[INCH-POUND]
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10 November 2020
SUPERSEDING
A-A-60017
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COMMERCIAL ITEM DESCRIPTION

TUBE AND FITTINGS, METALLIC, BRAKE, FUEL, AND TRANSMISSION LINES, NICKEL-COPPER ALLOY, GENERAL REQUIREMENTS FOR

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 tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy. Tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy covered by this CID are intended for commercial/industrial applications.

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

AA60017	-4	-25	S
CID number	Tube size Dash number (see table III)	Tube coil length (see table I or II)	Fittings Number and type (See table I or II)

PIN examples:

AA60017-4-25S - Specifies tubing 1/4 inch OD twenty five feet long, with 8 short inverted flare nuts.
AA60017-6-50L - Specifies tubing 3/8 inch OD fifty feet long, with 16 long inverted flare nuts.
AA60017-8-25 - Specifies tubing 1/2 inch OD twenty five feet long, with no inverted flare nuts.

3. SALIENT CHARACTERISTICS.

3.1 Interface and physical dimensions. Tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy supplied to this CID shall be as specified herein. A flaring tool is required to assemble the tube assembly.

3.2 CID specification sheet. The family of tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy shall be in accordance with the requirements specified herein.

Beneficial comments, recommendations, additions, deletions, clarifications, etc., and any data that may improve this document should be sent to: DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus OH 43218-3990, or fluidflow@dla.mil. Since contact information can change you may want to verify the currency of the address information using the ASSIST Online database at https://assist.dla.mil.

3.3 Design and construction. Tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy supplied to this CID are for use with brake, fuel, and transmission lines, they are designed to be used where the underbody of the vehicle is subjected to the harshest environments, where the longest life-span for lines is required, and/or where direct OEM replacement is desired.

3.4 Tube. Tubing shall be supplied in coils 10, 15, 25, 50, or 100 feet as specified in the PIN. Tubing without inverted flare nuts are specified with a "Blank" designator, see table I. Tubing shall be seamless - extruded from an ingot, not rolled. Length tolerance shall be in accordance with ASTM B251/B251M. Note: reference tables in ASTM B251/B251M for ASTM B466/466M type tubing.

Table I. Tubing coil lengths, number and type of brass inverted flare nuts.

Tube coil length PIN Code	Length of tube coil		Tube coil length with nut PIN Code		Coil length and number of inverted flare nuts supplied
			Short nut	Long nut	
-10	10 foot coil		-10S	-10L	10 foot coil with 4 inverted flare nuts.
-15	15 foot coil		-15S	-15L	15 foot coil with 6 inverted flare nuts.
-25	25 foot coil		-25S	-25L	25 foot coil with 8 inverted flare nuts.
-50	50 foot coil		-50S	-50L	50 foot coil with 16 inverted flare nuts.
-100	100 foot coil		-100S	-100L	100 foot coil with 32 inverted flare nuts.

3.4.1 Tube size O.D.. Tube O.D. size dash number is the size of tube expressed in sixteenths of an inch, tubes are measured on outside diameter, see table II for tube size dash number.

Table II. Tubing O.D. designators.

Tube size dash number	Tube size O.D. Nominal	
	Fraction	mm
-3	3/16	4.76
-4	1/4	6.35
-5	5/16	7.94
-6	3/8	9.53
-7	7/16	11..11
-8	1/2	12.70

3.4.2 Tube materials. Tube materials shall be 90-10 nickel-copper alloy brake tubing in accordance with SAE J1650 alloy UNS70600.

3.5 Inverted flare nut. Fittings supplied to this CID can be either "short nut" or "long nut" inverted flare, see figure 1.

3.5.1 Inverted flare nut material. Fitting materials shall be brass in accordance with SAE J512 (see table I).

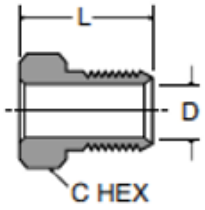
NOTE: Steel alloys, due to the corrosion couple between the steel and the Cu-Ni brake tubing, should not be in contact with Cu-Ni brake tubing.

3.5.2 Inverted flare nut dimensions. Fitting dimensions shall be in accordance with SAE J512 040110, see figure 1. Design of the "Long" brake nut variant differs only in the length of the nut specified by SAE J512 for P/N SAE J512 0401110B. All fittings shall meet the functional requirements of SAE J512.

NOTE: Other hardware, identified as "Long" by SAE J512, is unacceptable because they have the wrong form.

3.5.3 Inverted flare nuts supplied. When specified in the PIN, inverted flare nuts shall be supplied, see table I. The designator “S” for short nut and “L” for long nut. The length of coil tubing, the inverted flare nut type, and number of inverted flare nuts supplied shall be in accordance with table I. The inverted flare nuts shall fit the tubing size specified in the PIN, see figure 1.

