

**STARSHIELD™**

# **ZERO LENGTH SHIELD TERMINATION BACKSHELLS**

**FOR RUGGED EMI/RFI APPLICATIONS**

DECEMBER 2012



# WHAT IS STARSHIELD™ “ZERO LENGTH SHIELD TERMINATION?”

For decades, bundles of individually shielded cables have been used to solve many electrical system design issues from cross-talk to wire-routing/management and maintenance. These individual shields were frequently “pigtailed” by pulling the center conductors through the outer shield, or by soldering drain-wires to the shield, then terminating these pigtails or drain wires via a terminal lug to the cable-clamp on the back of the connector.

Pigtails or drain wires, suffer from several shortcomings. First, they force shield current to flow in an asymmetrical manner yielding higher transfer impedances. Second, and perhaps more importantly, the pigtail or drain-wire itself creates a “loop in the shield” or “standing antenna” effect. Coupled with the exposed lengths of unshielded wires, this condition acts as a receptor and/or radiator of noise. EMC performance will drop to unacceptable levels at higher frequencies dependent on the length of the pigtail. Over the years, more elegant methods of terminating pigtails or drain-wires have been developed that effectively shorten these lengths, however the underlying issue still exists—particularly in higher-bandwidth and less noise-tolerant applications which demand ever-shorter pigtail lengths for acceptable performance.

The best connection is one in which the individual shields are extended up to and make solid 360° connections to the backshell leaving no length of unshielded wires exposed outside of the ground plane. Effectively, this reduces the length of the pigtails or drain-wires to zero, and eliminates the standing antenna. Said another way, Zero Length Shield Termination may be achieved via a 360° termination of signal group shields (the individual shields over the wires or twisted pairs in a bundle) to an encapsulating ground in which no pigtails or drain wires are necessary to terminate the shields to the connector body or backshell.

Glenair’s StarShield “Zero Length Shield Termination” backshell methodology excludes pigtails or drain-wires altogether by providing termination platforms referred to as “ferrules” which allow individual shields to be terminated by a 360° solder connection in one easy process. The ferrules in-turn lock into a “star” that provide another 360° termination to the encapsulating ground plane of the backshell body. By eliminating the issues associated with pigtails or drain-wires, this system not only offers the highest level of EMC performance, but is also one of the most reliable, repairable individual shield termination methods on the market today.





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## StarShield™ Shield Termination Backshells

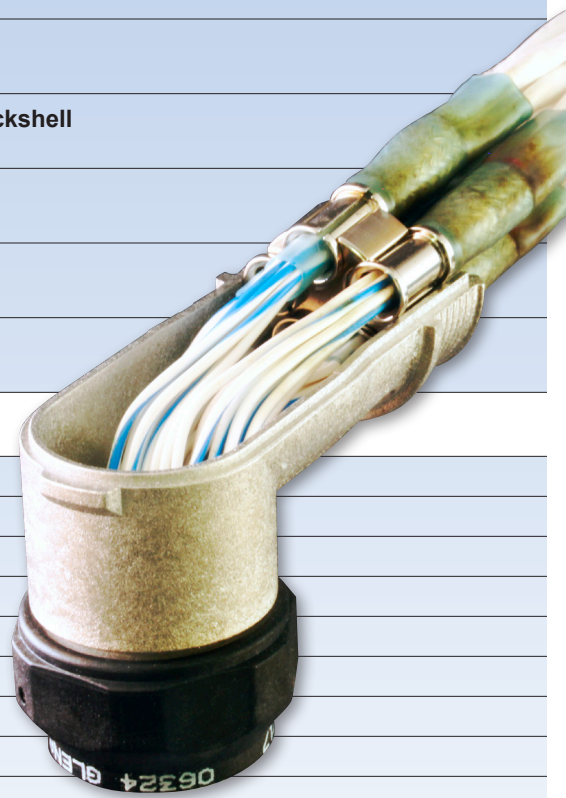
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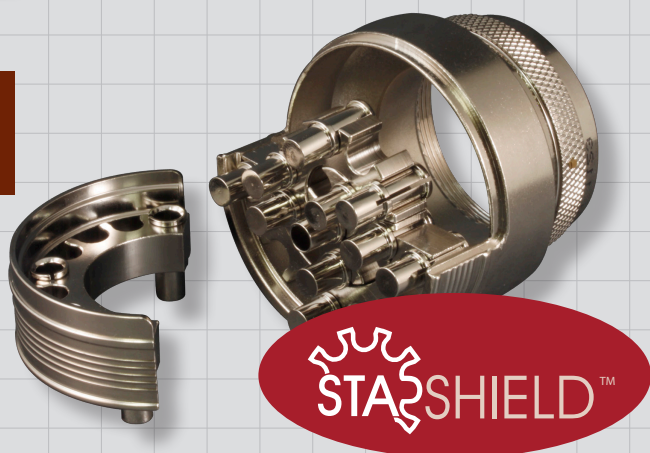
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## Introduction to StarShield™ Shield Termination Backshells

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### Product Features

- The unique StarShield™ configuration completely eliminates “standing antenna” problems common with pigtail shield termination systems.
- The backshell utilizes familiar heat shrink termination (HST) sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges.
- The StarShield™ system is available in a standard configuration featuring a threaded compression nut and a tapered split-ring that fits snugly into a conical backshell or a lightweight split banding version.
- Available fittings include EMI shield termination and shrink-boot backshells.

### “Zero Length” Individual Shield Termination Backshells

The Glenair Series 470-013 StarShield™ “Zero Length” Individual Shield Termination Backshell offers optimal grounding of EMI/EMP braided shielding. The unique StarShield™ configuration completely eliminates the need for the termination of additional shield drain wires or pigtails. The backshell utilizes familiar solder sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges. The internal configuration of the StarShield™ features a tapered split-ring that fits snugly into the conically machined backshell. Tightening the coupling nut in place effects 360° grounding of all conductive surfaces. Standard designs include banding and shrink-boot versions.

| Test Description         | StarShield™ Performance Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                | Procedure                                                                      |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Magnetic Permeability    | Relative permeability less than 2.0 for aluminum and 5.0 for stainless steel.                                                                                                                                                                                                                                                                                                                                                                                       | EIA-364.54                                                                     |
| DC resistance            | Resistance was measured between connector/fixture, and ferrule or a point near the end of the cable shield. Cable shield resistance was subtracted when measuring to a point near the end of the cable shield. The DC resistance did not exceed 5 milliohms after conditioning.                                                                                                                                                                                     | EIA-364.6                                                                      |
| Durability               | Backshells subjected to 10 cycles of assembly and disassembly (not including HST device). Showed no evidence of damage detrimental to performance.                                                                                                                                                                                                                                                                                                                  | GPS470013                                                                      |
| Temperature Cycling      | Condition IV, 5 cycles, except steps 2 and 4 were 2 minutes maximum duration. The temperature of step 1 was -65°C and temperature of step 3 was +200°C for nickel-plated Backshells with nickel-plated copper braids, +175°C for cadmium plated Backshells or silver-plated braids, or +150°C for tin-plated copper braids. After conditioning, Backshells met the subsequent performance requirements and showed no evidence of damage detrimental to performance. | EIA-364.32, condition IV and GPS470013                                         |
| Temperature Aging        | Backshells were subjected to maximum operating temperatures for a period of 1,000 hours. After conditioning, Backshells met the subsequent performance requirements and showed no evidence of damage detrimental to performance.                                                                                                                                                                                                                                    | GPS470013                                                                      |
| Coupling Thread Strength | After testing, backshell showed no evidence of damage detrimental to performance.                                                                                                                                                                                                                                                                                                                                                                                   | SAE AS85049 category 3A                                                        |
| Vibration                | Backshell was torqued to a suitable test fixture representative of an actual connector. Cable bundle was clamped or otherwise secured at 10.0 +/- .5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.                                                                                                                                                      | EIA-364.28<br>Condition VI, letter J<br>8 hrs/axis, monitored                  |
| Shock                    | The pulse was approximate half sine wave of 300 G ± 15 percent magnitude with duration of 3 ± 1 milliseconds. The wire bundle was clamped or otherwise secured at 10.0 +/- .5 inches from the test fixture. After testing, Backshell showed no evidence of loosening or damage detrimental to performance with no discontinuities >1g5.                                                                                                                             | EIA-364.27                                                                     |
| Bending Moment           | After testing, backshell showed no evidence of loosening or damage detrimental to performance.                                                                                                                                                                                                                                                                                                                                                                      | AS85049, category 3A (heavy duty)                                              |
| Cable Pull-out           | A minimum of one ferrule per backshell was tested and wired with 4 shielded twisted pairs. DC resistance was monitored during the test. DC resistance during the test did not exceed 7 milliohms.                                                                                                                                                                                                                                                                   | EIA364.38, condition E (25lbs)                                                 |
| Salt-Spray (Corrosion)   | The samples were suspended from the top of the chamber using waxed twine or string, glass rods or glass cord. StarShield™ backshells showed no signs of basis metal exposure which may affect performance as defined in AIR4789                                                                                                                                                                                                                                     | EIA364.26 test condition letter A (96hrs) and test condition letter C (500hrs) |
| Fluid Immersion          | One sample per fluid. StarShield™ backshell and HST devices showed no signs of swelling, cracking or other evidence of damage detrimental to performance.                                                                                                                                                                                                                                                                                                           | EIA-364.10                                                                     |
| Shielding effectiveness  | One representative medium size StarShield™ backshell was fitted to a brass or copper fixture, wired with copper tubes and tested in accordance with VG95373-41. Shielding effectiveness was greater than 98 dB at 30 MHz and 90 dB at 100 MHz                                                                                                                                                                                                                       | VG95373-41                                                                     |

