507-088
Composite RFI/EMI Banding Backshell
for MIL-DTL-83513 Micro-D Connectors

Basic Part Number	Basic Part Number	Connector Shell Size (See Table II)		Cable Entry (See Table IV)		Qwik-Ty Option (Omit for Standard)	
507	T	088	XM	21	B	06	S	K

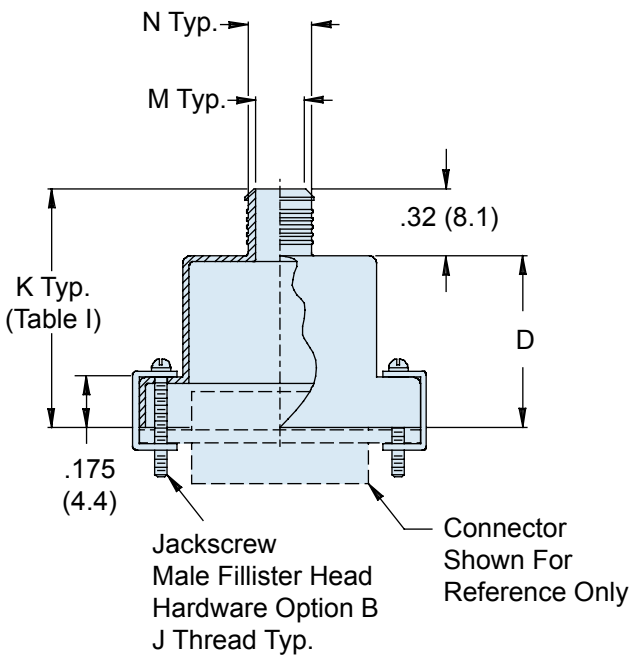
Cable Entry Style
T - Top
S - Side
E - End

Finish Symbol
(See Table III)

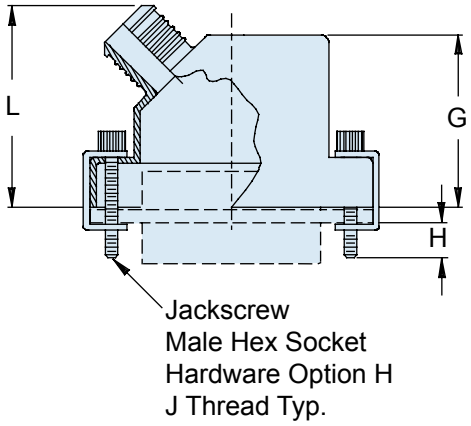
Hardware Options
B - (2) Male Fillister Head
E - (2) Extender Jackscrew
H - (2) Male Hex Socket
F - (2) Female Jackpost

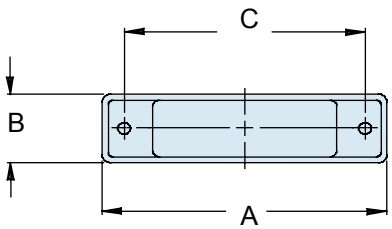
Band Option
K - Micro Band Supplied
(Omit for none)

STYLE T - TOP ENTRY

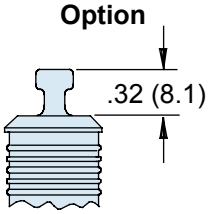


STYLE E - 45° ENTRY

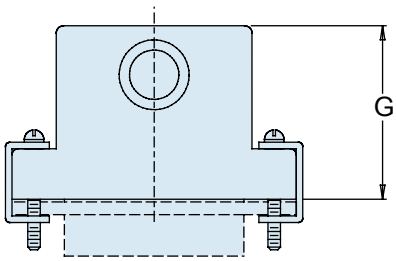




Qwik-Ty Option



STYLE S SIDE ENTRY



507-088
Composite RFI/EMI Banding Backshell
for MIL-DTL-83513 Micro-D Connectors

TABLE II: CONNECTOR SHELL SIZE ORDER NUMBER

SHELL SIZE	A	B	C	D	G
09	.775 (19.7)	.36 (9.1)	.565 (14.4)	.43 (10.9)	.650 (16.5)
15	.925 (23.5)	.36 (9.1)	.715 (18.2)	.44 (11.2)	.700 (17.8)
21	1.075 (27.3)	.36 (9.1)	.865 (22.0)	.56 (14.2)	.735 (18.7)
25	1.175 (29.8)	.36 (9.1)	.965 (24.5)	.62 (15.7)	.800 (20.3)
31	1.325 (33.7)	.36 (9.1)	1.115 (28.3)	.68 (17.3)	.860 (21.8)
37	1.475 (37.5)	.36 (9.1)	1.265 (32.1)	.72 (18.3)	.925 (23.5)
51	1.425 (36.2)	.40 (10.2)	1.215 (30.9)	.75 (19.1)	.975 (24.8)
100	2.160 (54.9)	.45 (11.4)	1.800 (45.7)	.81 (20.6)	1.050 (26.7)

SHELL SIZE	H	J THREAD	K ±.03 (0.8)	L MAX
09	.154 (3.9)	2-56 UNC-2	.75 (19.1)	1.00 (25.4)
15	.154 (3.9)	2-56 UNC-2	.76 (19.3)	1.03 (26.2)
21	.154 (3.9)	2-56 UNC-2	.88 (22.4)	1.05 (26.7)
25	.154 (3.9)	2-56 UNC-2	.94 (23.9)	1.09 (27.7)
31	.154 (3.9)	2-56 UNC-2	1.00 (25.4)	1.13 (28.7)
37	.154 (3.9)	2-56 UNC-2	1.04 (26.4)	1.16 (29.5)
51	.154 (3.9)	2-56 UNC-2	1.07 (27.2)	1.25 (31.8)
100	.194 (4.9)	4-40 UNC-2	1.13 (28.7)	1.32 (33.5)

TABLE III: FINISH

Symbol	Finish Description
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

TABLE IV: CABLE ENTRY

Entry Code	Shell Size	M Entry Dia	N Dia
04	09 THRU 100	.125 (3.2)	.219 (5.6)
05	09 THRU 100	.156 (4.0)	.250 (6.4)
06	09 THRU 100	.188 (4.8)	.281 (7.1)
07	09 THRU 100	.219 (5.6)	.313 (8.0)
08	09 THRU 100	.250 (6.4)	.344 (8.7)
09	31 THRU 100	.281 (7.1)	.375 (9.5)
10	51 THRU 100	.312 (7.9)	.406 (10.3)
11	100 ONLY	.344 (8.7)	.438 (11.1)
12	100 ONLY	.375 (9.5)	.469 (11.9)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. These composite backshells meet the requirements of SAE AIR 4567 and AS85049.
3. See Table I in Intro for front-end dimensional details.

557-186
Composite RFI/EMI Banding Backshell
for MIL-DTL-24308 D-Subminiature Connectors

Basic Part Number	Basic Part Number	Connector Shell Size (See Table II)	Jackscrew Type	Cable Entry (See Table I)	Band Option Band Supplied (Omit for none)
557	T	186	XM	2	F0	B	1 - 02	S	K

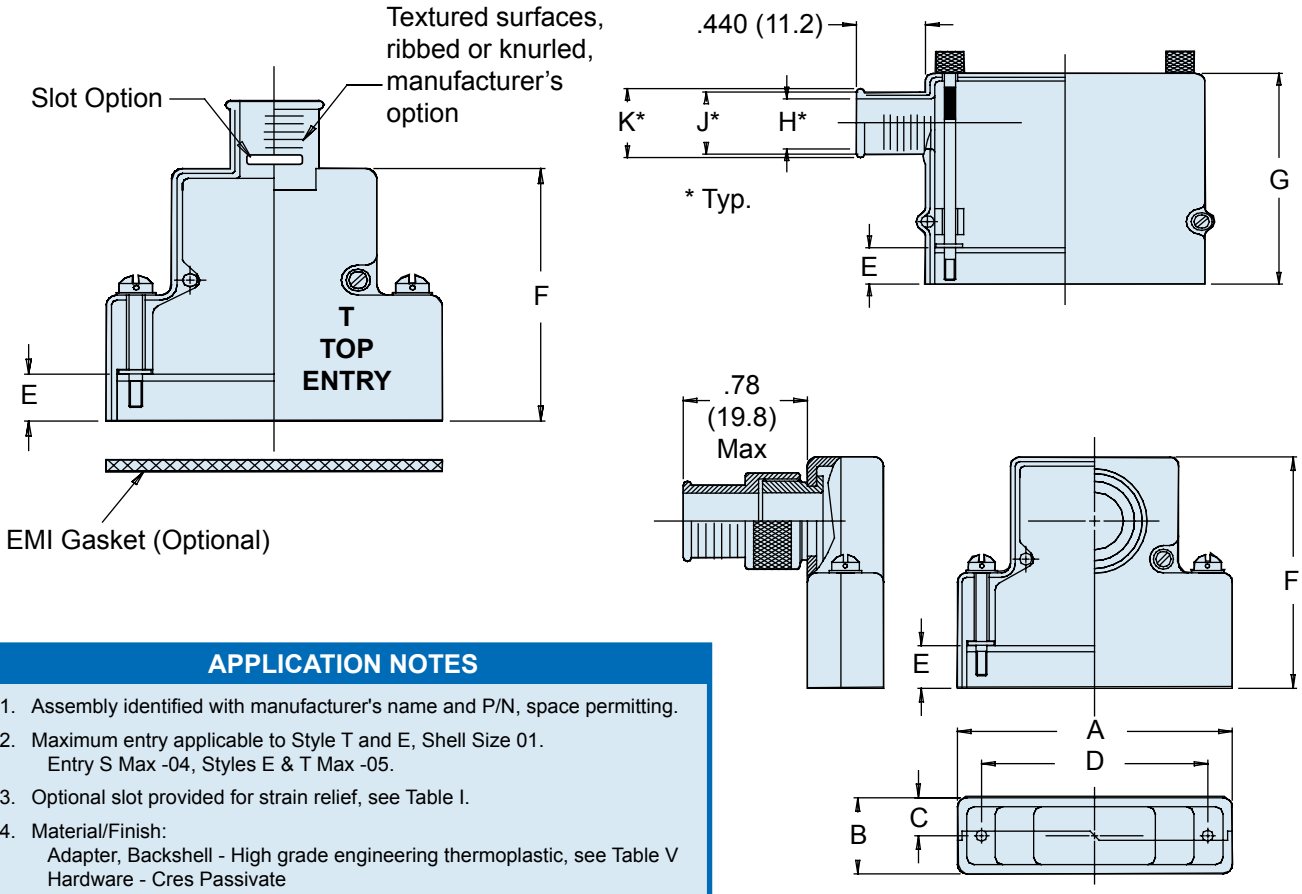
Cable Entry Style
T - Top
S - Side
E - End

Finish Symbol (*See Table III*)

Mounting Receptacle (*Table IV*)
CC - Cable-to-Cable Mounting
F0 - Front Mounting
R1-R7 - Rear Mounting

EMI Gasket Option
0 - Without EMI Gasket
1 - With EMI Gasket

Slot Option
Omit for Part with No Slot



APPLICATION NOTES

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. Maximum entry applicable to Style T and E, Shell Size 01.
   Entry S Max -04, Styles E & T Max -05.
3. Optional slot provided for strain relief, see Table I.
4. Material/Finish:
   Adapter, Backshell - High grade engineering thermoplastic, see Table V
   Hardware - Cres Passivate
   Gasket - Metex/N.A.
   Washer - Nylon/N.A.
5. Metric dimensions (mm) in parentheses.

557-186
Composite RFI/EMI Banding Backshell
for MIL-DTL-24308 D-Subminiature Connectors

Glenair®

TABLE V: FINISH

Symbol	Finish Description
XM	2000 Hour Corrosion Resistant Electroless Nickel
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel
XO	No Plating–Base Material Non-Conductive

TABLE I: CABLE ENTRY

Dash No.	H Dia	J Dia	K Dia	X
01	.125 (3.2)	.250 (6.4)	.312 (7.9)	N/A
02	.250 (6.4)	.375 (9.5)	.438 (11.1)	.062 (1.6)
03	.312 (7.9)	.438 (11.1)	.500 (12.7)	.094 (2.4)
04	.375 (9.5)	.500 (12.7)	.562 (14.3)	.156 (4.0)
05	.438 (11.1)	.562 (14.3)	.625 (15.9)	.188 (4.8)
06	.500 (12.7)	.625 (15.9)	.688 (17.5)	.219 (5.6)
07	.562 (14.3)	.688 (17.5)	.750 (19.1)	.250 (6.4)
08	.625 (15.9)	.750 (19.1)	.812 (20.6)	.250 (6.4)
09	.750 (19.1)	.875 (22.2)	.937 (23.8)	.312 (7.9)
10	.875 (22.2)	1.000 (25.4)	1.062 (27.0)	.375 (9.5)
11	1.000 (25.4)	1.125 (28.6)	1.188 (30.2)	.375 (9.5)

TABLE II: FRONT MOUNTING DIMENSIONS

Shell Size	A	B Max	C	D ±.005 (.1)	E	F	G	Max Entry (See Note 2)
1	1.363 (34.6)	.624 (15.8)	.312 (7.9)	.984 (25.0)	.340 (8.6)	1.625 (41.3)	1.750 (44.5)	**04/05**
2	1.691 (43.0)	.624 (15.8)	.312 (7.9)	1.312 (33.3)	.340 (8.6)	1.625 (41.3)	1.750 (44.5)	**05**
3	2.250 (57.2)	.624 (15.8)	.312 (7.9)	1.852 (47.0)	.343 (8.7)	1.844 (46.8)	2.000 (50.8)	**05**
4	2.879 (73.1)	.624 (15.8)	.312 (7.9)	2.500 (63.5)	.343 (8.7)	1.844 (46.8)	2.000 (50.8)	**05**
5	2.785 (70.7)	.735 (18.7)	.375 (9.5)	2.406 (61.1)	.343 (8.7)	1.844 (46.8)	2.000 (50.8)	**07**

TABLE III: REAR MOUNTING DIMENSIONS

Dash No.	Panel Thickness	E	F		G	
			Sizes 1 & 2	Sizes 3 - 5	Sizes 1 & 2	Sizes 3 - 5
R1	.031 (.8)	.247 (6.3)	1.525 (38.7)	1.745 (44.3)	1.656 (42.1)	1.904 (48.4)
R2	.047 (1.2)	.231 (5.9)	1.509 (38.3)	1.728 (43.9)	1.640 (41.7)	1.888 (48.0)
R3	.062 (1.6)	.216 (5.5)	1.500 (38.1)	1.720 (43.7)	1.625 (41.3)	1.873 (47.6)
R4	.093 (2.4)	.185 (4.7)	1.470 (37.3)	1.690 (42.9)	1.594 (40.5)	1.842 (46.8)
R5	.104 (2.6)	.174 (4.4)	1.451 (36.9)	1.671 (42.4)	1.583 (40.2)	1.831 (46.5)
R6	.125 (3.2)	.153 (3.9)	1.430 (36.3)	1.650 (41.9)	1.563 (39.7)	1.811 (46.0)
R7	.156 (4.0)	.125 (3.2)	1.400 (35.6)	1.620 (41.1)	1.532 (38.9)	1.780 (45.2)

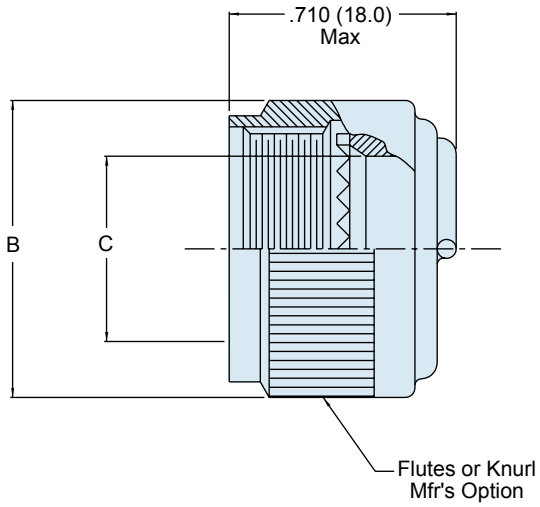
TABLE IV: CABLE-TO-CABLE MOUNTING DIMENSIONS

Shell Size	A	B Max	C	D ± .005 (0.1)	F	E +.030 (0.8)-.000	Max Entry (See Note 2)
1	1.363 (34.6)	.624 (15.8)	.322 (8.2)	.984 (25.0)	1.455 (37.0)	.170 (4.3)	05
2	1.691 (43.0)	.624 (15.8)	.322 (8.2)	1.312 (33.3)	1.455 (37.0)	.170 (4.3)	05
3	2.250 (57.2)	.624 (15.8)	.322 (8.2)	1.852 (47.0)	1.673 (42.5)	.172 (4.4)	05
4	2.879 (73.1)	.624 (15.8)	.322 (8.2)	2.500 (63.5)	1.673 (42.5)	.172 (4.4)	05
5	2.785 (70.7)	.735 (18.7)	.375 (9.5)	2.406 (61.1)	1.673 (42.5)	.172 (4.4)	07

610-014
E-Nut Backshell
for Connector Designators A, F, L, S & H

CONNECTOR DESIGNATOR:	
A	MIL-DTL-5015, -26482 Series II, and -83723 Series I and III
F	MIL-DTL-38999 Series I, II
L	MIL-DTL-38999 Series 1.5 (JN1003)
H	MIL-DTL-38999 Series III and IV
S	PATT 105 / 603 / 608

Product Series	Angular Function		Finish Symbol	
610 - E Nut	*S - Straight*		(*See Table III*)	
610	A	S	014	XB	22
Connector Designator *A, F, H, L and S*		Basic Part Number		Dash Number (*See Table II*)	



NOTES

1. Metric dimensions (mm) are in parenthesis and are for reference only.
2. See Table I in Intro for front-end dimensional details.

TABLE II: DASH NUMBER

Shell Size		B Max	C Diameter Ref.
A, F, L, S	H		
03	--	.702 (17.3)	.270 (6.9)
08	09	.640 (16.3)	.270 (6.9)
10	11	.765 (19.4)	.375 (9.5)
12	13	.890 (22.6)	.511 (13.0)
14	15	1.015 (25.8)	.585 (14.9)
16	17	1.140 (29.0)	.710 (18.0)
18	19	1.265 (32.1)	.789 (20.0)
20	21	1.390 (35.3)	.914 (23.2)
22	23	1.454 (36.9)	1.039 (26.4)
24	25	1.594 (40.5)	1.154 (29.3)
61	--	1.640 (41.7)	1.194 (30.3)

TABLE III: FINISH

Symbol	Finish Description
XB	No Plating - Black Color
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

620-042
Composite Strain-Relief Clamp
with Self-Locking Rotatable Coupling
Straight, 45° & 90°

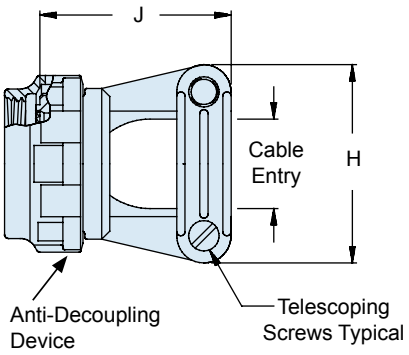
CONNECTOR DESIGNATOR:	
A	MIL-DTL-5015, -26482 Series II, and -83723 Series I and III
F	MIL-DTL-38999 Series I, II
L	MIL-DTL-38999 Series 1.5 (JN1003)
H	MIL-DTL-38999 Series III and IV
G	MIL-DTL-28840
U	DG123 and DG123A
SELF-LOCKING	
ROTATABLE COUPLING	
STANDARD PROFILE	

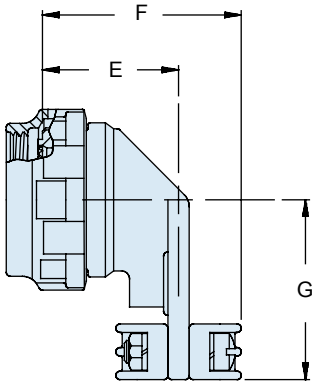
Product Series
620 - Strain Relief Clamp

Angle and Profile
A - 90° Clamp
B - 45° Clamp
S - Straight

Finish Symbol
(See Table III)

620	H	S	042	XO	19
	Connector Designator *A, F, L, H, G and U*		Basic Part Number		Connector Shell Size *(See Table II)*





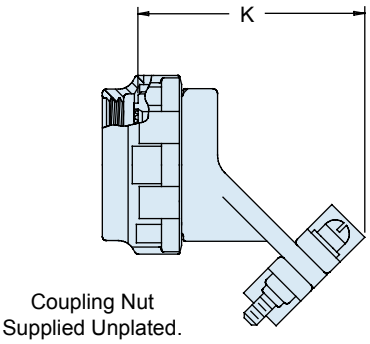


TABLE II: CONNECTOR SHELL SIZE ORDER NUMBER

Shell Size For Connector Designator*					E	F	G	H	J	K	Cable Entry**
A	F/L	H	G	U	(Ref)	±.06 (1.5)	±.0 1.5)	±.06 (1.5)	±.06 (1.5)	Max	±.03 0.8
08	08	09	–	–	.63 (16.0)	.86 (21.8)	.88 (22.4)	.88 (22.4)	.80 (20.3)	1.32 (33.5)	.22 (5.6)
10	10	11	–	08	.65 (16.5)	.91 (23.1)	.94 (23.9)	.94 (23.9)	.88 (22.4)	1.35 (34.3)	.26 (6.6)
12	12	13	11	10	.71 (18.0)	1.02 (25.9)	1.03 (26.2)	1.17 (29.7)	1.00 (25.4)	1.43 (36.3)	.34 (8.6)
14	14	15	13	12	.76 (19.3)	1.13 (28.7)	1.13 (28.7)	1.28 (32.5)	1.00 (25.4)	1.48 (37.6)	.46 (11.7)
16	16	17	15	14	.80 (20.3)	1.26 (32.0)	1.31 (33.3)	1.41 (35.8)	1.13 (28.7)	1.58 (40.1)	.55 (14.0)
18	18	19	17	16	.83 (21.1)	1.31 (33.3)	1.38 (35.1)	1.50 (38.1)	1.19 (30.2)	1.70 (43.2)	.62 (15.7)
20	20	21	19	18	.90 (22.9)	1.37 (34.8)	1.50 (38.1)	1.56 (39.6)	1.25 (31.8)	1.74 (44.2)	.70 (17.8)
22	22	23	–	20	.94 (23.9)	1.45 (36.8)	1.63 (41.4)	1.69 (42.9)	1.38 (35.1)	1.79 (45.5)	.78 (19.8)
24	24	25	23	22	.97 (24.6)	1.52 (38.6)	1.75 (44.5)	1.82 (46.2)	1.50 (38.1)	1.83 (46.5)	.85 (21.6)
28	–	–	25	24	1.02 (25.9)	1.68 (42.7)	1.79 (45.5)	1.94 (49.3)	1.75 (44.5)	2.13 (54.1)	.95 (24.1)

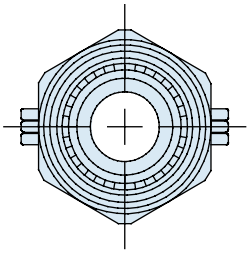
TABLE III: FINISH

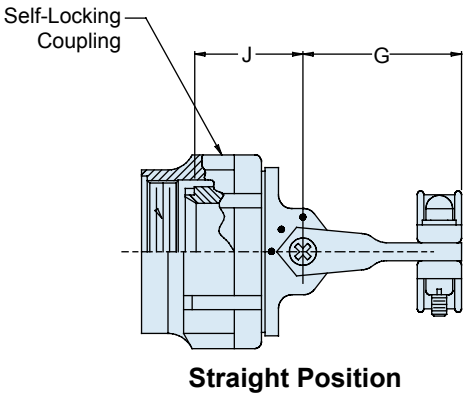
Symbol	Finish Description
XM	2000 Hour Corrosion Resistant Electroless Nickel
XO	No Plating
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

627-122
Composite Swing-Arm Strain Relief
with Self-Locking Rotatable Coupling

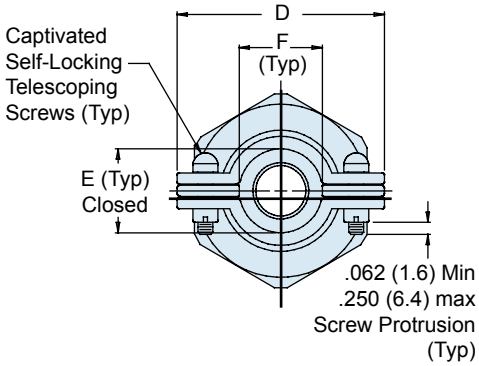
CONNECTOR DESIGNATOR:	
A	MIL-DTL-5015, -26482 Series II, and -83723 Series I and III
F	MIL-DTL-38999 Series I, II
H	MIL-DTL-38999 Series III and IV
SELF-LOCKING	
ROTATABLE COUPLING	
LOW PROFILE	

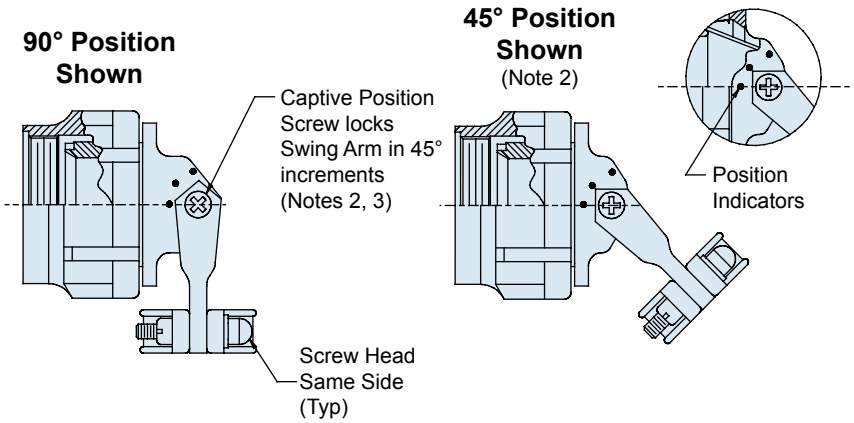
Product Series		Basic Part Number		Dash Number
627 - Swing-Arm Strain Relief				*(See Table II)*
627	A	122	XO	16
	Connector Designator *A, F and H*		Finish Symbol *(See Table III)*	





Straight Position





U.S. PATENT NO. 6419519

TABLE II: CONNECTOR SHELL SIZE ORDER NUMBER

Shell Size for Connector Designator*			E		F		G	H	J	
A	F	H	±.06 (1.5)		Min		Max	Max	±.03	0.8
08	08	09	.265	(6.7)	.220	(5.9)	1.060 (26.9)	.980 (24.9)	.880	(22.4)
10	10	11	.310	(7.9)	.270	(6.9)	1.090 (27.7)	1.050 (26.7)	.910	(23.1)
12	12	13	.390	(9.9)	.350	(8.9)	1.180 (30.0)	1.200 (30.5)	.950	(24.1)
14	14	15	.506	(12.9)	.470	(11.9)	1.240 (31.5)	1.300 (33.0)	1.010	(25.7)
16	16	17	.591	(15.0)	.550	(14.0)	1.320 (33.5)	1.440 (36.6)	1.050	(26.7)
18	18	19	.661	(16.8)	.620	(15.7)	1.390 (35.3)	1.560 (39.6)	1.080	(30.0)
20	20	21	.744	(18.9)	.700	(17.8)	1.550 (39.4)	1.690 (42.9)	1.120	(28.4)
22	22	23	.826	(21.0)	.780	(19.8)	1.550 (39.4)	1.770 (45.0)	1.160	(29.5)
24	24	25	.896	(22.8)	.850	(21.6)	1.610 (40.9)	1.890 (48.0)	1.200	(30.5)

TABLE III: FINISH

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XO	No Plating - Brown Color (Non-Conductive Finish)

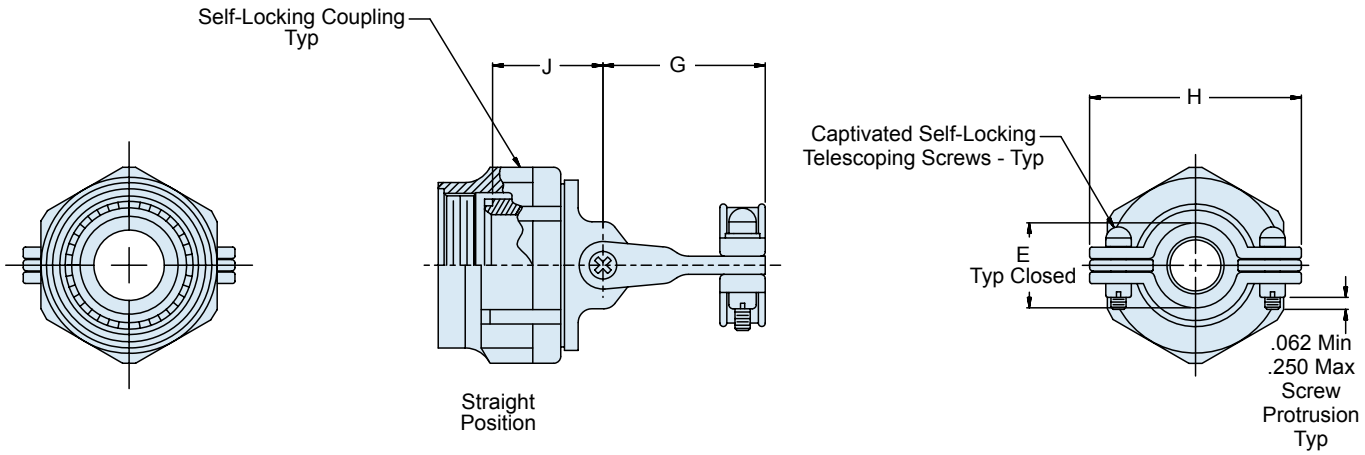
APPLICATION NOTES

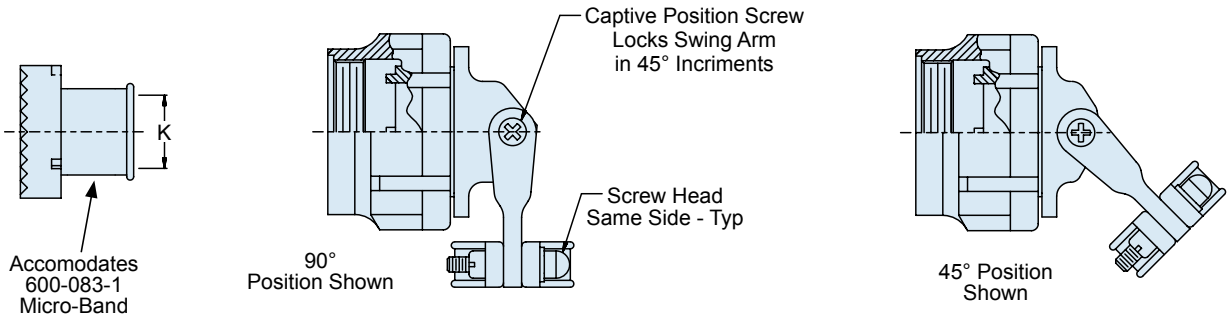
1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Glenair series 600 Backshell assembly Tools are recommended for assembly and installation.
3. Swing Arm locks in 45° increments– Sizes 08 thru 24, additional positioning increments are manufacturer's option.
4. Captive Screw can remain engaged to the body when positioning the Arm. When tightened, the Screw shall not protrude into the inside surfaces.
5. Coupling nut supplied unplated.
6. Consult factory for additional entry sizes available.
7. See Table I in Intro for front-end dimensional details.

