



**BODY OF KNOWLEDGE FOR  
API 936 REFRACTORY PERSONNEL  
CERTIFICATION EXAM**

Effective April 2024, August 2024, and December 2024

(Replaces Dec 2021)

API certified 936 refractory personnel must have knowledge of installation, inspection, testing and repair of refractory linings. The API 936 Refractory Personnel Certification Examination is designed to identify applicants possessing the required knowledge.

The exam consists of 75 scored questions and 10 pretest questions; and runs for 3 hours and 15 minutes; no references are available during the exam, and nothing may be brought into the test center.

The exam focuses on the content of API 936 and other referenced publications.

**REFERENCE PUBLICATIONS:**

**A. API Publications:**

- **API Standard 936**, Refractory Installation Quality Control Guidelines – Inspection and Testing Monolithic Refractory Linings and Materials, **4th Edition, June 2014\***
- **API TR 978**, Monolithic Refractories: Manufacture, Properties, and Selection, **1st Edition, March 2019**
- **API TR 979**, Applications of Refractory Lining Materials, **1st Edition, October 2018**
- **API TR 980**, Monolithic Refractories: Installation and Dryout, **1st Edition, April 2018**

**B. ASTM (American Society for Testing and Materials) Publications:**

- **C113-14 (2019)** – Standard Test Method for Reheat Change of Refractory Brick
- **C133-97 (2021)** – Standard Test Methods for Cold Crushing Strength and Modulus of Rupture of Refractories
- **C181-11 (2018)** – Standard Test Method for Workability Index of Fireclay and High-Alumina Plastic Refractories
  - Refractories
- **C704-15** -Standard Test Method for Abrasion Resistance of Refractory Materials at Room Temperatures

\* Per the publication effectivity sheet, this is the 4<sup>th</sup> edition. API 936, 5<sup>th</sup> edition will go into effect for the April 2025 exam window.



**Candidates are expected to demonstrate knowledge in the following categories:**

**1. Laboratory Testing Procedures**

The test questions may be based on the following topics:

1. Terms and definitions
2. Test methods (e.g., C704, CCS, PLC, Density) and related calculations
3. Material Qualification
4. Testingequipment, sample preparation techniques, dimensional requirements for test specimens
5. Various materials utilized (for example, plastic, ceramic fiber, anchor, metal fiber, corrosion coatings, etc.)
6. Curing and firing procedures
7. Acceptance/rejection criteria
8. Responsibilities of personnel and documentation requirements.

**2. Applicator and Material Qualification**

The test questions may be based on the following topics:

1. Installationmethods (e.g., gunning, casting, ramming, and hand packing)
2. Sampling and sample preparation procedures
3. Terms and definitions
4. Procedures for determining optimal water content and mixing
5. Applicable formulation and manufacturing information
6. Applicable knowledge of equipment and qualification process
7. Applicable test panel/mockup requirements
8. Applicable environmental controls
9. Surface preparation requirements
10. Responsibilities of personnel and documentation requirements

**3. Installation**

The test questions may be based on the following topics:

1. Terms and definitions
2. Responsibilities of personnel and documentation requirements
3. Knowledgeof detailedexecution planincluding design details and quality standards
4. Packaging and storage requirements
5. Surface preparation and cleanliness requirements
6. Anchor: welding, layouts, patterns, materials
7. Frequency andmethods of production sampling: gunning, casting, hand packing
8. Water addition: quantity and temperature, mixing procedures
9. Fiber addition: percentage, material, mixing
10. Installationenvironmental controls (minimum andmaximum temperatures)
11. Guniting procedures andequipment, including variables that affect guniting quality (i.e., air pressure, humidity, temperature, aging, water pressure, water purity, additives)
12. Knowledge of flash set
13. Casting procedures and equipment (e.g., air vibrator, vibrator frequency, vibrator sizing, forming, setup)
14. Ramming / Hand packed procedures and equipment



#### **4. Inspection**

The test questions may be based on the following topics:

1. Terminology, job specifications, application standards
2. Inspection and data collection procedures
3. Lining design and installation requirements
4. Visual and nondestructive test methods and qualification testing methods
5. Application/limitation for various inspection techniques (for example, hammer testing, sonic testing, radiography, core sampling, portable abrasion testing)
6. Material verification and traceability
7. Acceptance and rejection criteria
8. Repair procedures
9. Curing and dry out procedures
10. Inspectors' and contractors' responsibilities
11. Record keeping systems and requirements

#### **5. Post-Installation**

The test questions may be based on the following topics:

1. Terms and definitions
2. Responsibilities of personnel and documentation requirements
3. Knowledge of dryout requirements
4. Sealing requirements (for example, water mist, covering, membrane, curing)
5. Application and time limits for applying membrane curing compounds
6. Environmental conditions required for curing
7. Heating equipment, methods and procedures (e.g., gas fired burner, stress relieving heating elements)
8. Placement of temperature sensing probes
9. Knowledge of manufacturer's recommended heatup and cooldown schedules
10. Applicable heating rates for various classes of refractories
11. Lining integrity inspection techniques