



**HIGH-PERFORMANCE**

# **CONDUIT SYSTEMS**

**FOR INTERCONNECT APPLICATIONS**

APRIL 2012



*Turnkey*

# CABLE AND CONDUIT ASSEMBLY CAPABILITIES

TERMINATED, TESTED, AND READY FOR USE





**Flexible Metal-Core Conduit and  
High Performance Polymer-Core  
Convuluted Tubing Systems  
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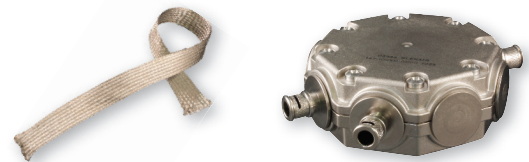
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**C**onduit is an outstanding alternative to jacketed cables, especially for prototype assemblies, systems with extreme flexibility and physical protection requirements and also when the need for field repair or system expansion is anticipated. Polymer tubing versions are lightweight, durable, flexible and available in a broad range of material choices. Metal-core versions offer crush resistance and high-levels of EMI shielding. Connector-to-conduit backshells, transition fittings and special adapters are available in factory assembled and user installable styles. Conduit offers outstanding EMI, mechanical and environmental protection including,

- Easy on-site installation and repair
- Superior crush protection and resistance to projectile damage
- Reliable E and H field EMI shielding
- Superior flexibility compared to jacketed cables
- Superior durability and aging protection from heat, chemicals, and fluids.

*Glenair is unique in the industry because we produce all our conduit component elements in-house, including extruded polymer tubing, braided EMI shielding, formed metal-core conduit, and machined, die-cast and injection molded backshells, adapters and fittings. In addition, we offer turnkey (wired and un-wired) conduit assemblies made from both Mil-qualified and Glenair commercial components.*

# WHY CHOOSE CONDUIT INSTEAD OF A STANDARD CABLE ASSEMBLY?

## 1 Ease of Installation and Repair

- *Factory terminated point-to-point and multi-branch assemblies deliver exceptional value and convenience.*
- *Conduit can be cut to length on-site and fitted with Glenair user-installable fittings—a faster and less costly solution compared to cabling with its long lead times and minimum orders.*
- *Conduit systems allow easy post-assembly access to wires for repairs, whether in the field or in the factory.*
- *For prototypes and mockups where wire routing lengths cannot be exactly determined before installation, the convenience of conduit as a wire protection solution is unmatched.*
- *Conduit systems are expandable, making it easy to add or remove wires as needed.*





## 2 Advanced EMI Protection

- *Metal-Core conduit provides optimal EMI/RFI shielding across all frequencies—H and E fields, TEMPEST and lightning strike.*
- *The continuously-wound and solder-sealed tubing completely encloses wire media—eliminating EMI susceptibility and emissions.*
- *Optional metallic or lightweight composite braided shielding provides an additional pathway to ground for EMI.*



## 3 Environmental and Mechanical Performance



- *Conduit is extremely flexible and offers wire routing versatility and environmental-sealing durability in repetitive flex applications*
- *Conduit delivers crush protection, abrasion protection, and high pull or tensile strength.*
- *Heat-resistant conduit materials, such as PFA, function in extreme temperatures from -95° to 500°F .*
- *High performance polymer materials are resistant to gamma radiation, ozone, fluids, fungus, and offer CBRN certification.*
- *Low smoke, zero halogen, low toxicity materials, such as PEEK, meet stringent environmental requirements.*



**T**he first choice in the design of a flexible conduit assembly is the selection of core tubing material—whether to choose lightweight polymer convoluted tubing, or flexible metal-core conduit. Glenair Series 72 Economical annular and Series 74 High Performance helical convoluted conduit; and Series 75 Metal Core conduit all have numerous advantages summarized below. Detailed material properties for each can be found in Sections B, C, and D of this catalog.

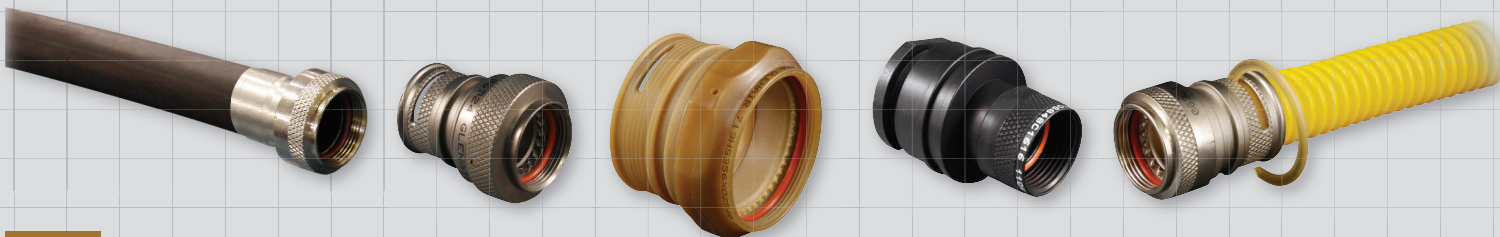
## SERIES 72

# ANNULAR POLYMER CORE

## ECONOMICAL CONVOLUTED TUBING, BACKSHELLS AND ASSEMBLIES

### Quick, easy and economical

- Economical, general-duty performance
- Easy-to-install fittings
- Thermally-stabilized Kynar®, PVDF and Siltem materials available
- Braid options for superior EMI protection
- Ideal for expandable systems or prototypes
- Used in air, rail and transit applications



## B

Turn to Section B for Glenair Series 72 economical annular convoluted tubing, including braid and jacketing options, factory-terminated crimp assemblies, and do-it-yourself backsells, fittings and transitions.



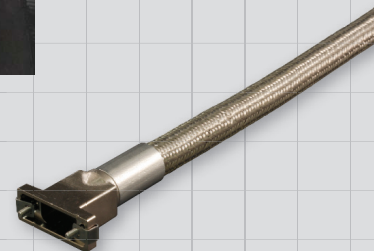
**SERIES 74**

# HELICAL POLYMER CORE

**HIGH-PERFORMANCE CONVOLUTED TUBING, BACKSHELLS AND ASSEMBLIES**

## High performance, durable and flexible

- *Lightweight, high temperature-rated materials*
- *Maximum flexibility, durability and performance*
- *Low-Smoke, Zero Halogen PEEK material available*
- *Braid options for superior EMI protection*
- *Ideal for expandable systems or prototypes*
- *Harsh chemical environment resistant*
- *Used in rugged landing gear and aerospace applications*



**C**

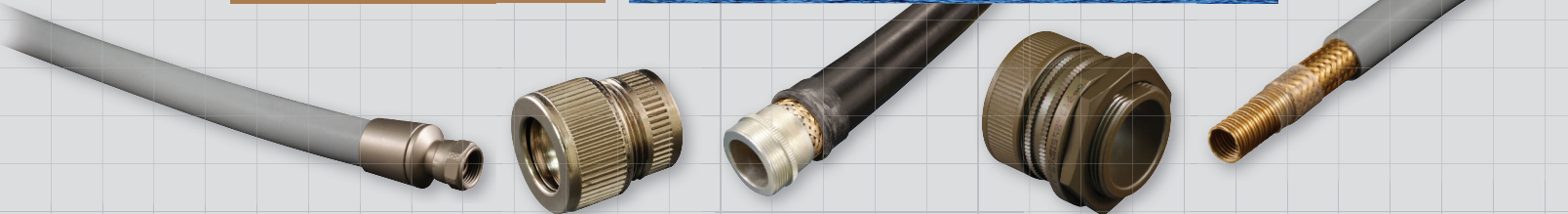
Turn to Section C for Glenair Series 74 High Performance helical convoluted tubing, including braid and jacketing options, factory-terminated crimp assemblies, and do-it-yourself backshells, fittings and transitions.

## SERIES 75

# FLEXIBLE METAL-CORE CONDUIT, BACKSHELLS, FITTINGS AND ASSEMBLIES

### Crush-proof EMI protection

- *Continuous solder seal for optimum EMI/EMP and environmental protection*
- *Superior crush resistance*
- *Used by the U.S. Navy in harsh-environment topside shipboard applications*
- *Metallic braid provides additional tensile (pull) strength*
- *Used in tanks, heavy machinery, airframes and submarines*



## D

Turn to Section D for Glenair Series 75 Flexible Metal-Core conduit, including braid and jacketing options, factory-terminated crimp assemblies, and do-it-yourself backshells, fittings and transitions.



**D**o-it-yourself conduit, conduit-to-connector backshells and other fittings allow users the flexibility to build prototype wire protection systems with ease and convenience. Do-it-yourself solutions are also employed when final cable/wire run lengths cannot be determined prior to installation; such is often the case in Navy ships, submarines, and communication shelter and bunker applications. Glenair offers a number of different do-it-yourself system technologies, each designed for particular performance requirements such as weight reduction, ease of assembly, durability, or to satisfy a particular military specification.

# DO-IT-YOURSELF

## BACKSHELLS, ADAPTERS AND TRANSITIONS

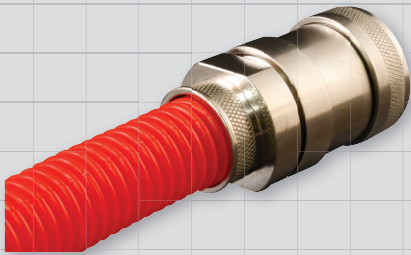
### Repairable and expandable on-site

- A range of fitting types, all designed for convenient user installation
- Easy to assemble and repair
- Excellent choice for topside shipboard applications
- Best for prototype systems
- For interconnect systems that require periodic expansion or maintenance



## SERIES 72 ANNULAR POLYMER CORE

**Two fitting design types are available for user termination and assembly of Series 72 annular thermoplastic tubing systems**



### Robust, Easy-to-Assemble Sentry System

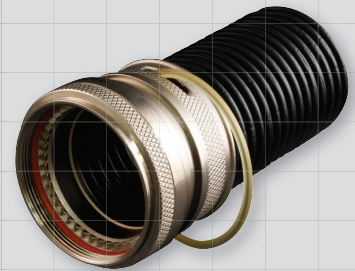
Sentry System fittings feature a Kynar® bushing and compression nut assembly design for robust, easy-to-assemble wire protection. Two fitting styles are available: one with an integral banding platform for applications where EMI termination is required, and a lightweight, compact design for weight- and space-saving environmental protection.

See Section B, part numbers 710-840, 710-841, 710-842, 710-847, 710-848, and 710-849.

### Easy-to-Install Guardian System

The Guardian System is Glenair's easy-to-install, economical general-purpose wire protection solution. The heart of the Guardian system is its unique retaining clip assembly system, offering high speed assembly without the need for special tools. Environmental O-Rings provide splash-proof environmental sealing, and all Guardian adapters feature shrink boot grooves for enhanced environmental sealing and strain relief. Guardian connector backshells are equipped with banding platforms for easy EMI shield termination.

See Section B, part numbers 712-839, 712-852, 713-356, and 713-376.



# SERIES 74 HELICAL POLYMER CORE

Five fitting design types are available for user termination and assembly of Series 74 convoluted thermoplastic tubing systems, including:



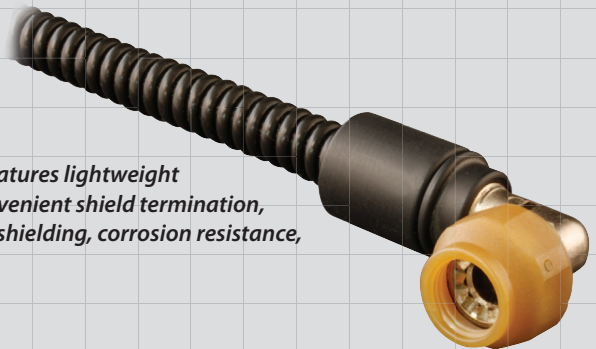
## Hat Trick: Compact, Versatile “3-in-1” Design

Glenair’s unique and versatile “Hat Trick” conduit system fittings provide three key functions—conduit attachment, shield termination and boot attachment—in one easy-to-use compact fitting. These do-it-yourself fittings are equipped with a threaded inner shell, banding platform and shrink boot groove as well as a self-locking coupling nut. Helical Series 74 convoluted tubing threads directly into the shell cavity for easy attachment without restricting the conduit’s inner diameter. Available in composite plastic and aluminum versions. Banding is fast, easy and reliable with Glenair Band-Master™ ATS bands. Add a shrink boot for environmental sealing rated to IP66.  
See Section C, part numbers 713-355, 713-359, 713-377, 713-378, 713-380, and 713-381



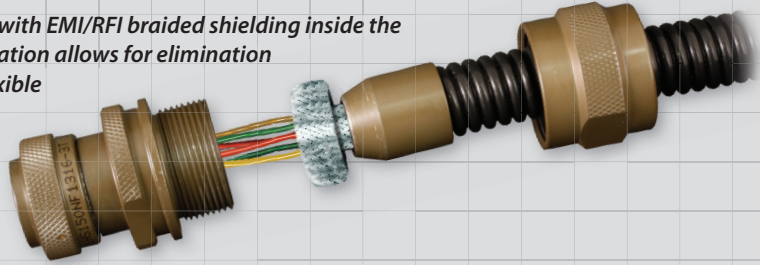
## AeroLite: Weight Saving Composite with Braid Slot for Shield Termination

Developed for weight savings in airframe applications, the AeroLite system features lightweight and corrosion resistant composite fittings. Each fitting has a braid slot for convenient shield termination, plus a self-locking anti-decoupling feature. AeroLite is the best choice for EMI shielding, corrosion resistance, vibration protection and weight savings.  
See Section C, part numbers 712-879, 712-880, 712-831, and 712-848



## The Harsh-Environment Internal Braid Solution

These special-purpose, do-it-yourself fittings are fabricated with EMI/RFI braided shielding inside the chemical- and UV-resistant convoluted tubing. This configuration allows for elimination of outer jacketing materials, providing a lightweight and flexible conduit that resists fuels, oils, solvents, and other harsh chemicals. Use with epoxy adhesive lined elastomer shrink boots for environmental sealing. Internal braid fittings provide easy termination of single or double layers of shielding.  
See Section C, part numbers 711-150, 711-149, and 711-148



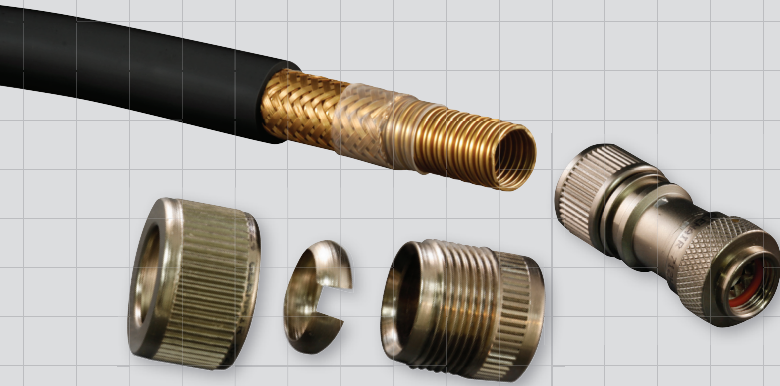
## Heavy-Duty Environmental System

These bump seal equipped heavy duty EMI/RFI conduit backshells, fittings and adapters are ideally suited for conventional conduit wire protection applications such as aircraft undercarriage and wheel-well wire routing. These heavy duty user installable fittings are designed for use with shielded conduit and feature easy-to-assemble ground ring shield termination.  
See Section C, part numbers 712-277, 712-389, 712-380, and 712-358



## SERIES 75 FLEXIBLE METAL CORE

Four fitting design types are available for user termination and assembly of Series 75 metal-core conduit systems, including:



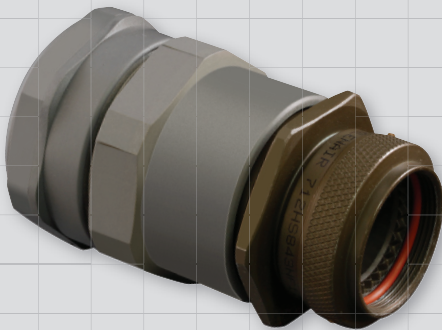
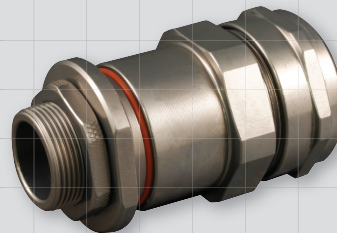
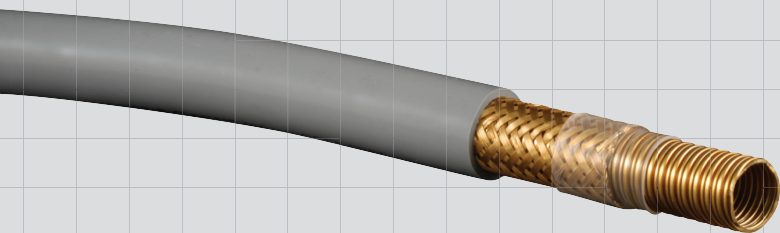
### RP Plus: Lightweight, Compact, with Secure EMI Termination with Self-Locking Coupling Nut

Glenair's lightest, most compact fitting design for metal-core conduit is based on the Navy RP2000 fitting series and utilizes integrated split ring inserts for secure EMI shield termination, with or without jacketing on the conduit. RP Plus fittings mate with M24758 Mil-spec conduit, and can be ordered with optional shrink boots for environmental sealing when terminating conduit with an outer jacket. See Section D, part numbers 712-832, 712-849, 712-850, and 712-878

### Heavy-Duty Environmental System: Metal

Glenair is a full-spectrum supplier of qualified MIL-PRF-24758 fittings. We bring the same rugged reliability and heavy duty performance to all of our MIL-PRF-24758 style commercial fittings. These topside, durable fittings feature individual termination of conduit, braiding and jacketing layers for maximum EMI performance and environmental sealing.

See Section D, part numbers 712-834, 712-835, 712-836, and 712-837



### Heavy-Duty Environmental System: Composite

The same reliable, ruggedized performance of our M24758 QPL products in a unique hybrid configuration: Heavy-duty metal connectors with lightweight, corrosion resistant composite "Haze Gray" fittings provide a durable weight saving solution.

See Section D, part numbers 712-843, 712-845, 712-844, and 712-846

**M**any of the conduit and convoluted tubing systems we fabricate at Glenair are completed at our factory with tamper-proof crimp-ring or solder terminations. User-assembled conduit components offer the convenience and flexibility of do-it-yourself field termination—especially valuable for prototyping of interconnect wire protection systems. But factory terminated assemblies—from simple point-to-point to elaborate multi-branch assemblies—offer size and weight savings, and the utmost in convenience, value, reliability and durability.

# FACTORY TERMINATED CONDUIT AND CONVOLUTED TUBING ASSEMBLIES

**Reduce package size, weight, and labor with turnkey factory assemblies**

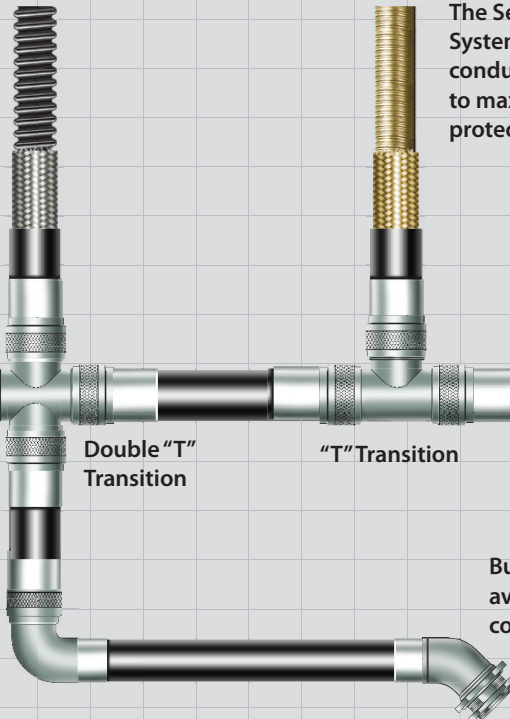
- *Glenair can design, build, terminate—and even pre-wire—turnkey conduit wire routing solutions.*
- *Certified factory assemblers and calibrated tooling create better-performing systems.*
- *Simple point-to-point or complex multi-branch.*



The Series 72 and 74 Polymer-Core Convoluted Tubing Systems offer the industry's broadest selection of high-performance materials—all designed to optimize flex cycles, temperature resistance, and weight reduction.

Internally-braided tubing systems provide a lightweight and chemically-resistant package without the use of conventional outer jacketing.

Detachable 90° Elbow Adapter for easy wire maintenance



Double "T" Transition

"T" Transition

The Series 75 Metal-Core Conduit System offers a wide range of flexible conduit core materials, all designed to maximize crush resistance and EMI protection.

Bulkhead Feed-Thru Fittings are available in Straight, 45°, and 90° configurations.



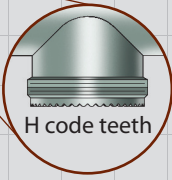
Retractable connector backshells facilitate large-gauge contact termination and insertion.

Circular straight, 45° and 90° Conduit-to-Connector backshells are available for all common circular connector series.

For individual shield termination and enhanced mechanical protection to Series 74 and 75 assemblies, use Band-In-A-Can Backshells in Straight, 45° and 90° configurations.

Double "Y" Transition

Direct-Attach Lazy "Y" Transition

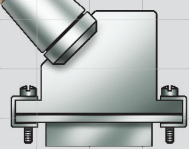


H code teeth

Transitions and adapters are available in a number of configurations, depending on series and system. Versions with H code teeth (shown) for either direct attachment to MIL-DTL-38999 connector adapters, or to additional lengths of conduit, accommodate self-locking coupling nuts for anti-decoupling and easy clocking of backshells and fittings.

Glenair offers a variety of elastomeric jacketing materials. Our UV resistant and temperature tolerant Duraelectric™ jacketing is available in several colors including black, OSHA Safety Orange, MIL-PRF-24758A Haze Gray, and Fed Std #3446 Desert Tan.

Rectangular Conduit-to-Connector Backshells for MIL-DTL-24308, MIL-DTL-83513 Micro-D, Glenair HiPer-D and Series 79 Micro-Crimp connectors are available in Straight, 45°, and 90° configurations.





## Conduit Backshells, Fittings and Adapters Standard Materials and Finishes

**A**

**Table II: Standard Finishes Master Table**

Glenair Symbol	Finish	Specification(s)
A	Cadmium Plate, Bright	AMS-QQ-P-416, Type I, Class 2
B	Cadmium Plate, Olive Drab	AMS-QQ-P-416, Type II, Class 3
C*	Anodize, Black	AMS-A-8625, Type II, Class 2
G*	Hard Coat, Anodic	AMS-A-8625, Type III, Class 1
J	Iridite, Gold Over Cadmium Plate Over Electroless Nickel	MIL-C-5541, Class 3 AMS-QQ-P-416, Type II, Class 3 over AMS-C-26074, Class 4, Grade B
LF	Cadmium Plate, Bright Over Electroless Nickel	1000 Hour Corrosion Resistance
M	Electroless Nickel	AMS-C-26074, Class 4, Grade B
MT	Nickel-PTFE	AMS2454
N	Cadmium Plate, Olive Drab Over Electroless Nickel	AMS-QQ-P-416, Type II, Class 3 over Electroless Nickel; AMS-C-26074, Class 4, Grade B
NC	Zinc Cobalt, Dark Olive Drab	96 Hour Corrosion Resistance
NF	Cadmium Plate, Olive Drab Over Electroless Nickel	1000 Hour Corrosion Resistance
T	Cadmium Plate, Olive Drab Over Electroless Nickel	AMS-QQ-P-416, Type II, Class 3 over Electroless Nickel, AMS-C-26074, Class 4, Grade B
U**	Cadmium Plate, Black	AMS-QQ-P-416, Type II, Class 3
UCR	Zinc Cobalt / Black	ASTM B 840 Grade 6 Type D over Electroless Nickel
XB	Composite, Unplated Black	
XM	Composite, Electroless Nickel	AMS-C-26074
XMT	Composite, Nickel-PTFE	GMF-002 Type 2 Class 2
XW	Composite, Cadmium Olive Drab	AMS-QQ-P-416 Type 2 Class 3 Over Electroless Nickel
Z1	Passivate	AMS-QQ-P-35 Type VI
ZM	Stainless Steel, Electroless Nickel	AMS-C-26074 Class 1 Grade A
ZMT	Stainless Steel, Nickel-PTFE	AMS2454
ZN	Zinc-Nickel, Olive Drab	ASTMB 841-91 Grade 5, Over Electroless Nickel 1000 Hour Salt Spray
ZNU	Aluminum, Zinc Nickel, Black	ASTMB 841-91 Grade 5, Over Electroless Nickel 1000 Hour Salt Spray
ZW	Stainless Steel, Cadmium Olive Drab	AMS-QQ-P-416 Type 2 Class 2 Over Electroless Nickel

\* Anodize finish; not suitable for EMI shielding or grounding applications.  
 \*\* Applicable to corrosion resisting steel backshells and accessories. Consult the factory for other available finishes.

### Additional Material Specifications and Notes

Component	Material	Specification
Machined components: such as backshell bodies, fabricated elbows, protective covers, rotatable couplers, dummy stowage receptacles, lock nuts, G-spring support rings, EMI ground rings, grommet followers, etc.	Aluminum	QQ-A-200, 225 ASTMB211, 221
Die cast components: such as angular backshells, strain relief backshells, strain relief bodies, strain relief saddles, special EMI ground rings, etc.	Aluminum	QQ-A-591 ASTMSC84A
Backshells or strain reliefs: available in optional corrosion resisting steel; and hardware such as screws, washers, rivets, wire rope, sash chain, band straps, etc.	Corrosion Resisting Steel	QQ-S-763 (300 Series) ASTMB484
Elastomeric seals: such as O-Rings, cable jacket seals, grommets, etc.	Silicone	ZZ-R-765
Anti-friction and thrust washers	Fluoropolymer	TFE
Anti-rotation device	Corrosion Resistant Material	N/A



# Conduit Backshells, Fittings and Adapters Interface Standards



**Table I: Conduit Backshell Interface Dimensions Master Table**

Connector Designator											A THREAD*	B	C	D	E
A	C*	D	E	F	G	H	J	K	L	S	REFERENCE	Dia Max	Dia Max	Dia Max	Dia Max
		08	08	08 [9]				08	08	08	7/16 - 28 UNEF	.59 (15.0)	.65 (16.5)	.77 (19.6)	.69 (17.5)
						09 [A]					M12 X 1 - 6H	.65 (16.5)	.77 (19.6)		.94 (24.8)
08							08 [A]	10			1/2 - 20 UNF	.65 (16.5)	.65 (16.5)		.69 (17.5)
											1/2 - 28 UNEF	.65 (16.5)	.77 (19.6)	.77 (19.6)	
03		10	10	10 [11]				11	10	10	9/16 - 24 UNEF	.72 (18.3)	.77 (19.6)	.89 (22.6)	.82 (20.8)
						11 [B]					M15 X 1 - 6H	.77 (19.6)	.82 (20.8)		1.06 (26.9)
10								12 [13]			5/8 - 24 UNEF	.77 (19.6)	.77 (19.6)	.89 (22.6)	.82 (20.8)
								10 [B]			5/8 - 28 UN	.77 (19.6)	.89 (22.6)		
		12		12 [13]					12	12	11/16 - 24 UNEF	.84 (21.3)	.89 (22.6)	1.02 (25.9)	.94 (23.8)
						13 [C]					M18 X 1 - 6H	.89 (22.6)	.94 (23.9)		1.17 (29.7)
12 [7]	12		12		11 [A]			14 [15]			3/4 - 20 UNEF	.91 (23.1)	.94 (23.9)	1.02 (25.9)	
		14	14	14 [15]					14	14	13/16 - 20 UNEF	.97 (24.6)	1.02 (25.9)	1.15 (29.2)	1.06 (26.9)
						15 [D]					M22 X 1 - 6H	1.03 (26.2)	1.07 (27.2)		1.29 (32.7)
14 [12]	14				13 [B]			16 [17]			7/8 - 20 UNEF	1.03 (26.2)	1.02 (25.9)	1.15 (29.2)	1.06 (26.9)
								14 [D]			7/8 - 28 UN	1.03 (26.2)	1.15 (29.2)		
		16	16	16 [17]					16	16	15/16 - 20 UNEF	1.09 (27.7)	1.15 (29.2)	1.26 (32.0)	1.17 (29.7)
						17 [E]					M25 X 1 - 6H	1.15 (29.2)	1.21 (30.7)		1.42 (36.1)
16 [19]	16				15 [C]			18			1 - 20 UNEF	1.15 (29.2)	1.21 (30.7)	1.23 (31.2)	1.17 (29.7)
								16 [E]			1 - 28 UN	1.15 (29.2)	1.36 (34.5)		
18 [27]		18	18	18 [19]					18	18	1 1/16 - 18 UNEF	1.22 (31.0)	1.23 (31.2)	1.40 (35.6)	1.29 (32.7)
						19 [F]					M28 X 1 - 6H	1.28 (32.5)	1.36 (34.5)		1.54 (39.1)
	18				17 [D]			20			1 1/8 - 18 UNEF	1.28 (32.5)	1.36 (34.5)	1.36 (34.5)	
								18 [F]			1 1/8 - 28 UN	1.28 (32.5)	1.48 (37.6)		
20 [37]		20	20	20 [21]					20	20	13/16 - 18 UNEF	1.34 (34.0)	1.36 (34.5)	1.53 (38.9)	1.42 (36.0)
						21 [G]					M31 X 1 - 6H	1.41 (35.8)	1.48 (37.6)		1.67 (42.4)
	20				19 [E]			22			1 1/4 - 18 UNEF	1.41 (35.8)	1.53 (38.9)	1.48 (37.6)	
								20 [G]			1 1/4 - 28 UN	1.41 (35.8)	1.60 (40.6)		
22		22	22	22 [23]					22	22	15/16 - 18 UNEF	1.47 (37.3)	1.48 (37.6)	1.60 (40.6)	1.54 (39.1)
						23 [H]					M34 X 1 - 6H	1.53 (38.9)	1.60 (40.6)		2.01 (51.1)
	22							24			13/8 - 18 UNEF	1.53 (38.9)		1.60 (40.6)	
								22 [H]			1 3/8 - 28 UN	1.53 (38.9)	1.73 (43.9)		
24		24	24	24 [25]	23 [F]				24	24	17/16 - 18 UNEF	1.59 (40.4)	1.73 (43.9)	1.94 (49.3)	1.66 (42.2)
						25 [J]					M37 X 1 - 6H	1.66 (42.2)	1.70 (43.2)		2.12 (53.8)
61								24 [J]			1 1/2 - 18 UNEF	1.66 (42.2)	1.67 (42.4)		
											1 1/2 - 28 UN	1.66 (42.2)	1.94 (49.3)		
					25 [G]						19/16 - 18 UNEF		1.82 (46.2)		
	24							28			15/8 - 18 UNEF	1.84 (46.7)		1.94 (49.3)	
28											13/4 - 18 UNS	1.97 (50.0)	1.97 (50.0)		2.01 (51.1)
	28				29 [H]			32			17/8 - 16 UN	2.09 (53.1)	2.19 (55.6)	2.19 (55.6)	
32											2 - 18 UNS	2.28 (57.9)	2.22 (56.4)		2.26 (57.4)
	32				33 [J]						2 1/16 - 16 UNS		2.44 (62.0)	2.44 (62.0)	
								36			2 1/8 - 16 UN	2.34 (59.4)		2.44 (62.0)	
36											2 1/4 - 16 UN	2.53 (64.3)	2.47 (62.7)		2.53 (64.3)
	36										2 5/16 - 16 UNS			2.69 (68.3)	
								40			2 3/8 - 16 UN	2.59 (65.8)		2.69 (68.3)	
40											2 1/2 - 16 UN	2.78 (70.6)	2.72 (69.1)		3.04 (77.2)
	40										2 5/8 - 16 UN			2.93 (74.4)	
44											2 3/4 - 16 UN	3.03 (77.0)	2.97 (75.4)		
48											3 - 16 UN	3.22 (81.8)	3.22 (81.8)		

\* Code C, MIL-C-22992, Left-Hand Thread

Connector designations in brackets [ ] are for reference only and are not to be used in part number development.



## Conduit Backshells, Fittings and Adapters Interface Standards and Connector Designators

**A**

### Conduit Adapter Interface Standards

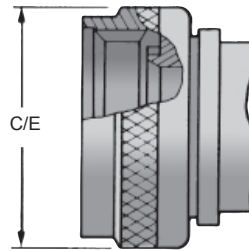
Desig.	Spec.	Series	Desig.	Spec.	Series	Desig.	Spec.	Series	Desig.	Spec.	Series
A	MIL-C-5015	MS3400	A	PATT 602		G	MIL-C-28840		L	EN3372	
	MIL-C-26482	2	B	MIL-C-5015	MS3100	H	MIL-C-38999			JN 1003	
	MIL-C-81703	3	C	MIL-C-22992	MS173XX		EN3645	III & IV		LN 29729	
	MIL-C-83723	I & III	D	MIL-C-26482	1	J	MIL-C-81511	1, 2, 3 & 4		NFC93422	HE06
	40M39569		E	MIL-C-26500	Aluminum					PAN6433-2	
	DEF 5326-3		F	MIL-C-38999	I & II	K	MIL-C-83723	II		PATT 615	
	EN 2997, 3646			40M38277					S	VG 96912	
	ESC 10, 11			PAN 6433-1						PATT 105	
	LN 29504			PATT 614						PATT 603	
	NFC93422	HE302		PATT 616						PATT 608	
	PAN 6432-1, -2			NFC93422	HE308, 9						

The following illustrations depict the standard fitting or adapter interface for the connector noted. Specification design standards are indicated wherever applicable. Consult factory for accessory part numbers for connector series not shown

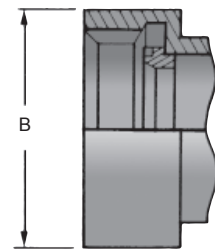
CONNECTOR DESIGNATOR	CONNECTOR SPECIFICATION	SERIES	ROTATABLE COUPLING	DIRECT COUPLING
----------------------	-------------------------	--------	--------------------	-----------------

**A**

MIL-C-5015	MS3400	
MIL-C-26482	2	
MIL-C-81703	3	
MIL-C-83723	I & III	
40M39569		
CECC 75201.001		
DEF 5326-3		
EN 2997		
EN 3646		
ESC 10		
ESC 11		
LN 29504		
NFC 93422	HE302	
PAN 6432-1		
PAN 6432-2		
PATT 602		

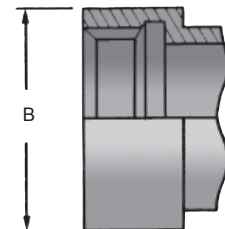


MIL-C-85049  
FIGURE 4  
(MS3155)



**B**

MIL-C-5015	MS3100	SEE PAGES 18-19
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# Conduit Backshells, Fittings and Adapters Interface Standards and Connector Designators



CONNECTOR DESIGNATOR	CONNECTOR SPECIFICATION	SERIES	ROTATABLE COUPLING	DIRECT COUPLING
<b>C</b>	MIL-C-22992	MS173XX	CONSULT FACTORY	
<b>D</b>	MIL-C-26482	MS312X Series 1	CONSULT FACTORY	
<b>E</b>	MIL-C-26500	Aluminum (Class F, G & R)	CONSULT FACTORY	
<b>F</b>	MIL-C-38999 40M38277 NFC93422 NFC93422 PAN 6433-1 PATT 614 PATT 616  Caution: These connector interfaces are not suitable for total environmental sealing; for further information consult factory.	I & II  HE308 HE309		

MIL-C-85049 FIGURE 2  
MIL-C-38999 FIGURE 3

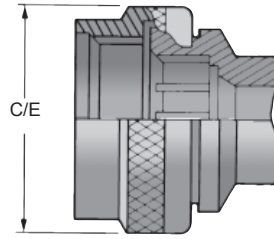


**Conduit Backshells, Fittings and Adapters  
Interface Standards and Connector Designators**

**A**

CONNECTOR DESIGNATOR	CONNECTOR SPECIFICATION	SERIES	ROTATABLE COUPLING	DIRECT COUPLING
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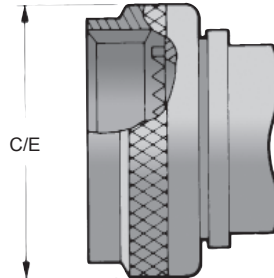
**G**



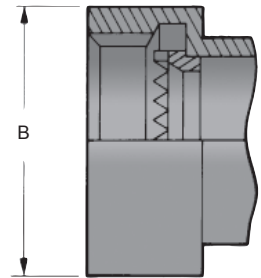
MIL-C-28840 FIGURE 7

CONSULT FACTORY

**H**



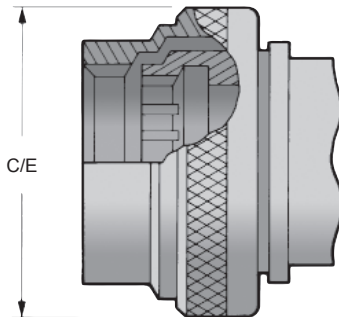
MIL-C-85049 FIGURE 3  
MIL-C-38999 FIGURE 3



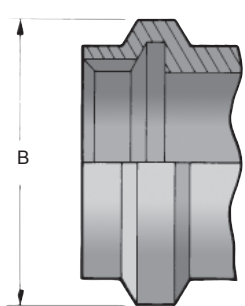
**J**

MIL-C-81511  
VG95329

1, 2, 3 & 4



MIL-C-81511 FIGURE 12C





# Conduit Backshells, Fittings and Adapters Interface Standards and Connector Designators



Conduit  
Introduction

A

CONNECTOR DESIGNATOR	CONNECTOR SPECIFICATION	SERIES	ROTATABLE COUPLING	DIRECT COUPLING
<b>K</b>	MIL-C-83723	Series II	CONSULT FACTORY	
<b>L</b>	EN3372 JN1003 LN 29729 NFC93422 PAN 6433-2 PATT 615 VG 96912	HE306		
<b>S</b>	PATT 105 PATT 603 PATT 608			



## Military Standard Connector Index

### Military Standard Connector Index

The following is a listing of circular connectors defined by US Military Specifications, cross-referenced to the applicable active or inactive part number series. The symbols in the Connector Designator column are an essential element in Glenair's backshell part number developments.

Part No.	Connector Designator	Specification	Series	Description
MS3100	B	SAE AS50151	MS3100	Receptacle Wall Mount (Solder)***
MS3101	B	SAE AS50151	MS3100	Plug (Solder)***
MS3102	**	SAE AS50151	MS3100	Receptacle Box Mount (Solder)***
MS3103	**	SAE AS50151	MS3100	Receptacle Potting (Solder)***
MS3105	**	SAE AS50151	MS3100	Dummy Receptacle***
MS3106	B	SAE AS50151	MS3100	Plug Straight (Solder)***
MS3107	B	SAE AS50151	MS3100	Plug Quick Disconnect (Solder)***
MS3108	B	SAE AS50151	MS3100	Plug 90° (Solder)***
MS3110	D-729	MIL-DTL-26482	1	Receptacle Wall Mount
MS3111	D	MIL-DTL-26482	1	Plug Cable Connecting
MS3112	**	MIL-DTL-26482	1	Receptacle Box Mount
MS3113	**	MIL-DTL-26482	1	Receptacle Solder Mount
MS3114	D-717	MIL-DTL-26482	1	Receptacle Jam Nut
MS3115	**	MIL-DTL-26482	1-2	Dummy Receptacle
MS3116	D	MIL-DTL-26482	1	Plug Straight
MS3119	**	MIL-DTL-26482	1	Receptacle Thru-Bulkhead
MS3120	D	MIL-DTL-26482	1	Receptacle Wall Mount (Crimp)
MS3121	D	MIL-DTL-26482	1	Plug Straight (Crimp)
MS3122	**	MIL-DTL-26482	1	Receptacle Box Mount (Crimp)
MS3124	D-717	MIL-DTL-26482	1	Receptacle Rear Mount Jam Nut (Crimp)
MS3126	D	MIL-DTL-26482	1	Plug Straight (Crimp)
MS3127	**	MIL-DTL-26482	1	Receptacle Box Mount (Crimp)
MS3128	D	MIL-DTL-26482	1	Receptacle Wall Mount (Crimp)
MS3130	*	QPL-81703	1	Receptacle Push Pull Wall Mount Flange
MS3132	X-706	QPL-81703	1	Receptacle Push Pull Box Mount
MS3134	X-706	QPL-81703	1	Receptacle Push Pull Jam Nut
MS3135	**	QPL-81703	1	Dummy Receptacle
MS3137	X-706	QPL-81703	1	Plug Straight Push Pull
MS3138	X-706	QPL-81703	1	Plug Lanyard Push Pull
MS3139	**	QPL-81703	1	Receptacle Thru-Bulkhead (Wall Mount)
* Consult Factory      ** Connector Does Not Accommodate Rear Accessories      ***Inactive For New Design				



# Military Standard Connector Index



Part No.	Connector Designator	Specification	Series	Description
MS3140	X-706B	QPL-81703	2	Receptacle Push Pull Wall Mount
MS3142	**	MIL-C-5015	MS3100	Receptacle Hermetic Box Mount (Solder)
MS3143	**	MIL-C-5015	MS3100	Receptacle Hermetic Solder Mount
MS3144	X-706B	QPL-81703	2	Receptacle Push Pull Jam Nut
MS3145	**	QPL-81703	3	Receptacle Hermetic Push Pull Box Mount
MS3146	**	QPL-81703	3	Receptacle Push Pull Hermetic Solder Mount
MS3147	X-706B	QPL-81703	2	Plug Push Pull (Crimp)
MS3148	X-706B	QPL-81703	2	Plug Push Pull Lanyard (Crimp)
MS3149	**	QPL-81703	3	Receptacle Push Pull Hermetic (Single-Hole Mount)
MS3400	A	MIL-C-5015	MS3400	Receptacle Wall Mount (Crimp)
MS3401	A	SAE AS50151	MS3400	Receptacle Cable Connecting (Crimp)
MS3402	**	SAE AS50151	MS3400	Receptacle, Box Mount (Crimp)
MS3404	A	SAE AS50151	MS3400	Receptacle Jam Nut (Crimp)
MS3406	A	SAE AS50151	MS3400	Plug (Crimp)
MS3408	A	SAE AS50151	MS3400	Plug 90° (Crimp)
MS3409	A	SAE AS50151	MS3400	Plug 45° (Crimp)
MS3412	A	SAE AS50151	MS3400	Receptacle Wall Mount (Crimp)
MS3424	A	SAE AS81703	3	Receptacle Push Pull Wall Mount
MS3440	**	MIL-DTL-26482	2	Receptacle Narrow Flange Mount (Was M83723/9/10)
MS3442	**	MIL-DTL-26482	2	Receptacle Wide Flange Mount
MS3443	**	MIL-DTL-26482	2	Receptacle Solder Flange Mount
MS3445	*	QPL-81703	2	Plug Push Pull Rack & Panel Mount
MS3446	A	QPL-81703	3	Plug Push Pull Rack & Panel Mount
MS3449	**	MIL-DTL-26482	2	Receptacle Push Pull Single Hole Mount
MS3450	A	SAE AS50151	MS3450	Receptacle Wall Mount (Was M83723/19/20) (Crimp)
MS3451	A	SAE AS50151	MS3450	Receptacle Cable Connecting (Was M83723/17/18) (Crimp)
MS3452	**	SAE AS50151	MS3450	Receptacle Box Mount (Was M83723/21/22) (Crimp)
MS3454	A	SAE AS50151	MS3450	Receptacle Jam Nut (Crimp)
MS3456	A	SAE AS50151	MS3450	Plug Straight (Was M83723/23/24) (Crimp)
MS3459	A	SAE AS50151	MS3450	Plug Straight Self Locking (Was M83723/52/53)
MS3463	**	QPL-81703	3	Receptacle Push Pull (Hermetic)
MS3464	A	QPL-81703	3	Receptacle Push Pull Jam Nut
MS3466	**	QPL-81703	3	Receptacle Push Pull Hermetic (Box Mount)
MS3467	A	QPL-81703	3	Plug Push Pull
* Consult Factory      ** Connector Does Not Accommodate Rear Accessories      *** Inactive For New Design				



## Military Standard Connector Index

A

Part No.	Connector Designator	Specification	Series	Description
MS3468	A	QPL-81703	3	Plug Push Pull Lanyard
MS3469	**	QPL-81703	3	Receptacle Push Pull Hermetic Jam Nut
MS3470	A	MIL-DTL-26482	2	Receptacle Narrow Flange Mount (Was M83723/1/2)
MS3471	A	MIL-DTL-26482	2	Receptacle Cable Connecting (Was M83723/7/8)
MS3472	A	MIL-DTL-26482	2	Receptacle Wide Flange Mount (Was M83723/3/4)
MS3473	**	MIL-DTL-26482	2	Receptacle Solder Mount Hermetic
MS3474	A	MIL-DTL-26482	2	Receptacle Rear Mount Jam Nut (Was M83723/5/6)
MS3475	A	MIL-DTL-26482	2	Plug RFI Shielded (Was M83723/42/43)
MS3476	A	MIL-DTL-26482	2	Plug Straight (Was M83723/13/14)
MS3477	**	MIL-DTL-26482	2	Receptacle Hermetic Box Mount
MS3479	**	MIL-DTL-26482	2	Receptacle Hermetic Rear Mount Jam Nut
MS17343	C	MIL-DTL-22992	R	Receptacle Wall Mount
MS17344	C	MIL-DTL-22992	R	Plug Straight
MS17345	C	MIL-DTL-22992	R	Plug Cable Connecting (Female)
MS17346	C	MIL-DTL-22992	R	Receptacle Box Mount
MS17347	C	MIL-DTL-22992	R	Receptacle Jam Nut
MS17348	**	MIL-DTL-22992	R	Receptacle Jam Nut Box Mount
MS18062	**	MIL-DTL-22992	R	Dummy Receptacle
MS20026	*	MIL-DTL-27599	I	Receptacle Wall Mount Solder***
MS20027	*	MIL-DTL-27599	I	Receptacle Line***
MS20028	*	MIL-DTL-27599	I	Plug Straight***
MS20029	**	MIL-DTL-27599	I	Receptacle Jam Nut Mount***
MS20030	*	MIL-DTL-27599		Receptacle Box Mount Hermetic
MS20031	**	MIL-DTL-27599		Receptacle Jam Nut Hermetic***
MS20032	**	MIL-DTL-27599		Receptacle Solder Mount Hermetic***
MS20034	*	MIL-DTL-27599		Receptacle Wall Mount***
MS20035	*	MIL-DTL-27599		Receptacle Box Mount***
MS24264	E	MIL-C-26500	F G & R	Receptacle Flange Mount*** Use MIL-DTL-83723
MS24265	E	MIL-C-26500	F G & R	Receptacle Single Hole Mount*** Use MIL-DTL-83723
MS24266	E	MIL-C-26500	F G & R	Plug Straight*** Use MIL-DTL-83723
MS25183	**	SAE AS50151	MS3100	Plug Potting Seal (Solder)
MS27034	**	MIL-C-26500		Receptacle Hermetic Solder Mount
MS27334	*	MIL-DTL-27599		Receptacle Wall Mount ***
MS27335	**	MIL-DTL-27599		Receptacle Box Mount ***
* Consult Factory      ** Connector Does Not Accommodate Rear Accessories      ***Inactive For New Design				







## Military Standard Connector Index

A

Part No.	Connector Designator	Specification	Series	Description
MS27508	**	MIL-DTL-38999	II	Receptacle Back Panel Box Mount
MS27513	**	MIL-DTL-38999	II	Receptacle Box Mount
MS27515	F	MIL-DTL-38999	I	Inactive Use MS27656
MS27613	E-710	MIL-DTL-26500		Receptacle Panel Mount ***Use MIL-DTL-83723
MS27614	E-710	MIL-DTL-26500		Receptacle D-Hole Mount ***Use MIL-DTL-83723
MS27615	E-710	MIL-DTL-26500		Plug Straight ***Use MIL-DTL-83723
MS27652	F	MIL-DTL-38999	I	Inactive Use MS27466
MS27653	F	MIL-DTL-38999	I	Inactive Use MS27467
MS27654	F	MIL-DTL-38999	I	Inactive Use MS27656
MS27656	F	MIL-DTL-38999	I	Receptacle Back Panel Wall Mount (MS27499)
MS27661	F-752	MIL-DTL-38999	I	Plug Lanyard Release
MS27662	**	MIL-DTL-38999	I	Receptacle Thru-Bulkhead
MS27664	**	MIL-DTL-38999	II	Receptacle Back-Panel Wall Mount
MS27665	F	MIL-DTL-38999	I	Plug Rack & Panel Mount
MS27667	**	MIL-DTL-38999	II	Receptacle Thru-Bulkhead
MS90555	*	MIL-DTL-22992	L	Receptacle Wall Mount
MS90556	*	MIL-DTL-22992	L	Plug Straight
MS90557	*	MIL-DTL-22992	L	Plug Cable Connecting
MS90558	*	MIL-DTL-22992	L	Receptacle W/Coupling Ring Wall Mount
M28840/10	G	MIL-DTL-28840		Receptacle Wall Mount
M28840/11	G	MIL-DTL-28840		Receptacle Cable Connecting
M28840/12	**	MIL-DTL-28840		Receptacle Box Mount
M28840/14	G	MIL-DTL-28840		Receptacle Jam Nut
M28840/16	G	MIL-DTL-28840		Plug Straight
D38999/20	H	MIL-DTL-38999	III	Receptacle Wall Mount
D38999/21	**	MIL-DTL-38999	III	Receptacle Hermetic (Box Mount)
D38999/23	**	MIL-DTL-38999	III	Receptacle Hermetic Jam Nut
D38999/24	H	MIL-DTL-38999	III	Receptacle Jam Nut
D38999/25	**	MIL-DTL-38999	III	Receptacle Hermetic Solder Mount
D38999/26	H	MIL-DTL-38999	III	Plug Straight
D38999/27	**	MIL-DTL-38999	III	Receptacle Hermetic Weld Mount
D38999/29	H-701	MIL-DTL-38999	III	Plug Lanyard Release
D38999/30	H-701	MIL-DTL-38999	III	Plug Lanyard Release
D38999/31	H	MIL-DTL-38999	III	Plug Lanyard Release
* Consult Factory      ** Connector Does Not Accommodate Rear Accessories      ***Inactive For New Design				

# Military Standard Connector Index



Part No.	Connector Designator	Specification	Series	Description
D38999/36	H	MIL-DTL-38999	III	Plug Lanyard Release
D38999/40	H	MIL-DTL-38999	IV	Receptacle Wall Mount
D38999/41	**	MIL-DTL-38999	IV	Box Mount Receptacle Hermetic
D38999/42	**	MIL-DTL-38999	IV	Receptacle Box Mount
D38999/43	H	MIL-DTL-38999	IV	Jam Nut Mount Hermetic Receptacle
D38999/44	H-715	MIL-DTL-38999	IV	Receptacle Jam Nut
D38999/45	**	MIL-DTL-38999	IV	Solder Mount Hermetic Receptacle
D38999/46	H	MIL-DTL-38999	IV	Plug Straight EMI
D38999/47	H	MIL-DTL-38999	IV	Plug Straight
D38999/49	H	MIL-DTL-38999	IV	In Line Cable Receptacle
D38999/60	H	MIL-DTL-38999	III	Tight Tolerance Fiber Optic Plug
D38999/61	H	MIL-DTL-38999	III	Tight Tolerance Wall Mount Fiber Optic Receptacle
M81511/1	J	MIL-C-81511	2	Receptacle Flange Mount
M81511/2	**	MIL-C-81511	2	Receptacle Solder Flange
M81511/3	J	MIL-C-81511	2	Receptacle Jam Nut
M81511/4	**	MIL-C-81511	2	Receptacle Jam Nut ***
M81511/5	J	MIL-C-81511	2	Plug Cable Connecting ***
M81511/6	J	MIL-C-81511	2	Plug ***
M81511/21	J	MIL-C-81511	1	Receptacle Flange Mount ***
M81511/22	**	MIL-C-81511	1	Receptacle Solder Flange Mount ***
M81511/23	J	MIL-C-81511	1	Receptacle Jam Nut ***
M81511/24	**	MIL-C-81511	1	Receptacle Jam Nut ***
M81511/25	J	MIL-C-81511	1	Receptacle Cable Connecting ***
M81511/26	J	MIL-C-81511	1	Plug ***
M81511/27	**	MIL-C-81511	1	Receptacle Thru-Bulkhead Jam Nut ***
M81511/28	**	MIL-C-81511	2	Receptacle Thru-Bulkhead Single Hole Mount ***
M81511/31	J	MIL-C-81511	2	Receptacle Flange Mount ***
M81511/32	J	MIL-C-81511	2	Receptacle Jam Nut Mount ***
M81511/33	J	MIL-C-81511	2	Receptacle, Cable Connecting ***
M81511/34	J	MIL-C-81511	2	Plug ***
M81511/35	J	MIL-C-81511	1	Receptacle Flange Mount ***
M81511/36	J	MIL-C-81511	1	Receptacle Jam Nut ***
M81511/37	J	MIL-C-81511	1	Receptacle Cable Connecting ***
M81511/38	J	MIL-C-81511	1	Plug ***
* Consult Factory      ** Connector Does Not Accommodate Rear Accessories      ***Inactive For New Design				















## MIL-C-5015 Connector Fittings (MS3100 Series)

### A

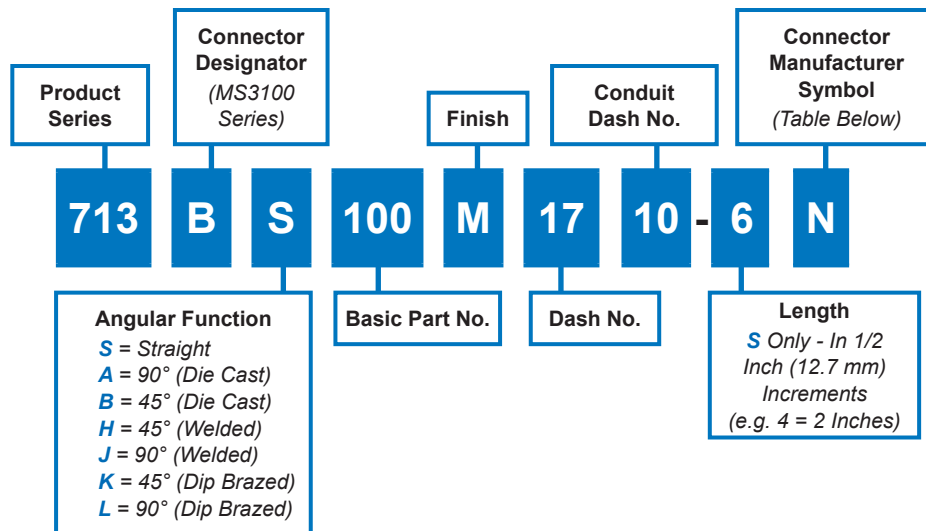
### Part Number Development For Connector Designator "B"

The threaded rear ends on MIL-C-5015 solder-type connectors are not specification controlled. Rear accessory accommodation, therefore, varies from one manufacturer to the next with no universal standard for the number of threads or interlocking teeth. As a result, many MS3100 connectors and accessories are not interchangeable in certain shell sizes and service classes.

To assure optimum backshell compatibility for each MS3100 Series solder contact connector, it is necessary to add an additional connector manufacturer's symbol to the part number.

The connector manufacturer's symbol ensures the interface dimensions and mechanical features for each MS3100 connector manufacturer's product are accommodated in the backshell. If there is any doubt as to the provenance of the connector, Symbol A, universal fit, should be selected.

For proper use of these backshells, discard all rear hardware, including wire seal grommets, normally supplied with the MS3100 Series connectors. (This information does not apply to endbell extenders commonly supplied with MS3100A Series connectors.) Connector manufacturer symbols are shown in the table below and pertinent connector fitting interface information (Table I) may be found on page A-13.



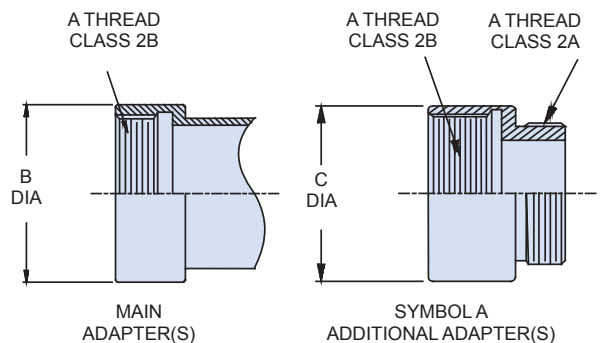
Connector Manufacturer Symbols			
Symbol	Manufacturer	Connector Series	Class
A	All	MS3100, 01, 06	A/E/F/R
G	Glenair	ITS	A/E/F/R
H	Amphenol	MS3100, 01, 06 97 Series Blue Insert	A
L	Amphenol/BCO	MS3100, 01, 06 10-214, 10-720 10-721, 10-726	A/E/F/R
M	Cannon	MS3100, 01, 06	A
N		MS3100, 01, 063 CA00, 01, 06	E/F/R

# MIL-C-5015 Connector Fittings (MS3100 Series)

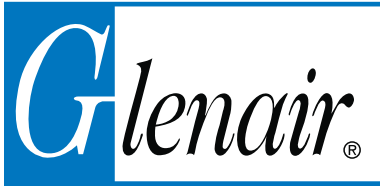


MS3100 Series Manufacturer Designations						
Dash Number	Shell Size	Conn. Mfg. Desig.	See Note 1	A Thread Class 2B	B Dia Max	C Dia Max
01	8S	A	1	7/16 - 28 UNEF	.656 (16.7)	.625 (15.9)
02	8S	J, M, N,	2	7/16 - 28 UNEF	.656 (16.7)	.625 (15.9)
03	8S	L	3	3/8 - 32 UNEF	.607 (15.4)	.562 (14.3)
04	8S	H	3	7/16 - 27 UNS	.656 (16.7)	.625 (15.9)
05	10S	A	1	1/2 - 28 UNEF	.724 (18.4)	.687 (17.4)
06	10S	H, J, L, N	2	1/2 - 28 UNEF	.724 (18.4)	.687 (17.4)
07	10S	M	3	9/16 - 24 UNEF	.724 (18.4)	.687 (17.4)
08	10SL	A	1	9/16 - 24 UNEF	.724 (18.4)	.687 (17.4)
09	10SL	M, N	2	9/16 - 24 UNEF	.724 (18.4)	.687 (17.4)
10	10SL	H, J, L	3	5/8 - 24 UNEF	.848 (21.5)	.812 (20.6)
11	12, 12S	A	1	5/8 - 24 UNEF	.848 (21.5)	.812 (20.6)
12	12, 12S	L, N	2	5/8 - 24 UNEF	.848 (21.5)	.812 (20.6)
13	12, 12S	H, J, M	3	11/16 - 24 UNEF	.848 (21.5)	.812 (20.6)
14	12SL, 14, 14S	A	2	3/4 - 20 UNEF	.974 (24.7)	.937 (23.8)
15	16, 16S	A	2	7/8 - 20 UNEF	1.102 (28.0)	1.062 (27.0)
16	18	A	2	1 - 20 UNEF	1.220 (31.0)	1.187 (30.1)
17	20	A	1	1 1/8 - 18 UNEF	1.343 (34.1)	1.312 (34.1)
18	20	H, L, M, N	2	1 1/8 - 18 UNEF	1.343 (34.1)	1.312 (33.3)
19	20	J	3	1 1/8 - 24 UNS	1.343 (34.1)	1.312 (33.3)
20	22	A	2	1 1/4 - 18 UNEF	1.343 (34.1)	1.437 (36.5)
21	24	A	2	1 3/8 - 18 UNEF	1.468 (37.3)	1.562 (39.7)
22	28	A	2	1 5/8 - 18 UNEF	1.593 (40.5)	1.812 (46.0)
23	32	A	1	1 7/8 - 16 UN	2.125 (54.0)	2.062 (52.4)
24	32	L, M, N	2	1 7/8 - 16 UN	2.125 (54.0)	2.062 (52.4)
25	32	H, J	3	1 29/32 - 18 UNS	2.125 (54.0)	2.062 (52.4)
26	36	A	1	2 1/8 - 16 UN	2.375 (60.3)	2.312 (58.7)
27	36	M, N	2	2 1/8 - 16 UN	2.375 (60.3)	2.312 (58.7)
28	36	L	3	2 1/16 - 16 UNS	2.375 (60.3)	2.312 (58.7)
29	36	J	3	2 1/16 - 20 UNEF	2.375 (60.3)	1.312 (33.3)
30	36	H	3	2 1/8 - 18 UNS	2.375 (60.3)	2.312 (58.7)
31	40	A	1	2 3/8 - 16 UN	2.625 (66.7)	2.562 (65.1)
32	40	H, M, N	2	2 3/8 - 16 UN	2.625 (66.7)	2.562 (65.1)
33	40	L	3	2 5/16 - 16 UNS	2.625 (66.7)	2.562 (65.1)
34	44	A	2	2 5/8 - 16 UN	2.906 (73.8)	2.875 (73.0)
35	48	A	1	2 7/8 - 16 UN	3.156 (80.2)	3.125 (79.4)
36	48	H	2	2 7/8 - 16 UN	3.156 (80.2)	3.125 (79.4)
37	48	N	3	2 13/16 - 18 UNS	3.156 (80.2)	3.125 (79.4)

1. Since the rear accessory accommodation is not spec controlled, many of the connectors manufactured by one supplier are incompatible with the adapters manufactured for another supplier. Therefore, to assure compatibility, the specific manufacturer's connector series symbol should be used when ordering. If the specific manufacturer is not known, order symbol A and corresponding dash number, for MS universal fit.
2. Symbol A mates with all connectors for each shell size.
3. Additional transition adapters may be supplied with symbol A for each shell size, as noted.