627-142
Composite Swing-Arm Strain Relief
with Keyed Banding Insert and Self-Locking Coupling

CONNECTOR DESIGNATOR:	
A	MIL-DTL-5015, -26482 Series II, and -83723 Series I and III
F	MIL-DTL-38999 Series I, II
H	MIL-DTL-38999 Series III and IV
SELF-LOCKING	
ROTATABLE COUPLING	
LOW PROFILE	

Product Series		Basic Part Number		Dash Number	
627 - Swing-Arm Strain Relief				(See Table II)	
627	A	142	XO	16	K
	Connector Designator A, F, H		Finish Symbol (See Table III)		Band Option K - Band (600-083) (Omit for None)





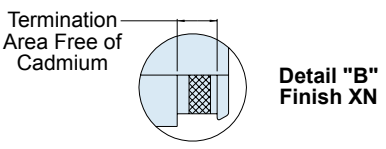


TABLE II: DASH NUMBER

Shell Size		E ± .031	G Max	H Max	J ± .06	K Diameter
A, F	H					A, F and H Code
08	09	.265 (6.7)	1.06 (26.9)	.98 (24.9)	.94 (23.9)	.140 (3.6)
10	11	.312 (7.9)	1.09 (27.7)	1.05 (26.7)	.97 (24.6)	.270 (6.9)
12	13	.438 (11.1)	1.18 (30.0)	1.20 (30.5)	1.03 (26.2)	.390 (9.9)
14	15	.500 (12.7)	1.24 (31.5)	1.30 (33.0)	1.09 (27.7)	.512 (13.0)
16	17	.625 (15.9)	1.32 (33.5)	1.44 (36.6)	1.12 (28.4)	.637 (16.2)
18	19	.688 (17.5)	1.39 (35.3)	1.56 (39.6)	1.15 (29.2)	.757 (19.2)
20	21	.750 (19.1)	1.55 (39.4)	1.69 (42.9)	1.18 (30.0)	.881 (22.4)
22	23	.812 (20.6)	1.55 (39.4)	1.77 (45.0)	1.25 (31.8)	1.006 (25.6)
24	25	.938 (23.8)	1.61 (40.9)	1.89 (48.0)	1.28 (32.5)	1.131 (28.7)

TABLE III: FINISH

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XO	No Plating - Brown Color (Non-Conductive Finish)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Glenair series 600 Backshell assembly Tools are recommended for assembly and installation.
3. Swing Arm locks in 45° increments–Sizes 10 thru 24, additional positioning increments are manufacturer's option.
4. Captive Screw can remain engaged to the body when positioning the Arm. When tightened, the Screw shall not protrude into the inside surfaces.
5. Coupling nut supplied unplated.
6. Consult factory for additional entry sizes available.
7. See Table I in Intro for front-end dimensional details.
8. K diameter may be smaller than required to accomodate fully populated connector. Consult engineering department for additional information.

770-001
Shrink Boot
Heat Shrink Molded Part

Product Series

Angular Function
A - 90°
B - 45°
S - Straight

Part Size
(See Table I)

Adhesive Lined
W1 - Zero Halogen
W2 - 80°C Hot Melt
R - 150°C Epoxy Pre-Coat
(Omit for No Adhesive)

770 - 001 A 1 00 W1

Basic Part Number
001 - Lipped Boot with Eyelet
002 - Short Lipped Boot with Eyelet
003 - Lipped Boot
004 - Short Lipped Boot
005 - Non-Lipped Boot

Material
1 - 150°C Compound 2025 Elastomeric Oil Resistant and Flame Retardant
2 - Low Smoke Hazard Material
3 - Flexible Polyolefin

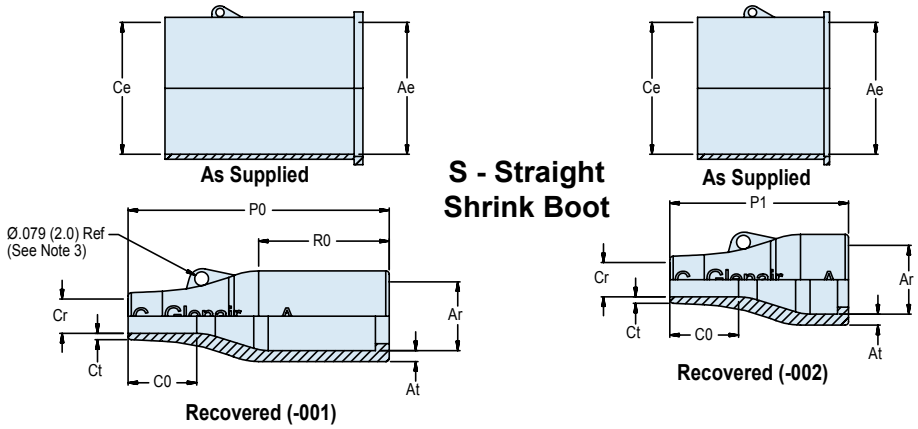
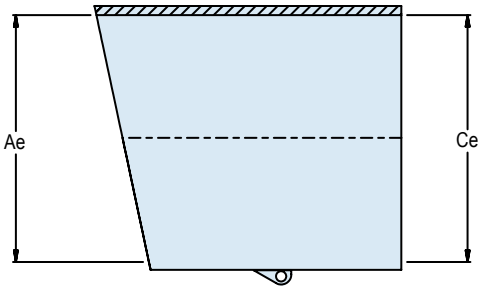


TABLE I: STRAIGHT BOOT DIMENSIONS, BOOT AND SHELL SIZE

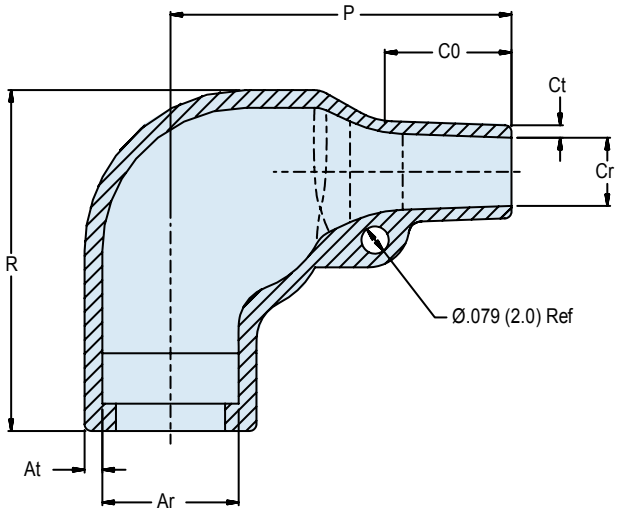
Boot Size	Shell Size	Ae Dia Min	Ce Dia Min	Ar Dia Max	at ±30%	Cr Dia Max	ct ±20%	CO Ref	PO ±10%	P1 ±10%	RO Ref
00	5	.354 (9.0)	.354 (9.0)	.217 (5.5)	.039 (1.0)	.079 (2.0)	.028 (0.7)	.295 (7.5)	.984 (25.0)	N/A	.551 (14.0)
01	5, 6	.472 (12.0)	.472 (12.0)	.276 (7.0)	.043 (1.1)	.118 (3.0)	.028 (0.7)	.295 (7.5)	.984 (25.0)	N/A	.551 (14.0)
02	6, 7	.669 (17.0)	.669 (17.0)	.276 (7.0)	.051 (1.3)	.138 (3.5)	.028 (0.7)	.395 (10.0)	1.181 (30.0)	N/A	.728 (18.5)
03	8, 10	.945 (24.0)	.945 (24.0)	.413 (10.5)	.063 (1.6)	.197 (5.5)	.035 (0.9)	.395 (10.0)	1.496 (38.0)	1.024 (26.0)	.748 (19.0)
04	11-16	1.181 (30.0)	1.181 (30.0)	.551 (14.0)	.071 (1.8)	.236 (6.0)	.039 (1.0)	.630 (16.0)	2.165 (55.0)	1.693 (43.0)	1.181 (30.0)
05	16-17	1.260 (32.0)	1.260 (32.0)	.709 (18.0)	.071 (1.8)	.276 (7.0)	.047 (1.2)	.748 (19.0)	2.638 (67.0)	1.850 (47.0)	1.299 (33.0)
06	17-21	1.417 (36.0)	1.417 (36.0)	.886 (22.0)	.079 (2.0)	.335 (8.5)	.047 (1.2)	.787 (20.0)	3.150 (80.0)	2.362 (60.0)	1.575 (40.0)
07	21-23	1.693 (43.0)	1.693 (43.0)	1.102 (28.0)	.087 (2.2)	.394 (10.0)	.051 (1.3)	1.142 (29.0)	3.898 (99.0)	3.150 (80.0)	2.165 (55.0)
08	25	2.362 (60.0)	2.362 (60.0)	1.378 (35.0)	.130 (3.3)	.591 (15.0)	.063 (1.6)	1.575 (40.0)	5.118 (130.0)	4.331 (110.0)	1.969 (50.0)

APPLICATION NOTES

1. Material: Fluid resistant elastomer - Glenair Material Type 1.
2. When the minimum number of conductors are used, wire bundle/cable may require build-up to B^2 max.
3. Sizes 00 to 02 do not contain eyelet.



As Supplied



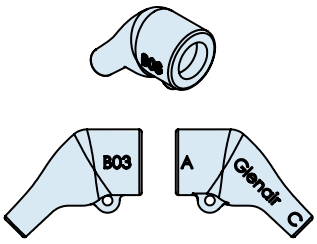
Size 03 To 08
Recovered

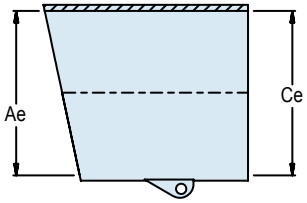
**A - 90°
Shrink Boot**

TABLE I: 90° BOOT DIMENSIONS, BOOT AND SHELL SIZE

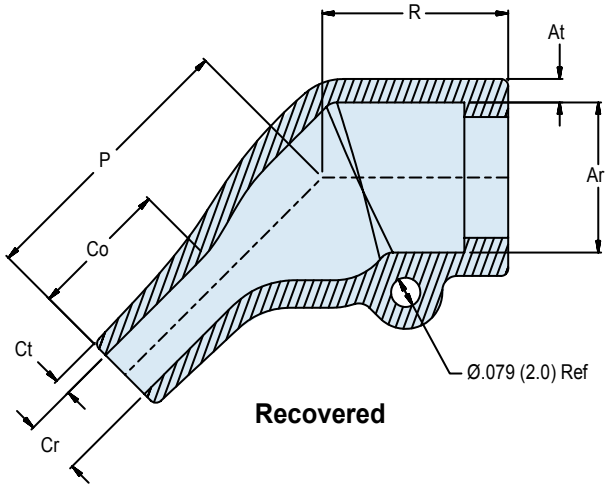
Boot Size	Shell Size	Ae Dia Min	Ce Dia Min	Ar Dia Max	at ±30%	Cr Dia Max	ct ±20%	CO Ref	P ±20%	R Ref
03	9	.945 (24.0)	.945 (24.0)	.394 (10.0)	.063 (1.6)	.197 (5.0)	.035 (0.9)	.394 (10.0)	.984 (25.0)	.984 (25.0)
04	11-15	1.181 (30.0)	1.181 (30.0)	.532 (13.5)	.071 (1.8)	.217 (5.5)	.039 (1.0)	.472 (12.0)	1.260 (32.0)	1.063 (27.0)
05	13-17	1.260 (32.0)	1.260 (32.0)	.709 (18.0)	.071 (1.8)	.276 (7.0)	.047 (1.2)	.591 (15.0)	1.535 (39.0)	1.260 (32.0)
06	17-21	1.417 (36.0)	1.417 (36.0)	.886 (22.0)	.079 (2.0)	.335 (8.5)	.047 (1.2)	.630 (16.0)	1.929 (49.0)	1.496 (38.0)
07	21-23	1.693 (43.0)	1.693 (43.0)	1.102 (28.0)	.087 (2.2)	.394 (10.0)	.059 (1.5)	.709 (18.0)	2.165 (55.0)	1.850 (47.0)
08	23-25	2.165 (55.0)	2.165 (55.0)	1.378 (35.0)	.130 (3.3)	.591 (15.0)	.079 (2.0)	1.260 (32.0)	3.150 (80.0)	2.165 (55.0)

770-001
45° Shrink Boot
Heat Shrink Molded Part





As Supplied



Recovered

B - 45°
Shrink Boot

TABLE I: 45° BOOT DIMENSIONS, BOOT AND SHELL SIZE

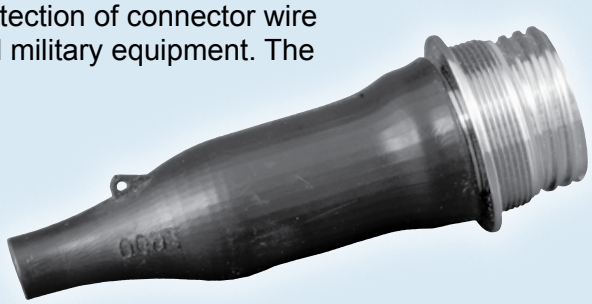
Boot Size	Shell Size	Ae Dia Min	Ce Dia Min	Ar Dia Max	at ±30%	Cr Dia Max	ct ±20%	CO Ref	P ±10%	R Ref
03	9	.945 (24.0)	.945 (24.0)	.413 (10.50)	.063 (1.6)	.157 (4.0)	.035 (0.9)	.315 (8.0)	.748 (195.0)	.500 (12.7)
04	11-15	1.181 (30.0)	1.181 (30.0)	.551 (14.0)	.071 (1.8)	.236 (6.0)	.039 (1.0)	.354 (9.0)	1.180 (30.0)	.748 (19.0)
05	13-17	1.260 (32.0)	1.260 (32.0)	.709 (18.0)	.079 (2.0)	.276 (7.0)	.071 (1.8)	.591 (15.0)	1.378 (35.0)	.984 (25.0)
06	17-21	1.417 (36.0)	1.417 (36.0)	.886 (22.0)	.079 (2.0)	.335 (8.5)	.071 (1.8)	.709 (18.0)	1.575 (40.0)	1.260 (32.0)
07	21-23	1.693 (43.0)	1.693 (43.0)	1.102 (28.0)	.087 (2.2)	.394 (10.0)	.079 (2.0)	.709 (18.0)	1.772 (45.0)	1.496 (38.0)

Glenair Environmental Shrink-Boot Adapters and Series 770 Boots

Easy-to-use, semi-rigid heat-shrinkable boots offer excellent electrical, mechanical and environmental protection. Made from flame-retardant elastomeric material, these adhesive-lined boots are resistant to high temperature and chemicals. Shrink boot material is flame retardant, and the “2” option can be specified for compliance to NES smoke and toxicity requirements.

Heating the boot causes the boot to shrink while an adhesive lining bonds the boot to the connector and cable and fills small gaps for a complete seal. Choose straight cable exit or right angle exit.

Heat-shrinkable boots are ideal for environmental protection of connector wire terminations in most harsh environments including tactical military equipment. The products also supply a modicum of strain-relief.



Glenair offers a full range of sizes and shapes to accommodate mil-standard circular and rectangular connectors and backshells. Boots are also available for Series 80 Mighty Mouse connectors and accessories.

This catalog contains a wide selection of connector accessory backshells that accomodate shrink boots. These products may now be ordered with Glenair Series 770 Shrink Boots:

Protect your Connector Investment with Protective Covers and Dummy Stowage Receptacles

Glenair composite protective covers reduce weight while providing reliable protection of connectors and contacts

Glenair makes a full range of composite plug and receptacle covers for 5015, 28840, 38999 and 83723 series connectors. Protective covers are a critical component in interconnect systems where maintenance and test cycles can lead to damage of exposed connectors. Customers may select from split and solid ring designs equipped with rope, sash and bead style chains made from either nylon or stainless steel. Conductive and nonconductive plating options are available, to match the conductivity and impedance requirements of the application and the connector. All covers meet the intermateability requirements for the specified connector series. For connector series not shown in this catalog please consult the factory. For a listing of protective covers in stock, please see our *Same Day Inventory listing* on our website at www.glenair.com. Samples are always available upon request.

Electrically conductive RFI/EMI covers

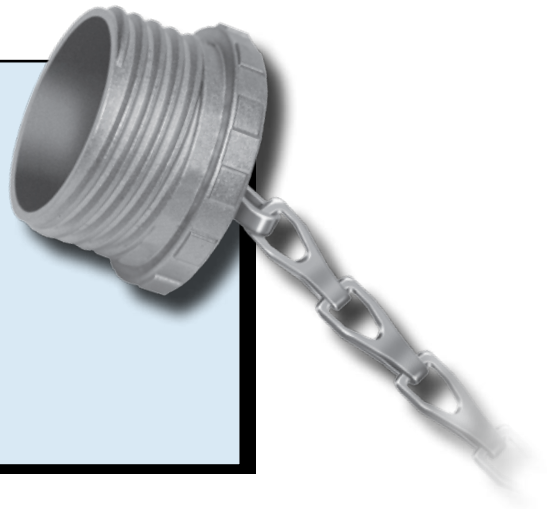
Non-conductive versions available

MIL-DTL-5015, MIL-DTL-38999, MIL-DTL-28840, and MIL-DTL-83723 designs

Lower weight than comparable metal components

100% corrosion free materials

Complete range of ring styles and attachment options



Errata

Catalog contents—including part numbers, materials and dimensions—are accurate to the best of our ability when we go to print. Even so, customers are advised to consult the factory for the latest specifications, particularly to confirm critical dimensions such as connector interface dimensions, threads, and so on. When errors or mistakes are brought to our attention, corrected content is posted immediately to our website: www.glenair.com.

Dimensional Tables
Protective Cover Attachments

TABLE III	
SYM	ATTACHMENT TYPE
D	Bead Chain, CRES, Passivate
F	Wire Rope, Nylon Jacket
G	Nylon Rope
H	Wire Rope, Teflon Jacket
N	No Attachment
R	Wire Rope, PVC Jacket
S	#8 Sash Chain, CRES, Passivate
T	Wire Rope, No Jacket
U	Wire Rope, Polyurethane Jacket with Terminal

ROPE
(Types F, G, H, R, T, U)

SASH CHAIN
(Type S)

K DIA

BEAD CHAIN
(Type D)

TABLE IV	
DASH NO	K DIA ±.010 (0.3)
01	.140 (3.6)
02	.182 (4.6)
03	.191 (4.9)
04	.197 (5.0)
05	.167 (4.2)
06	.125 (3.2)
07	.218 (5.5)
09	.156 (4.0)

SPLIT RING

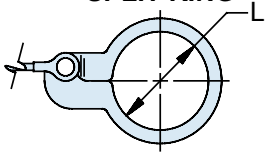


TABLE V	
DASH NO	L DIA ±.015 (0.4)
50	.425 (10.8)
52	.485 (12.3)
54	.640 (16.3)
56	.750 (19.1)
58	.890 (22.6)
60	1.015 (25.8)
62	1.095 (27.8)
64	1.130 (28.7)
66	1.250 (31.8)
68	1.350 (34.3)
70	1.390 (35.3)
72	1.485 (37.7)
74	1.625 (41.3)
76	1.750 (44.5)
78	1.875 (47.6)
80	1.980 (50.3)
82	2.060 (52.3)
84	2.235 (56.8)
86	2.310 (58.7)
88	2.475 (62.9)
90	2.655 (67.4)
92	2.810 (71.4)
94	3.045 (77.3)

SOLID RING

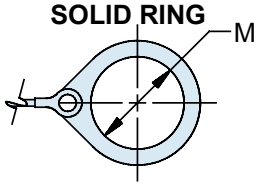


TABLE VI	
DASH NO	M DIA ±.015 (0.4)
08	.468 (11.9)
10	.593 (15.1)
12	.718 (18.2)
13	.765 (19.4)
14	.844 (21.4)
15	.890 (22.6)
16	.968 (24.6)
17	1.015 (25.8)
18	1.093 (27.8)
19	1.140 (29.0)
20	1.203 (30.6)
21	1.265 (32.1)
22	1.343 (34.1)
23	1.453 (36.9)
24	1.484 (37.7)
25	1.577 (40.1)
27	1.640 (41.7)
28	1.687 (42.8)
29	1.765 (44.8)
30	1.890 (48.0)
31	1.953 (49.6)
32	1.968 (50.0)
33	2.077 (52.8)
35	2.140 (54.4)
36	2.187 (55.5)
40	2.406 (61.1)
44	2.656 (67.5)
48	3.031 (77.0)

SOLID RING

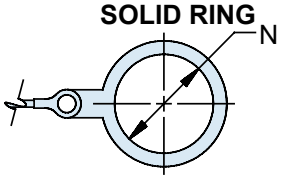


TABLE VII	
DASH NO	N DIA ±.015 (0.4)
100	.391 (9.9)
101	.516 (13.1)
102	.583 (14.8)
103	.641 (16.3)
104	.708 (18.0)
105	.766 (19.5)
205	.788 (20.0)
106	.896 (22.2)
206	.907 (23.0)
107	1.016 (25.8)
207	1.025 (26.0)
108	1.141 (29.0)
208	1.203 (30.6)
109	1.266 (32.2)
110	1.391 (35.3)
111	1.521 (38.6)
211	1.536 (39.0)
112	1.641 (41.7)
113	1.766 (44.9)
114	1.891 (48.0)
115	2.078 (52.8)
116	2.406 (61.1)
117	2.510 (63.8)

Metric dimensions (mm) are in parentheses and are for reference only.

660-045 • 660-046
Composite MIL-DTL-5015
Protective Covers

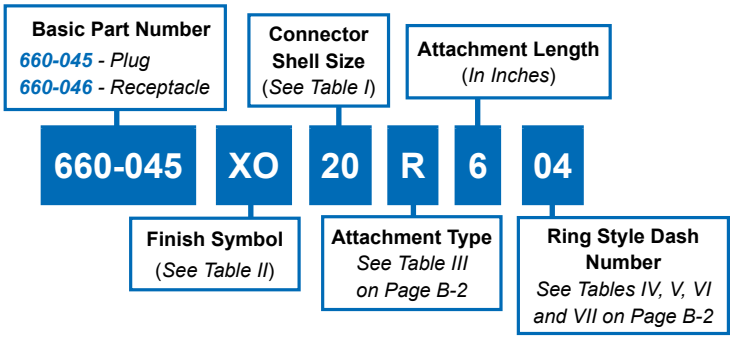
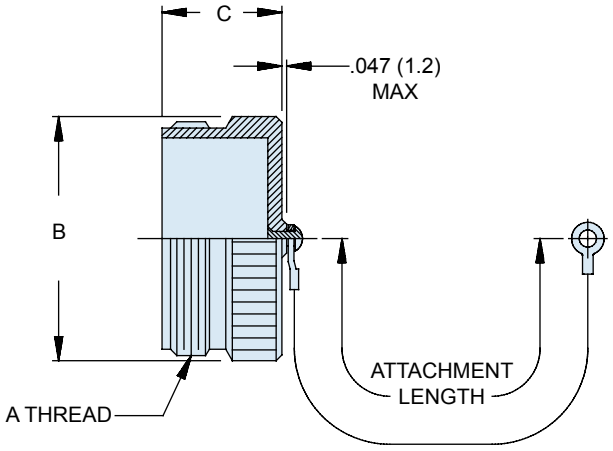


TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

B

660-045
MIL-DTL-5015 PLUG COVER



660-046
MIL-DTL-5015 RECEPTACLE COVER

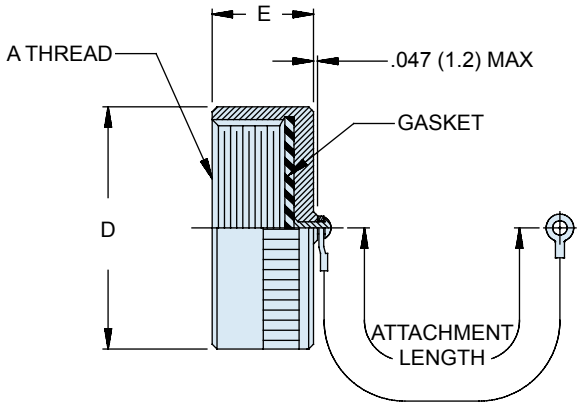


TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

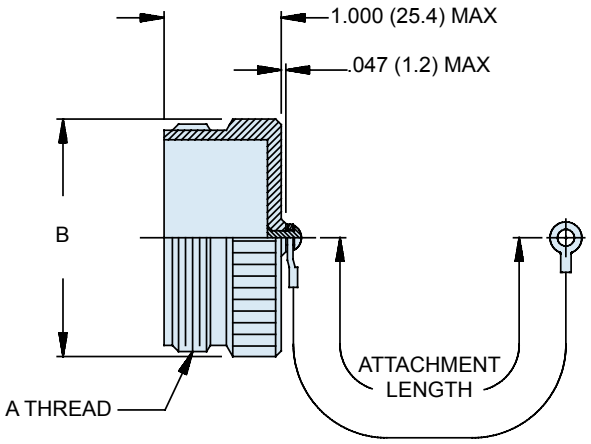
SHELL SIZE	A THREAD	B MAX	C MAX	D MAX	E MAX
08	1/2 - 28 UNEF	.562 (14.3)	.656 (16.7)	.688 (17.5)	.465 (11.8)
10	5/8 - 24 UNEF	.687 (17.4)	.656 (16.7)	.815 (20.7)	.465 (11.8)
12	3/4 - 20 UNEF	.812 (20.6)	.844 (21.4)	1.000 (25.4)	.465 (11.8)
14	7/8 - 20 UNEF	.937 (23.8)	.844 (21.4)	1.125 (28.6)	.465 (11.8)
16	1 - 20 UNEF	1.062 (27.0)	.844 (21.4)	1.188 (30.2)	.465 (11.8)
18	1 1/8 - 18 UNEF	1.187 (30.1)	.844 (21.4)	1.344 (34.1)	.465 (11.8)
20	1 1/4 - 18 UNEF	1.312 (33.3)	.844 (21.4)	1.469 (37.3)	.465 (11.8)
22	1 3/8 - 18 UNEF	1.437 (36.5)	.844 (21.4)	1.594 (40.5)	.465 (11.8)
24	1 1/2 - 18 UNEF	1.562 (39.7)	.844 (21.4)	1.719 (43.7)	.465 (11.8)
28	1 3/4 - 18 UNS	1.812 (46.0)	.844 (21.4)	1.969 (50.0)	.531 (13.5)
32	2 - 18 UNS	2.062 (52.4)	.844 (21.4)	2.219 (56.4)	.531 (13.5)
36	2 1/4 - 16 UN	2.312 (58.7)	.844 (21.4)	2.469 (62.7)	.531 (13.5)
40	2 1/2 - 16 UN	2.562 (65.1)	.844 (21.4)	2.719 (69.1)	.531 (13.5)
44	2 3/4 - 16 UN	2.812 (71.4)	.844 (21.4)	2.969 (75.4)	.531 (13.5)
48	3 - 16 UN	3.062 (77.8)	.844 (21.4)	3.188 (81.0)	.531 (13.5)

Metric dimensions (mm) are in parentheses and are for reference only.

