

INCH-POUND

MIL-PRF-64266/15
9 September 2010

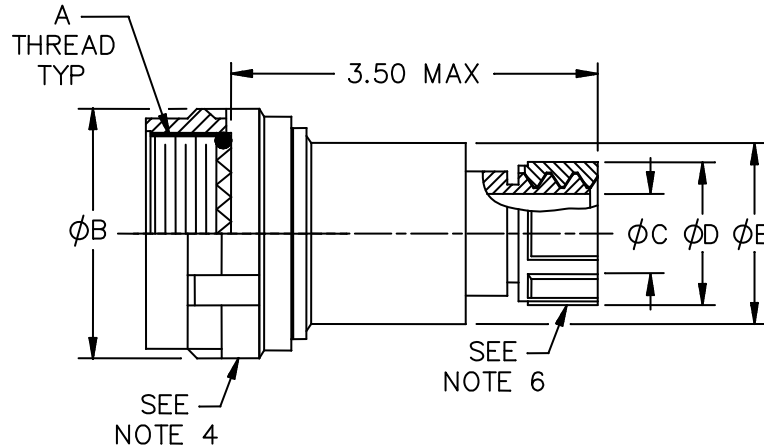
PERFORMANCE SPECIFICATION SHEET

CONNECTORS, FIBER OPTIC, CIRCULAR, PLUG AND RECEPTACLE STYLE,
 MULTIPLE REMOVABLE GENDERLESS TERMINI, SCREW THREADS,
 BACKSHELL, SOLID, SINGLE FIBER CABLES,
 CONVOLUTED TUBING THREADED CABLE INTERFACE,
 NONENVIRONMENT RESISTING

This specification is approved for use by all Departments
 and Agencies of the Department of Defense.

The requirements for acquiring fiber optic connectors described
 herein shall consist of this specification sheet and MIL-PRF-64266.

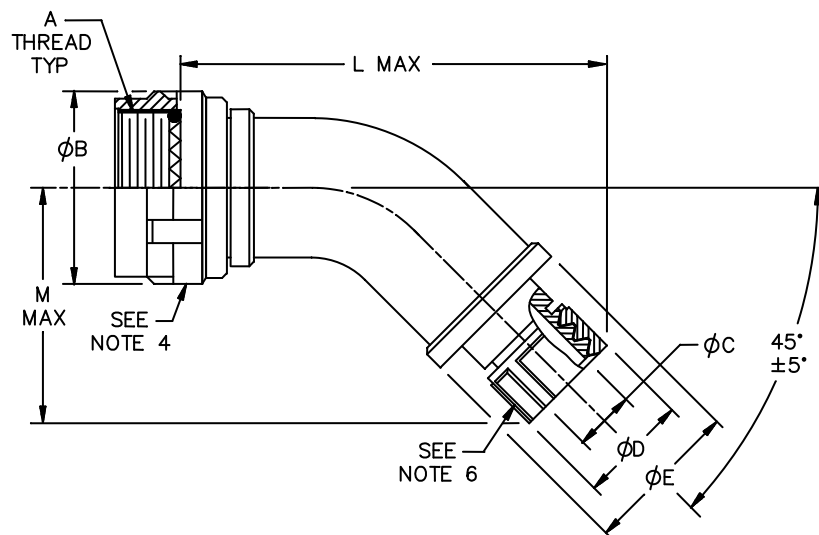
SCOPE. The performance requirements specified herein cover a backshell intended for use with a MIL-PRF-64266 or MIL-DTL-38999 connector plug or receptacle in a fiber optic only application. This backshell is intended for the cable harness configuration in which a bundle of single fiber cables (simplex optical cables) are routed through convoluted tubing to the connector plug or receptacle. This backshell is used for interface with the connector plug or receptacle on one end and with the convoluted tubing on the other end.