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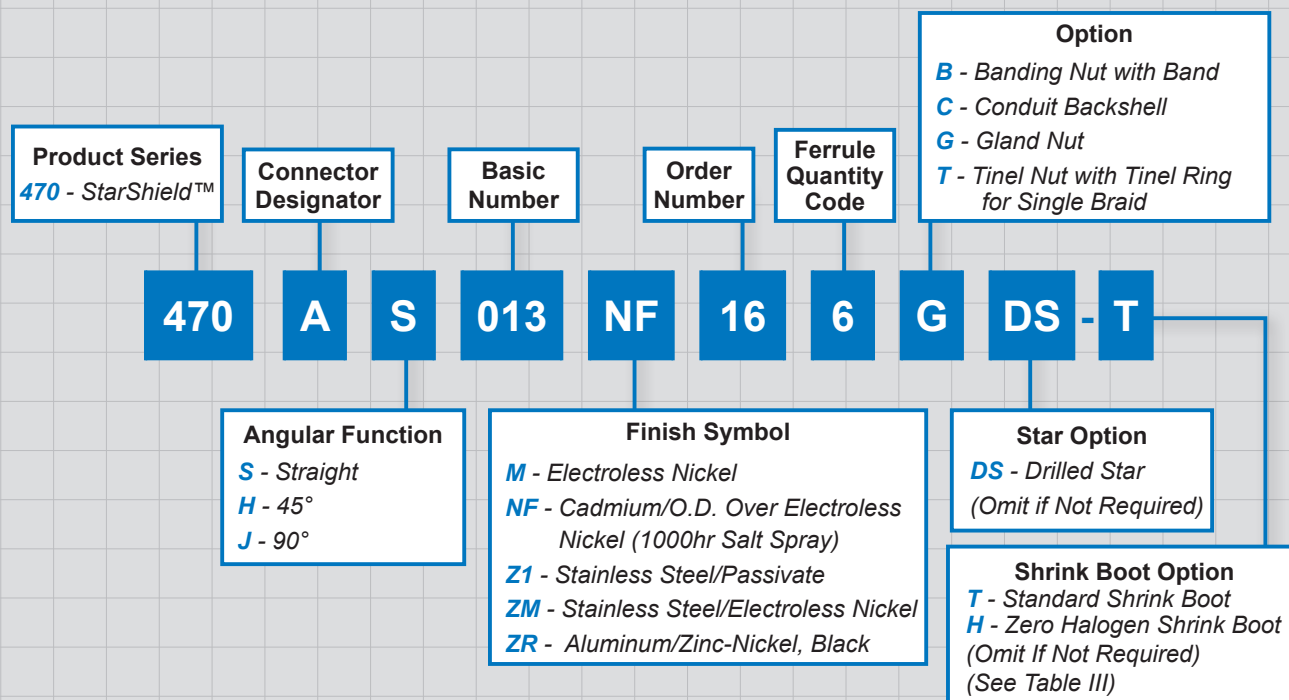
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# StarShield™ Shield Termination Backshells How To Order



## How to Order StarShield™ Shield Termination Backshells

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Connector Designator Table

| A                       |         | F                       |        | H                       |          |
|-------------------------|---------|-------------------------|--------|-------------------------|----------|
| Connector Specification | Series  | Connector Specification | Series | Connector Specification | Series   |
| MIL-DTL-5015            | MS3400  | MIL-DTL-38999           | I & II | MIL-DTL-38999           | III & IV |
| MIL-DTL-26482           | 2       | 30M38277                |        | EN3645                  |          |
| MIL-C-81703             | 3       | NFC93422                | HE308  | CECC75201.002           |          |
| MILL-DTL-83723          | I & III | NFC93422                | HE309  |                         |          |
| 40M39569                |         | PAN6433-1               |        |                         |          |
| CECC 7521.001           |         | PATT 641                |        |                         |          |
| DEF 5326-3              |         | PATT 616                |        |                         |          |
| EN 2997                 |         |                         |        |                         |          |
| EN 3646                 |         |                         |        |                         |          |
| ESC 10                  |         |                         |        |                         |          |
| ESC 11                  |         |                         |        |                         |          |
| LN 29504                |         |                         |        |                         |          |
| NFC 93422               | HE302   |                         |        |                         |          |
| PAN 6432-1              |         |                         |        |                         |          |
| PAN 6432-2              |         |                         |        |                         |          |
| PATT 602                |         |                         |        |                         |          |

\* Caution: these connector interfaces are not suitable for total environmental sealing; for further information consult factory.

**Consult factory for connector types not listed**

Dimensions in inches (millimeters) and are subject to change without notice.





## Glenair StarShield™ Assembly Procedure

### 1) Application Equipment

Glenair recommends the use of a Bak Rion Model 5100726 1600W hot-air-gun with a 34mm sieve spoon reflector (or equivalent system). Clamp the hot-air-gun in a bench mounted vice or comparable fixture to stabilize, with the reflector nozzle pointed upwards.

#### Hot air gun settings

With the air-gun vent open and appropriate reflector nozzle installed, set the hot air gun as follows:



#### For installation of protective sleeves:

Use setting of 4-5 or 450°- 520°F (230°- 270°C)

#### For installation of the heat shrinkable terminator (HST):

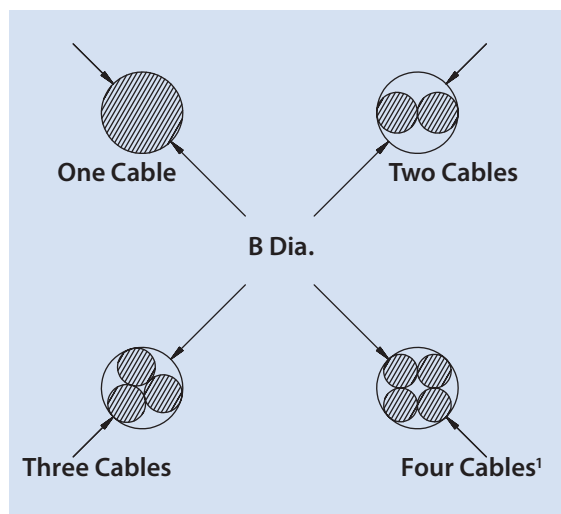
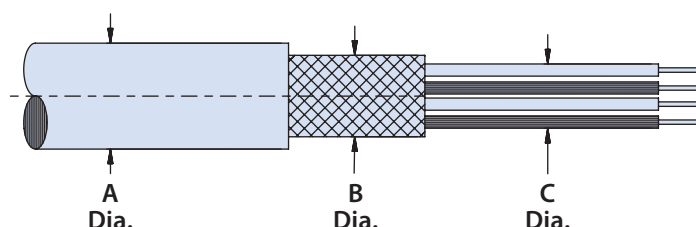
Use setting of 8-9 or 720°- 790°F (380°- 420°C)

While the hot air gun is warming, take a moment to check that all necessary StarShield™ assembly equipment is ready to terminate, and that extra components are on hand in case of a mis-termination.

### 2) Cable Preparation

Single or multi-conductor shielded cables meeting the envelope dimensions below may be used in any combination not to exceed 4 braids per ferrule.

Figure 1



1) Refer to Figure 3 for Special Instructions

#### Envelope Diameters

| Size        | Ø A         |             | Ø B        |            | Ø C         |             |
|-------------|-------------|-------------|------------|------------|-------------|-------------|
|             | Min.        | Max.        | Min.       | Max.       | Min.        | Max.        |
| 687-764-02* | .122 (3.1)  | .271 (6.9)  | .094 (2.4) | .208 (5.3) | N/A         | .165 (4.2)  |
| 687-764-04* | .169 (4.3)  | .350 (8.9)  | .094 (2.4) | .244 (6.2) | N/A         | .165 (4.2)  |
| 687-809-03* | .110 (2.79) | .189 (4.80) | N/A        | N/A        | .110 (2.79) | .189 (4.80) |

\* Finish Code

Please see section D of this Catalog for tool ordering information

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# Glenair StarShield™ Assembly Procedure



The filling factors listed below may be used as a guideline in determining the number of wires per ferrule. Actual fit-checks should be performed to ensure feasibility.

