

METRIC
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A-A-59503C

3 March 2011

SUPERSEDING

A-A-59503B

20 October 2008

## COMMERCIAL ITEM DESCRIPTION

## NITROGEN, TECHNICAL

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This commercial item description (CID) covers two types of nitrogen: gaseous and liquid. Each type of nitrogen can be obtained in three different technical grades based primarily on nitrogen purity and oxygen content. Liquid nitrogen is used as a cooling agent for low temperature and cryogenic processes to shield temperature-sensitive materials and equipment from the effects of heat. Gaseous nitrogen is used to purge or pressurize systems or provide inert atmospheres. The list of intended uses includes, but is not limited to: pressurizing fuel tanks, hydraulic system accumulators, aircraft struts, rocket engine propellant systems, and carbon dioxide cylinders; purging aircraft oxygen converters; and purging and calibrating instruments. Since some systems are sensitive to oil contamination, gaseous nitrogen is divided into two classes: oil free and oil tolerant. Class 1, oil free nitrogen, is used for applications that cannot tolerate hydrocarbons, such as the purging of oxygen equipment. Class 2, oil tolerant nitrogen, is used for pressurizing oil-containing systems such as aircraft struts.

2. **CLASSIFICATION.** The nitrogen shall be classified by the following types, grades, and classes:

2.1 **Type.** The technical nitrogen shall be one of the following types, as specified in the acquisition order (see 7.4):

Type I - Gaseous

Type II - Liquid

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: <a href="mailto:STDZNMGT@dla.mil">STDZNMGT@dla.mil</a> or Defense Logistics Agency Aviation VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616. Since contact information can change, you may want to verify the currency of this address information using the ASSIST database at <a href="https://assist.daps.dla.mil/">https://assist.daps.dla.mil/</a> .
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2.2 Grade. Nitrogen of grades UHP and A are equivalent to quality verification levels (QVLs) presented in Compressed Gas Association (CGA) G-10.1, "Commodity Specification for Nitrogen". The technical nitrogen shall be one of the following grades, as specified in the acquisition order (see 7.4):

- Grade UHP - 99.999 percent pure nitrogen (equivalent to QVL Q)
- Grade A - 99.998 percent pure nitrogen (equivalent to QVL L)
- Grade B - 99.50 percent pure nitrogen

2.3 Class. The terms "oil free" and "oil tolerant", indicated by class 1 and class 2, replaced the older terms "water pumped" and "oil pumped", respectively. The older terminology referenced the type of compressors, water and soap lubricated, or oil lubricated, used in charging nitrogen gas into cylinders. Due to advancements in compressor technology and other systems being used, the newer terms now refer to the type of application. When applied to nitrogen, the term "oil free" shall be used to identify applications that cannot tolerate hydrocarbon contamination. The term "oil tolerant", when applied to nitrogen, indicates that the gas can be used in applications that can tolerate or contain hydrocarbon material. This terminology applies only to gaseous nitrogen (see 7.5). The technical nitrogen shall be one of the following classes, as specified in the acquisition order (see 7.4):

- Class 1 - Oil free
- Class 2 - Oil tolerant (type I only)

### 3. SALIENT CHARACTERISTICS

3.1 Material. The material shall conform to the requirements as specified in table I. The limiting characteristics shall be determined by one of the methods described in CGA G-10.1.

TABLE I. Requirements.<sup>1</sup>

Limiting characteristics	Grade UHP <sup>2</sup>	Grade A <sup>2</sup>	Grade B <sup>2</sup>
CGA G-10.1 Quality Verification Level	QVL Q	QVL L	n/a
Nitrogen, minimum (percent by volume) <sup>3</sup>	99.999	99.998	99.50
Argon, neon, helium	5	-	-
Oxygen	1	10	5,000
Water vapor	2	4	26
Total hydrocarbon content (as methane)	1	20	50

<sup>1</sup> Additional information on the properties and handling of nitrogen may be found in CGA P-9, "The Inert Gases: Argon, Nitrogen, and Helium".

<sup>2</sup> Unless otherwise indicated, quantities given are the maximum in parts per million by volume (ppm (v/v)).

<sup>3</sup> Unless otherwise indicated, the percent by volume of nitrogen includes trace quantities of argon, neon, and helium.