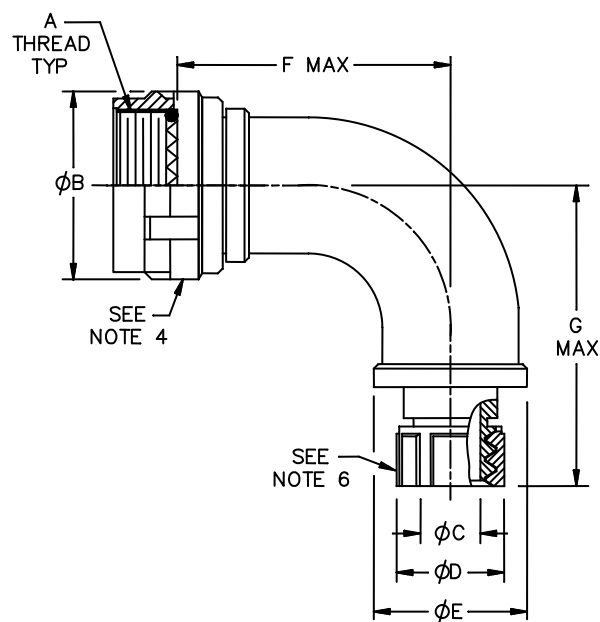
Straight Backshell

FIGURE 1. Straight, 45 and 90 degree backshell orientations.

MIL-PRF-64266/15



45° backshell



90° backshell

FIGURE 1. Straight, 45 and 90 degree backshell orientations - Continued.

MIL-PRF-64266/15

Shell size	A thread ISO metric	B dia Max		C dia min	D dia max		E dia max	
		inches	mm		inches	mm	inches	mm
11	M15x1.0-6H	1.00	25.4	See table I	1.10	27.9	1.38	35.1
13	M18x1.0-6H	1.13	28.7		1.16	29.5	1.38	35.1
15	M22x1.0-6H	1.25	31.8		1.48	37.6	1.38	35.1
17	M25x1.0-6H	1.38	35.1		1.48	37.6	1.56	39.6
19	M28x1.0-6H	1.50	38.1		1.48	37.6	1.56	39.6
21	M31x1.0-6H	1.63	41.4		1.67	42.4	1.81	46.0
23	M34x1.0-6H	1.75	44.5		2.10	53.3	1.81	46.0
25	M37x1.0-6H	1.88	47.8		2.10	53.3	2.12	53.8

Shell size	F Max		G Max		L Max		M Max	
	inches	mm	inches	mm	inches	mm	inches	mm
11	2.0	50.8	3.7	94.0	4.2	106.7	2.7	68.6
13	2.1	53.3	3.7	94.0	4.4	111.8	2.8	71.1
15	2.1	53.3	3.8	96.5	4.4	111.8	2.8	71.1
17	2.2	55.9	3.9	99.1	4.4	111.8	2.8	71.1
19	2.2	55.9	3.9	99.1	4.4	111.8	2.8	71.1
21	2.3	58.4	4.0	101.6	4.5	114.3	2.9	73.7
23	2.4	61.0	4.0	101.6	4.6	116.8	3.0	76.2
25	2.4	61.0	4.0	101.6	4.8	121.9	3.1	78.7

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Dimensions apply to plated/finished part.
4. Backshell internal configuration not shown. The backshell interface dimensions shall be in accordance with figure A-6 of MIL-PRF-64266.
5. See table VII herein for relationship of convoluted tubing size to shell size.
6. Backshell interface dimensions with convoluted tubing shall be in accordance with table II for convoluted tubing made from FEP and table III for convoluted tubing made from PEEK.

FIGURE 1. Straight, 45 and 90 degree backshell orientations - Continued.TABLE I. Backshell, cable entry end adapter dimensions, convoluted tubing material dependent.

