

INCH-POUND

A-A-52047B

19 December 2002

SUPERSEDING

A-A-52047A

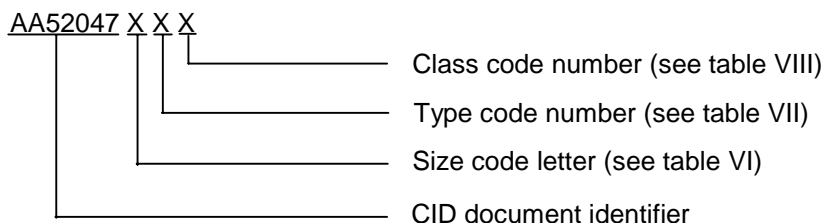
1 June 1996

## COMMERCIAL ITEM DESCRIPTION

### TUBING, NONMETALLIC (RUBBER AND PLASTIC)

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

1. SCOPE. This CID covers the general requirements for rubber and plastic tubing for use in laboratory procedures and special uses where softness and high purity are required and when electrical conductivity may be required. Rubber and plastic tubing covered by this CID are intended for commercial/industrial applications.
2. CLASSIFICATION/PART OR IDENTIFICATION NUMBER (PIN). This CID uses a classification system that is included in the PIN as shown in the following example (see 7.1).



Beneficial comments recommendations, additions, deletions, clarifications, and any data which may improve this document should be sent to: Defense Supply Center, Columbus, ATTN: (DSCC-VAI), P.O. Box 3990, Columbus, OH 43216-5000, or telephone (614) 692-0538, or facsimile (FAX) (614) 692-6939.

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TABLE I. Dimension Codes.

DIMENSION (inch)	SIZE CODE
1/8	J
3/16	A
1/4	B
5/16	C
3/8	D
1/2	E
5/8	F
3/4	G
1	H

TABLE II. Material Codes.

MATERIAL	TYPE CODE
Commercial Rubber Tubing	I
Synthetic Rubber Tubing	II
Natural Rubber Compound Tubing	III
Latex Tubing	IV
Laboratory Pure Gum Natural Rubber or Synthetic Tubing	V
Plastic Tubing	VI

TABLE III. Class codes.

ATTRIBUTE	CLASS CODE
Light Wall	1
Heavy Wall	2
Pressure	3
Gooch	4
Vacuum	5
General Use	6
Pressure & Vacuum	7

2.1 Type. The tubing covered by this CID shall be of the following types and classes (see 7.4).

2.1.1 Type I, commercial rubber tubing. Type I tubing shall be natural rubber, synthetic rubber, or a mixture of the two in the following classes:

- Class 1 - Light wall.
- Class 2 - Heavy wall.
- Class 3 - Pressure.
- Class 4 - Gooch.

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2.1.2 Type II, Synthetic rubber tubing. Type II tubing shall be compounded from synthetic rubber in the following classes:

- Class 1 - Light wall.
- Class 2 - Heavy wall.
- Class 5 - Vacuum connections.

2.1.3 Type III, Natural rubber compound tubing. Type III shall be compounded from natural rubber (inside diameter as shown in paragraph 2.2 below with a tolerance of  $\pm 0.062$  inch, Wall Thickness of  $0.062 \pm 0.016$  inch, Length of 3 feet  $\pm 1$  inch).

2.1.4 Type IV, Latex tubing. Type IV tubing shall be made from liquid natural rubber latex.

2.1.5 Type V, Laboratory pure gum, natural rubber, or synthetic tubing. Type V tubing shall be natural rubber or synthetic equivalent (CIS 1-4 polyisoprene) in the following classes:

- Class 1 - Light wall.
- Class 2 - Heavy wall.
- Class 3 - Pressure.
- Class 4 - Gooch.

2.1.6 Type VI, Plastic tubing. Type VI plastic tubing shall contain polyvinyl chloride as the base material in the following classes:

- Class 6 - General use.
- Class 7 - Pressure and vacuum.

