Society of Automotive Engineers, Inc.
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AEROSPACE RECOMMENDED PRACTICE

ARP 1308

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Revised

PREFERRED ELECTRICAL CONNECTORS FOR AEROSPACE VEHICLES AND ASSOCIATED EQUIPMENT

1. PURPOSE

This Aerospace Recommended Practice (ARP) serves as a guide toward standard practice for the selection and use of preferred electrical connectors for aerospace vehicles and associated equipment.

1.1 Scope: The intent of this ARP is to identify selected electrical connectors, their general application characteristics, and associated configuration options recommended for new design, repair, and retrofit purposes (see 6.1). It is acknowledged that those connectors listed herein will not completely satisfy all aerospace vehicle and equipment requirements but optimization of the use of these components will facilitate standardization in the form of maximum utilization of a minimum variety of connectors.

1.2 Classification: Electrical connectors shall be classified in accordance with the connector geometric configuration, size (see 6.2) and coupling method as follows:

Class	Description
1	Cylindrical, Standard, Threaded Coupling
2	Cylindrical, Miniature, Bayonet Coupling
3	Cylindrical, Miniature, Threaded Coupling
4	Cylindrical, Subminiature, Bayonet Coupling
5	Rectangular, Miniature, Blind Mate Coupling
6	Rectangular, Subminiature, Blind Mate Coupling

1.3 Application: Cylindrical connectors, threaded and bayonet coupling, are intended for cable-to-panel applications. Rectangular connectors, blind mate coupling, are intended for rack-to-panel applications.

2. APPLICABLE DOCUMENTS

The following documents shall form a part of this ARP to the extent specified herein. The applicable issue of each shall be that in effect on the date of this document unless otherwise specified in the manufacturer's detail specifications. Supplemental specifications, standards, or the like, which by reference in any of the following publications are indicated to be part thereof, shall not be considered effective except as specifically stated in the manufacturer's detail specification or as may be otherwise mutually agreed upon between the vendor and the purchaser.

2.1 Military Specifications:

MIL-C-005015F (Navy)	Connectors, Electric, AN Type, General Specification for
MIL-C-0026482F (Navy)	Connectors, Electric, Circular, Miniature, Quick Disconnect, Environment Resisting, General Specification for

2.1 (Continued)

MIL-C-26500	Connectors, General Purpose, Electric, Miniature, Circular, Environment Resisting, General Specification for
MIL-C-0038999E (USAF)	Connectors, Electric, Circular, Miniature, High Density, Quick Disconnect, Environment Resistant, Removable Crimp Contacts
MIL-C-39029	Contacts, Electric, General Specification
MIL-C-83723B (USAF)	Connector, Electric, Circular, Environment Resisting, General Specification for

2.2 Military Standards:

MIL-STD-1344	Test Methods for Electrical Connectors
MIL-STD-1560	Insert Arrangements for MIL-C-38999 and MIL-C-27599 Electrical, Circular Connectors
MIL-STD-1646	Servicing Tools for Electric Contacts and Connections, Selection and Use of

2.3 Society of Automotive Engineers Publications:

ARP 914	Glossary of Electrical Connection Terms

3. REQUIREMENTS

3.1 General: The qualification, materials, design, construction, intermateability, interchangeability, and performance requirements applicable to preferred electrical connectors specified in this ARP shall be in accordance with those requirements of the military specification referenced for each particular connector specified herein.

3.2 Class 1 Electrical Connectors: Class 1 electrical connectors shall, as a minimum, have the following application characteristics:

a) Coupling method: Threaded
b) Shell sizes: 20, 22, 28, 36
c) Contact sizes: 8, 12, 16
d) Contact termination: Crimp
e) Contact retention: Rear insertion/extraction
f) Usage characteristics: Temperature range: -55° C to +175° C; Environment resisting; Fluid resisting; Conductive finish
g) Configurations: Per Table I, herein