660-047 • 660-048
Composite MIL-DTL-28840
Protective Covers

Basic Part Number	Connector Shell Size	Attachment Length			
660-047 - Plug 660-048 - Receptacle	(See Table I)	(In Inches)			
660-047	XO	23	R	6	04
	Finish Symbol (See Table II)		Attachment Type See Table III on Page B-2		Ring Style Dash Number See Tables IV, V, VI and VII on Page B-2

660-047
MIL-DTL-28840 PLUG COVER



660-048
MIL-DTL-28840 RECEPTACLE COVER

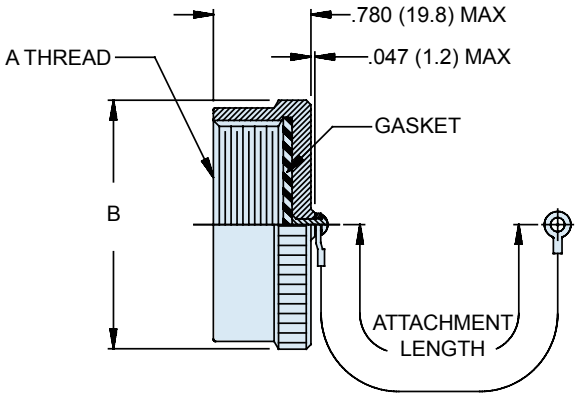


TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

DESIG-NATOR	SHELL SIZE (REF)	A THREAD	B MAX
A	11	.750 -.1P-.2L-DS	1.028 (26.1)
B	13	.875 -.1P-.2L-DS	1.141 (29.0)
C	15	1.062 -.1P-.2L-DS	1.263 (32.1)
D	17	1.125 -.1P-.2L-DS	1.387 (35.2)
E	19	1.312 -.1P-.2L-DS	1.513 (38.4)
F	23	1.500 -.1P-.2L-DS	1.703 (43.5)
G	25	1.625 -.1P-.2L-DS	1.825 (46.4)
H	29	1.812 -.1P-.2L-DS	2.143 (54.4)
J	33	2.000 -.1P-.2L-DS	2.329 (59.2)

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

Metric dimensions (mm) are in parentheses and are for reference only.

Basic Part Number
660-049 - Plug
660-050 - Receptacle

Connector Shell Size
(See Table I)

Attachment Length
(In Inches)

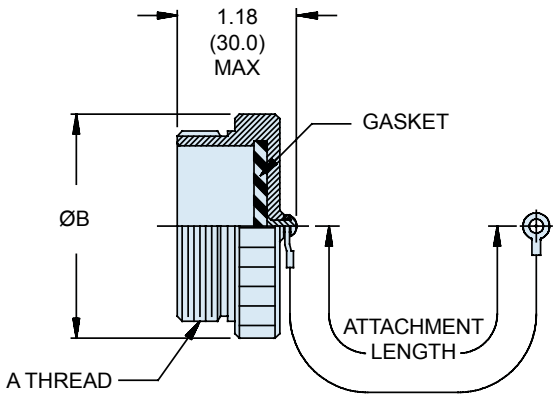
660-049	XO	21	R	6	04

Finish Symbol
(See Table II)

Attachment Type
See Table III on Page B-2

Ring Style Dash Number
See Tables IV, V, VI and VII on Page B-2

660-049
MIL-DTL-38999/32
PLUG COVER



660-050
MIL-DTL-38999/33
RECEPTACLE COVER

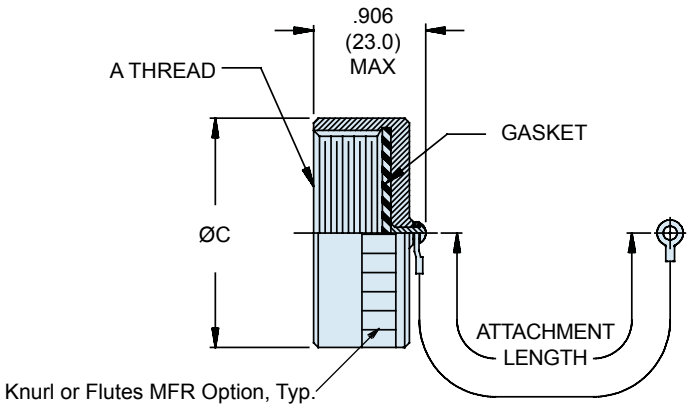


TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

SHELL SIZE	A THREAD	B DIA MAX	C DIA MAX
09	.6250 -0.1P-0.3L-TS	.906 (23.0)	.906 (23.0)
11	.7500 -0.1P-0.3L-TS	1.024 (26.0)	1.102 (28.0)
13	.8750 -0.1P-0.3L-TS	1.220 (31.0)	1.220 (31.0)
15	1.0000 -0.1P-0.3L-TS	1.300 (33.0)	1.260 (32.0)
17	1.1875 -0.1P-0.3L-TS	1.457 (37.0)	1.457 (37.0)
19	1.2500 -0.1P-0.3L-TS	1.575 (40.0)	1.535 (39.0)
21	1.3750 -0.1P-0.3L-TS	1.732 (44.0)	1.654 (42.0)
23	1.5000 -0.1P-0.3L-TS	1.811 (46.0)	1.772 (45.0)
25	1.6250 -0.1P-0.3L-TS	1.969 (50.0)	1.929 (49.0)

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

Metric dimensions (mm) are in parentheses and are for reference only.

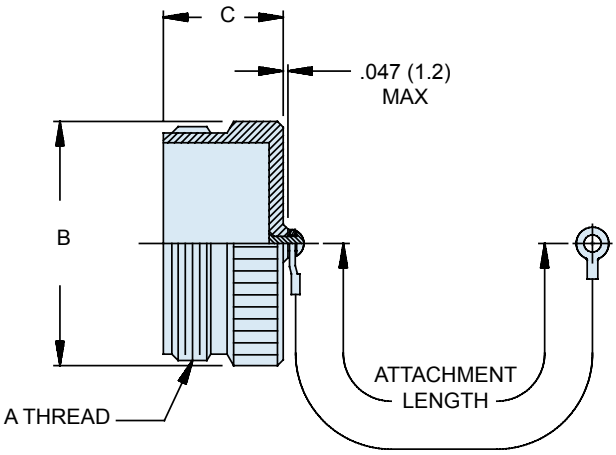
660-077 • 660-078
Glenair Composite 190 Series
Protective Covers

Basic Part Number	Connector Shell Size	Attachment Length			
660-077 - Plug 660-078 - Receptacle	(See Table I)	(In Inches)			
660-077	XO	20	R	6	04
	Finish Symbol (See Table II)	Attachment Type See Table III on Page B-2		Ring Style Dash Number See Tables IV, V, VI and VII on Page B-2	

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

660-077
Glenair 190-015 PLUG COVER



660-078
Glenair 190-016 RECEPTACLE COVER

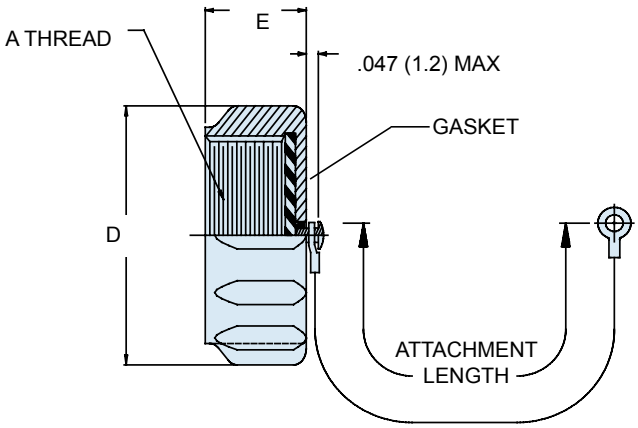


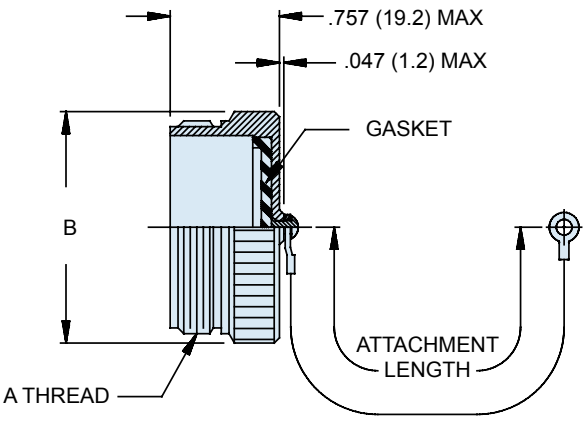
TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

SHELL SIZE	A THREAD	B MAX	C MAX	D MAX	E MAX
10SL	.625 - .1P-1L	1.125 (28.6)	1.093 (27.8)	1.156 (29.4)	.750 (19.1)
14S	.875 - .1P-1L	1.312 (33.3)	1.093 (27.8)	1.343 (34.1)	.719 (18.3)
18	1.125 - .1P-1L	1.565 (39.8)	1.093 (27.8)	1.596 (40.5)	.975 (24.8)

Metric dimensions (mm) are in parentheses and are for reference only.

Basic Part Number	Connector Shell Size	Attachment Length			
660-051 - Plug 660-052 - Receptacle	(See Table I)	(In Inches)			
660-051	XO	20	R	6	04
	Finish Symbol (See Table II)		Attachment Type See Table III on Page B-2		Ring Style Dash Number See Tables IV, V, VI and VII on Page B-2

660-051
MIL-DTL-83723 SERIES III
THREADED PLUG COVER



660-052
MIL-DTL-83723 SERIES III
THREADED RECEPTACLE COVER

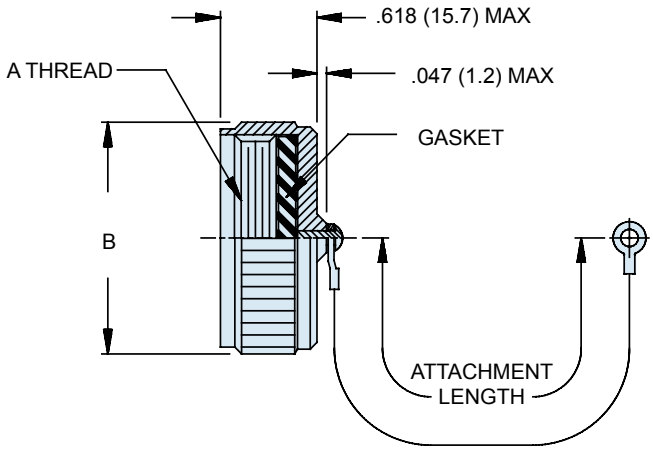


TABLE I: CONNECTOR SHELL SIZE NO.

SHELL SIZE	A THREAD CLASS 2A/2B	B DIA MAX
08	9/16 - 24 UNEF	.776 (19.7)
10	11/16 - 24 UNEF	.906 (23.0)
12	7/8 - 20 UNEF	1.078 (27.4)
14	15/16 - 20 UNEF	1.141 (29.0)
16	1 1/16 - 18 UNEF	1.266 (32.2)
18	1 3/16 - 18 UNEF	1.375 (34.9)
20	1 5/16 - 18 UNEF	1.510 (38.4)
22	1 7/16 - 18 UNEF	1.625 (41.3)
24	1 9/16 - 18 UNEF	1.760 (44.7)

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

Metric dimensions (mm) are in parentheses and are for reference only.

650-025
Composite Dummy Stowage Receptacle
for MIL-DTL-38999 Series III Connectors

Product Series
650 - Composite Dummy Stowage Receptacle

Angle and Profile
S - Straight

Finish Symbol
(See Table II)

650	H	S	025	XM	17	A

Connector Designator
H - MIL-DTL-38999 Series III

Basic Part Number

Connector Shell Size
(See Table I)

Alternate Position
A, B, C, D, E
N = Normal

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

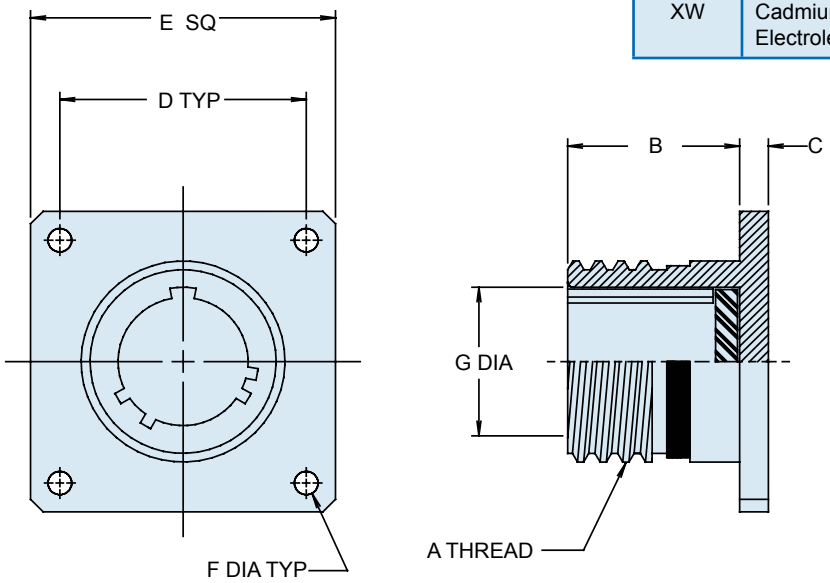


TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

SHELL SIZE	SHELL SIZE CODE	A THREAD	B MAX	C MAX	D	E MAX	F ± .007 (0.2)	G DIA
09	A	.625 - .1P-3LTS	.843 (21.4)	.110 (2.8)	.719 (18.3)	.949 (24.1)	.128 (3.3)	.492 (12.5)
11	B	.750 - .1P-3LTS	.843 (21.4)	.110 (2.8)	.812 (20.2)	1.043 (26.5)	.128 (3.3)	.620 (15.7)
13	C	.875 - .1P-3LTS	.843 (21.4)	.110 (2.8)	.906 (23.0)	1.138 (28.9)	.128 (3.3)	.769 (19.5)
15	D	1.000 - .1P-3LTS	.843 (21.4)	.110 (2.8)	.969 (24.6)	1.232 (31.3)	.128 (3.3)	.894 (22.7)
17	E	1.187 - .1P-3LTS	.843 (21.4)	.110 (2.8)	1.062 (27.0)	1.322 (33.6)	.128 (3.3)	1.019 (25.9)
19	F	1.250 - .1P-3LTS	.843 (21.4)	.110 (2.8)	1.156 (29.4)	1.448 (36.8)	.128 (3.3)	1.124 (28.5)
21	G	1.375 - .1P-3LTS	.811 (20.6)	.137 (3.5)	1.250 (31.8)	1.574 (40.0)	.128 (3.3)	1.249 (31.7)
23	H	1.500 - .1P-3LTS	.811 (20.6)	.137 (3.5)	1.375 (34.9)	1.700 (43.2)	.154 (3.9)	1.374 (34.9)
25	J	1.625 - .1P-3LTS	.811 (20.6)	.137 (3.5)	1.500 (38.1)	1.822 (46.3)	.154 (3.9)	1.499 (38.1)

Metric dimensions (mm) are in parentheses and are for reference only.

667-117
Composite Receptacle Cover
for MIL-DTL-38999 Series III Connectors with Anti-Decoupling Device

Basic Part Number	Connector Shell Size	Attachment Length	Ground Spring
667-117 - Protective Cover	(See Table I)	(In Inches)	(Omit for None)
667-117	XW	19	R	6	01	G

Finish Symbol	Attachment Type	Ring Style Dash Number
(See Table III)	See Table II	See Tables IV, V, VI and VII on Page B-2

TABLE III

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

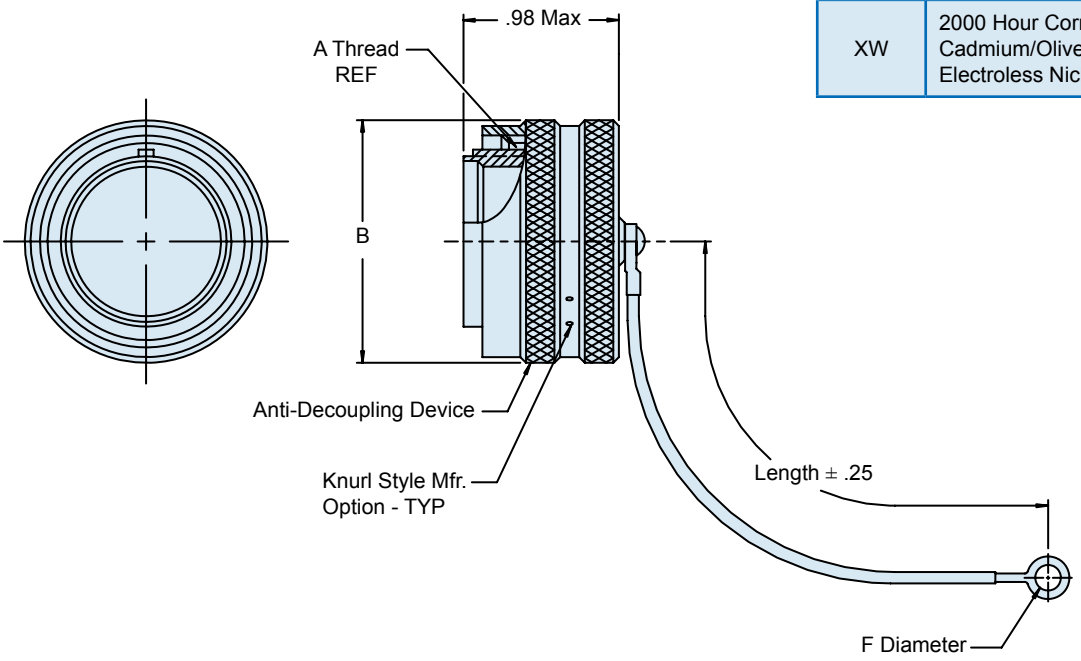


TABLE I: CONNECTOR SHELL SIZE

Shell Size	A Thread	B Max
09	.6250-0.1P-0.3L-TS	.858
11	.7500-0.1P-0.3L-TS	.984
13	.8750-0.1P-0.3L-TS	1.157
15	1.0000-0.1P-0.3L-TS	1.279
17	1.1875-0.1P-0.3L-TS	1.405
19	1.2500-0.1P-0.3L-TS	1.515
21	1.3750-0.1P-0.3L-TS	1.641
23	1.5000-0.1P-0.3L-TS	1.767
25	1.6250-0.1P-0.3L-TS	1.889

TABLE II: ATTACHMENT

Symbol	Attachment
F	Wire Rope, Nylon Jacket w/ Terminal
G	.094 Diameter Nylon Cord (black) w/ Loop Ends
H	Wire Rope, Teflon Jacket w/ Terminal
N	Attachment Omitted
R	Wire Rope, PVC Jacket w/ Terminal
T	Wire Rope, NO Jacket, w/ Terminal
K	Nylon Rope

Metric dimensions (mm) are in parentheses and are for reference only.

667-118
Composite Receptacle Cover
for MIL-DTL-5015 Series Connectors with Anti-Decoupling Device

Basic Part Number	Attachment Type		Ring Style Dash Number	
667-118 - Protective Cover	*See Table II*		*See Tables IV, V, VI and VII on Page B-2*	
667-118	**16**	**R**	**6**	**01**
	Connector Shell Size (*See Table I*)		**Attachment Length** (*In Inches*)	

TABLE II	
Symbol	**Finish Description**
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

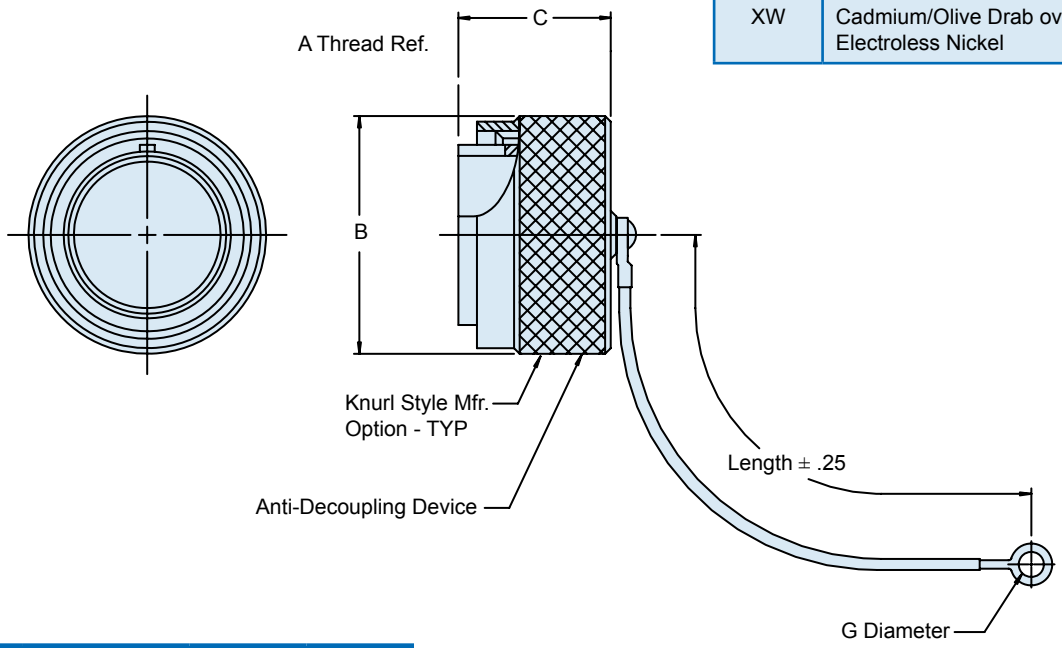


TABLE I: CONNECTOR SHELL SIZE			
Shell Size	**A Thread**	**B Max**	**C Max**
08	1/2-28	.844	1.13
10	5/8-24	.969	
12	3/4-20	1.062	
14	7/8-20	1.156	
16	1-20	1.250	
18	1 1/8-18	1.344	
20	1 1/4-18	1.469	
22	1 3/8-18	1.549	
24	1 1/2-18	1.719	
28	1 3/4-18	1.969	

TABLE II: ATTACHMENT	
Symbol	**Attachment**
F	Wire Rope, Nylon Jacket w/ Terminal
G	.094 Diameter Nylon Cord (black) w/ Loop Ends
H	Wire Rope, Teflon Jacket w/ Terminal
N	Attachment Omitted
R	Wire Rope, PVC Jacket w/ Terminal
T	Wire Rope, NO Jacket, w/ Terminal
K	Nylon Rope

Metric dimensions (mm) are in parentheses and are for reference only.

667-079
Composite Receptacle Cover
for MIL-DTL-38999 Series III Connectors with Anti-Rotation Device

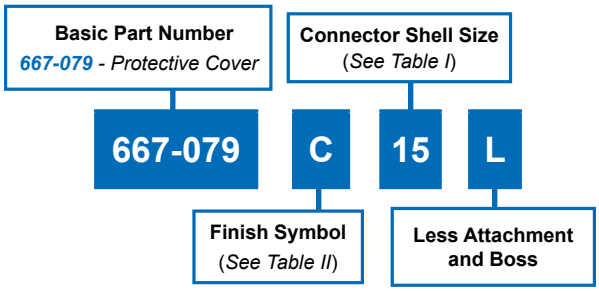


TABLE II	
Symbol	**Finish Description**
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

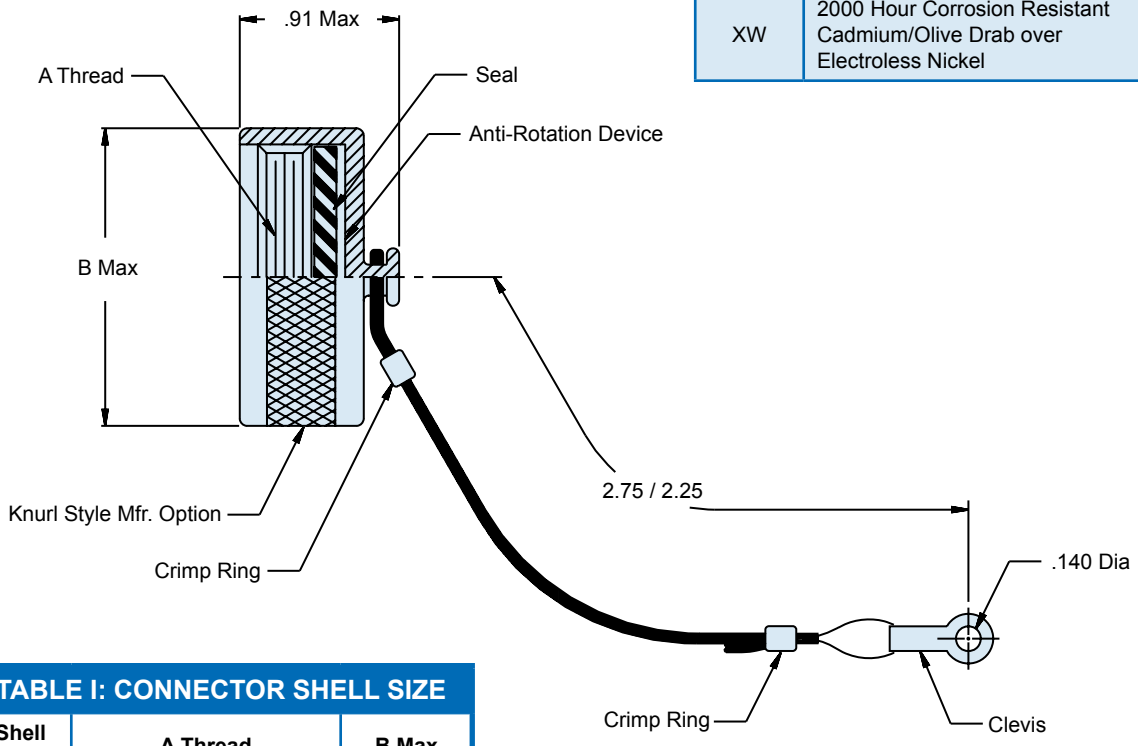


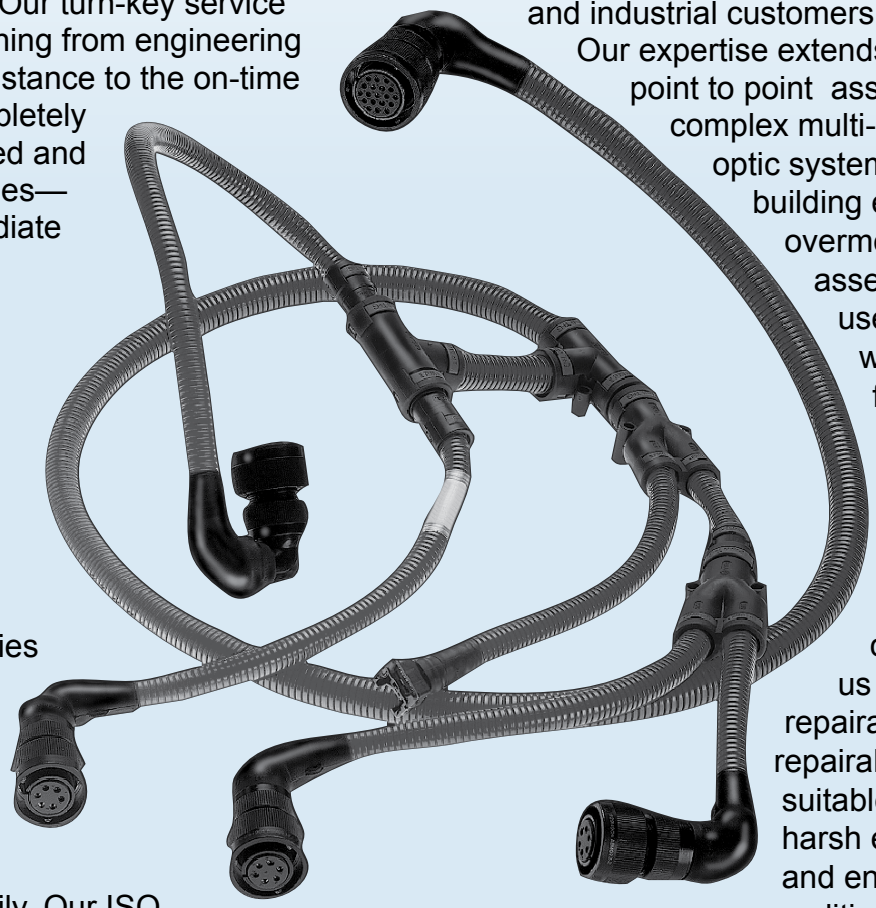
TABLE I: CONNECTOR SHELL SIZE		
Shell Size	**A Thread**	**B Max**
09	.6250-0.1P-0.3L-TS	.906
11	.7500-0.1P-0.3L-TS	1.102
13	.8750-0.1P-0.3L-TS	1.220
15	1.0000 -0.1P-0.3L-TS	1.260
17	1.1875 -0.1P-0.3L-TS	1.457
19	1.2500 -0.1P-0.3L-TS	1.535
21	1.3750 -0.1P-0.3L-TS	1.654
23	1.5000 -0.1P-0.3L-TS	1.772
25	1.6250 -0.1P-0.3L-TS	1.929

Metric dimensions (mm) are in parentheses and are for reference only.

