



Standard Practice for Installing Fused Silica Open Tubular Capillary Columns in Gas Chromatographs¹

This standard is issued under the fixed designation E1510; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

^{ε1} NOTE—Warning statements were editorially corrected in January 2013.

1. Scope

1.1 This practice covers the installation and maintenance of fused silica capillary columns in gas chromatographs that are already retrofitted for their use. This practice excludes information on:

- 1.1.1 Injection techniques.
- 1.1.2 Column selection.
- 1.1.3 Data acquisition.
- 1.1.4 System troubleshooting and maintenance.

1.2 For additional information on gas chromatography, please refer to Practice E260. For specific precautions, see 7.2.2.2(1), 7.2.2.2(2), 7.2.7, and 7.2.7.2.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *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.* For specific safety information, see Section 6, 7.2.2.2(1), 7.2.2.2(2), 7.2.7, and 7.2.7.2.²

2. Referenced Documents

2.1 ASTM Standards:³

E260 Practice for Packed Column Gas Chromatography
E355 Practice for Gas Chromatography Terms and Relationships

¹ This practice is under the jurisdiction of ASTM Committee E13 on Molecular Spectroscopy and Separation Science and is the direct responsibility of Subcommittee E13.19 on Separation Science.

Current edition approved Jan. 1, 2013. Published January 2013. Originally approved in 1993. Last previous edition approved in 2005 as E1510 – 95 (2005). DOI: 10.1520/E1510-95R13.

² Reprinted by permission of Restek Corp., 110 Benner Circle, Bellefonte, PA 16823-8812.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

2.2 CGA Publications:⁴

CGA P-1 Safe Handling of Compressed Gases in Containers
CGA G-5.4 Standard for Hydrogen Piping Systems at Consumer Locations
CGA P-9 The Inert Gases: Argon, Nitrogen and Helium
CGA V-7 Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures
CGA P-12 Safe Handling of Cryogenic Liquids
HB-3 Handbook of Compressed Gases

3. Terminology

3.1 Terms and relations are defined in Practice E355.

3.2 Nomenclature for open tubular or capillary columns with a bore of 0.75 mm or less:

3.3 *porous layer open tubular (PLOT)*—refers to columns with particles attached on the inside wall consisting of copolymers such as styrene/divinylbenzene, molecular sieves, or adsorbents such as Al₂O₃ in film thicknesses of 5 to 50 μm.

3.4 *support coated open tubular (SCOT)*—refers to fine particles (silica or fine diatomite) coated with liquid stationary phase, which is then deposited on the inside column wall to improve stationary phase stability and sample capacity.

3.5 *wall coated open tubular (WCOT)*—refers to columns coated on the inside wall with a liquid stationary phase in film thicknesses of 0.1 to 10.0 μm. Also referred to as FSOT or fused silica open tubular.

4. Summary of Practice

4.1 The packed gas chromatography system is described in Practice E260 and is essentially the same as a capillary gas chromatography system except for modifications to the injector and detector to accommodate the low flow rates and sample capacity associated with capillary columns. Refer to the gas chromatography (GC) instrument manual for specific details on injector or detector pneumatics for capillary columns.

4.2 Prior to performing a capillary GC analysis, the capillary column configuration must be determined. The stationary

⁴ Available from Compressed Gas Association (CGA), 4221 Walney Rd., 5th Floor, Chantilly, VA 20151-2923, <http://www.cganet.com>.