



American National Standard for Nitrogen Generators

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Foreword

This standard is intended to be used to evaluate components and performance of nitrogen generators.

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ANSI regulations require that this American National Standard shall be revised, reaffirmed, or withdrawn within five years of the date of publication.

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1. INTRODUCTION

1.1 Purpose

- 1.1.1 This standard states examination criteria for nitrogen generators for use in fire protection systems. Nitrogen generators provide pressurized nitrogen to the sprinkler piping to minimize interior pipe corrosion.
- 1.1.2 Examination criteria may include, but are not limited to, performance requirements, marking requirements, examination of manufacturing facility(ies), audit of quality assurance procedures, and a follow-up program.

1.2 Scope

- 1.2.1 This standard encompasses the design and performance requirements for nitrogen generators.
- 1.2.2 Nitrogen generators may use membranes or pressure swing adsorption as the nitrogen separation mechanism. Other technologies may be evaluated on a case-by-case basis. The use of nitrogen storage bottles or plant nitrogen is not in the scope of this standard.

1.3 Basis for Requirements

- 1.3.1 The requirements of this standard are based on experience, research and testing, and/or the standards of other organizations. The advice of manufacturers, users, trade associations, jurisdictions, and/or loss control specialists was also considered.
- 1.3.2 The requirements of this standard reflect tests and practices used to examine characteristics of nitrogen generators. Nitrogen generators having characteristics not anticipated by this standard may be tested if demonstrated performance is equal, or superior, to that required by this standard, or if the intent of the standard is met.

Alternatively, Nitrogen generators that meet all of the requirements identified in this standard may not be acceptable if other conditions that adversely affect performance exist or if the intent of this standard is not met. It is the sole discretion of the testing laboratory.

1.4 Basis for ANSI Specification

- 1.4.1 Certification is based upon satisfactory evaluation of the product and the manufacturer in the following major areas:
 - The suitability of the product;
 - The performance of the product as specified by the manufacturer;
 - The durability and reliability of the product.
- 1.4.2 A satisfactory review of the manufacturer's installation and maintenance instructions for the Nitrogen generators is required. The evaluation shall be performed to ensure that the document is accurate and complete.

1.5 System of Units

Units of measurement used in this standard are United States (U.S.) customary units. These are followed by their arithmetic equivalents in International System (SI) units, enclosed in parentheses. The first value stated shall be regarded as the requirement. The converted equivalent value may be approximate. Appendix A lists the selected units and conversions to SI units for measures appearing in this standard. Conversion of U.S. customary units is in accordance with the Institute of Electrical and Electronics Engineers (IEEE)/American Society for Testing Materials (ASTM) SI 10-2002, *American National Standard for Use of the International System of Units (SI): The Modern Metric System*.

1.6 Applicable Documents

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 cited edition applies. For undated references, the latest edition of the referenced document (including any amendments) applies:

American Society of Mechanical Engineers (ASME) B16.5, *Pipe Flanges and Flanged Fittings: NPS ½ through NPS24 Metric/Inch Standard*
American National Standards Institute (ANSI)/American Water Works Association (AWWA) C606, *Grooved and Shouldered Joints*
ASME B1.20.1, *Pipe Threads, General Purpose (Inch)*
ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 – *Rules for Construction of Pressure Vessels*
FM Global Property Loss Prevention Data Sheet 2-0, *Installation Guidelines for Automatic Sprinklers*
IEEE/ASTM SI 10, *American National Standard for Metric Practice*
International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17025, *General Requirements for the Competence of Testing and Calibration Laboratories*
SAE International J10, *Automotive and Off-Highway Air Brake Reservoir Performance and Identification Requirements – Truck and Bus*
Code of Federal Regulations Title 49, Section 178.61 – *Specification 4BW welded steel cylinders with electric-arc welded longitudinal seam*

1.7 Definitions

For purposes of this standard, the following terms apply:

Accepted

This term refers to installations acceptable to the authority enforcing the applicable installation rules. Acceptance is based upon an overall evaluation of the installation. Acceptance is not a characteristic of a product. It is installation specific. A product accepted for one installation may not be acceptable elsewhere.

Air Pressure Maintenance Device

This term refers to a device that automatically maintains the air pressure within a dry pipe or pre-action sprinkler system within pre-set limits. These devices may also be used with pressurized nitrogen in a nitrogen filled system.

Bypass Mode

Most nitrogen generators can not produce enough nitrogen to pressurize the sprinkler system with nitrogen at 40 psig within 30 minutes. Therefore, they contain valves that allow the nitrogen separator to be bypassed so the system can be filled with compressed air. For the purposes of this standard the valve settings that bypass the nitrogen separator is called Bypass Mode. (Contrast with **Nitrogen Generating Mode**)

In situations where 'Bypass' mode is insufficient to provide enough flow of air to pressurize a sprinkler system in 30 minutes, a supplemental air compressor or nitrogen gas supplied from cylinders can be used. These alternates are not addressed in detail in this standard.

Bypass Capacity

The nitrogen generator must be capable of producing a minimum of this volume of compressed air at 40 psi (275 kPa) in 30 minutes in bypass mode (contrast with System Capacity).

Control Panel

The control panel is the portion of the nitrogen generator that contains the controls. Minimum requirements for the control panel are found in Section 3.2.4.