2.2 Size. The tubing covered by this CID shall be of the following nominal sizes (in inches) (see 7.4).

1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1
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### 3. SALIENT CHARACTERISTICS.

3.1 Interface and physical dimensions. Tubing, nonmetallic supplied to this CID shall be as specified herein.

3.2 Description. The tubing shall be manufactured for use in laboratory procedures and special uses where softness and high purity are required and when electrical conductivity may be required. The physical properties shall be as shown in table I.

3.2.1 Specific gravity. The tubing shall have a specific gravity as defined in table I when tested in accordance with ASTM D 792.

3.2.2 Tensile strength.

3.2.2.1 Initial. The tubing shall have an initial tensile strength as defined in table I when tested in accordance with ASTM D 412.

3.2.2.2 Air heat test. The tubing shall have a tensile strength as defined in table I when tested in accordance with ASTM D 573.

3.2.2.3 Immersion. The tubing shall have a tensile strength as defined in table I when tested in accordance with ASTM D 543.

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TABLE IV. Physical properties.

Property	Type I	Type II	Type III	Type IV	Type V	Type VI
Specific gravity (maximum)	1.4	---	---	---	0.97	---
Tensile strength: Initial (psi) (minimum)	2400	1100	1200	3500	3000	2000
After air heat aging (7 days) (% of initial) (minimum)	75	75	75	75 <sup>1/</sup>	75	---
After 14 days immersion in a 3% salt solution at 82 °F (28 °C) (psi) (minimum)	---	---	---	---	---	2000
Ultimate elongation: Initial (%) (minimum)	650	450	400	750	700	300
After 14 days immersion in a 3% salt solution at 82 °F (28 °C) (%) (minimum)	---	---	---	---	---	300
Tensile stress at 100% elongation (psi) (maximum)	150	200	300	---	125	800

1/ Except that Type IV tubing, 0.125-inch inside diameter, shall retain a minimum of 65 percent of its original strength.

### 3.2.3 Ultimate elongation.

3.2.3.1 Initial. The tubing shall have an initial ultimate elongation as defined in table I when tested in accordance with ASTM D 412.

3.2.3.2 Immersion. The tubing shall have a tensile strength as defined in table I when tested in accordance with ASTM D 543.

3.2.4 Tensile stress at 100% elongation. The tubing shall have a maximum tensile stress at 100% elongation as defined in table I when tested in accordance with ASTM D 412.

3.3 Electrical conductivity. When specified (see 7.4), the tubing shall be electrically conductive. The maximum resistance value over a 3-foot section of electrically conductive tubing shall be 1.0 megohm when tested in accordance with the applicable procedures specified in NFPA 99 except that the electrodes shall be attached at or near both ends of the tubing, before and after exposure to oxygen aging, liquid ethyl ether, oil immersion, and flexing.

3.3.1 Oxygen aging. The two 3-foot lengths of electrically conductive rubber tubing shall be aged as specified in ASTM D 572 for a period of 94 ±1/2 hours.

3.3.2 Liquid ethyl ether. The two 3-foot lengths of electrically conductive rubber tubing shall be maintained for 5 hours full of ethyl ether in the liquid phase.

3.3.3 Oil immersion. The two 3-foot lengths of electrically conductive rubber tubing shall be immersed in oil conforming to ASTM D 471, No. 2, for 120 hours at a temperature of 73.4 ±3.6 °F (23 ±2 °C).

3.3.4 Flexing. The two 3-foot lengths of electrically conductive rubber tubing shall be passed back and forth over a pulley 1.750 inches in diameter. One end of the tubing shall be fixed vertically with the end facing down. The tubing shall pass over the pulley so that the movable end will hang vertically

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downward. A 5-pound weight shall be suspended from the second end. The pulley shall be caused to raise and lower vertically for a distance of 2 feet at a rate of 50 times (25 cycles) per minute for 2,500 cycles.

3.4 Dimensions. Dimensions and tolerances shall be as shown in tables II through V for the types indicated.

TABLE V. Dimensions for Type I and Type V (inches).