## Circular Connectors

| Connector |                    |
|-----------|--------------------|
| Size      | AWG 22 Contact Qty |
| 9-35      | 6                  |
| 11-35     | 13                 |
| 13-35     | 22                 |
| 15-35     | 37                 |
| 17-35     | 55                 |
| 19-35     | 66                 |
| 21-35     | 79                 |
| 23-35     | 100                |
| 25-35     | 128                |

| StarShield™ |             |                                  |                |                                  |                |
|-------------|-------------|----------------------------------|----------------|----------------------------------|----------------|
| Size        | Ferrule Qty | AWG 22 Shielded Wire Maximum Qty | Filling Factor | AWG 20 Shielded Wire Maximum Qty | Filling Factor |
| 9           | 1           | 8                                | 100%           | 6                                | 100%           |
| 11          | 2           | 16                               | 100%           | 12                               | 92%            |
| 13          | 3           | 24                               | 100%           | 18                               | 82%            |
| 15          | 5           | 40                               | 100%           | 24                               | 37%            |
| 17          | 6           | 48                               | 87%            | 36                               | 55%            |
| 19          | 7           | 56                               | 85%            | 42                               | 64%            |
| 21          | 9           | 72                               | 91%            | 54                               | 68%            |
| 23          | 10          | 80                               | 80%            | 60                               | 60%            |
| 25          | 12          | 96                               | 75%            | 72                               | 56%            |

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## ARINC 600 Connectors

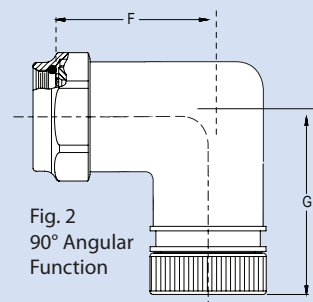
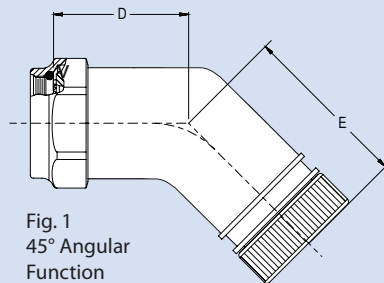
| Connector      |                    |
|----------------|--------------------|
| ARINC 600 Size | AWG 22 Contact Qty |
| 2              | 300                |
| 3              | 600                |

| StarShield™ |             |                                  |                |                                  |                |
|-------------|-------------|----------------------------------|----------------|----------------------------------|----------------|
| Size        | Ferrule Qty | AWG 22 Shielded Wire Maximum Qty | Filling Factor | AWG 20 Shielded Wire Maximum Qty | Filling Factor |
| 21          | 18          | 144                              | 48%            | 108                              | 36%            |
| 21          | 36          | 288                              | 48%            | 216                              | 36%            |

- With an AWG 22 (wire OD .039"/1.0mm), a ferrule can accept up to 4 screened twisted pairs (8 wires total)
- With an AWG 20 (wire OD .051"/1.3mm), a ferrule can accept up to 3 screened twisted pairs (6 wires)
- Filling factors can be increased if unshielded wires are used by routing them through a drilled star.

## StarShield™ Cable Length Preparation

| Table I                             |                 |
|-------------------------------------|-----------------|
| Angular Function and Connector Size | Length Constant |
| 45° & 90° Circular 9                | 1.60            |
| 45° & 90° Circular 11 & 13          | 1.74            |
| 45° & 90° Circular 15 & 17          | 2.03            |
| 45° & 90° Circular 19               | 2.13            |
| 45° & 90° Circular 21               | 2.48            |
| 45° & 90° Circular 23               | 2.61            |
| 45° & 90° Circular 25               | 2.76            |
| Straight Circular All Sizes         | 1.82            |



To calculate the cable length, see Table I (at left) to establish the *length constant* according to the connector designator's size and angular function. Then use the formula below to calculate the total length

$$45^\circ L = \text{Length constant} + D + E$$

Example:  
470HT017XM176G  
 $L = 2.03 + 0.81 + 1.20 = 4.04$  in.

$$\text{Straight } L = \text{Length constant} + \text{Straight length}$$

Example:  
470HS017XM176G  
 $L = 1.82 + 1.11 = 2.93$  in.

Dimensions in inches (millimeters) and are subject to change without notice.

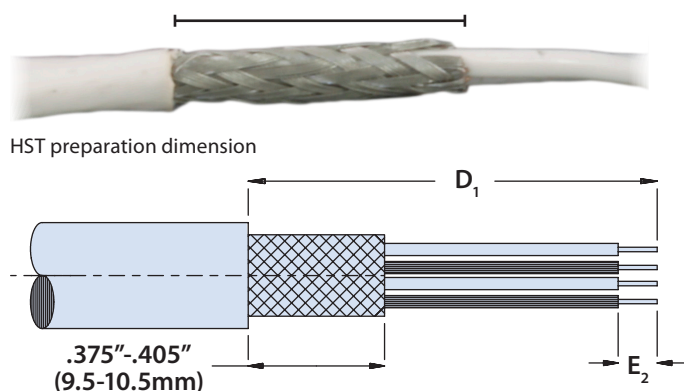


## Glenair StarShield™ Assembly Procedure

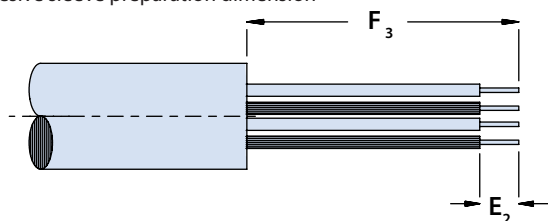
Figure 2

.375"-.405"  
(9.5-10.5mm)

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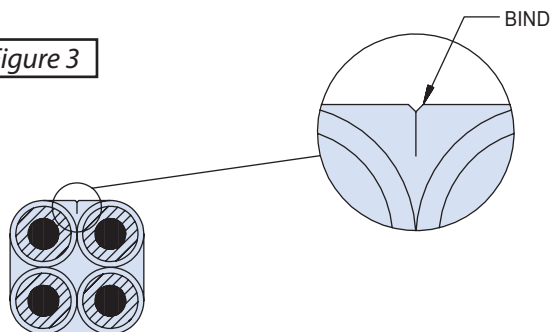


Adhesive sleeve preparation dimension

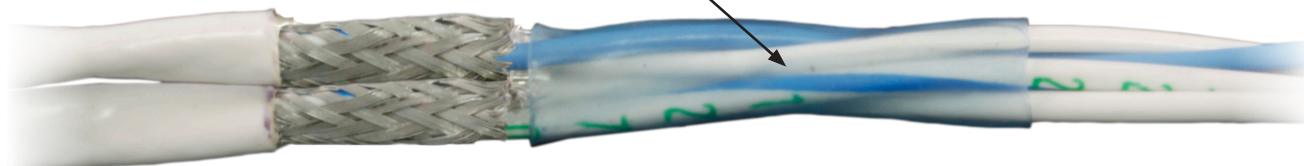


1.  $D_1$  dimension allows for at least one repair of the crimp contact.
2.  $E_2$  dimension determined by crimp contact mfr instructions.
3.  $F_3$  dimension for adhesive sleeve allows for at least one repair to the crimp contact

Figure 3



Heat Shrinkable Protective Sleeve



Strip the cables according to the following dimensions.

| Backshell Style    | Size    | D Dim<br>±.02" (0.5mm) | F Dim<br>±.02" (0.5mm) |
|--------------------|---------|------------------------|------------------------|
| Straight ARINC 600 | All     | 3.23 (82)              | 2.83 (71.88)           |
| Straight Circular  | All     | 3.07 (78)              | 2.67 (67.82)           |
| 45° & 90° Circular | 9       | 3.35 (85)              | 2.95 (74.93)           |
| 45° & 90° Circular | 11 & 13 | 3.54 (90)              | 3.14 (79.76)           |
| 45° & 90° Circular | 15 & 17 | 3.94 (100)             | 3.54 (89.92)           |
| 45° & 90° Circular | 19      | 4.13 (105)             | 3.73 (94.74)           |
| 45° & 90° Circular | 21      | 4.53 (115)             | 4.13 (104.90)          |
| 45° & 90° Circular | 23      | 4.72 (120)             | 4.32 (109.73)          |
| 45° & 90° Circular | 25      | 4.92 (125)             | 4.52 (114.81)          |

Make sure not to fray braided shielding ends. Contacts may be installed at this time if desired, provided their size is not so great as to prevent the leads to pass through the ferrule.

### 3) Assembly

Arrange prepared cables into bundles in accordance with plan. (See figure 1 in step 2)

For applications with 4 braids, we recommend the use of a solid tin plated copper wire Ø.008-.016" (0.2-0.4mm) to bind the shields securely during the installation. Secure them together as shown in figure 3. Trim ends to .20" (5mm) long and fold flat along length of cable.

Using the hot air gun (see step 1), install provided .75" (19mm) protective sleeve directly adjacent the stripped braid. This will prevent the wire conductors from getting pinched in the ferrule slot as well as keeping the wire bundle well managed throughout the rest of the assembly process.

Please see section D of this Catalog for tool ordering information

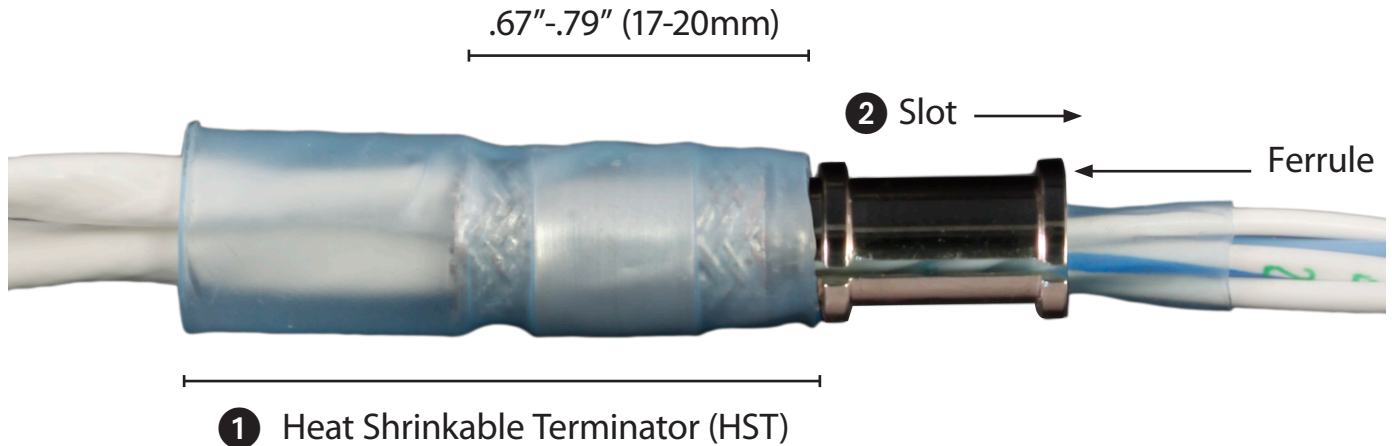


# Glenair StarShield™ Assembly Procedure



Introduction to  
StarShield™

- ① Stage the StarShield™ HST over the cable bundle, positioning the solder preform directly over the stripped section of braided shielding.