Convoluted size	Convoluted tube material	C dia Min	
		inches	mm
3/8	FEP	.31	7.9
	PEEK	.32	8.1
7/16	FEP	.38	9.7
	PEEK	.37	9.4
1/2	FEP	.44	11.2
	PEEK	.43	10.9
5/8	FEP	.57	14.5
	PEEK	.55	14.0
3/4	FEP	.70	17.8
	PEEK	.68	17.3
7/8	FEP	.80	20.3
	PEEK	.79	20.1

MIL-PRF-64266/15

TABLE I. Backshell, cable entry end adapter dimensions, convoluted tubing material dependent - Continued.

Convoluted size	Convoluted tube material	C dia Min	
1	FEP	.92	23.4
	PEEK	.92	23.4
1-1/4	FEP	1.13	28.7
	PEEK	1.17	29.7

TABLE II. Convoluted tubing interface dimensions for FEP material.

Convoluted tubing size	Maximum inside diameter (inch)	Minimum inside diameter (inch)	Maximum outside diameter (inch)	Minimum convolution depth (inch)	Maximum wall thickness (inch)	Convolutions per inch \pm 1 (righthand)
3/8	.375	.359	.510	0.054	0.013	11
7/16	.437	.427	.571	0.054	0.013	11
1/2	.500	.480	.650	0.063	0.018	10
5/8	.625	.603	.770	0.063	0.018	10
3/4	.750	.725	.930	0.079	0.018	9
7/8	.875	.860	1.073	0.079	0.018	8
1	1.00	.970	1.226	0.090	0.018	8
1-1/4	1.25	1.205	1.539	0.115	0.018	7

TABLE III. Convoluted tubing interface dimensions for PEEK material.

Convoluted tubing size	Maximum inside diameter (inch)	Minimum inside diameter (inch)	Maximum outside diameter (inch)	Minimum convolution depth (inch)	Nominal wall thickness \pm .002 (inch)	Convolutions per inch \pm 1 (righthand)
3/8	.375	.364	.500	0.054	0.008	8
7/16	.437	.427	.571	0.054	0.008	8
1/2	.500	.485	.630	0.063	0.008	8
5/8	.625	.608	.750	0.063	0.008	8
3/4	.750	.730	.890	0.079	0.009	8
7/8	.875	.855	1.060	0.079	0.009	8
1	1.00	.980	1.195	0.090	0.010	7
1-1/4	1.25	1.220	1.780	0.115	0.010	7

REQUIREMENTS:

Temperature ranges:

Operating: -67°F to 329°F (-55°C to 165°C)
Non-operating: -40°F to 185°F (-40°C to 85°C)
Storage: -40°F to 185°F (-40°C to 85°C)

Dimensions and configurations: See figure 1 herein and MIL-PRF-64266, figure A-6.

Weight: Weight shall not exceed the specified value in table IV for the applicable shell size, cable entry angle, and material.

MIL-PRF-64266/15

TABLE IV. Backshell weights.

Shell size	Cable entry angle	Composite		Aluminum		Stainless steel	
		lb	grams	lb	grams	lb	grams
11	straight	.07	31.8	.12	54.4	.34	154.2
	45°,90°	.08	36.3	.15	68.0	.45	204.1
13	straight	.08	36.3	.14	63.5	.40	131.4
	45°,90°	.09	40.3	.16	72.6	.46	208.7
15	straight	.09	40.3	.16	72.6	.46	208.7
	45°,90°	.10	45.4	.18	81.6	.51	231.3
17	straight	.11	49.9	.19	86.2	.55	249.5
	45°,90°	.12	54.4	.23	104.3	.63	285.8
19	straight	.12	54.4	.20	90.7	.60	272.2
	45°,90°	.13	59.0	.23	104.3	.67	303.9
21	straight	.15	68.0	.26	117.9	.75	340.2
	45°,90°	.17	77.1	.31	140.6	.89	403.7
23	straight	.15	68.0	.28	127.0	.78	353.8
	45°,90°	.18	81.6	.32	145.1	.84	381.0
25	straight	.17	77.1	.31	140.6	.89	403.7
	45°,90°	.20	90.7	.35	158.8	1.02	462.7

Fabrication procedure: Standard fabrication procedure (for both the terminus placement/termination onto the end of fiber optic cabling and the assembly of the connector and backshell onto the fiber optic cabling) shall be used. Standard fabrication procedure shall be in accordance with NAVAIR 01-1A-505-4/T.O. 1-1A-14-4/TM 1-1500-323-24-4. A copy of this document can be obtained at web site: <https://jswag.navair.navy.mil>.