Nominal Size	Class 1, Light Wall		Class 2, Heavy Wall		Class 3, Pressure		Class 4, Gooch
	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside width measured flat $\pm 0.016$
1/8	.125	.031	.125	.062	.125	.188	1.250
3/16	.188	.047	.188	.094	.188	.188	1.500
1/4	.250	.062	.250	.094	.250	.188	1.750
5/16	.312	.062	.312	.094	.312	.188	
3/8	.375	.062	.375	.125	.375	.250	
1/2	.500	.094	.500	.125	.500	.250	
5/8	-	-	.625	.125	-	-	
3/4	-	-	.750	.125	-	-	
1	-	-	1.000	.125	-	-	

TABLE VI. Dimensions for Type II tubing (inches).

Nominal Size	Class 1, Light Wall		Class 2, Heavy Wall		Class 5, Vacuum Connections	
	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$
1/8	.125	.047	.125	.094	.188	.188
3/16	.188	.047	.188	.094	.250	.188
1/4	.250	.062	.250	.125	-	-
5/16	.312	.062	.312	.125	-	-
3/8	.375	.062	.375	.125	-	-
1/2	.500	.062	.500	.125	-	-
5/8	.625	.062	.625	.125	-	-
3/4	-	-	.750	.125	-	-
1	-	-	1.000	.125	-	-

TABLE VII. Dimensions and tolerance, Type IV tubing (inches).

Nominal Size	Inside Diameter $\pm 0.016$	Wall Thickness	Tolerance $\pm$
1/8	.125	.031	.008
3/16	.188	.094	.016
1/4	.250	.062	.016
5/16	.312	.062	.016

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TABLE VIII. Dimensions and tolerance for Type VI tubing (inches).

Nominal Size	Class 6, General Use		Class 7, Pressure And Vacuum Connections	
	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$	Inside diameter $\pm 0.016$	Wall thickness $\pm 0.016$
1/8	.125	.094	.125	.250
3/16	.188	.094	.188	.250
1/4	.250	.125	.250	.250
5/16	.312	.125	-	-
3/8	.375	.125	-	-
1/2	.500	.125	-	-
5/8	.625	.125	-	-
3/4	.750	.125	-	-
1	1.000	.125	-	-

3.5 Physical properties. In addition to the physical properties specified in table I, Type VI tubing shall meet the following requirements.

3.5.1 Swelling. There shall be not more than 2 percent swelling of the tubing after immersion for 14 days in a 3% salt solution at 82 °F (28 °C).

3.5.2 Resistance to cold. There shall be no signs of cracking when the tubing is bent back upon itself at  $-1 \pm 2$  °F ( $-18 \pm 1$  °C).

3.5.3 Flammability. Type VI tubing shall be exposed to an open flame for 15 seconds and then removed from the flame. The tubing shall self-extinguish within 5 seconds.

3.6 Materials. Materials used shall be free from defects that would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. The term "recovered materials" means materials that have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specified (see 7.4).

3.7 Marking. Tubing, nonmetallic supplied to this CID shall be marked with the manufacturer's (MFR's) standard commercial PIN.

3.8 Workmanship. The quality of workmanship shall be such as to produce rubber and plastic tubing that is in accordance with the requirements of this CID.

#### 4. REGULATORY REQUIREMENTS.

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

#### 5. PRODUCT CONFORMANCE.

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 for a least one year preceding the solicitation. When required, the contractor shall certify that the product offered to the Government meets

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the salient characteristics of this description (see 7.4). The Government reserves the right to require the provisions of the contract. All rubber tubing shall be no more than 12 months old on date of acceptance by the Government.

6. PACKAGING. Preservation, packing, and marking shall be as specified in the contract or purchase order.

7. NOTES.

7.1 PIN. The PIN should be used for Government purposes to buy commercial products to this CID. See section 2 for PIN format example.