Custom Conduit Assemblies

Wired, Terminated and Tested–Ready for Use

Glenair's complete capability in wire protection systems extends to the design, manufacture and test of custom conduit assemblies—built to your exact specifications. Our turn-key service includes everything from engineering and design assistance to the on-time delivery of completely wired, terminated and tested assemblies—ready for immediate use.



Glenair's has established an enviable reputation for consistently high quality. Regardless of simplicity or complexity, or whether quantities are large or small, the same high standards of quality assurance are applied uniformily. Our ISO 9001:2000 and AS9100:2004 Rev B certified quality system and strict adherence to military and commercial testing standards ensures each conduit assembly is throughly inspected at each stage of the process. Each system undergoes a final inspection process which includes appearance, identification, dielectric, continuity, and insulation tests conducted on a 100% basis in preparation for final customer source inspection.

Glenair has built electrical, optical and hybrid assemblies for military, commercial and industrial customers since the 1950's. Our expertise extends from simple point to point assemblies to complex multi-branch and fiber optic systems. Today, we're building everything from overmolded fiber optic assemblies for marine use, to wheel-well assemblies for the world's leading aircraft manufacturers.

Our in-house braiding and sleeving capabilites allow us to build both repairable and non-repairable assemblies suitable for use in harsh electromagnetic and environmental conditions. We offer a complete range of jacketing, shielding and braided protective covering options including NBC (nuclear, biological, chemical) materials.

From one-of-a-kind conduit systems, to high volume mass production requirements, Glenair delivers with consistent quality, on-time delivery and reliable customer service.

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Convoluted Tubing Wire Protection Systems: Where Flexibility and Field Repairability Meet.

Advanced EMI Shielded Wire Protection Systems for Shipboard, Aerospace, Electric Vehicle and Heavy Equipment Applications

Glenair's Series 74 Helical Convoluted Tubing Systems provide outstanding wire circuit and cable protection for applications that require advanced durability and flexibility compared to standard jacketed cables. The series 74 system features a broad selection of transition fittings and adapters for easy routing and incorporation of industry-standard connectors. Our PEEK™ and Teflon® polymers result in extremely rugged, lightweight enclosures for wiring systems deployed in harsh environment applications. Turnkey wired assemblies can be equipped with a broad range of fittings, jacketing and screening materials.

Convoluted Tubing Service Temperature Ranges of -95°F to +500°F Long Term,+600°F Short Term

Tensile Strength Ratings to 7,000 PSI

Resistance to Hydraulic Fluids, Fuels, Lubricating Oils, Solvents and Decontaminating Agents

Lightweight, Halogen-Free

Crush-Resistant

High-Temperature

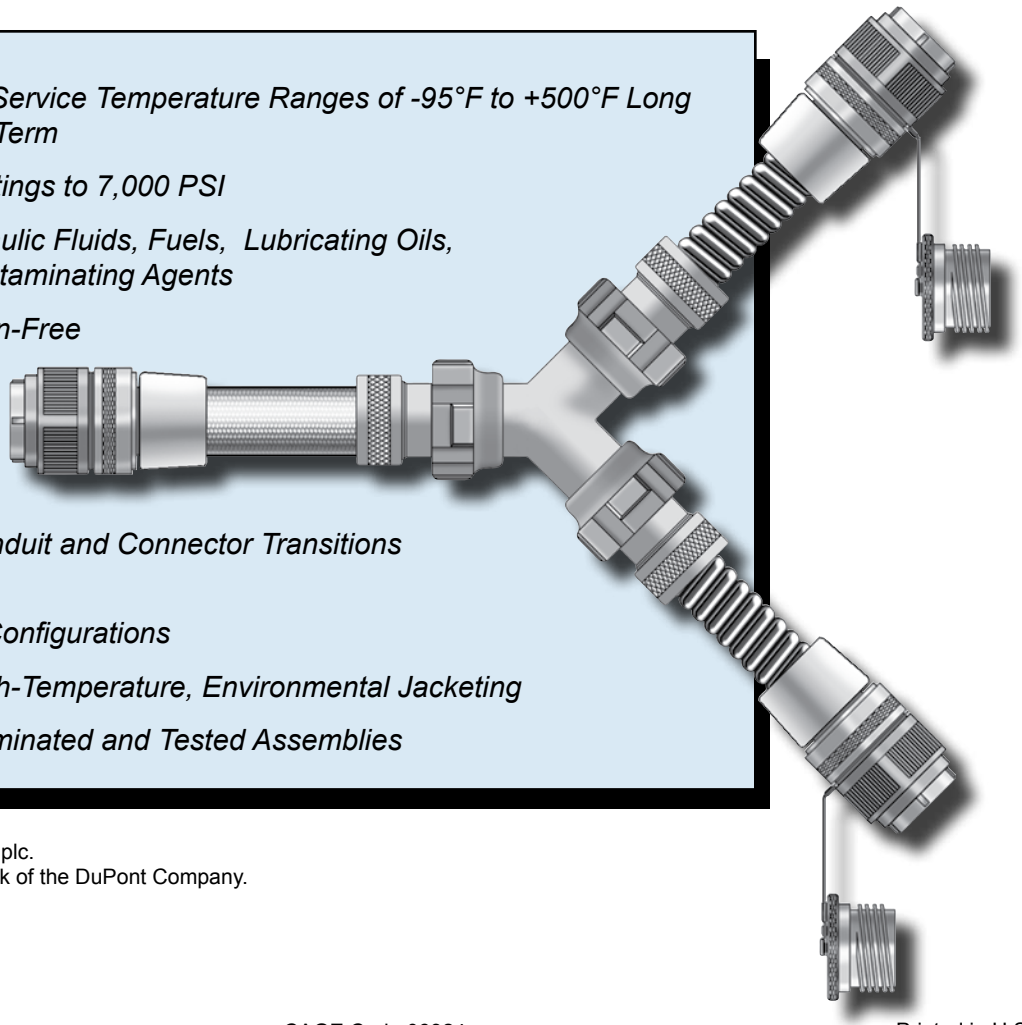
Maximum Flexibility

Broad Range of Conduit and Connector Transitions and Fittings

EMI/RFI Shielding Configurations

Broad Range of High-Temperature, Environmental Jacketing

Turnkey, Wired, Terminated and Tested Assemblies



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CAGE Code 06324

Printed in U.S.A.

Introduction to Conduit
Interconnect Technologies and Packaging
Selection Guide

This selection guide is designed to assist you with the selection of components and planning for installation of Glenair polymer plastic and composite convoluted tubing and fittings. Convoluted tubing wire protection assemblies are made up of lengths of bulk convoluted tubing, and various combinations of conduit fittings and adapters that allow the user to efficiently terminated the tubing and attach the assembly to connectors and other interconnect interfaces. There are three basic tasks in the selection process:

(1) Specify the size of bulk tubing which meets the volume requirements of the application.

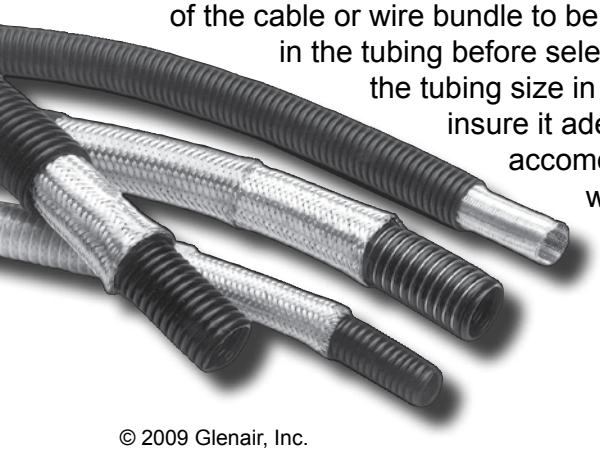
(2) Specify the style of bulk tubing which meets the environmental, electrical and mechanical requirements of the application.

(3) Select the transition fittings and connector adapters that satisfy the routing and interconnect requirements of the application.

Step 1: Select Tubing Size

Conduit size is identified by its inside diameter (ID) expressed in inches and fractions. Most of our tubing products range from 3/16 of an inch to 2 inches. The ID is referenced with a numerical size code which is used in the part number.

Convoluted tubing wire protection systems are normally filled to 80% of the inside diameter of the tube. You will need to verify the diameter of the cable or wire bundle to be housed in the tubing before selecting the tubing size in order to insure it adequately accomodates your wiring.



In some applications, such as when the tubing will ultimately be attached to a bulkhead feed-through or a stuffing tube, the diameter of the feed-through fitting needs to be taken into account when selecting the tubing size. Obviously, if the tubing needs to terminate to a one inch feed-through fitting, you should select one inch tubing. In fact, in a well-designed system, the diameter of the conduit, any necessary transition fittings, connector adapters, feed-throughs etc. should all be the same size.

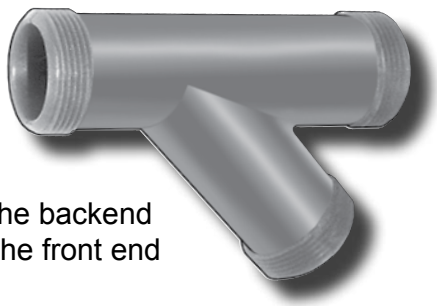
Step 2: Select Tubing Style

Glenair manufactures a wide range of high-temperature tolerant polymer plastic convoluted tubing products, such as PFA, FEP, PTFE, ETFE and PEEK. Each material has specific performance attributes that are summarized in the accompaning table. Selection is most often based on one or more attributes such as crush resistance, strength or cost.

The other decision point in tubing style selection has to do with the addition of outer layers of EMI shielding and/or environmental jacketing to the core material. Braided sheilding provides a conductive path for EMI and also adds pull strength to the final assembly. Various flavors of envirnmental jacketing, summarized in the accompanying table, protect the assembly from moisture and caustic chemicals.

Step 3: Select Transition Fittings and Connector Adapters

Multi-branch convoluted tubing wire protection assemblies utilize various composite plastic transition fittings, in straight, "T," "Y," and "+" configurations, to facilitate routing. The tubing is terminated into the backend of the fitting while the front end



CAGE Code 06324
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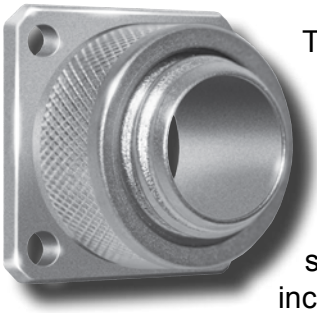
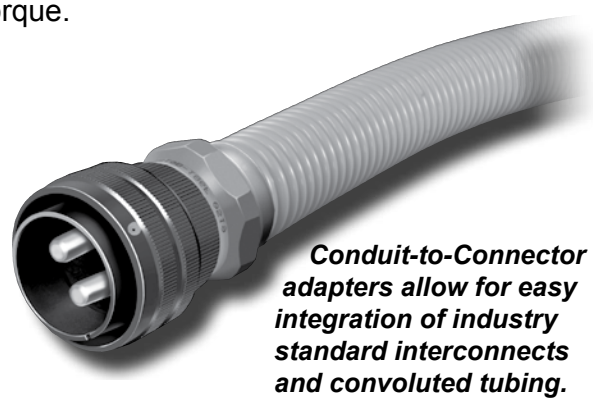
is equipped with an appropriate thread profile and coupler for the attachment of the necessary transition. The assemblies also utilize connector adapters, in straight 45° and 90° configurations, for the incorporation of circular and rectangular connectors.



Selection is easy. The size of the fitting or adapter is indicated with a "dash number" or numeric size code that, just like the tubing, corresponds to the shell size of the part in inches and fractions. The appropriate sized fitting for a one inch tube, for example, would be a number "32." Conveniently, this is the same number used for one inch bulk tubing. So selection is a simple matter of matching the size code in the fitting part number with the size code of the selected conduit. Your selection of a straight, 45°, 90°, "T," "Y," or "+" configuartion part will depend on the routing requirements of your system.

NOTE 1: Glenair recommends the use of our TG70 strap wrench, or appropriately sized 600-157 series holding tools for use fitting-to-fitting, or connector-to-adapter assembly.

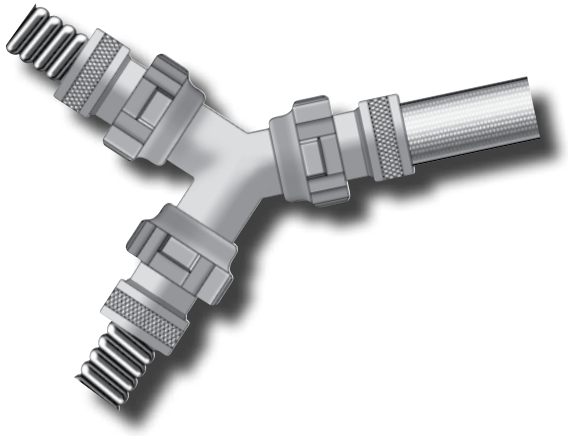
NOTE 2: Glenair also recommends the use of torque wrenches to ensure adapters and connectors are mated with the optimal amount of torque.



Conduit-to-Connector adapters allow for easy integration of industry standard interconnects and convoluted tubing.

A Note On Braided Shielding

Glenair is able to provide turnkey convoluted tubing wire protection systems—complete with braided shielding and jacketing. Braided shields are effective at minimizing low frequency interference at audio and RF ranges. Braided shields also provide additional structural integrity while maintaining good flexibility and flex life. In use, the reduction of EMI is dependent upon the signal amplitude and frequency in relation to the many combinations of mesh count, wire diameter and the braid material. Generally, the higher the percentage of braid coverage, the more effective the shield against high-frequency emissions. Available materials include tin-plated copper, nickel-plated copper and tin-plated iron/copper as well as metal-clad composite materials such as AmberStrand®. Depending on the ratio of metal braid to composite plastic, Glenair's composite braided shielding product can reduce the weight of EMI shielding up to 75%.



Glenair takes a systems approach to the design and manufacture of our composite and polymer plastic wire protection systems. The following pages present all the necessary component products to create 100% composite/plastic wire protection systems optimized for the most extreme environmental, mechanical, and electrical performance requirements. Please do not hesitate to contact our factory for free application engineering and assistance in the design of your next assembly.

C

Convoluted Tubing Material Properties

MATERIAL PROPERTY	PERFLUORO-ALKOXY (PFA)	FLUORINATED ETH-YLENE PROPYLENE (FEP)	ETHYLENE TETRA-FLUOROETHYLENE (ETFE)	POLYTETRAFLU-OROETHYLENE (PTFE)	POLYVINYLIDENE FLUORIDE (PVDF)	POLYETHER KETONE* (PEEK)
Service Temperature	-95°F/500°F (-71°C/260°C)	-95°F/400°F (-71°C/204°C)	-65°F/310°F (-54°C/154°C)	-95°/500°F (-71°C/260°C)	-65°F/330°F (-54°C/166°C)	-76°F/392°F (-60°C/200°C)
Tensile Strength	3,000 PSI (20,684 KP)	2,500 PSI (17,237 KP)	5,000 PSI (34,474 KP)	2,500 PSI (17,237 KP)	5,000 PSI (34,474 KP)	7,000 PSI (48,300 KP)
Elongation	250%	200%	100%	175%	250%	100%
SpecificGravity	2.15	2.15	1.70	2.15	1.8 Max	1.26
Heat Aging	2000 Hrs.@ 525°F (274°C)	2000 Hrs.@ 430°F (221°C)	2000 Hrs.@ 350°F (177°C)	2000 Hrs. @ 525°F (274°C)	168 Hrs. @ 347°F (175°C)	2,000 Hrs. @ 464°F (240°C)
Dielectric Strength	12,000V	12,000V	12,000V	12,000V	10,000V	12,000V
Volume Resistivity	1018	1018	1016	1018	1016	1016
Water Absorption	0.03%	0.01%	0.02%	0.01%	0.02%	0.03%
Solvent Resistance	No swelling, stickiness or weight change					
Flammability	Non-burning					
Fungus Resistance	Does not support fungus growth					

* Polyetheretherketone is the suggested material for Halogen-free, low fire hazard requirements.

Outer Jacketing Material Properties

MATERIAL PROPERTY	EPDM (Ethylene Propylene Diene Monomer)	HYPALON (Chlorosulfonated Polyethylene)	NEOPRENE (Polychloroprene)	VITON (Fluoroelastomer)
Temperature Range	-60°F to +300°F (-51°C to +149°C)	-60°F to +300°F (-51°C to +149°C)	-60°F to +250°F (-51°C to +121°C)	-40°F to +392°F (-40°C to +200°C)
Specific Gravity	1.26	1.18	1.25	1.80
Weight: Lbs./Cubic Inch	.045	.043	.045	.055
Abrasion Resistance	Excellent	Excellent	Excellent	Excellent
Wear Resistance	Good	Good	Good	Good
Flame Resistance	Good	Good	Good	Good
Sunlight Resistance	Good	Excellent	Excellent	Excellent
Chemical Resistance:				
Aliphatic Hydrocarbons	Good	Good	Good	Excellent
Aromatic Hydrocarbons	Good	Fair	Fair	Excellent
Ketones, Etc.	Good	Poor	Poor	Poor
Oil & Gasoline	Good	Good	Good	Excellent

Hypalon, Tefzel, and Viton are registered trademarks of DuPont Company
Kynar is a registered trademark of Pennwalt Corp., Inc.

How to use the tables on this page:

It is possible for a wire bundle to contain wires of all the same size diameter, or a variety of mixed diameters. The gauge provides only the diameter of the conductor, and this information alone is not sufficient to determine required tubing size. Referring to the appropriate wire specification is necessary to establish the overall diameter over the insulation and/or braids.

	STEP	ALL WIRES SAME DIAMETER	TWO DIFFERENT WIRE DIAMETERS
1.	A bundle containing 30 wires	30 wires @ .045 DIA	15 wires @ .045 DIA 15 wires @ .135 DIA
2.	Determine average wire diameter	30 x .045 = 1.35 1.35 / 30 = .045 Average Wire Diameter	15 x .045 = .68 15 x .135 = 2.03 2.71 2.71 / 30 = .090 Average Wire Diameter
3.	Using Table I, find factor for 30 wires (6.7), and multiply by average wire diameter	.045 x 6.7 = .3015 Wire Bundle Diameter	.090 x 6.7 = .603 Wire Bundle Diameter
4.	Tubing size is determined on Table II. 70% fill is recommended	Size 12 (.305 DIA = 70% Fill)	Size 24 (.607 DIA = 70% Fill)

TABLE I

Number of Wires	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	28	32
Factor	1	2	2.2	2.4	2.7	2.9	3	3.3	3.8	4	4.3	4.6	5	5.3	5.6	6	6.5	6.9
Number of Wires	36	40	45	50	55	60	65	70	75	80	90	100	125	150	175	200	250	300
Factor	7.4	7.7	8.1	8.5	8.9	9.3	9.7	10.1	10.5	10.9	11.6	12.2	13.7	15	16.1	17.2	19.3	21

TABLE II

TUBING SIZE	TUBING I.D.	50% FILL	60% FILL	70% FILL	80% FILL
6	0.187 (4.7)	0.128 (3.3)	0.14 (3.6)	0.151 (3.8)	0.162 (4.1)
9	0.281 (7.1)	0.193 (4.9)	0.211 (5.4)	0.229 (5.8)	0.244 (6.2)
10	0.312 (7.9)	0.217 (5.5)	0.237 (6.0)	0.256 (6.5)	0.274(7.0)
12	0.375 (9.5)	0.257 (6.5)	0.282 (7.2)	0.305 (7.7)	0.326 (8.3)
14	0.437 (11.1)	0.302 (7.7)	0.331 (8.4)	0.357 (9.1)	0.382 (9.7)
16	0.5 (12.7)	0.343 (8.7)	0.376 (9.6)	0.406 (10.3)	0.434 (11.0)
20	0.625 (15.9)	0.426 (10.8)	0.467 (11.9)	0.505 (12.8)	0.539 (13.7)
24	0.75 (19.1)	0.513 (13.0)	0.562 (14.3)	0.607 (15.4)	0.649 (16.5)
28	0.875 (22.2)	0.608 (15.4)	0.666 (16.9)	0.72 (18.3)	0.769 (19.5)
32	1 (25.4)	0.686 (17.4)	0.751 (19.1)	0.812 (20.6)	0.868 (22.0)
40	1.25 (31.8)	0.852 (21.6)	0.933 (23.7)	1.008 (25.6)	1.078 (27.4)

Note: Consult factory for Series 72 Type B tubing.

Metric dimensions (mm) are indicated in parentheses.

Glenair®

Series 74
Helical Convoluted Tubing (AMS-T-81914)
Standard Tubing, Braiding and Jacketing Configurations
PEEK, PFA, FEP, PTFE and Tefzel® (ETFE) Formulas

About Glenair Series 74 Helical Convoluted Tubing Styles

Glenair offers our polymer plastic Series 74 Helical Convoluted Tubing unshielded or with a variety of braids to meet various electromagnetic shielding requirements. Type A is provided unshielded; Type B unshielded, with a protective outer braided black Dacron® covering; Types C through F define standard combinations of braided metal EMI shielding; Type G unshielded, with an outer elastomeric jacket. Other combinations can be provided upon request.

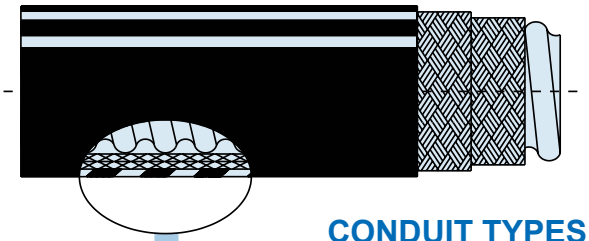
Glenair Series 74 Helical Convoluted Tubing is manufactured in conformance to SAE-AMS-T-81914, providing the user with standard and thin wall thickness, and a choice of standard or close convolutions. For low-smoke zero-halogen applications that require a high strength and superior crush resistance, Glenair can supply PEEK™ tubing (semicrystalline thermoplastic). The PEEK™ material will be manufactured to Glenair tubing standards.

All of the Glenair convoluted tubing can be supplied either unjacketed or with a variety of elastomeric materials. Other options include: Dual wall i.e., FEP inner liner and FEP outer liner which can be supplied with various combinations of braid shielding between the liners; Reinforcement support spring option for added crush resistance which can be supplied with the Type A through Type G configurations shown; Internal braid shielding; and special processes such as cross-linking (please consult factory).

BULK CONDUIT LENGTH TOLERANCES

INCHES	
LENGTH	TOLERANCE
12 - 144	+ 2.0
145 - 600	+ 4.0
601 - up	+ 6.0

CENTIMETERS	
LENGTH	TOLERANCE
31 - 366	+ 5.0
367 - 1524	+ 10.2
1525 - up	+ 15.2



CONDUIT TYPES

A
- Natural or Black Convoluted Tubing

B
- Natural or Black Convoluted Tubing
- Protective Outer Braided Black-Dacron®

C
- Natural or Black Convoluted Tubing
- External Braided Shield: Tin/Copper, Nickel Plated Copper, Tin Plated Iron/Copper (SnCuFe), Composite AmberStrand® or Stainless Steel.
- Jacket

D
- Natural or Black Convoluted Tubing
- External Braided Shield: Tin/Copper, Nickel Plated Copper, Tin Plated Iron/Copper (SnCuFe), Composite AmberStrand® or Stainless Steel.

E
- Natural or Black Convoluted Tubing
- Inner Braided Shield: Tin/Copper, Nickel Plated Copper, or Tin Plated Iron/Copper (SnCuFe) or Composite AmberStrand®.
- External Braided Shield: Tin/Copper, Nickel Plated Copper, Tin Plated Iron/Copper (SnCuFe), Composite AmberStrand® or Stainless Steel.

F
- Natural or Black Convoluted Tubing
- Inner Braided Shield: Tin/Copper, Nickel Plated Copper, or Tin Plated Iron/Copper (SnCuFe) or Composite AmberStrand®.
- Outer Braided Shield: Tin/Copper, Nickel Plated Copper, Tin Plated Iron/Copper (SnCuFe), Composite AmberStrand® or Stainless Steel.
- Jacket

G
- Natural or Black Convoluted Tubing
- Jacket

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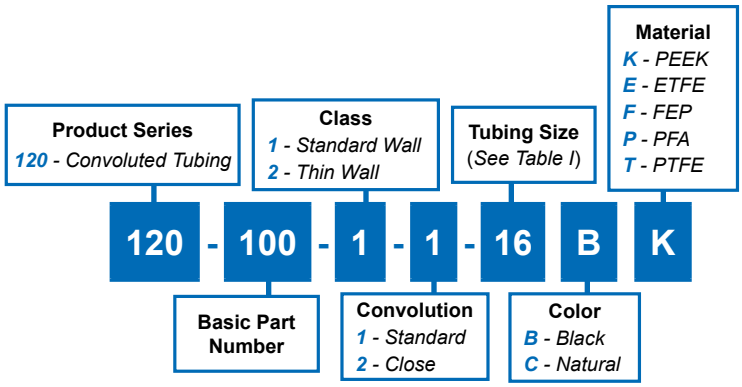
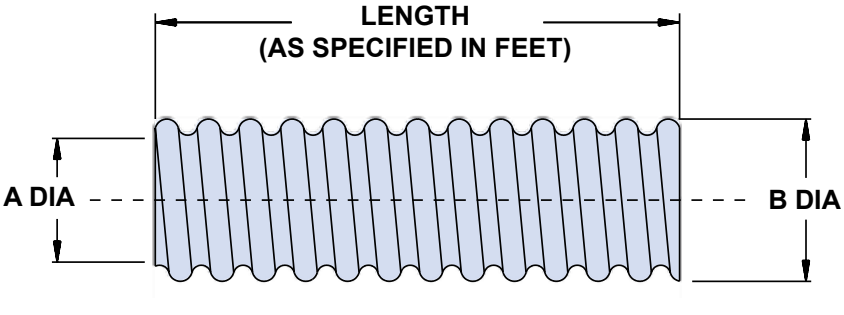
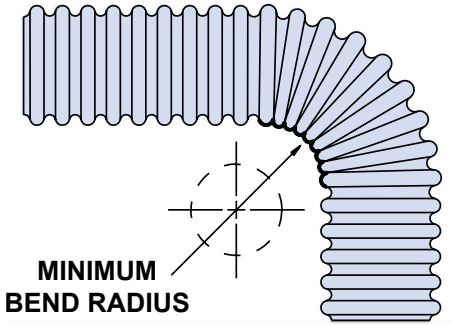
Series 74 TYPE A

Convoluted Tubing Only







C

TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS	
06	3/16	.181	(4.6)	.320	(8.1)	.50	(12.7)
09	9/32	.273	(6.9)	.414	(10.5)	.75	(19.1)
10	5/16	.306	(7.8)	.450	(11.4)	.75	(19.1)
12	3/8	.359	(9.1)	.510	(13.0)	.88	(22.4)
14	7/16	.427	(10.8)	.571	(14.5)	1.00	(25.4)
16	1/2	.480	(12.2)	.650	(16.5)	1.25	(31.8)
20	5/8	.603	(15.3)	.770	(19.6)	1.50	(38.1)
24	3/4	.725	(18.4)	.930	(23.6)	1.75	(44.5)
28	7/8	.860	(21.8)	1.073	(27.3)	1.88	(47.8)
32	1	.970	(24.6)	1.226	(31.1)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.539	(39.1)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	1.832	(46.5)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.156	(54.8)	3.63	(92.2)
64	2	1.937	(49.2)	2.332	(59.2)	4.25	(108.0)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths - consult factory.
4. Consult factory for PEEK™ min/max dimensions.