## Determining Tubing/Conduit Core Size

### How to use the tables on this page:

**A**

It is possible for a wire bundle to contain wires of all the same size diameter, or a variety of mixed diameters. The gauge indicates 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 including the insulation and/or braided shielding.

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	$30 \times .045 = 1.35$ $1.35 \div 30 = .045$ average wire diameter	$15 \times .045 = .68$ $15 \times .135 = \underline{2.03}$ 2.71 $2.71 \div 30 = .090$ average wire diameter
3. Using Table I, find factor for 30 wires (6.7) and multiply by average wire diameter	$.045 \times 6.7 = .3015$ wire bundle diameter	$.090 \times 6.7 = .603$ 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	1.0	2.0	2.2	2.4	2.7	2.9	3.0	3.3	3.8	4.0	4.3	4.6	5.0	5.3	5.6	6.0	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	15.0	16.1	17.2	19.3	21.0

**Table II**

Dash No.	I.D.	Cross-sectional Area	FILL				
			50%	60%	70%	80%	90%
06	3/16 (0.188)	0.027	0.132	0.145	0.156	0.167	0.177
08	1/4 (0.250)	0.049	0.177	0.194	0.209	0.224	0.237
09	9/32 (0.281)	0.062	0.199	0.218	0.235	0.251	0.267
10	5/16 (0.313)	0.076	0.221	0.242	0.261	0.279	0.296
12	3/8 (0.375)	0.110	0.265	0.290	0.314	0.335	0.356
14	7/16 (0.438)	0.150	0.309	0.338	0.366	0.391	0.415
16	1/2 (0.500)	0.196	0.354	0.387	0.418	0.447	0.474
20	5/8 (0.625)	0.307	0.442	0.484	0.523	0.559	0.593
24	3/4 (0.750)	0.442	0.530	0.581	0.627	0.671	0.712
28	7/8 (0.875)	0.601	0.619	0.678	0.732	0.783	0.830
32	1 (1.000)	0.785	0.707	0.775	0.837	0.894	0.949
40	1 1/4 (1.250)	1.227	0.884	0.968	1.046	1.118	1.186
48	1 1/2 (1.500)	1.767	1.061	1.162	1.255	1.342	1.423
56	1 3/4 (1.750)	2.405	1.237	1.356	1.464	1.565	1.660
64	2 (2.000)	3.142	1.414	1.549	1.673	1.789	1.897
80	2 1/2 (2.500)	4.909	1.768	1.936	2.092	2.236	2.372
96	3 (3.000)	7.069	2.121	2.324	2.510	2.683	2.846

# Wire Diameter and Weight Lookup Tables



Conduit Introduction

A

Bulk Conduit Length Tolerances	
The following tolerances apply to the lengths of bulk conduit	
Inches	
Length	Tolerance
12 - 144	+ 2.0
145 - 600	+4.0
601 - up	+ 6.0
Centimeters	
Lenth	Tolerance
31 - 366	+5.0
367 - 1524	+10.2
1525 - up	+15.2

WIRE	REFERENCE DIAMETER	REFERENCE WEIGHT (LBS/1000 FT) MAX
M22759/11-28	0.033 (±.002)	1.36
M22759/11-26	0.038 (±.002)	1.90
M22759/11-24	0.043 (±.002)	2.58
M22759/11-22	0.049 (±.002)	3.72
M22759/11-20	0.058 (±.002)	5.43
M22759/11-18	0.068 (±.002)	8.14
M22759/11-16	0.075 (±.002)	10.00
M22759/11-14	0.090 (±.002)	15.10
M22759/11-12	0.111 (±.003)	24.10
M22759/11-10	0.139 (±.004)	37.80
M22759/11-8	0.202 (±.004)	65.50

WIRE	REFERENCE DIAMETER	REFERENCE WEIGHT (LBS/1000 FT) MAX
M22759/33-30	0.024 (±.002)	0.66
M22759/33-28	0.027 (±.002)	0.91
M22759/33-26	0.032 (±.002)	1.40
M22759/33-24	0.037 (±.002)	2.00
M22759/33-22	0.043 (±.002)	2.90
M22759/33-20	0.050 (±.002)	4.40
M22759/44-28	0.027 (±.002)	0.91
M22759/44-26	0.032 (±.002)	1.40
M22759/44-24	0.037 (±.002)	2.00
M22759/44-22	0.043 (±.002)	2.80
M22759/44-20	0.050 (±.002)	4.30
M22759/44-18	0.060 (±.002)	6.50
M22759/44-16	0.068 (±.002)	8.30
M22759/44-14	0.085 (±.003)	13.00
M22759/44-12	0.103 (±.003)	19.70

TWISTED PAIR (JACKET & SHIELD)				TWISTED PAIR (NO JACKET OR SHIELD)			
Part Number	Max OD	MAX weight (lbs/1000 ft)	REFERENCE BASIC WIRE	Part Number	Max OD	MAX weight (lbs/1000 ft)	REFERENCE BASIC WIRE
M27500-28RC2S06	0.128	12.947	M22759/11-28	M27500-28RC2U00	0.070	2.774	M22759/11-28
M27500-26RC2S06	0.138	15.107	M22759/11-26	M27500-26RC2U00	0.080	3.876	M22759/11-26
M27500-24RC2S06	0.148	17.553	M22759/11-24	M27500-24RC2U00	0.090	5.263	M22759/11-24
M27500-22RC2S06	0.160	21.149	M22759/11-22	M27500-22RC2U00	0.102	7.589	M22759/11-22
M27500-20RC2S06	0.178	26.543	M22759/11-20	M27500-20RC2U00	0.120	11.077	M22759/11-20
M27500-18RC2S06	0.198	34.188	M22759/11-18	M27500-18RC2U00	0.140	16.606	M22759/11-18
M27500-16RC2S06	0.212	39.464	M22759/11-16	M27500-16RC2U00	0.154	20.400	M22759/11-16
M27500-14RC2S06	0.242	53.044	M22759/11-14	M27500-14RC2U00	0.184	30.804	M22759/11-14
M27500-12RC2S06	0.286	76.061	M22759/11-12	M27500-12RC2U00	0.228	49.164	M22759/11-12
M27500-10RC2S06	0.348	114.607	M22759/11-10	M27500-10RC2U00	0.286	77.112	M22759/11-10
M27500-8RC2S06	0.500	207.438	M22759/11-8	M27500-8RC2U00	0.412	133.620	M22759/11-8
M27500-30SC2S06	0.110	9.614	M22759/33-30	M27500-30SC2U00	0.052	1.346	M22759/33-30
M27500-28SC2S06	0.116	10.759	M22759/33-28	M27500-28SC2U00	0.058	1.856	M22759/33-28
M27500-26SC2S06	0.126	12.817	M22759/33-26	M27500-26SC2U00	0.068	2.856	M22759/33-26
M27500-24SC2S06	0.136	15.100	M22759/33-24	M27500-24SC2U00	0.078	4.080	M22759/33-24
M27500-22SC2S06	0.148	18.206	M22759/33-22	M27500-22SC2U00	0.090	5.916	M22759/33-22
M27500-20SC2S06	0.162	22.748	M22759/33-20	M27500-20SC2U00	0.104	8.976	M22759/33-20

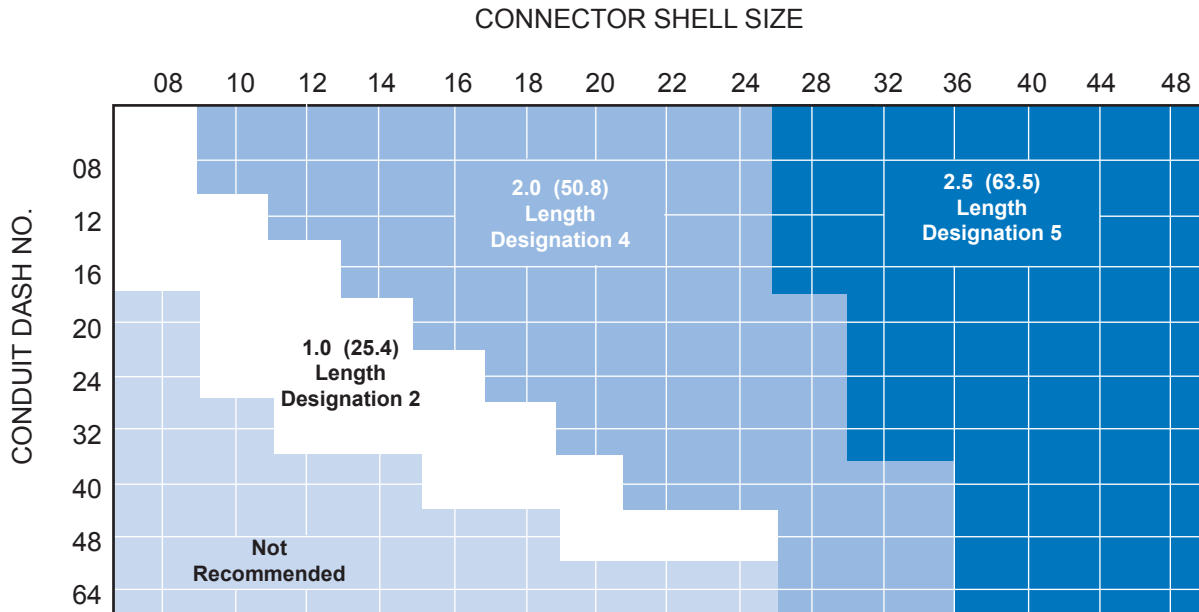


## Standard Minimum Lengths Style 1 and Style 2 Conduit Fittings

A

### Standard Minimum Lengths

The following chart defines the standard minimum lengths for straight conduit fittings, 713\*S100 through 713\*S103. These recommended minimum lengths have been established to provide adequate working room behind the connector for the shell size and conduit dash number combinations listed. These lengths also provide sufficient clearance for wire routing when using small size conduit with large size connectors.

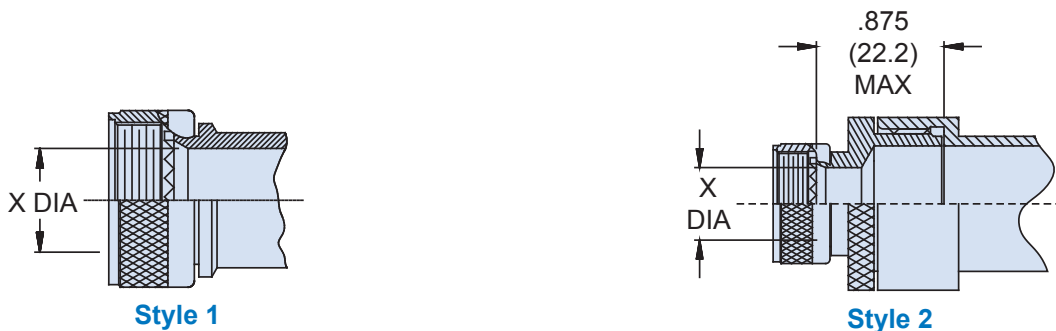


### Style 1 / Style 2 Conduit Fittings

To provide an optimized termination between all series of conduit and the connector it is necessary to select either style 1 or style 2 fitting configuration as illustrated.

Style 1 applies to wire bundle or cable diameters which are smaller than the X-diameters listed for each connector designation and shell size on the following page. When the wire bundle or cable diameter exceeds the listed X-diameter, then style 2 is desired.

Style 2 configuration also may be desirable to provide fitting increased working room inside the conduit fitting to accommodate conductor cross-overs, splices, ground leads, etc., and should be considered when selecting the conduit fitting part number.





# Maximum Cable/Wire Bundle Diameter for Style 1 Conduit Fitting Catalog Notes



## Style 1 Fittings: X Diameter

Shell Size	Connector Designator									
	A	D	E	F	G	H	J	K	L	S
03	.295 (7.5)									
08	.295 (7.5)	.300 (7.6)	.350 (8.9)	.299 (7.6)			.446 (11.3)	.320 (8.1)	.299 (7.6)	.312 (7.9)
09						.299 (7.6)				
10	.400 (10.2)	.405 (10.3)	.443 (11.3)	.427 (10.8)			.571 (14.5)	.30 (7.6)	.427 (10.8)	.429 (10.9)
11					.367 (9.3)	.427 (10.8)		.38 (9.7)		
12	.536 (13.6)	.550 (14.0)	.595 (15.1)	.541 (13.7)				.40 (10.2)	.541 (13.7)	.554 (14.1)
13					.502 (12.8)	.541 (13.7)		.40 (10.2)		
14	.610 (15.5)	.635 (16.1)	.693 (17.6)	.641 (16.3)			.821 (20.9)	.48 (12.2)	.641 (16.3)	.668 (17.0)
15					.647 (16.4)	.641 (16.3)		.48 (12.2)		
16	.735 (18.7)	.795 (20.2)	.786 (20.0)	.766 (19.5)			.946 (24.0)	.60 (15.2)	.766 (19.5)	.793 (20.1)
17					.744 (18.9)	.766 (19.5)		.60 (15.2)		
18	.814 (20.7)	.875 (22.2)	.923 (23.4)	.855 (21.7)			1.071 (27.2)	.72 (18.3)	.885 (22.5)	.888 (22.6)
19					.876 (22.3)	.885 (22.5)				
20	.939 (23.9)	1.005 (25.5)	1.051 (26.7)	.980 (24.9)			1.196 (30.4)	.86 (21.8)	.980 (24.9)	1.025 (26.0)
21						.980 (24.9)				
22	1.064 (27.0)	1.120 (28.4)	1.176 (29.9)	1.165 (29.6)			1.321 (33.6)	.97 (24.6)	1.165 (29.6)	1.150 (29.2)
23					1.073 (27.3)	1.165 (29.6)				
24	1.179 (29.9)	1.180 (30.0)	1.301 (33.0)	1.230 (31.2)			1.446 (36.7)	1.08 (27.4)	1.230 (31.2)	1.275 (32.4)
25					1.205 (30.6)	1.230 (31.2)				
28	1.414 (35.9)							1.24 (31.5)		
29					1.442 (36.6)					
32	1.660 (42.2)							1.51 (38.4)		
33					1.640 (41.7)					
36	1.875 (47.6)							1.75 (44.5)		
40	2.090 (53.1)							1.86 (47.2)		
44	2.345 (59.6)									
48	2.595 (65.9)									
61	1.219 (31.0)									

## Style 1 X Dia.

Dash No.	Conn. Desig. B
01	.358 (9.1)
02	.358 (9.1)
03	.312 (7.9)
04	.358 (9.1)
05	.437 (11.1)
06	.437 (11.1)
07	.483 (12.3)
08	.483 (12.3)
09	.483 (12.3)
10	.531 (13.5)
11	.531 (13.5)
12	.531 (13.5)
13	.531 (13.5)
14	.656 (16.7)
15	.781 (19.8)
16	.966 (24.5)
17	1.031 (26.2)
18	1.031 (26.2)
19	1.031 (26.2)
20	1.156 (29.4)
21	1.320 (33.5)
22	1.531 (38.9)
23	1.781 (45.2)
24	1.781 (45.2)
25	1.781 (45.2)
26	1.900 (48.3)
27	1.900 (48.3)
28	1.968 (50.0)
29	1.968 (50.0)
30	1.968 (50.0)
31	2.218 (56.3)
32	2.218 (56.3)
33	2.218 (56.3)
34	2.531 (64.3)
35	2.781 (70.6)
36	2.781 (70.6)
37	2.656 (67.5)

### Catalog Notes

For all parts in this catalog:

- All parts will be identified with manufacturer's name and part number, space permitting.
- Glenair 600 series backshell assembly tools are recommended for assembly and installation.
- Conduit in part drawings is shown for reference only.
- On all length callouts, tolerance is  $\pm .060$  unless otherwise specified.
- Metric dimensions appear in parentheses in diagrams and tables, based on 1 inch = 25.4 mm, for reference only. Unless otherwise specified, the following other dimensional tolerances apply:
  - .xx =  $\pm .03$  (0.8)
  - .xxx =  $\pm .015$  (0.4)
  - Lengths =  $\pm .060$  (1.52)
  - Angles =  $\pm 5^\circ$

*Turnkey*

# SERIES 72 ANNULAR TUBING ASSEMBLIES

TERMINATED, TESTED, AND READY FOR IMMEDIATE USE



Series 72  
**Economical Annular Polymer-Core  
 Convoluted Tubing Systems**  
 Introduction and Quick Selection Guide



**High-Performance Annular Convoluted Tubing, Backshells, Fittings and Assemblies**

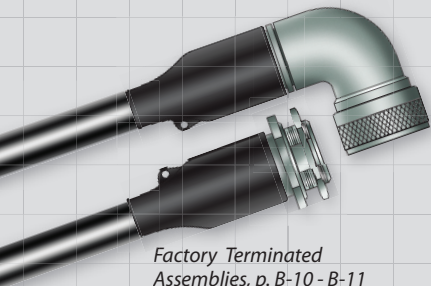
**Glenair Series 72 Annular Polymer-Core Convoluted Tubing** provides an economical, lightweight, durable enclosure for interconnect wiring, available in three flexible and versatile materials, with or without EMI/RFI braiding and jacketing.

**Do-It-Yourself Fittings** are the best choice when ease of assembly and installation is a requirement, when prototyping wire-routing systems, or when running annular tubing in unpredictable lengths.

**Prefer a Turnkey Solution?** Glenair can terminate point-to-point or complex multi-branch annular tubing assemblies to fit your specific application requirements.



Convoluted Tubing configurations, pages B-2 – B-9



Factory Terminated Assemblies, p. B-10 - B-11



Sentry system, pages B-12 – B-23



Easy-to-Install Guardian system, pages B-24 – B-31

Part No.	Description	Page No.
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<b>Easy-to-Install Guardian System</b>		
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**Series 72**  
**High-Performance Polymer-Core**  
**Annular Convoluted Tubing**  
**Configuration Options**

**Annular convoluted tubing, braided shielding, and jacketing options**

Polymer core annular tubing is Glenair's economical wire-routing solution for easy on-site installation. System design begins with your selection of core material, either Kynar, PVDF, or G-FLEX Siltem. Core materials may be outfitted with braided shielding and jacketing options per the type designators listed below to address specific mechanical, electrical (EMI), and environmental protection requirements. See the following pages for detailed how-to-order information.

**B**

**Part Number**  
**120-144**



*Pg. B-5*

**For non-environmental and non-EMI/RFI applications**

Strong, abrasion resistant annular conduit tubing, supplied in thermally stabilized Kynar®, PVDF, or medium duty Siltem. Available in 7 colors, standard or slit.

**Part Number**  
**121-190**



*Pg. B-6*

**For non-environmental EMI/RFI applications**

Annular conduit tubing with braided shield for EMI/RFI protection and additional structural integrity, particularly pull (tensile) strength.

**Part Number**  
**121-191**



*Pg. B-7*

**For environmental EMI/RFI applications**

Annular conduit tubing with braided shielding for EMI/RFI protection and a ruggedized jacket for environmental protection against dust, dirt, and moisture incursion.

**Part Number**  
**121-192**



*Pg. B-8*

**For non-environmental EMI/RFI applications with high dB shielding requirements**

Annular conduit tubing with double braided shield for high frequency EMI/RFI protection and mechanical strength.

**Part Number**  
**121-193**



*Pg. B-9*

**For environmental EMI/RFI applications with high dB shielding requirements**

Annular conduit tubing with double braided shield and jacket for optimum EMI/RFI protection, strength and environmental sealing.



**Series 72**  
**High-Performance Polymer-Core**  
**Annular Convoluted Tubing**  
**Material Properties and Colors**



**Tubing Material Choices**

Y	Kynar®	Flexible, thermally stabilized, resistant to harsh chemicals and radiation. UV resistant, self-extinguishing, nontoxic and resistant to low-temperatures. 166° C temp. rating.
V	PVDF	Flexible and chemical/radiation resistant. Available in 4 colors plus standard black and natural. 150° C temperature rating.
S	G-FLEX Siltem	Lightweight, halogen-free, low toxicity, low smoke. 175° temperature rating. Ideal for harsh environment applications. Exceptional flexibility and crush resistance.

**Material Properties - Kynar® and PVDF**

Material Property	Service Temperature	Tensile Strength	Elongation	Specific Gravity
Kynar® and PVDF	-65°F/330°F (-54°C/166°C)*	5000 PSI (34,474 KP)	250%	1.8 Max
Material Property	Heat Aging	Dielectric Strength	Volume Resistivity	Water Absorption
Kynar® and PVDF	168 Hrs. @ 347°F (175°C)	10,000V	10 <sup>16</sup>	0.02%
Material Property	Solvent Resistance	Flammability	Fungus Resistance	
Kynar® and PVDF	No swelling, stickiness or weight change	Non-burning	Does not support fungus growth	

\*Note: Kynar® and PVDF material properties are identical, with the exception that Kynar® has been irradiated for thermal stability, and thus has a higher temperature rating of 166°C compared to 150° for non-thermally-stabilized PVDF.

G-FLEX Siltem is Glenair's proprietary annular polymer-core convoluted tubing formulation, developed for harsh environment applications that require a lightweight, halogen-free material with exceptional flexibility and crush resistance

**Material Properties - G-FLEX Siltem**

Material Property	Flexural Modulus	Flexural Strength	Tensile Strength	Elongation
	168,000 PSI	5590 PSI	5700 PSI	60%
Material Property	Melt Flow Rate	Dielectric Strength	Volume Resistivity	Water Absorption
	38.0 G/10 min	422.9 V/mil	>1.E+16 Ohm-cm	0.58%

**Color Options**

	Standard Black	Standard for Kynar and PVDF annular convoluted tubing materials
N	Natural/Clear	Standard for G-FLEX Siltem. Available for for all Series 72 annular convoluted tubing materials
R	Red	Available for Kynar and PVDF annular convoluted tubing materials
Y	Yellow	Available for Kynar and PVDF annular convoluted tubing materials
BL	Blue	Available for Kynar and PVDF annular convoluted tubing materials
TN	Desert Tan	Available for Kynar and PVDF annular convoluted tubing materials
O	Orange	Available for Kynar and PVDF annular convoluted tubing materials



## Series 72 Annular Polymer-Core Convoluted Tubing Material Properties and Colors

B

### EMI/RFI Braided Shielding and Non-Metallic (Fabric) Overbraids

T	Tin/Copper	150°C temperature rating, 125 lbs. tensile strength, 96 hr. salt spray corrosion resistance
C	Stainless Steel	Highest tensile strength (225 lbs.), highest temperature—1093°C+
N	Nickel/Copper	200°C temperature rated, 150 lbs. tensile strength, 500 hrs. salt spray corrosion resistance
S	SnCuFe	Tin plated iron/copper
L	ArmorLite™	Microfilament metal-clad ultra lightweight stainless steel braid
D	Dacron	Yarn with excellent abrasion resistance, good chemical resistance, non-conductive
M	Nomex	-55°C to 260°C temperature range - will not melt, excellent chemical resistance, non-conductive
E	AmberStrand® 100%	Expandable, flexible, high-strength conductive metal-clad composite thermoplastic
F	AmberStrand® 75%/25%	75% Expandable, flexible, high-strength conductive metal-clad composite thermoplastic combined with 25% nickel-plated 36AWG copper wire for additional strength

### Jacketing Options

N	Neoprene	Tough, durable polychloroprene for mechanical and environmental protection
H	Hypalon®	Light weight with broad temperature range
E	EPDM	Better resistance to Ketones
V	Viton	Heaviest material with best resistance to oil and gasoline
B	Duraelectric, Black	Weatherproof, halogen free, flame resistant, functional to 260°C
G	Duraelectric, Gray	Qualified to US Navy MIL-PRF-24758A, Fed Std 595B #26270 Haze Gray color
TN	Duraelectric, Desert Tan	Duraelectric in Fed Std #3446 Desert Tan color
O	Duraelectric, Orange	OSHA Safety Orange to mark energized electrical cables

### Jacketing Material Properties and Chemical Resistance

Material Property	EPDM (Ethylene Propylene Diene Monomer)	Hypalon (Chlorosulfonated Polyethylene)	Neoprene (Polychloroprene)	Viton (Fluoroelastomer)	Duraelectric
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)	-94°F to +392°F (-70°C to +200°C)
Specific Gravity	1.26	1.18	1.25	1.80	1.22
Weight: Lbs./Cubic Inch	.045	.043	.045	.055	.045
Abrasion Resistance	Excellent	Excellent	Excellent	Good	Good
Wear Resistance	Good	Good	Good	Good	Good
Flame Resistance	Good	Good	Good	Good	Excellent
Sunlight Resistance	Excellent	Excellent	Good	Excellent	Excellent
<b>Chemical Resistance</b>					
Aliphatic Hydrocarbons	Good	Good	Good	Excellent	Excellent
Aromatic Hydrocarbons	Good	Fair	Fair	Excellent	Excellent
Ketones, Etc.	Good	Poor	Poor	Poor	Excellent
Oil & Gasoline	Good	Good	Fair	Excellent	Excellent

# 120-144 Annular Polymer-Core Convuluted Tubing

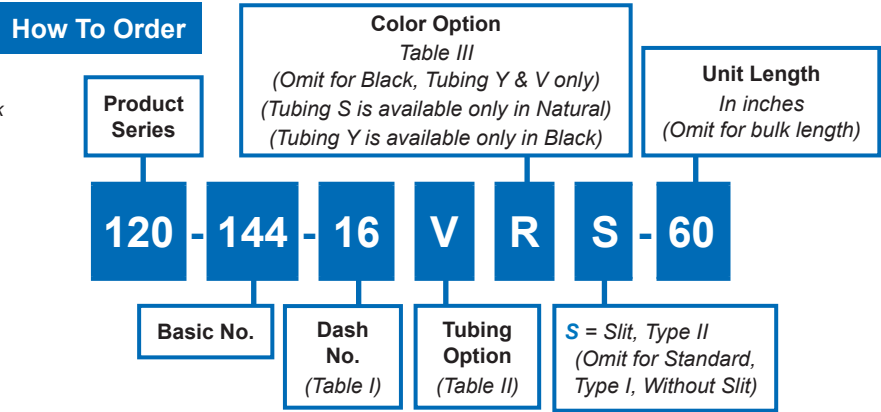


**Outstanding mechanical wire protection and lubricity for non-EMI/RFI applications**



Standard Black and Natural/Clear Annular Convuluted Tubing

Blue, Yellow, Red, Desert Tan, and Orange Annular Convuluted Tubing

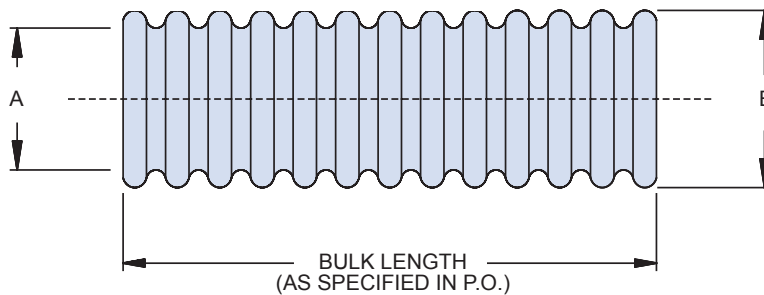


Dash No	A Inside Dia		B Outside Dia
	Min	Max	Max
06	.17 (4.3)	.19 (4.8)	.32 (8.1)
09	.24 (6.1)	.28 (7.1)	.42 (10.7)
12	.33 (8.4)	.37 (9.4)	.52 (13.2)
14	.40 (10.1)	.44 (11.2)	.59 (15.0)
16	.45 (11.4)	.50 (12.7)	.66 (16.8)
20	.57 (14.5)	.62 (15.7)	.77 (20.0)
24	.69 (17.5)	.75 (19.1)	.94 (23.9)
28	.81 (20.6)	.87 (22.1)	1.08 (27.4)
32	.93 (23.6)	1.00 (25.4)	1.20 (30.5)
40	1.18 (30.0)	1.25 (31.8)	1.44 (36.6)
48	1.43 (36.3)	1.50 (38.1)	1.71 (43.4)
52	1.56 (39.6)	1.63 (41.4)	1.85 (47.0)

Y	Kynar/Thermally stabilized
V	PVDF/Not thermally stabilized
S	G-FLEX Siltem/Medium duty

N	Natural/Clear
R	Red (available in PVDF only)
Y	Yellow (available in PVDF only)
BL	Blue (available in PVDF only)
TN	Desert Tan (available in PVDF only)
O	Orange (available in PVDF only)
Omit for standard black	

Dash No (I.D.)	Max. Length
09 (.281")	2000 ft.
12 (.375")	1500 ft.
16 (.5")	1000 ft.
20 (.625")	700 ft.
24 (.75")	500 ft.
32 (1")	300 ft.
40 (1.25")	200 ft.
48 (1.5")	200 ft.
52 (1.625")	200 ft.



**Packaging**

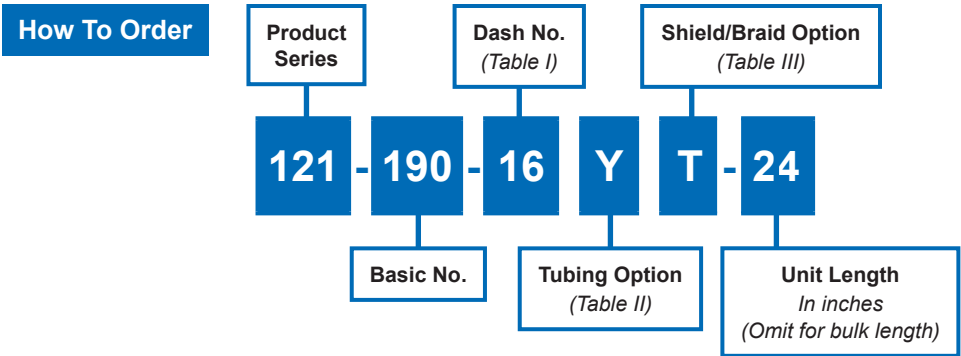
Long-length orders of conduit are subject to the practical limits of shipping box sizes. For example, the maximum length of 1/2 inch (dash 16) conduit that can fit in a standard shipping container is 1000 feet. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of conduit material based on tubing diameter and box size. Consult factory for non-standard length or packaging requirements.



# 121-190 Annular Polymer-Core Convuluted Tubing with External Braid

## 121-190 Tubing plus a single EMI/RFI braided shield

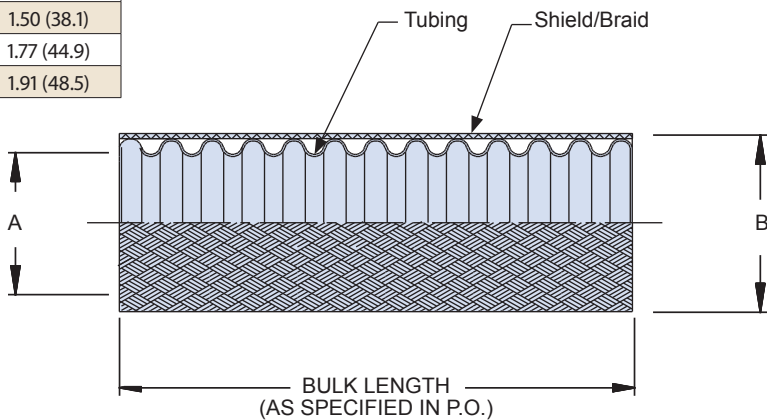
B



Dash No	A Inside Dia		B Outside Dia
	Min	Max	Max
06	.17 (4.3)	.19 (4.8)	.38 (9.6)
09	.24 (6.1)	.28 (7.1)	.48 (12.2)
12	.33 (8.4)	.37 (9.4)	.58 (14.7)
14	.40 (10.1)	.44 (11.2)	.65 (16.5)
16	.45 (11.4)	.50 (12.7)	.72 (18.3)
20	.57 (14.5)	.62 (15.7)	.83 (21.1)
24	.69 (17.5)	.75 (19.1)	1.00 (25.4)
28	.81 (20.6)	.87 (22.1)	1.14 (28.9)
32	.93 (23.6)	1.00 (25.4)	1.26 (32.0)
40	1.18 (30.0)	1.25 (31.8)	1.50 (38.1)
48	1.43 (36.3)	1.50 (38.1)	1.77 (44.9)
52	1.56 (39.6)	1.63 (41.4)	1.91 (48.5)

Y	Kynar/Thermally stabilized
V	PVDF/Not thermally stabilized
S	G-FLEX Siltem/Medium duty - natural color only

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
L	ArmorLite™
D	Dacron
M	Nomex
E	AmberStrand® 100%
F	AmberStrand® 75%/25%



Dash No.	Max Length Per Pkg.
09& 12	200 ft (60m)
16 - 52	100 ft (30m)

### Packaging

Long-length orders of 121-190 braided conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.



121-191

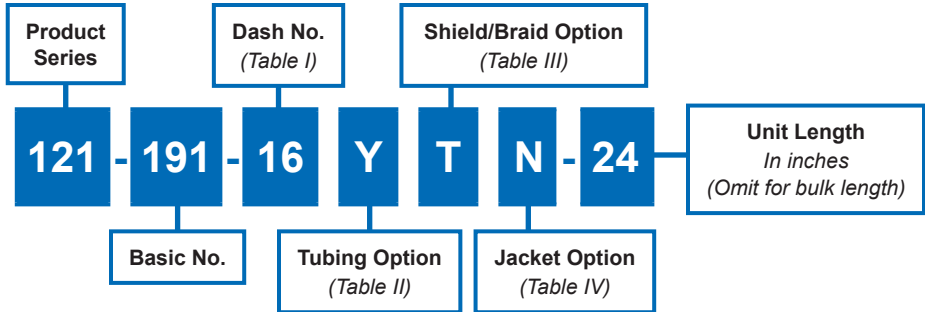
Annular Polymer-Core Convulsed Tubing  
with External Braid and Jacket



Series 72  
Annular Tubing

Tubing with one EMI/RFI Braided shield plus jacket for use in environmental applications

How To Order



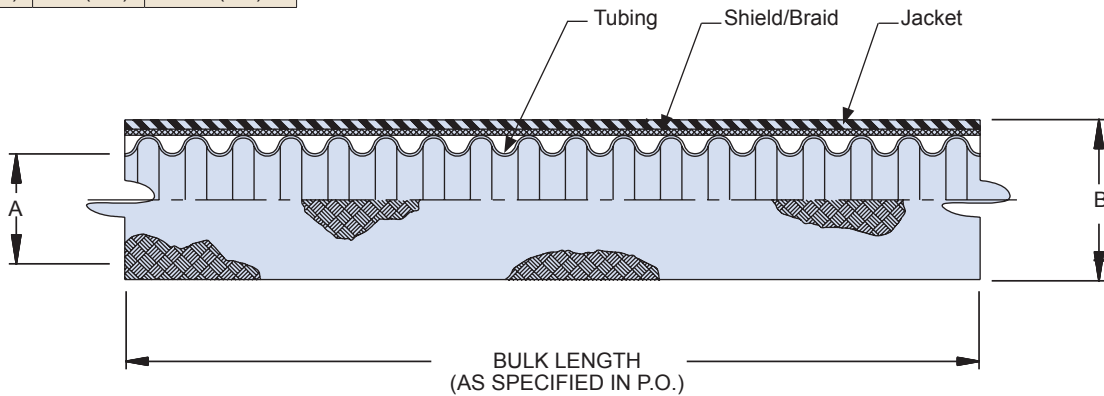
B

Dash No	A Inside Dia		B Outside Dia
	Min	Max	Max
06	.17 (4.3)	.19 (4.8)	.51 (12.9)
09	.24 (6.1)	.28 (7.1)	.61 (15.5)
12	.33 (8.4)	.37 (9.4)	.71 (18.0)
14	.40 (10.1)	.44 (11.2)	.78 (19.8)
16	.45 (11.4)	.50 (12.7)	.85 (21.6)
20	.57 (14.5)	.62 (15.7)	.96 (24.4)
24	.69 (17.5)	.75 (19.1)	1.13 (28.7)
28	.81 (20.6)	.87 (22.1)	1.27 (32.2)
32	.93 (23.6)	1.00 (25.4)	1.39 (35.3)
40	1.18 (30.0)	1.25 (31.8)	1.63 (41.4)
48	1.43 (36.3)	1.50 (38.1)	1.90 (48.3)
52	1.56 (39.6)	1.63 (41.4)	2.04 (51.8)

Y	Kynar/Thermally stabilized
V	PVDF/Not thermally stabilized
S	G-FLEX Siltem/Medium duty - natural color only

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
L	ArmorLite™
D	Dacron
M	Nomex
E	AmberStrand® 100%
F	AmberStrand® 75%/25%
-	No braid

N	Neoprene
H	Hypalon
E	EPDM
V	Viton
B	Duralectric, black
G	Bluejacket, Gray
TN	Duralectric, Desert Tan



Dash No.	Max Length Per Pkg.
09& 12	200 ft (60m)
16 - 52	100 ft (30m)

Packaging

121-191 braided and jacketed conduit is typically supplied in 50 foot lengths. Longer lengths are available—consult factory for additional information. Unless otherwise specified, Glenair packages optimal lengths of product based on weight, size, and commercial carrier specifications. If necessary, consult factory for additional information on package weight restrictions.



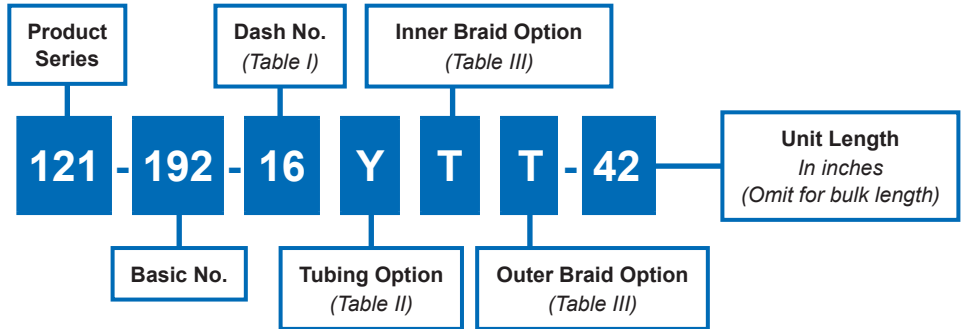
# 121-192 Annular Polymer-Core Convulsed Tubing with Double External Braid

**Tubing plus a double layer of high dB EMI/RFI shielding**

**B**



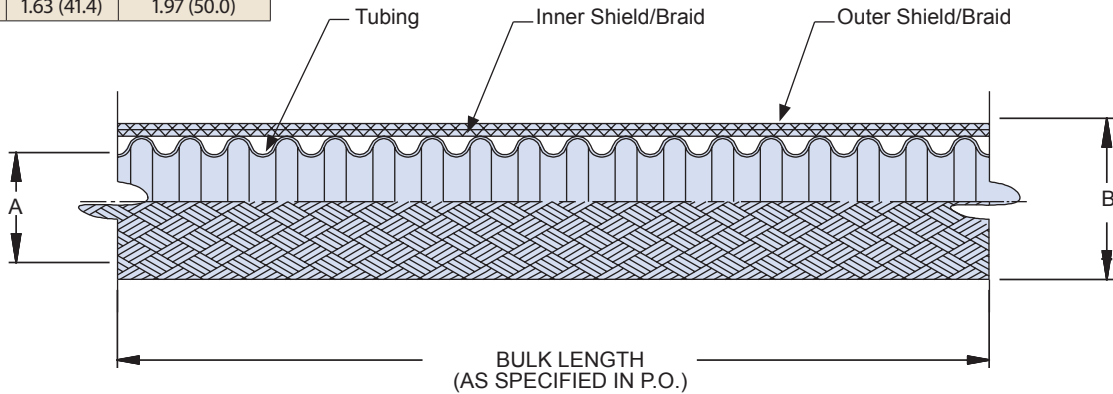
**How To Order**



Dash No	A Inside Dia		B Outside Dia
	Min	Max	Max
06	.17 (4.3)	.19 (4.8)	.44 (11.1)
09	.24 (6.1)	.28 (7.1)	.54 (13.7)
12	.33 (8.4)	.37 (9.4)	.64 (16.2)
14	.40 (10.1)	.44 (11.2)	.71 (18.0)
16	.45 (11.4)	.50 (12.7)	.78 (19.8)
20	.57 (14.5)	.62 (15.7)	.89 (22.6)
24	.69 (17.5)	.75 (19.1)	1.06 (26.9)
28	.81 (20.6)	.87 (22.1)	1.20 (30.5)
32	.93 (23.6)	1.00 (25.4)	1.32 (33.5)
40	1.18 (30.0)	1.25 (31.8)	1.56 (39.6)
48	1.43 (36.3)	1.50 (38.1)	1.83 (46.5)
52	1.56 (39.6)	1.63 (41.4)	1.97 (50.0)

Y	Kynar/Thermally stabilized
V	PVDF/Not thermally stabilized
S	G-FLEX Siltem/Medium duty - natural color only

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
L	ArmorLite™
D	Dacron
M	Nomex
E	AmberStrand® 100%
F	AmberStrand® 75%/25%



Dash No.	Max Length Per Pkg.
09&12	200 ft (60m)
16 - 52	100 ft (30m)

**Packaging**

Long-length orders of 121-192 braided conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.

121-193

Annular Polymer-Core Convulsed Tubing  
with Double External Braid and Jacket

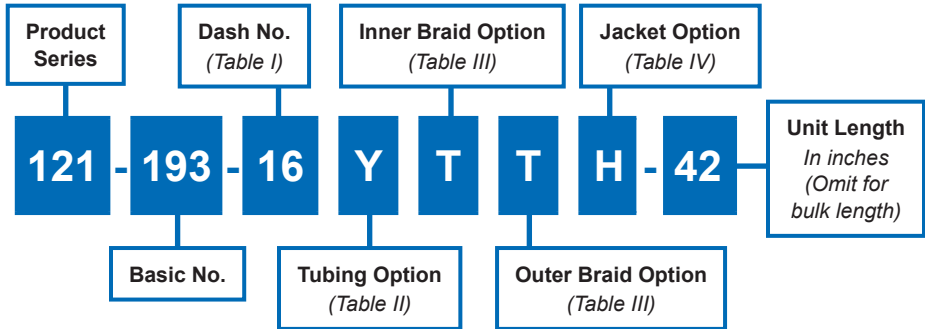


Series 72  
Annular Tubing

B

For environmental EMI/RFI applications with high dB shielding requirements

How To Order

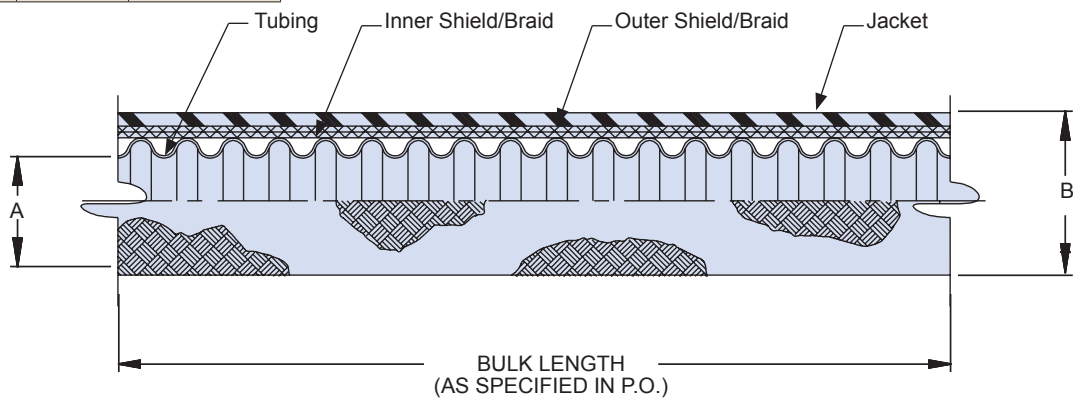


Dash No	A Inside Dia		B Outside Dia
	Min	Max	Max
06	.17 (4.3)	.19 (4.8)	.57 (14.5)
09	.24 (6.1)	.28 (7.1)	.67 (17.0)
12	.33 (8.4)	.37 (9.4)	.77 (19.5)
14	.40 (10.1)	.44 (11.2)	.84 (21.3)
16	.45 (11.4)	.50 (12.7)	.91 (23.1)
20	.57 (14.5)	.62 (15.7)	1.02 (25.9)
24	.69 (17.5)	.75 (19.1)	1.19 (30.2)
28	.81 (20.6)	.87 (22.1)	1.33 (33.8)
32	.93 (23.6)	1.00 (25.4)	1.45 (36.8)
40	1.18 (30.0)	1.25 (31.8)	1.69 (42.9)
48	1.43 (36.3)	1.50 (38.1)	1.96 (49.8)
52	1.56 (39.6)	1.63 (41.4)	2.10 (53.3)

Y	Kynar/Thermally stabilized
V	PVDF/Not thermally stabilized
S	G-FLEX Siltem/Medium duty - natural color only

N	Neoprene
H	Hypalon
E	EPDM
V	Viton
B	Duralectric, black
G	Bluejacket, Gray
TN	Duralectric, Desert Tan

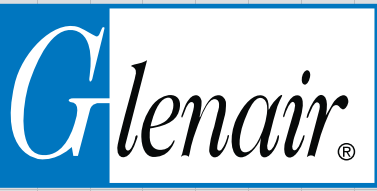
T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
L	ArmorLite™
D	Dacron
M	Nomex
E	AmberStrand® 100%
F	AmberStrand® 75%/25%



Dash No.	Max Length Per Pkg.
09& 12	200 ft (60m)
16 - 52	100 ft (30m)

Packaging

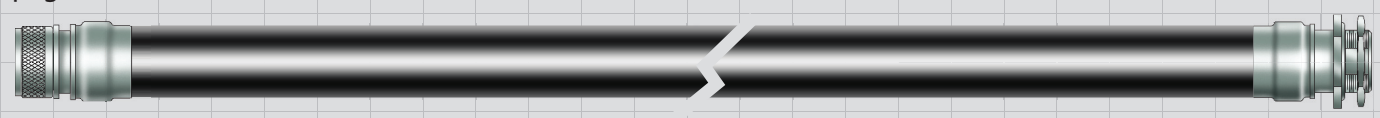
121-193 braided and jacketed conduit is typically supplied in 50 foot lengths. Longer lengths are available—consult factory for additional information. Unless otherwise specified, Glenair packages optimal lengths of product based on weight, size, and commercial carrier specifications. If necessary, consult factory for additional information on package weight restrictions.



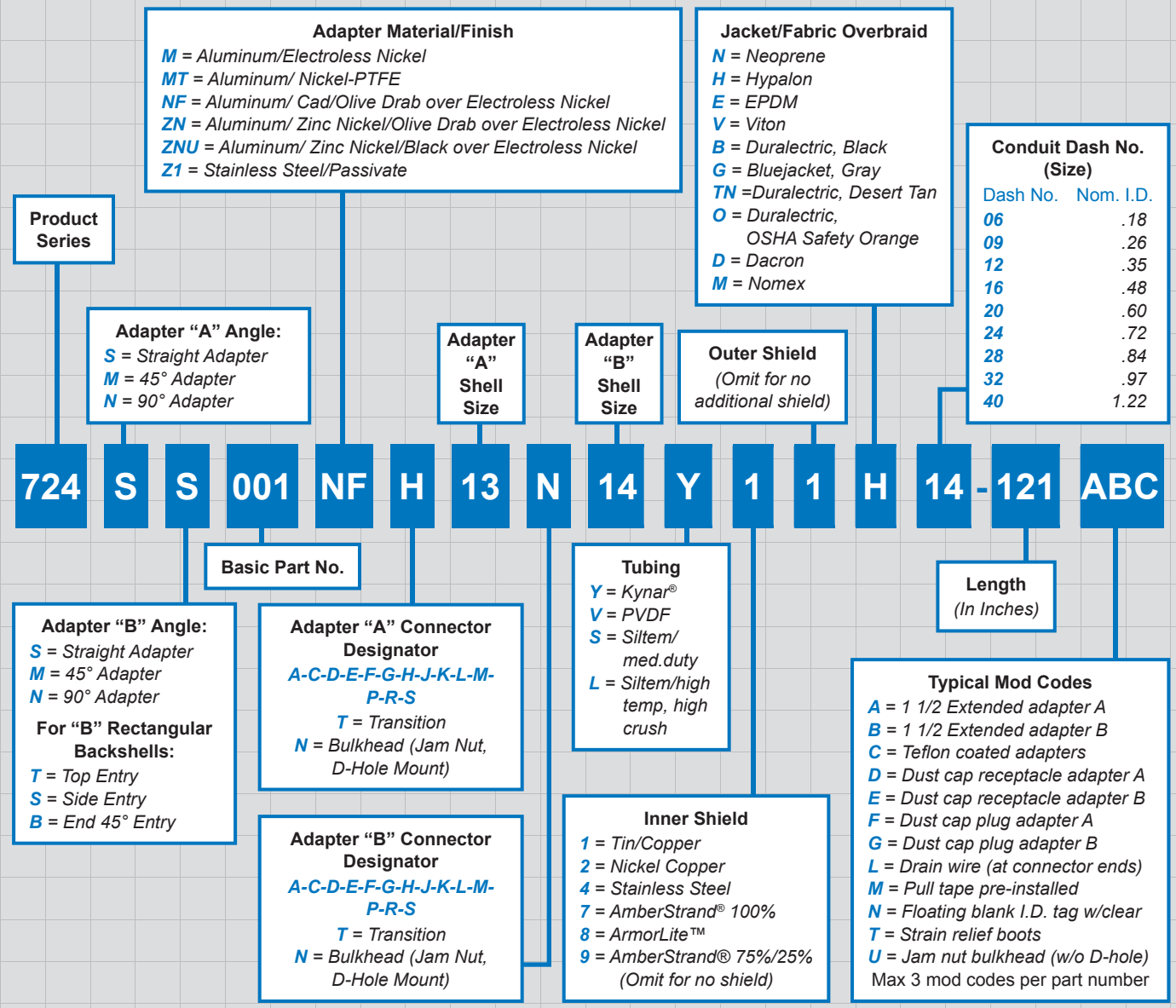
# Factory Terminated Series 72 Assemblies How-to-Order

## How-To-Order: Factory Terminated Series 72 Convolved Tubing Assembly

Use the order tree below to develop part numbers for the full range of Series 72 System point-to-point factory terminated assemblies. Diagrams of basic Series 72 point-to-point assemblies are shown on the facing page.



### How To Order





Factory Terminated Series 72 Assemblies  
Point-to-Point Assembly Selection Guide



**Part Number**  
724-001

**Connector Backshell to Bulkhead Feed-Thru or Connector Backshell**  
(circular connector to bulkhead feed-thru option shown)



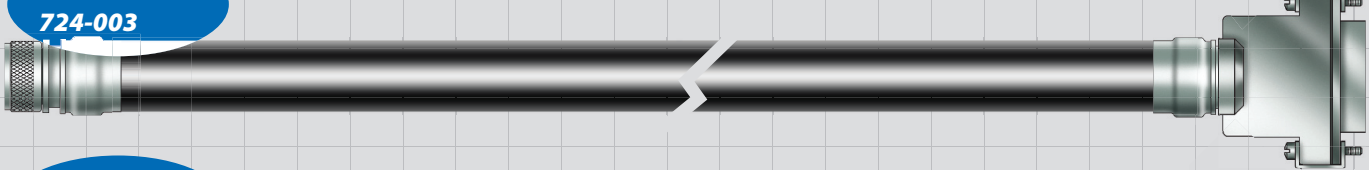
**Part Number**  
724-002

**Circular Connector Backshell to D-Subminiature Connector Backshell**  
(45° backshell shown)



**Part Number**  
724-003

**Circular Connector Backshell to Micro-D Connector Backshell**



**Part Number**  
724-004

**Circular Connector Backshell to Series 79 Micro-Crimp Connector Backshell**  
(45° backshell shown)



**Part Number**  
724-005

**Circular Connector Backshell to Swivel Joint Circular Connector Backshell**



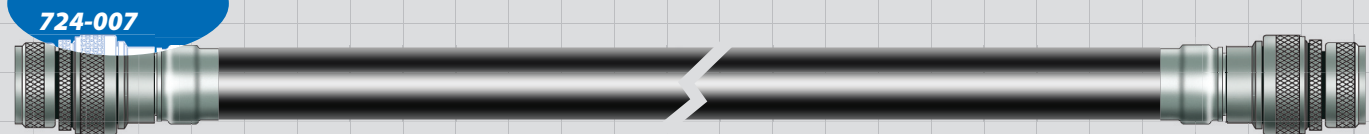
**Part Number**  
724-006

**Retractable Circular Connector Backshell to Circular Connector Backshell**  
(90° backshell shown)



**Part Number**  
724-007

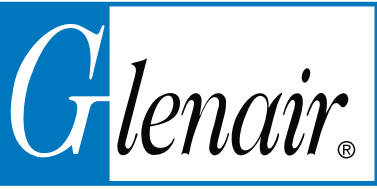
**Band-In-A-Can Connector Backshell to Band-In-A-Can Connector Backshell**



**Part Number**  
724-008

**Mighty Mouse Connector Backshell to Mighty Mouse Connector Backshell**  
(consult factory for part number development)

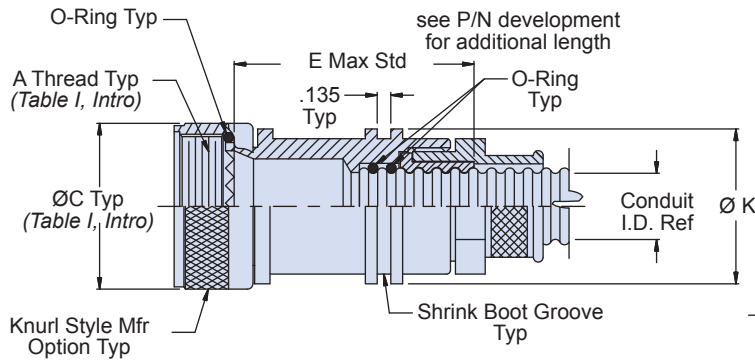
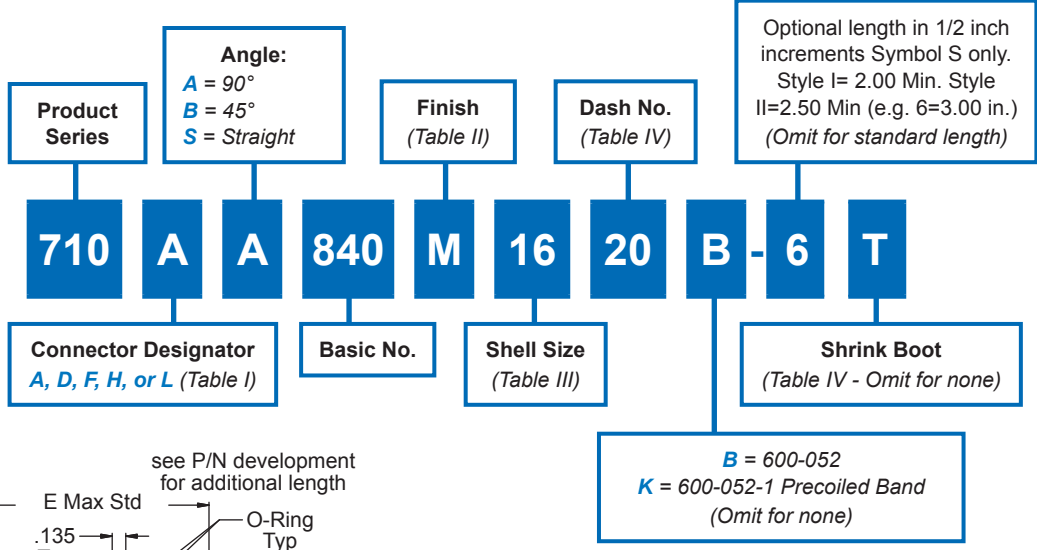




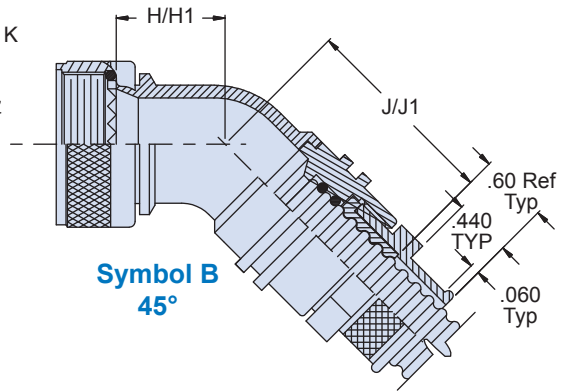
**710-840**  
**Sentry System EMI/Environmental**  
**Convolved Tubing to Connector Backshell, Metal**  
**for Series 72 Annular Convolved Tubing**

**Sentry System EMI/environmental convolved tubing-to-connector backshell with banding platform and shrink boot groove**

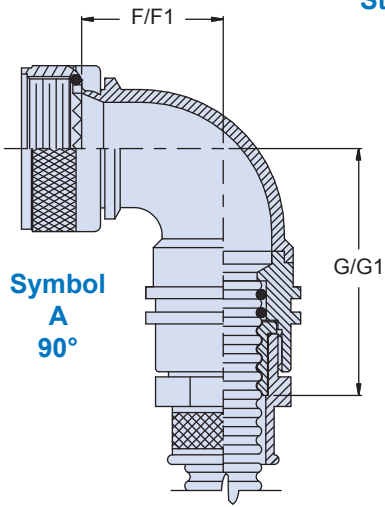
**How To Order**



**Symbol S**  
Straight



**Symbol B**  
45°



**Symbol A**  
90°

**Material and Finish**

- Adapters, coupling nuts, RFI nuts & elbows: See Table II
- Split Bushings: Kynar/N.A.
- Band: CRES/Passivated
- O-Rings: Silicone/N.A.
- Shrink Boot: See individual drawing

**Notes**

- When conduit diameter exceeds Max Dash No. (Table III), Style II will be supplied. Dimensions F1, G1, H1 and J1 apply to Style II angular fittings.
- Interfacial O-Ring not supplied with Connector Designator A.