3.2 Odor. The nitrogen shall have no odor.

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3.3 Particulate matter. The material shall contain no solid particles whose maximum dimension is greater than 50 micrometers ( $\mu\text{m}$ ) for type I nitrogen or 30  $\mu\text{m}$  for type II nitrogen, when specified in the acquisition order (see 7.4). This shall be determined by any acceptable commercial method practiced by the manufacturers of nitrogen. Because the major source of contamination is from cylinders and other containment or transfer systems, control of particulate matter in the supplier's and user's dispensing equipment can be assured by the installation of a 10- $\mu\text{m}$  (nominal) or better filter in the service line.

#### 4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

4.2 Material safety data sheet (MSDS). A MSDS shall be furnished in accordance with FED-STD-313, "Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities", and 29 Code of Federal Regulations (CFR), 1910.1200, "Hazard Communication".

4.3 Hazard warning label. Occupational Safety and Health Administration hazard warning labels shall be furnished in accordance with 29 CFR 1910.1200.

#### 5. PRODUCT CONFORMANCE PROVISIONS

5.1 Product conformance. The products provided shall meet the salient characteristics of this CID, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5.2 Market acceptability. The products offered must have been previously sold either to the government or on the commercial market.

5.2.1 Market acceptability criterion. The company must be able to show data from tests or process monitoring that demonstrates the ability of the product to meet the salient characteristics of technical grade nitrogen as specified herein.

#### 6. PACKAGING

6.1 Preservation, packing, and marking. Preservation, packing, and marking shall be as specified in the acquisition order (see 7.4).

6.2 Packaging and special markings. All government-owned cylinders that have been provided for filling shall be reconditioned as necessary in accordance with MIL-STD-1411. Department of Defense cylinders shall conform to RR-C-901, be equipped with valves conforming to A-A-59860, and be color-coded in accordance with MIL-STD-101. The capacity of nitrogen

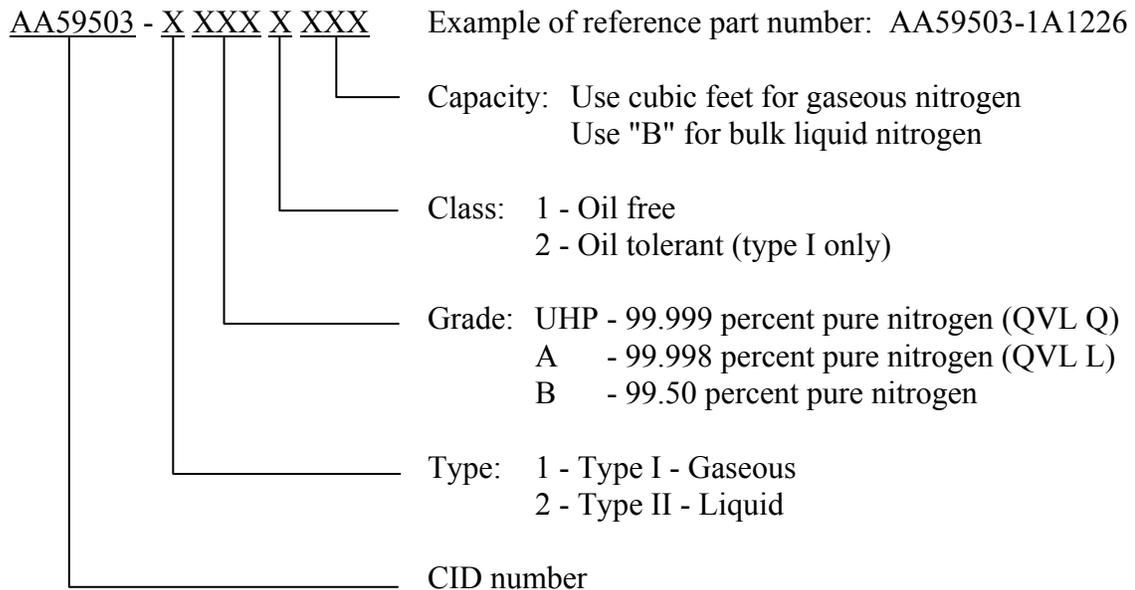
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shall be specified in cubic feet for gaseous nitrogen and designated by the letter "B" for bulk liquid nitrogen, and shall be as specified in the acquisition order (see 7.4).

