Refractory Installation Quality Control—Inspection and Testing of Refractory Brick Systems and Materials

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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 of extreme usefulness 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 in use and under development several substitute materials 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 the 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 (QC) procedures for aluminum silicate dense and insulating fire brick refractory systems 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 QC process are also defined (see 4.4).

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 936, *Refractory Installation Quality Control—Inspection and Testing Monolithic Refractory Lining and Materials*

API 976, *Refractory Installation Quality Control—Inspection and Testing AES/RCF Fiber Linings and Materials*

ASTM C16, [1] *Standard Test Method for Load Testing Refractory Shapes at High Temperatures*

ASTM C27, *Standard Classification of Fireclay and High-Alumina Refractory Brick*

ASTM C113, *Standard Test Method for Reheat Change of Refractory Brick*

ASTM C133, *Standard Test Method for Cold Crushing Strength and Modulus of Rupture of Refractories*

ASTM C134, *Standard Test Methods for Size, Dimensional Measurements, and Bulk Density of Refractory Brick and Insulating Firebrick*

ASTM C155, *Standard Classification of Insulating Firebrick*

ASTM C210, *Standard Test Method for Reheat Change of Insulating Firebrick*

ASTM C832, *Standard Test Method of Measuring Thermal Expansion and Creep of Refractories Under Load*

Harbison-Walker Refractories Company, [2] *Modern Refractory Practice*, Fifth Edition, Indresco, Pittsburgh, Pennsylvania

ISO 3187, [3] *Refractory Products—Determination of Creep in Compression*

ISO 5017, *Dense Shaped Refractory Products—Determination of Bulk Density, Apparent Porosity and True Porosity*

ISO 10059-2, *Dense, Shaped Refractory Products—Determination of Cold Compressive Strength—Part 2: Test with Packing*

[1] ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, Pennsylvania 19428-2959, www.astm.org.

[2] Harbison-Walker International, 1305 Cherrington Parkway, Suite 100, Pittsburgh, PA 15108, thinkhwi.com.

[3] International Organization for Standardization, ISO Central Secretariat, Chemin de Blandonnet 8, CP 401 - 1214 Vernier, Geneva, Switzerland, www.iso.org.