710-840

**Sentry System EMI/Environmental  
Convuluted Tubing to Connector Backshell, Metal  
for Series 72 Annular Convuluted Tubing**

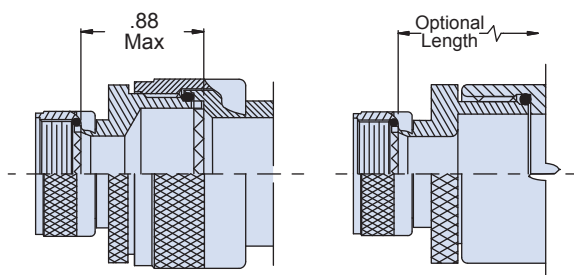


Series 72  
Annular Tubing

**B**

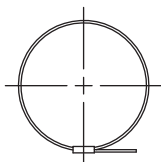
**Table III: Shell Size/Dimensions**

Shell Size		E Max	F Max	G Max	H Max	J Max	Max Conduit Style I
A,D,F,L	H						
08	09	1.470 (37.3)	.500 (12.7)	1.995 (49.7)	.457 (11.6)	2.005 (50.9)	12
10	11	1.491 (37.9)	.595 (15.1)	2.075 (52.7)	.520 (13.2)	2.005 (50.9)	12
12	13	1.530 (38.9)	.610 (15.5)	2.095 (53.2)	.582 (14.8)	2.065 (52.5)	16
14	15	1.552 (39.4)	.700 (17.8)	2.165 (55.0)	.645 (16.4)	2.155 (54.7)	20
16	17	1.580 (40.1)	.885 (22.5)	2.255 (57.3)	.738 (18.7)	2.265 (57.5)	24
18	19	1.610 (40.9)	.975 (24.8)	2.425 (61.6)	.927 (23.5)	2.455 (62.4)	28
20	21	1.650 (41.9)	.975 (24.8)	2.425 (61.6)	.927 (23.5)	2.455 (62.4)	32
22	23	1.685 (42.8)	1.125 (28.6)	2.535 (64.4)	1.020 (25.9)	2.605 (66.2)	32
24	25	1.710 (43.4)	1.125 (28.6)	2.535 (64.4)	1.020 (25.9)	2.605 (66.2)	40
28		1.785 (45.6)	1.225 (31.1)	2.705 (68.7)	1.145 (29.1)	2.655 (67.4)	40
32		1.855 (47.1)	1.575 (40.0)	2.925 (74.3)	1.207 (30.7)	2.755 (70.0)	40
36		1.920 (48.8)	1.775 (45.1)	2.955 (75.1)	1.238 (31.4)	2.845 (72.3)	40



**Style II  
45° & 90°**

**Style II  
Straight**



**SYM K  
Band**

**Table II: Finish**

Symbol	Material	Finish
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/Olive Drab over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel

**Table IV: Dash No./Dimensions**

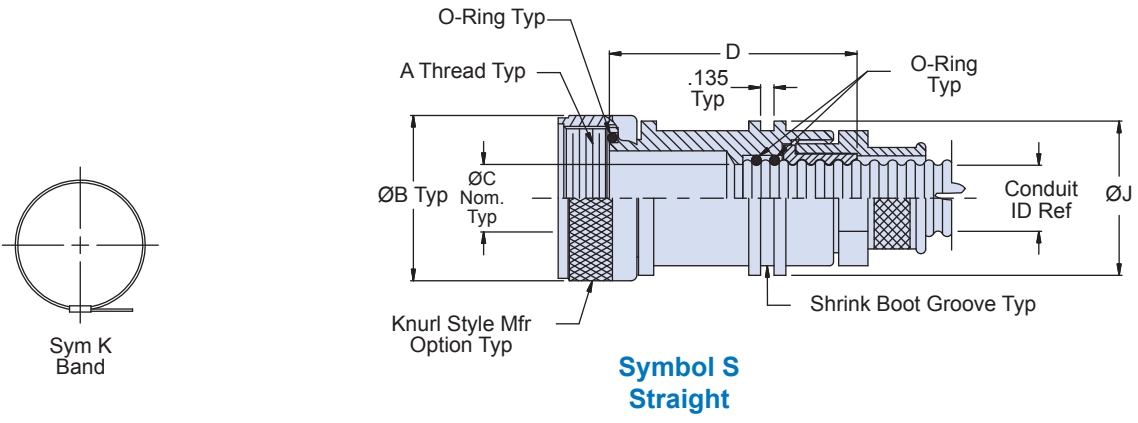
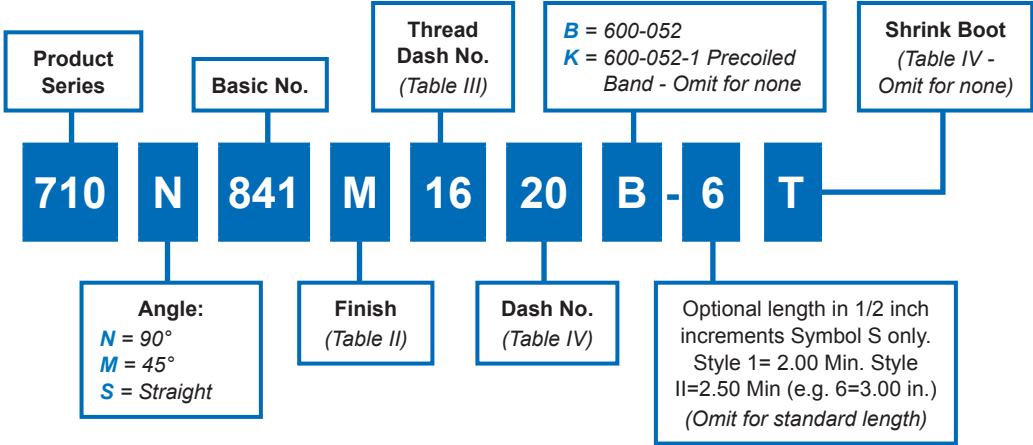
Dash No	Conduit I.D. Ref		F1 Max	G1 Max	H1 Max	J1 Max	Ø K	Shrink Boot
	Min	Max						
09	.24 (6.1)	.28 (7.1)	N/A	N/A	N/A	N/A	.875 (22.5)	<a href="#">770-001S105</a>
12	.33 (8.4)	.37 (9.4)	N/A	N/A	N/A	N/A	1.062 (26.9)	<a href="#">770-001S106</a>
16	.45 (11.4)	.50 (12.7)	.610 (15.5)	2.095 (53.3)	.582 (15.0)	2.065 (52.6)	1.188 (30.2)	<a href="#">770-001S106</a>
20	.57 (14.5)	.62 (15.8)	.700 (17.8)	2.165 (55.1)	.645 (16.5)	2.155 (54.9)	1.312 (33.3)	<a href="#">770-001S107</a>
24	.69 (17.5)	.75 (19.1)	.885 (22.6)	2.255 (57.4)	.738 (18.8)	2.265 (57.7)	1.500 (38.1)	<a href="#">770-001S107</a>
28	.81 (20.6)	.87 (22.1)	.975 (24.9)	2.425 (61.7)	.927 (23.6)	2.455 (62.5)	1.688 (42.9)	<a href="#">770-001S108</a>
32	.93 (23.6)	1.00 (25.4)	1.125 (28.7)	2.535 (64.5)	1.020 (25.9)	2.605 (66.3)	1.812 (46.0)	<a href="#">770-001S108</a>
40	1.18 (30.0)	1.25 (31.8)	1.775 (45.2)	2.955 (75.2)	1.238 (31.5)	2.845 (72.4)	2.062 (52.3)	<a href="#">770-001S108</a>



**710-841**  
**Sentry System EMI/Environmental**  
**Convuluted Tubing to Transition Backshell, Metal**  
**for Series 72 Annular Convuluted Tubing**

**Sentry System EMI/environmental convuluted tubing to transition or end fitting backshell with banding platform and shrink boot lip**

**How To Order**



**Material and Finish**

- Adapters, coupling nuts, RFI nuts & elbows: See Table II
- Split Bushings: Kynar/N.A.
- Band: CRES/Passivated
- O-Rings: Silicone/N.A.
- Shrink Boot: See individual drawing

**Notes**

For use with: 710-077, 100, 101, 102, 103, 106, 107, 108, 109, 114, 115, 116, 117, 370, 371, 372, 373, 405, 406; 713-100, 101, 110.



710-841

**Sentry System EMI/Environmental  
Convolved Tubing to Transition Backshell, Metal  
for Series 72 Annular Convolved Tubing**



Series 72  
Annular Tubing

B

Table III: Dash No./Dimensions

Thread Dash No.	A Thread Class 2B	Ø B Max	Ø C Nom	D Max	E Max	F Max	G Max	H Max
09	9/16-24 UNEF	.690 (17.5)	.281 (7.1)	1.491 (37.9)	.78 (19.8)	1.66 (42.2)	.56 (14.2)	1.44 (36.6)
12	5/8-24 UNEF	.760 (19.3)	.375 (9.5)	1.530 (38.9)	.78 (19.8)	1.66 (42.2)	.56 (14.2)	1.44 (36.6)
16	3/4-20 UNEF	.890 (22.6)	.500 (12.7)	1.552 (39.4)	.84 (21.3)	1.72 (43.7)	.58 (14.7)	1.46 (37.1)
20	7/8-20 UNEF	1.024 (25.9)	.625 (16.0)	1.580 (40.1)	.96 (24.4)	1.84 (46.7)	.63 (16.0)	1.51 (38.4)
24	1.00-20 UNEF	1.152 (29.2)	.750 (19.1)	1.610 (40.9)	1.03 (26.2)	1.91 (48.5)	.66 (16.8)	1.54 (39.1)
28	1 3/16-18 UNEF	1.363 (34.5)	.875 (22.4)	1.685 (42.9)	1.15 (29.2)	2.03 (51.6)	.71 (18.0)	1.59 (40.4)
32	1 5/16-18 UNEF	1.488 (37.9)	1.000 (25.4)	1.710 (43.4)	1.21 (30.7)	2.09 (53.1)	.74 (18.8)	1.62 (41.2)
40	1 1/2-18 UNEF	1.676 (42.7)	1.250 (31.8)	1.785 (45.5)	1.34 (34.0)	2.22 (56.4)	.79 (20.1)	1.67 (42.4)

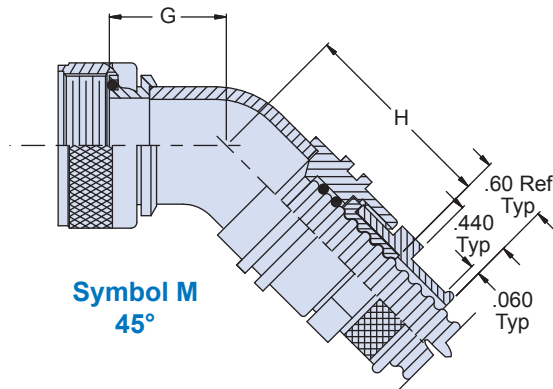


Table II: Finish

Symbol	Material	Finish
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/Olive Drab over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel

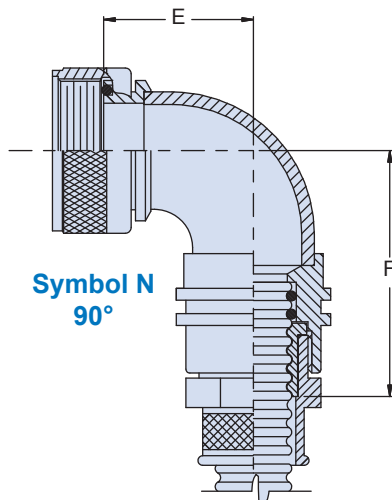


Table IV: Dash No./Dimensions/Shrink Boot

Dash No.	Conduit I.D. Ref		Ø J	Shrink Boot
	Min	Max		
09	0.24 (6.1)	0.28 (7.1)	0.875 (22.4)	<a href="#">770-001S105</a>
12	0.33 (8.4)	0.37 (9.4)	1.062 (26.9)	<a href="#">770-001S106</a>
16	0.45 (11.4)	0.50 (12.7)	1.188 (30.2)	<a href="#">770-001S106</a>
20	0.57 (14.5)	0.62 (15.8)	1.312 (33.3)	<a href="#">770-001S107</a>
24	0.69 (17.5)	0.75 (19.1)	1.500 (38.1)	<a href="#">770-001S107</a>
28	0.81 (20.6)	0.87 (22.1)	1.688 (42.9)	<a href="#">770-001S108</a>
32	0.93 (23.6)	1.00 (25.4)	1.812 (46.0)	<a href="#">770-001S108</a>
40	1.18 (30.0)	1.25 (31.8)	2.062 (52.3)	<a href="#">770-001S108</a>

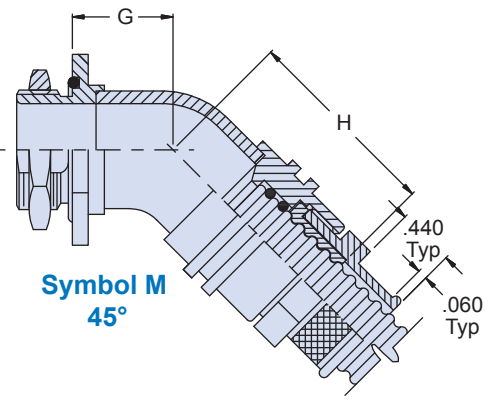
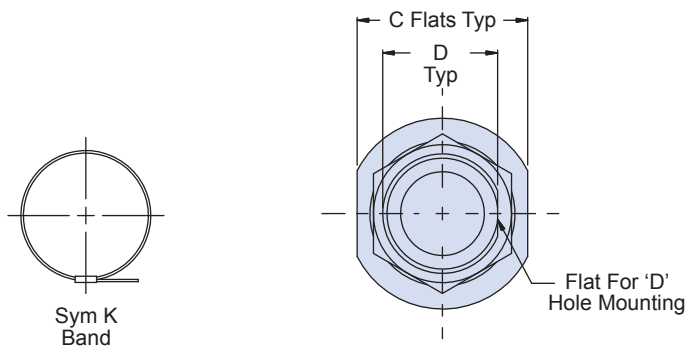
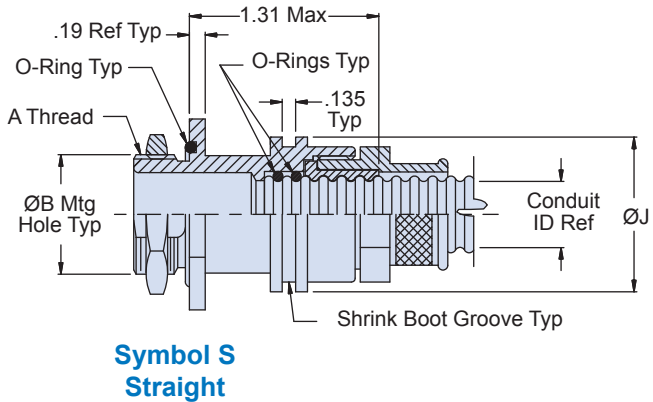
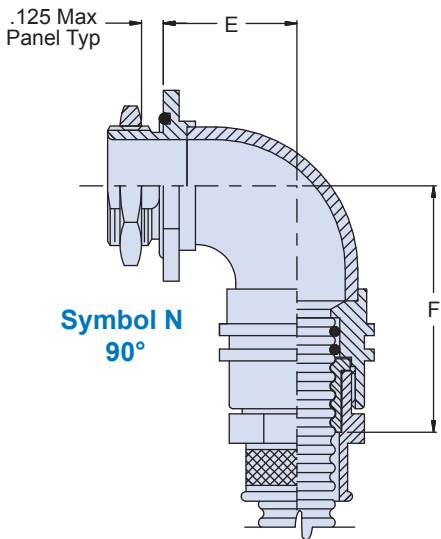
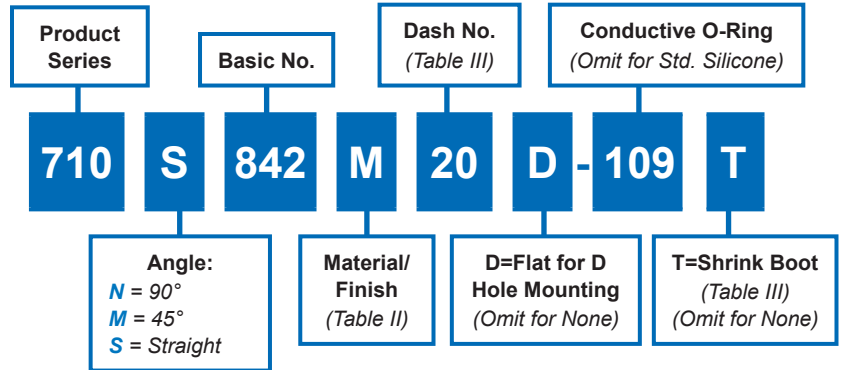


**710-842**  
**Sentry System EMI/Environmental**  
**Metal Convuluted Tubing to Bulkhead Feed-Thru Adapter**  
**for Series 72 Annular Convuluted Tubing**

**Sentry System EMI/environmental bulkhead feed-thru adapter with banding platform and shrink boot lip**

How To Order

B



710-842

**Sentry System EMI/Environmental  
Metal Convoluted Tubing to Bulkhead Feed-Thru Adapter  
for Series 72 Annular Convoluted Tubing**

Series 72  
Annular Tubing

B

Table III: Dash No./Dimensions

Dash No.	Conduit I.D. Ref		A Thread	ØB +.015 / -.000	C Flats	D +.000 / -.015
	Min	Max				
09	.24 (6.1)	.28 (7.1)	9/16 - 24 UNEF - 2A	0.568 (14.5)	0.812 (20.6)	0.500 (12.7)
12	.33 (8.4)	.37 (9.4)	5/8 - 24 UNEF - 2A	0.630 (16.0)	0.875 (22.4)	0.563 (14.2)
16	.45 (11.4)	.50 (12.7)	3/4 - 20 UNEF - 2A	0.755 (19.3)	1.000 (25.4)	0.688 (17.5)
20	.57 (14.5)	.62 (15.8)	7/8 - 20 UNEF - 2A	0.880 (22.4)	1.125 (28.7)	0.812 (20.6)
24	.69 (17.5)	.75 (19.1)	1 - 20 UNEF - 2A	1.005 (25.7)	1.250 (31.8)	0.938 (23.9)
28	.81 (20.6)	.87 (22.1)	1 3/16 - 18 UNEF - 2A	1.193 (30.2)	1.438 (36.6)	1.125 (28.7)
32	.93 (23.6)	1.00 (25.4)	1 5/16 - 18 UNEF - 2A	1.318 (33.5)	1.562 (39.6)	1.250 (31.8)
40	1.18 (30.0)	1.25 (31.8)	1 1/2 - 18 UNEF - 2A	1.505 (38.4)	1.812 (46.0)	1.438 (36.6)

Table III (continued)

Dash No.	E Max	F Max	G Max	H Max	Ø J	Shrink Boot
09	0.75 (19.1)	1.66 (42.2)	0.53 (13.5)	1.44 (36.6)	0.875 (22.4)	<a href="#">770-001S105</a>
12	0.75 (19.1)	1.66 (42.2)	0.53 (13.5)	1.44 (36.6)	1.052 (26.9)	<a href="#">770-001S106</a>
16	0.81 (20.6)	1.72 (43.7)	0.55 (14.0)	1.46 (37.1)	1.188 (30.2)	<a href="#">770-001S106</a>
20	0.93 (23.6)	1.84 (46.7)	0.60 (15.2)	1.51 (38.4)	1.313 (33.3)	<a href="#">770-001S107</a>
24	1.00 (25.4)	1.91 (48.5)	0.63 (16.0)	1.54 (39.1)	1.500 (38.1)	<a href="#">770-001S107</a>
28	1.12 (28.5)	2.03 (51.6)	0.68 (17.3)	1.59 (40.4)	1.688 (42.9)	<a href="#">770-001S108</a>
32	1.18 (30.0)	2.09 (53.1)	0.71 (18.0)	1.62 (41.2)	1.812 (46.0)	<a href="#">770-001S108</a>
40	1.31 (33.3)	2.22 (56.4)	0.76 (19.3)	1.67 (42.4)	2.062 (52.3)	<a href="#">770-001S108</a>

Table II: Finish

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/Olive Drab over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel

### Material and Finish

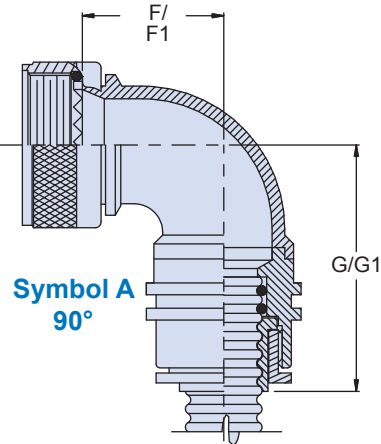
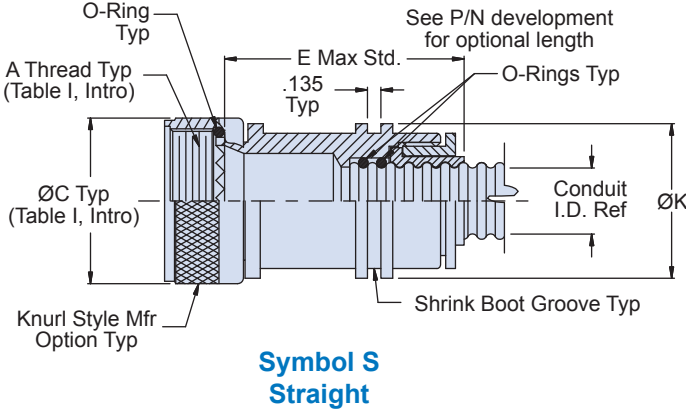
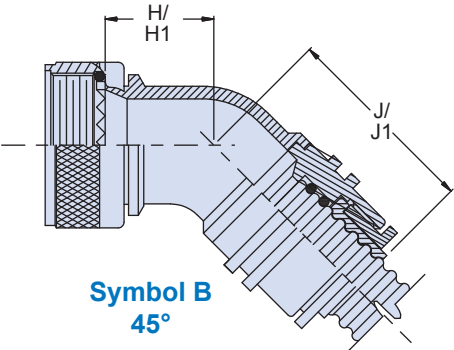
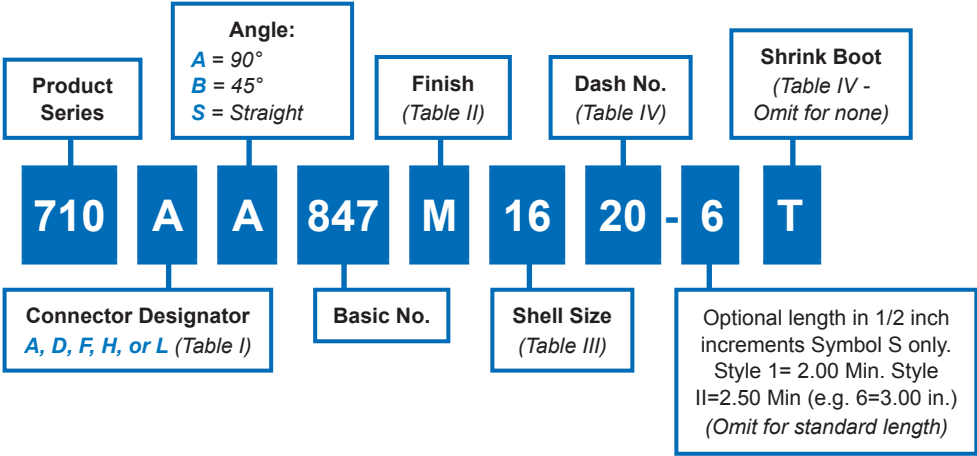
- Adapters, jam nuts, RFI nuts & elbows: See Table II
- Split Bushings: Kynar/N.A.
- Band: CRES/Passivated
- O-Rings: Silicone/N.A.
- Shrink Boot: See individual drawing



**710-847**  
**Sentry System Compact Environmental**  
**Metal Convoluted Tubing to Connector Backshell**  
**for Series 72 Annular Convoluted Tubing**

**Sentry System compact environmental connector backshell with shrink boot lip**

**How To Order**



**Material and Finish**

- Adapters, coupling nuts & elbows: See Table II
- Gland Nuts & Split Bushings: Kynar/N.A.
- O-Rings: Silicone/N.A.
- Shrink Boot: See individual drawing

**Notes**

- When conduit diameter exceeds Max Dash No. (Table III), Style II will be supplied. Dimensions F1, G1, H1 and J1 apply to Style II angular fittings.
- Interfacial O-Ring not supplied with Connector Designator A

710-847

## Sentry System Compact Environmental Metal Convuluted Tubing to Connector Backshell for Series 72 Annular Convuluted Tubing

Series 72  
Annular Tubing

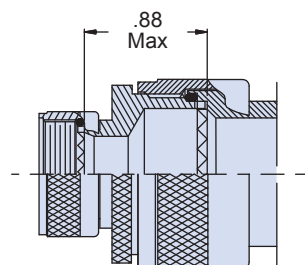
B

Table III: Shell Size/Dimensions

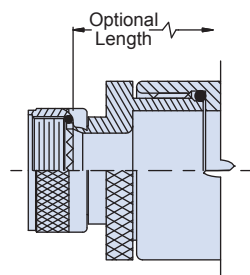
Shell Size		E Max	F Max	G Max	H Max	J Max	Max Conduit Style I
A,D,F,L	H						
08	09	1.470 (37.3)	.500 (12.7)	1.955 (49.7)	.457 (11.6)	2.005 (50.9)	12
10	11	1.491 (37.9)	.595 (15.1)	2.075 (52.7)	.520 (13.2)	2.005 (50.9)	12
12	13	1.530 (38.9)	.610 (15.5)	2.095 (53.2)	.582 (14.8)	2.065 (52.5)	16
14	15	1.552 (39.4)	.700 (17.8)	2.165 (55.0)	.645 (16.4)	2.155 (54.7)	20
16	17	1.580 (40.1)	.885 (22.5)	2.255 (57.3)	.738 (18.7)	2.265 (57.5)	24
18	19	1.610 (40.9)	.975 (24.8)	2.425 (61.6)	.927 (23.5)	2.455 (62.4)	28
20	21	1.650 (41.9)	.975 (24.8)	2.425 (61.6)	.927 (23.5)	2.455 (62.4)	32
22	23	1.685 (42.8)	1.125 (28.6)	2.535 (64.4)	1.020 (25.9)	2.605 (66.2)	32
24	25	1.710 (43.4)	1.125 (28.6)	2.535 (64.4)	1.020 (25.9)	2.605 (66.2)	40
28		1.785 (45.3)	1.225 (31.1)	2.705 (68.7)	1.145 (29.1)	2.655 (67.4)	40
32		1.855 (47.1)	1.575 (40.0)	2.925 (74.3)	1.207 (30.7)	2.755 (70.0)	40
36		1.920 (48.8)	1.775 (45.1)	2.955 (75.1)	1.238 (31.4)	2.845 (72.3)	40

Table IV: Dash No./Dimensions/Shrink Boot

Dash No	Conduit I.D. Ref		F1 Max	G1 Max	H1 Max	J1 Max	Ø K	Shrink Boot
	Min	Max						
09	.24 (6.1)	.28 (7.1)	N/A	N/A	N/A	N/A	.875 (22.4)	<a href="#">770-001S105</a>
12	.33 (8.4)	.37 (9.4)	N/A	N/A	N/A	N/A	1.062 (26.9)	<a href="#">770-001S106</a>
16	.45 (11.4)	.50 (12.7)	.610 (15.5)	2.095 (53.3)	.582 (15.1)	2.065 (52.6)	1.188 (30.2)	<a href="#">770-001S106</a>
20	.57 (14.5)	.62 (15.8)	.700 (17.8)	2.165 (55.1)	.645 (16.5)	2.155 (54.9)	1.312 (33.3)	<a href="#">770-001S107</a>
24	.69 (17.5)	.75 (19.1)	.885 (22.6)	2.255 (57.4)	.738 (18.8)	2.265 (57.7)	1.500 (38.1)	<a href="#">770-001S107</a>
28	.81 (20.6)	.87 (22.1)	.975 (24.9)	2.425 (61.7)	.927 (23.6)	2.455 (62.5)	1.688 (42.9)	<a href="#">770-001S108</a>
32	.93 (23.6)	1.00 (25.4)	1.125 (28.7)	2.535 (64.5)	1.020 (25.9)	2.605 (66.3)	1.812 (45.8)	<a href="#">770-001S108</a>
40	1.18 (30.0)	1.25 (31.8)	1.775 (45.2)	2.955 (75.2)	1.238 (31.5)	2.845 (72.4)	2.062 (52.3)	<a href="#">770-001S108</a>



**Style II**  
45° & 90°

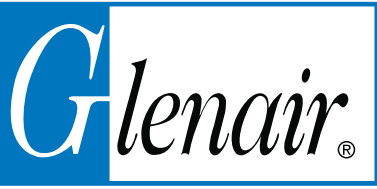


**Style II**  
Straight

Table II: Finish

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/Olive Drab over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel





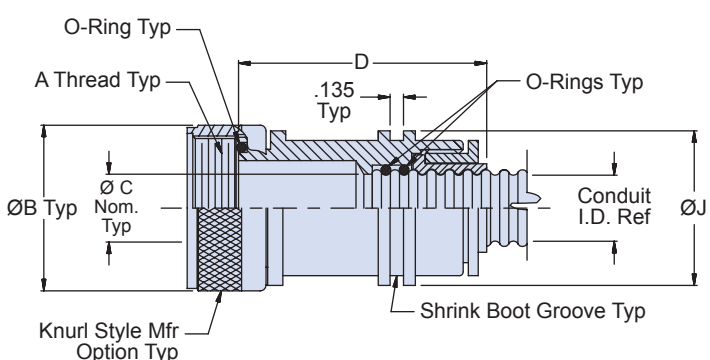
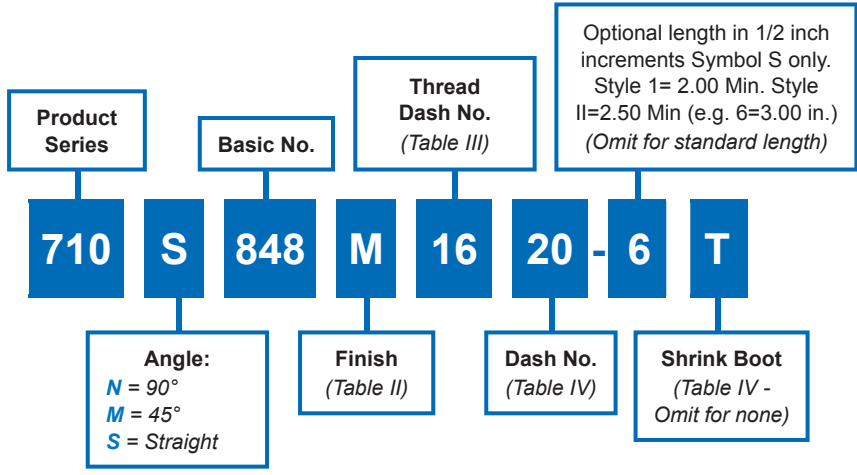
**710-848**  
**Sentry System Compact Environmental**  
**Convuluted Tubing to Transition or End Fitting Backshell**  
**for Series 72 Annular Convuluted Tubing**

**Sentry System compact environmental transition adapter with shrink boot lip**

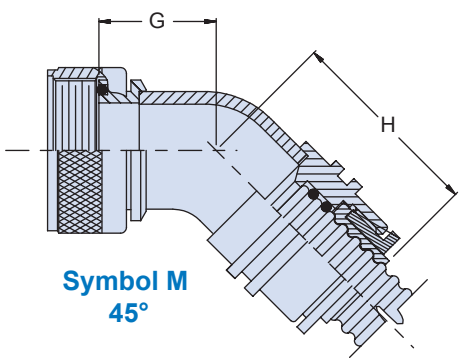
**How To Order**



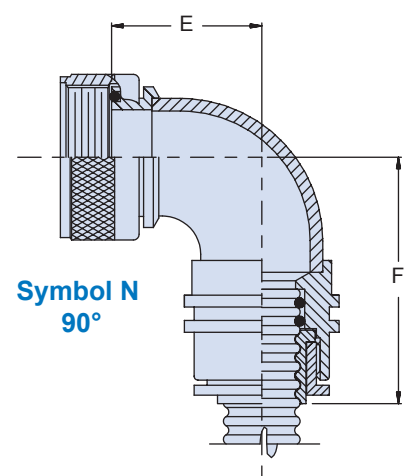
**B**



**Symbol S**  
**Straight**



**Symbol M**  
**45°**



**Symbol N**  
**90°**

710-848

**Sentry System Compact Environmental  
Convulated Tubing to Transition or End Fitting Backshell  
for Series 72 Annular Convulated Tubing**

Series 72  
Annular Tubing

B

Table III: Dash No./Dimensions

Thread Dash No.	A Thread Class 2B	Ø B Max	Ø C Nom	D Max	E Max	F Max	G Max	H Max
09	9/16-24 UNEF	.690 (17.5)	.281 (7.1)	1.491 (37.9)	.78 (19.81)	1.66 (42.16)	.56 (14.22)	1.44 (36.58)
12	5/8-24 UNEF	.760 (19.3)	.375 (9.5)	1.530 (38.9)	.78 (19.81)	1.66 (42.16)	.56 (14.22)	1.44 (36.58)
16	3/4-20 UNEF	.890 (22.6)	.500 (12.7)	1.552 (39.4)	.84 (21.34)	1.72 (43.69)	.58 (14.73)	1.46 (37.08)
20	7/8-20 UNEF	1.024 (25.9)	.625 (16.0)	1.580 (40.1)	.96 (24.38)	1.84 (46.74)	.63 (16.00)	1.51 (38.35)
24	1.00-20 UNEF	1.152 (29.2)	.750 (19.1)	1.610 (40.9)	1.03 (26.16)	1.91 (48.51)	.66 (16.76)	1.54 (39.12)
28	1 3/16-18 UNEF	1.363 (34.5)	.875 (22.4)	1.685 (42.9)	1.15 (29.21)	2.03 (51.56)	.71 (18.03)	1.59 (40.39)
32	1 5/16-18 UNEF	1.488 (37.9)	1.000 (25.4)	1.710 (43.4)	1.21 (30.73)	2.09 (53.09)	.74 (18.80)	1.62 (41.15)
40	1 1/2-18 UNEF	1.676 (42.7)	1.250 (31.8)	1.785 (45.5)	1.34 (34.04)	2.22 (56.39)	.79 (20.07)	1.67 (42.42)

Table II: Finish

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/Olive Drab over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel

Table IV: Dash No./Dimensions/Shrink Boot

Dash No	Conduit I.D. Ref		Ø J	Shrink Boot
	Min	Max		
09	.24 (6.1)	.28 (7.1)	.875 (22.4)	<a href="#">770-001S105</a>
12	.33 (8.4)	.37 (9.4)	1.062 (26.9)	<a href="#">770-001S106</a>
16	.45 (11.4)	.50 (12.7)	1.188 (30.2)	<a href="#">770-001S106</a>
20	.57 (14.5)	.62 (15.8)	1.312 (33.3)	<a href="#">770-001S107</a>
24	.69 (17.5)	.75 (19.1)	1.500 (38.1)	<a href="#">770-001S107</a>
28	.81 (20.6)	.87 (22.1)	1.688 (42.9)	<a href="#">770-001S108</a>
32	.93 (23.6)	1.00 (25.4)	1.812 (45.7)	<a href="#">770-001S108</a>
40	1.18 (30.0)	1.25 (31.8)	2.062 (52.3)	<a href="#">770-001S108</a>

**Material and Finish**

- Adapters, Coupling nuts & elbows: See Table II
- Gland nuts & Split Bushings: Kynar/N.A.
- O-Rings: Silicone/N.A.
- Shrink Boot: See individual drawing

**Notes**

For use with: 710-077, 100, 101, 102, 103, 106, 107, 108, 109, 114, 115, 116, 117, 370, 371, 372, 373, 405, 406; 713-100, 101, 110.

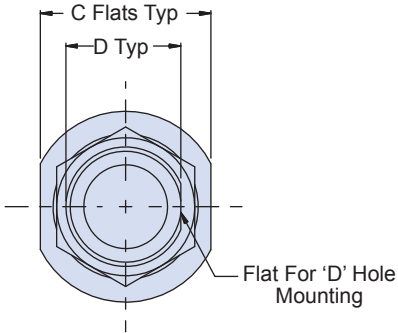
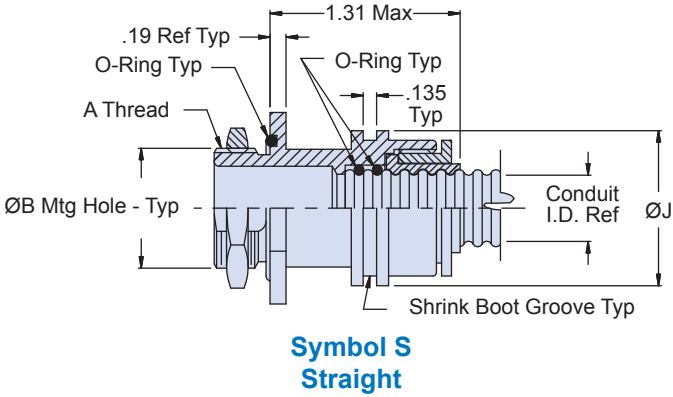
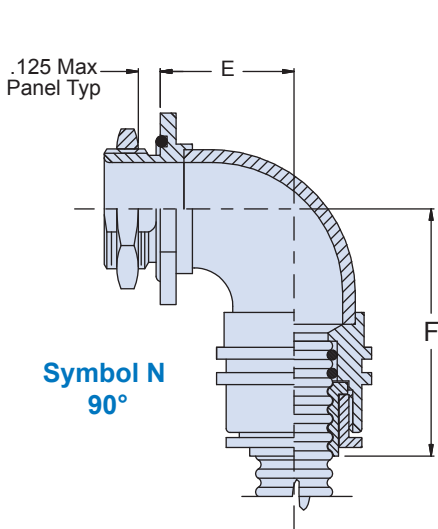
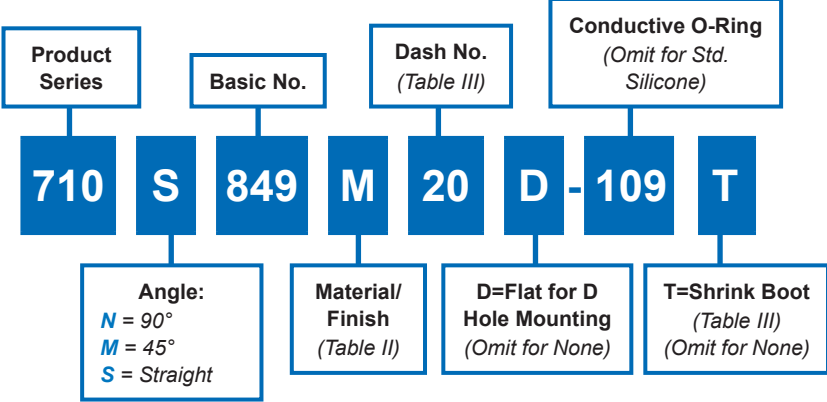


**710-849**  
**Sentry System Compact Environmental**  
**Convuluted Tubing to Bulkhead Feed-Thru Fitting**  
**for Series 72 Annular Convuluted Tubing**

**Sentry System compact environmental bulkhead feed-thru fitting with shrink boot lip**

**How To Order**

**B**



- Material and Finish**
- Adapters, Jam nuts & elbows: See Table II
  - Gland nuts & Split Bushings: Kynar/N.A.
  - O-Rings: Silicone/N.A.
  - Shrink Boot: See individual drawing

710-849

**Sentry System Compact Environmental  
Convulated Tubing to Bulkhead Feed-Thru Fitting  
for Series 72 Annular Convulated Tubing**



Series 72  
Annular Tubing

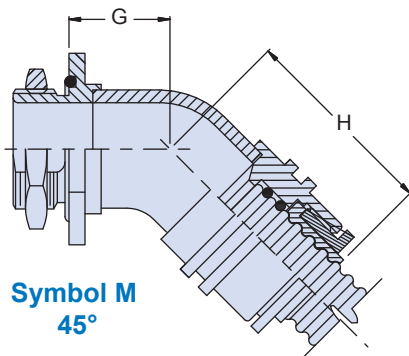
B

**Table III: Dash No./Dimensions**

Dash No.	Conduit I.D. Ref		A Thread	Ø B +.015 / -.000	C Flats	D +.000 / -.015
	Min	Max				
09	.24 (6.1)	.28 (7.1)	9/16 - 24 UNEF - 2A	0.568 (14.48)	0.812 (20.57)	0.500 (12.70)
12	.33 (8.4)	.37 (9.4)	5/8 - 24 UNEF - 2A	0.630 (16.00)	0.875 (22.35)	0.563 (14.22)
16	.45 (11.4)	.50 (12.7)	3/4 - 20 UNEF - 2A	0.755 (19.30)	1.000 (25.40)	0.688 (17.53)
20	.57 (14.5)	.62 (15.8)	7/8 - 20 UNEF - 2A	0.880 (22.35)	1.125 (28.70)	0.812 (20.57)
24	.69 (17.5)	.75 (19.1)	1 - 20 UNEF - 2A	1.005 (25.65)	1.250 (31.75)	0.938 (23.88)
28	.81 (20.6)	.87 (22.1)	1 3/16 - 18 UNEF - 2A	1.193 (30.23)	1.438 (36.58)	1.125 (28.70)
32	.93 (23.6)	1.00 (25.4)	1 5/16 - 18 UNEF - 2A	1.318 (33.53)	1.562 (39.62)	1.250 (31.75)
40	1.18 (30.0)	1.25 (31.8)	1 1/2 - 18 UNEF - 2A	1.505 (38.35)	1.812 (45.97)	1.438 (36.58)

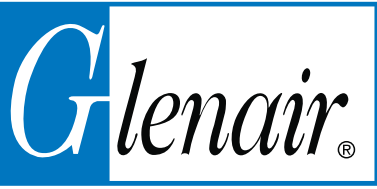
**Table III (continued)**

Dash No.	E Max	F Max	G Max	H Max	Ø J	Shrink Boot
09	0.75 (19.1)	1.66 (42.2)	0.53 (13.5)	1.44 (36.6)	0.875 (22.4)	<a href="#">770-001S105</a>
12	0.75 (19.1)	1.66 (42.2)	0.53 (13.5)	1.44 (36.6)	1.062 (26.9)	<a href="#">770-001S106</a>
16	0.81 (20.6)	1.72 (43.7)	0.55 (14.0)	1.46 (37.1)	1.188 (30.2)	<a href="#">770-001S106</a>
20	0.93 (23.6)	1.84 (46.7)	0.60 (15.2)	1.51 (38.4)	1.312 (33.3)	<a href="#">770-001S107</a>
24	1.00 (25.4)	1.91 (48.5)	0.63 (16.0)	1.54 (39.1)	1.500 (38.1)	<a href="#">770-001S107</a>
28	1.12 (28.5)	2.03 (51.6)	0.68 (17.3)	1.59 (40.4)	1.688 (42.9)	<a href="#">770-001S108</a>
32	1.18 (30.0)	2.09 (53.1)	0.71 (18.0)	1.62 (41.2)	1.812 (46.0)	<a href="#">770-001S108</a>
40	1.31 (33.3)	2.22 (56.4)	0.76 (19.3)	1.67 (42.4)	2.062 (52.3)	<a href="#">770-001S108</a>



**Table II: Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	CAD/O.D. over Electroless Nickel (1,000 hour salt spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZMT	300 Series SST	Nickel-PTFE
ZN	Aluminum Alloy	Zinc Nickel/O.D. over Electroless Nickel (1,000 hour salt spray)
ZW	300 Series SST	CAD O.D. over Electroless Nickel



**712-839**  
**Guardian System - Metal**  
**Convoluted Tubing to Connector Universal Backshell**  
**for Series 72 Annular Convoluted Tubing**

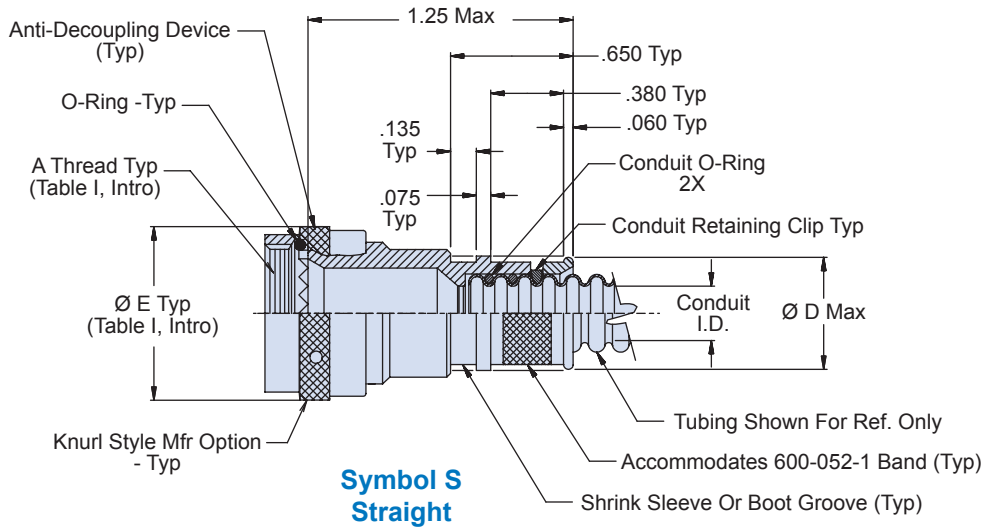
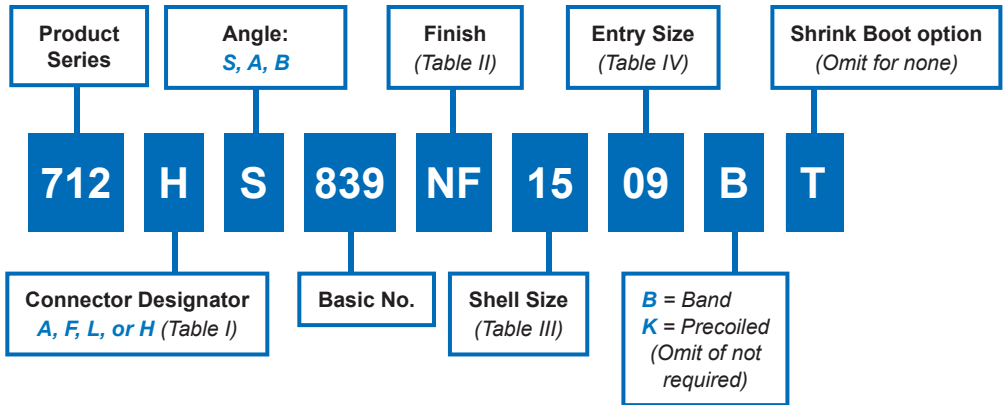
**Metal Guardian System universal convoluted tubing to connector and adapter backshell, self locking, EMI/RFI environmental**

**How To Order**



Self-Locking

**B**



**Material and Finish**

- Adapters, elbows, coupling nut: See Table II
- O-Rings: Silicone/NA
- Retaining clip: High grade engineering thermoplastic/NA
- Anti-decoupling device: Corrosion resistant material

**Tools and Assembly notes**

- Conduit retaining clip and conduit O-Ring to be supplied unassembled
- For effective grounding, connector with conductive Finish should be used
- Glenair assembly procedure is recommended for adapter to conduit termination. See Guardian assembly procedure at the end of this section
- Interfacial O-Ring not supplied with Connector Designator "A"



**712-839**  
**Guardian System - Metal**  
**Convoluted Tubing to Connector Universal Backshell**  
**for Series 72 Annular Convoluted Tubing**



Series 72  
Annular Tubing

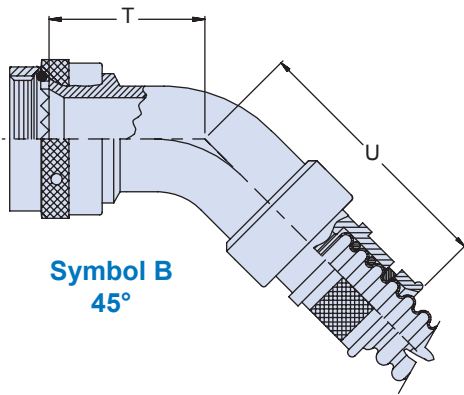


Table III: Shell Size/Dimensions					
Shell Size		T	U	V	W
A,F,L	H	Max	Max	Max	Max
08	09	0.600 (15.2)	1.610 (40.9)	0.680 (17.3)	1.780 (45.2)
10	11	0.630 (16.0)	1.800 (45.7)	0.770 (19.6)	1.880 (47.8)
12	13	0.660 (16.8)	1.850 (47.0)	0.800 (20.3)	1.880 (47.8)
14	15	0.690 (17.5)	1.920 (48.8)	0.880 (22.4)	1.920 (48.8)
16	17	0.820 (20.8)	2.050 (52.1)	1.060 (26.9)	2.030 (51.6)
18	19	0.970 (24.6)	2.230 (56.6)	1.150 (29.2)	2.210 (56.1)
20	21	0.970 (24.6)	2.280 (57.9)	1.150 (29.2)	2.250 (57.2)
22	23	1.000 (25.4)	2.420 (61.5)	1.300 (33.0)	2.360 (59.9)
24	25	1.000 (25.4)	2.470 (62.7)	1.300 (33.0)	2.410 (61.2)
28	33	1.125 (28.6)	2.560 (65.0)	1.400 (35.6)	2.630 (66.8)
32	37	1.250 (31.8)	2.645 (67.2)	1.750 (44.5)	2.920 (74.2)

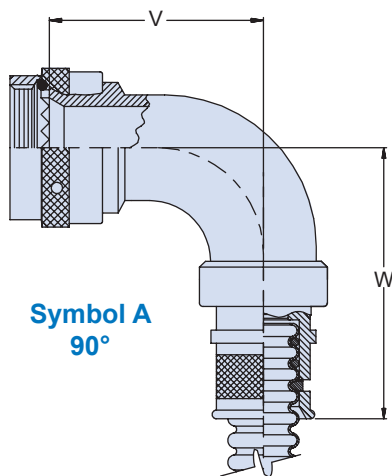
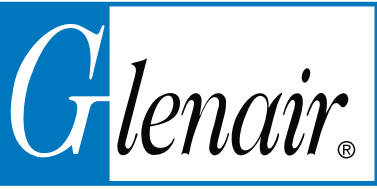


Table IV: Entry Code/Dimensions/Shrink Boot				
Entry Code	Ø D Max	Conduit I.D.		T Shrink Boot
		Min	Max	
06	.53 (13.5)	.16 (4.1)	.19 (4.8)	<a href="#">770-001S103</a>
09	.63 (16.0)	.24 (6.1)	.28 (7.1)	<a href="#">770-001S103</a>
12	.73 (18.5)	.33 (8.4)	.37 (9.4)	<a href="#">770-001S104</a>
16	.86 (21.8)	.45 (11.4)	.50 (12.7)	<a href="#">770-001S104</a>
20	.98 (24.9)	.57 (14.5)	.62 (15.8)	<a href="#">770-001S105</a>
24	1.15 (29.2)	.69 (17.5)	.75 (19.1)	<a href="#">770-001S106</a>
28	1.27 (32.3)	.81 (20.6)	.87 (22.2)	<a href="#">770-001S107</a>
32	1.40 (35.6)	.93 (23.6)	1.00 (25.4)	<a href="#">770-001S107</a>
36	1.53 (38.9)	1.07 (27.2)	1.13 (28.7)	<a href="#">770-001S107</a>
40	1.62 (41.1)	1.18 (30.0)	1.25 (31.8)	<a href="#">770-001S107</a>
48	1.98 (50.3)	1.45 (36.8)	1.50 (38.1)	<a href="#">770-001S108</a>
52	2.07 (52.6)	1.58 (40.1)	1.63 (41.4)	<a href="#">770-001S108</a>
56	2.14 (54.4)	1.70 (43.2)	1.75 (44.4)	<a href="#">770-001S108</a>

Table II: Finish		
Sym	Material	Finish Description
C	Aluminum	Anodize, Black (Non-conductive)
M		Electroless Nickel
MT		Nickel-PTFE
NF		Cad/Olive Drab over Electroless Nickel
UCR		Zinc Cobalt/Black
ZN		Zinc Nickel/Olive Drab over Electroless Nickel
ZNU		Zinc Nickel/Black over Electroless Nickel
Z1		Passivate
ZM	Stainless Steel	Electroless Nickel
ZMT		Nickel-PTFE
ZW		CAD O.D. over Electroless Nickel

**B**



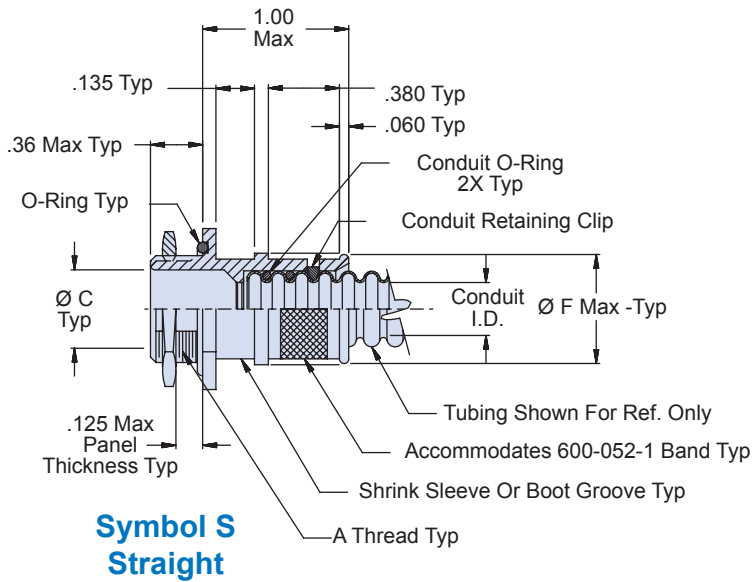
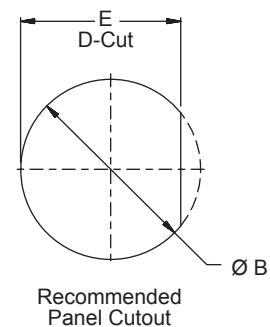
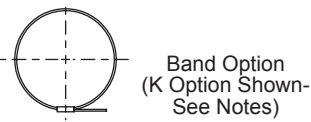
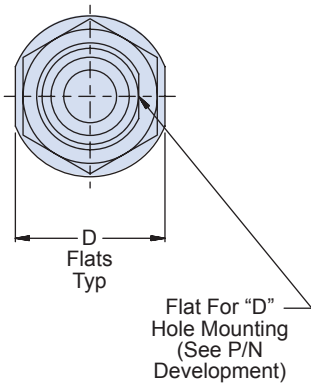
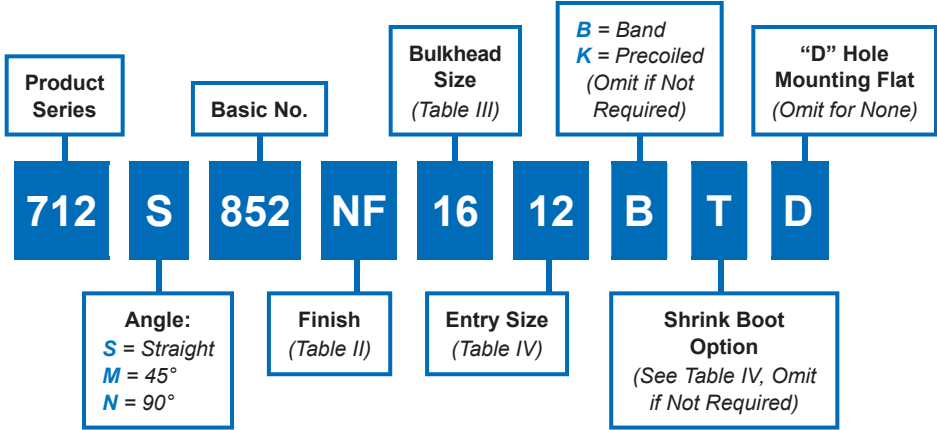
**712-852**  
**Guardian System - Metal**  
**Convoluted Tubing to Bulkhead Feed-Thru Fitting**  
**for Series 72 Annular Convoluted Tubing**

**Metal Guardian System bulkhead feed-thru fitting, EMI/RFI environmental**

**B**



**How To Order**



**Material and Finish**

- Adapters, elbows: See Table II
- O-Rings: Silicone/NA
- Retaining Clip: High Grade Engineering Thermoplastic/NA

**Notes**

- Conduit retaining clip and O-Ring to be supplied unassembled.
- Glenair assembly procedure is recommended for adapter to conduit termination. See Guardian assembly procedure at the end of this section

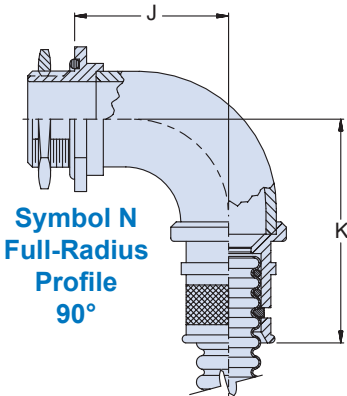
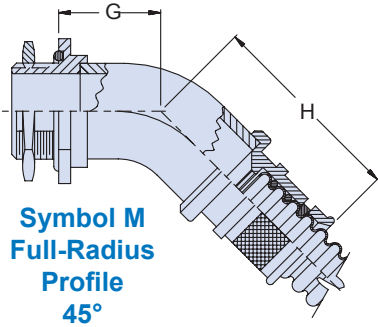
712-852

**Guardian System - Metal**  
**Convoluted Tubing to Bulkhead Feed-Thru Fitting**  
**for Series 72 Annular Convoluted Tubing**