Glenair®

120-103
Series 74 Helical Convoluted Tubing (AMS-T-81914)
Type B: Convoluted Tubing with Black Dacron® Braid

Product Series
120 - Convoluted Tubing

Class
1 - Standard Wall
2 - Thin Wall[2]

Tubing Size
(See Table I)

Material
K - PEEK[4]
E - ETFE
F - FEP
P - PFA
T - PTFE[3]

120	-	103	-	1	-	1	-	16	B	K

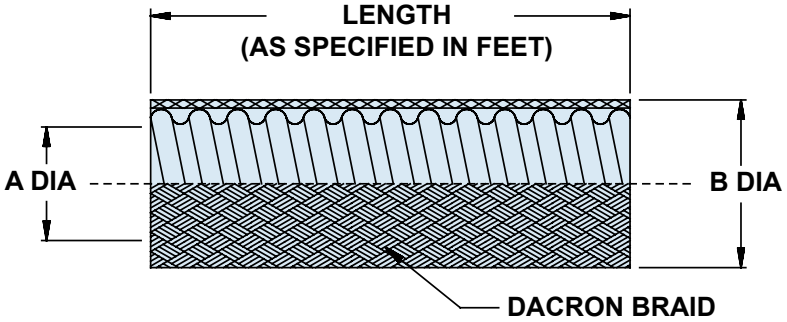
Basic Part Number

Convolution
1 - Standard
2 - Close

Color
B - Black
C - Natural

Series 74 TYPE B EXTERNAL BLACK DACRON® BRAID

C



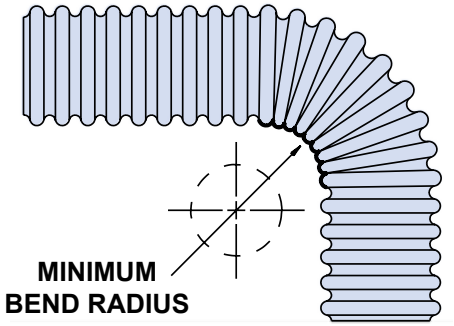


TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS	
06	3/16	.181	(4.6)	.390	(9.9)	.50	(12.7)
09	9/32	.273	(6.9)	.484	(12.3)	.75	(19.1)
10	5/16	.306	(7.8)	.520	(13.2)	.75	(19.1)
12	3/8	.359	(9.1)	.580	(14.7)	.88	(22.4)
14	7/16	.427	(10.8)	.641	(16.3)	1.00	(25.4)
16	1/2	.480	(12.2)	.720	(18.3)	1.25	(31.8)
20	5/8	.603	(15.3)	.840	(21.3)	1.50	(38.1)
24	3/4	.725	(18.4)	1.000	(25.4)	1.75	(44.5)
28	7/8	.860	(21.8)	1.143	(29.0)	1.88	(47.8)
32	1	.970	(24.6)	1.296	(32.9)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.609	(40.9)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	1.902	(48.3)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.226	(56.5)	3.63	(92.2)
64	2	1.937	(49.2)	2.402	(61.0)	4.25	(108.0)

APPLICATION NOTES

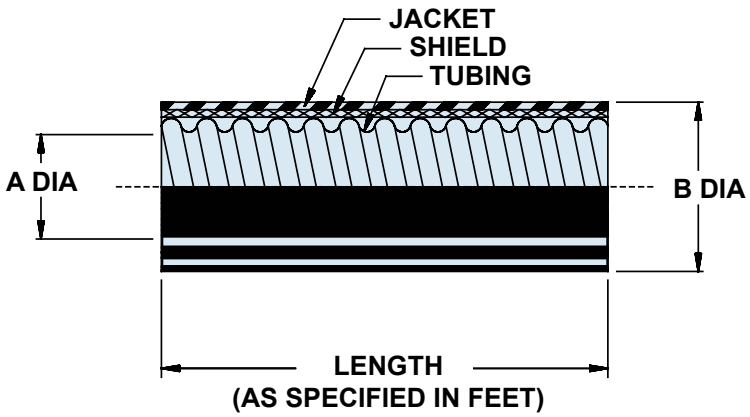
1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths - consult factory.
4. Consult factory for PEEK™ min/max dimensions.

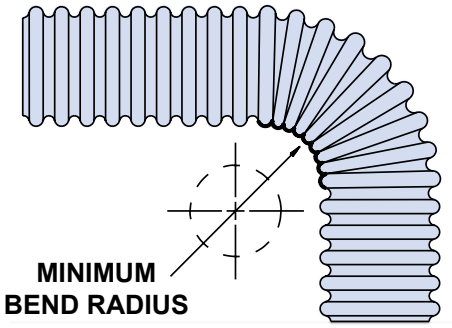
Series 74 TYPE C EXTERNAL SHIELD AND JACKET

Product Series	Class	Tubing Size	Material	Jacket
121 - Convoluted Tubing	*1* - Standard Wall *2* - Thin Wall$_2$	(See Table I)	*K* - PEEK$_4$ *E* - ETFE *F* - FEP *P* - PFA *T* - PTFE$_3$	*E* - EPDM *N* - Neoprene *H* - Hypalon® *V* - Viton

121	-	100	-	1	-	1	-	16	B	K	T	H

Basic Part Number	Convolution	Color	Shield
	1 - Standard *2* - Close	*B* - Black *C* - Natural	*A* - Composite AmberStrand® *C* - Stainless Steel *N* - Nickel/Copper *S* - SnCuFe *T* - Tin/Copper





C

TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

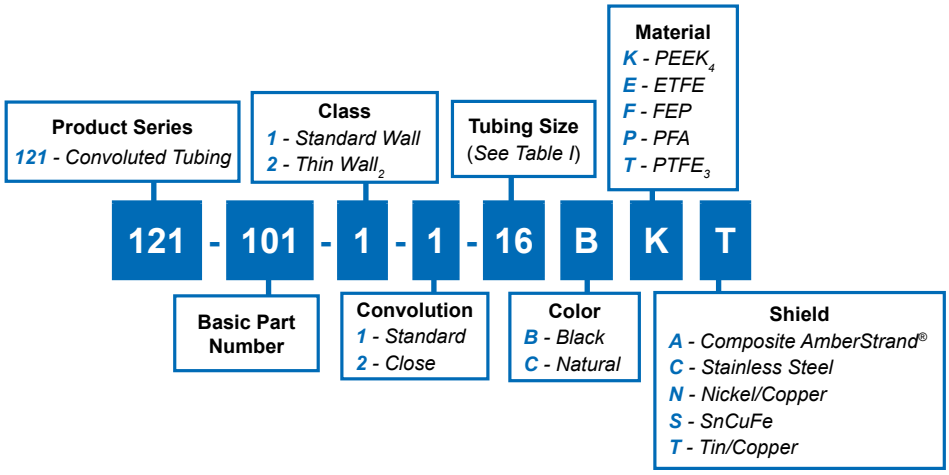
TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS	
06	3/16	.181	(4.6)	.490	(12.4)	.50	(12.7)
09	9/32	.273	(6.9)	.584	(14.8)	.75	(19.1)
10	5/16	.306	(7.8)	.620	(15.7)	.75	(19.1)
12	3/8	.359	(9.1)	.680	(17.3)	.88	(22.4)
14	7/16	.427	(10.8)	.741	(18.8)	1.00	(25.4)
16	1/2	.480	(12.2)	.820	(20.8)	1.25	(31.8)
20	5/8	.603	(15.3)	.940	(23.9)	1.50	(38.1)
24	3/4	.725	(18.4)	1.100	(27.9)	1.75	(44.5)
28	7/8	.860	(21.8)	1.243	(31.6)	1.88	(47.8)
32	1	.970	(24.6)	1.396	(35.5)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.709	(43.4)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	2.002	(50.9)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.327	(59.1)	3.63	(92.2)
64	2	1.937	(49.2)	2.502	(63.6)	4.25	(108.0)

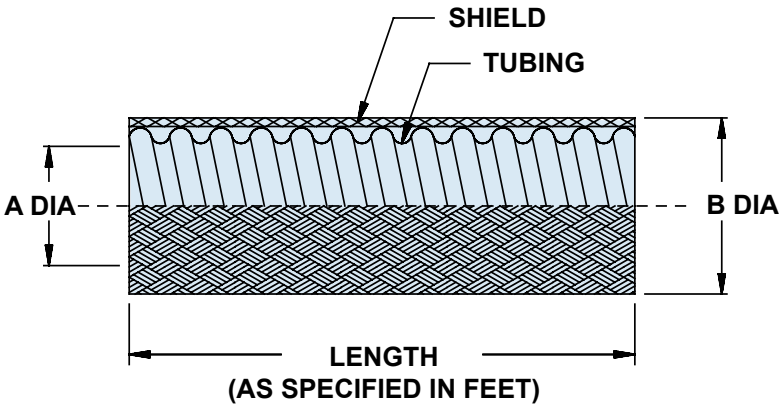
APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths - consult factory.
4. Consult factory for PEEK™ min/max dimensions.

121-101
Series 74 Helical Convoluted Tubing (AMS-T-81914)
Type D: Convoluted Tubing with Single External Shield

Series 74
TYPE
D
EXTERNAL SHIELD





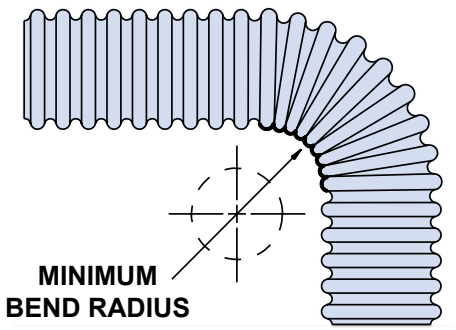


TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS	
06	3/16	.181	(4.6)	.370	(9.4)	.50	(12.7)
09	9/32	.273	(6.9)	.464	(11.8)	.75	(19.1)
10	5/16	.306	(7.8)	.500	(12.7)	.75	(19.1)
12	3/8	.359	(9.1)	.560	(14.2)	.88	(22.4)
14	7/16	.427	(10.8)	.621	(15.8)	1.00	(25.4)
16	1/2	.480	(12.2)	.700	(17.8)	1.25	(31.8)
20	5/8	.603	(15.3)	.820	(20.8)	1.50	(38.1)
24	3/4	.725	(18.4)	.980	(24.9)	1.75	(44.5)
28	7/8	.860	(21.8)	1.123	(28.5)	1.88	(47.8)
32	1	.970	(24.6)	1.276	(32.4)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.589	(40.4)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	1.882	(47.8)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.132	(54.2)	3.63	(92.2)
64	2	1.937	(49.2)	2.382	(60.5)	4.25	(108.0)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths - consult factory.
4. Consult factory for PEEK™ min/max dimensions.

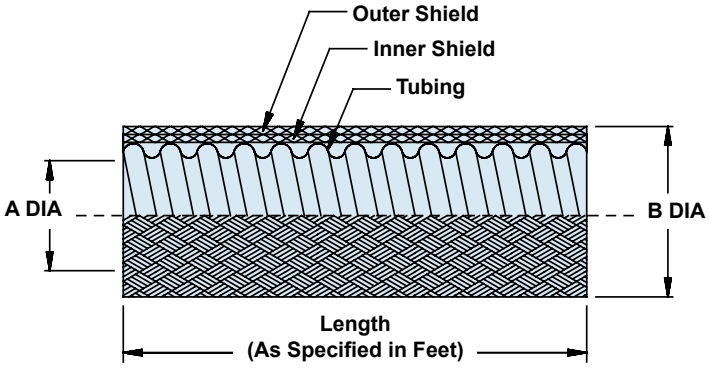
121-102
Series 74 Helical Convoluted Tubing (AMS-T-81914)
Type E: Convoluted Tubing with Two External Shields

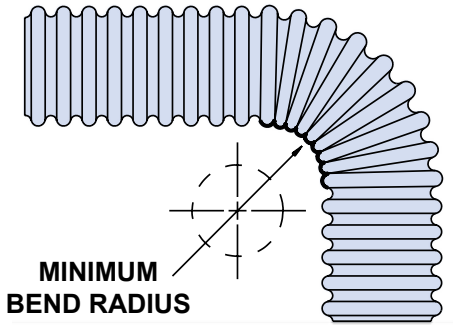
Series 74 TYPE E TWO EXTERNAL SHIELDS

Product Series	Class	Tubing Size	Material	Outer Shield
121 - Convoluted Tubing	1 - Standard Wall 2 - Thin Wall[2]	(See Table I)	K - PEEK[4] E - ETFE F - FEP P - PFA T - PTFE[3]	A - Composite AmberStrand® C - Stainless Steel N - Nickel/Copper S - SnCuFe T - Tin/Copper

121	-	102	-	1	-	1	-	16	B	K	T	H

Basic Part Number	Convolution	Color	Inner Shield
	1 - Standard 2 - Close	B - Black C - Natural	A - Composite AmberStrand® N - Nickel/Copper S - SnCuFe T - Tin/Copper





C

TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS *	
06	3/16	.181	(4.6)	.420	(10.7)	.50	(12.7)
09	9/32	.273	(6.9)	.514	(13.1)	.75	(19.1)
10	5/16	.306	(7.8)	.550	(14.0)	.75	(19.1)
12	3/8	.359	(9.1)	.610	(15.5)	.88	(22.4)
14	7/16	.427	(10.8)	.671	(17.0)	1.00	(25.4)
16	1/2	.480	(12.2)	.750	(19.1)	1.25	(31.8)
20	5/8	.603	(15.3)	.870	(22.1)	1.50	(38.1)
24	3/4	.725	(18.4)	1.030	(26.2)	1.75	(44.5)
28	7/8	.860	(21.8)	1.173	(29.8)	1.88	(47.8)
32	1	.970	(24.6)	1.326	(33.7)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.639	(41.6)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	1.932	(49.1)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.182	(55.4)	3.63	(92.2)
64	2	1.937	(49.2)	2.432	(61.8)	4.25	(108.0)

*The minimum bend radius is based on Type A construction. For multiple-braided coverings, these minimum bend radii may be increased slightly.

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths - consult factory.
4. Consult factory for PEEK™ min/max dimensions.

121-103
Series 74 Helical Convoluted Tubing (AMS-T-81914)
Type F: Convoluted Tubing with Jacket and Two Shields

Product Series
121 - Convoluted Tubing

Class
1 - Standard Wall
2 - Thin Wall[2]

Tubing Size
(See Table I)

Material
K - PEEK[4]
E - ETFE
F - FEP
P - PFA
T - PTFE[3]

Outer Shield
A - Composite AmberStrand®
C - Stainless Steel
N - Nickel/Copper
S - SnCuFe
T - Tin/Copper

121	-	103	-	1	-	1	-	16	B	K	T	S	H

Basic Part Number

Convolution
1 - Standard
2 - Close

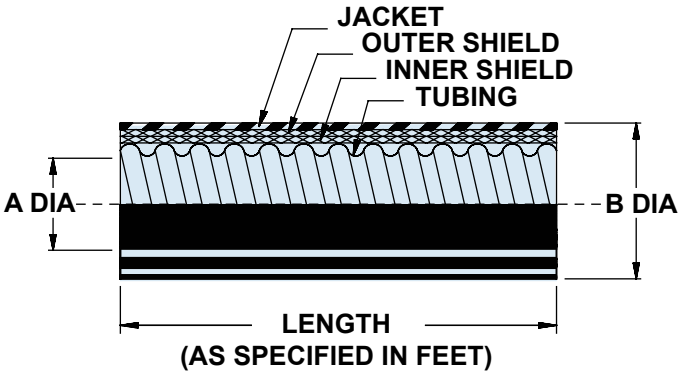
Color
B - Black
C - Natural

Inner Shield
A - Composite AmberStrand®
N - Nickel/Copper
S - SnCuFe
T - Tin/Copper

Jacket
E - EPDM
N - Neoprene
H - Hypalon®
V - Viton

Series 74 TYPE F
JACKET AND TWO EXTERNAL SHIELDS

C



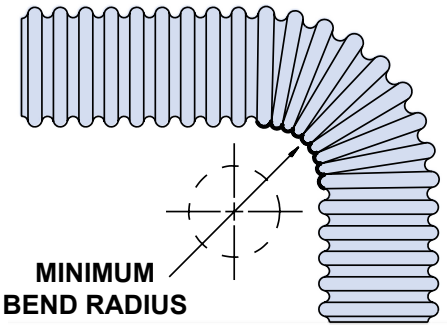


TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

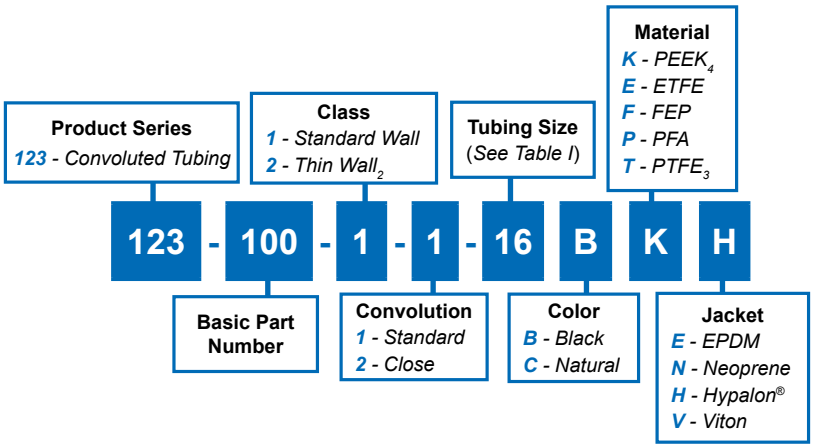
TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS *	
06	3/16	.181	(4.6)	.540	(13.7)	.50	(12.7)
09	9/32	.273	(6.9)	.634	(16.1)	.75	(19.1)
10	5/16	.306	(7.8)	.670	(17.0)	.75	(19.1)
12	3/8	.359	(9.1)	.730	(18.5)	.88	(22.4)
14	7/16	.427	(10.8)	.791	(20.1)	1.00	(25.4)
16	1/2	.480	(12.2)	.870	(22.1)	1.25	(31.8)
20	5/8	.603	(15.3)	.990	(25.1)	1.50	(38.1)
24	3/4	.725	(18.4)	1.150	(29.2)	1.75	(44.5)
28	7/8	.860	(21.8)	1.293	(32.8)	1.88	(47.8)
32	1	.970	(24.6)	1.446	(36.7)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.759	(44.7)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	2.052	(52.1)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.302	(58.5)	3.63	(92.2)
64	2	1.937	(49.2)	2.552	(64.8)	4.25	(108.0)

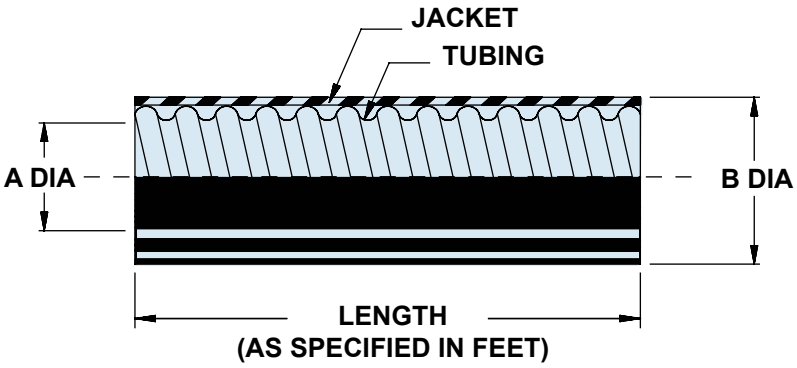
*The minimum bend radius is based on Type A construction. For multiple-braided coverings, these minimum bend radii may be increased slightly.

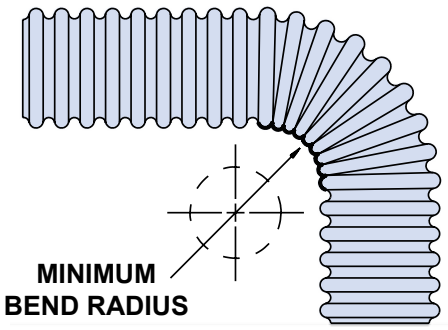
APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths consult factory.
4. Consult factory for PEEK™ min/max dimensions.

Series 74 TYPE G EXTERNAL JACKET







C

TABLE I: TUBING SIZE ORDER NUMBER AND DIMENSIONS

TUBING SIZE	FRACTIONAL SIZE REF	A INSIDE DIA MIN		B DIA MAX		MINIMUM BEND RADIUS	
06	3/16	.181	(4.6)	.460	(11.7)	.50	(12.7)
09	9/32	.273	(6.9)	.554	(14.1)	.75	(19.1)
10	5/16	.306	(7.8)	.590	(15.0)	.75	(19.1)
12	3/8	.359	(9.1)	.650	(16.5)	.88	(22.4)
14	7/16	.427	(10.8)	.711	(18.1)	1.00	(25.4)
16	1/2	.480	(12.2)	.790	(20.1)	1.25	(31.8)
20	5/8	.603	(15.3)	.910	(23.1)	1.50	(38.1)
24	3/4	.725	(18.4)	1.070	(27.2)	1.75	(44.5)
28	7/8	.860	(21.8)	1.213	(30.8)	1.88	(47.8)
32	1	.970	(24.6)	1.366	(34.7)	2.25	(57.2)
40	1 1/4	1.205	(30.6)	1.679	(42.6)	2.75	(69.9)
48	1 1/2	1.437	(36.5)	1.972	(50.1)	3.25	(82.6)
56	1 3/4	1.688	(42.9)	2.222	(56.4)	3.63	(92.2)
64	2	1.937	(49.2)	2.472	(62.8)	4.25	(108.0)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Consult factory for thin-wall, close convolution combination.
3. For PTFE maximum lengths consult factory.
4. Consult factory for PEEK™ min/max dimensions.

377-041
Composite Fiber-Optic Conduit Backshell
Self-Locking Rotatable Coupling

CONNECTOR DESIGNATOR:
H - MIL-DTL-38999 Series III and IV **U** - DG123 and DG123A
SELF-LOCKING
ROTATABLE COUPLING
STANDARD PROFILE

Product Series
377 - Fiber Optic Strain Relief

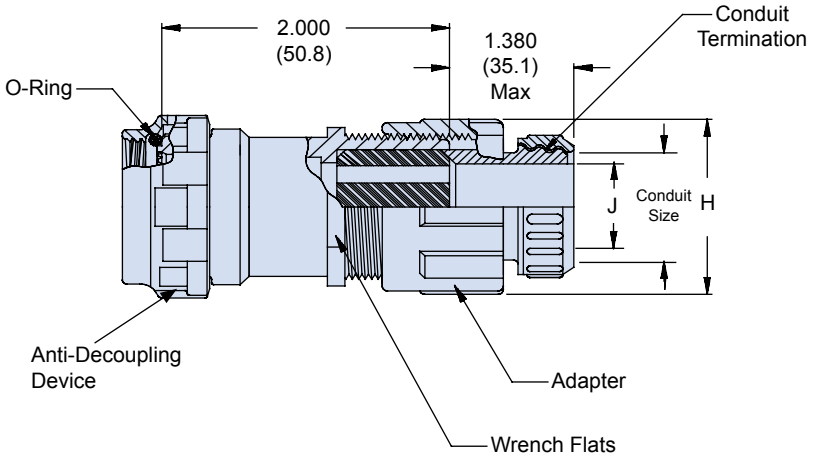
Angle and Profile
S - Straight
W - 90° Elbow

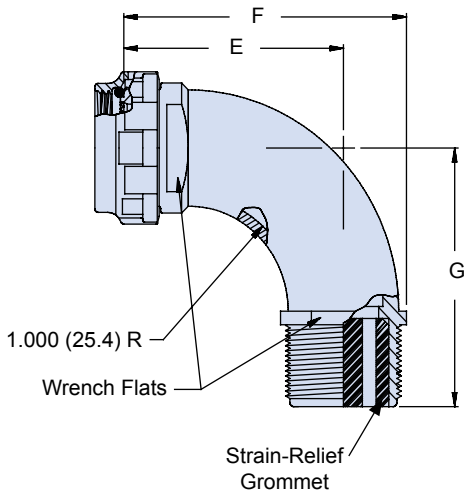
Finish Symbol
(*See Table I*)

Add letter **K** for transition to accomodate PEEK conduit material. **Omit** for standard Teflon conduit material.

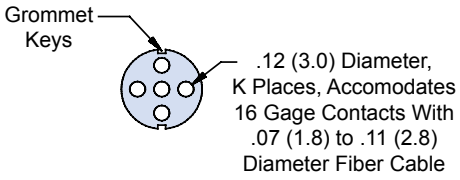
377	H	S	041	XM	19	K	T
	Connector Designator *H and U*		**Basic Part Number**	**Connector Shell Size** (*See Table II*)		**Shrink Boot Option** (*Omit for none*)	

C





* Conduit I.D. Accomodates Glenair Series 74 Type A Convoluted Tubing, In Accordance With SAE-AMS-T-81914.



Note: See Table II For Front-End Details and Shell Size References

TABLE I	
Symbol	**Finish Description**
XB	No Plating - Black Color, Non-Conductive
XO	No Plating - Brown Color, Non-Conductive

TABLE II: CONNECTOR SHELL SIZE ORDER NUMBER

Shell Size For Conn. Desig.		E		F		G		H		J		Conduit	K (# of Holes) *	
H	U	± .06	(1.5)	± .09	(2.3)	± .06	(1.5)	(Max)		(Ref.)		Size	Code H	Code U
11	---	1.70	(43.2)	2.39	(60.7)	1.90	(48.3)	1.41	(35.8)	.270	(6.9)	12	2	---
13	11	1.78	(45.2)	2.47	(62.7)	1.96	(49.8)	1.41	(35.8)	.330	(8.4)	14	4	2
15	13	1.82	(46.2)	2.51	(63.8)	2.02	(51.3)	1.41	(35.8)	.390	(9.9)	16	5	4
17	15	1.89	(48.0)	2.70	(68.6)	2.09	(53.1)	1.64	(41.7)	.510	(13.0)	20	8	5
19	17	1.93	(49.0)	2.74	(69.6)	2.13	(54.1)	1.64	(41.7)	.640	(16.3)	24	11	8
21	19	2.00	(50.8)	2.94	(74.7)	2.19	(55.6)	1.89	(48.0)	.770	(19.6)	28	16	11
23	21	2.08	(52.8)	3.02	(76.7)	2.25	(57.2)	1.89	(48.0)	.890	(22.6)	32	21	16
25	23	2.14	(54.4)	3.20	(81.3)	2.32	(58.9)	2.16	(54.9)	.890	(22.6)	32	29	21
---	25	2.22	(56.4)	3.28	(83.3)	2.39	(60.7)	2.16	(54.9)	.890	(22.6)	32	---	29

* Use Glenair 687-142 seal plug in vacant holes

Metric dimensions (mm) are in parentheses and are for reference only.

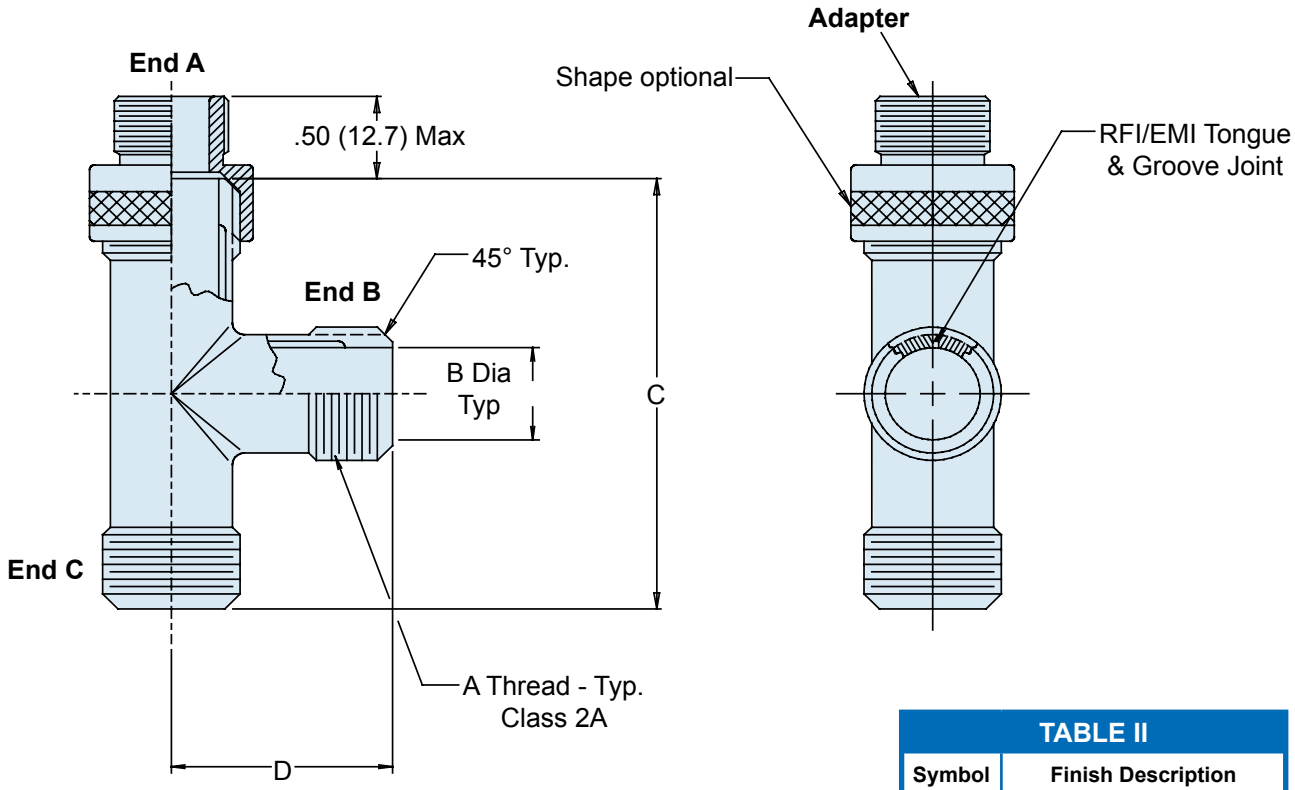
Glenair®

710-318
Composite Split Junction Fitting
"T" Configuration

Basic Part Number	End A Fitting (See Table I)	End C Fitting (See Table I)		
710-318	XM	03	04	05
	Finish Symbol (See Table II)	End B Fitting (See Table I)		

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Transitions mate to 710S269, S270 and S271 adapters.
3. When all ends are identical, insert only one dash number. When multiple dash numbers are ordered, transition size will be determined by the largest. Adapter may be supplied on smaller entries. Letter to follow entry will be supplied with adapters.