3.3 Class 2 Electrical Connectors: Class 2 electrical connectors shall, as a minimum, have the following application characteristics:

a) Coupling method: Bayonet
b) Shell sizes: 8, 10, 12, 14, 16, 18, 22, 24
c) Contact sizes: 12, 16, 20
d) Contact termination: Crimp
e) Contact retention: Rear insertion/extraction
f) Usage characteristics: Temperature range: -55° C to +200° C; Environment resisting; Fluid resisting; Conductive finish
g) Configuration: Per Table II, herein

3.4 Class 3 Electrical Connectors: Class 3 electrical connectors shall, as a minimum, have the following application characteristics:

a) Coupling method: Threaded
b) Shell sizes: 8, 10, 12, 16, 18, 22
c) Contact sizes: 16, 20
d) Contact termination: Crimp
e) Contact retention: Rear insertion/extraction
f) Usage characteristics: Temperature range: -55° C to +200° C; Environment resisting; Fluid resisting; Conductive finish
g) Configuration: Per Table III, herein

3.5 Class 4 Electrical Connectors: Class 4 electrical connectors shall, as a minimum, have the following application characteristics:

a) Coupling method: Bayonet
b) Shell sizes: 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
c) Contact sizes: 12, 16, 20, 22D
d) Contact termination: Crimp
e) Contact retention: Rear insertion/extraction
f) Usage characteristics: Temperature range: -65° C to +200° C; Environment resisting, Fluid resisting, Conductive finish
g) Configuration: Per Table IV, herein. Series I connectors are of the extended shell, scoop-proof design; Series II connectors are of the low silhouette, non scoop-proof design. The Series I and II connectors are not interchangeable or intermateable.

3.6 Class 5 Electrical Connectors: This requirement will be added at a later date.

3.7 Class 6 Electrical Connectors: This requirement will be added at a later date.

4. QUALITY ASSURANCE PROVISIONS

Quality assurance provisions applicable to electrical connectors specified in this ARP shall be in accordance with those provisions specified in the military specification referenced for each particular connector. Unless otherwise specified in the referenced military specification, testing of connectors shall be in accordance with MIL-STD-1344.

5. PREPARATION FOR DELIVERY

Preparation for delivery provisions applicable to electrical connectors specified in this ARP shall be in accordance with those provisions specified in the military specification referenced for each particular connector.

6. NOTES

6.1 Intended Use: Electrical connectors listed in this specification are intended for use in aerospace vehicles including military/commercial airplane and missile airframes, propulsion units, and associated avionics components. These connectors represent items primarily preferred for power, control, and instrumentation cable interconnection applications for new equipment designs and may be used for repair and retrofit purposes on existing equipments for those connector types listed in the tables herein under the "Intermates With" column.

6.2 Connector Size Classification: Connector size infers the ratio of the dimensional envelope and weight characteristics of a connector configuration versus the typical spacing of contacts, or concentration, contained within the connector insert (oftimes designated as "density"). For specific details, see the governing military specification which defines each class of connectors.

6.3 Part Numbers: Part numbers assigned to electrical connectors are in accordance with the military specification sheets or MS drawings referenced for specific connector configurations specified in this Recommended Practice. Part numbers are limited to those configurations, classes, shell sizes, and insert arrangements and positions specified in the tables of this document.

6.4 Terminology: Terminology utilized herein is in accordance with ARP 914.

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TABLE I

Class 1, Cylindrical, Standard, Threaded Coupling Connector Configurations[1]

CONNECTOR DESCRIPTION	MILITARY SPECIFICATION			INTERMATES WITH:	INSERT ARRANGEMENT[2]			
	NUMBER	CLASS	MS DWG		SHELL SIZE	MS DWG	ARR NO.	QTY/SIZE CONTACTS
Receptacle Wall Mounting	MIL-C-5015	K,L	MS3450	MIL-C-5015, All Classes	20 22 28	MS33685 MS33686 MS33688	20-15 22-22 28-20	7/12 4/8 4/16,10/12
Receptacle Box Mounting	MIL-C-5015	L	MS3452	MIL-C-5015, All Classes	28 36	MS33688 MS33690	28-21 36-10	37/16 48/16
Receptacle, Jam Nut Mtg	MIL-C-5015	K,L	MS3454	MIL-C-5015, All Classes				
Plug, Cable	MIL-C-5015	K,L	MS3456/ MS3459[3]	MIL-C-5015, All Classes				

1. Connector hardware is in accordance with the following: pin contacts, MS3162; socket contacts, MS3163; grommet sealing plugs, MS25251; protective covers, MS25042/MS25043; contact crimping tools, MIL-STD-1646; and contact insertion/extraction tools, MS27534. See military specification for rear-end accessory hardware.