Series 72  
Annular Tubing

**B**



**Table III: Bulkhead Size/Dimensions**

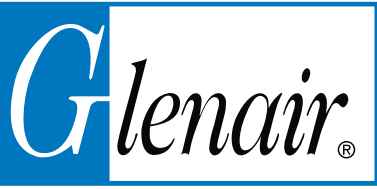
Bulkhead Size	A Thread Class 2A	Ø B +.015 -0.000	Ø C	D Flats	E +.010 -0.000	Max Entry Size
06	3/8-32 UNEF	0.380 (9.7)	0.188 (4.8)	0.625 (15.9)	0.323 (8.2)	09
08	7/16-28 UNEF	0.443 (11.3)	0.250 (6.4)	0.688 (17.5)	0.385 (9.8)	12
09	1/2-20 UNF	0.505 (12.8)	0.281 (7.1)	0.750 (19.1)	0.448 (11.4)	12
10	1/2-20 UNF	0.505 (12.8)	0.312 (7.9)	0.750 (19.1)	0.448 (11.4)	12
12	9/16-24 UNEF	0.568 (14.4)	0.375 (9.5)	0.812 (20.6)	0.510 (13.0)	16
14	5/8-24 UNEF	0.630 (16.0)	0.438 (11.1)	0.875 (22.2)	0.573 (14.6)	16
16	11/16-24 UNEF	0.693 (17.6)	0.500 (12.7)	0.937 (23.8)	0.635 (16.1)	20
20	13/16-20 UNEF	0.818 (20.8)	0.625 (15.9)	1.062 (27.0)	0.760 (19.3)	20
24	15/16-20 UNEF	0.943 (24.0)	0.750 (19.1)	1.250 (31.8)	0.885 (22.5)	24
28	1 1/16-18 UNEF	1.068 (27.1)	0.875 (22.2)	1.375 (34.9)	1.010 (25.7)	32
32	1 3/16-18 UNEF	1.193 (30.3)	1.000 (25.4)	1.562 (39.7)	1.135 (28.8)	32
36	1 3/8-18 UNEF	1.380 (35.1)	1.125 (28.6)	1.687 (42.9)	1.323 (33.6)	36
40	1 7/16-18 UNEF	1.443 (36.7)	1.250 (31.8)	1.875 (47.6)	1.385 (35.2)	40
48	1 3/4-18 UNS	1.755 (44.6)	1.500 (38.1)	1.688 (42.9)	1.698 (43.1)	48
52	1 7/8-18 UNS	1.880 (47.8)	1.625 (41.3)	2.250 (57.2)	1.823 (46.3)	52
56	1 15/16-16 UN	1.943 (49.4)	1.750 (44.4)	2.313 (58.8)	1.905 (48.4)	56

**Table II: Finish**

Sym	Material	Finish Description
C	Aluminum	Anodize, Black (Non-conductive)
M		Electroless Nickel
MT		Nickel-PTFE
NF		Cad/Olive Drab over Electroless Nickel
UCR		Zinc Cobalt/Black
ZN		Zinc Nickel/Olive Drab over Electroless Nickel
ZNU		Zinc Nickel/Black over Electroless Nickel
Z1	Stainless Steel	Passivate
ZM		Electroless Nickel
ZMT		Nickel-PTFE
ZW		CAD O.D. over Electroless Nickel

**Table IV: Entry Size/Dimensions/Shrink Boot**

Entry Size	Ø F Max	Conduit I.D.		G Max	H Max	J Max	K Max	Shrink Boot Ref
		Min	Max					
06	.53 (13.5)	.16 (4.1)	.19 (4.8)	.50 (12.7)	1.02 (25.9)	.68 (17.3)	1.20 (30.5)	<a href="#">770-001S103</a>
09	.63 (16.0)	.24 (6.1)	.28 (7.1)	.53 (13.5)	1.04 (26.4)	.75 (19.1)	1.26 (32.0)	<a href="#">770-001S103</a>
12	.73 (18.5)	.33 (8.4)	.37 (9.4)	.53 (13.5)	1.04 (26.4)	.75 (19.1)	1.26 (32.0)	<a href="#">770-001S104</a>
16	.86 (21.8)	.45 (11.4)	.50 (12.7)	.55 (14.0)	1.07 (27.2)	.87 (20.6)	1.39 (33.8)	<a href="#">770-001S104</a>
20	.98 (24.9)	.57 (14.5)	.62 (15.7)	.61 (15.5)	1.12 (28.4)	.93 (23.6)	1.45 (36.8)	<a href="#">770-001S105</a>
24	1.15 (29.2)	.69 (17.5)	.75 (19.1)	.63 (16.0)	1.15 (29.2)	1.00 (25.4)	1.51 (38.4)	<a href="#">770-001S106</a>
28	1.27 (32.3)	.81 (20.6)	.87 (22.1)	.68 (17.3)	1.20 (30.5)	1.12 (28.4)	1.64 (41.7)	<a href="#">770-001S107</a>
32	1.40 (35.6)	.93 (23.6)	1.00 (25.4)	.71 (18.0)	1.22 (31.0)	1.18 (30.0)	1.70 (43.2)	<a href="#">770-001S107</a>
36	1.53 (38.9)	1.07 (27.2)	1.13 (28.7)	.75 (19.0)	1.26 (32.0)	1.29 (32.8)	1.81 (46.0)	<a href="#">770-001S107</a>
40	1.62 (41.1)	1.18 (30.0)	1.25 (31.8)	.76 (19.3)	1.28 (32.5)	1.31 (33.3)	1.83 (46.5)	<a href="#">770-001S107</a>
48	1.98 (50.3)	1.45 (36.8)	1.50 (38.1)	.79 (20.1)	1.31 (33.3)	1.42 (36.1)	1.94 (49.3)	<a href="#">770-001S108</a>
52	2.07 (52.6)	1.58 (40.1)	1.63 (41.4)	.81 (20.6)	1.33 (33.8)	1.44 (36.6)	1.96 (49.8)	<a href="#">770-001S108</a>
56	2.14 (54.4)	1.70 (43.2)	1.75 (44.4)	.86 (21.8)	1.38 (35.1)	1.57 (39.9)	2.09 (53.1)	<a href="#">770-001S108</a>



**713-356**  
**Guardian System - Composite**  
**Convoluted Tubing to Connector Backshell**  
**for Series 72 Annular Convoluted Tubing**

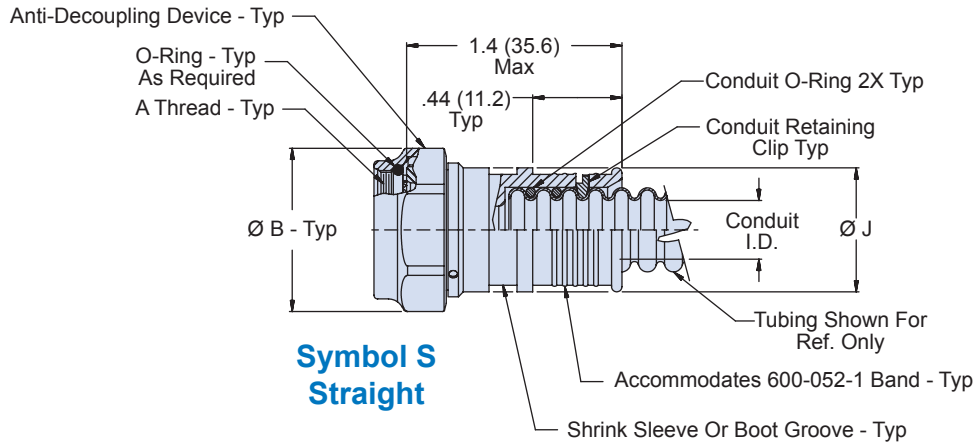
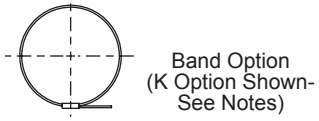
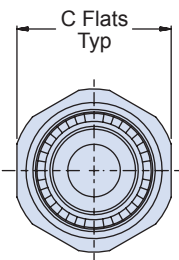
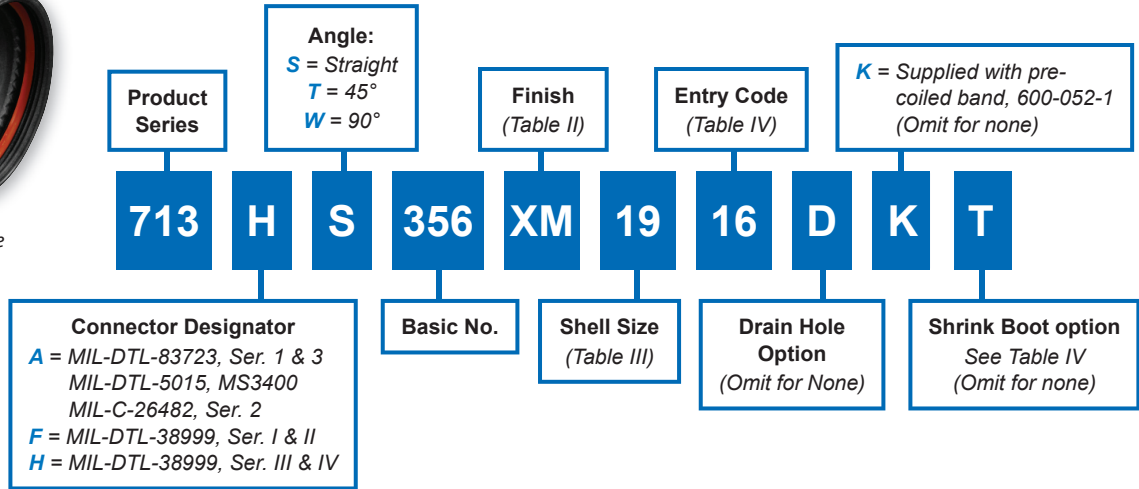
**Composite Guardian System convoluted tubing to connector backshell,  
EMI/RFI\* Environmental**



\*EMI/RFI when conductive finish is specified

**B**

**How To Order**



**Symbol S  
Straight**

**Material and Finish**

- Elbow, adapter: High grade engineering thermoplastic/See Table II
- Coupling nut: High grade engineering thermoplastic, black/no plating
- Conduit retaining clip: High grade engineering thermoplastic/no plating
- Anti-decoupling device: Corrosion resistant material/NA
- O-Rings: Silicone/NA

**Tools and Assembly notes**

- Conduit retaining clip and conduit O-Ring to be supplied unassembled.
- For effective grounding, connector with conductive finish should be used.
- Glenair assembly procedure is recommended for adapter to conduit termination. See Guardian assembly procedure at the end of this section

713-356

**Guardian System - Composite  
Convuluted Tubing to Connector Backshell  
for Series 72 Annular Convuluted Tubing**



Series 72  
Annular Tubing

**Table III: Connector Designators/Dimensions**

Connector Designator A		Connector Designator F		Connector Designator H		Ø B Max	C Flats	
Shell Size	A Thread Class 2B	Shell Size	A Thread Class 2B	Shell Size	A Thread Iso Metric		Max	Min
08	1/2-20 UNF	08	7/16-28 UNEF	09	M12 X 1.0-6H	.83 (21.1)	.750 (19.1)	.736 (18.7)
10	5/8-24 UNEF	10	9/16-24 UNEF	11	M15 X 1.0-6H	.96 (24.4)	.875 (22.2)	.860 (21.8)
12	3/4-20 UNEF	12	11/16-24 UNEF	13	M18 X 1.0-6H	1.09 (27.7)	1.000 (25.4)	.980 (24.9)
14	7/8-20 UNEF	14	13/16-20 UNEF	15	M22 X 1.0-6H	1.22 (31.0)	1.125 (28.6)	1.100 (27.9)
16	1-20 UNEF	16	15/16-20 UNEF	17	M25 X 1.0-6H	1.35 (34.3)	1.250 (31.8)	1.224 (31.1)
18	1 1/16-18 UNEF	18	1 1/16-18 UNEF	19	M28 X 1.0-6H	1.48 (37.6)	1.375 (34.9)	1.348 (34.2)
20	1 3/16-18 UNEF	20	1 3/16-18 UNEF	21	M31 X 1.0-6H	1.62 (41.1)	1.500 (38.1)	1.469 (37.3)
22	1 5/16-18 UNEF	22	1 5/16-18 UNEF	23	M34 X 1.0-6H	1.75 (44.5)	1.625 (41.3)	1.581 (40.2)
24	1 7/16-18 UNEF	24	1 7/16-18 UNEF	25	M37 X 1.0-6H	1.89 (48.0)	1.750 (44.5)	1.690 (42.9)

**Table III (cont.)**

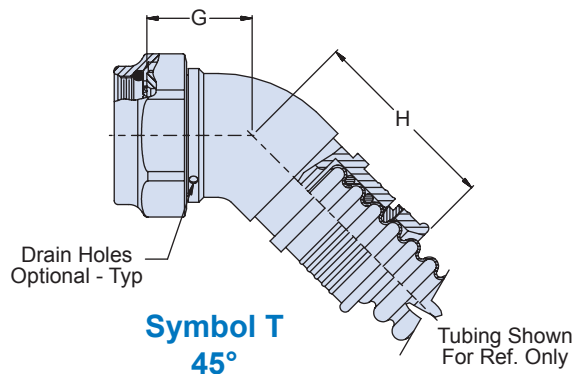
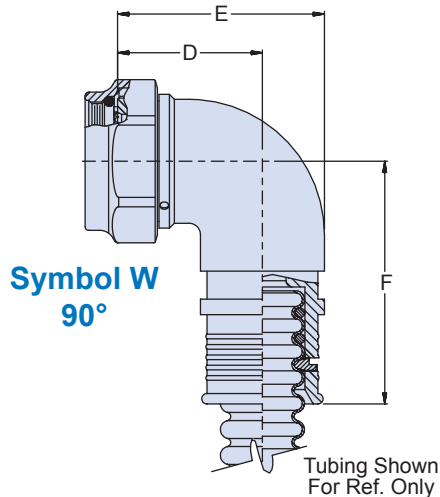
Conn Desig		D	E	F	G	H
A,F	H	±.06 (1.5)	±.09 (2.3)	±.09 (2.3)	±.06 (1.5)	±.09 (2.3)
08	09	.69 (17.5)	.88 (22.4)	1.19 (30.2)	.72 (18.3)	1.00 (25.4)
10	11	.75 (19.1)	1.00 (25.4)	1.25 (31.8)	.75 (19.1)	1.06 (26.9)
12	13	.81 (20.6)	1.13 (28.7)	1.31 (33.3)	.75 (19.1)	1.13 (28.7)
14	15	.88 (22.4)	1.31 (33.3)	1.38 (35.1)	.76 (19.3)	1.16 (29.5)
16	17	.94 (23.9)	1.38 (35.1)	1.44 (36.6)	.78 (19.8)	1.18 (30.0)
18	19	.97 (24.6)	1.44 (36.6)	1.47 (37.3)	.79 (20.1)	1.19 (30.2)
20	21	1.06 (26.9)	1.63 (41.4)	1.56 (39.6)	.82 (20.8)	1.22 (31.0)
22	23	1.13 (28.7)	1.75 (44.5)	1.63 (41.4)	.86 (21.8)	1.26 (32.0)
24	25	1.19 (30.2)	1.88 (47.8)	1.69 (42.9)	.89 (22.6)	1.29 (32.8)

**Table IV: Entry Code/Dimensions/Shrink Boot**

Entry Code	Ø J Max	Conduit I.D.		Shrink Boot
		Min	Max	
06	.53 (13.5)	.16 (4.1)	.19 (4.8)	<b>770-001S103</b>
09	.63 (16.0)	.24 (6.1)	.28 (7.1)	<b>770-001S103</b>
12	.73 (18.5)	.33 (8.4)	.37 (9.4)	<b>770-001S104</b>
16	.86 (21.8)	.45 (11.4)	.50 (12.7)	<b>770-001S104</b>
20	.98 (24.9)	.57 (14.5)	.62 (15.8)	<b>770-001S105</b>
24	1.15 (29.2)	.69 (17.5)	.75 (19.1)	<b>770-001S106</b>
28	1.27 (32.3)	.81 (20.6)	.87 (22.2)	<b>770-001S107</b>
32	1.40 (35.6)	.93 (23.6)	1.00 (25.4)	<b>770-001S107</b>
36	1.53 (38.9)	1.07 (27.2)	1.13 (28.7)	<b>770-001S107</b>
40	1.62 (41.1)	1.18 (30.0)	1.25 (31.8)	<b>770-001S107</b>
48	1.98 (50.3)	1.45 (36.8)	1.50 (38.1)	<b>770-001S108</b>
52	2.07 (52.6)	1.58 (40.1)	1.63 (41.4)	<b>770-001S108</b>
56	2.14 (54.4)	1.70 (43.2)	1.75 (44.4)	<b>770-001S108</b>

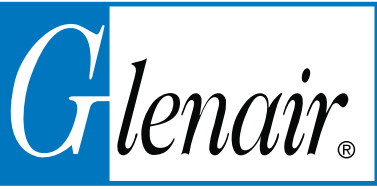
**Table II: Finish**

Symbol	Finish Description
XM	Electroless Nickel
XW	Cad/Olive Drab over Electroless Nickel
XB	Black color/Unplated
XMT	Nickel-PTFE



B





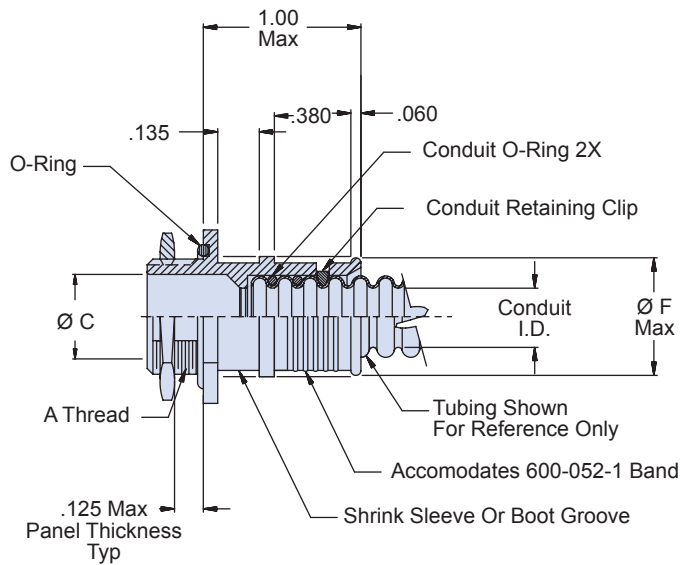
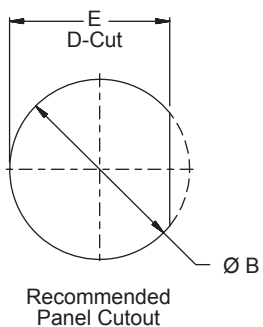
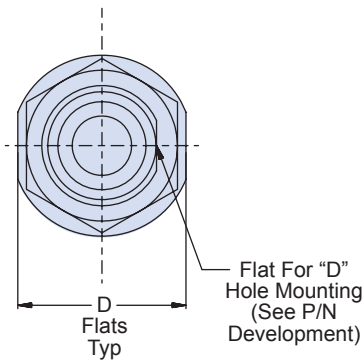
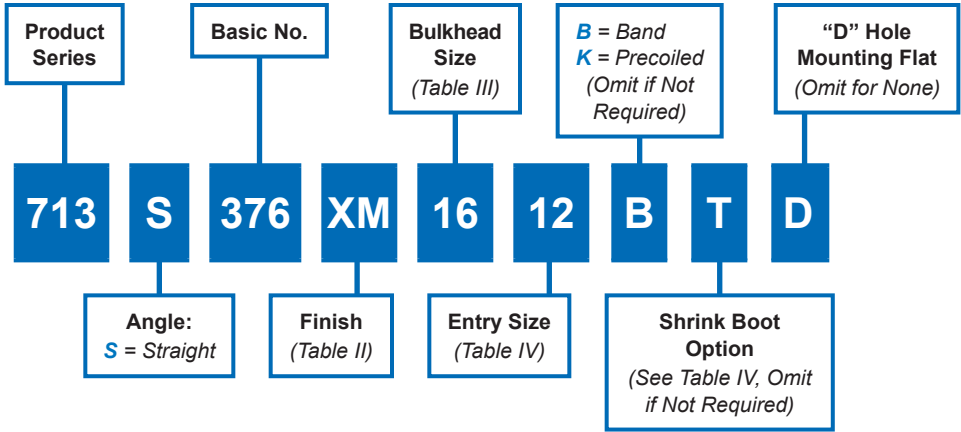
# 713-376 Guardian System - Composite Convuluted Tubing to Bulkhead Feed-Thru Fitting for Series 72 Annular Convuluted Tubing

## Composite Guardian System convuluted tubing to bulkhead feed-thru fitting

B



### How To Order



### **Material and Finish**

- Adapter and Jam nut: High grade engineering thermoplastic/See Table II
- O-Rings: Silicone/NA
- Retaining clip: High grade engineering thermoplastic/no plating

### **Tools and Assembly notes**

- Conduit retaining clip and conduit O-Ring to be supplied unassembled
- For effective grounding, connector with conductive finish should be used
- Glenair assembly procedure is recommended for adapter to conduit termination. See Guardian assembly procedure at the end of this section

713-376

**Guardian System - Composite  
Convuluted Tubing to Bulkhead Feed-Thru Fitting  
for Series 72 Annular Convuluted Tubing**

Series 72  
Annular Tubing

B

Table III: Bulkhead Size/Dimensions

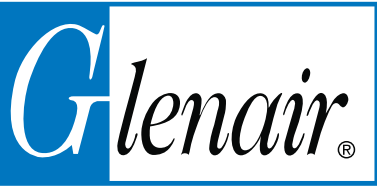
Bulkhead Size	A Thread Class 2A	Ø B +.015 -.000	Ø C	D Flats	E +.010 -.000	Max Entry Size
06	7/16-28 UNEF	0.443 (11.3)	0.188 (4.8)	0.688 (17.5)	0.385 (9.8)	09
08	1/2-20 UNF	0.505 (12.8)	0.250 (6.4)	0.750 (19.1)	0.448 (11.4)	12
09	9/16-24 UNEF	0.568 (14.4)	0.281 (7.1)	0.812 (20.6)	0.510 (13.0)	12
10	9/16-24 UNEF	0.568 (14.4)	0.312 (7.9)	0.812 (20.6)	0.510 (13.0)	12
12	5/8-24 UNEF	0.630 (16.0)	0.375 (9.5)	0.875 (22.2)	0.573 (14.6)	16
14	11/16-24 UNEF	0.693 (17.6)	0.438 (11.1)	0.938 (23.8)	0.635 (16.2)	16
16	3/4-20 UNEF	0.755 (19.2)	0.500 (12.7)	1.000 (25.4)	0.698 (17.7)	20
20	7/8-20 UNEF	0.880 (22.4)	0.625 (15.9)	1.125 (28.6)	0.822 (20.9)	20
24	1-20 UNEF	1.005 (25.5)	0.750 (19.1)	1.250 (31.8)	0.948 (24.1)	24
28	1 3/16-8 UNEF	1.193 (30.3)	0.875 (22.2)	1.438 (36.5)	1.135 (28.8)	32
32	1 5/16-18 UNEF	1.318 (33.5)	1.000 (25.4)	1.562 (39.7)	1.260 (32.0)	32
36	1 7/16-18 UNEF	1.443 (36.7)	1.125 (28.6)	1.625 (41.3)	1.385 (35.2)	36
40	1 1/2-18 UNEF	1.505 (38.2)	1.250 (31.8)	1.812 (46.0)	1.448 (36.8)	40
48	1 3/4-18 UNS	1.755 (44.6)	1.500 (38.1)	2.062 (52.4)	1.698 (43.1)	48
52	1 7/8-18 UNS	1.880 (47.8)	1.625 (41.3)	2.125 (54.0)	1.823 (46.3)	52
56	2-18 UNS	2.005 (50.9)	1.750 (44.4)	2.312 (58.7)	1.938 (49.2)	56

Table II: Finish

Symbol	Finish Description
XMT	Nickel-PTFE Gray (1000 Hr. Salt Spray)
XM	Electroless Nickel
XW	Cadmium Olive Drab over Electroless Nickel
XMT	No Plating - Base Material, Non-Conductive

Table IV: Entry Code/Dimensions/Shrink Boot

Entry Code	Ø F Max	Conduit I.D.		Shrink Boot
		Min	Max	
06	.53 (13.5)	.16 (4.1)	.19 (4.8)	<a href="#">770-001S103</a>
09	.63 (16.0)	.24 (6.1)	.28 (7.1)	<a href="#">770-001S103</a>
12	.73 (18.5)	.33 (8.4)	.37 (9.4)	<a href="#">770-001S104</a>
16	.86 (21.8)	.45 (11.4)	.50 (12.7)	<a href="#">770-001S104</a>
20	.98 (24.9)	.57 (14.5)	.62 (15.8)	<a href="#">770-001S105</a>
24	1.15 (29.2)	.69 (17.5)	.75 (19.1)	<a href="#">770-001S106</a>
28	1.27 (32.3)	.81 (20.6)	.87 (22.2)	<a href="#">770-001S107</a>
32	1.40 (35.6)	.93 (23.6)	1.00 (25.4)	<a href="#">770-001S107</a>
36	1.53 (38.9)	1.07 (27.2)	1.13 (28.7)	<a href="#">770-001S107</a>
40	1.62 (41.1)	1.18 (30.0)	1.25 (31.8)	<a href="#">770-001S107</a>
48	1.98 (50.3)	1.45 (36.8)	1.50 (38.1)	<a href="#">770-001S108</a>
52	2.07 (52.6)	1.58 (40.1)	1.63 (41.4)	<a href="#">770-001S108</a>
56	2.14 (54.4)	1.70 (43.2)	1.75 (44.4)	<a href="#">770-001S108</a>



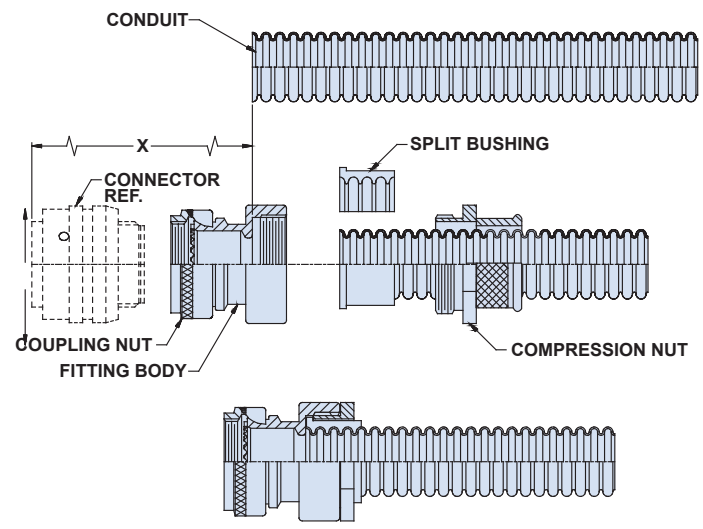
# Installation Procedures for Sentry System

(710-840, 710-841, 710-842, 710-847, 710-848, 710-849)

## Sentry System Fittings

### Pre-Assembly Preparation

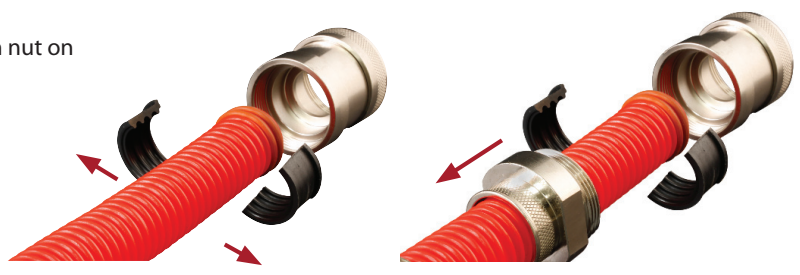
1. Determine overall conduit assembly length required from connector face to connector face. From this dimension, establish conductor length needed for connector termination and add two inches.
2. Temporarily assemble connector to fitting and hand tighten. Establish and deduct the "X" dimension(s) from the overall assembly length in Step 1.
3. Disassemble fitting from connector. Prepare conduit and assemble to fitting per instructions for the fitting series used.



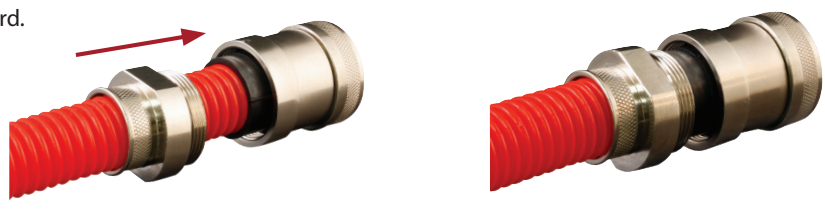
### Fitting/Conduit Assembly

1. Cut the conduit to length plus 0.5 inch (12.7 mm) per pre-assembly preparation step 2 using conduit shears or an equivalent. Using the "split bushing" as a guide, trim conduit perpendicular to the bore.

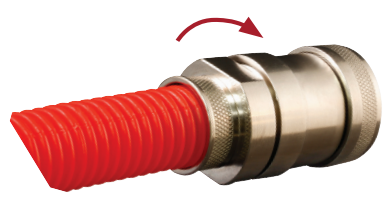
2. Remove bushing and slide compression nut on conduit.



3. Reinstall bushing and bring nut forward.



4. Thread nut into rear of fitting body and bottom on shoulder. Torque to 35 to 50 inch pounds.

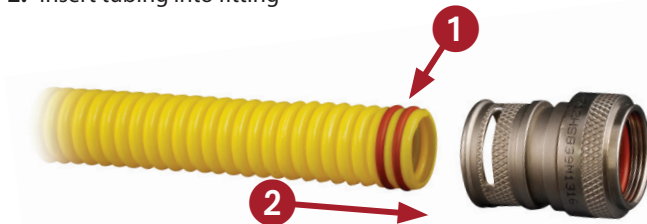


Glenair 600 series backshell assembly tools are recommended for assembly and installation. A catalog is available on request, or may be accessed on the internet at [www.glenair.com](http://www.glenair.com).

## Guardian System Fittings

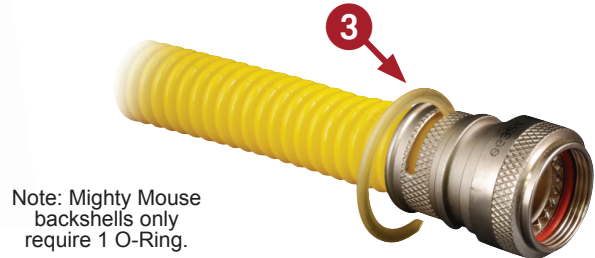
### O-Ring Attachment

1. Install pair of provided O-Rings on the two forwardmost tubing convolutes
2. Insert tubing into fitting



### Retention Ring Attachment

3. Run provided retaining clip into slot, aligned with the third convolution of conduit, behind the 2 O-Rings.



Note: Mighty Mouse backshells only require 1 O-Ring.

### BandMaster™ ATS Band Termination

#### Cable Prep

1. Pull overall braid shield over the band platform so that all braid strands will be captured by the band.



#### Install Band

2. Wrap the band through the buckle twice. Insert the free end into the banding tool in the direction shown on the tool. Squeeze the short grey handle to insert the band. Slide the band onto the cable. Close the black handle repeatedly until the handle no longer opens. Close the long grey handle until the tool cuts the band. Remove the excess strap from the tool by closing the small grey handle.



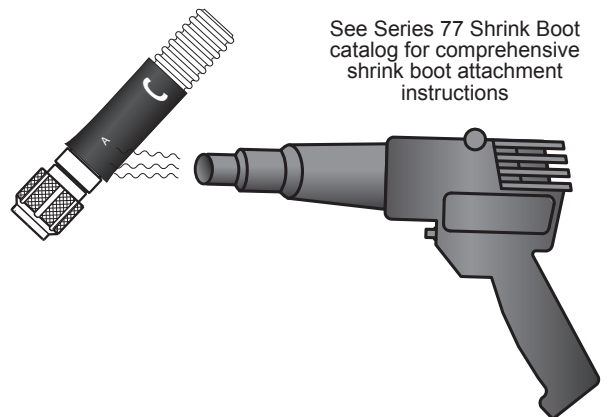
#### Trim Braid

3. It's a snap! Just trim the excess braid and you're done.



### Shrink Boot Attachment

1. Position the boot so that the lipped "A" end is on the adapter, and the "C" end is on the conduit.
2. Apply heat to adapter end of boot until the lipped end recovers fully and fits into the groove of the adapter.
3. Continue to heat down the body of the boot towards the "C" end, applying heat in brush-like strokes until "C" end is fully recovered.
4. After the boot is fully recovered, apply additional heat as necessary to the entire boot to ensure good adhesion. Do not overheat as conduit can be damaged by excessive heating.



See Series 77 Shrink Boot catalog for comprehensive shrink boot attachment instructions

Glenair 600 series backshell assembly tools are recommended for assembly and installation. A catalog is available on request, or may be accessed on the internet at [www.glenair.com](http://www.glenair.com).



*Turnkey*

# SERIES 74 CONVOLUTED TUBING ASSEMBLIES

TERMINATED, TESTED, AND READY FOR IMMEDIATE USE





Series 74  
**High-Performance Helical Polymer-Core  
 Convoluted Tubing Systems**  
 Introduction and Quick Selection Guide



**High-Performance Helical Convoluted Tubing, Backshells, Fittings and Assemblies**

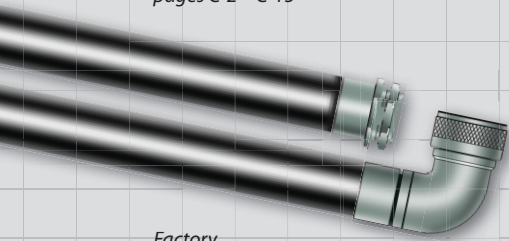
**Glenair Series 74 High-Performance Helical Polymer-Core Convoluted Tubing** provides a lightweight, durable enclosure for interconnect wiring, with backshells, transitions and a wide range of high-performance convoluted tubing types with and without EMI/RFI braiding and jacketing.

**Do-It-Yourself Fittings** are the best choice when ease of assembly and installation is a requirement, when prototyping wire-routing systems, or when running convoluted tubing in unpredictable lengths.

**Prefer a Turnkey Solution?** Factory terminated assemblies offer weight reduction and size savings, as well as highly durable tamper-proof crimp fittings.



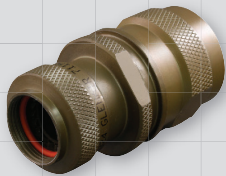
Helical Convoluted  
 Tubing configurations,  
 pages C-2 – C-15



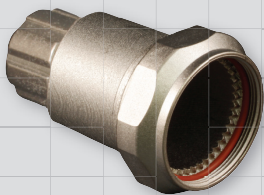
Factory  
 Terminated  
 Assemblies, p. C-16 - C-17



Easy-to-Assemble  
 Hat Trick system,  
 pages C-18 – C-29



Super-Durable  
 Internal Braid system,  
 pages C-30 – C-35



Ultra-Lightweight  
 Composite Hummer-Nut  
 system, pages C-52 – C-57

Part No.	Description	Page No.
<b>Helical Convoluted Tubing Configurations</b>		
	Configuration Options and Material Properties	C-2 – C-8
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121-101	Convoluted Tubing with Braid	C-10
121-102	Convoluted Tubing with 2 Braids	C-11
121-100	Convoluted Tubing with Braid and Jacket	C-12
121-103	Convoluted Tubing with 2 Braids and Jacket	C-13
123-100	Convoluted Tubing with Environmental Jacket	C-14
121-195	Convoluted Tubing with Internal Braid	C-15
<b>Factory Terminated Assemblies</b>		
	Factory Crimp Conduit Assemblies - How To Order	C-16
	Point-to-Point Conduit Assembly basic part numbers	C-17
<b>Easy-to-Install Hat Trick System</b>		
713-355	Convoluted Tubing-to-Connector Backshell, Metal	C-18
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713-377	Convoluted Tubing-to-Connector Backshell, Composite	C-22
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713-380	Hat Trick "Y" Transition	C-26
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<b>Super-Durable Internal Braid System</b>		
711-150	Convoluted Tubing-to-Connector Backshell	C-30
711-149	Convoluted Tubing-to-Bulkhead Fitting	C-32
711-148	Convoluted Tubing-to-Transition or End Fitting Adapter	C-34
<b>AeroLite System</b>		
712-879	Convoluted Tubing-to-Connector Backshell	C-36
712-880	Convoluted Tubing-to-Bulkhead Fitting	C-38
712-831	Convoluted Tubing-to-Connector Backshell, Composite	C-40
712-848	Convoluted Tubing-to-Bulkhead Fitting, Composite	C-42
<b>Legacy Heavy-Duty Ground Ring System</b>		
712-277	Convoluted Tubing-to-Connector Backshell	C-44
712-389	Convoluted Tubing-to-Bulkhead Fitting	C-46
712-380	Convoluted Tubing-to-Transition or End Fitting Adapter	C-48
712-358	Convoluted Tubing-to-Convoluted Tubing Splice Kit	C-50
<b>Hummer Nut System</b>		
712-178	Convoluted Tubing-to-Connector Backshell	C-52
712-202	Convoluted Tubing-to-Bulkhead Fitting	C-54
712-379	Convoluted Tubing-to-Transition or End Fitting Adapter	C-56
712-419	Convoluted Tubing-to-Connector Backshell, Composite	C-58
712-475	Convoluted Tubing-to-Bulkhead Fitting, Composite	C-60
	Installation Procedures	C-62



## Series 74 High-Performance Helical Polymer-Core Convuluted Tubing Systems Configuration Options

### Series 74 convuluted tubing, braided shielding, and jacketing options

The Series 74 Convuluted Tubing System is a flexible and durable alternative to standard jacketed cable. System design begins with your selection of core material, either ETFE, FEP, PFA or PTFE, or halogen-free PEEK. Core materials may be outfitted with braided shielding and jacketing options to address specific mechanical, electrical (EMI), and environmental protection requirements. See the individual catalog pages for detailed how-to-order information.

**Part Number**  
**120-100**

Pg. C-9



**Outstanding mechanical wire protection and lubricity for non-environmental and non-EMI/RFI applications**

Helical plastic convuluted tubing, available in a choice of 5 materials. Choose standard black or clear color.

**Part Number**  
**121-101**

Pg. C-10



**Adds EMI/RFI braided shielding for use in non-environmental applications**

Helical plastic convuluted tubing, available in a choice of 5 materials, with a single braided shield for EMI/RFI protection.

**Part Number**  
**121-102**

Pg. C-11



**Adds a second layer of high dB EMI/RFI shielding for use in non-environmental applications**

Helical plastic convuluted tubing, available in a choice of 5 materials, with double braided shield for high frequency shielding applications.

**Part Number**  
**121-100**

Pg. C-12



**A jacketed configuration with one EMI/RFI shield for use in environmental applications**

Helical plastic convuluted tubing, available in a choice of 5 materials, with braided shielding for EMI/RFI protection and a ruggedized jacket for environmental protection.

**Part Number**  
**121-103**

Pg. C-13



**Double-braided and jacketed configuration for environmental and high dB EMI/RFI shielding protection**

Helical plastic convuluted tubing, available in a choice of 5 materials with double shielding and jacket for optimum EMI/RFI protection and environmental sealing.

**Part Number**  
**123-100**

Pg. C-14



**For environmental applications without EMI shielding requirements**

Helical convuluted tubing in choice of 5 materials with a ruggedized jacket for environmental protection.

**Part Number**  
**121-195**

Pg. C-15



**Internal braid configuration for harsh chemical environment applications, with EMI/RFI shielding**

Chemical- and UV-resistant plastic conduit tubing with internal braid for weight savings and harsh-environment EMI/RFI protection.

# Series 74 High-Performance Helical Polymer-Core Convolute Tubing Systems Material Properties and Colors



### Convolute Tubing Material Choices

E	ETFE Fluoropolymer (Series 74 standard)	Highest tensile strength and lubricity. Combines mechanical toughness with outstanding chemical, dielectric and thermal properties, improved radiation resistance. This is our standard material for a reason: ETFE delivers the best performance and best value in high-performance polymer resins.
F	FEP	Economical with relatively high thermal stability, excellent dielectric properties. Unaffected by virtually all solvents and chemicals, good adhesion resistance.
P	PFA	Outstanding lubricity and resistance to corrosives, -95°F to 500°F temperature rating. Melt-extruded for better cold flow and greater long-term sealing than PTFE; more economical.
T	PTFE	Outstanding resistance to corrosives, -95°F to 500°F temperature rating. Somewhat better folding endurance than PFA. However, this paste-extruded fluoropolymer material is more difficult to process and so costs more than PFA with virtually equal performance.
K	PEEK	Low-smoke, zero-halogen with high strength and superior crush resistance. Lightest weight of all the tubing polymers, but also the highest material cost.

### Convolute Tubing Material Properties

Material Property	Perfluoroalkoxy (PFA)	Fluorinated Ethylene Propylene (FEP)	Ethylene Tetrafluoroethylene (ETFE)	Polytetrafluoroethylene (PTFE)	Polyether Ketone (PEEK)
Service Temperature	-95°F/500°F (-71°C/260°C)	-95°F/400°F (-71°C/204°C)	-88°F/302°F (-67°C/150°C)	-95°F/500°F (-71°C/260°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)	7,000 PSI (48,300 KP)
Elongation	250%	200%	100%	175%	100%
Specific Gravity	2.15	2.15	1.70	2.15	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)	2,000 Hrs. @ 464°F (240°C)
Dielectric Strength	12,000V	12,000V	12,000V	12,000V	12,000V
Volume Resistivity	1018	1018	1016	1018	1016
Water Absorption	0.03%	0.01%	0.02%	0.01%	0.03%
Solvent Resistance	No swelling, stickiness or weight change				
Flammability	Non-burning				
Fungus Resistance	Does not support fungus growth				

### Convolute Tubing Color Options

B	Standard Black	Standard for all Series 74 convolute tubing materials
C	Clear (Natural)	Available for all Series 74 convolute tubing materials

Consult factory for additional color options



### Summary and Analysis

Understanding the performance characteristics of available material types is an essential first step in specifying the correct convoluted tubing for your interconnect application. But two of the most popular fluoropolymer materials, PFA and PTFE are so close in most major performance areas that selection is more often an issue of price, rather than performance.

Both materials show outstanding chemical properties for resistance to corrosive agents, nonsolubility, and nonflammability. Both are virtually identical in terms of their electrical properties for dielectric, dissipation, and surface resistivity. Even in critical melting point (service temperature) ratings, both materials have identical properties. In fact, it is only in three areas, cold flow, folding endurance and cost that these virtually identical fluoropolymer resins differ significantly.

Because PFA is melt extruded, it exhibits better cold flow values than PTFE, which translates to better long-term sealing and reduced loosening of fittings. In terms of cost, PFA convoluted tubing is typically the better performer, as the melt extruded product is less costly to fabricate and can be produced in any length, effectively eliminating the scrap associated with PTFE.

**PFA vs PTFE Comparison Table**

Property	PFA 350	PTFE
Service Temperature	-95°F/500°F -71°C/260°C	-95°F/500°F -71°C/260°C
Thermal Conductivity	.25 W/MK	.19 W/MK
Tensile Strength	4,000 PSI (20,684 KP)	3,600 PSI (17,237 KP)
Specific Gravity	2.12 - 2.17	2.13 - 2.25
Hardness	55	55
Cold Flow	>2% 6.9 MPa (1,000 PSI) @25°C (73°F) at 1,000 hrs.	>10% 6.9 MPa (1,000 PSI) @25°C (73°F) at 1,000 hrs.
Flexural Modulus	590 - 625 MPa 85,000 - 90,000 PSI	345 - 620 MPa 50,000 - 90,000 PSI
MIT Folding Endurance	5 x 10 <sup>5</sup>	1 x 10 <sup>6</sup>
Chemical Properties	inert	Inert
Electrical Resistivity	>1018 OHM/CM	>1018 OHM/CM
Water Absorption	<.03%	<.01%



**Series 74**  
**High-Performance Helical Polymer-Core**  
**Convuluted Tubing Systems**  
**Braided Shield and Jacket Options and Material Properties**



**EMI/RFI Braided Shielding and Non-Metallic (Fabric) Overbraids**

T	Tin/Copper	150°C temperature rating, 125 lbs. tensile strength, 96 hr. salt spray corrosion resistance
C	Stainless Steel	Highest tensile strength (225 lbs.), highest temperature—1093°C+
N	Nickel/Copper	200°C temperature rated, 150 lbs. tensile strength, 500 hrs. salt spray corrosion resistance
S	SnCuFe	Tin plated iron/copper
L	ArmorLite™	Microfilament metal-clad ultra lightweight stainless steel braid
D	Dacron	Yarn with excellent abrasion resistance, good chemical resistance, non-conductive
M	Nomex	-55°C to 260°C temperature range - will not melt, excellent chemical resistance, non-conductive
E	AmberStrand® 100%	Expandable, flexible, high-strength conductive metal-clad composite thermoplastic
F	AmberStrand® 75%/25%	75% Expandable, flexible, high-strength conductive metal-clad composite thermoplastic combined with 25% nickel-plated 36AWG copper wire for additional strength

**Jacketing Options**

N	Neoprene	Tough, durable polychloroprene for mechanical and environmental protection
H	Hypalon®	Light weight with broad temperature range
E	EPDM	Better resistance to Ketones
V	Viton	Heaviest material with best resistance to oil and gasoline
B	Duraelectric, Black	Weatherproof, halogen free, flame resistant, functional to 260°C
G	Duraelectric, Gray	Qualified to US Navy MIL-PRF-24758A, Fed Std 595B #26270 Haze Gray color
TN	Duraelectric, Desert Tan	Duraelectric in Fed Std #3446 Desert Tan color
O	Duraelectric, Orange	OSHA Safety Orange to mark energized electrical cables

**Jacketing Material Properties and Chemical Resistance**

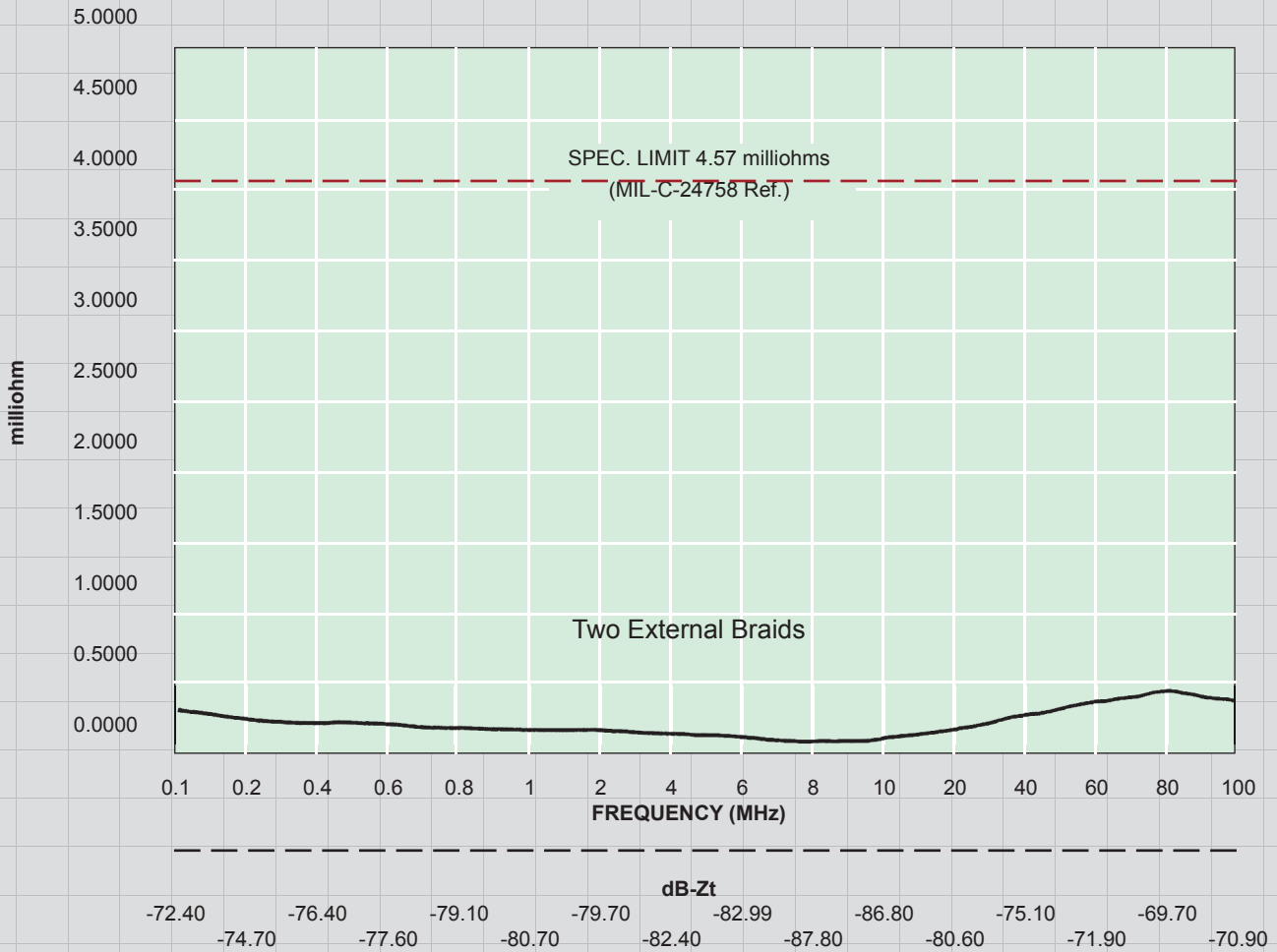
Material Property	EPDM (Ethylene Propylene Diene Monomer)	Hypalon (Chlorosulfonated Polyethylene)	Neoprene (Polychloroprene)	Viton (Fluoroelastomer)	Duraelectric
Temperature Range	-60°F to +300°F (-51°C to +149°C)	-60°F to +300°F (-51°C to +149°C)	-60°F to +250°F (-51°C to +121°C)	-40°F to +392°F (-40°C to +200°C)	-94°F to +392°F (-70°C to +200°C)
Specific Gravity	1.26	1.18	1.25	1.80	1.22
Weight: Lbs./Cubic Inch	.045	.043	.045	.055	.045
Abrasion Resistance	Excellent	Excellent	Excellent	Excellent	Good
Wear Resistance	Good	Good	Good	Good	Good
Flame Resistance	Good	Good	Good	Good	Excellent
Sunlight Resistance	Good	Excellent	Excellent	Excellent	Excellent
<b>Chemical Resistance</b>					
Aliphatic Hydrocarbons	Good	Good	Good	Excellent	Excellent
Aromatic Hydrocarbons	Good	Fair	Fair	Excellent	Excellent
Ketones, Etc.	Good	Poor	Poor	Poor	Excellent
Oil & Gasoline	Good	Good	Good	Excellent	Excellent





Transfer Impedance - Series 74 Convolved Tubing (FEP)  
with 2 Tin/Copper Braids and User Installable Fittings  
0.5 Inch Diameter

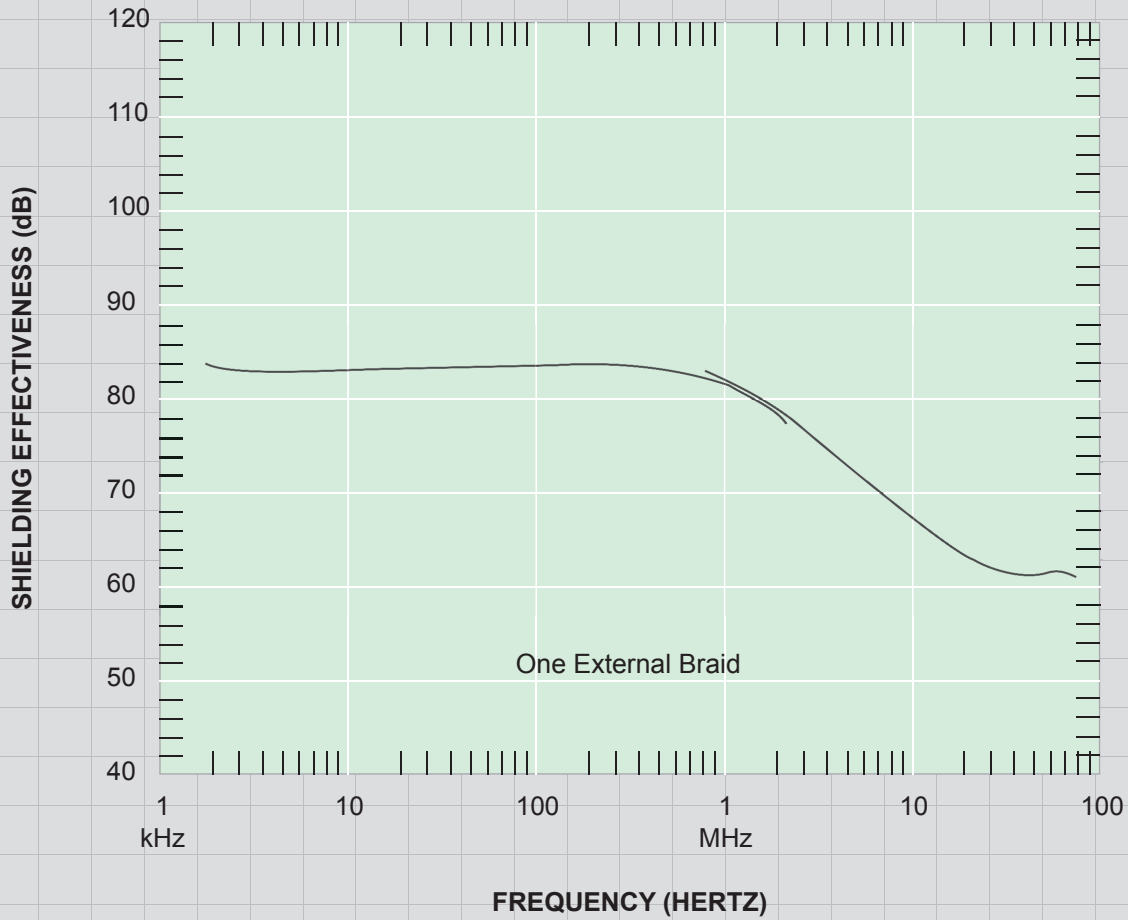
C



# Shield Effectiveness of Series 74 Tubing with One External Tin/Copper Braid 1 Inch Diameter Tubing

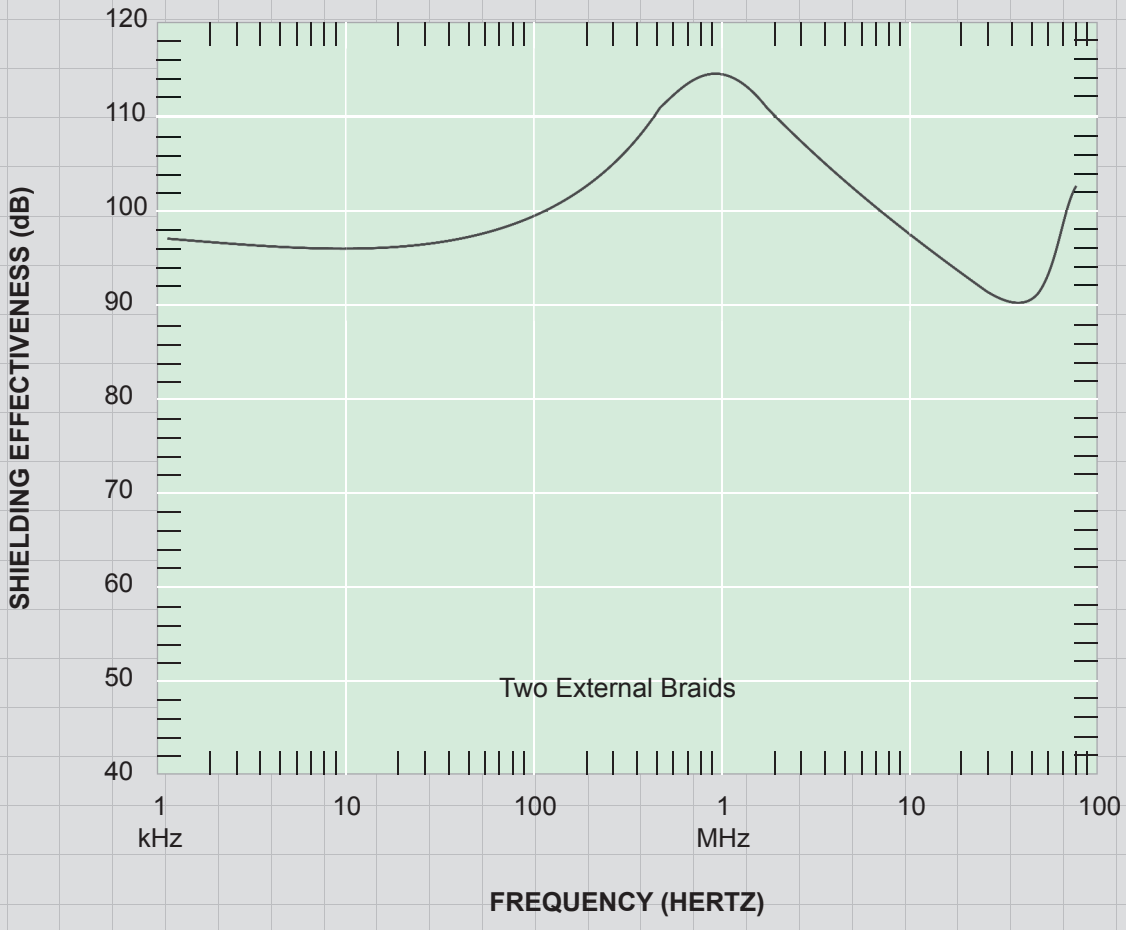


Series 74  
Helical Tubing





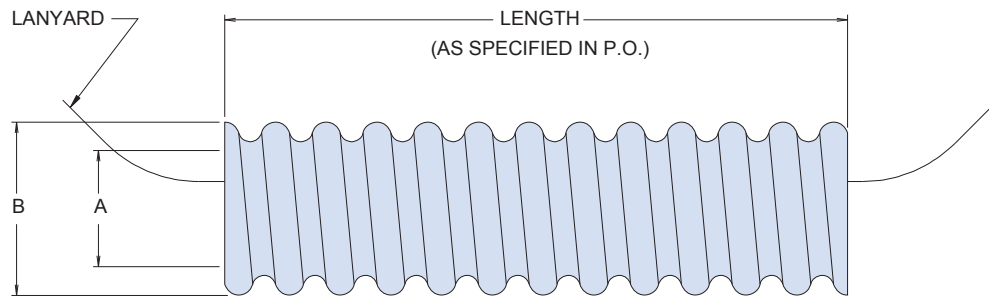
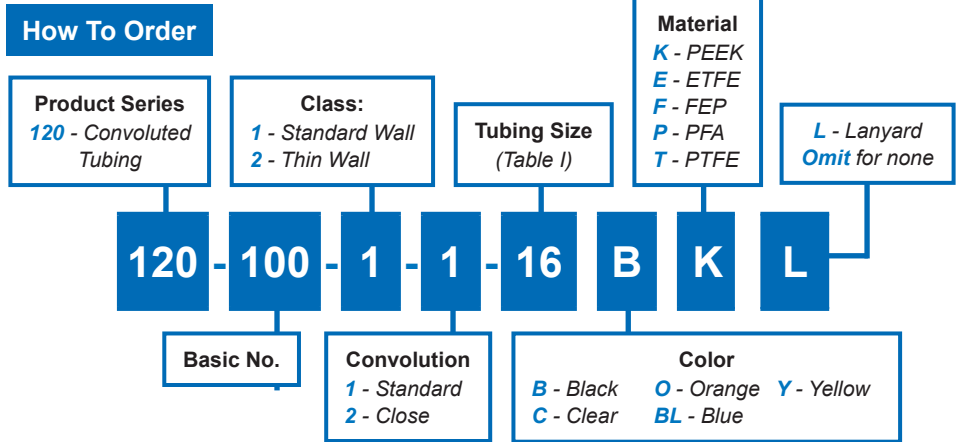
# Shield Effectiveness of Series 74 Tubing with Two External Tin/Copper Braids 1 Inch Diameter Tubing



120-100  
Helical Polymer-Core Convulated Tubing  
In Accordance With SAE AMS-81914

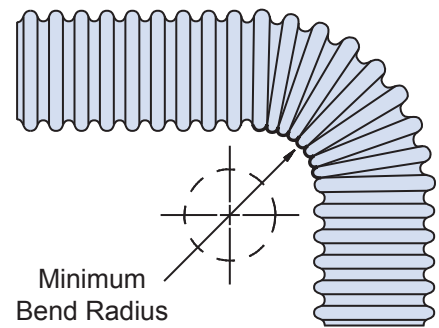


**Outstanding mechanical wire protection and lubricity for non-environmental and non-EMI/RFI applications**



**Table I: Tubing Size Order Number and Dimensions**

Tubing Size	Fractional Size Ref	A Inside Dia Min	B Dia Max	Min 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)



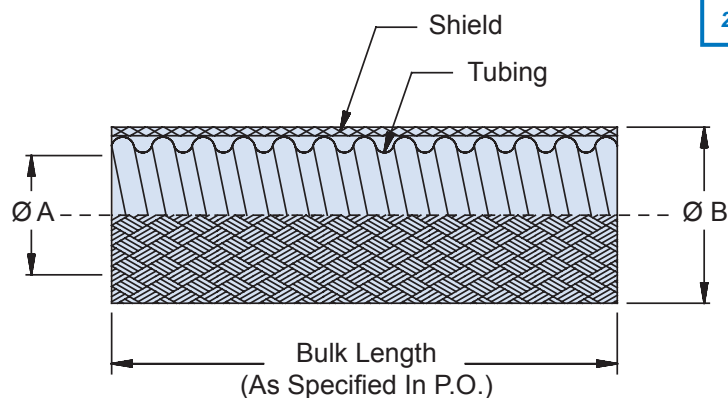
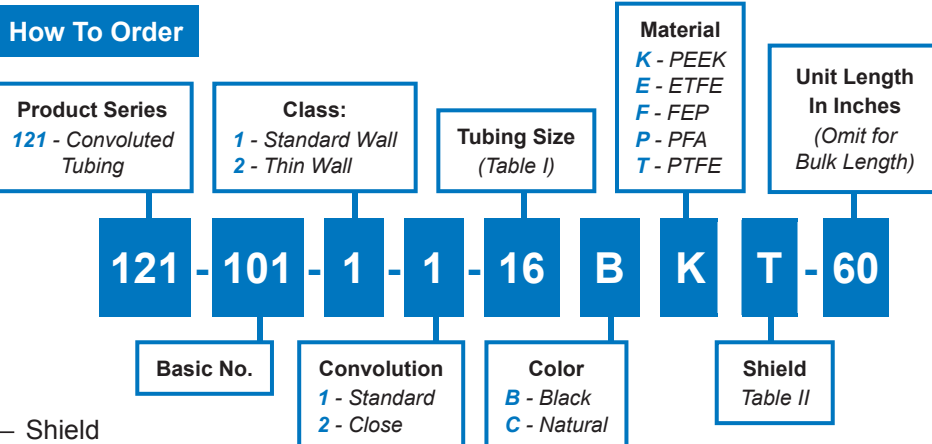
**Packaging**

- Long-length orders of 120-100 conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.