C

TABLE I: END ORDER NUMBER AND DIMENSIONS

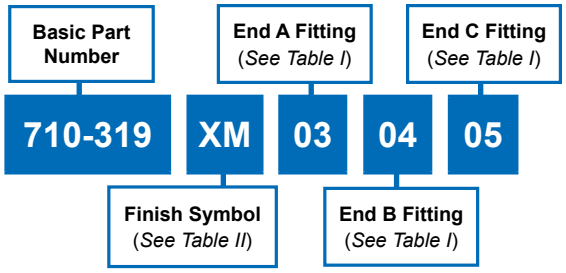
End No.	A Thread Unified	B Dia		C Max		D Max		Weight in Pounds Max.
01	.750 - 20	.500	(12.7)	2.375	(60.3)	1.187	(30.1)	.082
02	1.000 - 20	.750	(19.1)	2.625	(66.7)	1.312	(33.3)	.114
03	1.312 - 18	1.000	(25.4)	2.875	(73.0)	1.437	(36.5)	.160
04	1.500 - 18	1.250	(31.8)	3.125	(79.4)	1.652	(42.0)	.191
05	2.000 - 18	1.625	(41.3)	3.500	(88.9)	1.750	(44.5)	.273
06	.500 - 20	.281	(7.1)	2.125	(54.0)	1.062	(27.0)	.031
07	.625 - 24	.375	(9.5)	2.250	(57.2)	1.125	(28.6)	.043

TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

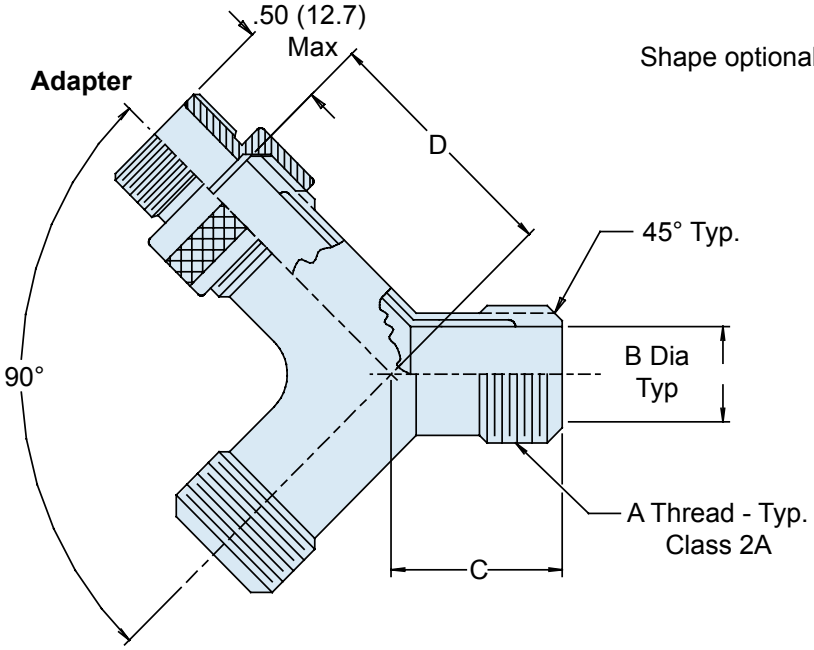
CAGE Code 06324 Printed in U.S.A.

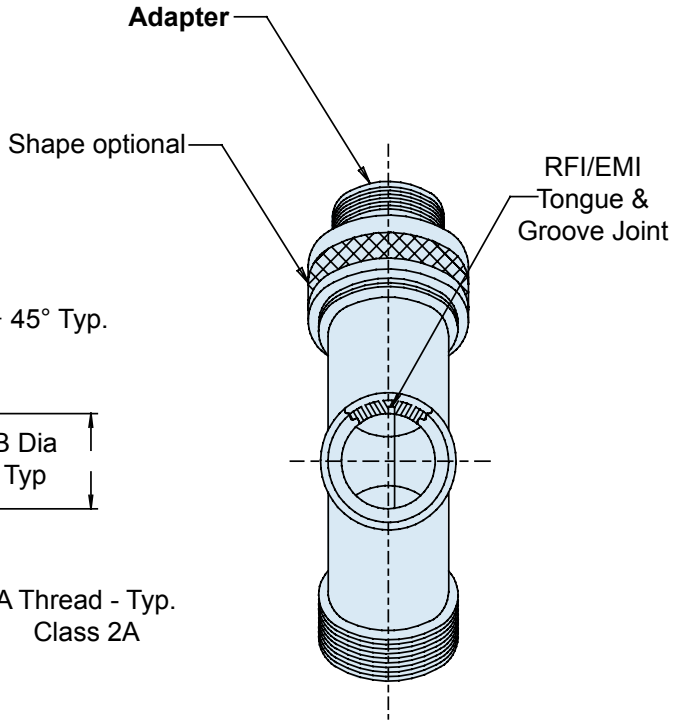
710-319
Composite Split Junction Fitting
"Y" Configuration



APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Transitions mate to 710S269, S270 and S271 adapters.
3. When all ends are identical, insert only one dash number. When multiple dash numbers are ordered, transition size will be determined by the largest. Adapter may be supplied on smaller entries. Letter to follow entry will be supplied with adapters.





C

TABLE I: END ORDER NUMBER AND DIMENSIONS

End No.	A Thread Unified	B Dia		C Max		D Max	
01	.750 - 20	.500	(12.7)	1.312	(33.3)	1.312	(33.3)
02	1.000 - 20	.750	(19.1)	1.500	(38.1)	1.500	(38.1)
03	1.312 - 18	1.000	(25.4)	1.937	(49.2)	1.937	(49.2)
04	1.500 - 18	1.250	(31.8)	2.187	(55.5)	2.187	(55.5)
05	2.000 - 18	1.625	(41.3)	2.625	(66.7)	2.625	(66.7)

TABLE II

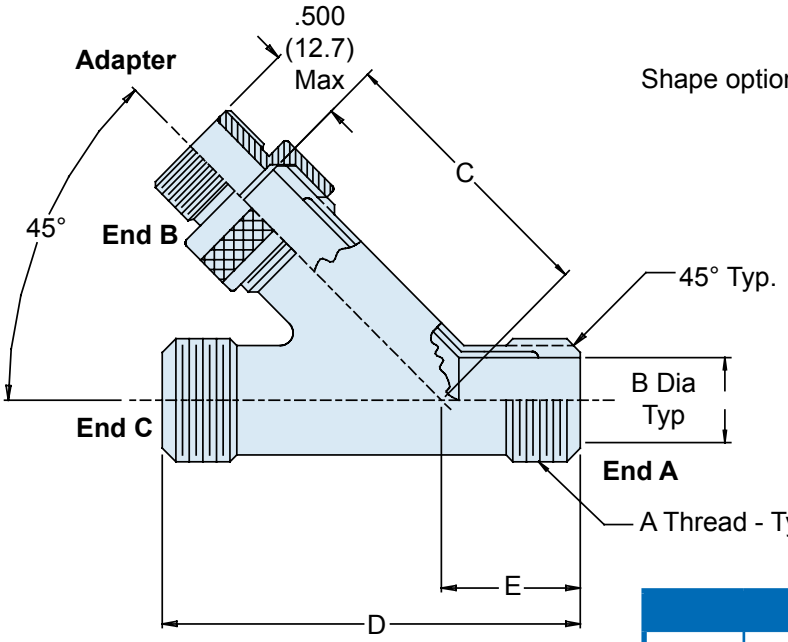
Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

710-320
Composite Split Junction Fitting
Straight with 45° Branch Configuration

Basic Part Number	End A Fitting (See Table I)	End C Fitting (See Table I)		
710-320	XM	03	04	05
	Finish Symbol (See Table II)	End B Fitting (See Table I)		

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Transitions mate to 710S269, S270 and S271 adapters.
3. When all ends are identical, insert only one dash number. When multiple dash numbers are ordered, transition size will be determined by the largest. Adapter may be supplied on smaller entries. Letter to follow entry will be supplied with adapters.



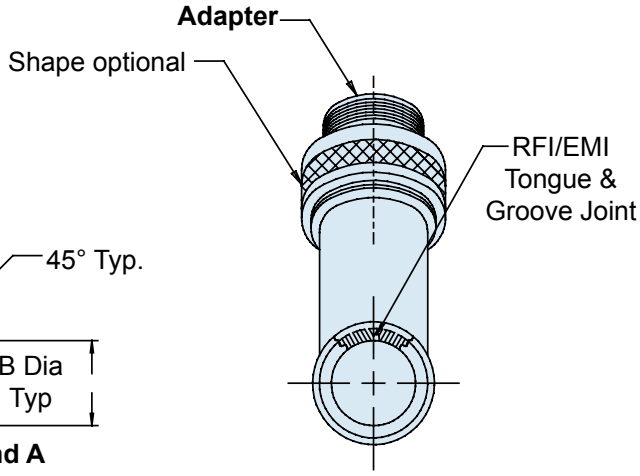


TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Condctive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

TABLE I: END ORDER NUMBER AND DIMENSIONS

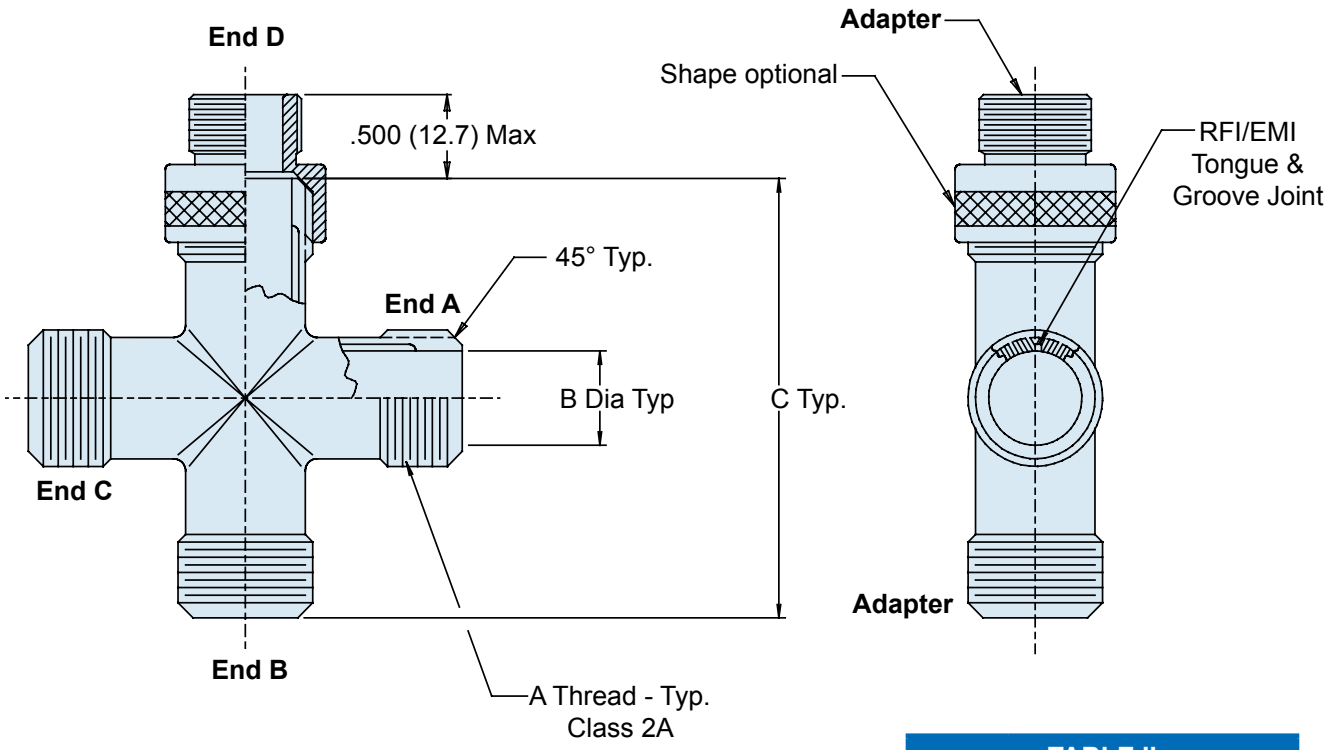
End No.	A Thread Unified	B Dia	C Max	D Max	E Max	Weight in Pounds Max.
01	.750 - 20	.500 (12.7)	2.250 (57.2)	3.000 (76.2)	1.125 (28.6)	.093
02	1.000 - 20	.750 (19.1)	2.500 (63.5)	3.375 (85.7)	1.188 (30.2)	.132
03	1.312 - 18	1.000 (25.4)	2.875 (73.0)	4.000 (101.6)	1.333 (33.9)	.192
04	1.500 - 18	1.250 (31.8)	3.125 (79.4)	4.375 (111.1)	1.458 (37.0)	.235
05	2.000 - 18	1.625 (41.3)	3.625 (92.1)	5.125 (130.2)	1.708 (43.4)	.347
06	.500 - 20	.281 (7.1)	1.750 (44.5)	2.625 (66.7)	1.000 (25.4)	.034
07	.625 - 24	.375 (9.5)	2.062 (52.4)	2.750 (69.9)	1.062 (27.0)	.047

710-321
Composite Split Junction Fitting
Plus ("+") Configuration

Basic Part Number	End A Fitting (See Table I)		End C Fitting (See Table I)		
710-321	XM	03	04	05	06
	Finish Symbol (See Table II)	End B Fitting (See Table I)		End D Fitting (See Table I)	

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Transitions mate to 710S269, S270 and S271 adapters.
3. When all ends are identical, insert only one dash number. When multiple dash numbers are ordered, transition size will be determined by the largest. Adapter may be supplied on smaller entries. Letter to follow entry will be supplied with adapters.



C

TABLE I: END ORDER NUMBER AND DIMENSIONS

End No.	A Thread Unified	B Dia		C Max		Weight in Pounds Max.
01	.750 - 20	.500	(12.7)	2.375	(60.3)	.109
02	1.000 - 20	.750	(19.1)	2.625	(66.7)	.152
03	1.312 - 18	1.000	(25.4)	2.875	(73.0)	.213
04	1.500 - 18	1.250	(31.8)	3.125	(79.4)	.254
05	2.000 - 18	1.625	(41.3)	3.500	(88.9)	.364
06	.500 - 20	.281	(7.1)	2.125	(54.0)	.041
07	.625 - 24	.375	(9.5)	2.250	(57.2)	.057

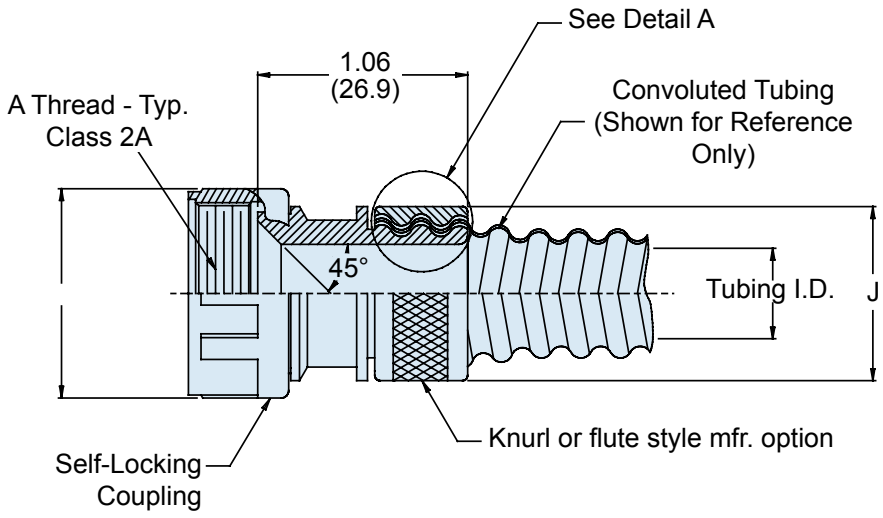
TABLE II

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

712S269
Composite Shrink Boot Conduit Fitting
For Glenair Series 74 Helical Convoluted Tubing

Basic Part Number	Conduit Fitting Shell Size (See Table I)	Product Series		Finish Symbol (See Table III)	Tubing Size (See Table II)	Optional Adhesive Land Configuration (See Detail A)
712S269	XM	03	24	K	A	

Product Series
K - For use with PEEK conduit material.
(Omit for PFA, ETFE, FEP or PTFE)



DETAIL A
Optional Adhesive
Land Configuration
(See Part Number)

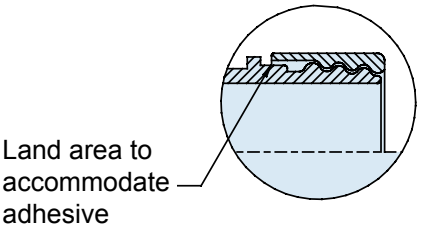


TABLE III	
Symbol	**Finish Description**
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

TABLE I: CONDUIT FITTING SHELL SIZE			
Shell Size	**A Thread Unified**	**Max Conduit Size Table 2**	**Weight in Pounds Max.**
01	.750 - 20	16	.032
02	1.000 - 20	24	.043
03	1.312 - 18	32	.057
04	1.500 - 18	40	.070
05	2.000 - 18	64	.094
06	.500 - 20	09	.030
07	.625 - 24	12	.031

TABLE II: TUBING SIZE				
Tubing Size	**Conduit I.D.**		**J Dia Max**	
06	.188	(4.8)	.790	(20.1)
09	.281	(7.1)	.985	(25.0)
10	.312	(7.9)	.985	(25.0)
12	.375	(9.5)	1.035	(26.3)
14	.437	(11.1)	1.100	(27.9)
16	.500	(12.7)	1.160	(29.5)
20	.625	(15.9)	1.285	(32.6)
24	.750	(19.1)	1.480	(37.6)
28	.875	(22.2)	1.670	(42.4)
32	1.000	(25.4)	1.720	(43.7)
40	1.250	(31.8)	2.100	(53.3)
48	1.500	(38.1)	2.420	(61.5)
56	1.750	(44.5)	2.660	(67.6)
64	2.000	(50.8)	2.910	(73.9)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Convoluted tubing to be ordered seperately. See Type A.
3. Mates to 710-318, -319, -320 and -321 transitions
4. Coupling nut supplied unplated.
5. For permanent termination use 3M Scotch Weld after installing tubing. See detail A.

CAGE Code 06324
Printed in U.S.A.

712S270
Composite EMI/RFI Single Shield Termination
Conduit Fitting
For Glenair Series 74 Helical Convoluted Tubing

Basic Part Number	Conduit Fitting Shell Size (See Table I)	Product Series K - For use with PEEK conduit material. (Omit for PFA, ETFE, FEP or PTFE)		
712S270	XM	03	24	K
	Finish Symbol (See Table III)	Tubing Size (See Table II)		

TABLE III

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

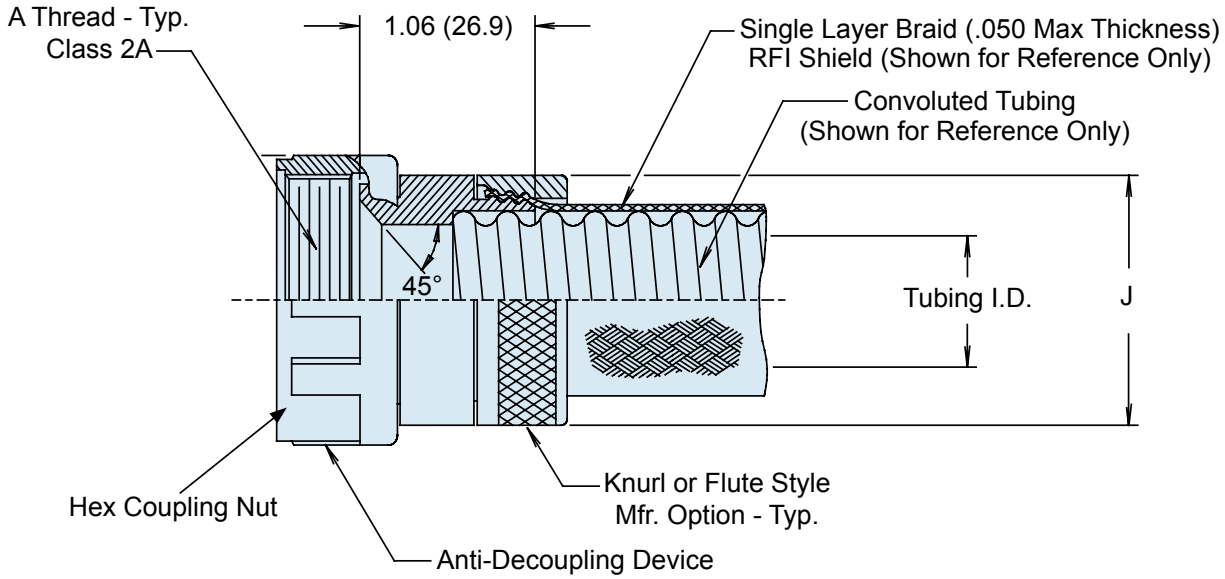


TABLE I: CONDUIT FITTING SHELL SIZE

Shell Size	A Thread Unified	Max Conduit Size Table 2	Weight in Pounds Max.
01	.750 - 20	16	.035
02	1.000 - 20	24	.047
03	1.312 - 18	32	.062
04	1.500 - 18	40	.077
05	2.000 - 18	64	.104
06	.500 - 20	09	.030
07	.625 - 24	12	.031

TABLE II: TUBING SIZE

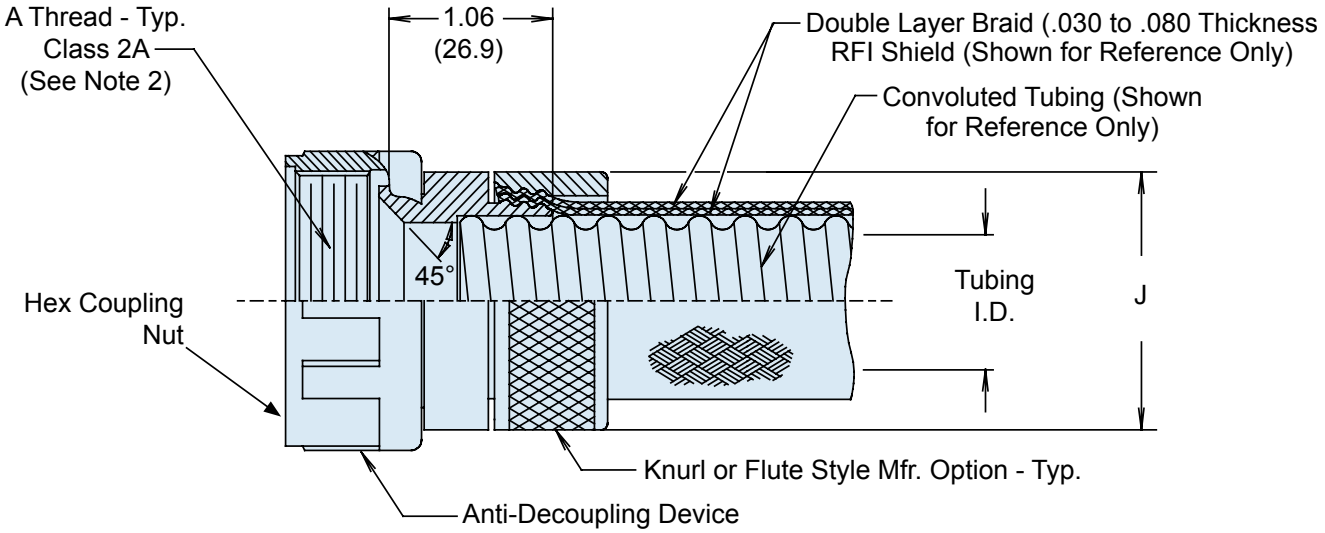
Tubing Size	Conduit I.D.		J Dia Max	
06	.188	(4.8)	.790	(20.1)
09	.281	(7.1)	.985	(25.0)
10	.312	(7.9)	.985	(25.0)
12	.375	(9.5)	1.035	(26.3)
14	.437	(11.1)	1.100	(27.9)
16	.500	(12.7)	1.160	(29.5)
20	.625	(15.9)	1.285	(32.6)
24	.750	(19.1)	1.480	(37.6)
28	.875	(22.2)	1.670	(42.4)
32	1.000	(25.4)	1.720	(43.7)
40	1.250	(31.8)	2.100	(53.3)
48	1.500	(38.1)	2.420	(61.5)
56	1.750	(44.5)	2.660	(67.6)
64	2.000	(50.8)	2.910	(73.9)

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Convoluted tubing to be ordered seperately. See Type B, D and E.
3. Mates to 710-318, -319, -320 and -321 transitions
4. Coupling nut supplied unplated.

712S271
Composite Dual EMI/RFI Shield Termination
Conduit Fitting
For Glenair Series 74 Helical Convoluted Tubing

Basic Part Number	Conduit Fitting Shell Size (See Table I)		Product Series K - For use with PEEK conduit material. (Omit for PFA, ETFE, FEP or PTFE)	
712S271	XM	03	24	K
	Finish Symbol (See Table III)		Tubing Size (See Table II)	



APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Convoluted tubing to be ordered seperately. See Type E tubing.
3. Mates to 710-318, -319, -320 and -321 transitions
4. Coupling nut supplied unplated.