7.1.1 Example of part or identification number: The example PIN, AA52047CI3, provided in Section 2 specifies a 5/16 inch inside diameter (C), commercial rubber tube (Type I), for pressure use (class 3).

7.2 Commercial and Government Entity (CAGE) code. For ordering purposes, inventory control, and submission of these TUBING, NONMETALLIC, (RUBBER AND PLASTIC) to DSCC under the Military Parts Control Advisory Group (MPCAG) evaluation program, CAGE code 58536 should be used.

7.3 Source of documents.

Other Publications

American Society of Testing and Materials (ASTM)

- ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension
- ASTM D 471 - Standard Test Method for Rubber Property - Effect of Liquids
- ASTM D 543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.
- ASTM D 573 - Standard Test Method for Rubber-Deterioration in an Air Oven
- ASTM D 792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

(Copies of ASTM standards are available from the American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

National Fire Protection Association (NFPA)

- NFPA 99 - Standard for Health Care Facilities

(Copies of NFPA standards are available from the National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02269.)

(Industry association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

7.4 Ordering data. Acquisition documents should specify the preferred options permitted herein and include the following information in procurement documents:

- a. Title, number, and date of this commercial item description (see 2.1).
- b. Type and class of tubing required.
- c. If electrical conductivity is required.
- d. Color of tubing required.
- e. Nominal size and length of tubing required.

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- f. Degree of preservation and packaging required.
- g. If certification that the tubing offered meets all requirements of this description is required (see 5.1).
- h. If Part Identification Number (PIN) is required.
- i. If used or rebuilt products are allowed (see 3.6).

7.5 Commercial products. As part of the market analysis and research effort, this CID was coordinated with the following manufacturers of commercial products. At the time of CID preparation and coordination, these manufacturers were known to have commercial products that would meet the requirements of this CID. (NOTE: This information should not be considered as a list of approved manufacturers or be used to restrict procurement to only the manufacturers shown.)

<u>MFR's CAGE</u>	<u>MFR's name and address</u>
1L0C5	Harrison Hose and Tubing Inc. 2705 Kuser Road Trenton, NJ 08691 Telephone: (609) 631-8804 FAX: (609) 631-8796
75345	Kirkhill Rubber Co. 300 E Cypress Street Brea, CA 92822 Telephone: (714) 529-4901 FAX: (714)-529-6775
76385	Minor Rubber Co. Inc. 49 Ackerman Street Bloomfield, NJ 07003 Telephone: (973) 338-6800 FAX: (973) 893-1399

7.6 Part number (P/N) supersession data. These CID part numbers supersede the following MFR's P/Ns as shown. This information is being provided to assist in reducing proliferation in the Government inventory system.

TABLE IX. P/N supersession data.

Dash number (see 7.1) AA52047 -	MFR's CAGE	MFR's P/N <u>1/</u>
BV2	76385	IC026260
BII1	76385	IC023416
DI2	76385	IC019448
DII2	76385	IC017715
DV2	76385	IC012344
EII1	76385	IC026906

1/ The manufacturer's P/N shall not be used for procurement to the requirements of this CID. At the time of preparation of this CID, the aforementioned commercial products were reviewed and could be replaced by the CID PIN shown. For actual part marking requirements see 3.7.



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7.7 Government users. To acquire information on obtaining these TUBING, NONMETALLIC, (RUBBER AND PLASTIC) from the Government inventory system, contact Defense Supply Center, Columbus, ATTN: DSCC Call Center (DSCC – NAB), Post Office Box 3990, Columbus, OH 43216-5000, or telephone (614) 692-2271 or -3191.

7.8 Subject term (key word) listing.

Conductive  
Gooch  
Gum  
Latex  
Natural  
PVC  
Synthetic

MILITARY INTERESTS:

Custodians:

Army - AT  
Air Force - 99  
Navy - SH  
DLA – CC

Review activities:

Air Force - 71  
Navy - SA

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

Preparing activity:

DLA - CC

(Project 4720-0339)