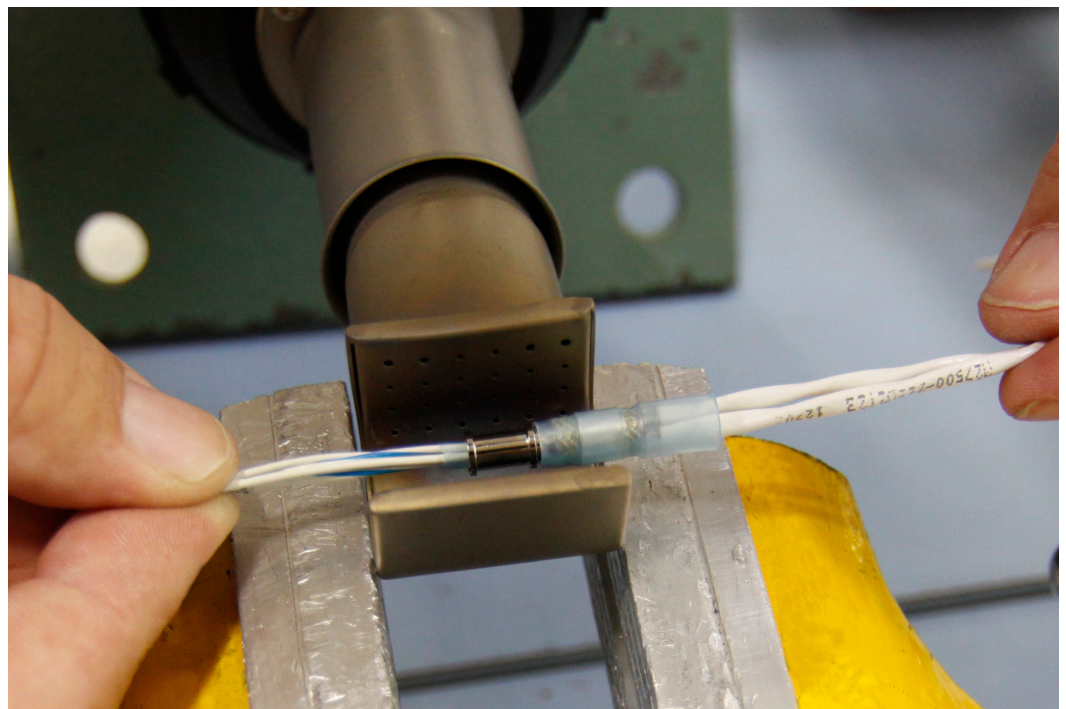


- ② Next, carefully slide the StarShield™ ferrule (with slotted side oriented towards contacts) over the leads until the non-lipped end slides under the HST braid. Cable jacketing should be positioned on the ferrule as shown above.

## 4) Termination Procedure

Check that the hot-air-gun is set to the recommended setting and has been allowed to warm up for 1 minute.

Position cable and staged ferrule/HST in the center of the hot-air-gun reflector, being careful not to touch the outer heat shrink material to the reflector.



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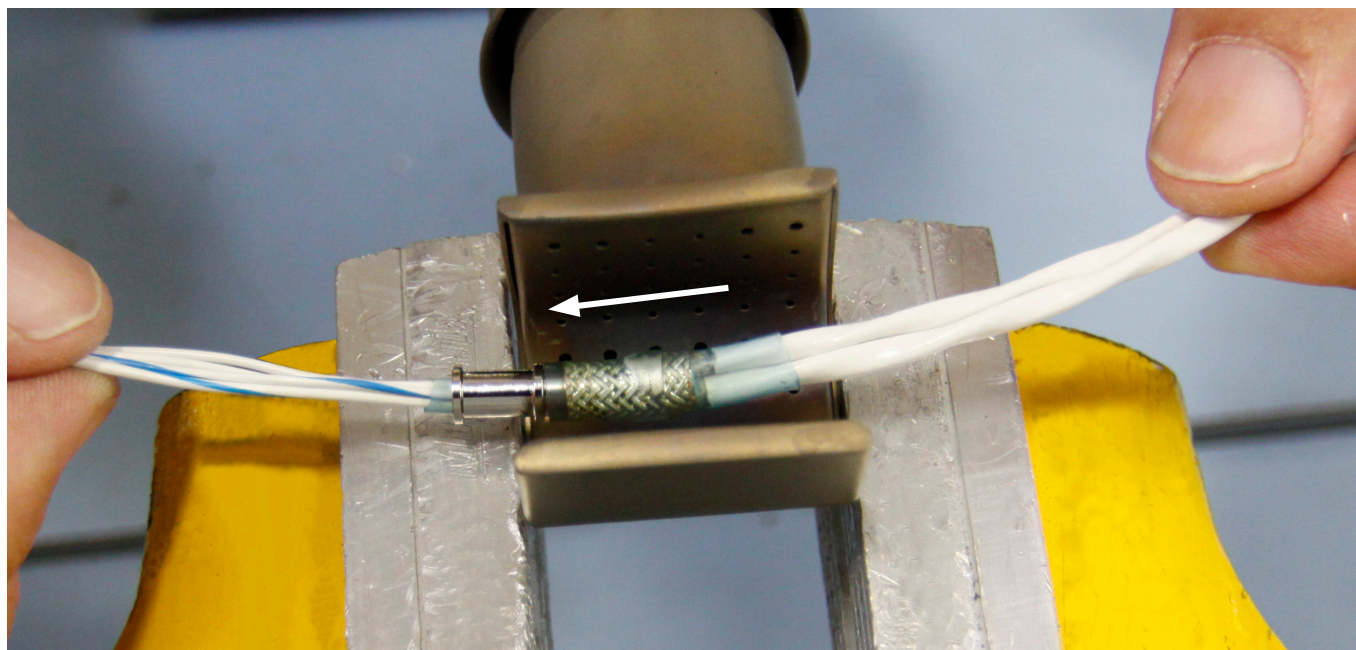
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## Glenair StarShield™ Assembly Procedure

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Focus heat on ferrule for a few seconds and begin moving towards the solder preform. Solder should melt and begin to flow freely. Continue to move the preform towards the center of the heat reflector as solder completely melts and flows along preform braid.

Heat until shrink sleeve has fully recovered around preform assembly and solder has completely melted and flowed through copper braid (approximately 15-45 seconds). Some solder flowing over the stripped cable braids should be seen. The solder will take on a lustrous appearance when properly melted. (Note: luster will subside as preform assembly cools to ambient temperature).



Be careful not to overheat preform assembly and scorch outer shrink sleeve. Slight browning of outer shrink sleeve is acceptable, but severe discoloration is indicative of improper termination.

*Please see section D of this Catalog for tool ordering information*

## Glenair StarShield™ Assembly Procedure

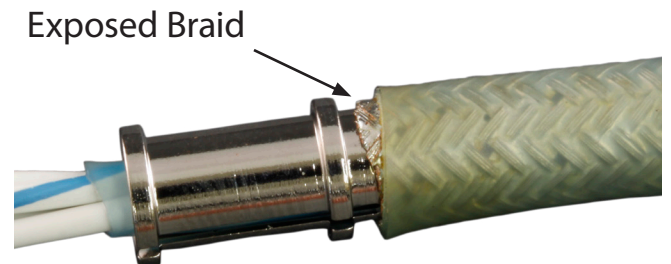
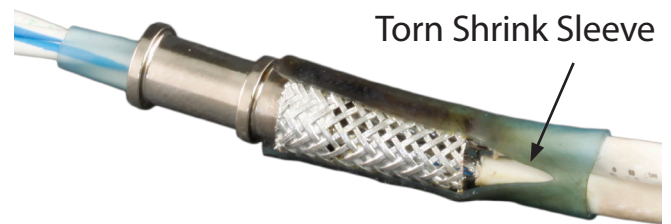


### 5) Inspection

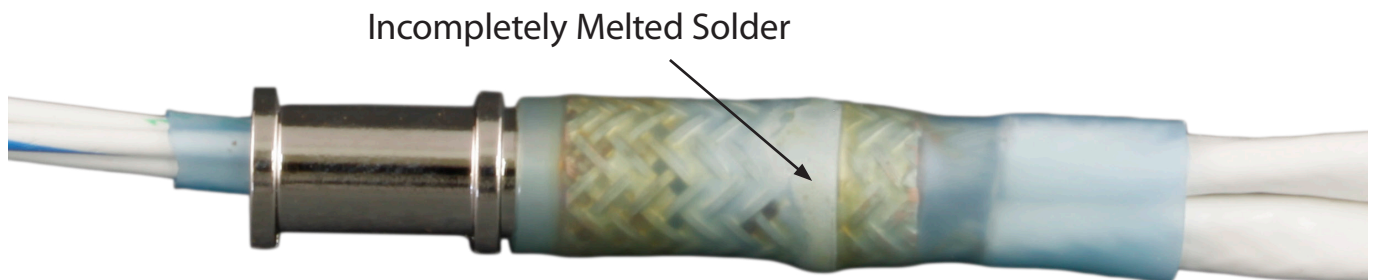
Allow the ferrule and HST assembly to cool completely before touching with bare hands.