121-101  
Helical Polymer-Core Convolute Tubing  
In Accordance With SAE AMS-81914 • with External Braid

**Tubing plus a single EMI/RFI braided shield for use in non-environmental applications**

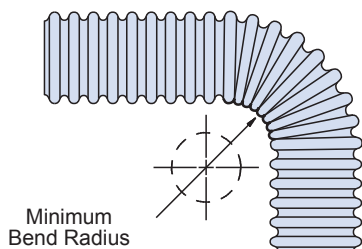


**Table I: Tubing Size Order Number and Dimensions**

Tubing Size	Fractional Size Ref	Ø A Inside Min	Ø B 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)

**Table II: Shield/Braid Option**

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
L	AarmorLite™
D	Dacron (Non-Conductive)
M	Nomex (Non-Conductive)
E	AmberStrand® 100%
F	AmberStrand® 75%/25%



**Packaging/Notes**

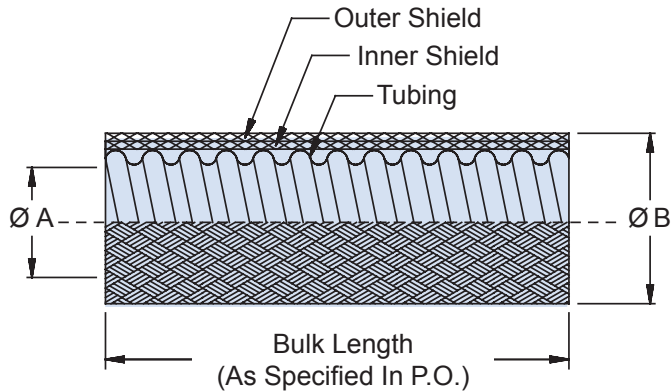
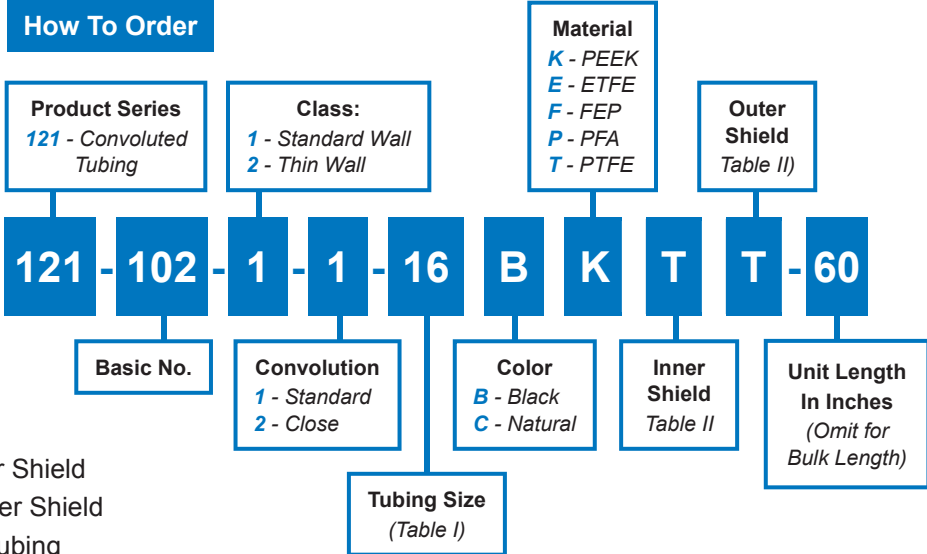
- Long-length orders of 121-101 braided conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.



121-102  
**Helical Polymer-Core Convoluted Tubing**  
 In Accordance With SAE AMS-81914 • with 2 External Braids



**Tubing plus a double layer of high dB EMI/RFI shielding for use in non-environmental applications**

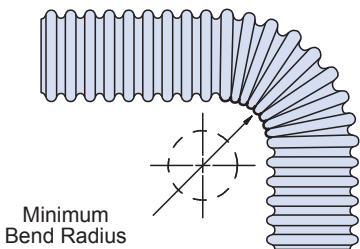


**Table I: Tubing Size Order Number and Dimensions**

Tubing Size	Fractional Size Ref	Ø A Inside Min	Ø B 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)	1.03 (26.2)	1.75 (44.5)
28	7/8	.860 (21.8)	1.17 (29.8)	1.88 (47.8)
32	1	.970 (24.6)	1.33 (29.8)	2.25 (57.2)
40	1 1/4	1.205 (30.6)	1.64 (41.6)	2.75 (69.9)
48	1 1/2	1.437 (36.5)	1.93 (49.1)	3.25 (82.6)
56	1 3/4	1.688 (42.9)	2.18 (55.4)	3.63 (92.2)
64	2	1.937 (49.2)	2.43 (61.8)	4.25 (108.0)

**Table II: Shield/Braid Option**

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
L	ArmorLite™
D	Dacron (Non-Conductive)
M	Nomex (Non-Conductive)
E	AmberStrand® 100%
F	AmberStrand® 75%/25%



**Packaging/Notes**

- Long-length orders of 121-102 braided conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.



# 121-100 Helical Polymer-Core Convoluted Tubing In Accordance With SAE AMS-81914 with External Braid and Jacket

**Tubing with one EMI/RFI Braided shield plus jacket for use in environmental applications**

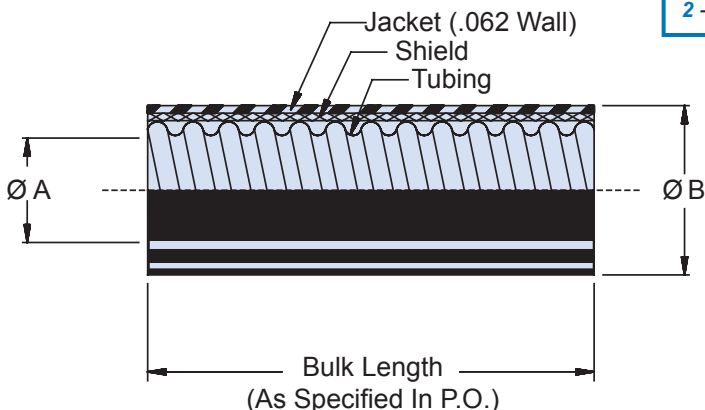
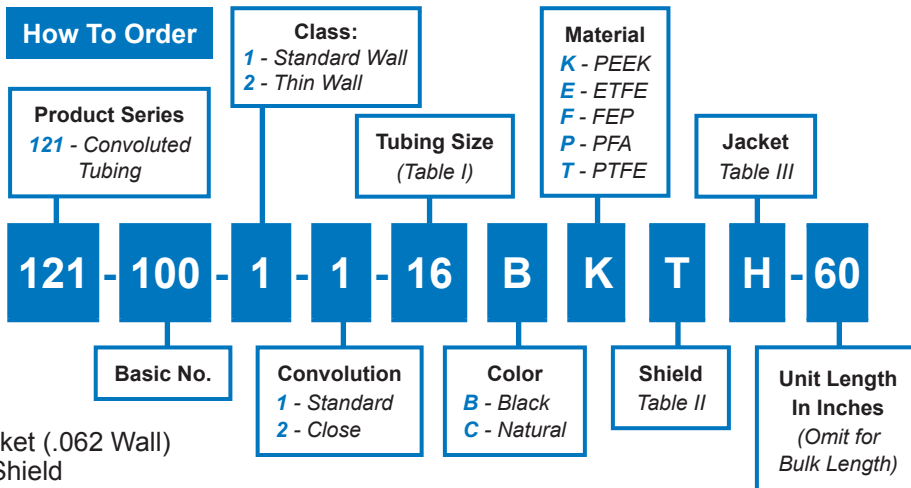
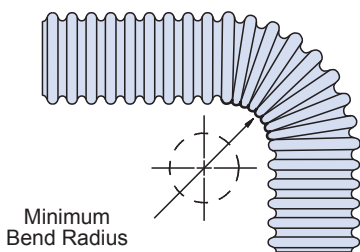


Table I: Tubing Size Order Number and Dimensions				
Tubing Size	Fractional Size Ref	Ø A Inside Min	Ø B Max	Minimum Bend Radius
06	3/16	.181 (4.6)	.490 (12.4)	.50 (12.7)
09	9/32	.273 (6.9)	.584 (14.8)	.75 (19.1)
10	5/16	.306 (7.8)	.620 (15.7)	.75 (19.1)
12	3/8	.359 (9.1)	.680 (17.3)	.88 (22.4)
14	7/16	.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)	2.252 (57.2)	3.63 (92.2)
64	2	1.937 (49.2)	2.502 (63.6)	4.25 (108.0)

Table II: Shield/Braid Option	
T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
L	ArmorLite™
D	Dacron (Non-Conductive)
M	Nomex (Non-Conductive)
E	AmberStrand® 100%
F	AmberStrand® 75%/25%

Table III: Jacket Option	
N	Neoprene
H	Hypalon®
E	EPDM
V	Viton
B	Duraelectric, Black
G	Duraelectric, Gray
TN	Duraelectric, Desert Tan
O	Duraelectric, OSHA Orange



### Packaging/Notes

- Long-length orders of 121-100 braided and jacketed conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.

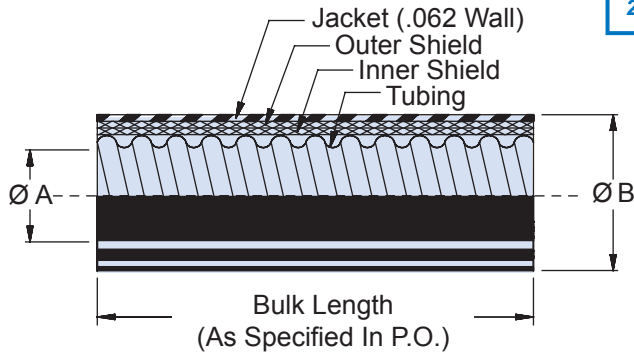
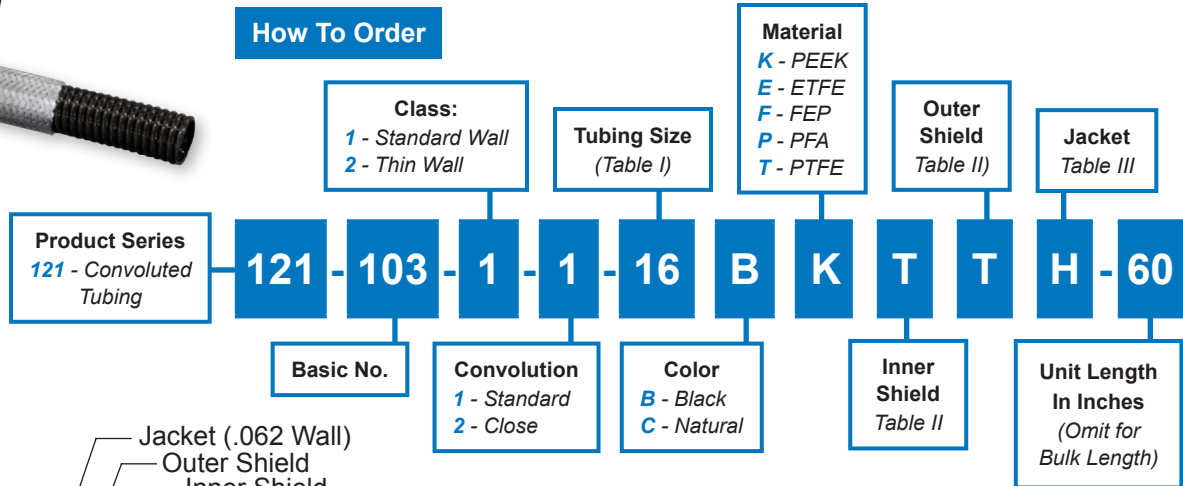
121-103  
**Helical Polymer-Core Convuluted Tubing**  
 In Accordance With SAE AMS-81914  
 with 2 External Braids and Jacket



**Tubing with double braid and jacket for environmental and high dB EMI/RFI shielding protection**



**How To Order**



**Table II: Shield/Braid Option**

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
L	ArmorLite™
D	Dacron (Non-Conductive)
M	Nomex (Non-Conductive)
E	AmberStrand® 100%
F	AmberStrand® 75%/25%

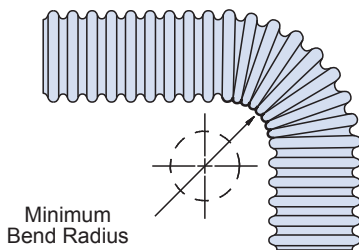
**Table III: Jacket Option**

N	Neoprene
H	Hypalon®
E	EPDM
V	Viton
B	Duraelectric, Black
G	Duraelectric, Gray
TN	Duraelectric, Desert Tan
O	Duraelectric, OSHA Orange

**Table I: Tubing Size Order Number and Dimensions**

Tubing Size	Fractional Size Ref	Ø A Inside Min	Ø B 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.



**Packaging/Notes**

- Long-length orders of 121-103 braided and jacketed conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.

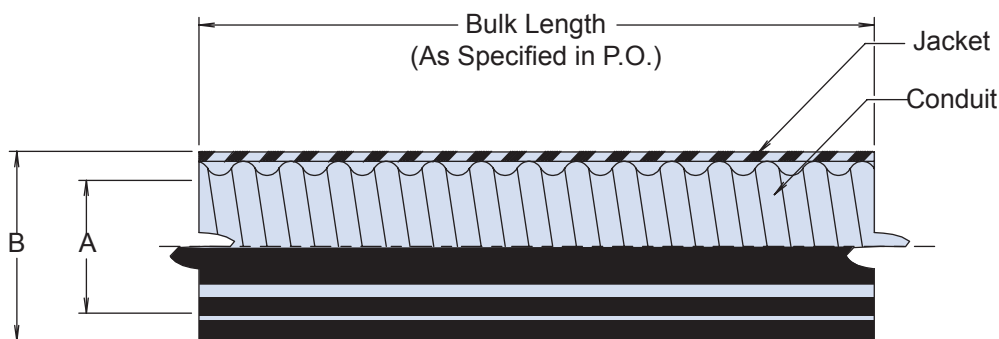
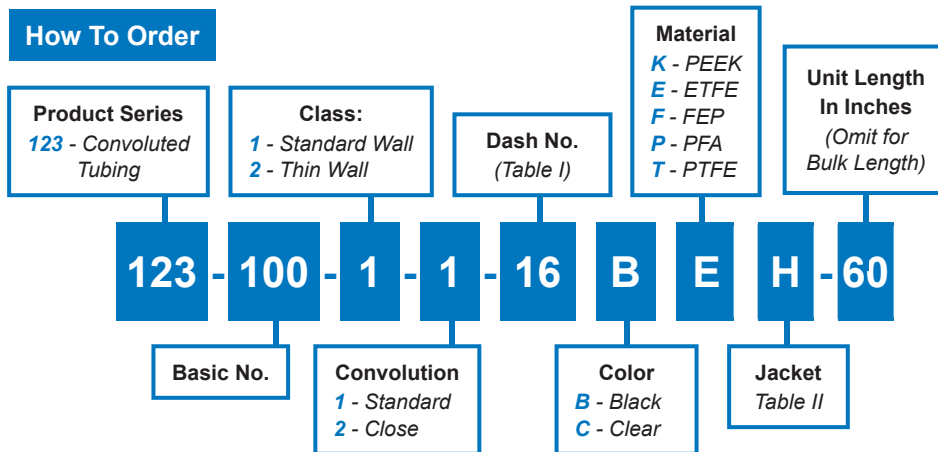


123-100  
Helical Polymer-Core Convoluted Tubing  
In Accordance With SAE AMS-81914 • with Environmental Jacket

**Tubing with jacket for environmental applications without EMI shielding requirements**



**How To Order**



**Table I: Tubing Size Order Number and Dimensions**

Tubing Size	Fractional Size Ref	Ø A Inside		Ø B Max
		Min	Max	
06	3/16	.181 (4.6)	0.188 (4.8)	0.460 (11.7)
09	9/32	.273 (6.9)	0.281 (7.1)	0.554 (14.1)
10	5/16	.306 (7.8)	0.312 (7.9)	0.590 (15.0)
12	3/8	.359 (9.1)	0.375 (9.5)	0.650 (16.5)
14	7/16	.427 (10.8)	0.437 (11.1)	0.711 (18.1)
16	1/2	.480 (12.2)	0.500 (12.7)	0.790 (20.1)
20	5/8	.603 (15.3)	0.625 (15.9)	0.910 (23.1)
24	3/4	.725 (18.4)	0.750 (19.1)	1.070 (27.2)
28	7/8	.860 (21.8)	0.875 (22.2)	1.213 (30.8)
32	1	.970 (24.6)	1.000 (25.4)	1.366 (34.7)
40	1 1/4	1.205 (30.6)	1.250 (31.8)	1.679 (42.6)
48	1 1/2	1.437 (36.5)	1.500 (38.1)	1.972 (50.1)
56	1 3/4	1.688 (42.9)	1.750 (44.5)	2.222 (56.4)
64	2	1.937 (49.2)	2.000 (50.8)	2.472 (62.8)

**Table II: Jacket Option**

N	Neoprene
H	Hypalon®
E	EPDM
V	Viton
B	Duralectric, Black
G	Duralectric, Gray
TN	Duralectric, Desert Tan
O	Duralectric, OSHA Orange

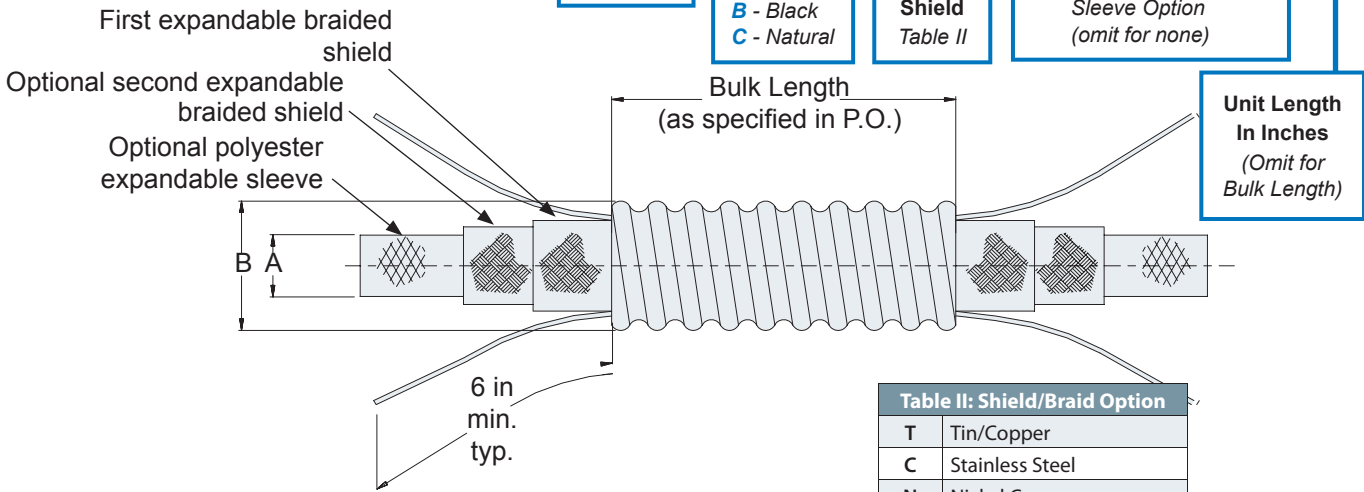
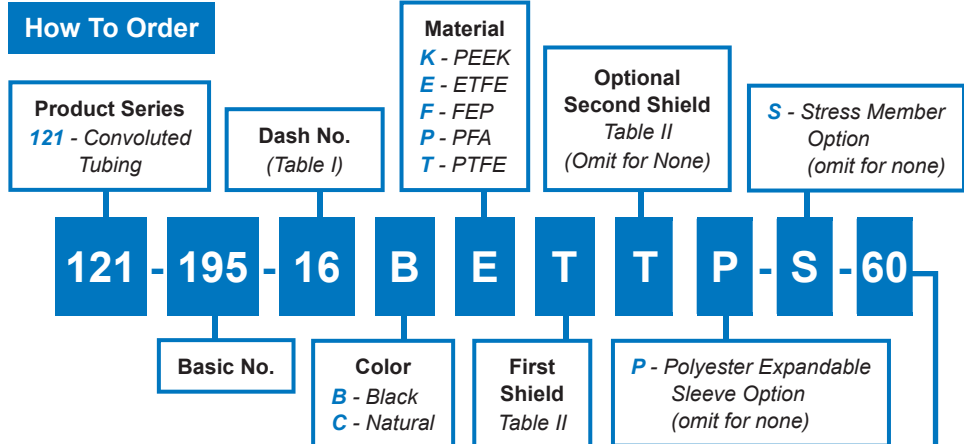
**Packaging/Notes**

- Long-length orders of 123-100 jacketed conduit are subject to carrier weight and box size restrictions. For example, UPS air shipments are currently limited to 50 lbs. per box. Unless otherwise specified, Glenair standard practice is to ship optimal lengths of product based on weight, size, and individual carrier specifications. Consult factory for additional information or to specify packaging requirements.
- Consult factory for thin-wall, close convolution combination and for PEEK™ and PTFE min/max dimensions.

121-195  
Helical Polymer-Core Convuluted Tubing  
In Accordance With SAE AMS-81914  
with One or Two Internal Braids



**Tubing with internal braid for harsh chemical environment applications, with EMI/RFI shielding**



Dash No.	A Inside Diameter						B Outside Diameter Max
	2 Braids & Sleeve		2 Braids		1 Braid		
	Min	Max	Min	Max	Min	Max	
06	N/A	N/A	0.041 (1.0)	0.048 (1.2)	0.111 (2.8)	0.118 (3.0)	0.320 (8.1)
09	0.063 (1.6)	0.071 (1.8)	0.133 (3.4)	0.141 (3.6)	0.203 (5.2)	0.211 (5.4)	0.414 (10.5)
10	0.096 (2.4)	0.102 (2.6)	0.166 (4.2)	0.172 (4.4)	0.236 (6.0)	0.242 (6.1)	0.450 (11.4)
12	0.149 (3.8)	0.165 (4.2)	0.219 (5.6)	0.235 (6.0)	0.289 (7.3)	0.305 (7.7)	0.510 (13.0)
14	0.217 (5.5)	0.227 (5.8)	0.287 (7.3)	0.297 (7.5)	0.357 (9.1)	0.367 (9.3)	0.571 (14.5)
16	0.270 (6.9)	0.290 (7.4)	0.340 (8.6)	0.360 (9.1)	0.410 (10.4)	0.430 (10.9)	0.650 (16.5)
20	0.393 (10.0)	0.415 (10.5)	0.463 (11.8)	0.485 (12.3)	0.533 (13.5)	0.555 (14.1)	0.770 (19.6)
24	0.515 (13.1)	0.540 (13.7)	0.585 (14.9)	0.610 (15.5)	0.655 (16.6)	0.680 (17.3)	0.930 (23.6)
28	0.650 (16.5)	0.665 (16.9)	0.720 (18.3)	0.735 (18.7)	0.790 (20.1)	0.805 (20.4)	1.073 (27.3)
32	0.760 (19.3)	0.790 (20.1)	0.830 (21.1)	0.860 (21.8)	0.900 (22.9)	0.930 (23.6)	1.226 (31.1)
40	0.995 (25.3)	1.040 (26.4)	1.065 (27.1)	1.110 (28.2)	1.135 (28.8)	1.180 (30.0)	1.539 (39.1)
48	1.227 (31.2)	1.290 (32.8)	1.297 (32.9)	1.360 (34.5)	1.367 (34.7)	1.430 (36.3)	1.832 (46.5)
56	1.478 (37.5)	1.540 (39.1)	1.548 (39.3)	1.610 (40.9)	1.618 (41.1)	1.680 (42.7)	2.156 (54.8)
64	1.727 (43.9)	1.790 (45.5)	1.797 (45.6)	1.860 (47.2)	1.867 (47.4)	1.930 (49.0)	2.332 (59.2)

T	Tin/Copper
C	Stainless Steel
N	Nickel Copper
S	SnCuFe
L	ArmorLite™
E	AmberStrand® 100%
F	AmberStrand® 75%/25%

- Packaging/Material Notes**
- Long-length orders of 121-195 conduit are subject to carrier weight and box size restrictions. Glenair standard practice is to ship optimal lengths of product based on weight, size, and carrier specifications. Consult factory for additional information or to specify packaging requirements.
  - Max continuous length is 360 in. Consult factory for longer lengths.
  - Two Kevlar stress members at 180° apart between tin copper shield and I.D. of tubing, to extend 6 in. min. beyond ends of tubing.
  - Expandable sleeve material: E-CTFE, black.





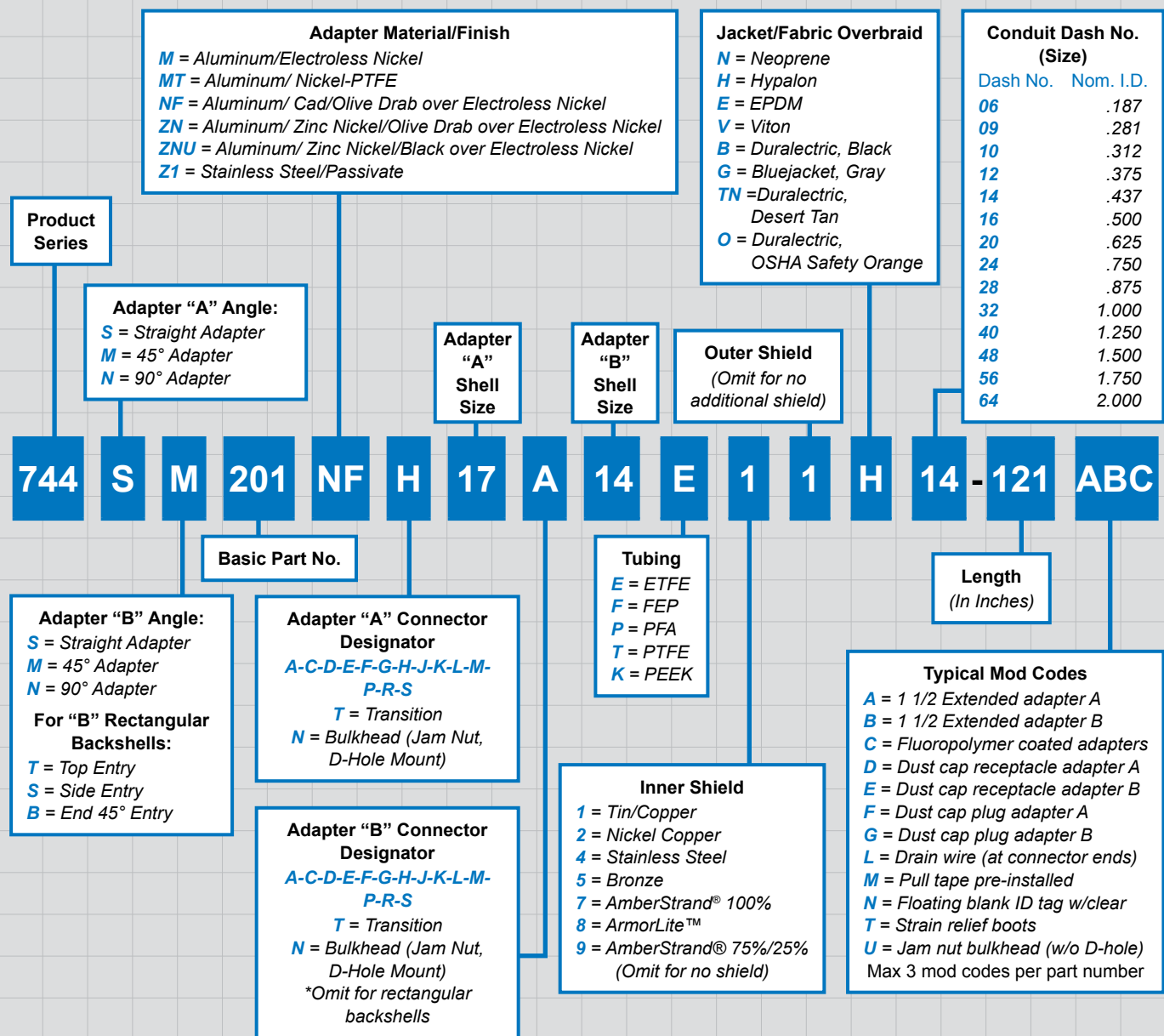
# Factory Terminated Series 74 Assemblies How-to-Order

## How-To-Order: Factory Terminated Series 74 Convuluted Tubing Assembly

Use the order tree below to develop part numbers for the full range of Series 74 System point-to-point factory terminated assemblies. Diagrams of basic Series 74 point-to-point assemblies are shown on the facing page.



### How To Order



Factory Terminated Series 74 Assemblies  
Point-to-Point Assembly Selection Guide



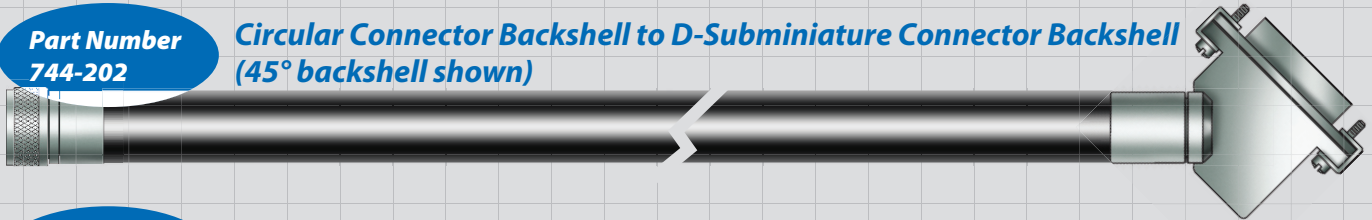
**Part Number**  
744-201

**Connector Backshell to Bulkhead Feed-Thru or Connector Backshell**  
(circular connector to bulkhead feed-thru option shown)



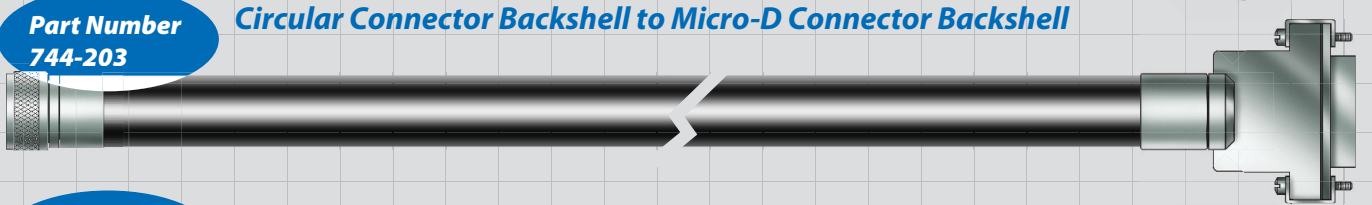
**Part Number**  
744-202

**Circular Connector Backshell to D-Subminiature Connector Backshell**  
(45° backshell shown)



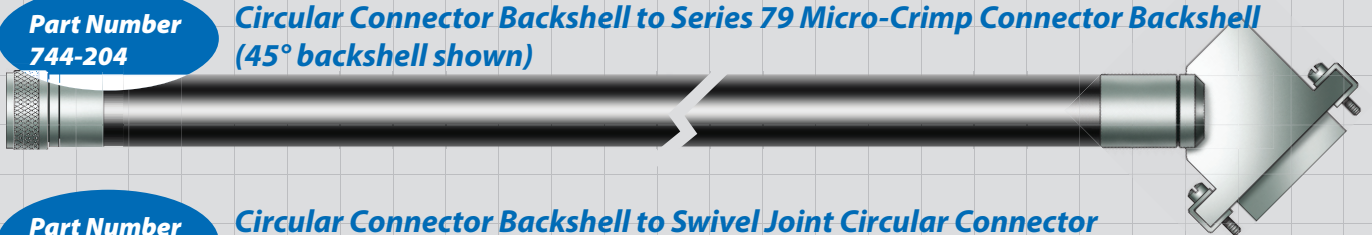
**Part Number**  
744-203

**Circular Connector Backshell to Micro-D Connector Backshell**



**Part Number**  
744-204

**Circular Connector Backshell to Series 79 Micro-Crimp Connector Backshell**  
(45° backshell shown)



**Part Number**  
744-205

**Circular Connector Backshell to Swivel Joint Circular Connector Backshell**



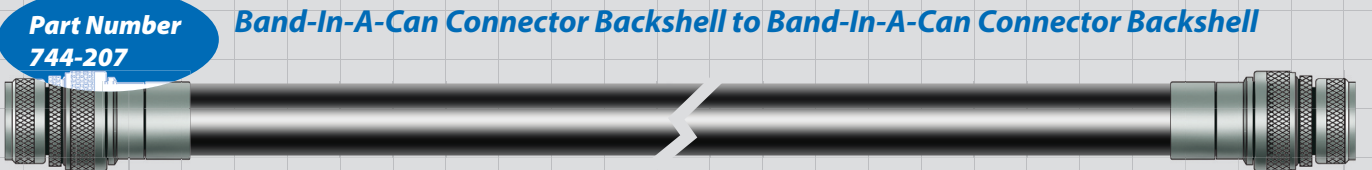
**Part Number**  
744-206

**Retractable Circular Connector Backshell to Circular Connector Backshell**  
(90° backshell shown)



**Part Number**  
744-207

**Band-In-A-Can Connector Backshell to Band-In-A-Can Connector Backshell**



**Part Number**  
744-208

**Mighty Mouse Connector Backshell to Mighty Mouse Connector Backshell**  
(consult factory for part number development)

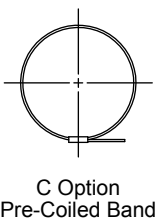
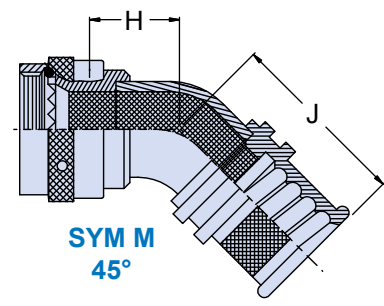
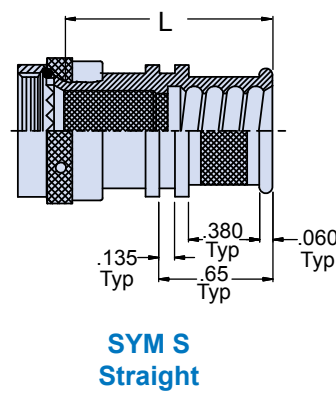
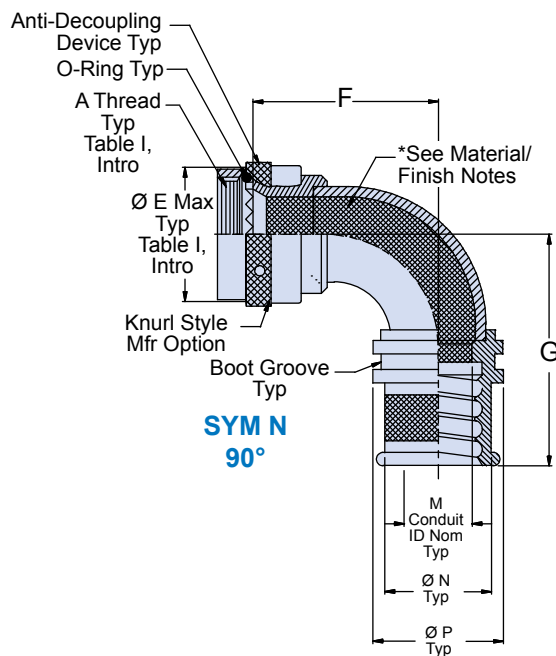
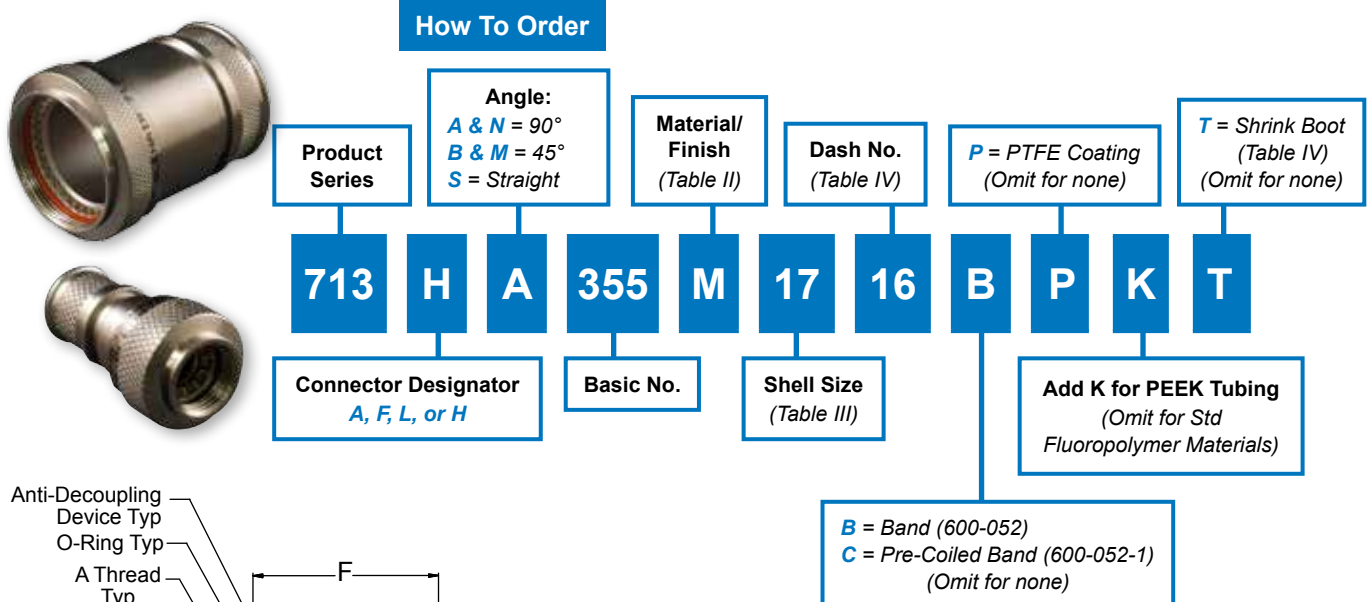


C



713-355  
Hat Trick System  
Environmental Self-Locking Metal Backshell  
with Band Termination for Series 74 Helical Convuluted Tubing

**Easy-to-install Hat Trick convoluted tubing-to-connector backshell, metal**



- Material and Finish/Notes**
- Adapters, Coupling Nuts and Elbows - Table II (See P/N development)
  - Anti-Decoupling Device - Corrosion resistant material
  - O-Ring - Silicone/N.A.
  - Band - SST/Passivate
  - Shrink Boot - See individual drawing.
  - \* Internal surfaces coated with PTFE Fluoropolymer in area indicated, see P/N development.
  - Interface O-Ring not applicable to connector designator A

**713-355**  
**Hat Trick System**  
 Environmental Self-Locking Metal Backshell  
 with Band Termination for Series 74 Helical Convuluted Tubing



Table III: Shell Size/Dimensions

Shell Size		F Max	G Max	H Max	J Max	L Dim	R Dim	S Dim	T Dim	U Dim	Max Dash No. Table IV
A, F, L	H										
08	09	0.88 (22.4)	1.28 (32.5)	0.76 (19.3)	1.06 (26.9)	1.25 (31.8)	.60 (15.2)	1.57 (39.9)	.68 (17.3)	1.74 (44.2)	10
10	11	0.94 (23.9)	1.34 (34.0)	0.79 (20.1)	1.08 (27.4)	1.25 (31.8)	.63 (16.0)	1.80 (45.7)	.77 (19.6)	1.88 (47.8)	14
12	13	1.00 (25.4)	1.46 (37.1)	0.81 (20.6)	1.13 (28.7)	1.25 (31.8)	.66 (16.8)	1.89 (48.0)	.80 (20.3)	1.92 (48.8)	20
14	15	1.06 (26.9)	1.63 (41.4)	0.86 (21.8)	1.26 (32.0)	1.35 (34.3)	.69 (17.5)	2.01 (51.1)	.88 (22.4)	2.01 (51.1)	24
16	17	1.13 (28.7)	1.85 (47.0)	0.90 (22.9)	1.41 (35.8)	1.45 (36.8)	.82 (20.8)	2.16 (54.9)	1.06 (26.9)	2.14 (54.4)	28
18	19	1.19 (30.2)	1.91 (48.5)	0.94 (23.9)	1.44 (36.6)	1.45 (36.8)	.97 (24.6)	2.34 (59.4)	1.15 (29.2)	2.31 (58.7)	32
20	21	1.25 (31.8)	2.29 (58.2)	0.97 (24.6)	1.74 (44.2)	1.75 (44.5)	.97 (24.6)	2.39 (60.7)	1.15 (29.2)	2.36 (59.9)	40
22	23	1.31 (33.3)	2.29 (58.2)	0.99 (25.1)	1.74 (44.2)	1.75 (44.5)	1.00 (25.4)	2.53 (64.3)	1.30 (33.0)	2.47 (62.7)	40
24	25	1.38 (35.1)	2.41 (61.2)	1.02 (25.9)	1.79 (45.5)	1.75 (44.5)	1.00 (25.4)	2.58 (65.5)	1.30 (33.0)	2.52 (64.0)	48
28		1.46 (37.1)	2.41 (61.2)	1.12 (28.5)	1.79 (45.5)	1.75 (44.5)	TBD	TBD	1.40 (35.6)	2.73 (69.3)	48

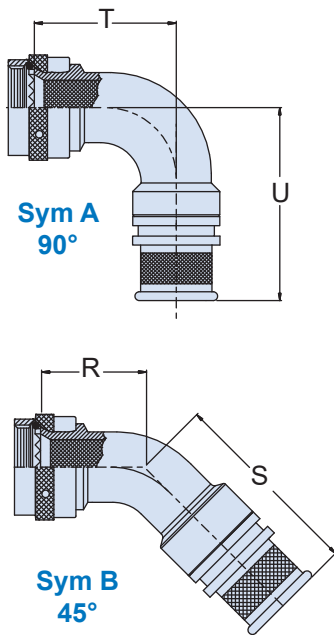


Table IV: Dash No. and Shrink Boot

Dash No.	M Conduit ID Nom.	Ø N	Ø P	Shrink Boot Part Number
06	.188 (4.8)	.419 (10.6)	.481 (12.2)	<a href="#">770-001S103</a>
09	.281 (7.1)	.513 (13.0)	.575 (14.6)	<a href="#">770-001S104</a>
10	.312 (7.9)	.549 (13.9)	.611 (15.5)	<a href="#">770-001S104</a>
12	.375 (9.5)	.609 (15.5)	.671 (17.0)	<a href="#">770-001S104</a>
14	.437 (11.1)	.670 (17.0)	.732 (18.6)	<a href="#">770-001S104</a>
16	.500 (12.7)	.749 (19.0)	.811 (20.6)	<a href="#">770-001S105</a>
20	.625 (15.9)	.869 (22.1)	.931 (23.6)	<a href="#">770-001S106</a>
24	.750 (19.1)	1.029 (26.1)	1.091 (27.7)	<a href="#">770-001S106</a>
28	.875 (22.2)	1.172 (29.8)	1.234 (31.3)	<a href="#">770-001S107</a>
32	1.000 (25.4)	1.320 (33.5)	1.382 (35.1)	<a href="#">770-001S107</a>
40	1.250 (31.8)	1.664 (42.3)	1.726 (43.8)	<a href="#">770-001S108</a>
48	1.500 (31.8)	1.957 (49.7)	2.019 (51.3)	<a href="#">770-001S108</a>

Table II: Material/Finish

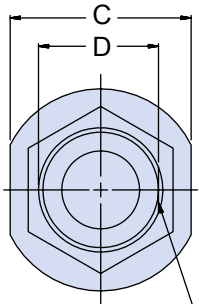
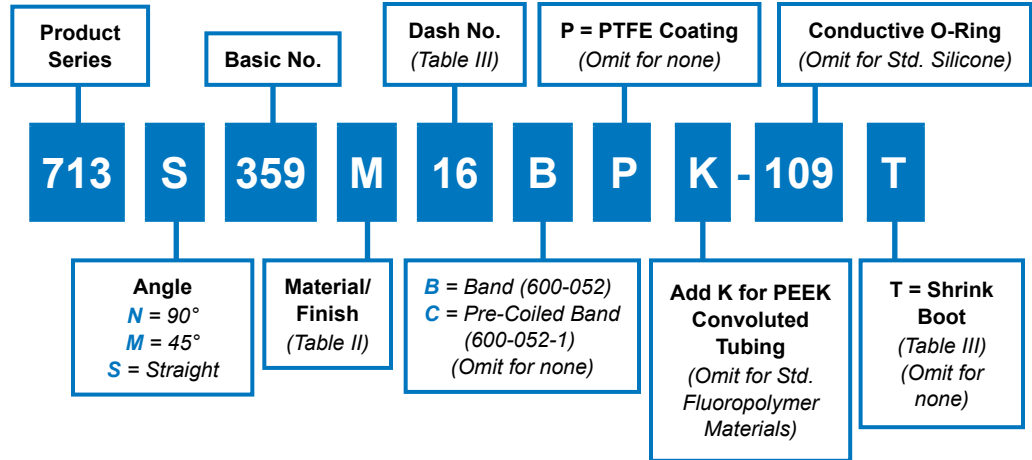
Sym	Material	Finish Description	Component
M	Aluminum Alloy	Electroless Nickel	
MT	Aluminum Alloy	Nickel-PTFE	
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)	
Z1	300 Series SST	Passivate	
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)	
ZM	300 Series SST	Electroless Nickel	Adapter, Elbow
		Passivate	Coupling Nut
ZW	300 Series SST	Cad O.D. Over Electroless Nickel	Adapter, Elbow
		Cad Olive Drab	Coupling Nut



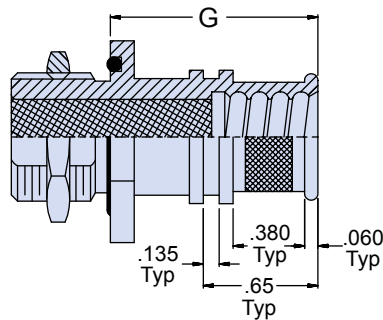
713-359  
**Hat Trick System**  
 Environmental Metal Bulkhead Fitting  
 with Band Termination for Series 74 Helical Convoluted Tubing

**Easy-to-install Hat Trick convoluted tubing-to-bulkhead fitting, metal**

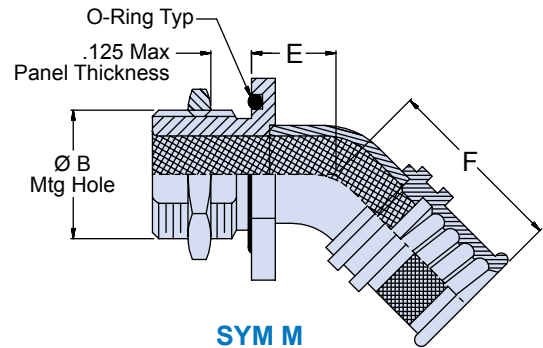
**How To Order**



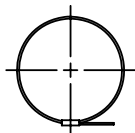
Flat For 'D' Hole Mounting  
(See P/N Development)



**SYM S**  
Straight



**SYM M**  
Full-Profile  
45°



C Option  
Pre-Coiled Band

**Material and Finish/Notes**

- Adapters, Hex Nuts: Table II (See P/N development)
  - O-Ring - Silicone/N.A.
  - Band - SST/Passivate
  - Shrink Boot - See individual drawing.
- \*Internal surfaces coated with PTFE in area indicated, see P/N development.

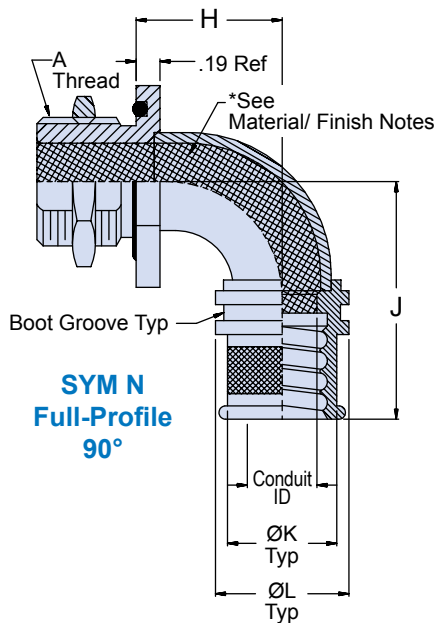


**713-359**  
**Hat Trick System**  
 Environmental Metal Bulkhead Fitting  
 with Band Termination for Series 74 Helical Convuluted Tubing



**Table III: Dimensions**

Dash No.	Conduit ID	A Thread Class 2A	Ø B +.015 -.000	C Flat	Ø D +.000 -.015	E Max	F Max
06	.188 (4.8)	7/16-28 UNEF	.443 (11.3)	.688 (17.5)	.375 (9.5)	.61 (15.5)	1.03 (26.2)
09	.281 (7.1)	9/16-24 UNEF	.568 (14.4)	.812 (20.6)	.500 (12.7)	.64 (16.3)	1.06 (26.9)
10	.312 (7.9)	9/16-24 UNEF	.568 (14.4)	.812 (20.6)	.500 (12.7)	.64 (16.3)	1.06 (26.9)
12	.375 (9.5)	5/8-24 UNEF	.630 (16.0)	.875 (22.2)	.563 (14.3)	.64 (16.3)	1.06 (26.9)
14	.437 (11.1)	11/16-24 UNEF	.693 (17.6)	.938 (23.8)	.625 (15.9)	.66 (16.8)	1.08 (27.4)
16	.500 (12.7)	3/4-20 UNEF	.755 (19.2)	1.000 (25.4)	.688 (17.5)	.66 (16.8)	1.08 (27.4)
20	.625 (15.9)	7/8-20 UNEF	.880 (22.4)	1.125 (28.6)	.812 (20.6)	.71 (18.0)	1.13 (28.7)
24	.750 (19.1)	1-20 UNEF	1.005 (25.5)	1.250 (31.8)	.938 (23.8)	.75 (19.1)	1.26 (32.0)
28	.875 (22.2)	1 3/16-18 UNEF	1.193 (30.3)	1.438 (36.5)	1.125 (28.6)	.79 (20.1)	1.41 (35.8)
32	1.000 (25.4)	1 5/16-18 UNEF	1.318 (33.5)	1.562 (39.7)	1.250 (31.8)	.84 (21.3)	1.44 (36.6)
40	1.250 (31.8)	1 1/2-18 UNEF	1.505 (38.2)	1.812 (46.0)	1.438 (36.5)	.87 (22.1)	1.74 (44.2)
48	1.500 (31.8)	1 3/4-18 UNS	1.755 (44.6)	2.062 (52.4)	1.688 (42.9)	.91 (23.1)	1.79 (45.5)
64	2.500 (63.5)	2 1/4-16 UN	2.255 (57.4)	2.750 (69.6)	2.188 (55.6)	1.30 (33.0)	1.91 (48.5)



**Table III (continued): Dimensions and Shrink Boot**

Dash No.	G Max	H Max	J Max	Ø K	Ø L	Shrink Boot Part Number
06	.94 (23.9)	.73 (18.5)	1.21 (30.7)	.419 (10.6)	.481 (12.2)	<b>770-001S103</b>
09	.94 (23.9)	.79 (20.1)	1.28 (32.5)	.513 (13.0)	.575 (14.6)	<b>770-001S104</b>
10	.94 (23.9)	.79 (20.1)	1.28 (32.5)	.549 (13.9)	.611 (15.5)	<b>770-001S104</b>
12	.94 (23.9)	.79 (20.1)	1.28 (32.5)	.609 (15.5)	.671 (17.0)	<b>770-001S104</b>
14	.94 (23.9)	.85 (21.6)	1.34 (34.0)	.670 (17.0)	.732 (18.6)	<b>770-001S104</b>
16	.94 (23.9)	.85 (21.6)	1.34 (34.0)	.749 (19.0)	.811 (20.6)	<b>770-001S105</b>
20	.94 (23.9)	.93 (23.6)	1.46 (37.1)	.869 (22.1)	.931 (23.6)	<b>770-001S106</b>
24	.94 (23.9)	1.00 (25.4)	1.63 (41.4)	1.029 (26.1)	1.091 (27.7)	<b>770-001S106</b>
28	1.00 (25.4)	1.12 (28.4)	1.85 (47.0)	1.172 (29.8)	1.234 (31.3)	<b>770-001S107</b>
32	1.00 (25.4)	1.18 (30.0)	1.91 (48.5)	1.320 (33.5)	1.382 (35.1)	<b>770-001S107</b>
40	1.31 (33.3)	1.31 (33.3)	2.29 (58.2)	1.664 (42.3)	1.726 (43.8)	<b>770-001S108</b>
48	1.31 (33.3)	1.43 (36.3)	2.41 (61.2)	1.957 (49.7)	2.019 (51.3)	<b>770-001S108</b>
64	1.31 (33.3)	2.35 (59.7)	2.85 (72.4)	TBD	TBD	<b>TBD</b>

**Table II: Material/Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZM	300 Series SST	Electroless Nickel
ZW	300 Series SST	Cad O.D. Over Electroless Nickel

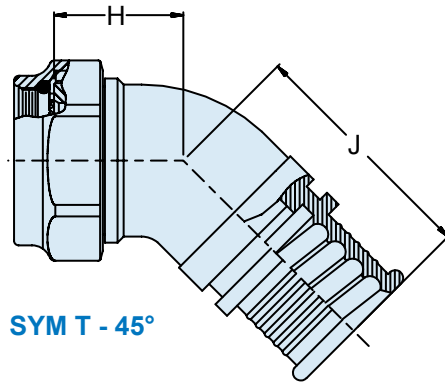
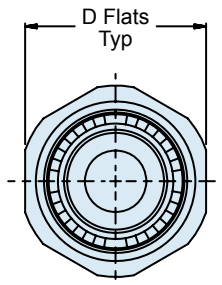
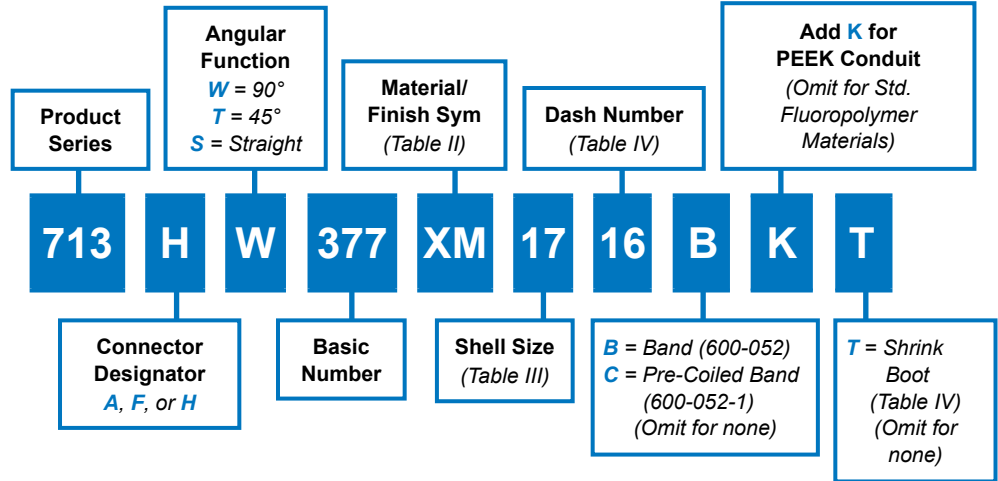


713-377  
**Hat Trick System**  
 Environmental Self-Locking Composite Backshell  
 with Band Termination for Series 74 Helical Convuluted Tubing

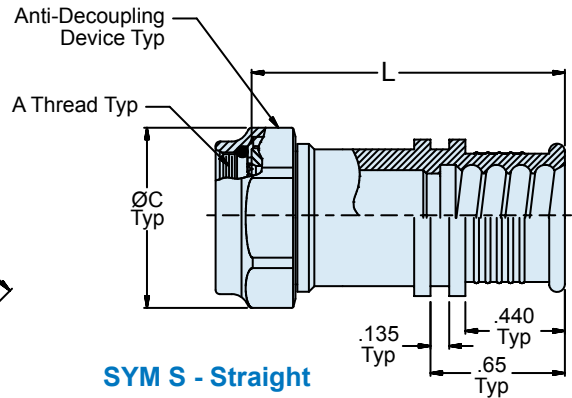
**Easy-to-install Hat Trick conduit-to-connector backshell, composite, self-locking, rotatable coupling**



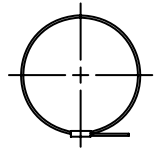
**How To Order**



**SYM T - 45°**



**SYM S - Straight**



C Option  
Pre-Coiled Band

**Material and Finish**

- Adapters & Elbows: High grade engineering thermoplastic/see Table II
- Coupling Nuts - High grade engineering thermoplastic, black/no plating
- Anti-decoupling Device: Corrosion resistant material
- O-Ring: Silicone/NA
- Band: SST/Passivate
- Shrink Boot - See individual drawing.
- Interface O-Ring not applicable to connector designator A.

