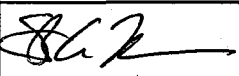
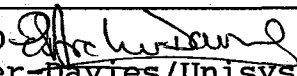
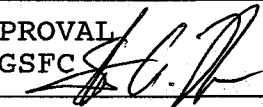
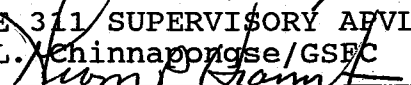


**REVISIONS**

SYMBOL	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE	2/25/94	

**SHEET REVISION STATUS**

SH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REV	--	--	--	--	--	--	--													
SH	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REV																				

ORIGINATOR <i>T.J. Perry</i> T.J. Perry/Unisys	DATE 2/25/94	FSC: 5935
APPROVED  S. Archer-Davies/Unisys	2/25/94	Connectors, Electrical, Miniature, Circular, Low Outgassing [Amphenol (453) Suffix], General Specification for
CODE 311 APPROVAL S. A. Naus/GSFC 	2/25/94	
CODE 311 SUPERVISORY APVL R. L. Chinnappose/GSFC 	2/25/94	
ADDITIONAL APPROVAL		

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 GODDARD SPACE FLIGHT CENTER  
 GREENBELT, MARYLAND 20771

CAGE CODE: 25306

PAGE 1 OF 7

## 1. SCOPE

- 1.1 Purpose. This specification delineates the general provisions for miniature, multiple contact, quick disconnect, circular electrical connectors intended for spaceflight use at Goddard Space Flight Center (GSFC). These connectors are manufactured by Amphenol Aerospace Corporation and are configured to MIL-C-38999 Series I (LJT), Series II (JT), Series III (TV) and MIL-C-26482 Series 2 (PTS-DR). The connectors are capable of operation to a maximum temperature of 200°C except for the Series III. Due to their unique coupling mechanism utilizing a special space-compatible lubricant, Series III connectors are limited to a maximum operating temperature of 150°C.

## 2. APPLICABLE DOCUMENTS

- 2.1 Documents. The following documents, of the issue in effect on the date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein. A later revision of a specification may be used as long as the later revision does not degrade the specification requirements.

### Specifications

MIL-C-26482 Connectors, Electrical, (Circular, Miniature, Quick Disconnect, Environment Resisting), Receptacles and Plugs, General Specification for

MIL-C-38999 Connectors, Circular, Miniature, High Density, Quick Disconnect (Bayonet, Threaded, and Breech Coupling), Environment Resistant, Removable Crimp and Hermetic Solder Contacts, General Specification for

MIL-I-45208 Inspection System Requirements

SD-6 Provisions Governing Qualifications

### Standards

MIL-STD-1353 Connectors, Electrical, Selection and Use of

### Other Publications

ASTM E595 Materials from Outgassing in a Vacuum Environment, Total Mass Loss and Collected Volatile Condensable, Standard Test Method for

NASA Ref.  
Pub. 1124      Outgassing Data for Selecting Spacecraft  
Materials

- 2.2 Order of precedence. In the event of conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specified exemption has been granted.
- 2.3 Copies of documents. Copies of federal and military documents may be obtained from the Standardization Document Order Desk, 700 Robbins Avenue, Building #4-Section D, Philadelphia, PA 19111-5094. Copies of ASTM publications are available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103. Copies of NASA publications are available from the Office of Flight Assurance Information Center, Code 300.1, NASA/GSFC, Greenbelt, MD 20771.

### 3. REQUIREMENTS

- 3.1 General. Connector procured to this specification shall meet the general requirements of MIL-C-38999.
- 3.2 Qualification. The individual connectors and contacts furnished under this specification shall be product which have been granted qualification approval by NASA/GSFC. Qualification approval shall be based on the following.
- 3.2.1 Application for qualification. Each application shall be made in accordance with SD-6, Provisions Governing Qualifications. All applications shall be submitted to the activity listed below:
- NASA/GSFC  
Greenbelt, MD 20771  
Attn: QPLD Administrator  
Code 311.2
- 3.2.2 Design and source approval. Prior to qualification, the manufacturer's facilities shall be subjected to survey (at the option of GSFC) by the Office of Flight Assurance, GSFC. Compliance with MIL-I-45208 is required. In addition the history and detailed engineering of the specific connector design will be reviewed, as will the documented manufacturing and quality control procedures. Only those sources approved in the design and source approval phase shall be eligible for qualification or award of contract under this specification. Source

approval and design approval do not constitute part qualification or an equivalent thereof.