Check for cuts, splits or charred spots in the outer heat shrink sleeve. A complete discolored dark brown sleeve indicates an overheated termination. A slight browning of the sleeve is acceptable.

Make sure that no braid strands are exposed from under the sleeve. If any such damage is evident, remove damaged sleeve and replace with new heat shrinkable sleeve Glenair part number 687-808-02 or 687-808-04.



If solder has not completely melted and flowed within the preform assembly and/or outer heat shrink sleeve has not fully recovered, reheating may be necessary.



### 6) Repair

Reheat incompletely melted terminations to obtain proper solder flow and/or fully recovered sleeve onto the cable jacket. If the outer shrink sleeve has split during the assembly process, it must be replaced. To do so, cut away existing (damaged) shrink sleeve with snips and carefully remove from solder preform. Slide replacement heat-shrinkable sleeve (Glenair P/N 687-808-\*\*) over terminated solder preform, leaving roughly .06" (1.5mm) of overlap on the braid/ferrule transition point. Heat new shrink sleeve until it recovers fully around preform and wires, making sure to constantly move it within the hot air gun reflector to ensure even heating and recovery. Once the new shrink sleeve is fully recovered, remove assembly from the hot air gun and allow the assembly to cool before proceeding with subsequent steps. Repeat inspections per step 5.



## 7) Replacement

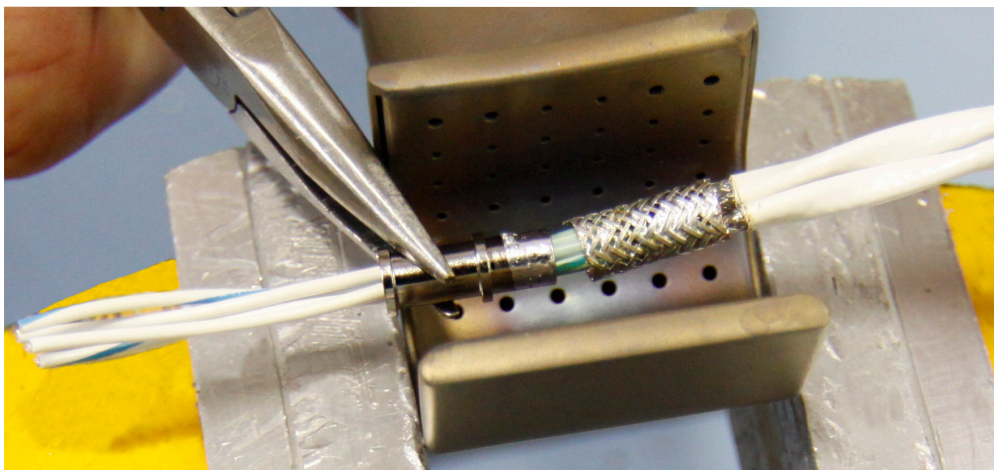
**A**

In the case of severely damaged StarShield™ HST assemblies, complete removal and re-termination may be necessary. Users will need a hot air gun fixed in a bench mount (see step 1), needle nose pliers and an unused StarShield™ HST kit (Glenair part number 687-764-\*\*\*)

*Set hot-air-gun to recommended setting (see step 1) and allow to warm up for one minute.*

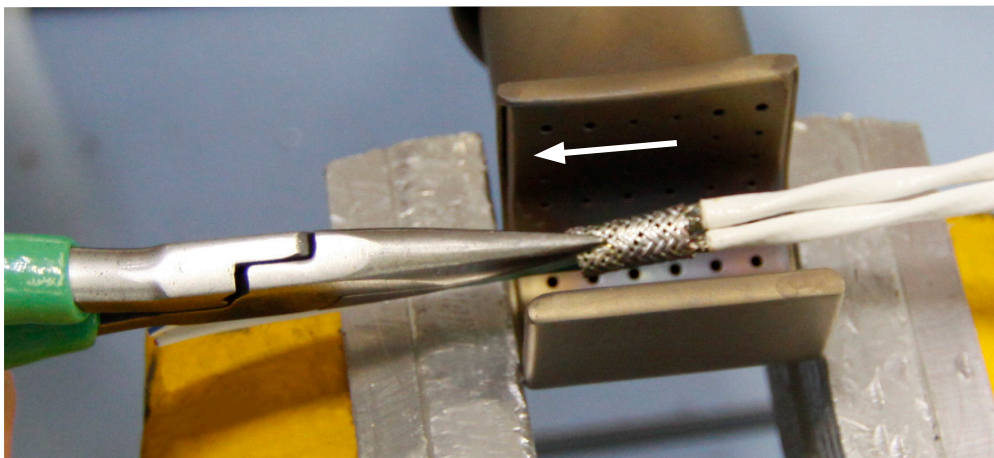
*Remove outer heat shrink sleeve completely, being careful not to cut or damage wire jacketing.*

With needle nose pliers firmly planted on end of ferrule, place StarShield™ ferrule/HST in hot air gun and allow solder to melt and flow. Once solder is molten, gently pull ferrule away from braided preform and slide off wires. Remove assembly from heat and set aside.



Next, grasp preform braid with needle nose pliers and return assembly to hot air gun reflector. When solder begins to melt, gently pull preform braid away from cable. Remove from heat and allow to cool.

Once assembly cools to ambient temperature, use fingers to gently scrape residual solder off cable jacketing and protective sleeve.



Re-terminate with a new StarShield™ HST (Glenair part number 687-764-\*\*\*) and inspect for damage per previous instructions.

*Please see section D of this Catalog for tool ordering information*

## Glenair StarShield™ Assembly Procedure



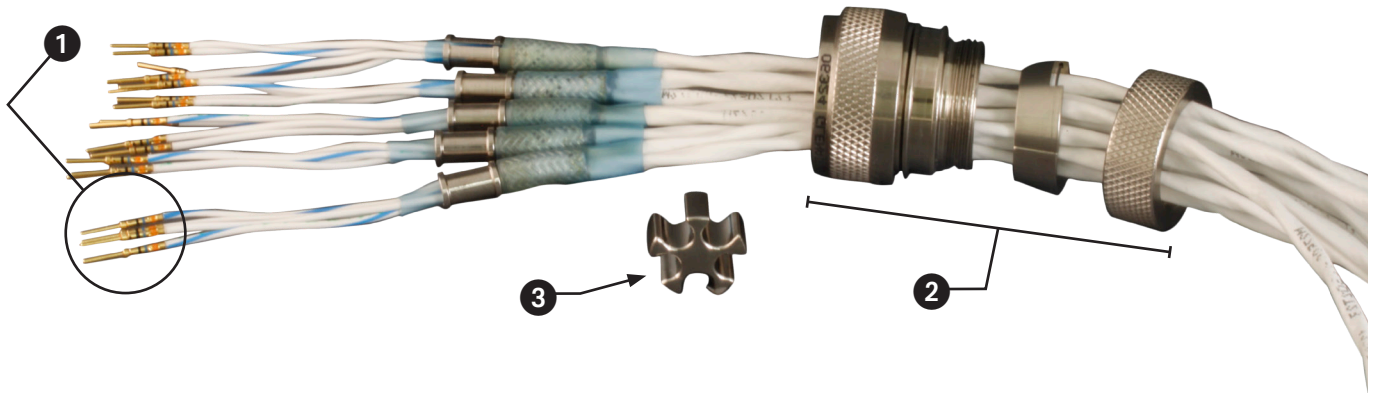
### 8) Assembly of StarShield™ Backshells

Install HST/ferrules onto cables per steps 1 through 4.

❶ Terminate crimp contacts onto leads per Glenair crimping instructions, or follow appropriate connector manufacturer's contact procedure.

❷ Slide the gland nut, compression ring and backshell body/coupling nut assembly over the cable bundle—paying special attention to the order and orientation of each component.

❸ For backshells with drilled stars, route the wires that pass through the center hole of the star before inserting the contacts into the connector. See split star configurations in step 9 for further instruction.



Using appropriate insertion tools, insert terminated contacts into the connector per Glenair insertion instructions, or per connector manufacturer's procedure.

*Please see section D of this Catalog for tool ordering information*



## Glenair StarShield™ Assembly Procedure

A

Hand tighten the backshell body/ coupling nut assembly onto the connector accessory threads until anti-rotation teeth engage. Once threads have engaged and anti-rotation teeth are sitting peak-to-valley, begin tightening with assembly tool to specified torque value. We suggest the connector be mated to an appropriate holding tool (see Glenair tools catalog) before final tightening takes place. Continue to tighten the coupling nut until specified torque value has been reached (see chart below for values). Effective EMI grounding is dependent upon proper tightening of backshell to connector body. Snap ferrules into place on the StarShield™ "star."