Backshell capture mechanism for the convoluted tubing: A threaded capture mechanism shall be used to secure the convoluted tubing to the backshell. The threaded capture mechanism is part of the backshell and located at the cable entry end. A retainer or means shall be provided to prevent convoluted tubing movement that may otherwise cause unwinding or separation. The threaded capture mechanism and the retainer shall be designed for use with convoluted tubing made from either fluorocarbon (FEP) or polyether-ether-ketone (PEEK), as specified in the PIN. The retainer and backshell capture mechanism shall be included as part of the PIN.

Requirement for locking mechanism on the backshell coupling nut: The backshell coupling nut shall include a ratchet type locking mechanism (anti-coupling device) to ensure that a backshell mated to a connector maintains full thread engagement (maintains complete coupling). Complete coupling of the mated connector and backshell is achieved by a clockwise rotation of the coupling nut. The anti-coupling mechanism or feature shall be between the backshell coupling nut and the backshell shell only. The locking mechanism shall be sufficient to ensure no backing off of the coupling nut during mechanical shock or vibration.

Wrench flats on composite backshells: Backshell body coupling nuts constructed from composite material shall contain wrench flats or a non-movable hex nut. This wrench flat or hex nut shall be sufficient to permit applying a torque for affixing the backshell to the connector.

Identification marking: Applicable. Both initial and after environmental testing.

MIL-PRF-64266/15

Backshell-to-connector mating torque: The backshell threads shall withstand the applied torque to mate (affix) the backshell to the connector that is specified in table III with no damage. The backshell shall be mated to a connector mounted in a suitable fixture to prevent movement of the connector during the test. The torque shall be applied to the backshell at a rate of approximately 10 in-lb per second until the specified applied torque is obtained. This torque shall be applied for a minimum of 1 minute.

TABLE V. Backshell-to-connector mating torque.

Shell size	Mating torque ± 5 in-lb	
	Composite	Metal
11	50	100
13	50	150
15	50	150
17	50	150
19	50	150
21	100	175
23	100	175
25	100	175

Cable pull-out force: Not applicable.

Cable seal flexing: Not applicable.

Twist: Not applicable.

External bending moment: Applicable. Applied bending moment shall be as specified in table VI.

TABLE VI. Backshell applied bending moment.

Shell size	Minimum applied bending moment					
	Composite		Aluminum		Stainless steel	
	in-lb	N-m	in-lb	N-m	in-lb	N-m
11	25	2.83	125	14.12	125	14.12
13	25	2.83	275	31.07	275	31.07
15	50	5.65	300	33.90	300	33.90
17	50	5.65	300	33.90	300	33.90
19	50	5.65	300	33.90	300	33.90
21	75	8.47	300	33.90	300	33.90
23	75	8.47	300	33.90	300	33.90
25	100	11.30	300	33.90	300	33.90

Impact: Applicable.

Crush: Applicable.

Water pressure: Not applicable.

Freezing water: Not applicable.

MIL-PRF-64266/15

Sand and dust: Applicable.

Electromagnetic effects: Applicable. When not tested as part of the initial qualification, the backshell shall be assembled to a MIL-PRF-64266/1 or MIL-PRF-64266/3 receptacle configured with a non-metallic insert. Electromagnetic effects testing shall be conducted both with and without mating the MIL-PRF-64266/1 or MIL-PRF-64266/3 receptacle to a mating plug connector or dust cover.