3.5.4 Operating temperature Minimum operating temperature -65ºF (-53ºC), Maximum operating temperature 250ºF (121ºC).



Tube size dash number	SAE J512 Fitting/tube size O.D.	Straight thread	C Hex	L (short nut)	L (Long nut)	D
-3	3/16	3/8-24	3/8	0.53	0.818	.188
-4	1/4	7/16-24	7/16	0.54	0.812	.188
-5	5/16	1/2-20	1/2	0.59	TBD	.250
-6	3/8	5/8-18	5/8	0.66	0.781	.312
-7	7/16	11/16-18	11/16	0.75	TBD	.375
-8	1/2	3/4-18	3/4	0.81	TBD	.576

NOTE: Dimensions and tolerances not show shall be in accordance with SAE J512 040110, short nut or long nut. The long nuts have special lengths not listed in SAE J512. Data reflected by SAE J512 is shown as "Reference" to clearly establish that this figure doesn't modify the design cited by SAE J512, but rather therein provides useful information.

Figure 1. Inverted flare nuts.

3.6 Usage. 90-10 copper-nickel corrosion resistant tube can be used for brake, fuel, and transmission lines. DOT approved for hydraulic brake systems and bends easier than steel tubing.

3.7 Working pressures. Working pressure see table III.

TABLE III. Working pressure maximum.

Tube O.D	PSI	Tube wall		Brass inverted flare fittings	PSI
3/16	3300	.028		-3	1900
1/4	2300	.028		-4	1400
5/16	1850	.028		-5	1200
3/8	1500	.028		-6	1000
7/16	1250	.028		-7	750
1/2	1050	.028		-8	750

3.8 Cleaning. The inside and outside surfaces of the finished tubing shall be cleaned in accordance with SAE J1650. Tubing and fittings shall be clean, and free from grease, oxide scale, carbon deposits, and any other contamination that cannot be readily removed by cleaning agents normally used in manufacturing plants.

3.9 Marking. Brake, fuel, and transmission line kits 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.)

3.10 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.11 Workmanship. Brake, fuel, and transmission line kits 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 offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with 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 market. The Government reserves the right to require proof of such conformance.

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 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 examples.

7.2 Commercial and Government Entity (CAGE) code. For ordering purposes, inventory control, and submission of these tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy to DLA Land and Maritime under the Parts Management Advisory Team (PMAT) 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 https://www.acquisition.gov/comp/far/index.html.)

ASTM INTERNATIONAL

ASTM B251/B251M	-	Standard Specification for General Requirements for Wrought Seamless Copper and Copper-Alloy Tube
ASTM B466/B466M	-	Standard Specification for Seamless Copper-Nickel Pipe and Tube

(Copies of these documents are available online at https://www.astm.org.)

SAE INTERNATIONAL

SAE J512	-	Automotive Tube Fittings
SAE J1650	-	Seamless Copper-Nickel Tubing

(Copies of these documents are available online at https://www.sae.org.)

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.

d. Test certificates of the tubing, if required, see SAE J1650.

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 acquisition to only the manufacturers shown.)

MFR's CAGE	MFR's name and address
4GB20	AGS Company P.O. Box 729 Muskegon, MI 49433 Phone 1-800-253-0403 E-mail: customerservice@agscompany.com https://agscompany.com
56L80	Federal Hill Trading Company 195 Federal Hill Road Oxford, MA 01540-1303 Phone 508-987-2660 FAX 508-987-2661 E-mail: fedhillusa@gmail.com https://store.fedhillusa.com/
1EJL1	NAPA 2105 HWY 180 E Silver City, MN 88061-7787 Phone 1-800-538-6272 E-mail: customersupport@napaonline.com https://www.napaonline.com/

7.6 Government users. To acquire information on obtaining these tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy from the Government inventory system, contact DLA Land and Maritime, ATTN: DLA Land and Maritime Call Center (-NAB), PO BOX 3990, Columbus, OH 43218-3990, or telephone (614) 692-2271 or (614) 692-3191.

APPENDIX A

TUBE AND FITTINGS, METALLIC, BRAKE, FUEL, AND TRANSMISSION LINES, NICKEL-COPPER ALLOY, INSTALLATION PROCEDURE

A.1 SCOPE.

A.1.1 Scope. This commercial item description (CID) covers the general requirements for tube and fittings, metallic, brake, fuel, and transmission lines, nickel-copper alloy, installation procedure covered by this CID are intended for commercial/industrial applications. This appendix is not a mandatory part of the commercial item description (CID).

A.1.2 Intended use. The long nut specified in the CID offers additional vibration capacity.

A1.3 Assembly instructions:

a. Cut tubing squarely and clean tube end thoroughly to remove burrs.
b. Place nut onto tube. Place threaded end of nut toward end of tube.
c. Flare tube end with flaring tool to provide a 37º or 45° flare, as required by the application.
d. Lubricate threads and assemble to fitting body.
e. Nut should be turned hand tight.
f. Tighten with a wrench until a solid feeling is encountered. From that point, apply a one-six turn.
g. Flare fittings are easy to disassemble and may be reassembled repeatedly, for a leak-proof connection.

NOTE: Do not over-torque as it may damage the fitting or split the tubing.

MILITARY INTERESTS:

Custodians:
Army - AT
Navy - AS
Air Force - 71
DLA - CC

Review activities:
Army - AV, MI
Navy - MC, SH

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FAS

Preparing Activity:

DLA - CC

Project 4710-2020-003

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