**Installation Torque Values for Circular Electrical Connector Accessories**

Accessory Thread Torque:  $\pm$  inch pounds

| Shell Sizes        | Group 1<br>Light & Medium Duty                                                                                                                                            | Group 2<br>Heavy Duty                                                                                                                                                      | Group 2                                                       |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|                    | MIL-C-5015 (MS3100 Series)<br>MIL-C-26482 Series I<br>MIL-C-26500<br>MIL-C-27599<br>MIL-C-38999 Series I, II<br>MIL-C-81511 Series I, II, III, IV<br>MIL-C-81703 Series I | MIL-C-5015 (MS3400 Series)<br>MIL-C-22992<br>MIL-C-26482 Series II<br>MIL-C-28840<br>MIL-C-38999 Series III, IV<br>MIL-C-81703 Series III<br>MIL-C-83723 Series I, II, III | Values for Hand Held Tool<br>Applications Field Repair Torque |
| 8, 9, A            | 35                                                                                                                                                                        | 56                                                                                                                                                                         | 40 - 50                                                       |
| 3, 10, 10SL, 11, B | 35                                                                                                                                                                        | 76                                                                                                                                                                         | 40 - 50                                                       |
| 7, 12, 12S, 13, C  | 40                                                                                                                                                                        | 108                                                                                                                                                                        | 40 - 50                                                       |
| 14, 14S, 15, D     | 40                                                                                                                                                                        | 116                                                                                                                                                                        | 50 - 60                                                       |
| 16, 16S, 17, E     | 40                                                                                                                                                                        | 116                                                                                                                                                                        | 50 - 60                                                       |
| 18, 19, 27, F      | 40                                                                                                                                                                        | 116                                                                                                                                                                        | 50 - 60                                                       |
| 20, 21, 37, G      | 80                                                                                                                                                                        | 136                                                                                                                                                                        | 80 - 90                                                       |
| 22, 23, H          | 80                                                                                                                                                                        | 136                                                                                                                                                                        | 80 - 90                                                       |
| 24, 25, 61, J      | 80                                                                                                                                                                        | 136                                                                                                                                                                        | 80 - 90                                                       |

**Notes:**

Values based on 80% of MIL-C-85049 thread strength.

Use group 1 values for all composite connector accessories.

When tightened with Glenair

600-091 And 600-007 torque tools. Consult factory.

Dimensions in inches (millimeters) and are subject to change without notice.

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**A-12**

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## Glenair StarShield™ Assembly Procedure



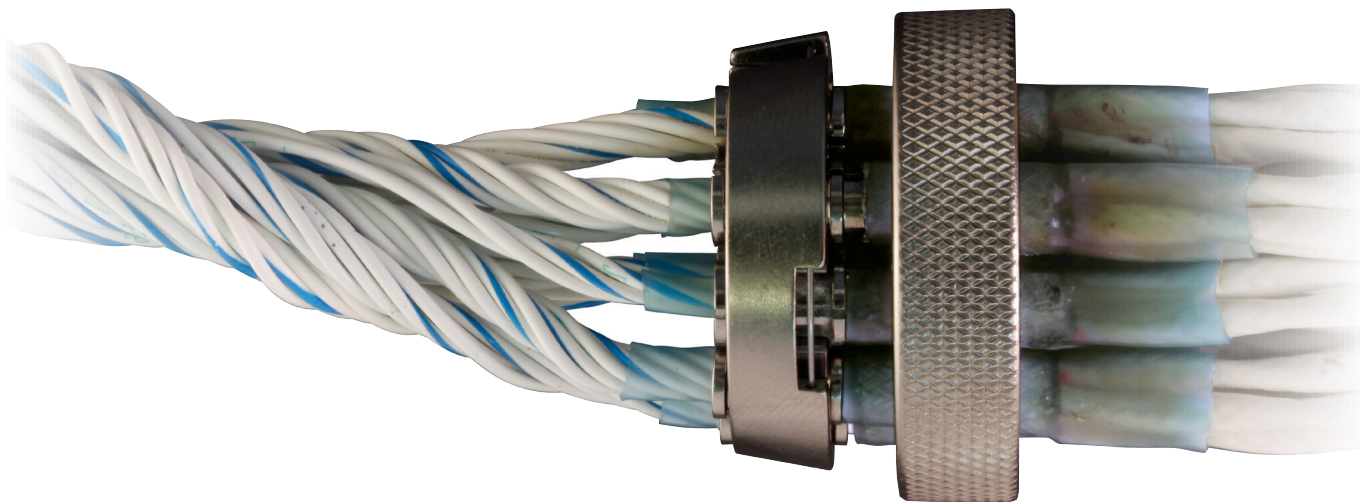
Introduction to  
StarShield™

A

### 9) Split Star Configurations

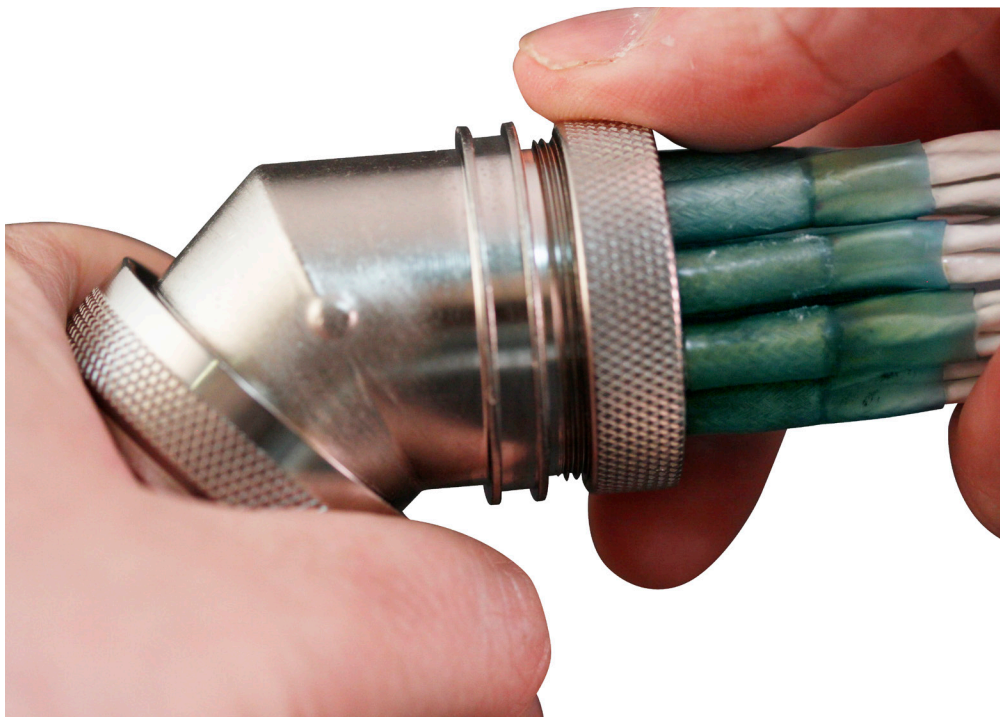
For star-in-star or split star configurations, install ferrules starting from the inner star or ferrule slot. Position conical ring on the star.

Position the sub-assemblies (stars, compression ring and ferrules) into the body by carefully twisting to “birdcage” the individual wire pairs first and then the entire wire bundle in a counter clockwise motion. If necessary, heat may be applied to the wires to make them more pliable and easier to fit into backshell body (Hot air gun setting 4–5 or 450°–520°F/230°–270°C with reducer nozzle).



**Glenair StarShield™  
Assembly Procedure****A**

Apply heat, then push and twist the wires until the gland nut threads engage the threads on the body.



Tighten the gland nut on the body to the appropriate torque value.



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## Glenair StarShield™ Assembly Procedure



