grab Air Sample Pump** Cat. No. 222-2301
2. An **airflow calibrator,** such as:
   - Defender Primary Standard Calibrator Cat. No. 717 Series
3. SKC **FlexFoil® PLUS Sample Bag*** Cat. No. 252-05 or 253-05
4. SKC **PTFE Tubing** Cat. No. 231-9-21 or 231-9-23

* This method specifies a 5-layer aluminized bag. SKC FlexFoil PLUS bags are constructed of 4-ply foil material that has been shown to effectively hold a concentration of 100 ppm carbon monoxide over a five-day period without sample loss. *For study details, go to http://www.skcinc.com/prod/245-01.asp and select link for Analysis of FlexFoil Bags for Carbon Monoxide, Carbon Dioxide, and Hydrogen.*

Optional Equipment:

1. SKC **Septum** Cat. No. 233-01-RS

SKC Application Guides:

1. Sampling Train — Air Sample Bags, #1167
2. Calibrating a Pump Using an Electronic Calibrator, #1366

	TWA	STEL
Flow Rate	50 ml/min	1000 ml/min
Sample Time	100 minutes	5 minutes
Air Volume	5 liters	5 liters
OSHA PEL	50 ppm	None
(per 29 CFR 1910.1000)		

Sampling and Analysis:

1. To set up a sample bag sampling train, attach a piece of PTFE tubing to the hose/valve fitting on the bag. Connect the other end of the tubing to the outlet fitting on the pump. The pump can be placed in a work area or mounted to a worker with a bag carrier. Open the valve on the bag. *Request SKC Application Guide #1167 for more information on preparing sample bag sampling trains.*

2. For calibrating the pump, connect the pump to the calibrator with a piece of flexible tubing. Calibrate the pump flow rate to the rate specified in the method. When calibration has been completed, disconnect the pump from the calibrator. *Request SKC Application Guide #1366 for more information on calibrating a pump.*

3. For sampling, set up a sampling train as described above. Turn on the pump.

4. Sample at an accurately known flow rate for the recommended period of time.

5. At the end of the sampling period, turn off the pump and note the ending time. Remove the sample bag and record any pertinent sampling information.

6. Calibrate the pump to verify that the flow has not changed by more than 5%.

7. Sample bags sent out for analysis should be packed loosely and padded to minimize the danger of being punctured during shipment. Do not ship the bags by air unless they are stored in a pressurized cabin.

Storage:

For best results analyze the sample within 24 hours of collection.

Analyzing Method:

Gas chromatography - discharge ionization detector (GC-DID)

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