Salt spray: Applicable.

Shell-to-shell conductivity: Applicable. Both initial and after salt spray. Perform both initial and after salt spray. For a backshell mated to a connector plug, the voltage drop of the mated connector plug-to-backshell shall be measured from a point on the rear accessory thread of the connector plug to a point on the backshell $1.0 \pm .25$ inch from the innermost backshell threads that mate with the backshell gland nut. For a backshell mated to a connector receptacle, the voltage drop of the mated connector receptacle-to-backshell shall be measured from a point on the flange of the connector receptacle adjacent to the mounting hole to a point on the backshell $1.0 \pm .25$ inch from the innermost backshell threads that mate with the backshell gland nut. When tested as part of the initial qualification, the voltage drop between the connector receptacle and connector plug shall be measured also.

Modified SO₂/salt spray: Applicable.

Altitude immersion: Applicable.

Fluid immersion: Applicable.

Cleaning procedures: Each shipment of backshells shall include recommended cleaning procedures. The following wording or equivalent is recommended "To clean, use lint free wipe dampened with alcohol and blow dry with air."

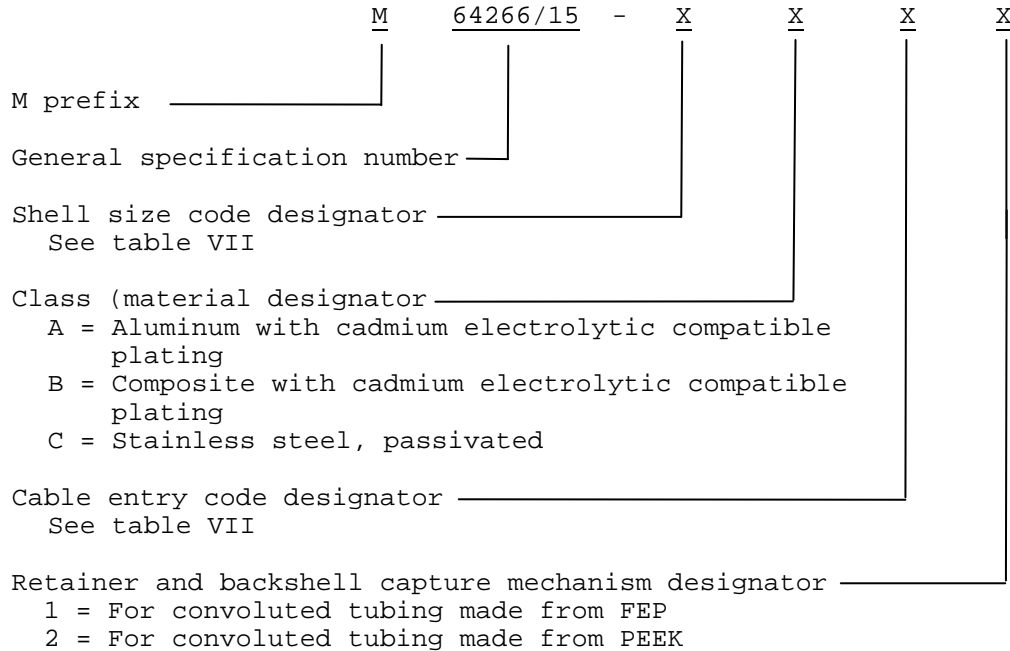
Qualification by similarity:

Non-environmental backshells: If a connector backshell that is environmental resisting and of a specified shell size is qualified to MIL-PRF-64266/12 and connector backshells of the same shell size and same cable entry end configuration in this specification sheet that are not environmental resisting meet the visual and mechanical size, weight, identification marking, workmanship, screw thread and the backshell and backshell accessory attachment inspections, then the connector backshells of the same shell size and same cable entry end configuration that are not environmental resisting is qualified.

MIL-PRF-64266/15

Marking:

Part or Identification Number (PIN): Marked on coupling ring of the backshell.



