INCH-POUND
A-A-52047D
19 August 2013
SUPERSEDING
A-A-52047C
5 May 2003

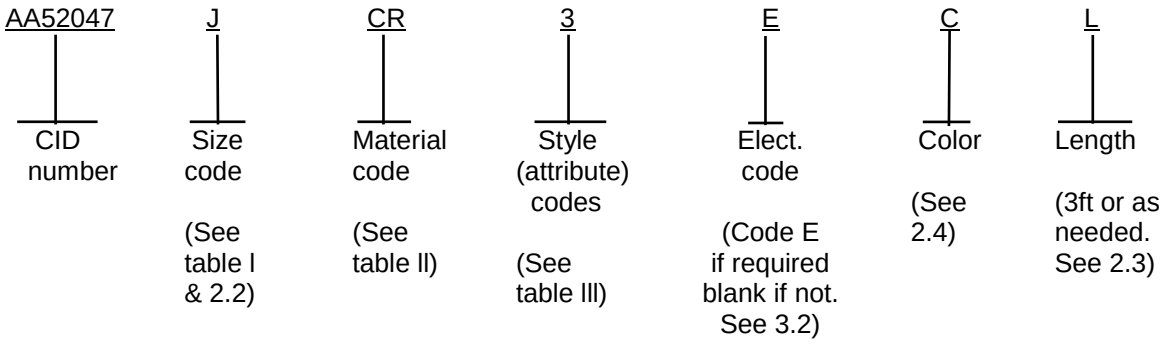
COMMERCIAL ITEM DESCRIPTION

TUBING, NONMETALLIC
(RUBBER AND PLASTIC)

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 the general requirements for tubing, nonmetallic (rubber and plastic). Tubing, nonmetallic (rubber and plastic) covered by this CID is intended for commercial/industrial applications.

2. CLASSIFICATION/PART OR IDENTIFYING NUMBER (PIN). This CID uses a classification system that is included in the PIN as shown in the following example (see 7.1).



Comments, suggestions, or questions on this document should be addressed to DLA Land and Maritime, Attn: VAI, 3990 East Broad Street, Columbus, OH 43218-3990 or fluidflow@.dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online at https://assist.dla.mil.

TABLE I. Size 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	Material PIN code
Commercial rubber tubing	I	CR
Synthetic rubber tubing	II	SR
Natural rubber compound tubing	III	NR
Latex tubing	IV	LT
Laboratory pure gum natural rubber or synthetic tubing	V	LP
Plastic tubing	VI	PT

TABLE III. Style (attribute) codes.

Attribute	Class code	PIN code
Light wall	1	1
Heavy wall	2	2
Pressure	3	3
Gooch	4	4
Vacuum	5	5
General use	6	6
Pressure & vacuum	7	7

2.1 Type. The tubing covered by this CID should be of the following types and classes.

2.1.1 Type I, Commercial rubber tubing. Type I tubing should 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.

2.1.2 Type II, Synthetic rubber tubing. Type II tubing should 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 should be compounded from natural rubber (inside diameter as shown in 2.2 below with a tolerance of ± 0.062 inch, wall thickness of 0.062 ±0.016 inch, (Length of 3 feet ±1 inch).

2.1.4 Type IV, Latex tubing. Type IV tubing should 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 should 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 should be of the following nominal sizes (in inches).

1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1

2.3 Length. Lengths should be 3 feet ±1 inch by default or as needed.

2.4 Color. Color as follows:

Color type	Material PIN code
Any color	A
Black	B
Clear	C
Translucent, amber	T

3. SALIENT CHARACTERISTICS.

3.1 Interface and physical dimensions. Tubing, nonmetallic (rubber and plastic) 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 D792.

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 D412.

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 D573.

3.2.2.3 Immersion. The tubing shall have a tensile strength as defined in table I when tested in accordance with ASTM D543.

TABLE IV. Physical properties. 1/

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 1/	75	---
After 14 days immersion in a 3% salt solution at 82 ºF (28 ºC) (psi) (minimum)	---	---	---	---	---	2000
Ultimate elongation: Initial (%) (minimum)	650	450	400	750	700	300
After 14 days immersion in a 3% salt solution at 82 ºF (28 ºC) (%) (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% 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 D412.

3.2.3.2 Immersion. The tubing shall have a tensile strength as defined in table I, when tested in accordance with ASTM D543.

3.2.4 Tensile stress at 100% elongation. The tubing shall have a maximum tensile stress at 100% elongation as defined in table IV, when tested in accordance with ASTM D412.

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 D572 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 D471, 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 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 V through VIII 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 ±0.016	Wall thickness ±0.016	Inside diameter ±0.016	Wall thickness ±0.016	Inside diameter ±0.016	Wall thickness ±0.016	Inside width measured flat ±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,l wall		Class 2, heavy wall		Class 5, vacuum connections	
	Inside diameter ±0.016	Wall thickness ±0.016	Inside diameter ±0.016	Wall thickness ±0.016	Inside diameter ±0.016	Wall thickness ±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 ±0.016	wall thickness	Tolerance ±
1/8	.125	.031	.008
3/16	.188	.094	.016
1/4	.250	.062	.016
5/16	.312	.062	.016

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

Nominal size	Class 6, general use		Class 7, pressure and vacuum connections	
	Inside diameter ±0.016	Wall thickness ±0.016	Inside diameter ±0.016	Wall thickness ±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% swelling of the tubing after immersion for 14 days in a 3% salt solution at 82º F (28º C).