- 3.2.3 Part qualification. The individual connectors and contacts shall be product which have passed the qualification inspection requirements of MIL-C-38999. Additionally, the connectors and contacts shall have passed the requirements cited herein.
- 3.3 Materials. Materials shall be in accordance with MIL-C-38999 except as modified herein.
- 3.3.1 Finishes. All nonmetallic shell and nut components shall be plated with electroless nickel in accordance with MIL-C-38999, Finish F.
- 3.3.2 Waved washer. The coupling nut captivated waved washer shall consist of carbon steel with a black oxide finish in accordance with the manufacturer's internal specifications.
- 3.3.3 Lubrication. Lubrication for threads and clamps shall be restricted to Apiezon-M grease.
- 3.3.4 Contact markings. Crimp contacts shall be supplied without bin code paint markings.
- 3.5 Thermal vacuum outgassing. All materials used in the finished connector shall not release greater than 1.0 percent total mass loss (TML) or 0.1 percent collected volatile condensable materials (CVCM) when tested in accordance with 4.5.1. Data listed in NASA Reference Publication 1124 Revision 3 may be used in lieu of actual test data for applicable material.
- 3.6 Part marking. Connectors shall be permanently marked with the manufacturer's name or trademark, date code, and the manufacturer's part number containing the (453) suffix. The applicable prefixes/suffixes for the manufacturer's part numbers are of the following format.

<u>MIL-C-38999 (Series I):</u>	LJT-(453)
<u>MIL-C-38999 (Series II):</u>	JT-(453)
<u>MIL-C-38999 (Series III):</u>	TV-(453)
<u>MIL-C-26482 (Series 2):</u>	PTS-DR-(453)

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 General. The Quality Assurance Provision of MIL-C-38999 shall be met, except where modified herein. NASA/GSFC reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to the prescribed requirements.

4.2 Classification of inspection. The inspections specified herein are classified as follows:

- a. Qualification inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).

4.3 Qualification inspection. Qualification inspection shall be performed in accordance with MIL-C-38999 except as modified herein. All manufacturers of product to this specification shall be listed as an approved source of supply for the equivalent military connector listed on the latest revision of QPL-38999 or QPL-26482.

4.3.1 Outgassing. Thermal vacuum outgassing (see 3.5) shall be performed in accordance with 4.5.1. Actual test data, or test data contained in NASA Reference Publication 1124, shall be submitted to the Qualifying activity.

4.3.2 Failure analysis. A failure analysis shall be performed on each connector having failed during qualification inspection. The failure analysis shall be designated to isolate the cause(s) of failure and yield adequate conclusions to initiate a corrective action plan to eliminate the cause(s) to prevent recurrence of the type of failure mode reported.

4.3.3 Failure analysis report. Two copies of the failure analysis report shall be submitted to GSFC, one copy to the address listed in 6.4 and one copy to the procuring activity. The report shall include, as a minimum, the following information:

- a. Date defect occurred.
- b. Lot number, lot size, and serial numbers (where applicable).
- c. Connector type designation.
- d. Test and/or examination at which defect was first noted.

- e. Failure mode.
- f. Cause of failure.
- g. Corrective action taken or to be taken.
- h. Effect of failure on other connectors in the inspection lot.
- i. Purchase orders or contracts affected.

4.3.4 Retention of qualification. To retain qualification, the retention of qualification requirements in accordance with MIL-C-38999 shall be met.

4.4 Quality conformance inspection. Connectors shall be subjected to quality conformance inspection (QCI) in accordance with MIL-C-38999.

4.5 Test methods

4.5.1 Thermal vacuum outgassing (see 3.5). The outgassing test shall be conducted in accordance with ASTM E595.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging. Preservation and packaging shall be in accordance with MIL-C-55330. The manufacturer shall be responsible for any damage to or deterioration of connectors and contacts resulting from faulty or improper packing, preservation, or packaging, and shall replace connectors and/or contacts without cost to GSFC or to the procuring activity.

6. NOTES

6.1 Ordering data. Procurement documents should specify the following:

- a. Title, number and date of this specification.
- b. Nomenclature by class, type, finish, style, size and manufacturer's part number.

6.2 Definitions. Definitions shall be those listed in MIL-STD-1353.

6.3 Qualification provisions. With respect to product requiring qualification, awards will be made only for product which have been tested and approved by GSFC before the time for opening of bids. The attention of the suppliers is called to this requirement: manufacturers

should arrange to have qualification tests made on product which they purpose to offer to GSFC to become eligible for awards of contracts or orders for product covered by this specification. The manufacturer shall bear the cost of qualification inspection to this specification. Information pertaining to qualification of product may be obtained from the activity whose address is listed in 6.4.

- 6.4 NOTICE. When GSFC drawings, specifications, or other data are sent for any purpose other than in connection with a definitely related GSFC procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever: the fact that GSFC might have formulated, furnished or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any person or corporations, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

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