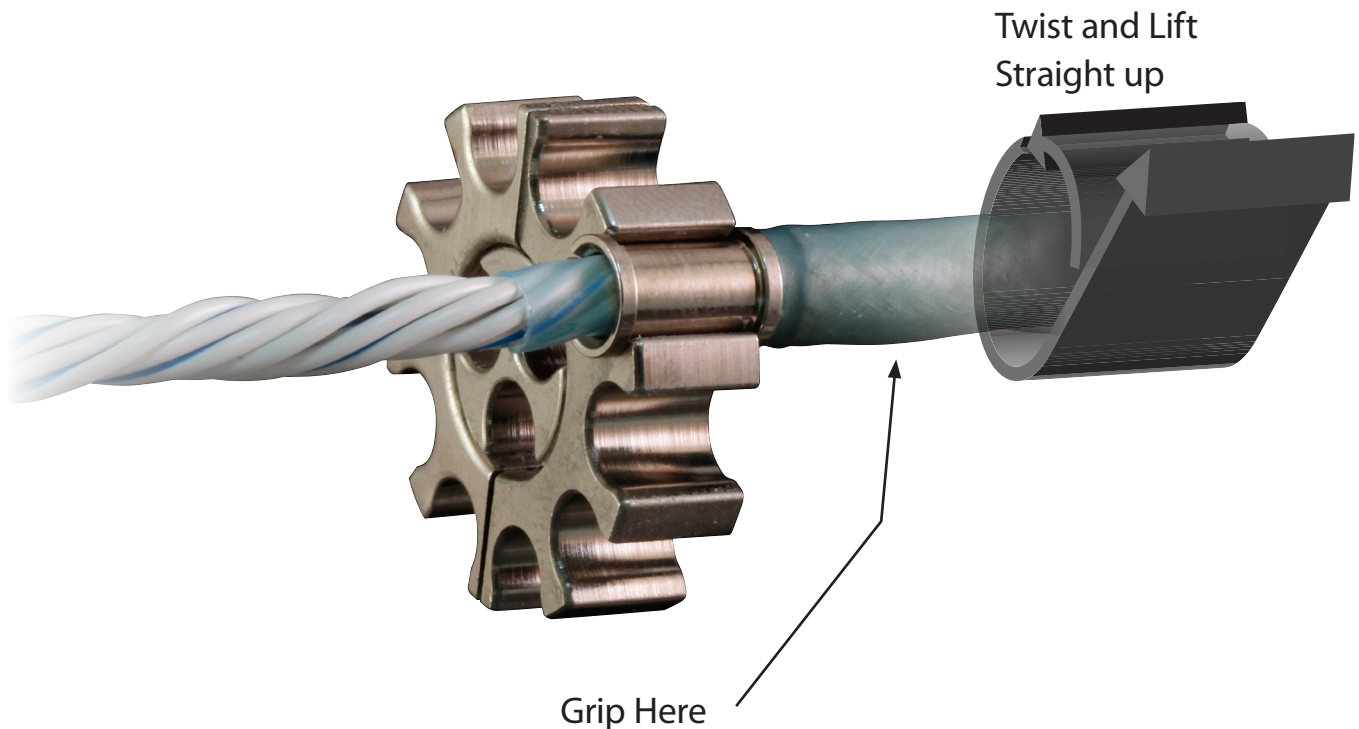
Introduction to  
StarShield™

Glenair recommends the use of an appropriately sized Series 600 backshell holding wrench, TG70 strap wrench, or TG69 soft jaw pliers. (These tools are used to grip the self-locking coupling nut. Any one of the three will do the job.) Connector plug or receptacle holder: These tools take the form of a socket device used in conjunction with a torque wrench, either hand held (600-161) or bench mounted (600-162). These tools are used to hold the inner body of the connector in place while the StarShield™ Backshell coupling nut and clamping nut are torqued onto the back. Note: most holder series tools provide "universal polarization", but a few connector series require specific polarization for each alternate keying arrangement. Please see section D of this Catalog for tool ordering information

A

### 10) Dismantling StarShield™ Backshells:

Dismantling is the reverse of the assembly. To remove a ferrule from a star, grip the ferrule assembly as close to the star as possible. Carefully twist and lift the ferrule straight up from the ferrule slot in the star. Do not remove the ferrule by lifting or pulling on the cable or wires only, or damage to the termination may result. For maximum contact extraction tool access, unclip all ferrules from the star, remove the star from the cable bundle before pushing the backshell body towards the cable.







# AmberStrand®

## THE ULTRA- LIGHTWEIGHT MICROFILAMENT METAL CLAD EMI/ RFI COMPOSITE BRAIDING

### MICROFILAMENT NICKEL CLAD STAINLESS STEEL BRAID

- Metal-clad EMI/RFI Shielding with a lightweight composite thermoplastic base material
- Highly conductive surface plating
- Reduce shielding weight up to 80% and more
- Reduce operation costs by permanently reducing launch and aircraft all-up weights
- Superior high frequency shielding compared to tinned and/or nickel plated copper
- Exceptional tensile strength: 590,000 psi (min)



# StarShield™ Backshell General Information



## StarShield™ Zero Length Termination Backshells

EMI/RFI backshells with heat shrink termination (HST) sleeves provide superior shielding performance and effectiveness in shielded twisted pair cable applications.



### Product Features

- The unique StarShield™ configuration completely eliminates “standing antenna” problems common with pigtail shield termination systems.
- The backshell utilizes familiar heat shrink termination (HST) sleeve technology for fast and reliable termination of shielding—even with dissimilar wire types and gauges.
- The internal configuration of the StarShield™ features a tapered split-ring that fits snugly into the conically machined backshell or a lightweight band-terminated compression system adapter.
- Available fittings include overbraid termination, conduit or shrink-boot adapters.
- Available for all standard MIL-AERO circular connector series, and many popular rectangular connector series.
- Environmental sealing, self-locking coupling nuts standard on StarShield™ backshells for select popular connector series
- Optional shrink boots also available.
- StarShield™ termination technology can be adapted to additional connector/backshell types not shown

| Part No.                                                                                        | Description                                                                                                                               | Page No. |
|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>83723 Series I &amp; III, 5015 MS400 Series, AS81703 Series 3, and MIL-C- 26482 Series 2</b> |                                                                                                                                           |          |
| <b>470-013</b>                                                                                  | StarShield™ environmental EMI/RFI shield termination backshell with self-nestor rotatable coupling nut and rear end options               | B-2      |
| <b>470-015</b>                                                                                  | StarShield™ environmental backshell with self-locking rotatable coupling nut and rear end options                                         | B-4      |
| <b>38999 Series I and II Connectors</b>                                                         |                                                                                                                                           |          |
| <b>470-013</b>                                                                                  | StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-nestor rotatable coupling nut           | B-6      |
| <b>470-015</b>                                                                                  | StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut          | B-8      |
| <b>38999 Series III and IV Connectors</b>                                                       |                                                                                                                                           |          |
| <b>470-013</b>                                                                                  | StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut          | B-10     |
| <b>470-014</b>                                                                                  | StarShield™ environmental EMI/RFI shield termination backshell with self-nestor rotatable coupling nut and rear end options               | B-12     |
| <b>470-015</b>                                                                                  | StarShield™ extended length, environmental, EMI/RFI shield termination backshell with self-locking rotatable coupling nut and shrink boot | B-14     |
| <b>470-017</b>                                                                                  | StarShield™ composite, EMI/RFI shield termination backshell with self-locking rotatable coupling nut and shrink boot                      | B-16     |
| <b>470-019</b>                                                                                  | StarShield™ split shell, high ferrule count, EMI/RFI shield termination backshell with self-locking rotatable coupling nut                | B-18     |
| <b>470-020</b>                                                                                  | StarShield™ split shell, non-environmental, EMI/RFI shield termination backshell with high ferrule count                                  | B-20     |
| <b>477-004</b>                                                                                  | StarShield™ environmental, extended length, EMI/RFI backshell with high ferrule count and self-nestor coupling                            | B-22     |
| <b>477-005</b>                                                                                  | StarShield™ 90°, extended length, environmental, EMI/RFI shield termination backshell with self-nestor coupling                           | B-24     |
| <b>477-006</b>                                                                                  | StarShield™ 30° environmental, high ferrule count, EMI/RFI shield termination backshell backshell with self-nestor coupling               | B-26     |
| <b>477-007</b>                                                                                  | StarShield™ environmental, extended length EMI/RFI shield termination backshell with self-nestor coupling                                 | B-28     |
| <b>477-008</b>                                                                                  | StarShield™ 30°, environmental, high ferrule count, EMI/RFI shield termination backshell with self-nestor coupling                        | B-30     |
| <b>477-009</b>                                                                                  | StarShield™ environmental, EMI/RFI shield termination backshell with self-nestor and rear end options                                     | B-32     |
| <b>800 Series Mighty Mouse connectors</b>                                                       |                                                                                                                                           |          |
| <b>470-021</b>                                                                                  | StarShield™ direct coupling, Mighty Mouse, EMI/RFI shield termination backshell with split banding porch                                  | B-34     |
| <b>477-013</b>                                                                                  | StarShield™ direct coupling, Mighty Mouse, EMI/RFI shield termination backshell with split banding porch                                  | B-36     |
| <b>StarShield Backshells for Rectangular Connectors</b>                                         |                                                                                                                                           |          |
| <b>527-448</b>                                                                                  | StarShield™ non environmental, EMI/RFI shield termination backshell assembly for size 2 ARINC 600                                         | B-38     |
| <b>527-449</b>                                                                                  | StarShield™ non-environmental, high ferrule count, EMI/RFI shield termination backshell assembly for size 2 ARINC 600                     | B-40     |
| <b>527-450</b>                                                                                  | StarShield™ shield termination, EMI/RFI shield termination backshell with banding porch for Collins SGA3 connector                        | B-42     |
| <b>550-089</b>                                                                                  | StarShield™ non-environmental shield termination backshell with cable entry and receptacle mounting options for D-Subminiature            | B-44     |

Dimensions in inches (millimeters) and are subject to change without notice.



470-013

StarShield™ EMI/RFI Shield Termination Backshell  
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703  
Series 3, and MIL-C- 26482 Series 2