# 713-377 Hat Trick System Environmental Self-Locking Composite Backshell with Band Termination for Series 74 Helical Convoluted Tubing

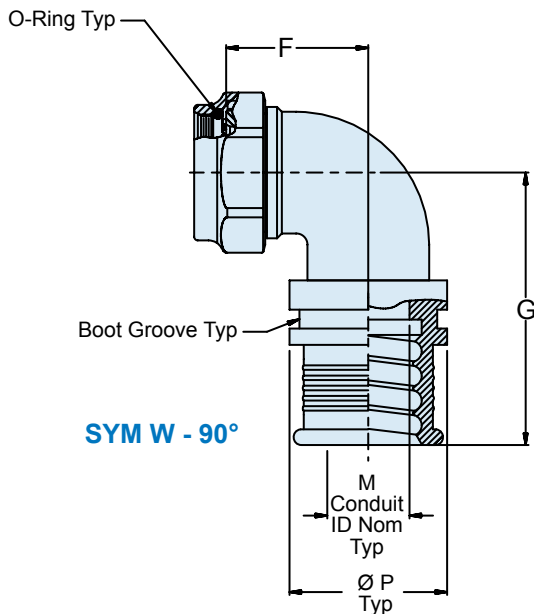


**Table III: Connector Designator and Dimensions**

Connector Designator A		Connector Designator F		Connector Designator H		Ø C Max	D Flats	
Shell Size	A Thread Class 2B	Shell Size	A Thread Class 2B	Shell Size	A Thread Iso Metric		Max	Min
08	1/2-20 UNF	08	7/16-28 UNEF	09	M12 X 1.0-6H	.830 (21.1)	.750 (19.1)	.736 (18.7)
10	5/8-24 UNEF	10	9/16-24 UNEF	11	M15 X 1.0-6H	.960 (24.4)	.875 (22.2)	.860 (21.8)
12	3/4-20 UNEF	12	11/16-24 UNEF	13	M18 X 1.0-6H	1.090 (27.7)	1.000 (25.4)	.980 (24.9)
14	7/8-20 UNEF	14	13/16-20 UNEF	15	M22 X 1.0-6H	1.220 (31.0)	1.125 (28.6)	1.100 (27.9)
16	1-20 UNEF	16	15/16-20 UNEF	17	M25 X 1.0-6H	1.350 (34.3)	1.250 (31.8)	1.224 (31.1)
18	1 1/16-18 UNEF	18	1 1/16-18 UNEF	19	M28 X 1.0-6H	1.480 (37.6)	1.375 (34.9)	1.348 (34.2)
20	1 3/16-18 UNEF	20	1 3/16-18 UNEF	21	M31 X 1.0-6H	1.620 (41.1)	1.500 (38.1)	1.469 (37.3)
22	1 5/16-18 UNEF	22	1 5/16-18 UNEF	23	M34 X 1.0-6H	1.750 (44.5)	1.625 (41.3)	1.581 (40.2)
24	1 7/16-18 UNEF	24	1 7/16-18 UNEF	25	M37 X 1.0-6H	1.890 (48.0)	1.750 (44.5)	1.690 (42.9)

**Table III (Cont.)**

Shell Size Connector Des.		F Max	G Max	H Max	J Max	L Dim	Max Dash No. Table IV
A, F	H						
08	09	.722 (18.3)	1.380 (35.1)	.748 (19.0)	1.148 (29.2)	1.25 (31.8)	10
10	11	.784 (19.9)	1.442 (36.6)	.782 (19.9)	1.263 (32.1)	1.30 (33.0)	14
12	13	.846 (21.5)	1.519 (38.6)	.777 (19.7)	1.321 (33.6)	1.36 (34.5)	20
14	15	.909 (23.1)	1.582 (40.2)	.785 (19.9)	1.362 (34.6)	1.42 (36.1)	24
16	17	.972 (24.7)	1.645 (41.8)	.807 (20.5)	1.382 (35.1)	1.49 (37.8)	28
18	19	1.034 (26.2)	1.683 (42.7)	.817 (20.8)	1.389 (35.3)	1.53 (38.9)	32
20	21	1.097 (27.9)	1.769 (44.9)	.847 (21.5)	1.425 (36.2)	1.59 (40.4)	40
22	23	1.159 (29.5)	1.832 (46.5)	.887 (22.5)	1.466 (37.2)	1.66 (42.2)	40
24	25	1.222 (31.0)	1.895 (48.1)	.917 (23.3)	1.492 (37.9)	1.72 (43.7)	48



**Table IV: Conduit Dash No. and Shrink Boot Part No.**

Dash No.	M Conduit ID Nom	Ø P	Shrink Boot Part Number
06	.188 (4.8)	.481 (12.2)	770-001S103
09	.281 (7.1)	.575 (14.6)	770-001S104
10	.312 (7.9)	.611 (15.5)	770-001S104
12	.375 (9.5)	.671 (17.0)	770-001S104
14	.437 (11.1)	.732 (18.6)	770-001S104
16	.500 (12.7)	.811 (20.6)	770-001S105
20	.625 (15.9)	.931 (23.6)	770-001S106
24	.750 (19.1)	1.091 (27.7)	770-001S106
28	.875 (22.2)	1.234 (31.2)	770-001S107
32	1.000 (25.4)	1.382 (35.1)	770-001S107
40	1.250 (31.8)	1.726 (43.9)	770-001S108
48	1.500 (31.8)	2.019 (53.3)	770-001S108

**Table II: Finish**

Sym	Finish Description
XMT	Nickel-PTFE - Grey (1,000 Hour Salt Spray)
XM	Electroless Nickel
XW	Cadmium/Olive Drab Over Electroless Nickel
XB	Black Color/Unplated

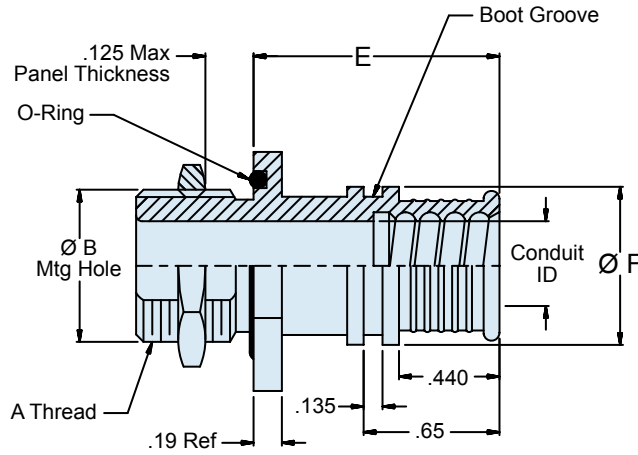
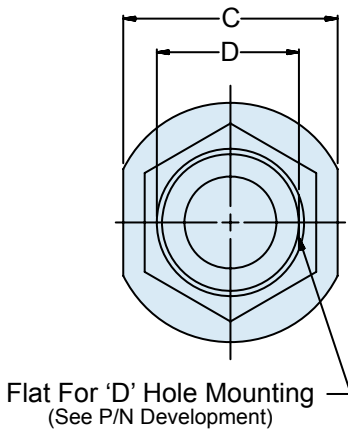
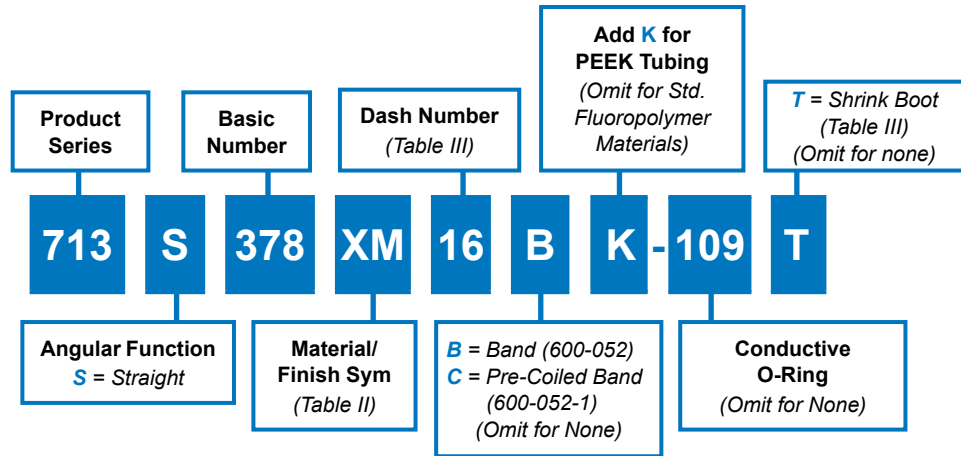


713-378  
**Hat Trick System**  
 Environmental Composite Bulkhead Fitting  
 with Band Termination for Series 74 Helical Convuluted Tubing

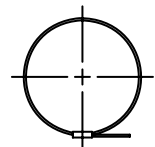
**Easy-to-install Hat Trick convoluted tubing-to-bulkhead fitting, composite**



**How To Order**



**SYM S - Straight**



C Option  
Pre-Coiled Band

**Material and Finish**

- Adapters, Hex Nuts: High grade engineering thermoplastic/see Table II
- O-Ring: Silicone/NA
- Band: SST/Passivate
- Shrink Boot - See individual drawing.

**713-378**  
**Hat Trick System**  
**Environmental Composite Bulkhead Fitting**  
**with Band Termination for Series 74 Helical Convuluted Tubing**



**Table III: Dimensions and Shrink Boot**

Dash No.	Conduit ID	A Thread Class 2A	Ø B +.015 -.000	C Flat	Ø D +.000 -.015	E Max	Ø F	Shrink Boot Part Number
06	.188 (4.8)	7/16-28 UNEF	.443 (11.3)	.688 (17.5)	.375 (9.5)	.940 (23.9)	.481 (12.2)	<a href="#">770-001S103</a>
09	.281 (7.1)	9/16-24 UNEF	.568 (14.4)	.812 (20.6)	.500 (12.7)	.940 (23.9)	.575 (14.6)	<a href="#">770-001S104</a>
10	.312 (7.9)	9/16-24 UNEF	.568 (14.4)	.812 (20.6)	.500 (12.7)	.940 (23.9)	.611 (15.5)	<a href="#">770-001S104</a>
12	.375 (9.5)	5/8-24 UNEF	.630 (16.0)	.875 (22.2)	.563 (14.3)	.940 (23.9)	.671 (17.0)	<a href="#">770-001S104</a>
14	.437 (11.1)	11/16-24 UNEF	.693 (17.6)	.938 (23.8)	.625 (15.9)	.940 (23.9)	.732 (18.6)	<a href="#">770-001S104</a>
16	.500 (12.7)	3/4-20 UNEF	.755 (19.2)	1.000 (25.4)	.688 (17.5)	.940 (23.9)	.811 (20.6)	<a href="#">770-001S105</a>
20	.625 (15.9)	7/8-20 UNEF	.880 (22.4)	1.125 (28.6)	.812 (20.6)	.940 (23.9)	.931 (23.6)	<a href="#">770-001S106</a>
24	.750 (19.1)	1-20 UNEF	1.005 (25.5)	1.250 (31.8)	.938 (23.8)	.940 (23.9)	1.091 (27.7)	<a href="#">770-001S106</a>
28	.875 (22.2)	1 3/16-18 UNEF	1.193 (30.3)	1.438 (36.5)	1.125 (28.6)	1.000 (25.4)	1.234 (31.2)	<a href="#">770-001S107</a>
32	1.000 (25.4)	1 5/16-18 UNEF	1.318 (33.5)	1.562 (39.7)	1.250 (31.8)	1.000 (25.4)	1.382 (35.1)	<a href="#">770-001S107</a>
40	1.250 (31.8)	1 1/2-18 UNEF	1.505 (38.2)	1.812 (46.0)	1.438 (36.5)	1.310 (33.3)	1.726 (43.9)	<a href="#">770-001S108</a>
48	1.500 (31.8)	1 3/4-18 UNS	1.755 (44.6)	2.062 (52.4)	1.688 (42.9)	1.310 (33.3)	2.019 (53.3)	<a href="#">770-001S108</a>
64	2.500 (63.5)	2 1/4-16 UN	2.255 (57.4)	2.750 (69.6)	2.188 (55.6)	1.310 (33.3)	TBD	<a href="#">TBD</a>



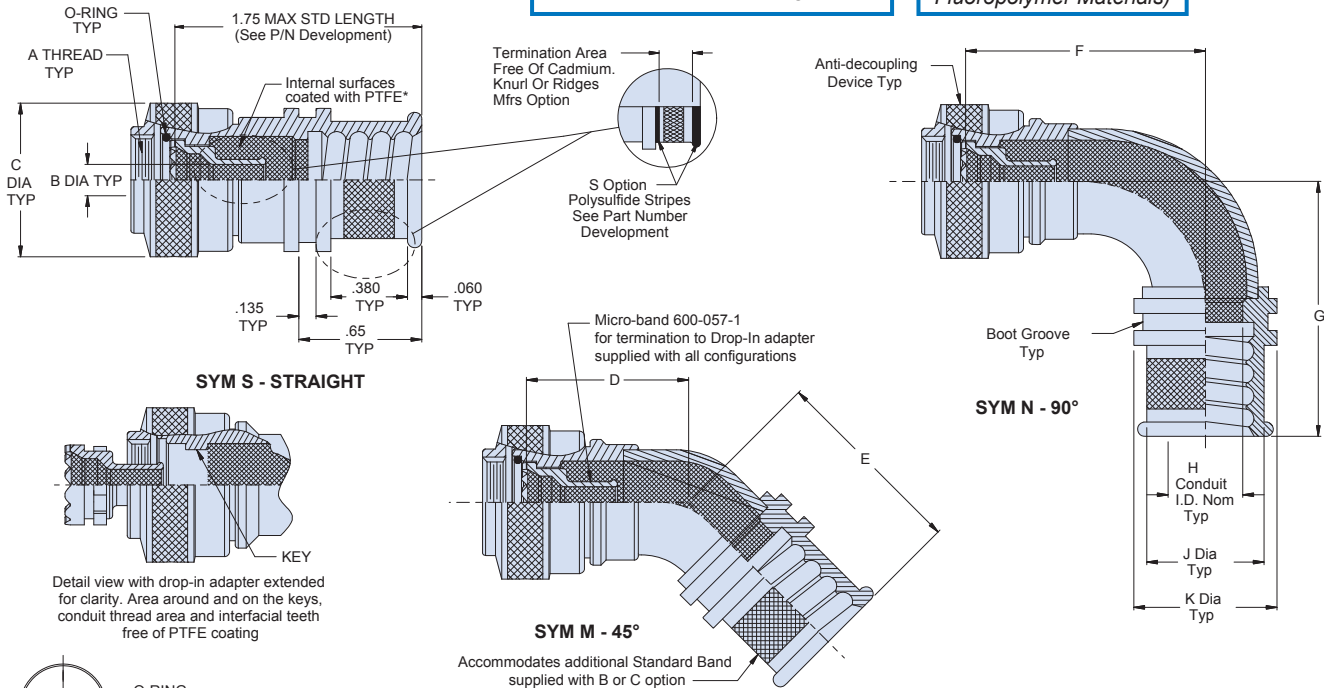
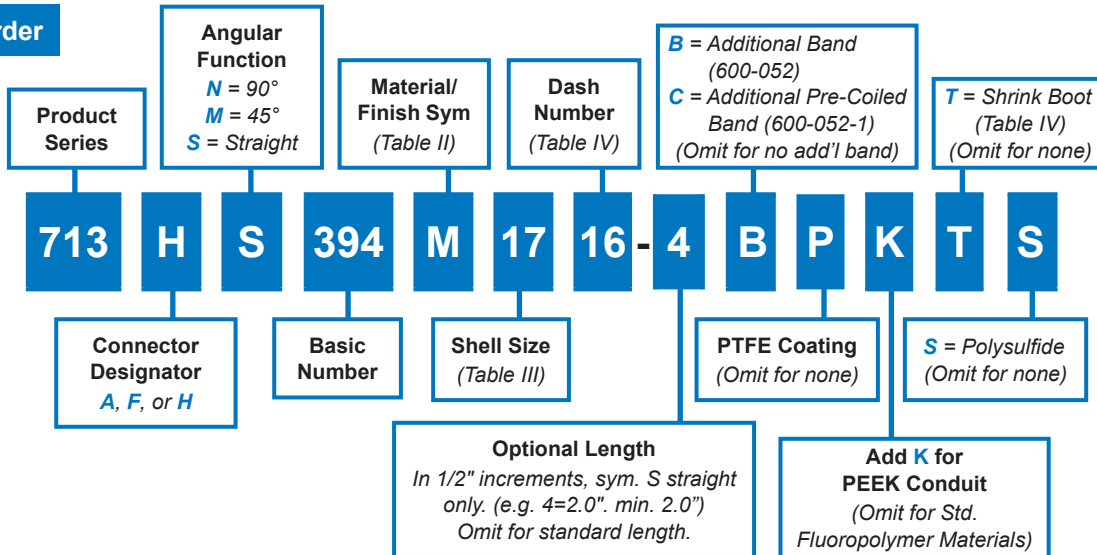
**Table II: Finish**

Sym	Finish Description
XMT	Nickel-PTFE - Grey (1,000 Hour Salt Spray)
XM	Electroless Nickel
XW	Cadmium/Olive Drab Over Electroless Nickel
XB	Black Color/Unplated
XO	No Plating - Base Material Non-Conductive



**Easy-to-install Hat Trick convoluted tubing-to-bulkhead fitting, metal**

**How To Order**



**Material and Finish/Notes**

- Adapters, Hex Nuts: Table II (See P/N development)
  - Anti-decoupling device: Corrosion-resistant material
  - O-Ring - Silicone/N.A. • Band - SST/Passivate • Shrink Boot - See individual drawing.
  - Assembly supplied with Micro-Band (600-057-1) for shield termination onto the drop-in adapter. Options B and C are for additional Standard Band to terminate overall shielding.
- \*Internal surfaces coated with PTFE in area indicated, see P/N development.

713-394

## Hat Trick System

Environmental Self-Locking Metal Backshell with Drop-In and Band Termination for Series 74 Helical Convuluted Tubing

Series 74  
Helical Tubing

Table III: Connector Designator and Dimensions

Shell Size	A Thread			B Dia			C Dia Max	D Max	E Max	F Max	G Max
	Connector Designator A	Connector Designator F	Connector Designator H	A	F	H					
08/09	1/2-20 UNF	7/16-28 UNEF	M12 X 1.0-6H	.160 (4.1)	.138 (3.5)	.160 (4.1)	.94 (23.9)	1.000 (25.4)	1.220 (31.0)	1.158 (29.4)	1.380 (35.1)
10/11	5/8-24 UNEF	9/16-24 UNEF	M15 X 1.0-6H	.270 (6.9)	.248 (6.3)	.270 (6.9)	1.06 (26.9)	1.027 (26.1)	1.230 (31.2)	1.220 (31.0)	1.420 (36.1)
12/13	3/4-20 UNEF	11/16-24 UNEF	M18 X 1.0-6H	.390 (9.9)	.374 (9.5)	.390 (9.9)	1.17 (29.7)	1.027 (26.1)	1.230 (31.2)	1.220 (31.0)	1.420 (36.1)
14/15	7/8-20 UNEF	13/16-20 UNEF	M22 X 1.0-6H	.512 (13.0)	.455 (11.6)	.512 (13.0)	1.29 (32.8)	1.079 (27.4)	1.260 (32.0)	1.283 (32.6)	1.460 (37.1)
16/17	1-20 UNEF	15/16-20 UNEF	M25 X 1.0-6H	.610 (15.5)	.577 (14.7)	.627 (15.9)	1.42 (36.1)	1.105 (28.1)	1.260 (32.0)	1.345 (34.2)	1.500 (38.1)
18/19	1 1/16-18 UNEF	1 1/16-18 UNEF	M28 X 1.0-6H	.672 (17.1)	.672 (17.1)	.747 (19.0)	1.54 (39.1)	1.157 (29.4)	1.310 (33.3)	1.408 (35.8)	1.560 (39.6)
20/20	1 3/16-18 UNEF	1 3/16-18 UNEF	M31 X 1.0-6H	.797 (20.2)	.797 (20.2)	.891 (22.6)	1.67 (42.4)	1.183 (30.0)	1.360 (34.5)	1.470 (37.3)	1.640 (41.7)
22/23	1 5/16-18 UNEF	1 5/16-18 UNEF	M34 X 1.0-6H	.922 (23.4)	.922 (23.4)	.996 (25.3)	2.01 (51.1)	1.208 (30.7)	1.400 (35.6)	1.533 (38.9)	1.730 (43.9)
24/25	1 7/16-18 UNEF	1 7/16-18 UNEF	M37 X 1.0-6H	1.047 (26.6)	1.047 (26.6)	1.121 (28.5)	2.12 (53.8)	1.234 (31.3)	1.450 (36.8)	1.595 (40.5)	1.810 (46.0)

Table IV: Dash No. and Shrink Boot

Dash No.	H Conduit I.D. Nom	Ø J	Ø K	Shrink Boot Part Number
06	.188 (4.8)	.419 (10.6)	.481 (12.2)	<a href="#">770-001S103</a>
09	.281 (7.1)	.513 (13.0)	.575 (14.6)	<a href="#">770-001S104</a>
10	.312 (7.9)	.549 (13.9)	.611 (15.5)	<a href="#">770-001S104</a>
12	.375 (9.5)	.609 (15.5)	.671 (17.0)	<a href="#">770-001S104</a>
14	.437 (11.1)	.670 (17.0)	.732 (18.6)	<a href="#">770-001S104</a>
16	.500 (12.7)	.749 (19.0)	.811 (20.6)	<a href="#">770-001S105</a>
20	.625 (15.9)	.869 (22.1)	.931 (23.6)	<a href="#">770-001S106</a>
24	.750 (19.0)	1.029 (26.1)	1.091 (27.7)	<a href="#">770-001S106</a>
28	.875 (22.2)	1.172 (29.8)	1.234 (31.3)	<a href="#">770-001S107</a>
32	1.000 (25.4)	1.320 (33.5)	1.382 (35.1)	<a href="#">770-001S107</a>
40	1.250 (31.8)	1.664 (42.3)	1.726 (43.8)	<a href="#">770-001S108</a>
48	1.500 (38.1)	1.957 (49.7)	2.019 (51.3)	<a href="#">770-001S108</a>

Table II: Material/Finish

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)

Table II continued

Sym	Material	Finish Description	Component
ZM	300 Series SST	Electroless Nickel	Adapters, Elbow
		Passivate	Coupling Nut
ZW	300 Series SST	Cad O.D. Over Electroless Nickel	Adapters, Elbow
		Cad Olive Drab	Coupling Nut



713-380

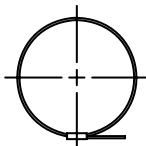
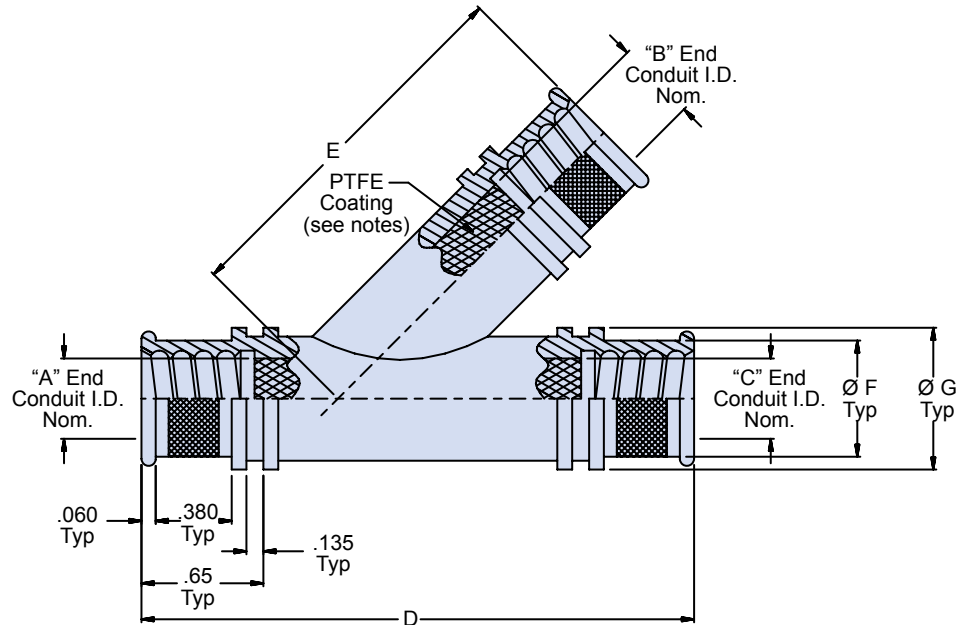
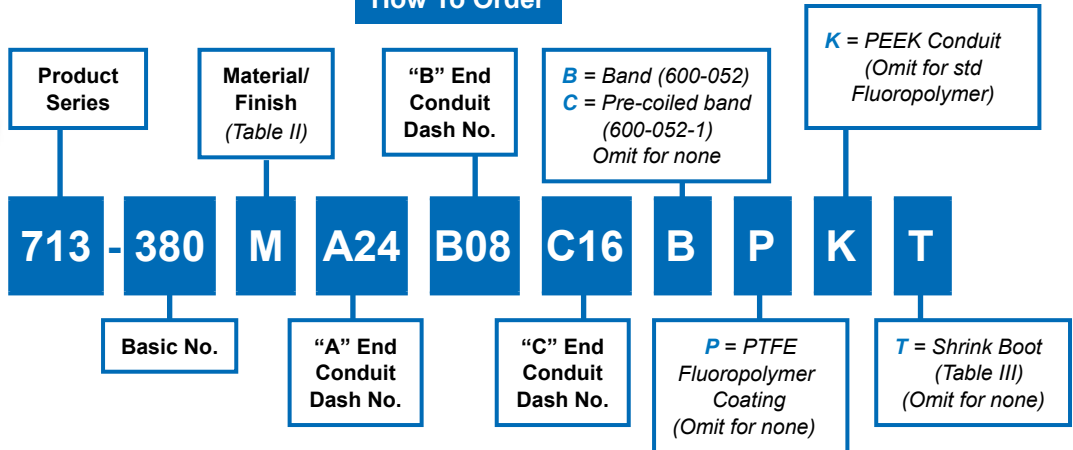
Hat Trick System

Y Transition for Direct Attachment of Series 74 Helical Convuluted Tubing

**Hat Trick Y transition with banding platform and boot groove for direct attachment of Series 74 conduit**



**How To Order**



C option  
Pre-coiled  
band

**Notes**

- Internal surfaces coated with PTFE Fluoropolymer in area indicated, see P/N development.
- Overall dimensions will be determined by largest dash no. ordered, e.g. 713-380MA20B16C32 will have Dash No. 32 dimensions.

**Material and Finish**

- Transition: Table II (see P/N development)
- Band: SST/Passivate
- Shrink Boot: See individual dwg.

713-380  
**Hat Trick System**  
 Y Transition for Direct Attachment of  
 Series 74 Helical Convuluted Tubing



**Table III: Dimensions and Shrink Boot**

Dash No	Conduit I.D. Nom	D Max	E Max	F Dia	G Dia	Shrink Boot Part Number
06	.188 (4.8)	2.66 (67.6)	1.52 (38.6)	.419 (1.6)	.481 (12.2)	<a href="#">770-001S103</a>
09	.281 (7.1)	2.82 (71.6)	1.63 (41.4)	.513 (13.0)	.575 (14.6)	<a href="#">770-001S104</a>
10	.312 (7.9)	2.82 (71.6)	1.69 (42.9)	.549 (13.9)	.611 (15.5)	<a href="#">770-001S104</a>
12	.375 (9.5)	2.91 (73.9)	1.73 (43.9)	.609 (15.5)	.671 (17.0)	<a href="#">770-001S104</a>
14	.437 (11.1)	3.06 (77.7)	1.83 (46.5)	.670 (17.0)	.732 (18.6)	<a href="#">770-001S104</a>
16	.500 (12.7)	3.06 (77.7)	1.86 (47.2)	.749 (19.0)	.811 (2.6)	<a href="#">770-001S105</a>
20	.625 (15.9)	3.38 (85.9)	2.08 (52.8)	.869 (22.1)	.931 (23.6)	<a href="#">770-001S106</a>
24	.750 (19.1)	3.44 (87.4)	2.18 (55.4)	1.029 (26.1)	1.091 (27.7)	<a href="#">770-001S106</a>
28	.875 (22.2)	3.75 (95.3)	2.51 (63.8)	1.172 (29.8)	1.234 (31.3)	<a href="#">770-001S107</a>
32	1.000 (25.4)	3.97 (10.8)	2.57 (65.3)	1.320 (33.5)	1.382 (35.1)	<a href="#">770-001S107</a>
40	1.250 (31.8)	4.28 (108.7)	2.90 (73.7)	1.664 (42.3)	1.726 (43.8)	<a href="#">770-001S108</a>
48	1.500 (38.1)	4.92 (125.0)	3.19 (81.0)	1.957 (49.7)	2.019 (51.3)	<a href="#">770-001S108</a>

**Table II: Material/Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT		Nickel-PTFE
NF		Cad/Olive Drab over Electroless Nickel (1000 hr. salt spray)
ZN		Zinc Nickel/Olive Drab over Electroless Nickel
ZNU		Zinc Nickel/Black over Electroless Nickel (1000 hr. salt spray)
Z1	Stainless Steel	Passivate
ZM		Electroless Nickel
ZW		Cad/Olive Drab over Electroless Nickel



713-381

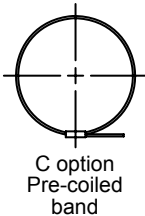
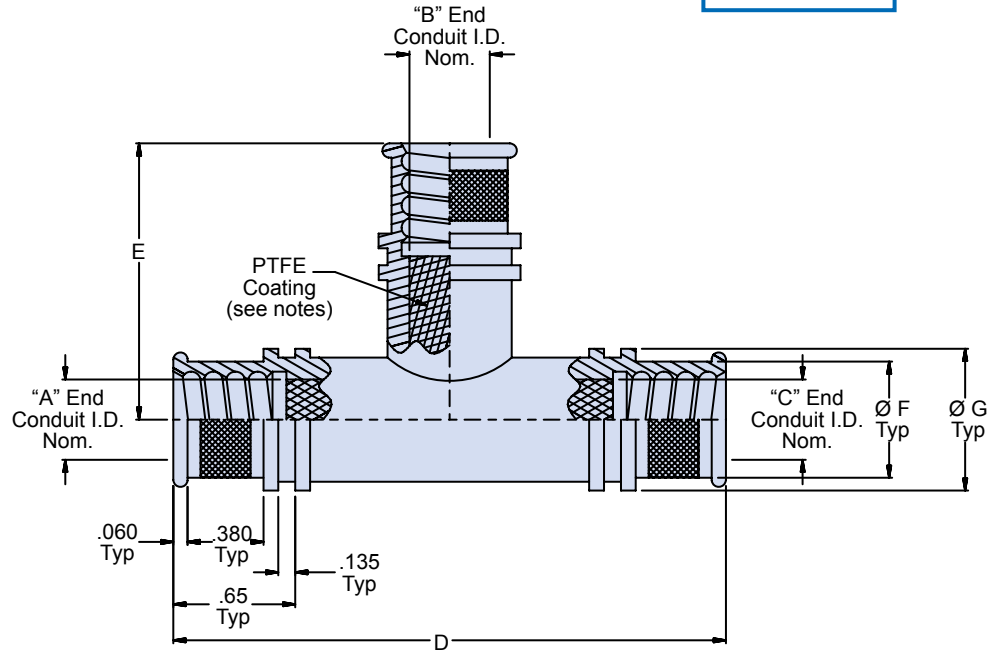
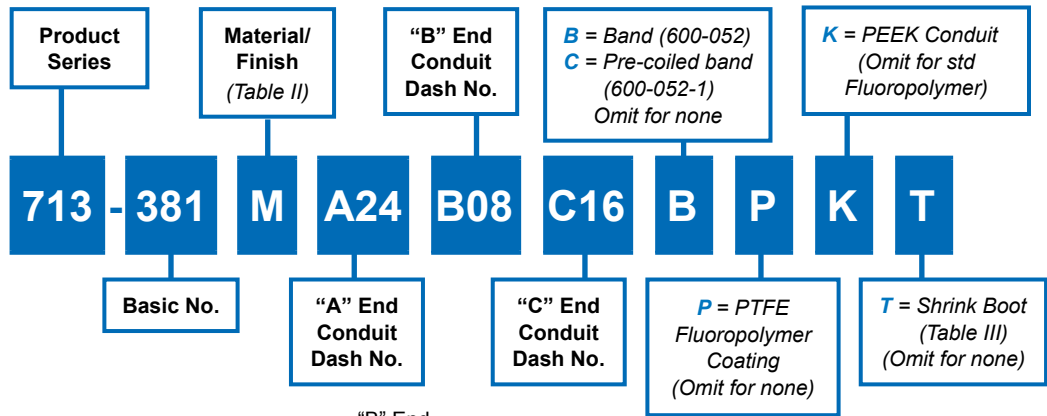
Hat Trick System

T Transition for Direct Attachment of  
Series 74 Helical Convuluted Tubing

**Hat Trick T Transition with banding platform and boot groove for direct attachment of Series 74 conduit**



**How To Order**



**Notes**

- Internal surfaces coated with PTFE Fluoropolymer in area indicated, see P/N development.
- Overall dimensions will be determined by largest dash no. ordered, e.g. 713-381MA20B16C32 will have Dash No. 32 dimensions.

**Material and Finish**

- Transition: Table II (see P/N development)
- Band: SST/Passivate
- Shrink Boot: See individual dwg.



**713-381**  
**Hat Trick System**  
**T Transition for Direct Attachment of**  
**Series 74 Helical Convuluted Tubing**



**Table III: Dimensions and Shrink Boot**

Dash No	Conduit I.D. Nom	D Max	E Max	F Dia	G Dia	Shrink Boot Part Number
06	.188 (4.8)	2.00 (50.8)	1.16 (29.5)	.419 (1.6)	.481 (12.2)	<a href="#">770-001S103</a>
09	.281 (7.1)	2.10 (53.3)	1.23 (31.2)	.513 (13.0)	.575 (14.6)	<a href="#">770-001S104</a>
10	.312 (7.9)	2.12 (53.8)	1.23 (31.2)	.549 (13.9)	.611 (15.5)	<a href="#">770-001S104</a>
12	.375 (9.5)	2.16 (54.9)	1.26 (32.0)	.609 (15.5)	.671 (17.0)	<a href="#">770-001S104</a>
14	.437 (11.1)	2.22 (56.4)	1.29 (32.8)	.670 (17.0)	.732 (18.6)	<a href="#">770-001S104</a>
16	.500 (12.7)	2.34 (59.4)	1.29 (32.8)	.749 (19.0)	.811 (2.6)	<a href="#">770-001S105</a>
20	.625 (15.9)	2.47 (62.7)	1.38 (35.1)	.869 (22.1)	.931 (23.6)	<a href="#">770-001S106</a>
24	.750 (19.1)	2.54 (64.5)	1.48 (37.6)	1.029 (26.1)	1.091 (27.7)	<a href="#">770-001S106</a>
28	.875 (22.2)	2.76 (70.1)	1.51 (38.4)	1.172 (29.8)	1.234 (31.3)	<a href="#">770-001S107</a>
32	1.000 (25.4)	3.12 (79.2)	1.51 (38.4)	1.320 (33.5)	1.382 (35.1)	<a href="#">770-001S107</a>
40	1.250 (31.8)	3.34 (84.8)	1.63 (41.4)	1.664 (42.3)	1.726 (43.8)	<a href="#">770-001S108</a>
48	1.500 (38.1)	3.82 (97.0)	1.88 (47.8)	1.957 (49.7)	2.019 (51.3)	<a href="#">770-001S108</a>

**Table II: Material/Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT		Nickel-PTFE
NF		Cad/Olive Drab over Electroless Nickel (1000 hr. salt spray)
ZN		Zinc Nickel/Olive Drab over Electroless Nickel
ZNU		Zinc Nickel/Black over Electroless Nickel (1000 hr. salt spray)
Z1	Stainless Steel	Passivate
ZM		Electroless Nickel
ZW		Cad/Olive Drab over Electroless Nickel



**711-150**  
**Internal Braid System**  
Environmental Self-Locking Metal Backshell  
for Series 74 Helical Convolted Tubing with Internal Braid

**Internal braid conduit-to-connector backshell, metal**

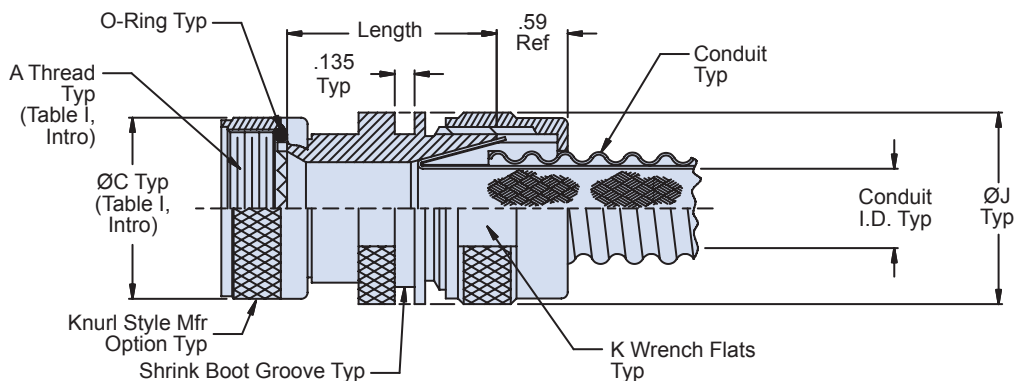
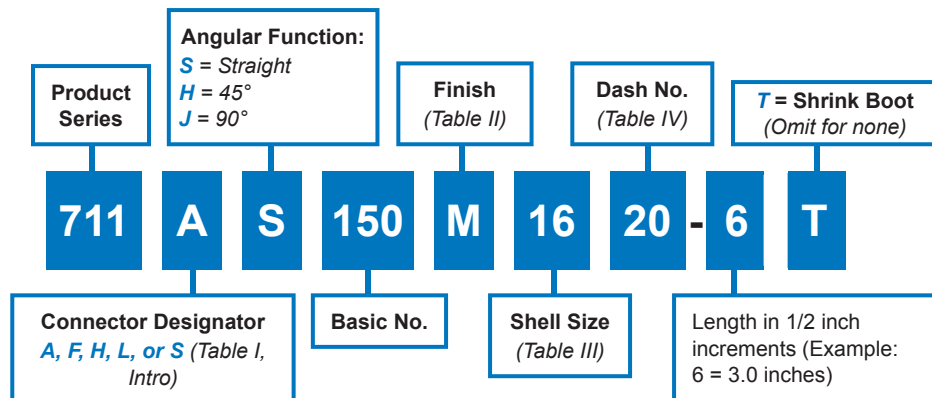


olive drab finish



nickel finish

**How To Order**



**SYM S - Straight**

**Material/Finish**

- Adapters, Elbows, Coupling Nuts, Nuts & Ferrules: Table II (see P/N development)
- O-Ring: Silicone/NA
- Anti-decoupling Device: Corrosion resistant material
- Shrink Boot: See individual drawings

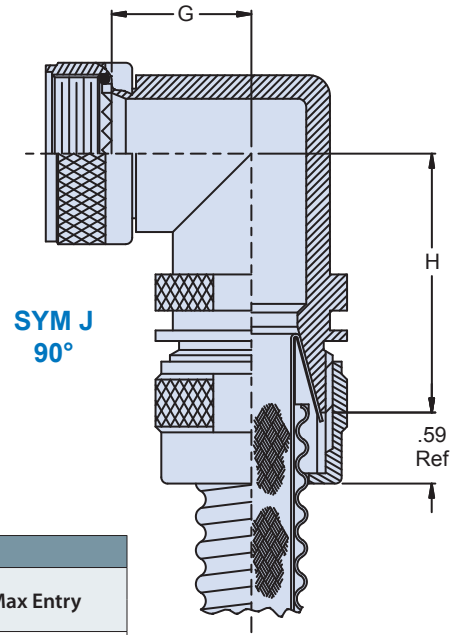
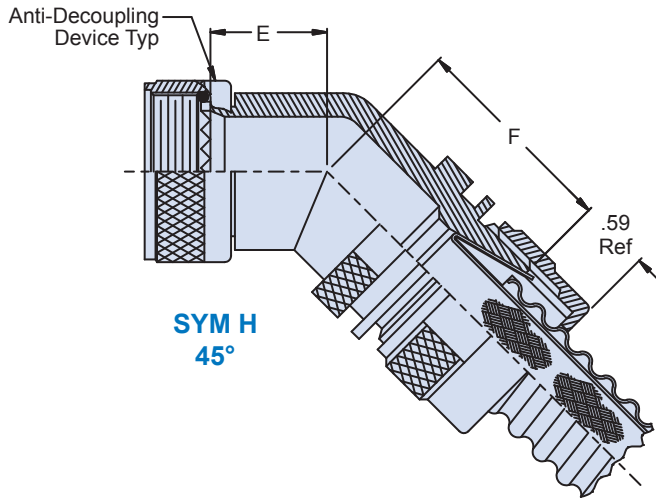
**Assembly Notes**

- Standard minimum length is 1.50 inches. For shorter length, consult factory. Note: applies to SYM S, Straight, only.
- O-Ring not supplied with Connector code "A".

**711-150**  
**Internal Braid System**  
 Environmental Self-Locking Metal Backshell  
 for Series 74 Helical Convoluted Tubing with Internal Braid



Series 74  
Helical Tubing



**Table III: Shell Size/Dimensions**

Shell Size		E	F	G	H	Max Entry
A, F, L, S	H	Max	Max	Max	Max	
08	09	.829 (21.1)	1.64 (41.7)	.94 (23.9)	1.75 (44.5)	20
10	11	.854 (21.7)	1.67 (42.4)	1.00 (25.4)	1.82 (46.2)	24
12	13	.878 (22.3)	1.69 (42.9)	1.06 (26.9)	1.88 (47.8)	28
14	15	.895 (22.7)	1.72 (43.7)	1.11 (28.2)	1.94 (49.3)	32
16	17	.922 (23.4)	1.75 (44.5)	1.17 (29.7)	2.00 (50.8)	32
18	19	.938 (23.8)	1.76 (44.7)	1.21 (30.7)	2.05 (52.1)	40
20	21	.963 (24.5)	1.80 (45.7)	1.27 (32.3)	2.12 (53.8)	40
22	23	.990 (25.1)	1.82 (46.2)	1.33 (33.8)	2.17 (55.1)	48
24	25	1.013 (25.7)	1.84 (46.7)	1.39 (35.3)	2.24 (56.9)	48
28		1.231 (31.2)	1.88 (47.8)	1.67 (42.4)	2.31 (58.7)	56
32		1.282 (32.5)	1.93 (49.0)	1.80 (45.7)	2.44 (62.0)	64
36		1.328 (33.8)	1.97 (50.0)	1.91 (48.5)	2.55 (64.8)	64

**Table IV: Dimensions/Shrink Boot**

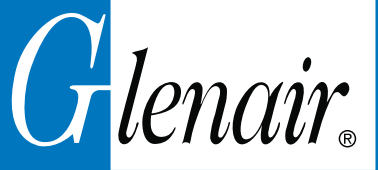
Dash No.	Conduit I.D.	ØJ	K Flat	Shrink Boot Part Number
06	See 121-195 Conduit Drawing	.94 (23.9)	.812 (20.6)	<a href="#">770-001S105</a>
09		1.00 (25.4)	.875 (22.2)	<a href="#">770-001S106</a>
10		1.06 (26.9)	.937 (23.8)	<a href="#">770-001S106</a>
12		1.13 (28.7)	1.000 (25.4)	<a href="#">770-001S106</a>
14		1.19 (30.2)	1.062 (27.1)	<a href="#">770-001S106</a>
16		1.25 (31.8)	1.125 (28.7)	<a href="#">770-001S107</a>
20		1.38 (35.1)	1.250 (31.8)	<a href="#">770-001S107</a>
24		1.56 (39.6)	1.438 (36.6)	<a href="#">770-001S108</a>
28		1.69 (42.9)	1.562 (39.6)	<a href="#">770-001S108</a>
32		1.88 (47.8)	1.750 (44.5)	<a href="#">770-001S108</a>
40		2.13 (54.1)	2.000 (50.8)	<a href="#">770-001S108</a>
48		2.50 (63.5)	2.375 (60.5)	TBD
56		2.75 (69.9)	2.625 (66.8)	TBD
64		3.00 (76.2)	2.875 (73.2)	TBD

**Table II: Material/Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZN	Aluminum Alloy	Zinc Nickel/O.D. over Electroless Nickel (1,000 Hour Salt Spray)

**Table II (continued)**

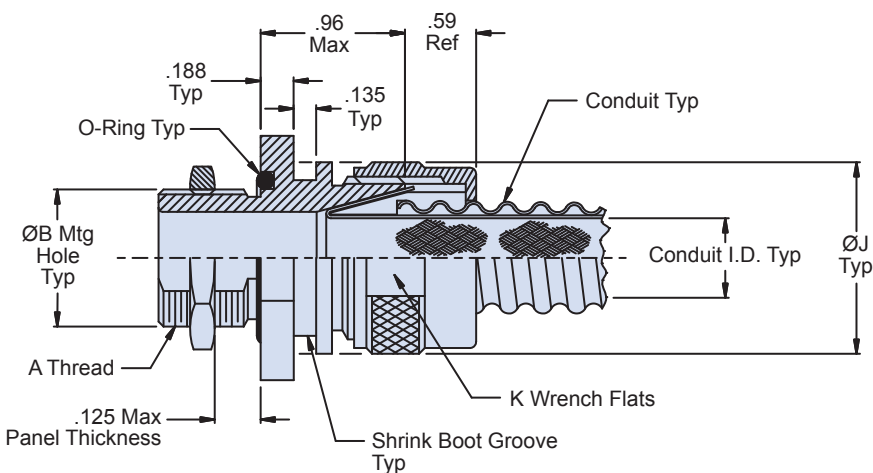
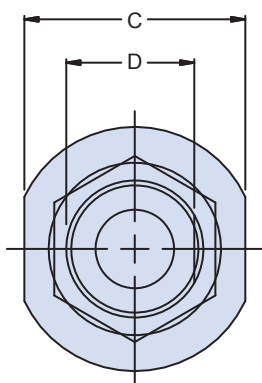
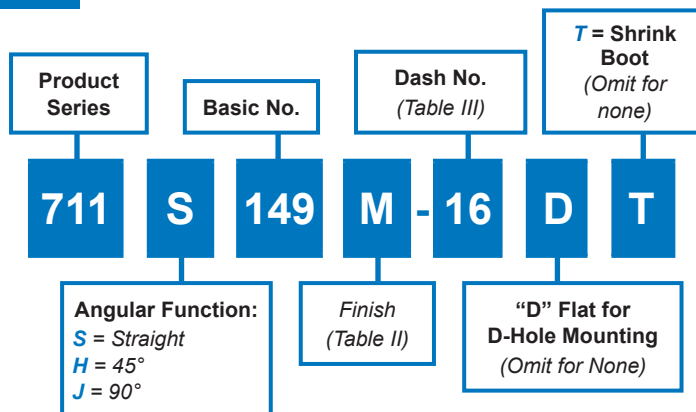
Sym	Material	Finish Description	Component
ZM	300 Series SST	Electroless Nickel	Adapter, Elbow
		Passivate	Coupling Nut
ZW	300 Series SST	Cadmium Olive Drab over Electroless Nickel	Adapter, Elbow
		Cadmium Olive Drab	Coupling Nut



**711-149**  
**Internal Braid System**  
 Environmental Metal Bulkhead Fitting with  
 Shrink Boot Groove for Series 74 Helical Convuluted Tubing

**Internal braid convoluted tubing-to-bulkhead fitting with shrink boot groove, metal**

**How To Order**

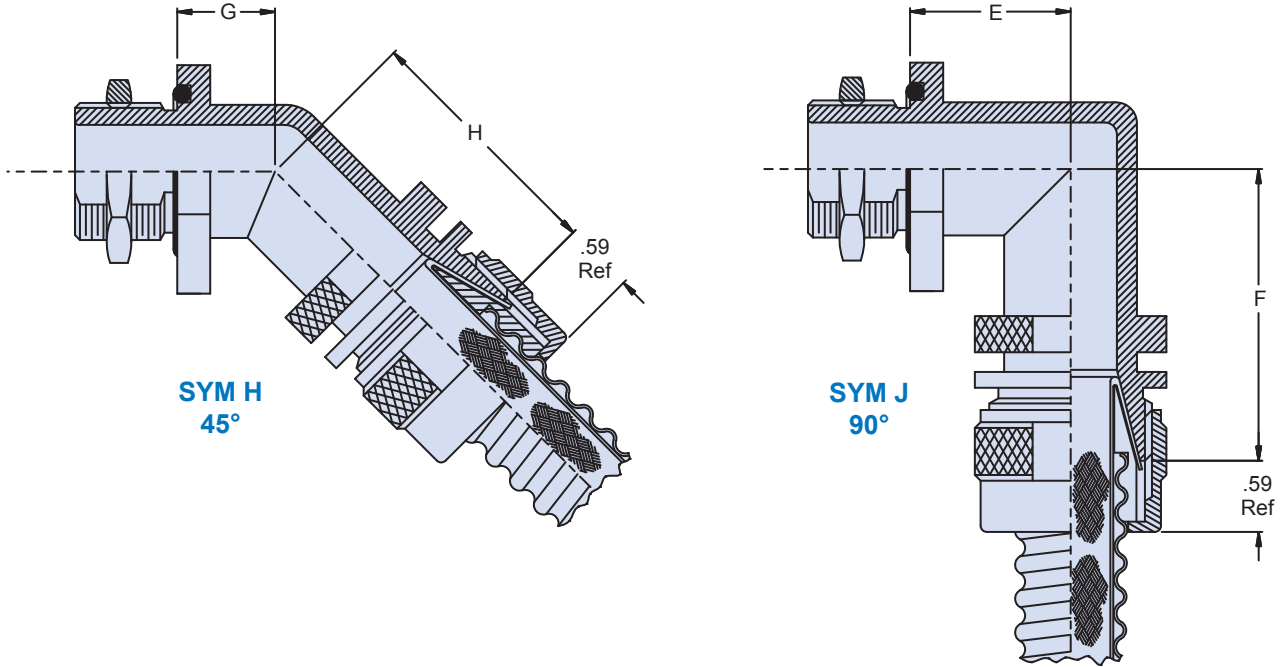


**SYM S - Straight**

**Material/Finish**

- Adapters, Elbows, Nuts, Hex Nuts & Ferrules: Table II (See P/N development)
- O-Ring: Silicone/NA
- Shrink Boot: See individual drawings

**711-149**  
**Internal Braid System**  
 Environmental Metal Bulkhead Fitting with  
 Shrink Boot Groove for Series 74 Helical Convuluted Tubing



**Table III: Dimensions and Shrink Boot**

Dash No.	Conduit ID	A Thread Class 2A	Ø B +.015 -.000	C Flat	D +.000 -.015	E Max	F Max	G Max	H Max	Ø J	K Flat	Shrink Boot Part Number
06	See 121-195 Conduit Drawing	7/16-28 UNEF	.443 (11.3)	.937 (23.8)	.375 (9.50)	.846 (21.5)	1.75 (44.5)	.462 (11.7)	1.64 (41.7)	.94 (23.9)	.812 (20.6)	<a href="#">770-001S105</a>
09		9/16-24 UNEF	.568 (14.4)	1.000 (25.4)	.500 (12.7)	.878 (22.3)	1.75 (44.5)	.475 (12.2)	1.64 (41.7)	1.00 (25.4)	.875 (22.2)	<a href="#">770-001S106</a>
10		9/16-24 UNEF	.568 (14.4)	1.062 (27.9)	.500 (12.7)	.909 (23.1)	1.75 (44.5)	.488 (12.4)	1.64 (41.7)	1.06 (26.9)	.937 (23.8)	<a href="#">770-001S106</a>
12		5/8-24 UNEF	.630 (16.0)	1.125 (28.7)	.563 (14.3)	.940 (23.9)	1.82 (46.2)	.500 (12.7)	1.67 (42.4)	1.13 (28.7)	1.000 (25.4)	<a href="#">770-001S106</a>
14		11/16-24 UNEF	.693 (17.6)	1.187 (30.2)	.625 (15.9)	.972 (24.7)	1.82 (46.2)	.513 (13.0)	1.67 (42.4)	1.19 (30.2)	1.062 (27.1)	<a href="#">770-001S106</a>
16		3/4-20 UNEF	.755 (19.2)	1.250 (31.8)	.688 (17.5)	1.003 (25.4)	1.82 (46.2)	.526 (13.5)	1.67 (42.4)	1.25 (31.8)	1.125 (28.7)	<a href="#">770-001S107</a>
20		7/8-20 UNEF	.880 (22.4)	1.375 (35.1)	.812 (20.6)	1.065 (25.7)	1.88 (47.8)	.552 (14.0)	1.69 (42.9)	1.38 (35.1)	1.250 (31.8)	<a href="#">770-001S107</a>
24		1-20 UNEF	1.005 (25.5)	1.500 (38.1)	.938 (23.8)	1.128 (28.7)	1.94 (49.3)	.578 (14.7)	1.72 (43.7)	1.56 (39.6)	1.437 (36.6)	<a href="#">770-001S108</a>
28		13/16-18 UNEF	1.193 (30.3)	1.625 (41.4)	1.125 (28.6)	1.190 (30.2)	2.00 (50.8)	.604 (15.3)	1.75 (44.5)	1.69 (42.9)	1.562 (39.6)	<a href="#">770-001S108</a>
32		15/16-18 UNEF	1.318 (33.5)	1.750 (44.5)	1.250 (31.8)	1.253 (31.8)	2.12 (53.8)	.630 (16.0)	1.80 (45.7)	1.88 (47.8)	1.750 (44.5)	<a href="#">770-001S108</a>
40		11/2-18 UNEF	1.505 (38.2)	2.125 (54.1)	1.438 (36.5)	1.440 (36.5)	2.24 (57.0)	.708 (18.0)	1.84 (46.7)	2.13 (54.1)	2.000 (50.8)	<a href="#">770-001S108</a>
48		13/4-18 UNS	1.755 (44.6)	2.437 (62.0)	1.688 (42.9)	1.596 (40.5)	2.31 (58.7)	.772 (19.6)	1.88 (47.8)	2.50 (63.5)	2.375 (60.5)	TBD
56		2-18 UNS	2.005 (51.1)	2.750 (69.6)	1.938 (49.3)	1.753 (44.5)	2.44 (62.0)	.837 (21.3)	1.93 (49.0)	2.75 (69.9)	2.625 (66.8)	TBD
64		2 1/4-16 UN	2.255 (57.4)	2.875 (73.2)	2.188 (55.6)	1.815 (46.2)	2.55 (64.8)	.863 (21.9)	1.97 (50.0)	3.00 (76.2)	2.875 (73.2)	TBD

**Table II: Material/Finish**

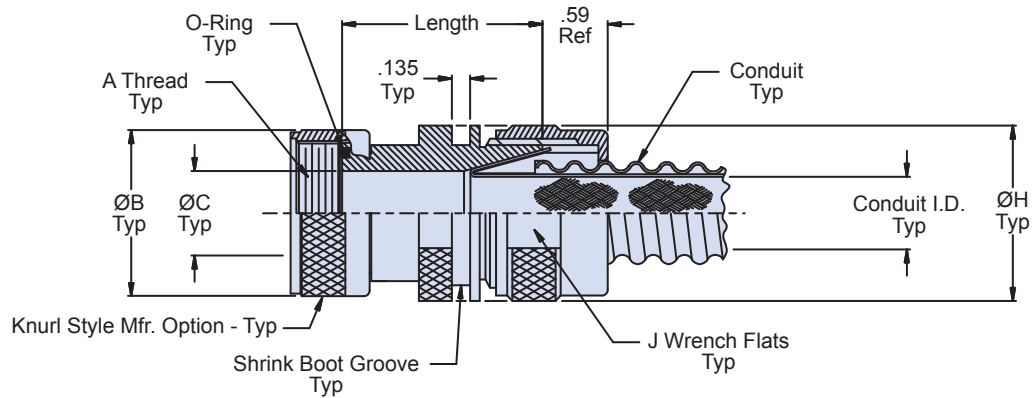
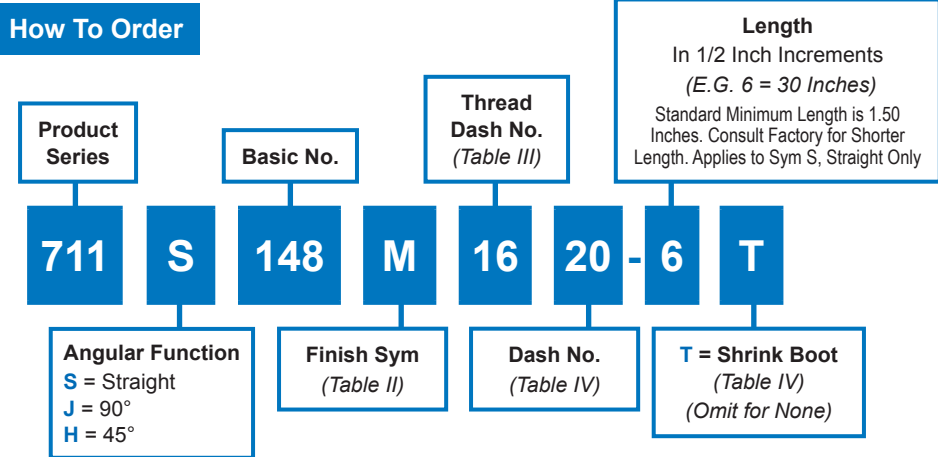
Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZW	300 Series SST	Cad O.D. Over Electroless Nickel





711-148  
Internal Braid System  
Conduit to Transition or End Fitting

**Internal Braid System convoluted tubing to transition or end fitting adapter**



**Sym S - Straight**

Intermateability Guide	
For use with	
Y transitions	710-106, 710-107, 710-370,
T transitions	710-108, 710-109, 710-371
Connector adapters	713-100, 713-101, 713-110
Bulkhead adapters	710-100, 710-101, 710-372
Bulkhead feed-thrus	710-102, 710-103, 710-373
Male Pipe thread adapters	710-114, 710-115, 710-405
Female pipe thread adapters	710-116, 710-117, 710-406

**Material & Finish**

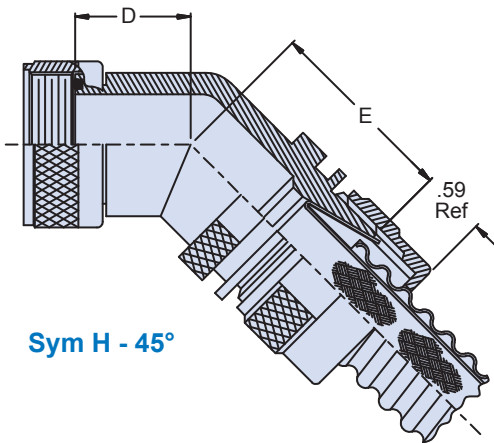
- Adapters, Elbows, Coupling Nuts & Ferrules: See Table III
- O-Rings: Silicone/NA
- Shrink Boot: See Individual Drawings