3.5.2 Resistance to cold. There shall be no signs of cracking when the tubing is bent back upon itself at -1 ±2 °F (-18 ±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 that the use of used or rebuilt products is allowed under this specification unless otherwise specified (see 7.4).

3.7 Marking. Tubing, nonmetallic (rubber and plastic) supplied to this CID shall be marked with the manufacturer's (MFR's) standard commercial PIN. (NOTE: The part number marked on the unit pack shall be the CID PIN.)

3.8 Workmanship Tubing, nonmetallic (rubber and plastic) shall be processed in such a manner as to be uniform in quality and shall be free from other defects that will affect life, serviceability, or appearance

4. REGULATORY REQUIREMENTS. 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 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.

5.2 Certification. Certification must be done with the procuring activity approval. The contractor shall certify that the product offered meets the salient characteristics of the description and conforms to the producer's own drawings, specifications, standards, and quality assurance practices, and is the same as the product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.

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 PIN. 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 DLA Land and Maritime under the Military Parts Control Advisory Group (MPCAG) evaluation program, CAGE code 58536 should be used.

7.3 Source of documents.

FEDERAL REGULATIONS

FAR – Federal Acquisition Regulations (FAR)

(Copies of these documents are available online at http://www.acquisition.gov/comp/far/index.html or from the U.S. Government Printing Office, 732 North Capital Street, NW, Washington D.C. 20401.)

Other Publications

ASTM INTERNATIONAL

ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers- Tension

ASTM D471 - Standard Test Method for Rubber Property - Effect of Liquids

ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents.

ASTM D572- Standard Practice for Air-Oven Aging of Polyolefin Geomembranes

ASTM D573 - Standard Test Method for Rubber-Deterioration in an Air Oven

ASTM D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement

(Copies of these documents are available online at http://www.astm.org or from the ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 - Standard for Health Care Facilities

(Copies of these documents are available online at http://www.nfpa.org or from the National Fire Protection Association, 1 Battery March Park, Quincy, MA 02269-9101.)

7.4 Ordering data. The contract or order should specify the following:

a. CID document number, revision, and CID PIN.
b. Product conformance provisions.
c. Packaging requirements.

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.)

MFR's CAGE	MFR's name and address
1L0C5	Harrison Hose and Tubing inc. 2705 Kuser Road Trenton, NJ 08691 JIM LOGUE 2705 KUSER RD TRENTON, NJ 086911807 - USA jloguehht@aol.com Tel: (609) 631-8804 Fax: (609) 631-8796
75345	Kirkhill Rubber co. ALEX CANAVAN 300 E. CYPRESS ST BREA, CA 92821 - USA alex.canavan@esterline.com Tel: (714) 529-4901 Fax: (714) 529-6584
76385	NAYANESH GAJERA 49 ACKERMAN ST BLOOMFIELD, NJ 070034299 - USA govtsales@minorrubber.com Tel: (973) 338-6800 Fax: (973) 893-1399

61125	J.G.B ENTERPRISES INC. 115 METROPOLITAN DR. LIVERPOOL, N.Y. 13088-5389 msalanger@jgbhose.com Tel: (315) 451-2770 Fax: (315) 451-8503 General Information jgb@jgbhose.com
52768	ALL METALS ENGINEERING CHRIS MIORELLI 21601 SURVEYOR CIRCLE HUNTINGTON BEACH, CA 92646 - USA chris@allmetals.net Tel: (714) 536-7546 Fax: (714) 536-3523
47210	ASPEN MANUFACTURING CO INC DBA ASPEN APPLIANCE PARTS JOHN DEFULGENTIS 703 VAN ROSSUM AVE UNIT-5 EDGEWATER PARK, NJ 080101739 - USA am4323@aol.com Tel: (800) 327-1794 Fax: (609) 871-6430
0TE27	D. W. INDUSTRIES INC. 6287 LONG DR 6287 LONG DRIVE HOUSTON, TX 77087-3457 Tel: (713) 644-8372 Fax: (713) 644-4947

7.6 Government users. To acquire information on obtaining these tubing, nonmetallic, (rubber and plastic) from the Government inventory system, contact DLA Land and Maritime, ATTN: DLA Land and Maritime- NAB, P.O. Box 3990, Columbus, OH 43218-3990, or telephone (614) 692-2271 or -3191.

7.7 Subject term (key word) listing.

Conductive
Gooch
Gum
Latex
Natural
PVC
Synthetic

7.8 Legacy. This commercial item description is a replacement for ZZ-T-831 for all federal agencies (ZZ-T-831 is canceled as of 30-APR-1993 and copies of these documents are available online at http://quicksearch.dla.mil or from the U.S. Government Printing Office, 732 North Capital Street, NW, Washington D.C. 20401.)

7.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

MILITARY INTERESTS

Custodians:
Army - AT
Navy - SH
Air Force - 99
DLA - CC

Review activities:
Army-AR
Navy – SA,YD
Air Force - 71

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FAS

Preparing activity:
DLA - CC

Project 4720-2012-016

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 Online database at https://assist.dla.mil/