2. Normal insert position and first alternate position only are preferred.

3. MS3459 self-locking coupling mechanism preferred for high vibration/physical shock applications.

TABLE II

Class 2, Cylindrical, Miniature, Bayonet Coupling Connector Configurations[1]

CONNECTOR DESCRIPTION	MILITARY SPECIFICATION			INTERMATES WITH:	INSERT ARRANGEMENT[2]			
	NUMBER	CLASS	MS DWG		SHELL SIZE	MS DWG	ARR NO.	QTY/SIZE CONTACTS
Receptacle, Flange Mtg	MIL-C-26482, Series 2	L	MS3470	MIL-C-26482; Series 1 and 2, All Classes	10	MS33709	6	6/20
					14	MS33711	12	4/16, 8/20
					14	MS33711	19	19/20
					18	MS33713	32	32/20
Receptacle Sgl. Hole Mtg	MIL-C-26482, Series 2	L	MS3474	MIL-C-26482; Series 1 and 2, All Classes	22	MS33715	55	55/20
					24	MS33716	61	61/20
Plug, Cable	MIL-C-26482; Series 2	L	MS3476	MIL-C-26482; Series 1 and 2, All Classes				

1 Connector hardware is in accordance with the following: pin contacts, MIL-C-39029/4; socket contacts, MIL-C-39029/5; grommet sealing plugs, MS3187; contact crimping tools, MIL-STD-1646; and contact insertion/extraction tools, MS27534. See military specification for rear-end accessory hardware.

2 Normal insert position and first alternate position only are preferred.

TABLE II (continued)

Class 2, Cylindrical, Miniature, Bayonet Coupling Connector Configurations[1]

CONNECTOR DESCRIPTION	MILITARY SPECIFICATION			INTERMATES WITH:	INSERT ARRANGEMENT[2]			
	NUMBER	CLASS	SPEC SHEET		SHELL SIZE	MS DWG	ARR NO.	QTY/SIZE CONTACTS
Receptacle, Flange Mtg, Socket Contact	MIL-C-83723, Series 3	R	MIL-C-83723/71	MIL-C-26500; Type B; Class R, F	8	MS27561	3	3/20
					12	MS24260	12	12/20
					16	MS24261	24	24/16
					18	MS24262	8	8/12
Receptacle, Flange Mtg, Pin Contact	MIL-C-83723, Series 3	R	MIL-C-83723/72	MIL-C-26500; Type B; Class R, F	18	MS24262	31	31/20
					22	MS24263	19	19/16
					22	MS24263	55	55/20
					24	MS27561	61	61/20
Receptacle, Sgl. Hole Mtg, Socket Contact	MIL-C-83723, Series 3	R	MIL-C-83723/73	MIL-C-26500; Type B; Class R, F				
Receptacle, Sgl. Hole Mtg, Pin Contact	MIL-C-83723, Series 3	R	MIL-C-83723/74	MIL-C-26500; Type B; Class R, F				
Plug, Cable, Socket Contact	MIL-C-83723, Series 3	R	MIL-C-83723/75	MIL-C-26500; Type B; Class R, F				
Plug, Cable, Pin Contact	MIL-C-83723, Series 3	R	MIL-C-83723/76	MIL-C-26500; Type B; Class R, F				

1 Connector hardware is in accordance with the following: pin contacts, MIL-C-39029/4; socket contacts, MIL-C-39029/5; grommet sealing plugs, MIL-C-83723/28; contact crimping tools, MIL-STD-1646; and contact insertion/extraction tools, MS27534. See military specification for rear-end accessory hardware.

2 Normal insert position and first alternate position only are preferred.