Refractory Installation Quality Control—Inspection and Testing of AES/RCF Linings and Materials

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Shall: As used in a standard, "shall" denotes a minimum requirement to conform to the standard.

Should: As used in a standard, "should" denotes a recommendation or that which is advised but not required to conform to the standard.

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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

Important Information Concerning Use of Asbestos or Alternative Materials

Asbestos is specified or referenced for certain components of the equipment described in some API standards. It has been extremely useful in minimizing fire hazards associated with petroleum processing. It has also been a universal sealing material, compatible with most refining fluid services.

Certain serious adverse health effects are associated with asbestos, among them the serious and often fatal diseases of lung cancer, asbestosis, and mesothelioma (a cancer of the chest and abdominal linings). The degree of exposure to asbestos varies with the product and the work practices involved.

Consult the most recent edition of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, Occupational Safety and Health Standard for Asbestos, Tremolite, Anthophyllite, and Actinolite, 29 *Code of Federal Regulations* Section 1910.1001; the U.S. Environmental Protection Agency, National Emission Standard for Asbestos, 40 *Code of Federal Regulations* Sections 61.140 through 61.156; and the U.S. Environmental Protection Agency (EPA) rule on labeling requirements and phased banning of asbestos products (Sections 763.160–179).

There are currently several substitute materials in use and under development to replace asbestos in certain applications. Manufacturers and users are encouraged to develop and use effective substitute materials that can meet the specifications for, and operating requirements of, the equipment to which they would apply.

Safety and health information with respect to particular products or materials can be obtained from the employer, the manufacturer, or supplier of that product or material, or the material safety datasheet.

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1 Scope

This standard provides installation quality control procedures and lining system design requirements for alkaline earth silicate fiber (AES)/refractory ceramic fiber (RCF) linings and may be used to supplement owner specifications. Materials, equipment, and personnel are qualified by the methods described, and applied refractory quality is closely monitored, based on defined procedures and acceptance criteria. The responsibilities of inspection personnel who monitor and direct the quality control process are also defined.

The lining described in this standard is for internal refractory linings on the process side of the equipment. External insulation and jacketing are not covered in this standard.

2 Normative References

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any addenda) applies.

API Standard 936, *Refractory Installation Quality Control – Inspection and Testing of Monolithics*

ASTM C177,[1] *Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus*

ASTM E1172, *Standard Practice for Describing and Specifying a Wavelength-Dispersive X-Ray Spectrometer*

ASTM C201, *Standard Test Method for Thermal Conductivity of Refractories*

ASTM C892, *Standard Specification for High-Temperature Fiber Blanket Thermal Insulation*

SSPC-SP 3,[2] *Power Tool Cleaning*

SSPC-SP 7/NACE No. 4,*Brush-Off Blast Cleaning*

3 Terms and Definitions

For the purposes of this document, the following terms and definitions apply.

3.1
alkaline earth silicate fiber
AES
Manmade vitreous fiber (MMVF) composed of at least 18 % alkali earth oxides developed to meet the fiber exemption requirements spelled out in 97/69/EC of the Dangerous Substances Initiative in the European Union (EU). These fibers are exonerated from the EU carcinogen classification on the basis of their low bio-persistence. They also may be known as bio-fiber, bio-soluble, or low bio-persistence fiber.

3.2
anchor [3]
Metallic or refractory device that holds the refractory or insulation in place.

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1 ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.
2 The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, Pennsylvania 15222, www.sspc.org.
3 Definition from API Standard 560, Fired Heaters for General Refinery Service.