TABLE I: CONDUIT FITTING SHELL SIZE			
Shell Size	A Thread Unified	Max Conduit Size Table 2	Weight in Pounds Max.
01	.750 - 20	16	.035
02	1.000 - 20	24	.047
03	1.312 - 18	32	.062
04	1.500 - 18	40	.077
05	2.000 - 18	64	.104
06	.500 - 20	09	.030
07	.625 - 24	12	.031

TABLE II: TUBING SIZE				
Tubing Size	Conduit I.D.		J Dia Max	
06	.188	(4.8)	.790	(20.1)
09	.281	(7.1)	.985	(25.0)
10	.312	(7.9)	.985	(25.0)
12	.375	(9.5)	1.035	(26.3)
14	.437	(11.1)	1.100	(27.9)
16	.500	(12.7)	1.160	(29.5)
20	.625	(15.9)	1.285	(32.6)
24	.750	(19.1)	1.480	(37.6)
28	.875	(22.2)	1.670	(42.4)
32	1.000	(25.4)	1.720	(43.7)
40	1.250	(31.8)	2.100	(53.3)
48	1.500	(38.1)	2.420	(61.5)
56	1.750	(44.5)	2.660	(67.6)
64	2.000	(50.8)	2.910	(73.9)

TABLE III	
Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

712-419
Composite Conduit-to-Connector Adapter
Straight, 45° and 90°
For Glenair Series 74 Helical Convoluted Tubing

Product Series	Angle and Profile		Finish Symbol	Tubing Size	To Accomodate EMI or Dacron Over Braid				
712 - Conduit Adapter	*S - Straight* *T - 45° Elbow* *W - 90° Elbow*		(See Table III)	(See Table II)	(Omit if not required)				
712	**F**	**T**	**419**	**XM**	**19**	**12**	**K**	**1**	**A**
Connector Designator *A, F, H and U*			**Basic Part Number**	**Connector Shell Size** (See Table I)		**Tubing Option** *K - PEEK* (Omit for PFA, ETFE, FEP or PTFE; see note 2)		**Optional Configuration** (See Detail A)	

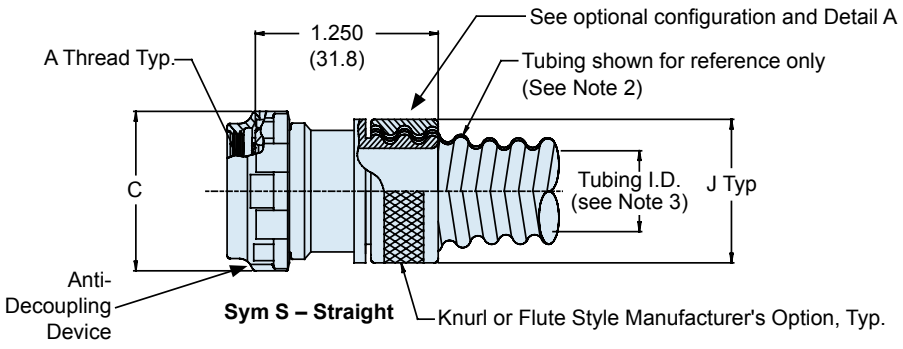
CONNECTOR DESIGNATOR:

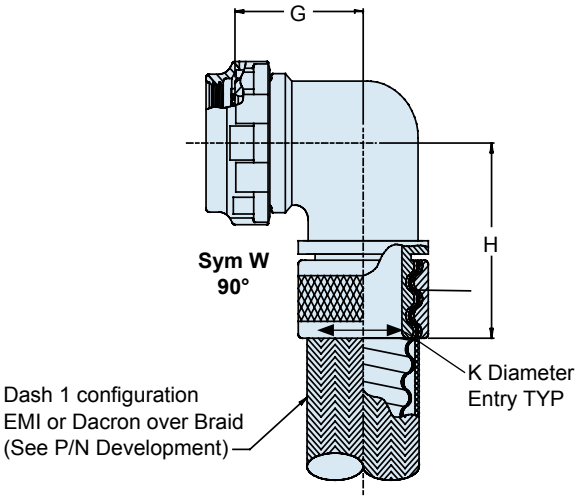
A - MIL-DTL-5015 / -26482 / -83723
F - MIL-DTL-38999 Series I, II
H - MIL-DTL-38999 Series III and IV
U - DG123 and DG123A

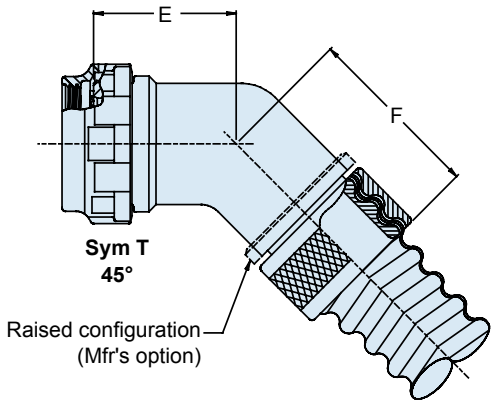
SELF-LOCKING

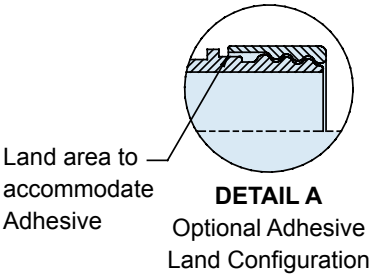
ROTATABLE COUPLING

LOW PROFILE









712-419
Composite Conduit-to-Connector Adapter
Straight, 45° and 90°
For Glenair Series 74 Helical Convoluted Tubing

Glenair®

C

TABLE I: CONNECTOR SHELL SIZE ORDER NUMBER

Shell Size A,F & H	Shell Size G & U	E ±.06 (1.5)	F ±.09 (2.3)	G ±.06 (1.5)	H ±.09 (2.3)	Tubing Size Max.
08, 09	–	.72 (18.3)	.89 (22.6)	.69 (17.5)	1.11 (28.2)	09
03, 10, 11	08	.75 (19.1)	.95 (24.1)	.75 (19.1)	1.16 (29.5)	12
12, 13	10, 11	.75 (19.1)	1.02 (25.9)	.81 (20.6)	1.22 (31.0)	16
14, 15	12, 13	.76 (19.3)	1.05 (26.7)	.88 (22.4)	1.29 (32.8)	20
16, 17	14, 15	.78 (19.8)	1.07 (27.2)	.94 (23.9)	1.35 (34.3)	24
18, 19	16, 17	.79 (20.1)	1.08 (27.4)	.97 (24.6)	1.38 (35.1)	28
20, 21	18, 19	.82 (20.8)	1.11 (28.2)	1.06 (26.9)	1.47 (37.3)	32
22, 23	20	.86 (21.8)	1.15 (29.2)	1.13 (28.7)	1.54 (39.1)	32
24, 25, 61	22, 23	.89 (22.6)	1.18 (30.0)	1.19 (30.2)	1.73 (43.9)	40
28	24, 25	.92 (23.4)	1.21 (30.7)	1.34 (34.0)	1.82 (46.2)	40

TABLE II: TUBING SIZE

Tubing Size	Conduit I.D.	J Dia Max	K Dia. Entry ± .03 (.76)
06	.188 (4.8)	.54 (13.7)	.12 (3.0)
09	.281 (7.1)	.63 (16.0)	.22 (5.6)
10	.312 (7.9)	.69 (17.5)	.24 (6.1)
12	.375 (9.5)	.73 (18.5)	.29 (7.4)
14	.437 (11.1)	.80 (20.3)	.34 (8.6)
16	.500 (12.7)	.87 (22.1)	.40 (10.2)
20	.625 (15.9)	1.00 (25.4)	.52 (13.2)
24	.750 (19.1)	1.18 (30.0)	.65 (16.5)
28	.875 (22.2)	1.32 (33.5)	.78 (19.8)
32	1.000 (25.4)	1.47 (37.3)	.90 (22.9)
40	1.250 (31.8)	1.76 (44.7)	1.08 (27.4)
48	1.500 (38.1)	2.13 (54.1)	1.32 (33.5)

TABLE III

Symbol	Finish Description
XB	No Plating - Black Color (Non-Conductive Finish)
XM	2000 Hour Corrosion Resistant Electroless Nickel
XMT	2000 Hour Corrosion Resistant Ni-PTFE, Nickel-Fluorocarbon Polymer. *1000 Hour Grey™*
XO	No Plating - Brown Color (Non-Conductive Finish)
XW	2000 Hour Corrosion Resistant Cadmium/Olive Drab over Electroless Nickel

APPLICATION NOTES

1. Metric dimensions (mm) are in parentheses and are for reference only.
2. Convoluted tubing size, tubing to be ordered separately (see Series 74 Catalog, Type A Tubing Section, Standard Pitch). Dash 1 configuration accommodates Type B or D Tubing. For PTFE maximum lengths - consult factory.
3. Different adapters are necessary to terminate PEEK tubing. Nominal I.D. reduced by approximately .060 (use Suffix P) in P/N development. For permanent termination use 3M Scotch Weld after installing tubing/shielding, see Detail A.

Glenair Composite Braid Doesn't Make the Fire Scout Fly...

...But It Sure Helps

When Northrop Grumman faced the challenge of reducing total system weight of the MQ-8B Fire Scout without sacrificing performance, they turned to their suppliers for help. Glenair suggested replacing the braided metal shielding used in the revolutionary aircraft with our lighter weight composite product. We explained the potential weight savings could be as much as 35% compared to the current base cable harness design, equipped with tin/copper shielding. The integration of composite EMI/RFI braid would not only reduce weight, but also improve the system's corrosion resistance and durability—all at no added risk to sensitive electronic equipment.

As it turned out, the use of composite shielding reduced the main cable harness assembly by 12.5 Lbs.—not an insignificant amount when reduced fuel fractions and the ability to remain aloft for extended periods are key mission requirements.

Glenair®

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Glenair Composite Metal-Clad Lightweight AmberStrand® EMI/RFI Braided Shielding

For many applications, the cable shield is the most important element in controlling EMI. Unfortunately, metal shielding—especially when applied in multiple layers—can be extremely heavy. The opportunity to provide robust EMI shielding at a fraction of the weight is the principal advantage of composite thermoplastic braid made from AmberStrand® material. Transfer impedance test reports demonstrate the effectiveness of the material as compared to conventional metal solutions. Mechanical properties are comparable to other non-metallic materials (see Table I).

Electrically Conductive

Superior High Frequency Shielding in High Temperature Applications

Pure AmberStrand® and Blended AmberStrand®/Nickel Copper Configurations

Comparable Performance to 36 AWG Tubular Copper Braid

Lightweight, Corrosion-Free

100 Feet of 5/8" AmberStrand Vs. Tinned Copper Shield Saves 5+ Pounds

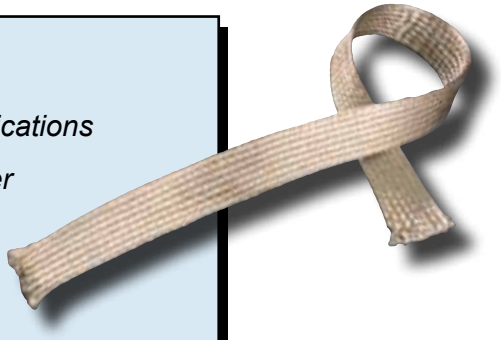


TABLE I: AMBERSTRAND® MECHANICAL PERFORMANCE COMPARED TO OTHER MATERIALS

Material Type	AmberStrand® (Thermoplastic)	PEEK (Monofil)	Teflon (Yarn)	Kevlar (Yarn)	Dacron (Yarn)	Halar (Monofil)	Teflon FEP (Monofil)	Nomex (Yarn)	Polyester Type FR (Monofil)	Ryton Type R-7 (Monofil)
Glenair P/N	103-026 103-027	102-051	102-061	102-071	102-073	102-023	102-060	103-013	102-001 102-002	102-080
Temperature Range	-65° C to +200°C	-65° C to +260°C	-55° C to +260°C	-55° C to +200°C	-73° C to +175°C	-62° C to +150°C	-65° C to +200°C	-55° C to +260°C	-55° C to +125°C	-55° C to +200°C
Tensile Strength (PSI) Yield	590,000	780,000	40,000	400,000	160,000	35,000	14,000	90,000	50,000	19,000
Elongation %	2.5%	38%	19%	3.6%	12%	15%	50%	252%	20%	35%
Chemical Resistance	Excellent	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Good	Excellent
Abrasion Resistance	Good	Excellent	Good	Good	Excellent	Excellent	Good	Good	Good	Excellent
Specific Gravity	1.45	1.30	2.10	1.44	1.38	1.68	2.17	1.58	1.38	1.25
Flammability	Will Not Burn	Very Low	Will Not Burn	Will Not Melt	Flammable	Flammable	Very Low	Will Not Melt	Very Low	Very Low

* Weight savings based on comparison to 36 AWG A-A-59569 tubular copper braid

 CAGE Code 06324 Printed in U.S.A.

103-026
100% AmberStrand® Composite Braid
for EMI Shielding Applications

Glenair®

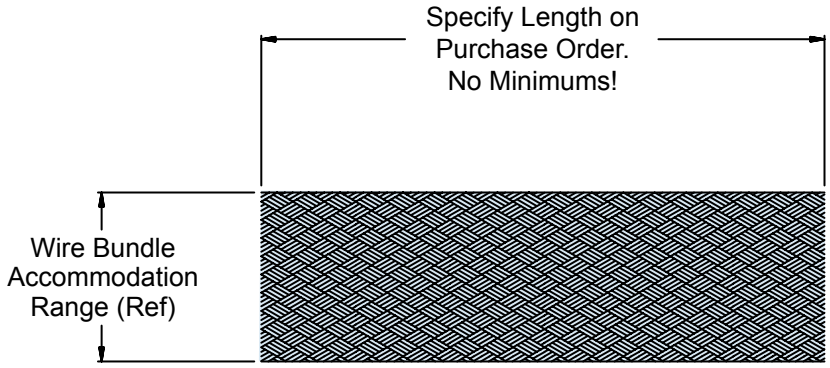
TABLE I			
Dash Number	Nominal I.D. (Ref.)	Ref. Wire Bundle Range	Approximate Grams Per Foot
004	.125 (3.2)	.093 (2.4) .140 (3.5)	1.0
008	.250 (6.4)	.125 (3.2) .312 (7.9)	1.8
012	.375 (9.5)	.250 (6.4) .437 (11.1)	2.3
016	.500 (12.7)	.250 (6.4) .375 (15.0)	3.7
020	.625 (15.9)	.375 (9.5) .700 (17.8)	4.4
024	.750 (19.1)	.500 (12.7) .830 (21.1)	5.2
032	1.000 (25.4)	.780 (19.8) 1.100 (27.94)	8.0
040	1.250 (31.8)	.938 (23.8) 1.312 (33.3)	10.0
048	1.500 (38.1)	1.187 (30.1) 1.590 (40.37)	15.2
064	2.000 (50.8)	1.312 (33.3) 2.090 (53.08)	22.0

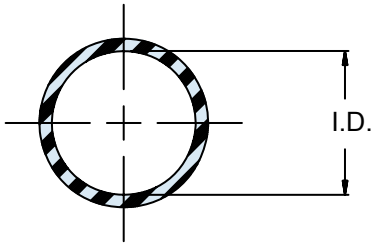
Product Series
103 - Braided Shielding

Dash Number

103 - 026 - 024

100% AmberStrand Metal-Clad Composite





APPLICATION NOTES

1. Marking - Label individual packages.
2. Material - Nickel Clad/Thermoplastic, silver color.
   Braid angle all sizes 40° - 50°
3. Braid is made from Nickel-plated AmberStrand® composite thermoplastic fibers. AmberStrand® is a registered trademark of Syscom Advanced Materials, Inc.
4. Metric dimensions (mm) are in parentheses and for reference only.

103-027
75% / 25% AmberStrand® Composite / NiCu Braid
for EMI Shielding Applications

Glenair®

TABLE I

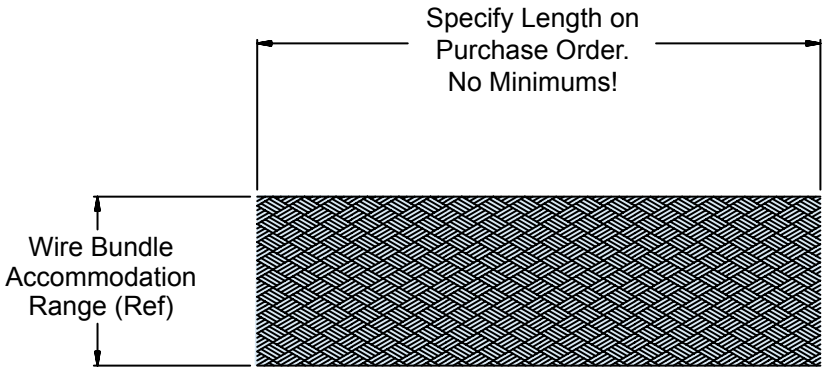
Dash Number	Nominal I.D. (Ref.)	Ref. Wire Bundle Range	Approximate Grams Per Foot	Carrier Breakdown
004	.125 (3.2)	.093 (2.4) .140 (3.5)	1.5	16 - AmberStrand® 4 - Nickel Copper
008	.250 (6.4)	.125 (3.2) .312 (7.9)	2.4	24 - AmberStrand® 8 - Nickel Copper
012	.375 (9.5)	.250 (6.4) .437 (11.1)	3.9	36 - AmberStrand® 12 - Nickel Copper
016	.500 (12.7)	.375 (9.5) .550 (13.9)	6.0	54 - AmberStrand® 18 - Nickel Copper
020	.625 (15.9)	.375 (9.5) .700 (17.8)	6.4	54 - AmberStrand® 18 - Nickel Copper
024	.750 (19.1)	.500 (12.7) .830 (21.1)	7.2	72 - AmberStrand® 24 - Nickel Copper
032	1.000 (25.4)	.780 (19.8) 1.100 (27.94)	11.0	48 - AmberStrand® 16 - Nickel Copper
040	1.250 (31.8)	.938 (23.8) 1.312 (33.3)	15.0	72 - AmberStrand® 24 - Nickel Copper
048	1.500 (38.1)	1.187 (30.1) 1.590 (40.37)	25.2	72 - AmberStrand® 24 - Nickel Copper
064	2.000 (50.8)	1.312 (33.3) 2.090 (53.08)	32.0	72 - AmberStrand® 24 - Nickel Copper

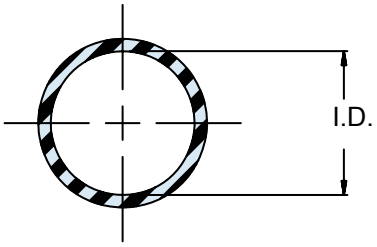
Product Series
103 - Braided Shielding

Dash Number

103 - 027 - 024

75%/25% Blended AmberStrand® Composite / NiCu Braid





D

APPLICATION NOTES

1. Marking - Label individual packages.
2. Material - Nickel Clad/Thermoplastic, silver color.
   Nickel plated Copper wire/ASTM B355 CL.7 OFHC, 36 awg
   Braid angle all sizes 40° - 50°
3. Consult factory for alternative blend ratios.
4. Braid is made from Nickel-plated AmberStrand® composite thermoplastic fibers. AmberStrand® is a registered trademark of Syscom Advanced Materials, Inc.
5. Metric dimensions (mm) are in parenthesis and for reference only.

102-051
PEEK Tubular Braid (Black)
for Series 74 Convoluted Tubing

Product Series
102 - Braided Shielding

102 - 051 **008**

Tubular Braid Size
(*See Table I*)

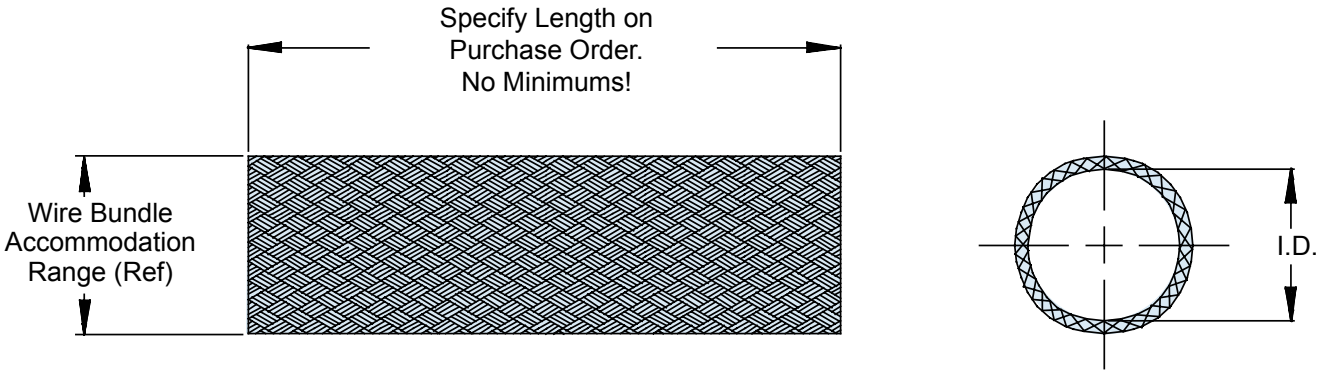


TABLE I: TUBULAR BRAID SIZE ORDER NUMBER

Braid Size	Nominal I.D.	Wire Bundle Accommodation Range Ref. Min.	Max.
004	.125 (3.2)	.125 (3.2)	.312 (7.9)
008	.250 (6.4)	.250 (6.4)	.500 (12.7)
016	.500 (12.7)	.375 (9.5)	.719 (18.3)
024	.750 (19.1)	.500 (12.7)	1.000 (25.4)
040	1.250 (31.8)	.750 (19.1)	1.250 (31.8)

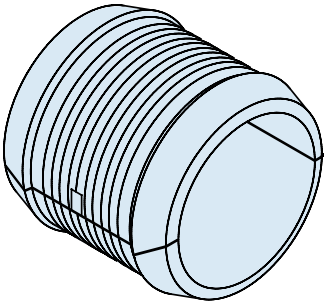
APPLICATION NOTES

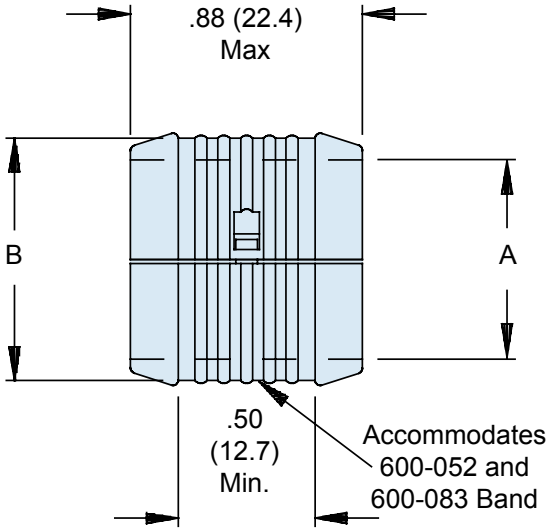
1. Metric dimensions (mm) are in parentheses and are for reference only.

687-749
Composite AS85049/93
Banding Split-Ring

For Use with Glenair Banding Backshells and Braid Socks

Consult Factory for Information on Other Split Ring Designs and Part Numbers





Basic Number	Cable Entry Diameter (See Table I)	
687-749	XB	16

Finish Symbol
XB - No Plating, Black Material

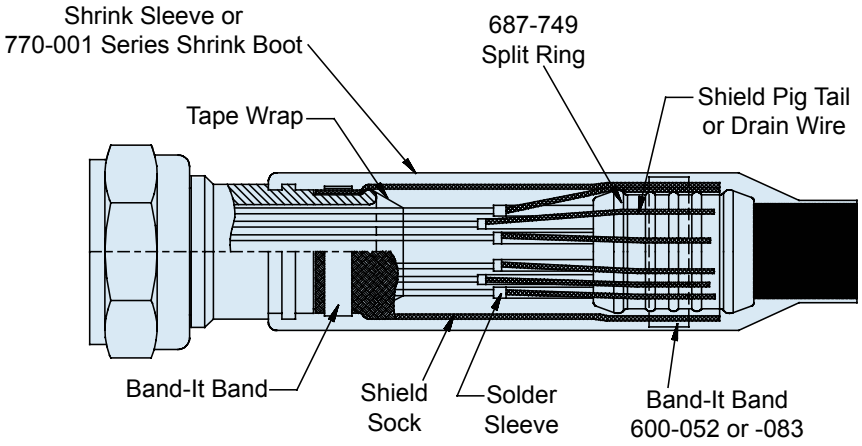
TABLE I: DASH NUMBER

Dash No.	A Diameter ± .03	(0.8)	B Diameter ± .03	(0.8)
04	.25	(6.4)	.36	(9.1)
06	.38	(9.7)	.49	(12.4)
08	.50	(12.7)	.61	(15.5)
10	.63	(16.0)	.74	(18.8)
12	.75	(19.1)	.86	(21.8)
14	.88	(22.4)	.99	(25.1)
16	1.00	(25.4)	1.10	(27.9)
18	1.13	(28.7)	1.24	(31.5)
20	1.25	(31.8)	1.36	(34.5)
22	1.38	(35.1)	1.49	(37.8)
24	1.50	(38.1)	1.61	(40.9)
26	1.63	(41.4)	1.74	(44.2)
28	1.75	(44.5)	1.86	(47.2)

APPLICATION NOTES

1. 687-749 supercedes and replaces 687-207 split ring.
2. Metric dimensions (mm) are in parentheses and are for reference only.

EXAMPLE APPLICATION



Glenair Announces:

140 Series EMI/RFI Composite Boxes

Now NAVSEA Approved for use on U.S. Naval Ships

NAVSEA Approved Composite Electrical Enclosures

Junction Boxes - Electrical Boxes - Sound-Powered Phones

NAVSEA Approval: Glenair advanced, corrosion-control composite electrical boxes are now NAVSEA approved for deployment around the fleet. All testing has been completed and NAVSEA is working with NAVSUP Mechanicsburg to introduce the individual boxes and replacement parts to the stock system. For NAVSEA contact information or for the latest procurement information on the NAVSEA 803-6983506 drawing please contact Glenair @ 818-247-6000.

Glenair salutes and extends its thanks to the many officers and sailors who participated in sea trails to evaluate and perfect the NAVSEA composite box conversion project, including the men and women of the:

- USS Geo. Washington (CVN-73)
- USS Theo. Roosevelt (CVN-71)
- USS Barry (DDG-52)
- USS Comstock (LSD-45)
- USS Vella Gulf (CG-72)
- USS Rushmore (LSD-47)
- USS Enterprise (CVN-65)
- USS D. D. Eisenhower (CVN-69)
- USS Curtis Wilbur (DDG54)
- USS John S. McCain (DDG56)
- USS Whidbey Island (LSD-41)
- USS Germantown (LSD-42)
- USS Fort McHenry (LSD-43)
- USS Harpers Ferry (LSD-49)
- USS Pearl Harbor (LSD-52)

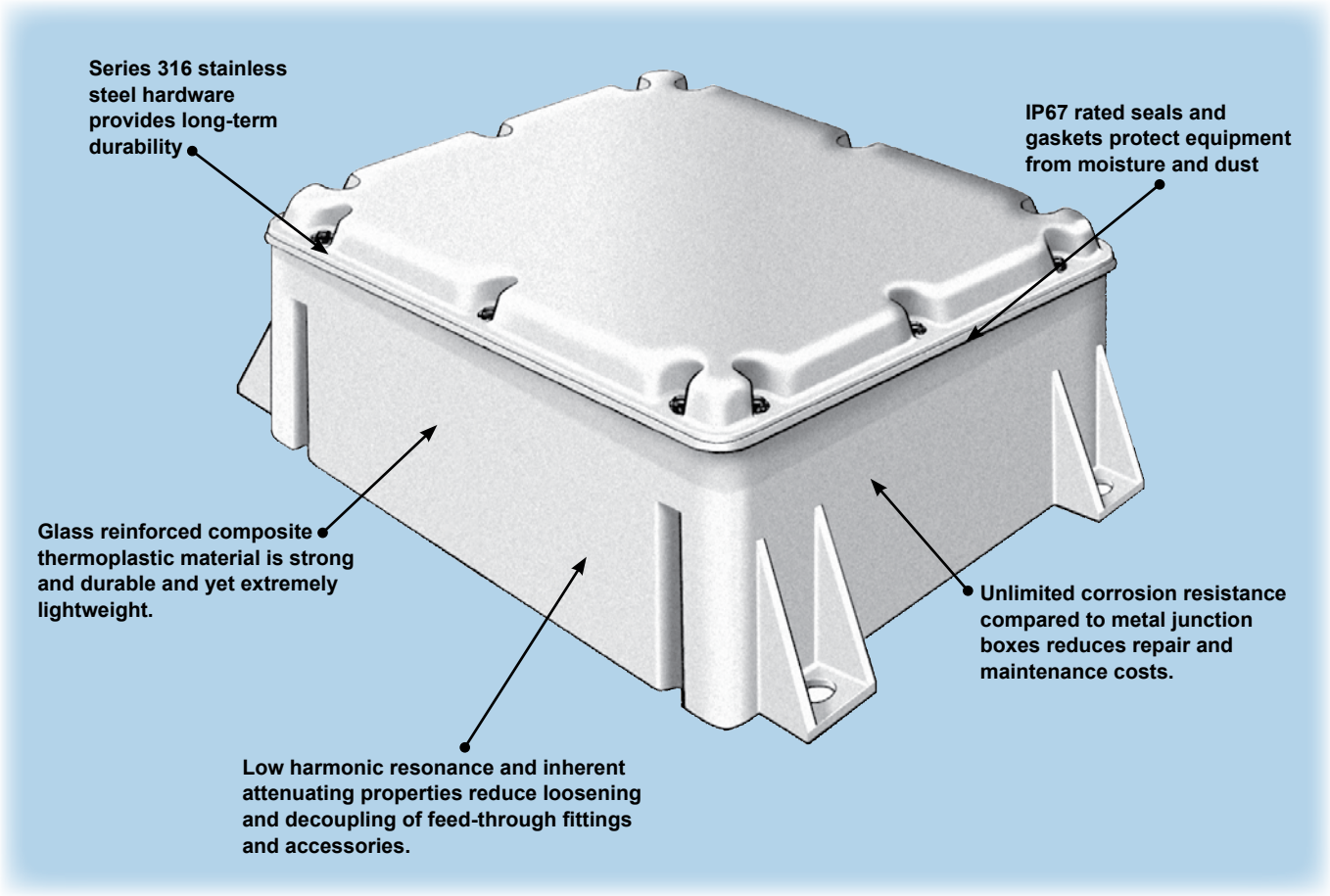
How to Order

Box/Part Type	National Stock Number (NSN)	Glenair Series Part Number	Navy Symbol Number Ref.
Junction Boxes			
Small Round	5975-01-556-7948	140-060XMS-05	-
Small Rectangular	5975-01-556-7957	140-060XMS-01	-
Medium Rectangular	5940-01-557-2672	140-060XMS-02	-
Large Rectangular	5940-01-557-2679	140-060XMS-03	-
Electrical Boxes			
Single Gang	5940-01-557-2645	147-023XMS-01	735.3
Single Gang	5940-01-557-2667	147-023XMS-02	1099.1
Single Gang	5940-01-557-2725	147-033XMS-0003	1098.1
Single Gang	5940-01-557-2719	147-032XMS-0005G	1101
Dual Gang	5975-01-556-9504	147-020XMS-02	-
Dual Gang	5940-01-557-2634	147-020XMS-05	-
Sound Powered Phone Box			
Single Gang	5975-01-556-9617	147-022XMS-01	2841
Dual Gang	5975-01-556-9572	147-021XMS-02	2842
Quad Gang	5940-01-557-2639	147-021XMS-03	2843
Terminal Boxes			
Small Round	5940-01-557-2579	140-060XMS-05T2	5201
Small Round	5940-01-557-2712	140-060XMS-05T4	400
Small Rectangular	5975-01-556-7967	140-060XMS-01T3	435.1
Small Rectangular	5975-01-556-9434	140-060XMS-01T4	528
Small Rectangular	5975-01-556-9443	140-060XMS-01T6	444
Large Rectangular	5975-01-556-9489	140-060XMS-03T1	432.1
Large Rectangular	5940-01-557-2564	140-060XMS-03T2	434
Large Rectangular	5940-01-557-2578	140-060XMS-03T5	529
Large Rectangular	5940-01-215-5963	140-060XMS-03T9	433.1
Large Square	—	140-060XMS-06T1	522.1
Large Square	—	140-060XMS-06T2	446
Large Square	—	140-060XMS-06T3	525
Replacement Parts and Fittings			
Composite Feedthrough Adapter*		637B094XB02102CB	-
Composite Sound-Power Receptacle Connector		227-059XO04W	-
Replacement Sound-Power Flop Lid Cover Assembly		630-038XO-02K	-
Replacement Electrical Flop Lid Cover Assembly		630-038XO-01K	-
Replacement Collar Mate Flop Lid Assembly		630-038XO-04K	-
Replacement Cover Screwkit		687-499-1	-
Turnkey Box/Panel Assemblies			
LSD41 Class Ship Stern Gate Control Panel Assembly		149-003	-
LSD49 Class Ship Stern Gate Control Panel Assembly		149-004	-
CVN Nimitz Class Elevator Control Communication System		147-038XMS-002	-
LSD41 and LSD49 LCAC Docking Light Panel		149-005	

Lots of Junction Boxes are Built for use in Harsh, EMI/RFI Applications. Ours are Built to Save You Money.