711-148  
Internal Braid System  
Conduit to Transition or End Fitting

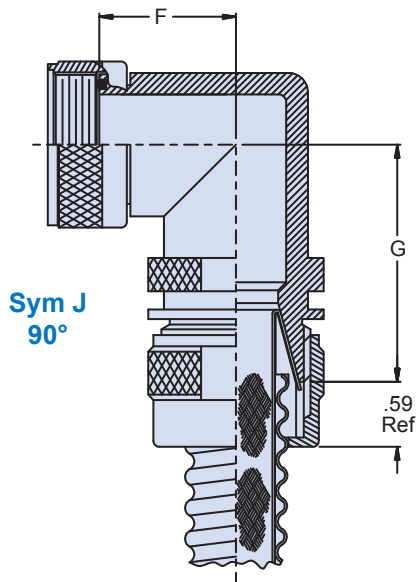


Table III: Dash No./Dimensions

Thread Dash No.	A Thread Class 2B	Ø B Max	Ø C	D Max	E Max	F Max	G Max	Max Conduit Dash No.
06	7/16-28 UNEF	.640 (16.3)	.188 (4.78)	.66 (16.8)	1.64 (41.7)	.81 (20.6)	1.75 (44.5)	20
09	9/16-24 UNEF	.690 (17.5)	.281 (7.14)	.66 (16.8)	1.64 (41.7)	.81 (20.6)	1.75 (44.5)	24
10	9/16-24 UNEF	.690 (17.5)	.312 (7.92)	.66 (16.8)	1.64 (41.7)	.81 (20.6)	1.75 (44.5)	24
12	5/8-24 UNEF	.760 (19.3)	.375 (9.53)	.66 (16.8)	1.67 (42.4)	.81 (20.6)	1.82 (46.2)	24
14	11/16-24 UNEF	.890 (22.6)	.438 (11.1)	.69 (17.5)	1.67 (42.4)	.87 (22.1)	1.82 (46.2)	28
16	3/4-20 UNEF	.890 (22.6)	.500 (12.7)	.69 (17.5)	1.67 (42.4)	.87 (22.1)	1.82 (46.2)	28
20	7/8-20 UNEF	1.024 (26.0)	.625 (15.9)	.71 (18.0)	1.69 (42.9)	.92 (23.4)	1.88 (47.8)	32
24	1-20 UNEF	1.152 (29.3)	.750 (19.1)	.73 (18.5)	1.72 (43.7)	.98 (24.9)	1.94 (49.3)	32
28	13/16-18 UNEF	1.363 (34.6)	.875 (22.2)	.77 (19.6)	1.75 (44.5)	1.08 (27.6)	2.00 (50.8)	40
32	15/16-18 UNEF	1.488 (37.8)	1.000 (25.4)	.80 (20.3)	1.80 (45.7)	1.14 (29.0)	2.12 (53.8)	40
40	1 1/2-18 UNEF	1.676 (42.6)	1.250 (31.8)	.82 (20.8)	1.84 (46.7)	1.20 (30.5)	2.24 (56.9)	48
48	1 3/4-18 UNS	1.960 (49.8)	1.500 (38.1)	1.04 (26.4)	1.88 (47.8)	1.48 (37.6)	2.31 (58.7)	56
56	2-18 UNS	2.210 (56.1)	1.750 (44.5)	1.09 (27.7)	1.93 (49.0)	1.61 (40.9)	2.44 (62.0)	64
64	2 1/4-16 UN	2.460 (62.5)	2.000 (50.8)	1.14 (29.0)	1.97 (50.0)	1.72 (43.7)	2.55 (64.8)	64



Sym H - 45°



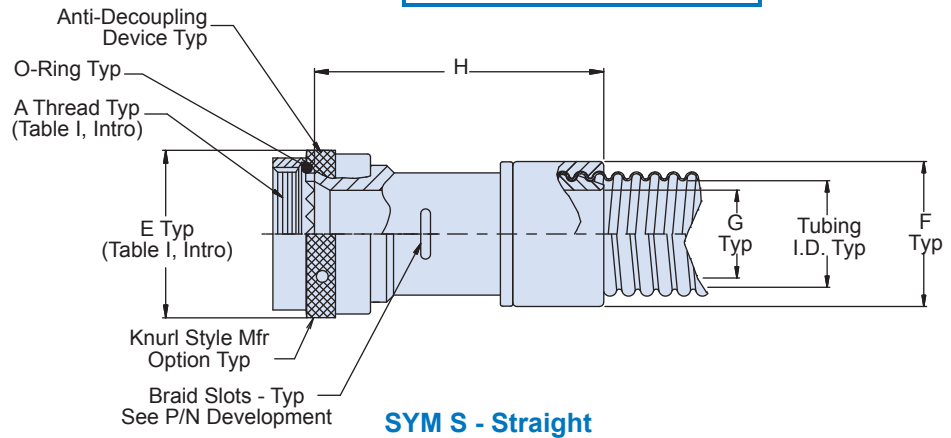
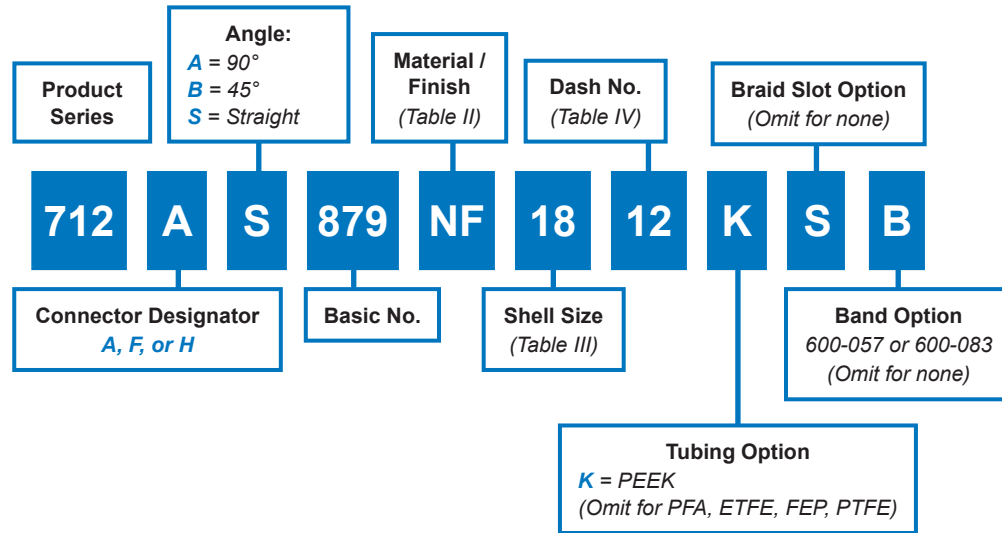
Sym J  
90°

Table IV: Dash No./Dimensions/Boot

Dash No.	Conduit I.D.	Ø H	J Flat	Shrink Boot Part No.
06	See 121-195 Conduit Drawing	.94 (23.9)	.812 (20.6)	<a href="#">770-001S105</a>
09		1.00 (25.4)	.875 (22.2)	<a href="#">770-001S106</a>
10		1.06 (26.9)	.937 (23.8)	<a href="#">770-001S106</a>
12		1.13 (28.7)	1.000 (25.4)	<a href="#">770-001S106</a>
14		1.19 (30.2)	1.062 (27.0)	<a href="#">770-001S106</a>
16		1.25 (31.8)	1.125 (28.6)	<a href="#">770-001S107</a>
20		1.38 (35.1)	1.250 (31.8)	<a href="#">770-001S107</a>
24		1.56 (39.6)	1.437 (36.5)	<a href="#">770-001S108</a>
28		1.69 (42.9)	1.562 (39.7)	<a href="#">770-001S108</a>
32		1.88 (47.8)	1.750 (44.5)	<a href="#">770-001S108</a>
40		2.13 (54.1)	2.000 (50.8)	<a href="#">770-001S108</a>
48		2.50 (63.5)	2.375 (60.3)	TBD
56		2.75 (69.9)	2.625 (66.7)	TBD
64		3.00 (76.2)	2.875 (73.0)	TBD

Table II: Material/Finish

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZW	300 Series SST	Cad O.D. Over Electroless Nickel

**Metal AeroLite System convoluted tubing to connector backshell**
**How To Order**

**Material and Finish**

- Adapters, Coupling Nuts and Elbows - Table II (See P/N development)
- Follower Nuts - High grade engineering thermoplastic black/no plating
- Anti-Decoupling Device - Corrosion-resistant material/NA
- O-Ring - Fluorosilicone/N.A.
- Band - SST/Passivate

**Notes**

- Interface O-Ring not applicable to connector designator A
- Nominal I.D. of PEEK tubing adapters are reduced by approximately .060 in.
- Convoluted tubing to be ordered separately, see 120-100 standard wall conduit.

712-879

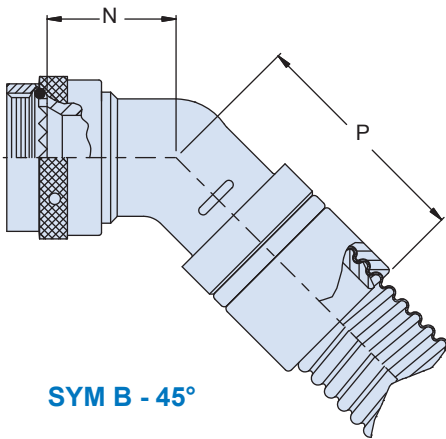
**AeroLite System - Metal**  
**Convuluted Tubing to Connector Backshell**  
**for Series 74 Helical Convuluted Tubing**



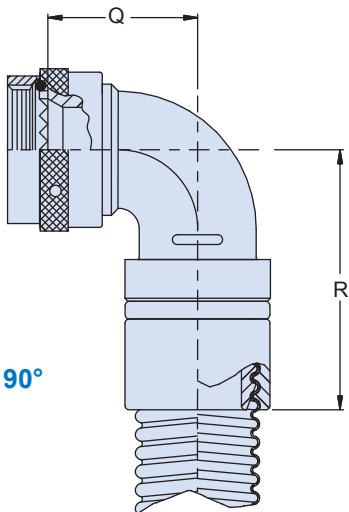
Series 74  
Helical Tubing

Table III: Shell Size/Dimensions

Shell Size		H Max	N Max	P Max	Q Max	R Max	Max Dash No. Table II
A, F, L	H						
08	09	1.71 (43.4)	.600 (15.2)	1.500 (38.1)	.680 (17.3)	1.670 (42.4)	09
10	11	1.71 (43.4)	.630 (16.0)	1.740 (44.2)	.770 (19.6)	1.810 (45.7)	12
12	13	1.76 (44.7)	.660 (16.8)	1.880 (47.8)	.800 (20.3)	1.900 (48.2)	20
14	15	1.76 (44.7)	.690 (17.5)	2.090 (53.1)	.880 (22.4)	2.090 (53.1)	24
16	17	1.86 (47.2)	.820 (20.1)	2.240 (56.9)	1.060 (26.9)	2.220 (56.4)	24
18	19	1.96 (49.8)	.970 (24.6)	2.530 (64.3)	1.150 (29.2)	2.500 (63.5)	28
20	21	1.96 (49.8)	.970 (24.6)	2.570 (65.3)	1.150 (29.6)	2.540 (64.5)	32
22	23	1.96 (49.8)	1.000 (25.4)	2.710 (68.8)	1.300 (33.0)	2.650 (67.3)	32
24, 61	25	2.06 (52.3)	1.000 (25.4)	2.870 (72.9)	1.300 (33.0)	2.800 (71.1)	40
28	⊗	2.06 (52.3)	TBD	TBD	1.400 (35.6)	3.020 (76.7)	40



SYM B - 45°



SYM A - 90°

Table IV: Dash No./Dimensions

Dash No.	M Conduit ID Nom.	F Dia Max	G Dia ± .015 Entry
06	.188 (4.8)	.580 (14.7)	.157 (4.0)
09	.281 (7.1)	.670 (17.0)	.250 (6.4)
10	.312 (7.9)	.710 (18.0)	.281 (7.1)
12	.375 (9.5)	.770 (19.6)	.344 (8.7)
14	.437 (11.1)	.830 (21.1)	.406 (10.3)
16	.500 (12.7)	.920 (23.4)	.469 (11.9)
20	.625 (15.9)	1.040 (26.4)	.594 (15.1)
24	.750 (19.1)	1.200 (30.5)	.714 (18.1)
28	.875 (22.2)	1.340 (34.0)	.839 (21.3)
32	1.000 (25.4)	1.500 (38.1)	.964 (24.5)
40	1.250 (31.8)	1.660 (42.2)	1.214 (30.8)

Table II - Finish

Sym	Material	Finish Description
B	Aluminum Alloy	Cadmium, Olive Drab
C		Anodize, Black
M		Electroless Nickel
MT		Nickel-PTFE
NF		Cad/O.D. over Electroless Nickel
UCR		Zinc Cobalt/Black
ZNU		Zinc Nickel/Black over Electroless Nickel
Z1		Stainless Steel, 300 Series

Table II - Finish (continued)

Sym	Material	Finish Description	Component
ZM	300 SERIES SST	Electroless Nickel	Adapter, Elbow
		Passivate	Coupling Nut
ZW		Cadmium Olive Drab over Electroless Nickel	Adapter, Elbow
		Cadmium Olive Drab	Coupling Nut
ZMT		Nickel-PTFE	Adapter, Elbow
		Passivate	Coupling Nut

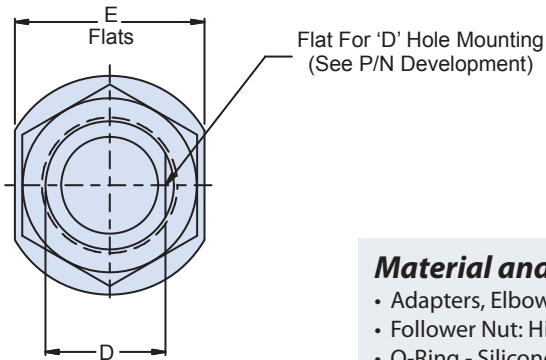
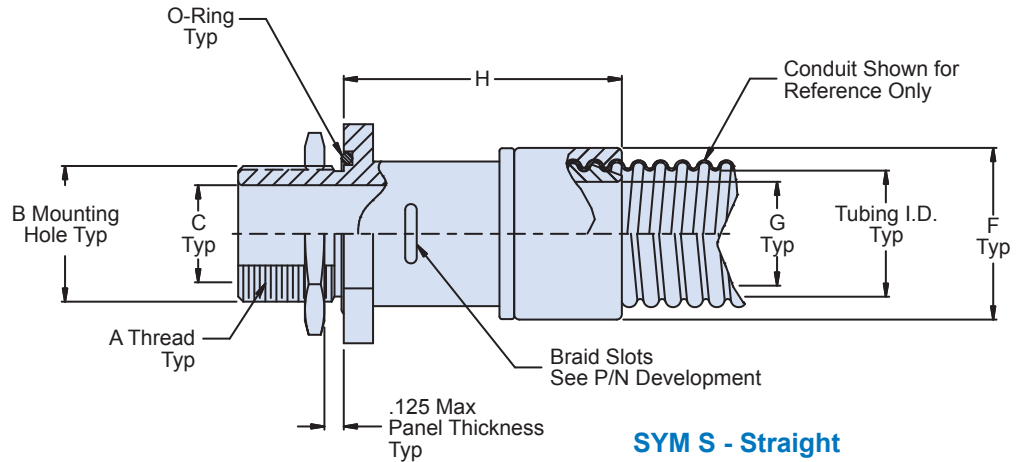
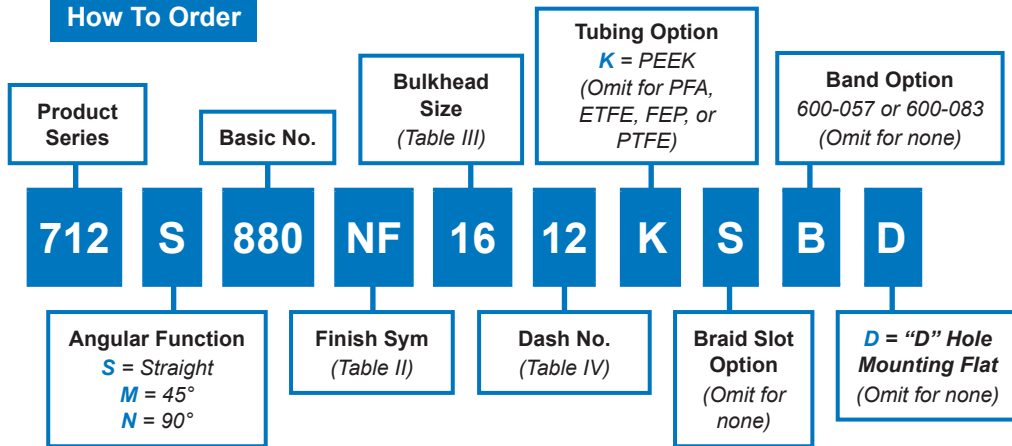


712-880

**AeroLite System - Metal  
Convolved Tubing to Bulkhead Fitting  
for Series 74 Helical Convolved Tubing**

**Metal AeroLite System convolved tubing to bulkhead fitting**

**How To Order**



**Material and Finish**

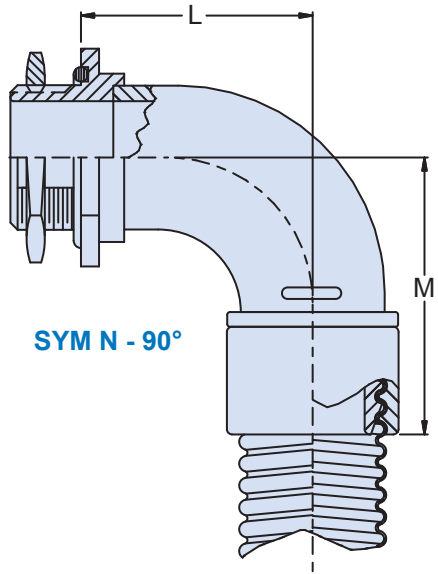
- Adapters, Elbows, Jam Nuts: See Table II
- Follower Nut: High Grade Engineering Thermoplastic, black/no plating
- O-Ring - Silicone/N.A.
- Band - SST/Passivate

**Notes**

- Convolved Tubing to be ordered separately, see 120-100, standard wall. Dash No. refers to Convolved Tubing size.
- Nom I.D. of PEEK Tubing Adapters are reduced by approximately .060 in.



**712-880**  
**AeroLite System - Metal**  
 Convoluted Tubing to Bulkhead Fitting  
 for Series 74 Helical Convoluted Tubing

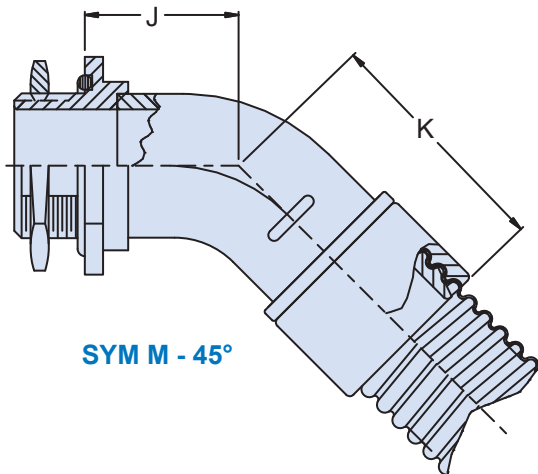


**Table III: Bulkhead Size/Dimensions**

Bulkhead Size	A Thread Class 2A	Ø B +.015 -.000	Ø C	D +.000 -.015	E Flats	Max Dash No.
06	7/16-28 UNEF	.443 (11.3)	.188 (4.78)	.375 (9.5)	.688 (17.5)	09
09	9/16-24 UNEF	.568 (14.4)	.281 (7.14)	.500 (12.7)	.812 (20.6)	12
10	9/16-24 UNEF	.568 (14.4)	.312 (7.92)	.500 (12.7)	.812 (20.6)	12
12	5/8-24 UNEF	.630 (16.0)	.375 (9.52)	.563 (14.3)	.875 (22.2)	14
14	11/16-24 UNEF	.693 (17.6)	.437 (11.1)	.625 (15.9)	.938 (23.8)	16
16	3/4-20 UNEF	.755 (19.2)	.500 (12.7)	.688 (17.5)	1.000 (25.4)	16
20	7/8-20 UNEF	.880 (22.4)	.625 (15.9)	.812 (20.6)	1.125 (28.6)	20
24	1-20 UNEF	1.005 (25.5)	.750 (19.1)	.938 (23.8)	1.250 (31.8)	24
28	1 3/16-18 UNEF	1.193 (30.3)	.875 (22.2)	1.125 (28.6)	1.438 (36.5)	28
32	1 5/16-18 UNEF	1.318 (33.5)	1.000 (25.4)	1.250 (31.8)	1.562 (39.6)	32
40	1 1/2-18 UNEF	1.505 (38.2)	1.250 (31.8)	1.438 (36.5)	1.812 (46.0)	40

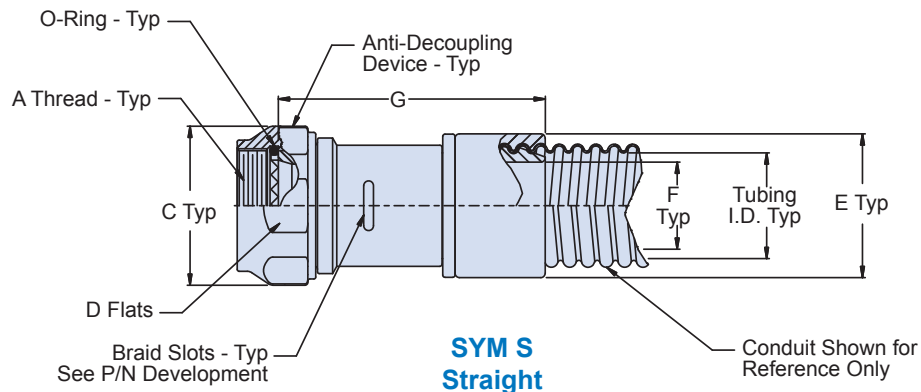
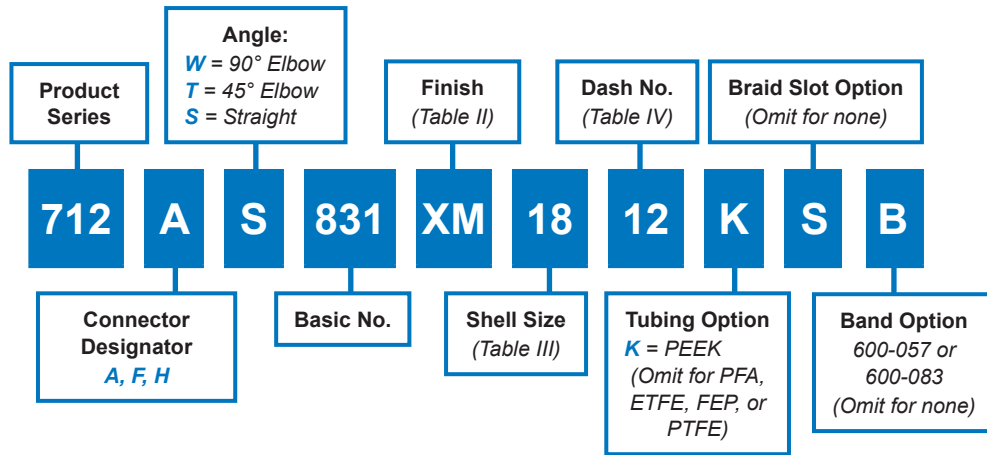
**Table IV: Dash No./Dimensions**

Dash No.	Tubing I.D. Nom	Ø F Max	Ø G +.015	H Max	J Max	K Max	L Max	M Max
06	.188 (4.80)	.580 (14.7)	.157 (4.00)	1.393 (35.3)	.50 (12.7)	1.23 (31.2)	.68 (17.3)	1.42 (36.1)
09	.281 (7.14)	.670 (17.0)	.250 (6.35)	1.393 (35.3)	.53 (13.5)	1.26 (32.0)	.75 (19.1)	1.48 (37.6)
10	.312 (7.92)	.710 (18.0)	.281 (7.14)	1.393 (35.3)	.53 (13.5)	1.26 (32.0)	.75 (19.1)	1.48 (37.6)
12	.375 (9.53)	.770 (19.6)	.344 (8.73)	1.393 (35.3)	.53 (13.5)	1.26 (32.0)	.75 (19.1)	1.48 (37.6)
14	.437 (11.1)	.830 (21.1)	.406 (10.3)	1.393 (35.3)	.55 (14.0)	1.29 (32.8)	.81 (20.6)	1.54 (39.1)
16	.500 (12.7)	.920 (23.4)	.469 (11.9)	1.443 (36.6)	.55 (14.0)	1.34 (34.0)	.81 (20.6)	1.59 (40.4)
20	.625 (15.9)	1.040 (26.4)	.594 (15.1)	1.443 (36.6)	.61 (15.5)	1.39 (35.3)	.93 (23.6)	1.72 (43.7)
24	.750 (19.1)	1.200 (30.5)	.714 (18.1)	1.543 (39.1)	.63 (16.0)	1.51 (38.4)	1.00 (25.4)	1.88 (47.8)
28	.875 (22.2)	1.340 (34.0)	.839 (21.3)	1.643 (41.7)	.68 (17.3)	1.67 (42.4)	1.12 (28.4)	2.10 (53.3)
32	1.000 (25.4)	1.500 (38.1)	.964 (24.5)	1.643 (41.7)	.71 (18.0)	1.69 (42.9)	1.18 (30.0)	2.17 (55.1)
40	1.250 (31.8)	1.660 (42.2)	1.214 (30.7)	1.743 (44.2)	.76 (19.3)	1.84 (46.7)	1.31 (33.3)	2.39 (60.7)



**Table II: Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZW	300 Series SST	Cad O.D. Over Electroless Nickel

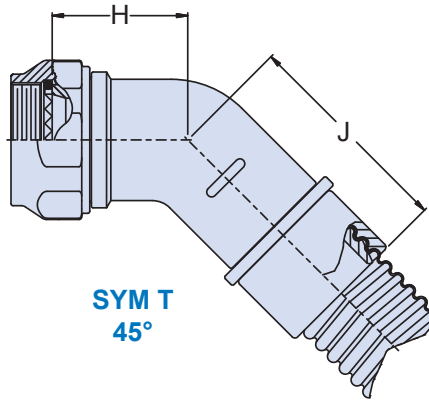
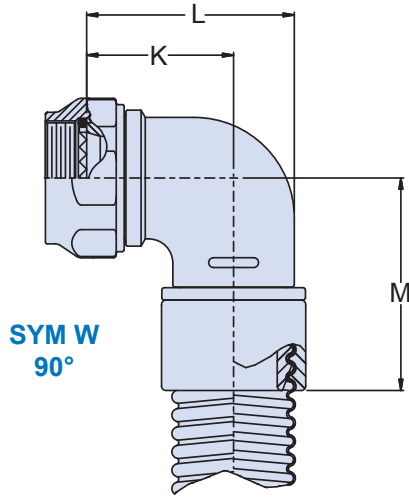
**Composite AeroLite System convuluted tubing to connector backshell**
**How To Order**

**Material/Finish**

- Adapters, Elbows: High grade engineering thermoplastic/See Table II
- Coupling Nuts, Ferrules: High grade engineering thermoplastic, black/no plating (XB)
- O-Ring: Fluorosilicone/NA (not supplied with Code A)
- Anti-Decoupling Device: Corrosion resistant material/N.A.
- Band: SST/Passivate

**Notes**

- Nom I.D. of PEEK tubing adapters are reduced by approximately .060 in.
- All coupling nuts and ferrules supplied unplated. Conduit termination platforms may also be unplated.
- Convuluted Tubing to be ordered separately, see 120-100, standard wall. Dash No. refers to Convuluted Tubing size.

712-831  
**AeroLite System - Composite**  
**Convuluted Tubing to Connector Backshell**  
**for Series 74 Helical Convuluted Tubing**



**Table III: Connector Designators and Dimensions**

Connector Designator A		Connector Designator F		Connector Designator H		Ø C Max	D Flats	
Shell Size	A Thread Class 2B	Shell Size	A Thread Class 2B	Shell Size	A Thread Iso Metric		Max	Min
08	1/2-20 UNF	08	7/16-28 UNEF	09	M12 X 1.0-6H	.830 (21.1)	.750 (19.1)	.736 (18.7)
10	5/8-24 UNEF	10	9/16-24 UNEF	11	M15 X 1.0-6H	.960 (24.4)	.875 (22.2)	.860 (21.8)
12	3/4-20 UNEF	12	11/16-24 UNEF	13	M18 X 1.0-6H	1.090 (27.7)	1.000 (25.4)	.980 (24.9)
14	7/8-20 UNEF	14	13/16-20 UNEF	15	M22 X 1.0-6H	1.220 (31.0)	1.125 (28.6)	1.100 (27.9)
16	1-20 UNEF	16	15/16-20 UNEF	17	M25 X 1.0-6H	1.350 (34.3)	1.250 (31.8)	1.224 (31.1)
18	11/16-18 UNEF	18	11/16-18 UNEF	19	M28 X 1.0-6H	1.480 (37.6)	1.375 (34.9)	1.348 (34.2)
20	13/16-18 UNEF	20	13/16-18 UNEF	21	M31 X 1.0-6H	1.620 (41.1)	1.500 (38.1)	1.469 (37.3)
22	15/16-18 UNEF	22	15/16-18 UNEF	23	M34 X 1.0-6H	1.750 (44.5)	1.625 (41.3)	1.581 (40.2)
24	17/16-18 UNEF	24	17/16-18 UNEF	25	M37 X 1.0-6H	1.890 (48.0)	1.750 (44.5)	1.690 (42.9)

**Table II: Finish**

SYM	Finish Description
XMT	Nickel-PTFE - Gray (1000 Hour Salt Spray)
XM	Electroless Nickel
XW	Cadmium Olive Drab Over Electroless Nickel
XB	No Plating, Black - Base Material Non-Conductive

**Table III continued: Shell Size and Dimensions**

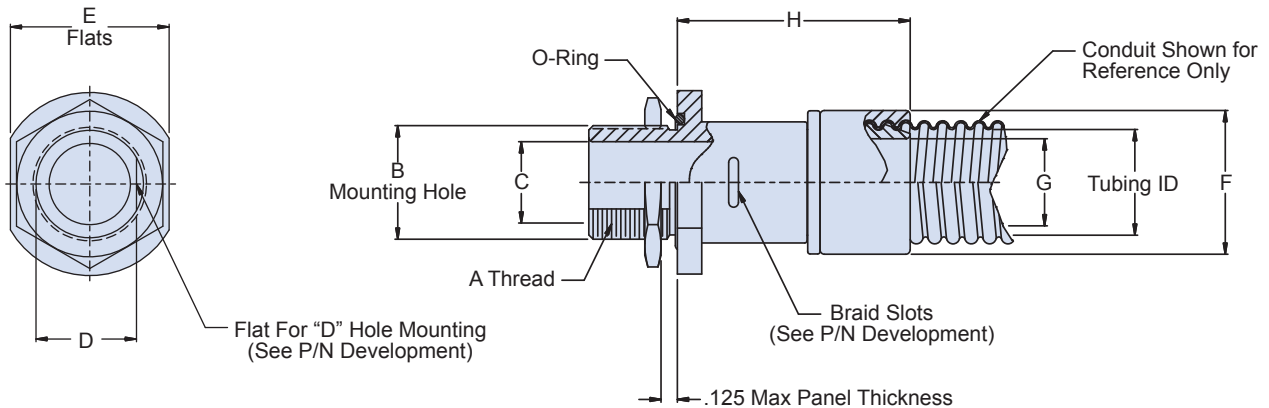
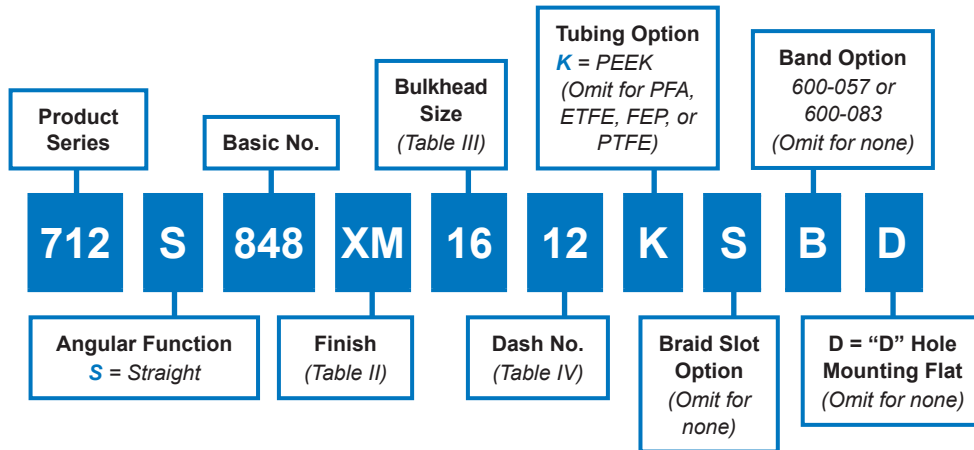
Shell Size A,F	H	G Max	H Max	J Max	K Max	L Max	M Max	Dash No. Max
08	09	1.71 (43.4)	.796 (20.2)	1.261 (32.0)	.770 (19.6)	.958 (24.3)	1.493 (37.9)	09
10	11	1.71 (43.4)	.830 (21.0)	1.376 (35.0)	.832 (21.1)	1.082 (27.5)	1.555 (39.5)	12
12	13	1.76 (44.7)	.825 (21.0)	1.453 (37.0)	.894 (22.7)	1.207 (30.7)	1.667 (42.3)	20
14	15	1.76 (44.7)	.833 (21.1)	1.494 (38.0)	.957 (24.3)	1.332 (33.8)	1.730 (44.0)	24
16	17	1.86 (47.2)	.855 (21.7)	1.614 (41.0)	1.020 (25.9)	1.458 (37.0)	1.893 (48.1)	24
18	19	1.96 (49.8)	.865 (22.0)	1.721 (43.7)	1.082 (27.5)	1.582 (40.2)	2.055 (52.2)	28
20	21	1.96 (49.8)	.895 (22.7)	1.743 (44.3)	1.145 (29.1)	1.707 (43.4)	2.117 (53.8)	32
22	23	1.96 (49.8)	.935 (23.7)	1.784 (45.3)	1.207 (30.7)	1.832 (46.5)	2.180 (55.4)	32
24, 61	25	2.06 (52.3)	.965 (24.5)	1.910 (48.5)	1.270 (32.3)	1.958 (49.7)	2.343 (59.5)	40
28	25	2.06 (52.3)	1.013 (25.7)	1.945 (49.4)	1.434 (36.4)	2.215 (56.3)	2.405 (61.1)	40

**Table IV: Dash No.**

Dash No.	Tubing I.D. Nom.	ØE Max	ØF ± .015 Entry
06	.188 (4.80)	.580 (14.7)	.157 (4.00)
09	.281 (7.10)	.670 (17.0)	.250 (6.40)
10	.312 (7.90)	.710 (18.0)	.281 (7.10)
12	.375 (9.50)	.770 (19.6)	.344 (8.70)
14	.437 (11.1)	.830 (21.1)	.406 (10.3)
16	.500 (12.7)	.920 (23.4)	.469 (11.9)
20	.625 (15.9)	1.040 (26.4)	.594 (15.1)
24	.750 (19.1)	1.200 (30.5)	.714 (18.1)
28	.875 (22.2)	1.340 (34.0)	.839 (21.3)
32	1.000 (25.4)	1.500 (38.1)	.964 (24.5)
40	1.250 (31.8)	1.660 (42.2)	1.214 (30.8)

**Composite AeroLite System convoluted tubing to bulkhead fitting**

**How To Order**



**Material/Finish**

- Adapters, Elbows, Jam Nuts: High grade engineering thermoplastic/See Table II
- Ferrules: High grade engineering thermoplastic, black/no plating (XB)
- O-Ring: Silicone/NA
- Band: SST/Passivate

**Notes**

- Convoluted Tubing to be ordered separately, see 120-100, standard wall. Dash No. refers to Convoluted Tubing size.
- Nominal I.D. of PEEK tubing adapters are reduced by approximately .060 in.

**712-848**  
**AeroLite System - Composite**  
**Convuluted Tubing to Bulkhead Feed-Thru Fitting**  
**for Series 74 Helical Convuluted Tubing**



**Table III: Bulkhead Size and Dimensions**

Bulkhead Size	A Thread Class 2A	Ø B +.015 -.000	Ø C	D +.000 -.015	E Flats	Max Dash No.
06	7/16-28 UNEF	.443 (11.3)	.188 (4.78)	.375 (9.5)	.688 (17.5)	09
09	9/16-24 UNEF	.568 (14.4)	.281 (7.14)	.500 (12.7)	.812 (20.6)	12
10	9/16-24 UNEF	.568 (14.4)	.312 (7.92)	.500 (12.7)	.812 (20.6)	12
12	5/8-24 UNEF	.630 (16.0)	.375 (9.52)	.563 (14.3)	.875 (22.2)	14
14	11/16-24 UNEF	.693 (17.6)	.437 (11.1)	.625 (15.9)	.938 (23.8)	16
16	3/4-20 UNEF	.755 (19.2)	.500 (12.7)	.688 (17.5)	1.000 (25.4)	16
20	7/8-20 UNEF	.880 (22.4)	.625 (15.9)	.812 (20.6)	1.125 (28.6)	20
24	1-20 UNEF	1.005 (25.5)	.750 (19.1)	.938 (23.8)	1.250 (31.8)	24
28	1 3/16-18 UNEF	1.193 (30.3)	.875 (22.2)	1.125 (28.6)	1.438 (36.5)	28
32	1 5/16-18 UNEF	1.318 (33.5)	1.000 (25.4)	1.250 (31.8)	1.562 (39.6)	32
40	1 1/2-18 UNEF	1.505 (38.2)	1.250 (31.8)	1.438 (36.5)	1.812 (46.0)	40

**Table IV: Dash No./Dimensions**

Dash No.	Tubing I.D. Nom	Ø F Max	Ø G Entry +.015	H Max
06	.188 (4.80)	.580 (14.7)	.157 (4.00)	1.393 (35.3)
09	.281 (7.14)	.670 (17.0)	.250 (6.35)	1.393 (35.3)
10	.312 (7.92)	.710 (18.0)	.281 (7.14)	1.393 (35.3)
12	.375 (9.53)	.770 (19.6)	.344 (8.73)	1.393 (35.3)
14	.437 (11.1)	.830 (21.1)	.406 (10.3)	1.393 (35.3)
16	.500 (12.7)	.920 (23.4)	.469 (11.9)	1.443 (36.6)
20	.625 (15.9)	1.040 (26.4)	.594 (15.1)	1.443 (36.6)
24	.750 (19.1)	1.200 (30.5)	.714 (18.1)	1.543 (39.1)
28	.875 (22.2)	1.340 (34.0)	.839 (21.3)	1.643 (41.7)
32	1.000 (25.4)	1.500 (38.1)	.964 (24.5)	1.643 (41.7)
40	1.250 (31.8)	1.660 (42.2)	1.214 (30.7)	1.743 (44.2)

**Table II: Finish**

SYM	Finish Description
XMT	Nickel-PTFE - Gray (1000 Hour Salt Spray)
XM	Electroless Nickel
XW	Cadmium Olive Drab Over Electroless Nickel
XO	No Plating - Base Material Non-Conductive



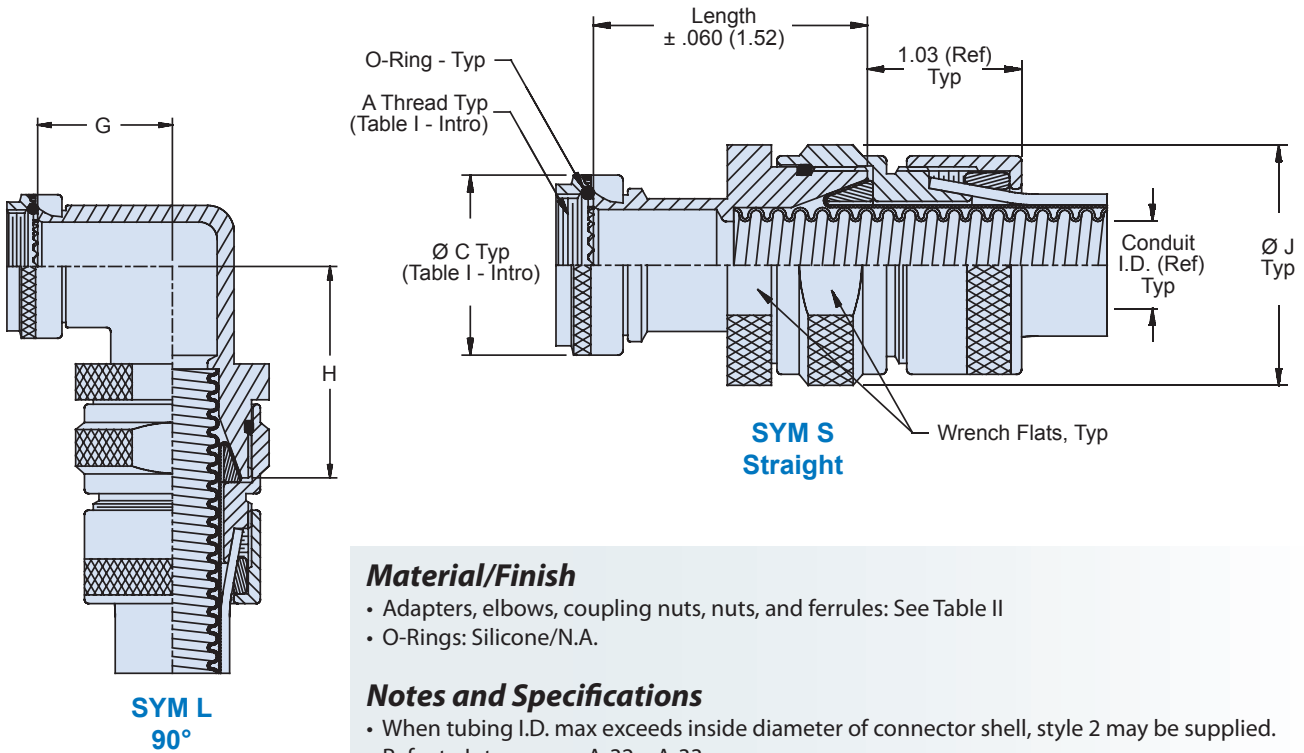
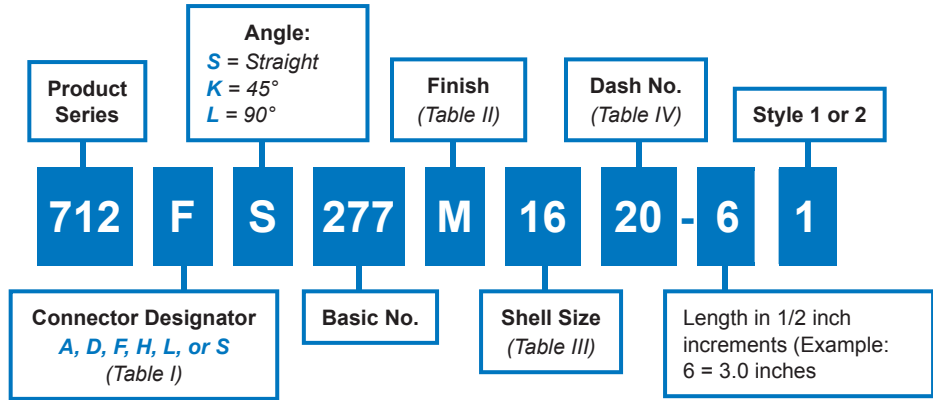


712-277  
Heavy-Duty Ground Ring System  
Backshell with Ground Ring Shield Termination  
for Series 74 Helical Convoluted Tubing

**Heavy-Duty convoluted tubing-to-connector backshell, environmental, for tubing with one or two braids and jacket**



**How To Order**



**Material/Finish**

- Adapters, elbows, coupling nuts, nuts, and ferrules: See Table II
- O-Rings: Silicone/N.A.

**Notes and Specifications**

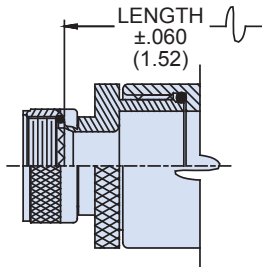
- When tubing I.D. max exceeds inside diameter of connector shell, style 2 may be supplied. Refer to Intro, pages A-32 – A-33.
- O-Ring not supplied with connector designator A
- Standard minimum length for Style I is 1.50 inch, for Style II is 2.00 inches. Consult factory for shorter length. Note: applies to Symbol S, Straight, only.

712-277

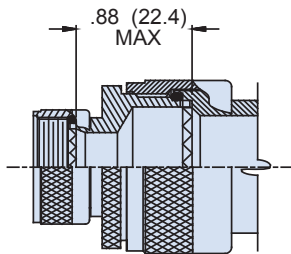
**Heavy-Duty Ground Ring System  
Backshell with Ground Ring Shield Termination  
for Series 74 Helical Convuluted Tubing**



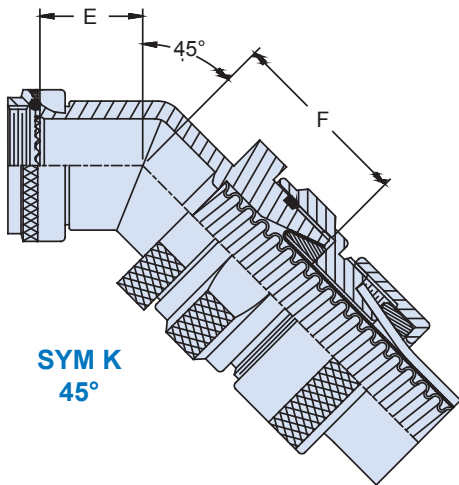
Series 74  
Helical Tubing



**STYLE 2  
(STRAIGHT)**



**STYLE 2  
(45° & 90°)**



**SYM K  
45°**

Table III: Shell Size/Dimensions					
Shell Size A, D, F, L, S	H	E Max	F Max	G Max	H Max
10	11	.66 (16.8)	1.26 (32.0)	.81 (20.6)	1.40 (35.6)
12	13	.69 (17.6)	1.28 (32.5)	.87 (22.1)	1.46 (37.1)
14	15	.71 (18.0)	1.31 (33.3)	.92 (23.4)	1.53 (38.9)
16	17	.73 (18.5)	1.33 (33.8)	.98 (24.9)	1.59 (40.4)
18	19	.75 (19.1)	1.34 (34.0)	1.02 (25.9)	1.61 (40.9)
20	21	.77 (19.6)	1.36 (34.5)	1.08 (27.4)	1.67 (42.4)
22	23	.80 (20.3)	1.40 (35.6)	1.14 (29.0)	1.75 (44.5)
24	25	.82 (20.8)	1.43 (36.3)	1.20 (30.5)	1.82 (46.2)
28		1.04 (26.4)	1.60 (40.6)	1.48 (37.6)	2.06 (52.3)
32		1.09 (27.7)	1.64 (41.7)	1.61 (40.9)	2.15 (54.6)
36		1.14 (29.0)	1.69 (42.9)	1.72 (43.7)	2.26 (57.4)

Table II: Finish		
Sym	Material	Finish Description
B	AL Alloy	Olive Drab over Cadmium Plate
J		Gold Iridite over Cadmiup Plate over Nickel
M		Electroless Nickel
N		Olive Drab over Cadmium Plate over Nickel
NC		Zinc-Cobalt, Olive Drab
NF		Olive Drab over Cadmium Plate over Electroless Nickel (500 Hour Salt Spray)
T		Bright Dip Cadmium Plate over Nickel
Z1	300 Series SST	Passivate

Table IV: Dash No./Dimensions			
Dash No.	Conduit I.D.		Ø J Max
	Min	Max	
06	.181 (4.6)	.188 (4.8)	1.09 (27.7)
09	.273 (6.9)	.281 (7.1)	1.16 (29.5)
10	.306 (7.8)	.312 (7.9)	1.22 (31.0)
12	.359 (9.1)	.375 (9.5)	1.28 (32.5)
14	.427 (10.8)	.437 (11.1)	1.34 (34.0)
16	.480 (12.2)	.500 (12.7)	1.41 (35.8)
20	.603 (15.3)	.625 (15.9)	1.53 (38.9)
24	.725 (18.4)	.750 (19.1)	1.66 (42.2)
28	.860 (21.8)	.875 (22.2)	1.78 (45.2)
32	.970 (24.6)	1.000 (25.4)	1.91 (48.5)
40	1.205 (30.6)	1.250 (31.8)	2.28 (57.9)
48	1.437 (36.5)	1.500 (38.1)	2.59 (65.8)
56	1.688 (42.9)	1.750 (44.5)	2.91 (73.9)
64	1.937 (49.2)	2.000 (50.8)	3.03 (77.0)



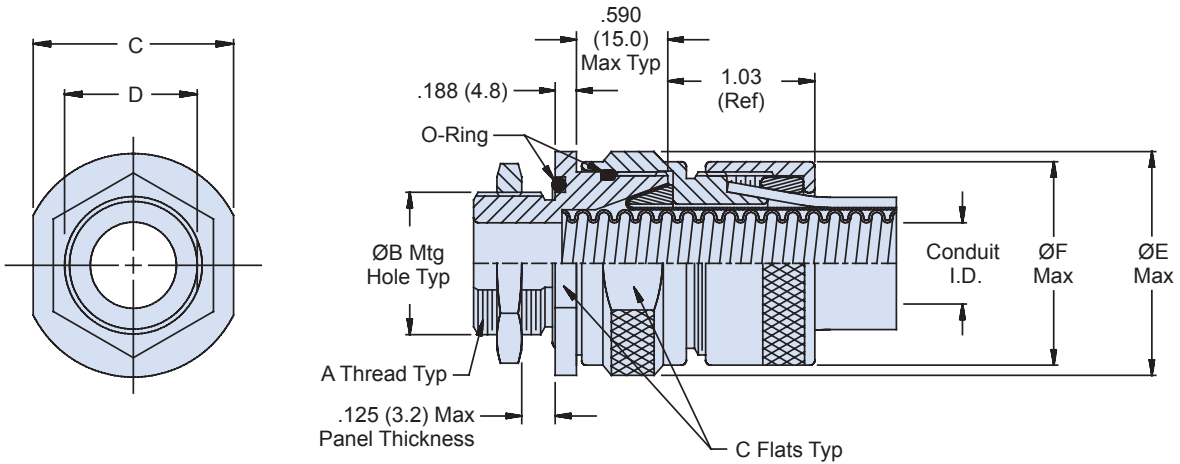
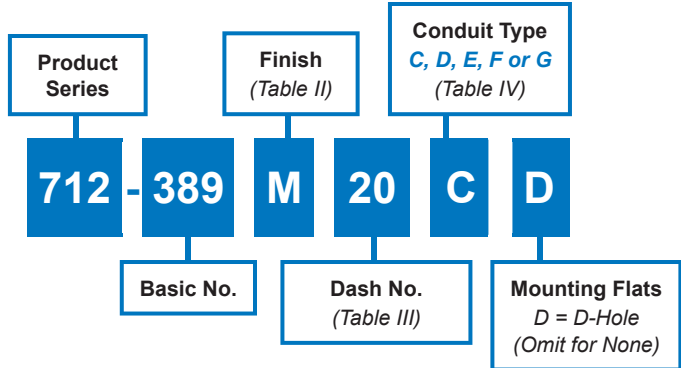


**712-389**  
**Heavy-Duty Ground Ring System**  
**Bulkhead Fitting with Ground Ring**  
**Shield Termination for Series 74 Helical Convuluted Tubing**

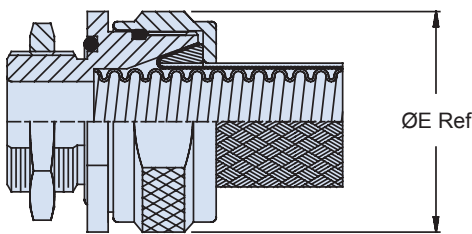
**Heavy-Duty convoluted tubing-to-bulkhead fitting**



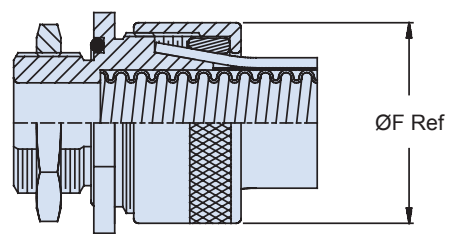
**How To Order**



**Types C & F**  
**Environmental**



**Types D, & E**  
**Non-Environmental**



**Type G**  
**Environmental**

**Material/Finish**

- Adapters, hex nuts, nuts, ferrules: See Table II
- O-Rings: Silicone/N.A.

**712-389**  
**Heavy-Duty Ground Ring System**  
**Bulkhead Fitting with Ground Ring**  
**Shield Termination for Series 74 Helical Convuluted Tubing**



**Table III: Dash No./Dimensions**

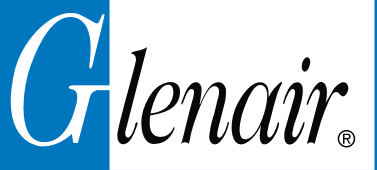
Dash No.	Conduit ID		A Thread Class 2A	Ø B +.03 (0.8) -.00 (0.0)	C Across Flat	D +.000 -.015	Ø E Max	Ø F Max
	Min	Max						
06	.181 (4.6)	.188 (4.8)	7/16 - 28 UNEF	.440 (11.2)	.937 (23.8)	.375 (9.5)	1.09 (27.7)	.780 (19.8)
09	.273 (6.9)	.281 (7.1)	9/16 - 24 UNEF	.560 (14.2)	1.00 (25.4)	.500 (12.7)	1.16 (29.5)	1.03 (26.2)
10	.306 (7.8)	.312 (7.9)	9/16 - 24 UNEF	.560 (14.2)	1.06 (27.0)	.500 (12.7)	1.22 (31.0)	1.03 (26.2)
12	.359 (9.1)	.375 (9.5)	5/8 - 24 UNEF	.630 (16.0)	1.13 (28.6)	.563 (14.3)	1.28 (32.5)	1.03 (26.2)
14	.427 (10.8)	.437 (11.1)	11/16 - 24 UNEF	.690 (17.5)	1.19 (30.1)	.625 (15.9)	1.34 (34.0)	1.22 (31.0)
16	.480 (12.2)	.500 (12.7)	3/4 - 20 UNEF	.750 (19.1)	1.25 (31.8)	.688 (17.5)	1.41 (35.8)	1.28 (32.5)
20	.603 (16.0)	.625 (15.9)	7/8 - 20 UNEF	.880 (22.4)	1.38 (34.9)	.812 (20.6)	1.53 (38.9)	1.41 (35.8)
24	.725 (18.4)	.750 (19.1)	1 - 20 UNEF	1.00 (25.4)	1.50 (38.1)	.938 (23.8)	1.66 (42.2)	1.53 (38.9)
28	.860 (21.8)	.875 (22.2)	13/16 - 18 UNEF	1.19 (30.2)	1.63 (41.3)	1.130 (28.6)	1.78 (45.2)	1.71 (43.4)
32	.970 (24.6)	1.000 (25.4)	15/16 - 18 UNEF	1.31 (33.3)	1.75 (44.5)	1.250 (31.8)	1.91 (48.5)	1.84 (46.7)
40	1.205 (30.6)	1.250 (31.8)	1 1/2 - 18 UNEF	1.50 (38.1)	2.13 (54.0)	1.440 (36.5)	2.28 (57.9)	2.16 (54.9)
48	1.437 (36.5)	1.500 (38.1)	1 3/4 - 18 UNS	1.75 (44.5)	2.44 (61.9)	1.690 (42.9)	2.59 (65.8)	2.46 (62.5)
56	1.688 (42.9)	1.750 (44.5)	2 - 18 UNS	2.00 (50.8)	2.75 (69.9)	1.940 (49.2)	2.91 (73.9)	2.78 (70.6)
64	1.937 (49.2)	2.000 (50.8)	2 1/4 - 16 UN	2.25 (57.2)	2.88 (73.0)	2.190 (55.6)	3.03 (77.0)	3.03 (77.0)

**Table II: Finish**

Sym	Material	Finish Description
B	AL Alloy	Olive Drab over Cadmium Plate
J		Gold Iridite over Cadmiup Plate over Nickel
M		Electroless Nickel
N		Olive Drab over Cadmium Plate over Nickel
NC		Zinc-Cobalt, Olive Drab
NF		Olive Drab over Cadmium Plate over Electroless Nickel (500 Hour Salt Spray)
T		Bright Dip Cadmium Plate over Nickel
Z1	300 Series SST	Passivate

**Table IV: Conduit Type**

Conduit Type	Part Number	Configuration
C	121-100	Tubing with braided shield and jacket
D	121-101	Tubing with braided shield
E	121-102	Tubing with two braided shields
F	121-103	Tubing with two braided shields and jacket
G	123-100	Tubing with jacket



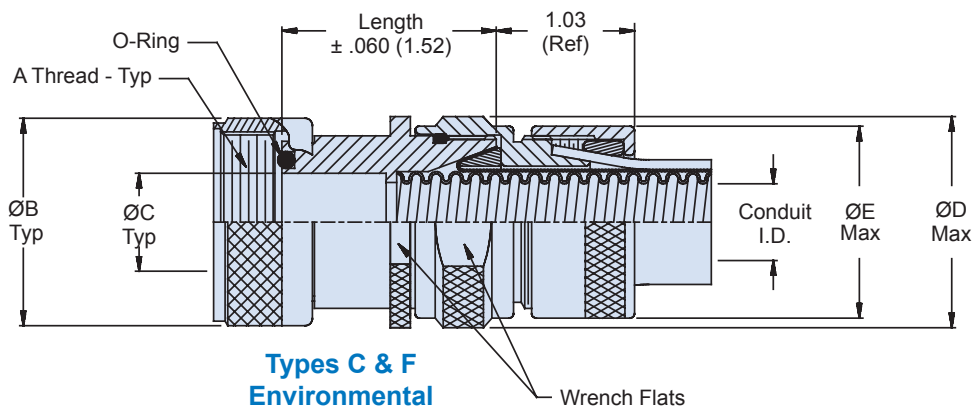
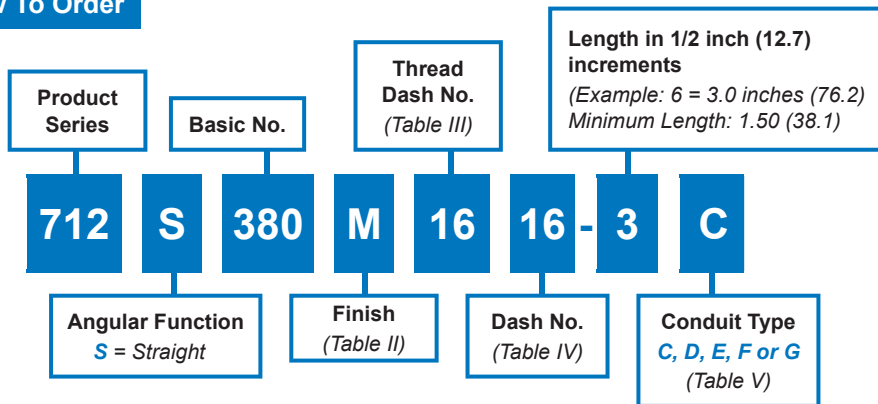
712-380

**Heavy-Duty Ground Ring System**  
Conduit to Transition or End Fitting Adapter with Ground Ring  
Shield Termination for Series 74 Helical Convuluted Tubing

**Heavy-Duty convoluted tubing to transition or end-fitting adapter**



**How To Order**



Intermateability Guide	
For use with	
Y transitions	710-106, 710-107, 710-370,
T transitions	710-108, 710-109, 710-371
Connector adapters	713-100, 713-101, 713-110
Bulkhead adapters	710-100, 710-101, 710-372
Bulkhead feed-thrus	710-102, 710-103, 710-373
Male Pipe thread adapters	710-114, 710-115, 710-405
Female pipe thread adapters	710-116, 710-117, 710-406

**Material/Finish**

- Adapters, coupling nuts, nuts, and ferrules: See Table II
- O-Rings: Silicone/N.A.