PIN example: M64266/15CAA1

TABLE VII. PIN code designators.

Shell size	Shell size code	Cable entry code	Cable entry angle 1/	Connector type	# of Cables in tube	Convoluted tubing size 2/
11	B	A	Straight	M64266	2	3/8
	B	B	45°	M64266	2	3/8
	B	C	90°	M64266	2	3/8
11	B	L	Straight	M64266	4	7/16
	B	M	45°	M64266	4	7/16
	B	N	90°	M64266	4	7/16
11	B	D	Straight	M38999	2	3/8
	B	E	45°	M38999	2	3/8
	B	F	90°	M38999	2	3/8
13	C	A	Straight	M64266	6	1/2
	C	B	45°	M64266	6	1/2
	C	C	90°	M64266	6	1/2
13	C	D	Straight	M38999	4	7/16
	C	E	45°	M38999	4	7/16
	C	F	90°	M38999	4	7/16
15	D	A	Straight	M64266	10	3/4
	D	B	45°	M64266	10	3/4
	D	C	90°	M64266	10	3/4
15	D	L	Straight	M64266	8	3/4
	D	M	45°	M64266	8	3/4
	D	N	90°	M64266	8	3/4

MIL-PRF-64266/15

TABLE VII. PIN code designators - Continued.

Shell size	Shell size code	Cable entry code	Cable entry angle 1/	Connector type	# of cables in tube	Convolved tubing size 2/
15	D	D	Straight	M38999	5	½
	D	E	45°	M38999	5	1/2
	D	F	90°	M38999	5	1/2
17	E	D	Straight	M38999	8	5/8
	E	E	45°	M38999	8	5/8
	E	F	90°	M38999	8	5/8
19	F	D	Straight	M38999	11	3/4
	F	E	45°	M38999	11	3/4
	F	F	90°	M38999	11	3/4
21	G	D	Straight	M38999	16	7/8
	G	E	45°	M38999	16	7/8
	G	F	90°	M38999	16	7/8
23	H	A	Straight	M64266	36	1-1/4
	H	B	45°	M64266	36	1-1/4
	H	C	90°	M64266	36	1-1/4
23	H	D	Straight	M38999	21	1
	H	E	45°	M38999	21	1
	H	F	90°	M38999	21	1
25	J	D	Straight	M38999	37	1-1/4
	J	E	45°	M38999	37	1-1/4
	J	F	90°	M38999	37	1-1/4
25	J	G	Straight	M38999	29	1
	J	J	45°	M38999	29	1
	J	K	90°	M38999	29	1

1/ Cable entry code based on cable entry angle, connector type, number of cavities in the connector insert, and convoluted tubing size listed for these first three parameters.

2/ Convoluted tubing size for each shell size and single fiber cable count in table VII has been selected to ensure adequate cable movement and limit cable bend stress.

Mating counterpart: Backshell mates with MIL-PRF-64266/1 wall mounting receptacle, MIL-PRF-64266/2 plug, and MIL-PRF-64266/3 jamnut mounting receptacle.

Installation and removal tools: Adjustable or 1.25 inches (31.8 mm) open end wrench, strap wrench, and scissors.

Referenced documents: In addition to MIL-PRF-64266, this specification sheet references the following documents:

MIL-DTL-38999
MIL-PRF-64266/1
MIL-PRF-64266/2
MIL-PRF-64266/3
MIL-PRF-64266/12
NAVAIR 01-1A-505-4/T.O. 1-1A-14-4/TM 1-1500-323-24-4

MIL-PRF-64266/15

Custodians:

Army - CR
Navy - AS
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC

(Project 6060-2009-005)

Review activities:

Army - TE
Navy - SH
Air Force - 13, 19, 93, 99
MISC - DI
MISC - MDA

Civil agencies:

GSA - FAS
NASA - NA

NOTE: The activities listed above were interested in this document on 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.daps.dla.mil>.