6.3 Palletization. The palletization of material shall be as specified in the acquisition order (see 7.4). MIL-STD-147 may be used for palletization.

## 7. NOTES

7.1 Part or identification number (PIN). The following PIN procedure is for government purposes and does not constitute a requirement for the contractor.

7.2 Sources of documents.

7.2.1 CFR and FAR. Copies of CFR and FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Electronic copies of CFR documents may be obtained from <http://www.gpoaccess.gov/ecfr/>. Electronic copies of FAR documents may be obtained from <https://www.acquisition.gov/far/>.

7.2.2 Federal specifications and standards. Copies of federal specifications and standards may be obtained from General Services Administration, Federal Supply Service, Specification Section, 470 East L'Enfant Plaza SW, Suite 8100, Washington, DC 20407. Electronic copies may be obtained from <https://assist.daps.dla.mil/>.

7.2.3 Military standards. Copies of military standards may be obtained from Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Electronic copies may be obtained from <https://assist.daps.dla.mil/>.

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7.2.4 CGA standards. Copies of CGA standards may be obtained from the Compressed Gas Association, 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923. Electronic copies may be obtained from <http://www.cganet.com/>.

7.3 International standardization agreements (ISAs). Certain provisions of this CID (section 3) are subject to ISA NATO STANAG 3624, "Nitrogen and Replenishment Equipment Characteristics". When amendment, revision, or cancellation of this specification is proposed which will modify the international agreement concerned, the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations. Copies of this ISA are available online at <https://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

7.4 Ordering data. The acquisition order should specify the following information:

- a. CID document number, revision, and CID PIN.
- b. Type of technical nitrogen (see 2.1).
- c. Grade of technical nitrogen (see 2.2).
- d. Class of technical nitrogen (see 2.3).
- e. Particulate matter testing, if required (see 3.3).
- f. Preservation, packing, and marking requirements (see 6.1).
- g. Capacity, in cubic feet for gaseous nitrogen, or "B" for bulk liquid nitrogen (see 6.2).
- h. Palletization requirements (see 6.3).

7.5 Intended use. Oil tolerant nitrogen gas, class 2, is not to be used to purge or pressurize oxygen or air for human respiration systems. It shall only be used with oil-containing systems or systems that can tolerate hydrocarbon contamination, like pressuring aircraft struts. Contamination of an oxygen system with an oil tolerant gas could result in a fire or explosion with loss of life or loss of a complete weapons system. This CID is not suitable for procurement of nitrogen for use in reactor plant, steam plant, and shipyard applications. For these applications see A-A-59155.

7.6 Valve outlet connections.

7.6.1 Cautionary note. The valve outlet connection for oil tolerant nitrogen should be different from oil free valve outlet connections to prevent the erroneous use of oil tolerant nitrogen cylinders for oil free applications. A reverse flow typically occurs during an oil tolerant operation (pressurizing oil-containing systems, e.g. aircraft struts). As a result, cylinders are contaminated with oil and cannot be used for oil free applications.

7.6.2 Valve connections. The applicable standard for valve connections is CGA V-1, "Standard for Compressed Gas Cylinder Valve Outlet and Inlet Connections". Note that valve connection 590 is a limited standard for nitrogen per CGA V-1. The connections listed in table II apply.

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TABLE II. Valve connection numbers.

Pressure (psig)	Up to 3,000	3,001 - 5,500
Class 1 (oil free)	580	680
Class 2 (oil tolerant)	590	621

7.7 Subject term (key word) listing.

Aviator's breathing oxygen  
 Calibrate  
 Compressed gas  
 Cooling agent  
 Cryogenic  
 Cylinder  
 Inert  
 Oil free  
 Oil tolerant  
 Pressurize  
 Purge  
 Struts, aircraft  
 Valves

## MILITARY INTERESTS:

## Custodians:

Army - AV  
 Navy - SH  
 Air Force - 68  
 DLA - GS

## Review Activities:

Army - AR, MD1  
 Navy - AS, MC, OS, YD  
 Other - DS

CIVIL AGENCY  
COORDINATING ACTIVITY:

GSA - FAS

## Preparing Activity:

DLA - GS3

(Project 6830-2011-003)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST database at <https://assist.daps.dla.mil/>.