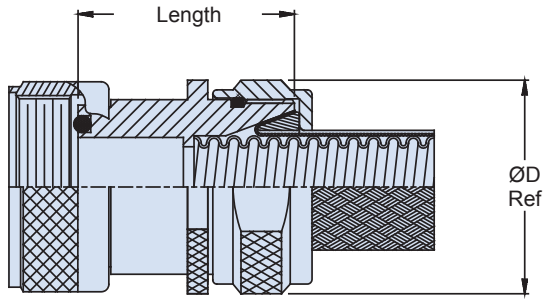
712-380

Heavy-Duty Ground Ring System

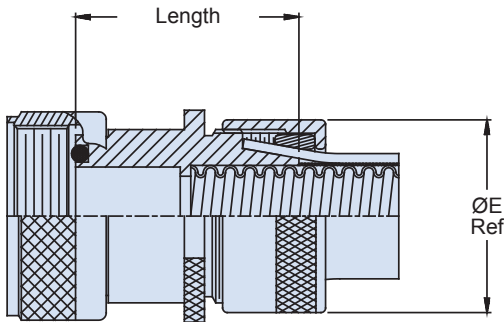
Conduit to Transition or End Fitting Adapter with Ground Ring Shield Termination for Series 74 Helical Convuluted Tubing



Series 74  
Helical Tubing



Types D & E  
Non-Environmental



Type G  
Environmental

Thread Dash No.	A Thread Class 2B	Ø B Max	Ø C	Max Dash No. Table IV
06	7/16 - 28 UNEF	.640 (16.3)	.188 (4.8)	06
09	9/16 - 24 UNEF	.690 (17.5)	.281 (7.1)	09
10	9/16 - 24 UNEF	.690 (17.5)	.312 (7.9)	10
12	5/8 - 24 UNEF	.760 (19.3)	.375 (9.5)	12
14	11/16 UNEF	.890 (22.6)	.438 (11.1)	14
16	3/4 - 20 UNEF	.890 (22.6)	.500 (12.7)	16
20	7/8 - 20 UNEF	1.024 (26.0)	.625 (15.9)	20
24	1 - 20 UNEF	1.152 (29.3)	.750 (19.1)	24
28	13/16 - 18 UNEF	1.363 (34.6)	1.000 (25.4)	28
32	115/16 - 18 UNEF	1.488 (37.8)	1.250 (31.8)	32
40	1 1/2 - 18 UNEF	1.676 (42.6)	2.500 (63.5)	40
48	1 3/4 - 18 UNS	1.960 (49.8)	1.500 (38.1)	48
56	2 - 18 UNS	2.210 (56.1)	1.750 (44.5)	56
64	2 1/4 - 16 UN	2.460 (62.5)	2.000 (50.8)	64

Dash No.	Conduit I.D.		Ø D Max	Ø E Max
	Min	Max		
06	.181 (4.6)	.188 (4.8)	1.09 (27.7)	.780 (19.8)
09	.273 (6.9)	.281 (7.1)	1.16 (29.5)	1.03 (26.2)
10	.306 (7.8)	.312 (7.9)	1.22 (31.0)	1.03 (26.2)
12	.359 (9.1)	.375 (9.5)	1.28 (32.5)	1.03 (26.2)
14	.427 (10.8)	.437 (11.1)	1.34 (34.0)	1.22 (31.0)
16	.480 (12.2)	.500 (12.7)	1.41 (35.8)	1.28 (32.5)
20	.603 (15.3)	.625 (15.9)	1.53 (38.9)	1.41 (35.8)
24	.725 (18.4)	.750 (19.1)	1.66 (42.2)	1.53 (38.9)
28	.860 (21.8)	.875 (22.2)	1.78 (45.2)	1.71 (43.3)
32	.970 (24.6)	1.000 (25.4)	1.91 (48.5)	1.84 (46.7)
40	1.205 (30.6)	1.250 (31.8)	2.28 (57.9)	2.16 (54.9)
48	1.437 (36.5)	1.500 (38.1)	2.59 (65.8)	2.46 (62.5)
56	1.688 (42.9)	1.750 (44.5)	2.91 (73.9)	2.78 (70.6)
64	1.937 (49.2)	2.000 (50.8)	3.03 (77.0)	3.03 (77.0)

Sym	Material	Finish Description
B	AL Alloy	Olive Drab over Cadmium Plate
J		Gold Iridite over Cadmiup Plate over Nickel
M		Electroless Nickel
N		Olive Drab over Cadmium Plate over Nickel
NC		Zinc-Cobalt, Olive Drab
NF		Olive Drab over Cadmium Plate over Electroless Nickel (500 Hour Salt Spray)
T	Bright Dip Cadmium Plate over Nickel	
Z1	300 Series SST	Passivate

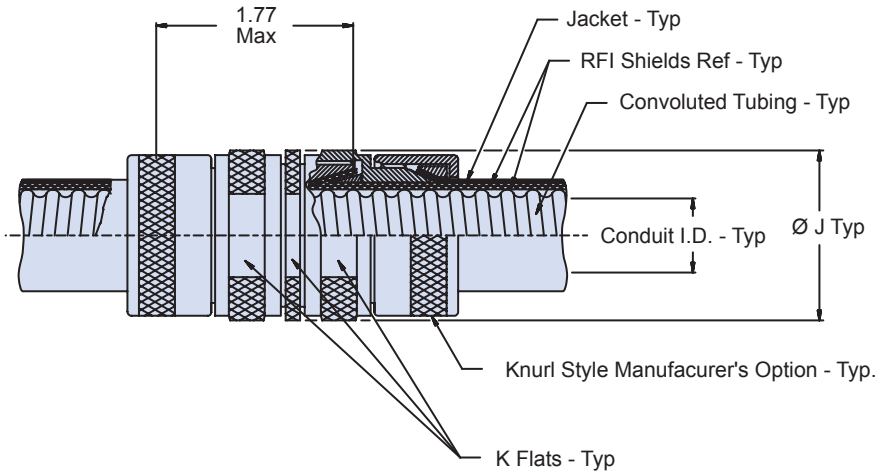
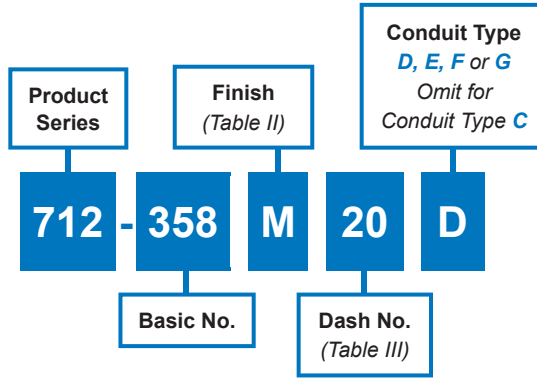
Conduit Type	Part Number	Configuration
C	121-100	Tubing with braided shield and jacket
D	121-101	Tubing with braided shield
E	121-102	Tubing with two braided shields
F	121-103	Tubing with two braided shields and jacket
G	123-100	Tubing with jacket



712-358  
Heavy Duty System  
Conduit to Conduit Splice Kit  
for Glenair Series 74 Convuluted Tubing

Heavy-Duty System user installable splice kit

How To Order



**Material/Finish**

- Adapters, nuts, and ferrules: Al Alloy/See Table II
- O-Rings: Silicone/N.A.

712-358  
**Heavy Duty System**  
**Conduit to Conduit Splice Kit**  
for Glenair Series 74 Convuluted Tubing



**Table II: Finish**

Sym	Tubing Material
M	Electroless Nickel Per MIL-C-26074, Class I, Grade B
NF	Cadmium, Olive Drab, Per Qq-P-416, Type II Class 3 Over Electroless Nickel Per Mil-C-26074, Class I, Grade B

**Table III: Dimensions**

Dash No.	Conduit I.D.		Ø J Max	K Flats
	Min	Max		
06	.181 (4.6)	.188 (4.8)	1.09 (27.7)	.937 (23.8)
09	.273 (6.9)	.281 (7.1)	1.16 (29.5)	1.000 (25.4)
10	.306 (7.8)	.312 (7.9)	1.22 (31.0)	1.062 (27.0)
12	.359 (9.1)	.375 (9.5)	1.28 (32.5)	1.125 (28.6)
14	.427 (10.8)	.437 (11.1)	1.34 (34.0)	1.187 (30.1)
16	.480 (12.2)	.500 (12.7)	1.41 (36.6)	1.250 (31.8)
20	.603 (15.3)	.625 (15.9)	1.53 (38.9)	1.375 (34.9)
24	.725 (18.4)	.750 (19.1)	1.66 (42.2)	1.500 (38.1)
28	.860 (21.8)	.875 (22.2)	1.78 (45.2)	1.625 (41.3)
32	.970 (24.6)	1.000 (25.4)	1.91 (48.5)	1.750 (44.5)
40	1.205 (30.6)	1.250 (31.8)	2.28 (57.9)	2.125 (54.0)
48	1.437 (36.5)	1.500 (38.1)	2.59 (65.8)	2.437 (61.9)
56	1.688 (42.9)	1.750 (44.5)	2.91 (73.9)	2.750 (69.9)
64	1.937 (49.2)	2.000 (50.8)	3.03 (77.0)	2.875 (73.0)

**Table IV: Conduit Type**

Conduit Type	Part Number	Configuration
C	121-100	Tubing with braided shield and jacket
D	121-101	Tubing with braided shield
E	121-102	Tubing with two braided shields
F	121-103	Tubing with two braided shields and jacket
G	123-100	Tubing with jacket

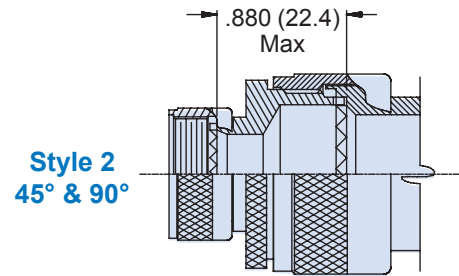
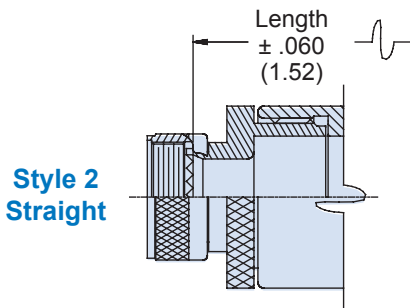
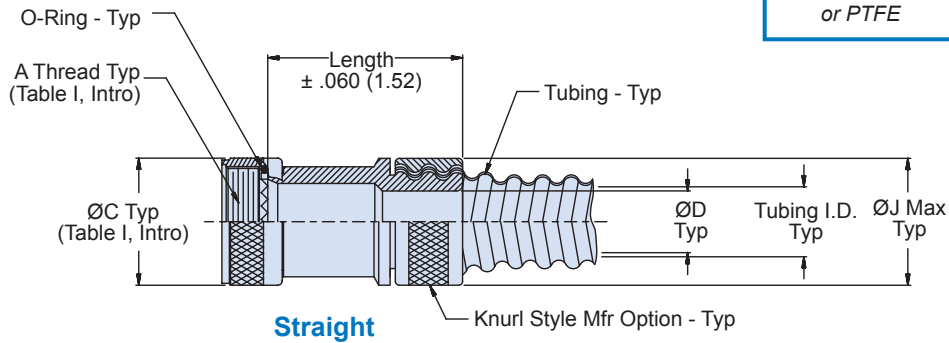
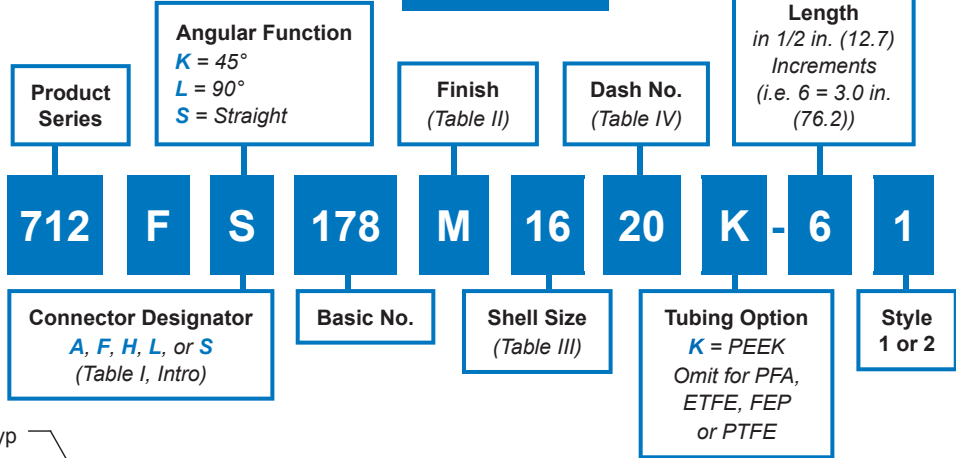


**712-178**  
**Hammer Nut System**  
Conduit to Connector Backshell  
for Standard or PEEK Series 74 Helical Convuluted Tubing

**Metal backshell with compression hammer nut for easy termination of conduit.**  
**Available for use with a wide range of connectors**



**How To Order**



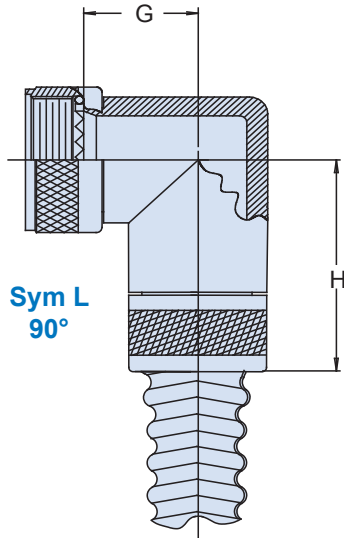
**Material/Finish**

- Adapters, elbows, coupling nuts, and ferrules: See Table II
- O-Rings: Silicone/N.A.

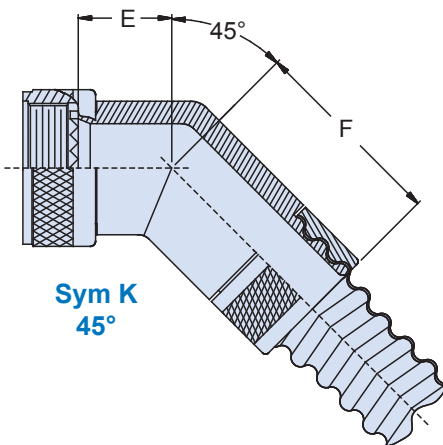
**Notes**

- When tubing I.D. max exceeds inside diameter of connector shell, style 2 may be supplied. Refer to Intro, pages A-32 – A-33.
- O-Ring not supplied with connector designator A.
- Standard minimum length for Style I is 1.50 inch, for Style II is 2.00 inches. Consult factory for shorter lengths. Note: applies to Symbol S, Straight, only.

**712-178**  
**Hammer Nut System**  
 Conduit to Connector Backshell  
 for Standard or PEEK Series 74 Helical Convoluted Tubing



Shell Size		E		F		G		H	
A, F, L, S	H	Max		Max		Max		Max	
08	09	.639	(16.2)	.950	(24.1)	.750	(19.1)	1.060	(26.9)
10	11	.664	(16.9)	.980	(24.9)	.810	(20.6)	1.120	(28.4)
12	13	.688	(17.5)	1.000	(25.4)	.870	(22.1)	1.180	(30.0)
14	15	.705	(17.9)	1.030	(26.2)	.920	(23.4)	1.250	(31.8)
16	17	.732	(18.6)	1.050	(26.7)	.980	(24.9)	1.310	(33.3)
18	19	.748	(19.0)	1.060	(26.9)	1.020	(25.9)	1.330	(33.8)
20	21	.773	(19.6)	1.080	(27.4)	1.080	(27.4)	1.390	(35.3)
22	23	.800	(20.3)	1.120	(28.4)	1.140	(29.0)	1.470	(37.3)
24	25	.823	(20.9)	1.150	(29.2)	1.200	(30.5)	1.540	(39.1)
28	-	1.041	(26.4)	1.320	(33.5)	1.480	(37.6)	1.780	(45.2)
32	-	1.092	(27.7)	1.360	(34.5)	1.610	(40.9)	1.870	(47.5)
36	-	1.138	(28.9)	1.410	(35.8)	1.720	(43.7)	1.980	(50.3)



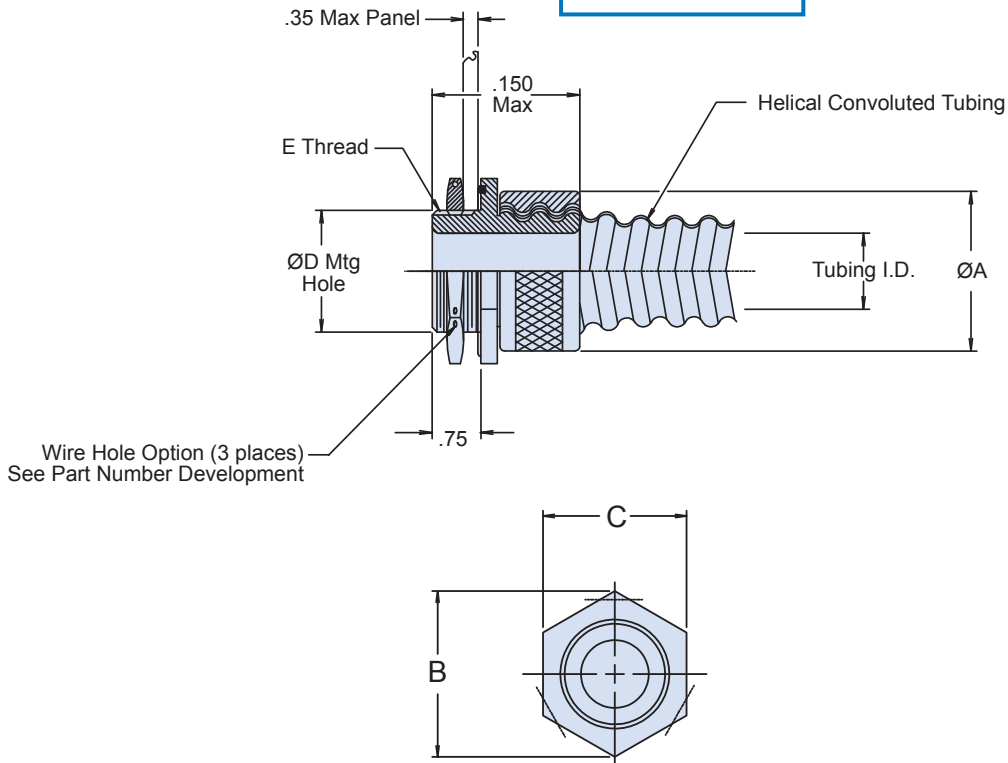
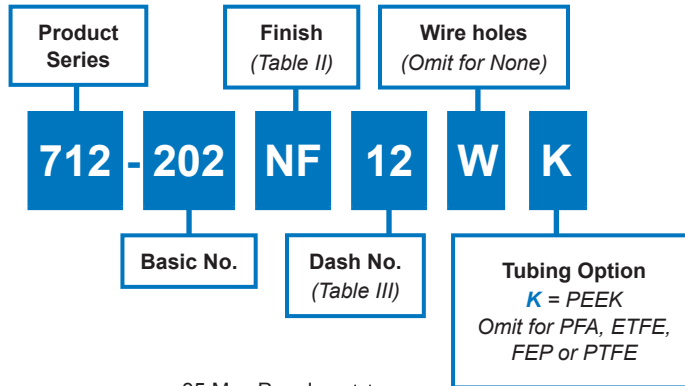
Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZW	300 Series SST	Cad O.D. Over Electroless Nickel

Dash No.	Tubing I.D.		D Dia		J Dia
	Min	Max	Std Teflon	PEEK	Max
06	.181 (4.60)	.188 (4.80)	.188 (4.8)	.115 (2.9)	.530 (13.5)
09	.273 (6.93)	.281 (7.14)	.265 (6.7)	.210 (5.3)	.590 (15.0)
10	.306 (7.80)	.312 (7.90)	.265 (6.7)	.235 (6.0)	.660 (16.8)
12	.364 (9.20)	.375 (9.53)	.325 (8.3)	.320 (8.1)	.710 (18.0)
14	.427 (10.8)	.437 (11.1)	.390 (9.9)	.365 (9.3)	.780 (19.8)
16	.485 (12.3)	.500 (12.7)	.470 (11.9)	.425 (10.8)	.840 (21.3)
20	.608 (15.4)	.625 (15.9)	.595 (15.1)	.550 (14.0)	.970 (24.6)
24	.730 (18.5)	.750 (19.1)	.735 (18.7)	.680 (17.3)	1.160 (29.5)
28	.860 (21.8)	.875 (22.2)	.875 (22.2)	.790 (20.1)	1.310 (33.3)
32	.975 (24.8)	1.000 (25.4)	.975 (24.8)	.915 (23.2)	1.410 (35.8)
40	1.210 (30.7)	1.250 (31.8)	1.192 (30.3)	1.165 (29.6)	1.720 (43.7)
48	1.437 (36.5)	1.500 (38.1)	1.445 (36.7)	1.415 (35.9)	2.010 (51.1)
56	1.688 (42.9)	1.750 (44.5)	1.690 (42.9)	1.660 (42.2)	2.280 (57.9)
64	1.937 (49.2)	2.000 (50.8)	2.000 (50.8)	1.905 (48.4)	2.420 (61.5)



**Hummer nut system convoluted tubing-to-bulkhead fitting**

**How To Order**



**Material/Finish/Notes**

- Adapter, Jam nut, nut - Al Alloy or 300 Series Stainless Steel/See Table II
- O-Rings - Silicone/N.A.,
- For effective grounding, connector with conductive finish should be used.

712-202  
**Hummer Nut System**  
**Conduit to Bulkhead Fitting**



Table II: Finish	
Sym	Finish
B	Cadmium Plate/Olive Drab
C	Anodize, Black (Non-Conductive)
J	Gold Iridite over Cadmium Plate over Nickel
M	Electroless Nickel
N	Cadmium Plate/Olive Drab over Nickel
NF	Cadmium Plate/Olive Drab over Electroless Nickel (1000 Hour salt spray)
T	Bright Dip Cadmium over Nickel
Z1	Passivate (300 Series CRES) Per AMS-2700, Type 6

Table II: Dash No./Dimensions							
Dash No.	Tubing I.D.		A Dia Max	B Dim	C Dim	D Dia +.015 -.000	E Thread Class 2A
	Min	Max					
06	0.181 (4.6)	0.188 (4.8)	0.729 (18.5)	0.72 (18.3)	0.625 (15.9)	0.448 (11.4)	7/16-28 UNEF
09	0.273 (6.9)	0.281 (7.1)	0.821 (20.9)	0.80 (20.3)	0.688 (17.5)	0.510 (13.0)	1/2-28 UNEF
10	0.306 (7.8)	0.312 (7.9)	0.852 (21.6)	0.87 (22.1)	0.750 (19.1)	0.572 (14.5)	9/16-24 UNEF
12	0.359 (9.1)	0.375 (9.5)	0.915 (23.2)	0.94 (23.9)	0.812 (20.6)	0.635 (16.1)	5/8-24 UNEF
14	0.427 (10.8)	0.437 (11.1)	0.978 (24.8)	1.01 (25.7)	0.875 (22.2)	0.697 (17.7)	11/16-24 UNEF
16	0.480 (12.2)	0.500 (12.7)	1.040 (26.4)	1.09 (27.7)	0.938 (23.8)	0.760 (19.3)	3/4-20 UNEF
20	0.603 (15.3)	0.625 (15.9)	1.165 (29.6)	1.23 (31.2)	1.062 (27.0)	0.885 (22.5)	7/8-20 UNEF
24	0.725 (18.4)	0.750 (19.1)	1.290 (32.8)	1.44 (36.6)	1.250 (31.8)	1.010 (25.7)	1-20 UNEF
28	0.860 (21.8)	0.875 (22.2)	1.415 (35.9)	1.59 (40.4)	1.375 (34.9)	1.135 (28.8)	11/8-18 UNEF
32	0.970 (24.6)	1.000 (25.4)	1.540 (39.1)	1.73 (43.9)	1.500 (38.1)	1.260 (32.0)	11/4-18 UNEF
40	1.205 (30.6)	1.250 (31.8)	1.790 (45.5)	2.02 (51.3)	1.750 (44.5)	1.510 (38.4)	11/2-18 UNEF
48	1.437 (36.5)	1.500 (38.1)	2.040 (51.8)	2.32 (58.9)	2.000 (50.8)	1.760 (44.7)	1 3/4-18 UNS
56	1.688 (42.9)	1.750 (44.5)	2.290 (58.2)	2.53 (64.3)	2.187 (55.5)	2.010 (51.1)	2-18 UNS
64	1.937 (49.2)	2.000 (50.8)	2.540 (64.5)	2.87 (72.9)	2.437 (61.9)	2.260 (57.4)	2 1/4-16 UN

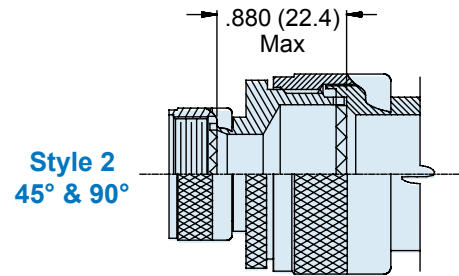
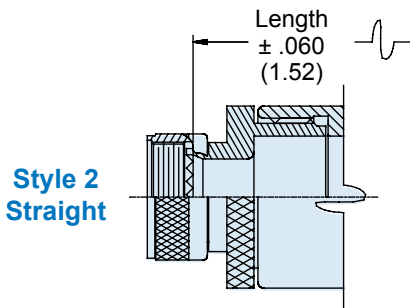
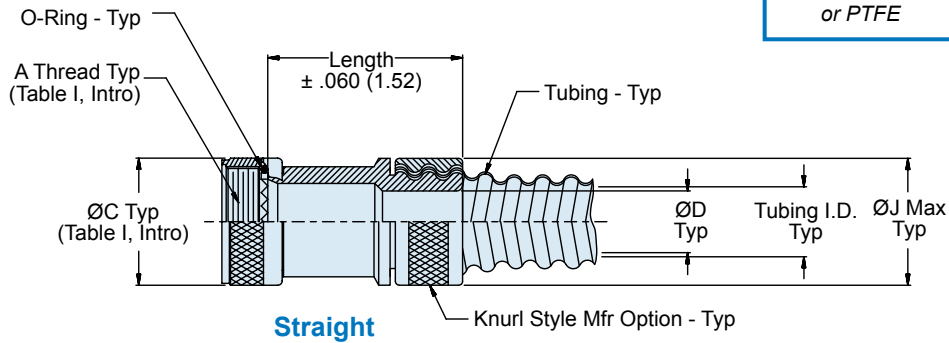
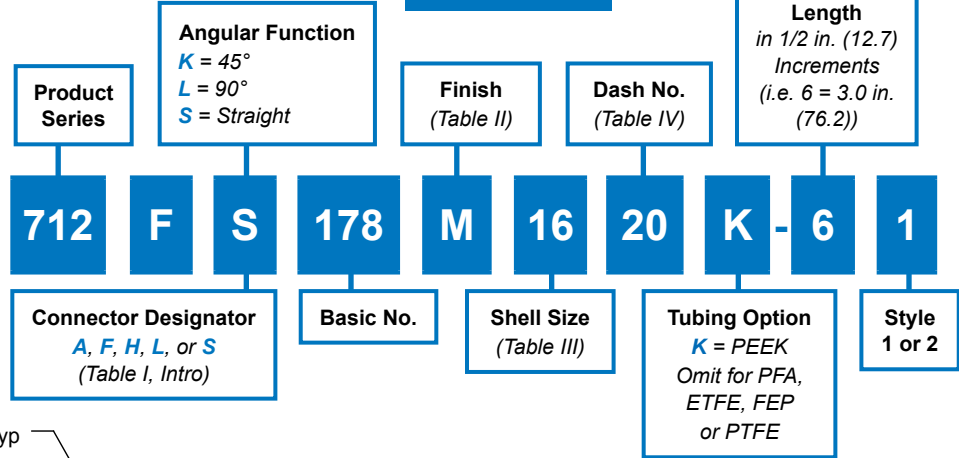


**712-178**  
**Hammer Nut System**  
Conduit to Connector Backshell  
for Standard or PEEK Series 74 Helical Convoluted Tubing

**Metal backshell with compression hammer nut for easy termination of conduit.**  
**Available for use with a wide range of connectors**



**How To Order**



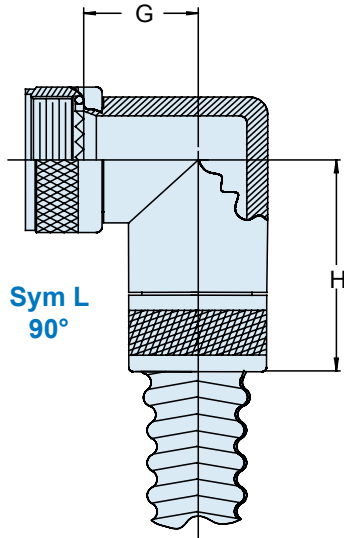
**Material/Finish**

- Adapters, elbows, coupling nuts, and ferrules: See Table II
- O-Rings: Silicone/N.A.

**Notes**

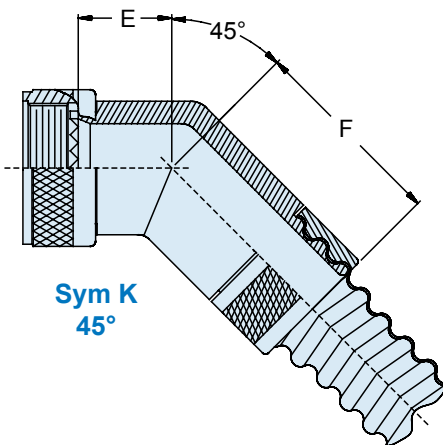
- When tubing I.D. max exceeds inside diameter of connector shell, style 2 may be supplied. Refer to Intro, pages A-32 – A-33.
- O-Ring not supplied with connector designator A.
- Standard minimum length for Style I is 1.50 inch, for Style II is 2.00 inches. Consult factory for shorter lengths. Note: applies to Symbol S, Straight, only.

**712-178**  
**Hammer Nut System**  
 Conduit to Connector Backshell  
 for Standard or PEEK Series 74 Helical Convoluted Tubing



**Table III: Shell Size/Dimensions**

Shell Size		E		F		G		H	
A, F, L, S	H	Max		Max		Max		Max	
08	09	.639	(16.2)	.950	(24.1)	.750	(19.1)	1.060	(26.9)
10	11	.664	(16.9)	.980	(24.9)	.810	(20.6)	1.120	(28.4)
12	13	.688	(17.5)	1.000	(25.4)	.870	(22.1)	1.180	(30.0)
14	15	.705	(17.9)	1.030	(26.2)	.920	(23.4)	1.250	(31.8)
16	17	.732	(18.6)	1.050	(26.7)	.980	(24.9)	1.310	(33.3)
18	19	.748	(19.0)	1.060	(26.9)	1.020	(25.9)	1.330	(33.8)
20	21	.773	(19.6)	1.080	(27.4)	1.080	(27.4)	1.390	(35.3)
22	23	.800	(20.3)	1.120	(28.4)	1.140	(29.0)	1.470	(37.3)
24	25	.823	(20.9)	1.150	(29.2)	1.200	(30.5)	1.540	(39.1)
28	-	1.041	(26.4)	1.320	(33.5)	1.480	(37.6)	1.780	(45.2)
32	-	1.092	(27.7)	1.360	(34.5)	1.610	(40.9)	1.870	(47.5)
36	-	1.138	(28.9)	1.410	(35.8)	1.720	(43.7)	1.980	(50.3)



**Table II: Finish**

Sym	Material	Finish Description
M	Aluminum Alloy	Electroless Nickel
MT	Aluminum Alloy	Nickel-PTFE
NF	Aluminum Alloy	Cad/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
Z1	300 Series SST	Passivate
ZM	300 Series SST	Electroless Nickel
ZN	Aluminum Alloy	Zinc Nickel/O.D. Over Electroless Nickel (1,000 Hour Salt Spray)
ZW	300 Series SST	Cad O.D. Over Electroless Nickel

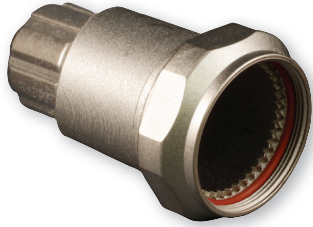
**Table IV: Dash No./Tubing Size**

Dash No.	Tubing I.D.		D Dia		J Dia Max
	Min	Max	Std Fluoropolymer	PEEK	
06	.181 (4.60)	.188 (4.80)	.188 (4.8)	.115 (2.9)	.530 (13.5)
09	.273 (6.93)	.281 (7.14)	.265 (6.7)	.210 (5.3)	.590 (15.0)
10	.306 (7.80)	.312 (7.90)	.265 (6.7)	.235 (6.0)	.660 (16.8)
12	.364 (9.20)	.375 (9.53)	.325 (8.3)	.320 (8.1)	.710 (18.0)
14	.427 (10.8)	.437 (11.1)	.390 (9.9)	.365 (9.3)	.780 (19.8)
16	.485 (12.3)	.500 (12.7)	.470 (11.9)	.425 (10.8)	.840 (21.3)
20	.608 (15.4)	.625 (15.9)	.595 (15.1)	.550 (14.0)	.970 (24.6)
24	.730 (18.5)	.750 (19.1)	.735 (18.7)	.680 (17.3)	1.160 (29.5)
28	.860 (21.8)	.875 (22.2)	.875 (22.2)	.790 (20.1)	1.310 (33.3)
32	.975 (24.8)	1.000 (25.4)	.975 (24.8)	.915 (23.2)	1.410 (35.8)
40	1.210 (30.7)	1.250 (31.8)	1.192 (30.3)	1.165 (29.6)	1.720 (43.7)
48	1.437 (36.5)	1.500 (38.1)	1.445 (36.7)	1.415 (35.9)	2.010 (51.1)
56	1.688 (42.9)	1.750 (44.5)	1.690 (42.9)	1.660 (42.2)	2.280 (57.9)
64	1.937 (49.2)	2.000 (50.8)	2.000 (50.8)	1.905 (48.4)	2.420 (61.5)

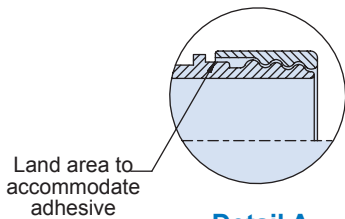
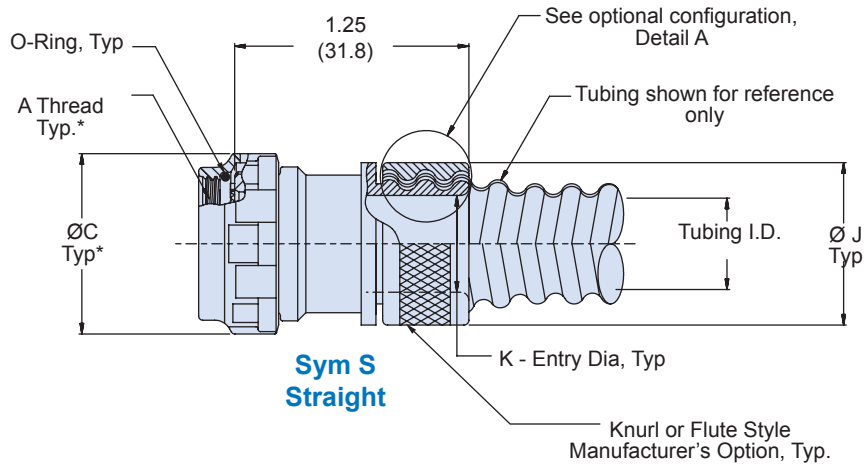
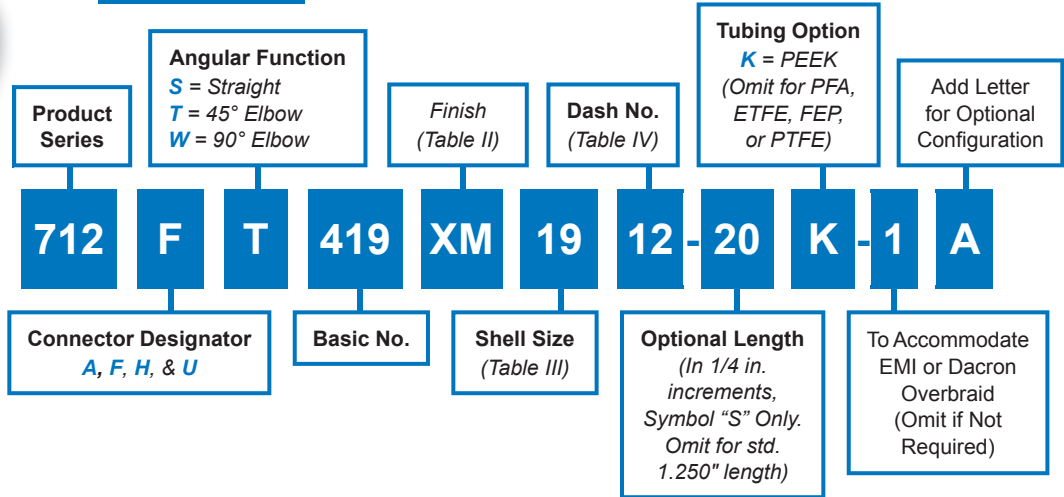


**712-419**  
**Lightweight Composite Hummer-Nut System**  
Composite Backshell for Series 74 Helical Convoluted Tubing,  
Shielding Optional

**Lightweight Composite Hummer Nut conduit-to-connector backshell**



**How To Order**



**Detail A**  
Optional adhesive land configuration, see P/N

**Material/Finish**

- Adapters, elbows, ferrules, coupling nuts: High grade engineering thermoplastic/ See Table II
- O-Ring: Silicone/NA

**Assembly Notes**

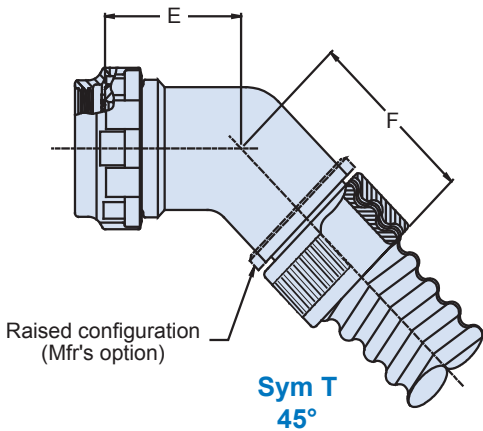
- Nominal I.D. of PEEK tubing adapters are reduced by approximately .060 in.
- For permanent installation use 3M Scotch Weld Tape after installing tubing/shield.
- O-Ring not supplied with connector designator A
- \* See composite catalog for front end dimensions



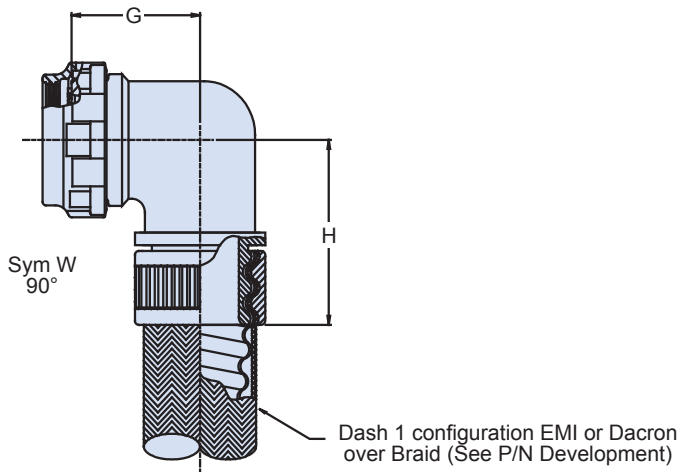
**712-419**  
**Lightweight Composite Hammer-Nut System**  
 Composite Backshell for Series 74 Helical Convuluted Tubing,  
 Shielding Optional



Shell Size		E	F	G	H	Tubing Size
A, F, & H	G & U	± .06 (1.5)	± .09 (2.3)	± .06 (1.5)	± .09 (2.3)	Max.
08, 09	-	.72 (18.3)	.89 (22.6)	.69 (17.5)	1.11 (28.2)	09
3, 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



Dash No.	Conduit I.D.	Ø J Max	Ø K Entry
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 (53.3)	1.08 (27.4)
48	1.500 (38.1)	2.13 (54.1)	1.32 (33.5)



Sym	Finish
XM	Electroless Nickel
XW	Cadmium Olive Drab over Electroless Nickel
XB	No Plating - Black Material
XO	No Plating - Natural, Non-conductive

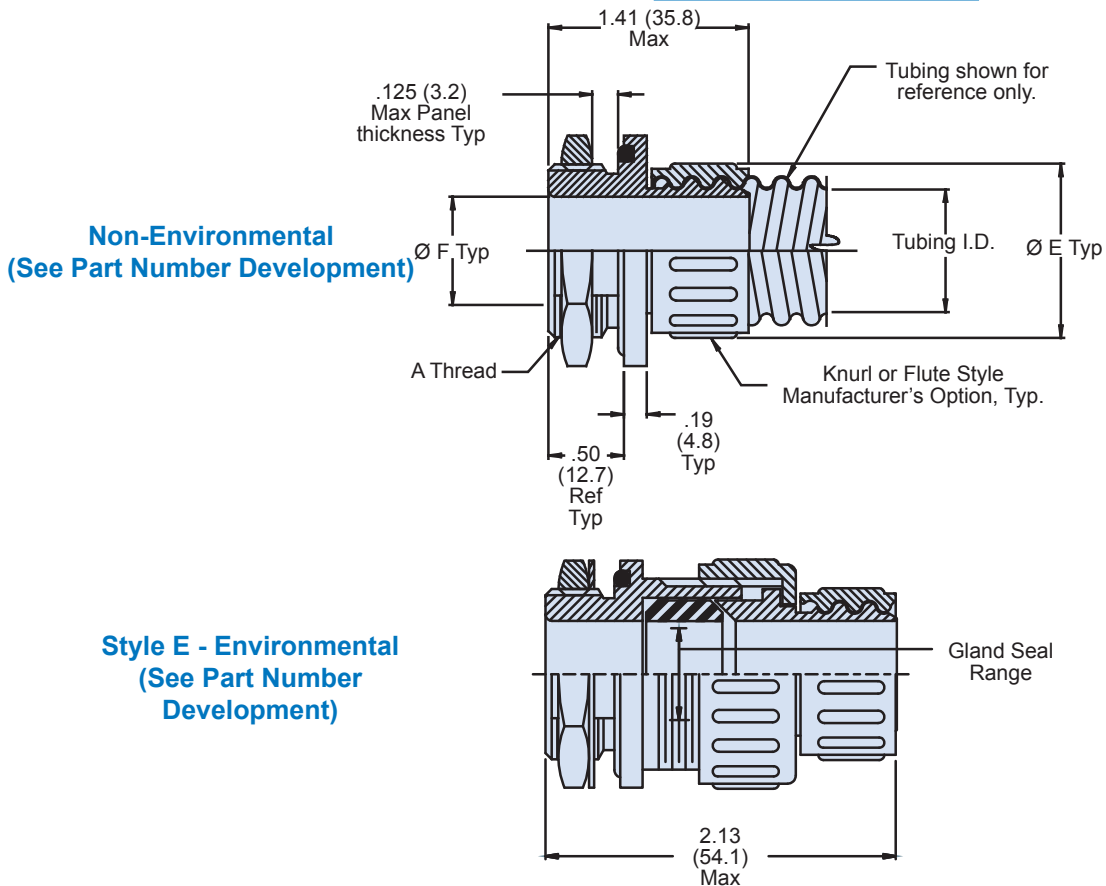
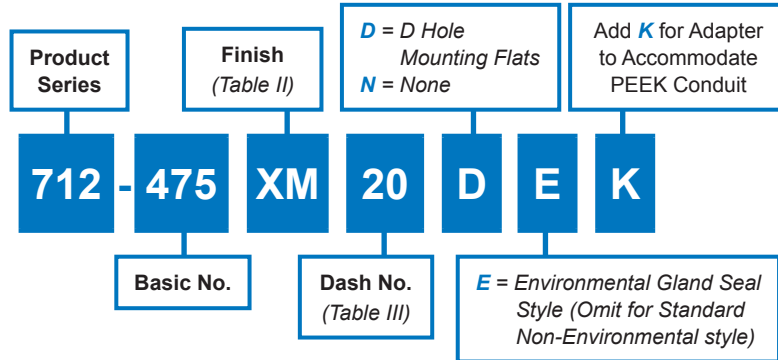


712-475

**Lightweight Composite Hummer-Nut System**  
Bulkhead Fitting, Environmental or Non-Environmental  
for Series 74 PEEK or Standard Tubing

**Lightweight Composite Hummer-Nut convoluted tubing-to-bulkhead fitting**

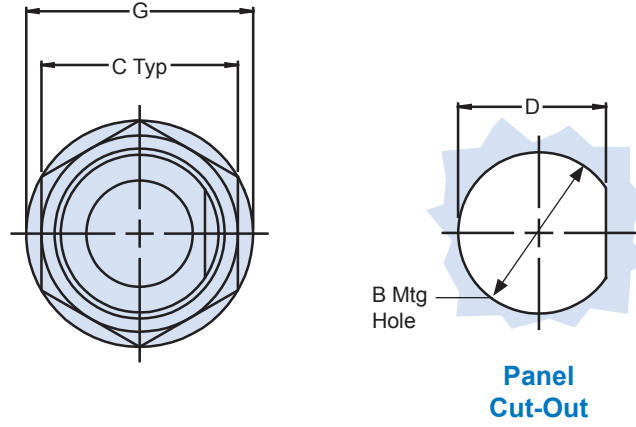
**How To Order**



**Material/Finish**

- Adapters, jam nuts, ferrules: High grade engineering thermoplastic/See Table II
- O-Ring, Gland seal: Silicone/NA
- Washer: CRES/Passivated

**712-475**  
**Lightweight Composite Hummer-Nut System**  
**Bulkhead Backshell for Environmental or**  
**Non-Environmental for Series 74 PEEK or Standard Tubing**



**Table III: Dash No./Dimensions**

Dash No.	A Thread Class 2A	Ø B ± .015 - .000	C Across Flats	D + .000 - .015	Ø E Max	Ø F Max	Ø G Max	H ± .005	Tubing I.D.		Gland Seal Range	
									Min	Max	Min	Max
06	M16 X 1.5	.640 (16.3)	.875 (22.2)	.595 (15.1)	.500 (12.7)	.162 (4.10)	1.02 (25.9)	.570 (14.5)	.181 (4.60)	.187 (4.70)	.156 (4.00)	.250 (6.40)
09	M16 X 1.5	.640 (16.3)	.875 (22.2)	.595 (15.1)	.600 (15.2)	.244 (6.20)	1.02 (25.9)	.570 (14.5)	.273 (6.90)	.281 (7.10)	.156 (4.00)	.250 (6.40)
10	M16 X 1.5	.640 (16.3)	.875 (22.2)	.595 (15.1)	.630 (16.0)	.274 (7.00)	1.02 (25.9)	.570 (14.5)	.306 (7.80)	.312 (7.90)	.156 (4.00)	.250 (6.40)
12	M16 X 1.5	.640 (16.3)	.875 (22.2)	.595 (15.1)	.700 (17.8)	.326 (8.30)	1.02 (25.9)	.570 (14.5)	.364 (9.20)	.375 (9.5)	.188 (4.80)	.312 (7.90)
14	M20 X 1.5	.802 (20.4)	1.062 (27.0)	.752 (19.1)	.760 (19.3)	.382 (9.70)	1.18 (30.0)	.727 (18.5)	.427 (10.8)	.437 (11.1)	.250 (6.40)	.438 (11.1)
16	M20 X 1.5	.802 (20.4)	1.062 (27.0)	.752 (19.1)	.850 (21.6)	.434 (11.0)	1.18 (30.0)	.727 (18.5)	.485 (12.3)	.500 (13.0)	.250 (6.40)	.438 (11.1)
20	M27 X 2.0	1.078 (27.4)	1.312 (33.3)	1.029 (26.1)	.970 (24.6)	.539 (13.7)	1.45 (36.8)	1.004 (25.5)	.608 (15.4)	.625 (15.9)	.375 (9.50)	.625 (15.9)
22	1-20 UNEF	1.005 (25.5)	1.312 (33.3)	.937 (23.8)	1.00 (25.4)	.649 (16.5)	1.39 (35.3)	.912 (23.2)	.608 (15.4)	.625 (15.9)	.375 (9.5)	.625 (15.9)
24	1-20 UNEF	1.005 (25.5)	1.312 (33.3)	.937 (23.8)	1.140 (29.0)	.649 (16.5)	1.39 (35.3)	.912 (23.2)	.730 (18.5)	.750 (19.1)	.375 (9.50)	.625 (15.9)
28	M27 X 2.0	1.078 (27.4)	1.312 (33.3)	1.029 (26.1)	1.280 (32.5)	.769 (19.5)	1.45 (36.8)	1.004 (25.5)	.860 (21.8)	.875 (22.2)	.438 (11.1)	.750 (19.1)
32	M36 X 2.0	1.437 (36.5)	1.750 (44.5)	1.403 (35.6)	1.450 (36.8)	.868 (22.0)	1.81 (46.0)	1.370 (34.8)	.975 (24.8)	1.000 (25.4)	.625 (15.9)	.938 (23.8)
40	1 1/2-18 UNEF	1.505 (38.2)	1.750 (44.5)	1.437 (36.5)	1.760 (44.7)	1.078 (27.4)	1.89 (48.0)	1.412 (35.9)	1.210 (30.7)	1.250 (31.8)	.875 (22.2)	1.250 (31.8)
48	1 3/4-18 UNEF	1.755 (44.6)	2.000 (50.8)	1.687 (42.8)	2.060 (52.3)	1.200 (30.5)	2.14 (54.4)	1.662 (42.2)	1.437 (36.5)	1.500 (38.1)	1.000 (25.4)	1.375 (34.9)
56	2-18 UNS	2.005 (50.9)	2.250 (57.2)	1.937 (49.2)	2.390 (60.7)	1.400 (35.6)	2.39 (60.7)	1.912 (48.6)	1.688 (42.9)	1.750 (44.5)	1.250 (31.8)	1.625 (41.3)
64	2 1/4 - 16 UN	2.255 (57.3)	2.500 (63.5)	2.187 (55.5)	2.570 (65.3)	1.600 (40.6)	2.64 (67.1)	2.162 (54.9)	1.937 (49.2)	2.000 (50.8)	1.250 (31.8)	1.625 (41.3)

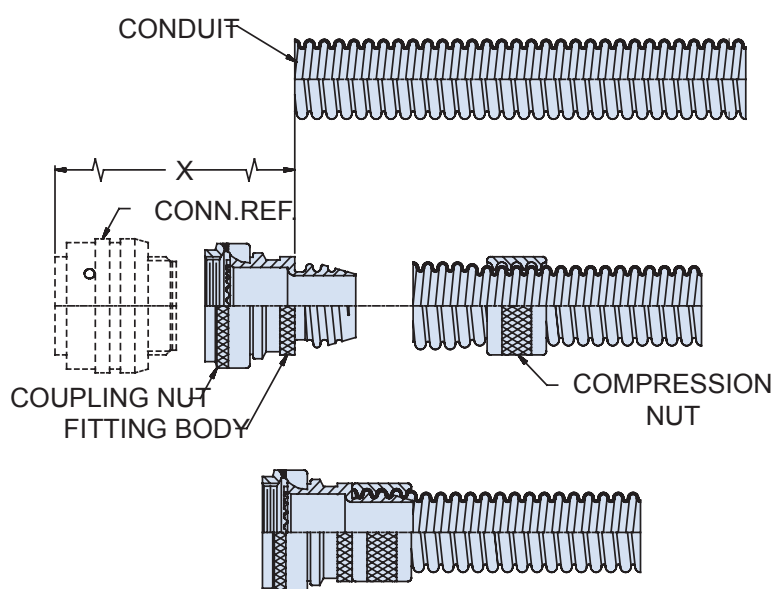
**Table II: Finish**

Sym	Finish
XM	Electroless Nickel
XW	Cadmium Olive Drab over Electroless Nickel
XB	No Plating - Black Material
XO	No Plating - Natural, Non-conductive

## Hummer Nut System Fittings

### Pre-Assembly Preparation

1. Determine overall conduit assembly length required from connector face to connector face. From this dimension, establish conductor length needed for connector termination and add two inches.
2. Temporarily assemble connectors to adapters and hand tighten. Establish and deduct the "X" dimension(s) from the overall assembly length in Step 1.
3. Disassemble fitting from connector. Prepare conduit and assemble to adapters per instructions below for the fitting series used.

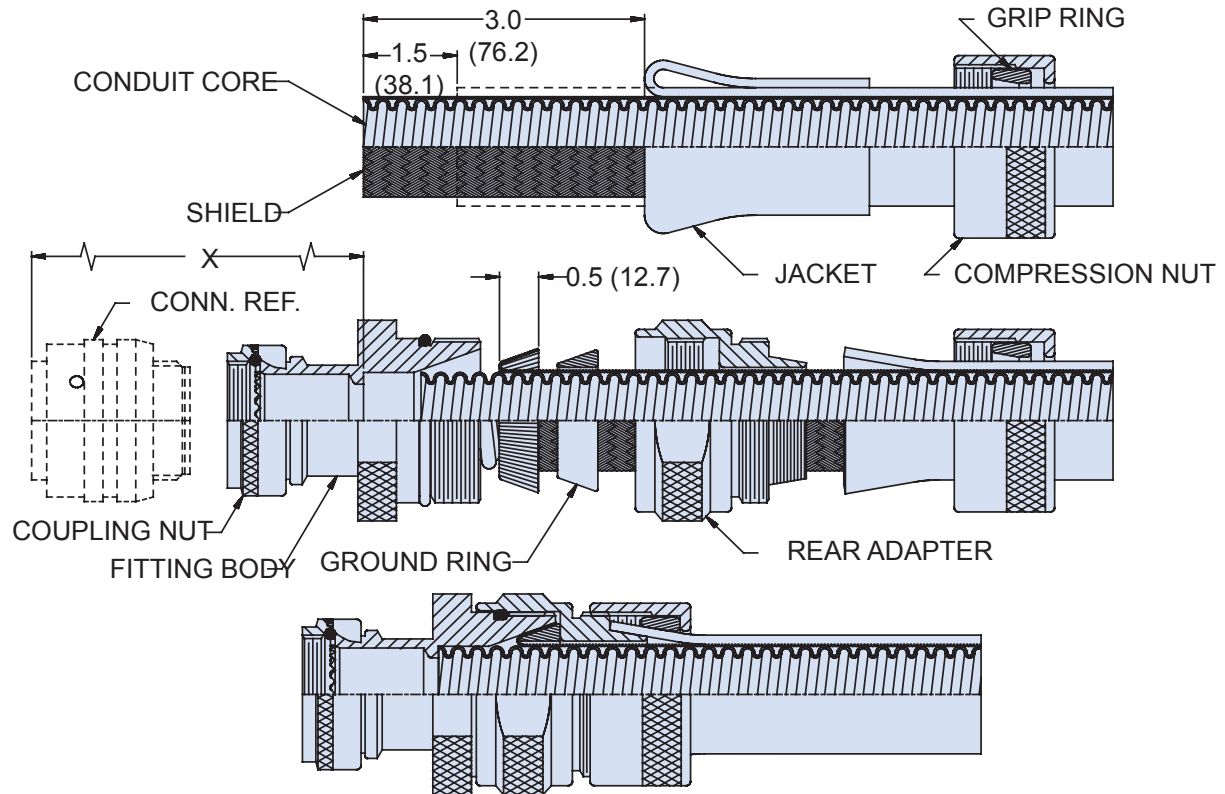


### Fitting/Conduit Assembly

1. Cut the conduit to length per pre-assembly preparation step 2 using conduit shears or an equivalent. Trim conduit perpendicular to the bore.
2. Thread compression nut onto conduit approximately 1.0 inch (25.4 mm).
3. Expand conduit approximately .06 diameter. Thread onto rear of fitting body and bottom on shoulder.
4. Thread compression nut forward over conduit and bottom on shoulder. Torque to 35 to 50 inch pounds.
5. Prepare and terminate other end of conduit per above.

Glenair 600 series backshell assembly tools are recommended for assembly and installation. A catalog is available on request, or may be accessed on the internet at [www.glenair.com](http://www.glenair.com).

## Heavy-Duty Ground Ring System Fittings



### Pre-Assembly Preparation

1. Determine overall conduit assembly length required from connector face to connector face. From this dimension, establish conductor length needed for connector termination and add two inches.
2. Temporarily assemble connector to fitting and hand tighten. Establish and deduct the "X" dimension(s) from the overall assembly length in Step 1.
3. Disassemble fitting from connectors. Prepare conduit and assemble to fitting per instructions below.

### Fitting/Conduit Assembly

1. Cut conduit to length per pre-assembly preparation step 2 using conduit shears or an equivalent. Trim jacket back 1.0 inches from end taking care not to cut or nick shield underneath.
2. Slide compression nut and grip ring onto conduit.
3. Fold jacket back approximately 3.0 inches (76.2 mm). Silicone grease or other lubricant may be used to aid this process.

4. Trim conduit and the shield perpendicular to the bore. Inspect inside of conduit for trimmings or other foreign matter and remove. Slide rear adapter and ground ring over shield and back to folded jacket.
5. Fold back (or comb out and fold back) shield approximately 0.5 inch (1.3 mm). Slide conduit core into bore in fitting and bottom on shoulder at "X" dimension. Slide ground ring forward into tapered bore in fitting, capturing shield. (If shield has been "combed out", make sure the ends are equally displaced about the ring and not bunched) Trim shield at rear end of ground ring and remove trimmings.
6. Bring rear adapter forward, thread to fitting body and torque 30 to 50 inch pounds. Verify conduit is seated in bore.
7. Fold jacket forward over serrated cone. Trim jacket flush to 1/8 inch back from shoulder and remove any trimmings.
8. Bring grip ring and compression nut forward, thread to fitting body and torque to 30 to 50 inch pounds.

Glenair 600 series backshell assembly tools are recommended for assembly and installation. A catalog is available on request, or may be accessed on the internet at [www.glenair.com](http://www.glenair.com).