



Standard Practice for Investigating Carbon Monoxide Poisoning Incidents¹

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1. Scope

1.1 This practice covers guidelines for collecting and preserving information and physical evidence related to incidents involving the poisoning of individuals by carbon monoxide.

1.2 This practice is not intended to be a guide for investigating carbon monoxide poisoning caused by hostile fires. Guidance on the investigation of carbon monoxide poisonings related to fire can be found in NFPA 921, *Guide for Fire and Explosion Investigations*.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

E 678 Practice for Evaluation of Technical Data²

E 860 Practice for Examining And Testing Items That Are or May Become Involved in Litigation²

E 1020 Practice for Reporting Incidents²

2.2 NFPA Standards:

NFPA 54 National Fuel Gas Code³

NFPA 921 Guide for Fire and Explosion Investigations³

3. Significance and Use

3.1 Carbon monoxide poisoning is responsible for approximately 300 deaths annually in the U.S., (excluding fire deaths) and carbon monoxide poisoning causes thousands of individuals to seek medical attention.

3.2 This practice is intended for use by individuals who investigate incidents involving carbon monoxide poisoning. If this procedure is followed, the cause for the carbon monoxide poisoning incident may be determined, and steps can be taken to prevent future incidents.

4. Equipment

4.1 *Electronic Carbon Monoxide Monitor*—A direct reading electronic monitor having a range of 0 to 1000 ppm is

useful in that its output provides almost instantaneous concentration data, and it therefore has the capability to warn the investigator if carbon monoxide levels are reaching dangerous concentrations.

4.2 *Reagent Tube Indicator*—Several types of reagent tube indicators are available for measuring carbon monoxide, carbon dioxide, and fuel gases. Reagent tubes capable of responding to concentrations of 0 to 100 ppm, 0 to 1000 ppm, and 0 to 1 % carbon monoxide in air are recommended.

4.3 *Ventilation Equipment*—A fan or similar device should be available to allow flushing the air space around equipment between tests.

4.4 All equipment shall be calibrated at least annually.

5. Safety

5.1 Testing equipment suspected of causing carbon monoxide poisoning can yield definitive results that cannot be obtained any other way. Testing equipment that may have injured individuals; however, is a potentially dangerous undertaking, in that the investigator runs the risk of becoming exposed to carbon monoxide being produced by improperly functioning equipment.

5.2 Safe testing procedures are of the utmost importance. Before any testing is planned, a safety officer shall be identified. The safety officer's responsibilities shall be to protect the safety and health of the investigator and any individuals who may be affected by the testing.

5.3 Stable communications should be assured between the site and emergency service providers.

5.4 Until its safe operation has been verified, only one person at a time should be allowed into any space where a piece of equipment is being tested for carbon monoxide output. That person should remain within sight of the safety officer or another individual capable of rescuing that individual from the space.

5.5 All testing shall be discussed in detail with all individuals involved in the testing, prior to the beginning of any test.

6. Procedure

6.1 *Scene Security*—the first priority is to evacuate the scene and prevent further injuries or loss of life.

6.1.1 After evacuation, the scene should be secured, and if possible, a field measurement of carbon monoxide levels in various locations around the scene should be taken.

¹ This practice is under the jurisdiction of ASTM Committee E30 on Forensic Sciences and is the direct responsibility of Subcommittee E30.05 on Engineering. Current edition approved April 10, 2003. Published June 2003.

² *Annual Book of ASTM Standards*, Vol 14.02.

³ Available from NFPA, 470 Atlantic Ave., Boston, MA 02210.