Glenair is the recognized leader in composite thermoplastic research and development for the interconnect accessory industry. Glenair's lightweight/ high-strength CostSaver Composite EMI/ RFI Junction Boxes are ideally suited for use in harsh environments where resistance to electromagnetic interference, corrosive fluids, high temperatures, shock and vibration is a critical requirement.

The boxes are designed to meet the shock and vibration requirements of MIL-S-901D and MIL-STD-167SHIPS. Box materials also meet stringent EMI/RFI/HIRF and indirect lightning strike performance specifications.



E

Glenair

Glenair CostSaver Composite EMI/RFI Junction Boxes
Design Guide - Step One

Step One: Specification of a Junction Box Assembly Begins with the Selection of the Right Size Box—Both in Terms of the Internal Volume and the External Package Size.

Glenair's CostSaver Composite Junction Boxes are ideally suited for use in harsh environments where weight savings and resistance to electromagnetic interference, corrosive fluids, high temperatures, shock and vibration are critical requirements.

Compared to aluminum, brass or steel boxes, Glenair's "CostSavers" provide equal or improved RFI/EMI protection, with considerable savings in corrosion-related maintenance.

Glenair boxes are outfitted with captive stainless steel cover screws for additional long-term corrosion resistance.

In retrofit applications, select the most efficient size to fit the existing electronics package. More than one box can sometimes be used efficiently if the electronics package can be split between two or more boxes. For new application designs, please consult the factory for advice on maximizing the use of internal package space.

Small Three-Legged Box (Series 140-106)

The latest box design from Glenair is ideally suited for reduced package-size junction box applications such as LED lighting, switches and other single component applications. Designed to accommodate a 3.5 inch internal mounting plate, the three-legged box is currently in use in a wide range of US Navy applications. Three sides of the hexagonal box, as well as the lid, can accommodate bulkhead fittings. Materials and performance ratings are identical to the other boxes in the Glenair composite box line.

Multi-Port Split Shell Box Series

Glenair now produces two configurations of multi-port split shell composite thermoplastic junction boxes, our 140-200 octagonal design box and our 140-203 twelve port rectangular box. Both designs are equipped with 316L stainless steel fasteners for corrosion resistance. The split-shell design affords easy access for maintenance or access to stored cable loops.

CAGE Code 06324

Printed in U.S.A.

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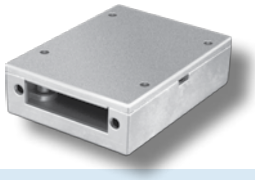
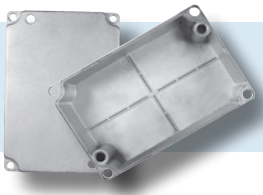
Glenair CostSaver
Rectangular Composite EMI/RFI Junction Boxes
Design Guide - Step One

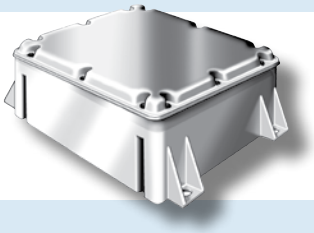
Ultra-Miniature Junction Box (Series 140-074)
Glenair's smallest and lightest box and is designed for non-environmental module-to-chassis applications using MTC connectors. Cover snaps in place without the use of fasteners.

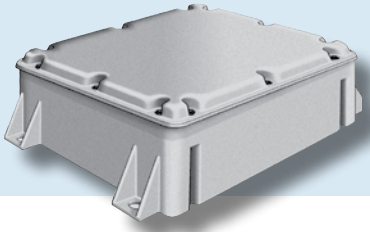




Mini Junction Box (Series 140-100)
Typically used in controlled (non-environmental) applications (such as instrument cases) or as a junction box for miniature connectors.

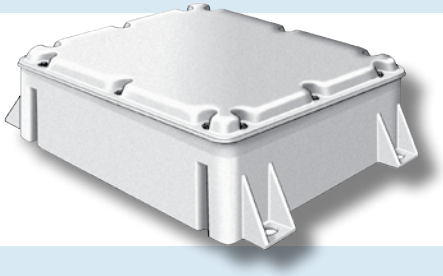
Small Junction Box (Series 140-101)
Designed for use in harsh environmental applications (shipboard weather deck, up-mast, etc.) which require EMI/RFI protection and resistance to vibration and shock.

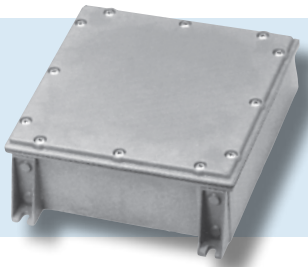




Medium Junction Box (Series 140-102)
Used in high-performance military and commercial applications as a terminal block enclosure, interconnect junction box or instrument case. Size is suitable for larger shell size connectors and fittings.

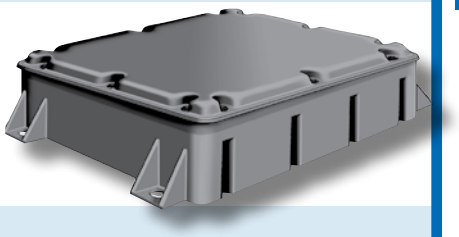
Large Junction Box (Series 140-103)
This large volume box is geared for cable storage and for use in large electrical and optical interconnect junctions. Top and side surface area accommodate large numbers of circular and rectangular connectors and fittings.

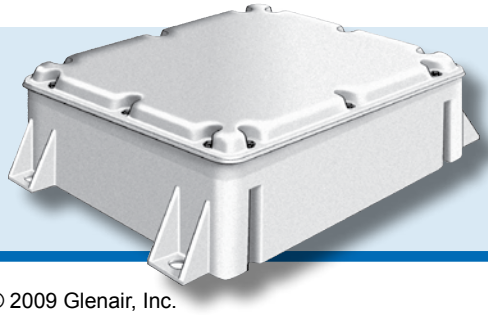




Small Low-Profile Junction Box (Series 140-104)
Ideal for use in limited size and space applications, this composite box is geared for fiber optics and other miniaturized interconnect components. The box has been used extensively in high-performance air and space retrofit applications

Medium Low-Profile Junction Box (Series 140-105)
This low-profile box is geared for tight spaces, such as under-seat cockpit and in-flight-entertainment systems. The box features three (optional) internal dividers for increased isolation of radiated EMI.





Jumbo Junction Box (Series 140-107)
This extra large box is geared for terminal junctions as well as integration of large pieces of electronic and electrical equipment.

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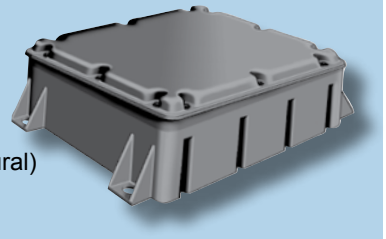
Glenair CostSaver Composite EMI/RFI Junction Boxes
Design Guide - Step Two

Step Two: Select Box Color, Plating and Plating Coverage

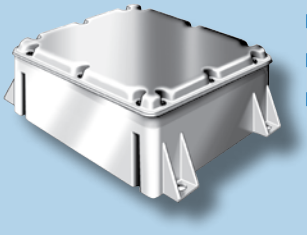
Color: Color pigments may be added directly to the polymer to create a limited range of standard color options. Currently Glenair offers the following box color selections:

- Black
- Blue
- Grey
- Brown (Natural)
- Purple



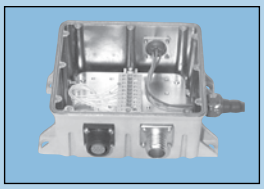
Certain industries and applications have standardized on particular colors and Glenair can provide custom colors as necessary. Colors may affect material performance. For exact matching of custom colors please provide the factory with a PMS color chip number or material sample.

Plating: Glenair offers three standard plating options for EMI/RFI applications:



- Electroless Nickel
- Ni-PTFE
- No Plating, Customer Choice of Base Color

Plating Coverage: Plating may be applied selectively to meet specific EMI/RFI shielding and grounding requirements (Unplated models are selected when the grounding of interconnect components for EMI protection is not required). Internal plating with selectively plated penetrations provides optimal EMI protection and surface durability (scratch resistance) External Plating provides complete electromagnetic compatibility without the cost of selective masking and plating.



Internal Plating Only

Selective Plating

PEI* Resin Withstands Long-Term Exposure to Heat, Moisture and Caustic Chemicals

Glenair CostSaver Composite Boxes are made from PEI, 30% glass fiber, (polyetherimide). PEI is an amorphous thermoplastic polyetherimide offering outstanding high heat resistance, high strength, modulus and broad chemical resistance. Its balance of properties and processability offers design engineers exceptional flexibility and freedom to innovate. PEI resins are inherently flame resistant with low smoke emission. It is radiation resistant, microwave transparent and is naturally flame retardant. Because of its unequaled properties, PEI is the ideal replacement for steel and other metals. PEI resins offer: inherent flame resistance, long-term heat resistance, dimensional stability, strength and modulus at elevated temperatures, hydrolytic and chemical stability, and environmental and corrosion resistance.

Environmental Properties

PEI resin is resistant to mineral acids, mineral salt solutions and dilute bases. Unlike other amorphous resins, PEI polyetherimide also demonstrates unusually good resistance to a wide range of caustic chemicals.

PEI resin is unaffected by most hydrocarbons, making it an excellent candidate for aircraft and shipboard applications exposed to gasoline, oils and other fuels.

PEI resin is inherently resistant to UV radiation without the addition of stabilizers. Exposure to 1000 hours of Xenon arc weatherometer irradiation (1.55 Watts/m2 irradiance at 340 nm, 63°C) produces a negligible change in the tensile strength of the resin.

PEI resin exhibits excellent hydrolytic stability of tensile strength after immersion in water. 10,000 hour immersion tests in water at 212°F (100°C) show that PEI resin's physical properties remain virtually unchanged, even with repeated cycling from steam pressure to drying in vacuum at room temperature.

*G.E. ULTEM® Resin

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Thermal Properties

An outstanding property of PEI resin is its ability to withstand long-term exposure to elevated temperatures. This high-heat performance, combined with excellent flammability ratings and UL recognition, qualifies PEI resin for demanding high temperature applications. UL rates PEI resin for continuous use at 170°C. The resin's high glass transition temperature, Tg, of 419°F (215°C), coupled with its high heat deflection temperature of 392°F (200°C) at 264 psi (1.82 N/mm2), contributes to its excellent retention of physical properties at elevated temperatures.

The coefficient of thermal expansion is an important design consideration in the production of large composite enclosures, fittings and mating connectors. The table below lists the coefficients of thermal expansion for PEI and the matching values for various metals:

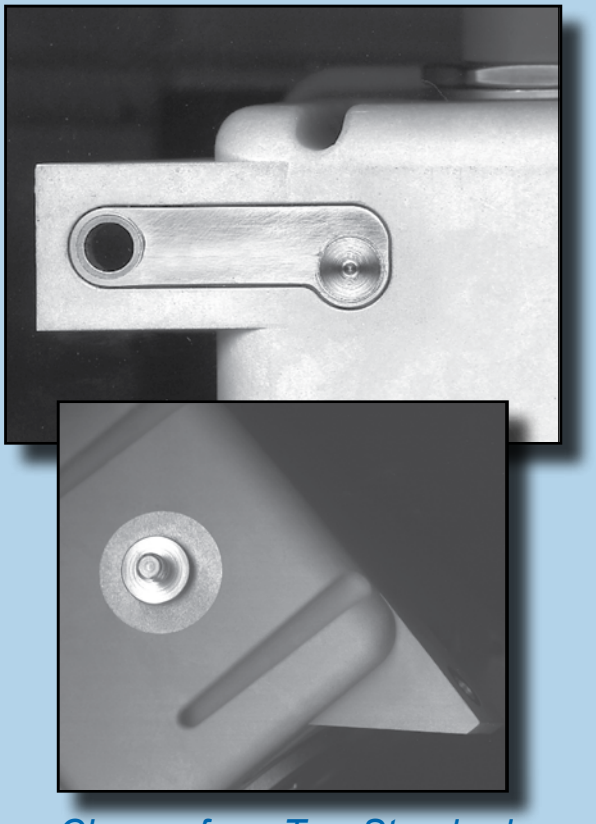
Coefficient of Linear Thermal Expansion

Material	10^{-5} in/in -°F	10^{-5} m/m -°C
PEI	1.1	2.0
Brass	0.4 - 1.0	1.6-1.8
Zinc	1.5	2.7
Aluminum	1.2	2.2
Steel	0.7-0.8	1.2-1.5

Strength

At room temperature PEI resin exhibits strength far beyond that of most engineering thermoplastics, with a tensile strength yield of over 15,000 psi (100 N/mm2) and a flexural strength at 5% deflection of 21,000 psi (145 N/mm2). Even more impressive is the strength at elevated temperatures. At 375°F (190°C), a temperature well beyond the useful rage of most other engineering thermoplastics, PEI retains approximately 6,000 psi (41 N/mm2) tensile strength. The inherent strength of PEI is increased by reinforcement with glass fibers, such as the 30% fiber mix used by Glenair.

Step Three: Select the (Optional) Grounding/Earthing Device



Choose from Two Standard Grounding Device Designs

MIL-STD-1310G (NAVY) requires that electrical equipment operated from an external power source be grounded to provide electrical safety and personnel shock protection. Glenair's integrated grounding foot (top photo) combines the earthing function into one of the box mounting feet; thus eliminating the need for an additional, external grounding strap and mounting point.

The simple grounding stud (bottom photo) is an inexpensive and yet effective way to provide overall grounding of the box. Typically, a wire grounding strap is fixed to the stud and taken to ground on an adjacent bulkhead. The threaded stud penetrates the box for easy attachment of an internal ground wire.

E

Glenair Composite Boxes, Connectors and Accessories Test Plan

Plating Adhesion Glenair# 9-44-18/TN94-159

The item is tested in accordance with MIL-DTL-38999 and should not exhibit any blistering, peeling or other separation of the units plating when immersed in ice water at 0ºC within 15 seconds after 30 minutes exposure to 200ºC in a circulating oven.

Vibration NTS# 973-7369-2

When mounted in a suitable fixture on a vibration table and subjected to vibration in accordance with MIL-STD-167 type 1 for box units & Mil STD-1344, Method 2005 Condition III, for fittings and accessories. The tested items should not exhibit loosening of component parts or evidence of damage.

Shock NTS# 973-7369-2

When mounted on an Impact plate the Glenair Box is subjected to shock load (Hammer drop) in accordance with MIL-STD-901D, Lightweight, Grade C, there shall be no loosening of parts or evidence of damage. A 400 LB hammer weight attached to a 5 foot long swing arm is raised and released to strike the mounting plate, 9 blows (3 blows in 3 axes).

Shock MOD# BR8470 Grade C & F

Glenair box is mounted on a suitable fixture and subjected to an initial 70G load progressing to 130G load in accordance with MOD BR 8470 Grade C & F, there shall be no loosening of parts or evidence of damage.

Salt Spray Glenair# 9-44-18/TN94-159

The item shall meet Braid Retention, Device conductivity, functional requirements and exhibit no exposure of underplate or base material when subjected to 2000 hrs per MIL-STD-1344 Method 1001.

Dust NTS# 973-7369-1

The item must conform to required torque limits and functional requirements within 25% after being subjected to sand and dust test of MIL-STD-202 Method 110.

UV Light Resistance GE RDM88050255-6042

There shall be no degradation of the mechanical properties defined in this specification after testing in accordance with ASTM D2565

Glenair's 140-060 Series Junction Box for the US Navy is available in four sizes and is supplied either with or without terminal rails and blocks

Impact

There shall be no evidence of breaking or cracking of components or other damage, which could affect the product performance. The box will be tested in accordance with MIL-STD-1344 Method 2015 using 8 drops from a height of 2 meters with plate indexed at 36º intervals.

External Bending Moment Glenair# 9-44-18/TN94-159

No evidence of damage detrimental to normal operation when subjected to 3X magnification after being subjected to loads specified in MIL-STD-1344.

Temperature Cycling NTS# 575-9249

Item is subjected to a controlled temperature in accordance with MIL-Std-1344 Method 1003 @ –65ºC to 200ºC. After testing the product must not exhibit any cracking, peeling or separation of plating, or other functional damage.

Hydrolytic Stability NTS# 878-536

In accordance with ASTMD570-81, Tested Items shall be free of defects detrimental to mechanical performance, no increase in weight greater than 1% and no evidence of cracking, breaking or loosening of component parts when subjected to boiling water.

Ice Resistance Glenair# 9-44-18/TN94-159

The item must conform to required torque limits and functional requirements within 25% after being immersed for a minimum of 3 cycles in tap water for 1 minute and placed in an ambient temperature of –65ºC for one hour (until surfaces are completely iced over).

Flammability

The item flame and after flow-extinguishing time shall not exceed limits defined in Table II of MIL-STD-1344 Method 1012, Smoke index, NES 711 issue 2, and NES 713 issue 3. Burning behavior by Oxygen index, ISO 4589.

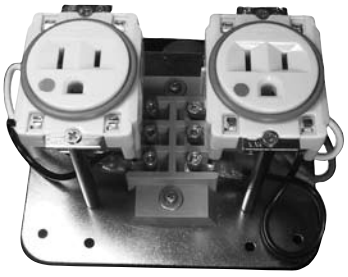
Water Tightness EA# 0C13513-039514

Water tightness and internal pressurization tested at 1 atmosphere (14.7 psi). Unit is subjected to a progressive internal pressure test in three feet of water at ambient temperature in increasing increments of 1psig for 2-minute intervals.

Outgassing JPL 081892

Unit is tested in accordance with ASTME 595; maximum allowable weight loss is 10%. After test and bake out the maximum allowable VCM (volatile condensable material) is 0.10%.

Electrical equipment ready for installation in Glenair's 147-020 Series Electrical Box for the U.S. Navy

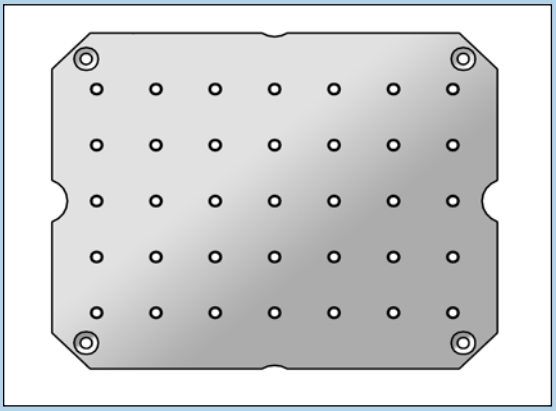


Electromagnetic Shielding TRW/ABQ-55C-1186-0

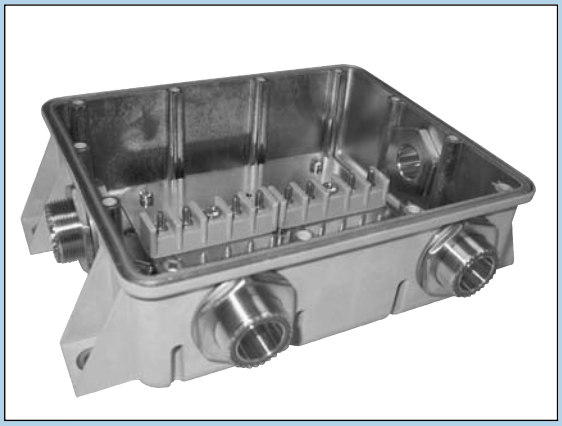
Shielding effectiveness / transfer impedance tests performed in accordance with Military industry standards and customer specific requirements. Transfer impedance measurements from 1 through 100 MHZ and radiated emissions were evaluated in the ranges from 20 through 1000 MHZ. The test specimen is subjected to an EMI field and measured to determine to specific levels of shielding properties are exhibited.

Step Four: Select Internal Terminal Rail Mounting Plate and Drilling

Glenair manufactures an internal terminal rail mounting plate for all box sizes except the Ultra-Miniature (140-074) and Mini (140-100). Terminal rail mounting plates are fabricated from aluminum alloy or stainless steel and are typically passivated or plated with electroless nickel. Custom platings are also available. The factory maintains dimensional specifications for all popular din rail and terminal block types and can drill plates per these specifications or to your drawing. Please consult factory for mounting options for nonstandard electronic components.



The Standard Plate Selection for Each Box Comes with Threaded Inserts for Most Popular Terminal Rails or Blocks



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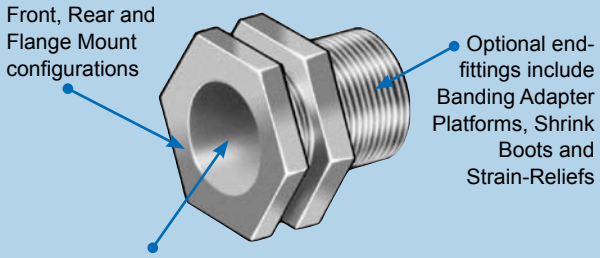
Glenair

Glenair CostSaver Composite EMI/RFI Junction Boxes
Design Guide - Step Five

Step Five: Select Box Input-Output Components: *Feed-Through Fittings*



Designed for use with all types of shielded and unshielded cable and conduit, from less than 1/4" to 1 3/4" in diameter

Glenair manufactures a full spectrum line of feed-through fittings for routing wire, cable and conduit into and out of switch gear and other types of junction boxes. The fittings are also ideal for thru-panel and bulkhead applications.

From environmental sealers and EMI/RFI shield terminators to strain reliefs and shrink boot adapters—Glenair has the right box feed-through for every application requirement.

Stainless versions are available in every configuration, but as a design consideration, composite feedthroughs should be considered for all applications where weight savings and extended corrosion protection is desired. Our composite thermoplastic designs (component series 637-094) offer significant weight savings over stainless steel and, again, unlimited corrosion protection. Many of our most popular part numbers are in stock, in quantity and ready for immediate delivery.

It is particularly important not to specify aluminum alloy fittings for harsh environment box applications. Compared to aluminum alloy, Glenair composite fittings provide equal or improved RFI/EMI protection, and are made from the same high-grade ULTEM® engineering thermoplastic as our boxes. Composite feedthroughs are designed to meet RTCA/DO-160C environmental conditions and physical strength requirements. Please consult the factory for assistance in selecting the best materials and platings for your application.

Braid Retention Glenair# 9-44-18/TN94-159

Fitting terminations shall be capable of providing 2.5 milliohms maximum resistance between braid and fitting interface when braid is subjected to a tensile load of 5 Kg applied gradually.

EMI Shielding MOD# ME1A24S136F

Shielding effectiveness Shipboard in accordance with M.O.D. Def Standard 59-41 DRE01. The Glenair box is subjected to an EMI field and measured to the level of shielding effectiveness per the Def standard 59-41 DRE01.

Indirect Lightning (Lightning Strike) LT# LT-95-1153, LT-00-1752

Testing in accordance with MIL-STD-1344. Item is subjected to Waveform 1 & 5B using a high current generator. The item must remain functional without degradation of unit's electrical performance. Waveform 1 and 5B are applied starting at 3ka increasing to 20ka checking continuity measurements at set intervals. Waveform 1 will additionally be subjected to an oscillatory wave starting at 30ka and increasing in 10ka steps until failure in continuity measured.

Glenair 147-021 and 147-022 Series Sound Powered Telephone Boxes for the US Navy are available in three box sizes with custom single, dual or quad jack receptacles

Humidity NTS# 575-9249

The test specimen is subjected to the humidity test specified in MIL-STD-1344 Method 1002 Test Condition Type II. The tested item shall exhibit no weight increase, swelling or other evidence of moisture absorption into the base material.

Fungus Resistance TBM84-3

Materials used shall be certified as fungus inert in accordance with requirements of MIL-STD-810C, Items must have no evidence of Fungus growth, deterioration or corrosion as a result of testing.

Shock NTS# 373-2685, Supplement 1

When mounted on an uneven surface with one mounting location lower to create torsion loading, box is subjected to shock per MIL-S-901D Class 1, Grade A, Type C (lightweight).

Glenair 147-015 Series Indicator Light Box is available in four sizes and supplied with US Navy specified indicator lights and switches

Magnetic Permeability Glenair# 9-44-18/TN94-159

Items shall be tested in accordance with MIL-STD-1344.

Ozone NTS# 678-3143

There shall be no evidence of cracking or other damage when item is tested in accordance with MIL-STD-1344 Method 1007.

Fluid Immersion NTS# 678-3143

Item shall meet the functional requirements in accordance with MIL-STD-1344 Method 1016 (one sample per fluid).

Halogen Free GE 050198

Testing for halogen releases when ignited in accordance with ASTME XX,

Radiation Test GE RDM88050255-6042

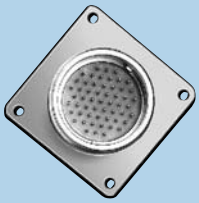
Gamma Ray, Electron Beam, X-Ray, Ultra Violet, Visible, Infrared, Microwave and Radio Frequency testing preformed.

Fitting to Box Conductivity NTS# 575-9249

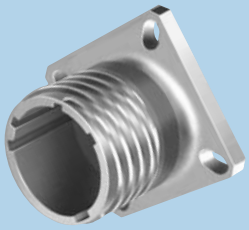
Max. Voltage drop of 3 millivolts before conditioning and 6 millivolts after conditioning when tested to MIL-STD-1344 Method 3007.

Step Six: Select Box Input-Output Components: *Environmental Connectors*

Glenair offers a wide range of circular and rectangular connectors, including MIL-DTL-28840, MIL-PRF-83513 and MIL-DTL-38999 Hermetics. Environmental connectors of this type, and the ones highlighted below, are ideally suited for use as input-output devices in box applications.



Glenair's Series 22 Geo-Marine® Connectors offer high-density insert arrangements for a variety of oceanographic, geophysical and other severe environmental applications. The mated stainless steel plug and receptacle have a hydro-static pressure sealing capability of up to 5000 psi (345 bar) and are available in either glass-seal hermetic or rigid dielectric environmental insulators.



Glenair's Composite MIL-DTL-38999 Series III Style Fiber Optic Connector is built to insure precise optical alignment. Composite materials make this one of the lightest weight, high-reliability connectors on the market. Connector polarization keys and keyways are molded to tighter tolerances than required by the MIL-DTL-38999 specification to reduce radial misalignment and insertion loss.

Glenair developed the **Series 800 "Mighty Mouse"** to fill the need for a miniaturized circular connector with performance comparable to other high-reliability aerospace connectors. The connector is intended for applications such as missile systems, satellites, man-portable battlefield gear, and light armored vehicles. It is ideally suited for use with Glenair's smaller junction boxes.

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