MILITARY HANDBOOK

OXYACETYLENE AND NITROGEN AND BREATHING OXYGEN FACILITIES

TO ALL HOLDERS OF MIL-HDBK-MIL-HDBK-1024/3

1. THE FOLLOWING PAGES OF MIL-HDBK-1024/3 HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
43	30 June 1992	43	15 March 1991
44	30 June 1992	44	15 March 1991
44a	30 June 1992	New Page	
59	30 June 1992	59	15 March 1991
60	30 June 1992	60	15 March 1991

2. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS.

3. Holders of MIL-HDBK-1024/3 will verify that all changes indicated above have been made. This notice page will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the Military Handbook is completely revised or cancelled.

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shall be mounted on concrete foundations. These cryogenic units are 2,000 gallon (7,571 L) or less in capacity and contain cryogenic tank, vaporizer, pumps, valves, and safety devices. Facility plates show a tank transfer area for 150 O┌2┐ and 150 N┌2┐ high pressure cylinders. Modify storage area when gas transfer operations require the handling of significantly different number of gas cylinders. The actual automatic control level and piping arrangement in a given system depend on the specific needs of the facility. Wall anchors and chains shall be provided to prevent filled cylinders from being accidentally knocked over. Provide 25 cubic feet (0.708 cubic meters) gas reservoirs in accordance with Military Specification MIL-F-22606, Flask, Compressed Gas, and End Plugs; for Air, Oxygen, and Nitrogen, Class 5000, Service B. In lieu of conformance to MIL-F-22606, pressure vessels complying with ASME BPVC D1, Appendix 22, Rules for Construction of Pressure Vessels, may be used with 3,000 psi (210.92 kilograms per square centimeter) design working pressure for oxygen reservoirs and 5,000 psi (351.64 kilograms per centimeter) design working pressure for nitrogen reservoirs. Provide reinforced masonry exterior walls, noncombustible roofs, structural steel framework, and minimum 50 feet (15.24 meters) practical turning radius for a semitrailer tank truck. While actual requirements must be calculated for specific projects, the following guide may be used for planning purposes.

(1) Disposal Area. In the disposal area detail of Facility Plate 141-87, Sheet 5B of 8, provide 12 inch (30.48 centimeters) deep sandbed for disposal area for contaminated products or accidental spills. Use washed concrete sand approximately 1/8-inch (0.3175-centimeter) diameter. Minimum volume of disposal pit shall be 200 cubic feet (5.664 cubic meters). Provide minimum 1 percent slope for surface drainage for the deck under the tank towards disposal pit.

(2) Deluge Shower and Eyewash Station. A deluge shower and eyewash station shall be provided adjacent to the bulk storage area, and shall be a nonfreeze type where required by climatic conditions. Ceiling type radiant electric heat may be provided in the transfer areas when the outdoor temperatures so dictate. Bulk oxygen installation locations are not hazardous per NFPA 70, Article 500, Hazardous (Classified) Locations. Therefore, general purpose or weatherproof types of electrical wiring and equipment are acceptable; however, all equipment shall be static grounded. The distance between oil filled transformers and bulk oxygen storage shall be a minimum of 25 feet. Provide exterior flood lighting for night operations when required.

(3) Mechanical Requirements

Plumbing

Cold water	Maximum 40 gallons per minute (151 L per min) (Do not include fire protection requirements in this flow rate)

Hot water	10 gallon (37.85 L) storage capacity electric water heater
Safety shower eyewash station	minimum available waterflow of 30 gpm (1.89 L per sec) at an inlet supply of 30 psi (21,093 kgs/m [2])
Heating	
Indoor design	65 deg. F (18.33 deg. C) for shop area and test Lab; 25 deg. F (minus 16.67 deg. C) for transfer area
Outdoor design	Refer to NAVFAC P-89 for temperatures

(4) Electrical Requirements (Kilowatts)

Lighting	12 kw (172 kg-cal per min) connected load; 11 kw (157.7 kg-cal per min) demand load
Power	34 kw (487.56 kg-cal per min) connected load; 31 (444.54 kg-cal per min) demand load
Total load	46 kw (659.64 kg-cal per min) connected load; 42 kw (602.28 kg-cal per min) demand load

(5) Area

LOX/LN [2] disposal	1010 sq ft (93.83 sq m)
LOX/LN [2] bulk storage	1850 sq ft (171.87 sq m)
Cylinder storage and transfer	1160 sq ft (107.76 sq m)
Office, shops, and test laboratory	1280 sq ft (118.91 sq m)
Overhanging covered dock	580 sq ft (53.88 sq m)
Canopy covered walkway	260 sq ft (24.15 sq m)

Gross area 6140 sq ft (570.41 sq m)

(6) Cylinder Systems. A cylinder manifold shall have two banks of cylinders that alternately supply the piping system. Provide a pressure regulator for each bank. Connect cylinders to a common header. Each bank shall contain a minimum of an average day's supply unless normal is delivery schedules require a greater supply. When the content of primary bank unable to supply the system, the secondary bank shall automatically operate to supply the system. Cylinder systems may be provided with reserve supply to operate

NFGS-02561	Joints, Reinforcement, and Mooring Eyes in Concrete Pavements
NFGS-03300	Cast in Place Concrete

NAVFAC P-PUBLICATION

P-89	Engineering Weather Data

NON-GOVERNMENT PUBLICATIONS:

The following publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the Department of Defense Index of Specifications and Standards (DODISS).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B31	Code for Pressure Piping

(Copies are available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME BPVC D1	Rules for Construction of Pressure Vessels, Division 1, Appendix 22

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A269	Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
ASTM D1752	Preformed Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction

(Copies are available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103, (215) 299-5400.)

COMPRESSED GAS ASSOCIATION, INC.

CGA C-13	Guidelines for Periodic Visual Inspection and Requalification of Acetylene Cylinders
CGA G-1.2	Recommendations for Chemical Acetylene Metering
CGA G-4.1	Cleaning Equipment for Oxygen Service
CGA G-4.4	Industrial Practices for Gaseous Oxygen Transmission and Distribution Piping Systems
CGA V-1	Compressed Gas Cylinder Valve Outlet and Inlet Connections

(Copies are available from Compressed Gas Association, Inc., Crystal Gateway 1, Suite 501, 1235 Jefferson Davis Highway, Arlington, VA 22202, (703) 979-0134.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 50	Bulk Oxygen Systems at Consumer Sites
NFPA 51	Oxygen-Fuel Gas Systems for Welding and Cutting
NFPA 51A	Acetylene Cylinder Charging Plants
NFPA 70	National Electrical Code

(Copies are available from National Fire Protection Association, One Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101)