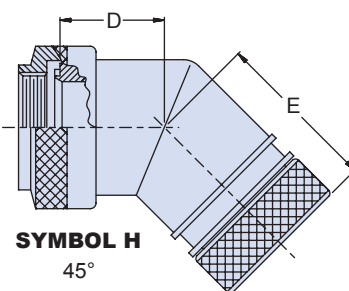
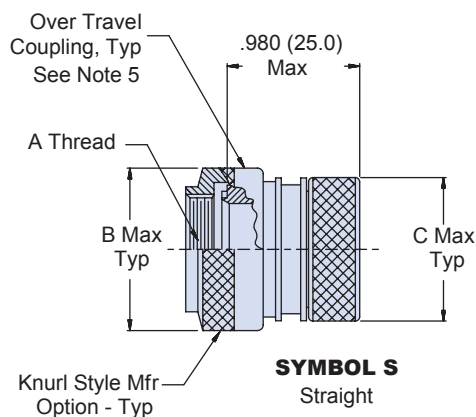
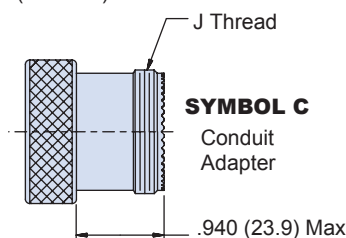
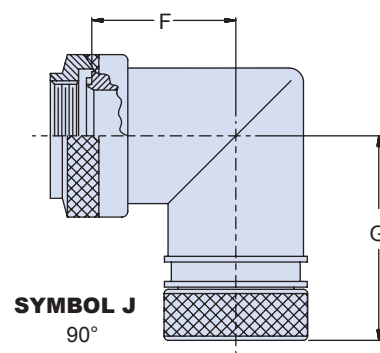
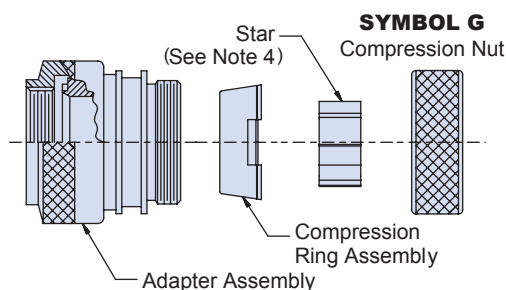
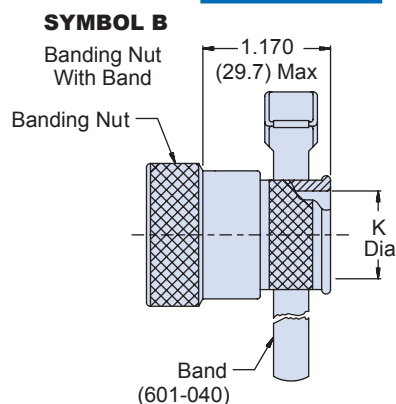
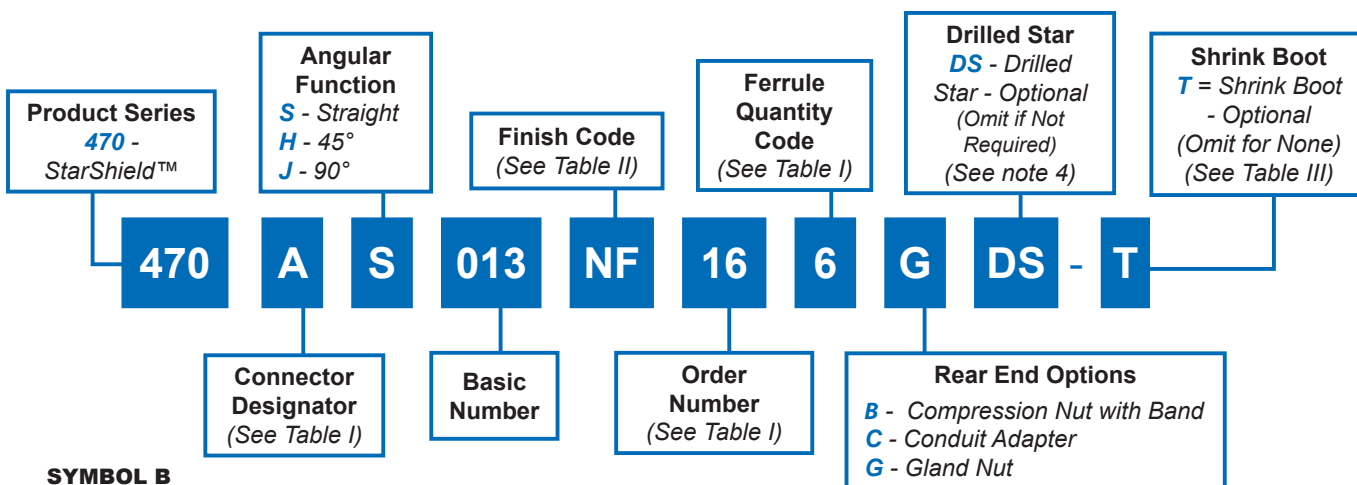


Environmental

Self  
NestorRear End  
OptionsStandard  
LengthHigh  
Ferrule Count

**StarShield™ environmental backshell with self-nestor coupling and rear end options**

B



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Rev. 03.08.21



# 470-015

## StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



StarShield™  
Backshells

Table I : Dimensions

| Order No | Connector Shell Size    |                        | A Thread Class 2 B | B DIA MAX  | C Dia Max    | D Max       | E Max         | F Max        |
|----------|-------------------------|------------------------|--------------------|------------|--------------|-------------|---------------|--------------|
|          | MIL-DTL-38999 Series II | MIL-DTL-38999 Series I |                    |            |              |             |               |              |
| 08       | 08                      | 09                     | 7/16-28 UNEF       | .69(17.5)  | .690 (17.5)  | .750 (19.1) | 1.000 (25.4)  | .880 (22.4)  |
| 10       | 10                      | 11                     | 9/16-24 UNEF       | .81(20.6)  | .850 (21.5)  | .780 (19.8) | 1.020 (26.0)  | .960 (24.4)  |
| 12       | 12                      | 13                     | 11/16-24 UNEF      | .94(23.9)  | .890 (22.5)  | .810 (20.6) | 1.040 (26.5)  | 1.000 (25.4) |
| 14       | 14                      | 15                     | 13/16-20 UNEF      | 1.06(26.9) | 1.000 (25.4) | .830 (21.1) | 1.080 (27.5)  | 1.070 (27.2) |
| 16       | 16                      | 17                     | 15/16-20 UNEF      | 1.17(29.7) | 1.120 (28.5) | .860 (21.8) | 1.100 ((28.0) | 1.130 (28.7) |
| 18       | 18                      | 19                     | 1 1/16-18 UNEF     | 1.29(32.8) | 1.240 (31.5) | .880 (22.4) | 1.120 (28.5)  | 1.180 (30.0) |
| 20       | 20                      | 21                     | 1 3/16-18 UNEF     | 1.41(35.8) | 1.380 (35.0) | .910 (23.1) | 1.140 (29.0)  | 1.250 (31.8) |
| 22       | 22                      | 23                     | 1 5/16-18 UNEF     | 1.54(39.1) | 1.500 (38.0) | .930 (23.6) | 1.180 (30.0)  | 1.310 (33.3) |
| 24       | 24                      | 25                     | 1 7/16-18 UNEF     | 1.66(42.2) | 1.610 (41.0) | .940 (23.9) | 1.220 (31.0)  | 1.360 (34.5) |

Table I: (Continued)

| Order No. | G Max        | J Thread ISO Metric | K ± .004 (.10) | Ferrule Quantity (See Note 4) |      |
|-----------|--------------|---------------------|----------------|-------------------------------|------|
|           |              |                     |                | Std.                          | Opt. |
| 09        | 1.140 (29.0) | M12 X 1 - 6g        | .315 (8.00)    | 1                             | -    |
| 11        | 1.200 (30.5) | M15 X 1 - 6g        | .531 (13.5)    | 2                             | -    |
| 13        | 1.260 (32.0) | M18 X 1 - 6g        | .591 (15.0)    | 3                             | -    |
| 15        | 1.320 (33.5) | M22 X 1 - 6g        | .709 (18.0)    | 5                             | -    |
| 17        | 1.380 (35.0) | M25 X 1 - 6g        | .827 (21.0)    | 6                             | 7    |
| 19        | 1.440 (36.5) | M28 X 1 - 6g        | .945 (24.0)    | 7                             | -    |
| 21        | 1.520 (38.5) | M31 X 1 - 6g        | 1.063 (27.0)   | 9                             | 11   |
| 23        | 1.570 (40.0) | M34 X 1 - 6g        | 1.181 (30.0)   | 10                            | 13   |
| 25        | 1.630 (41.5) | M37 X 1 - 6g        | 1.299 (33.0)   | 12                            | 17   |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Material/Finish

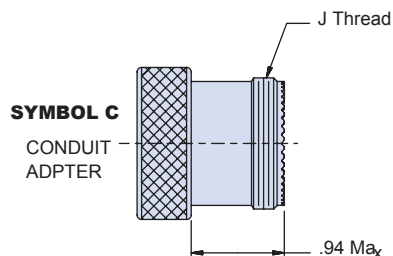
|                                                                      |                                 |
|----------------------------------------------------------------------|---------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| Anti-decoupling device                                               | Corrosion resistant material    |
| O-ring                                                               | Silicone/n.a.                   |
| Band                                                                 | CRES/passivate                  |

Table III: Shrink Boot

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S103             |
| 11         | 770-001S105             |
| 13         | 770-001S105             |
| 15         | 770-001S106             |
| 17         | 770-001S106             |
| 19         | 770-001S107             |
| 21         | 770-001S107             |
| 23         | 770-001S107             |
| 25         | 770-001S108             |

### Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Self-locking functionality, eliminates lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device



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470-015

StarShield™ EMI/RFI Shield Termination Backshell  
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703  
Series 3, and MIL-C- 26482 Series 2

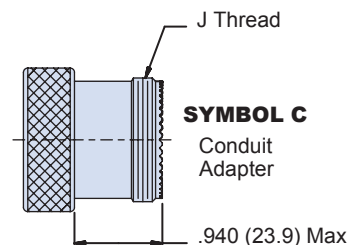
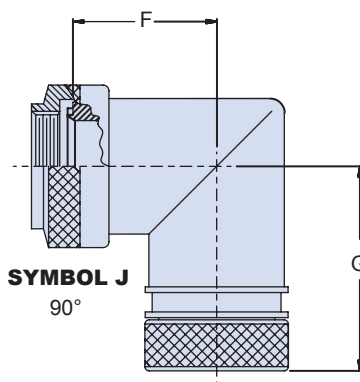
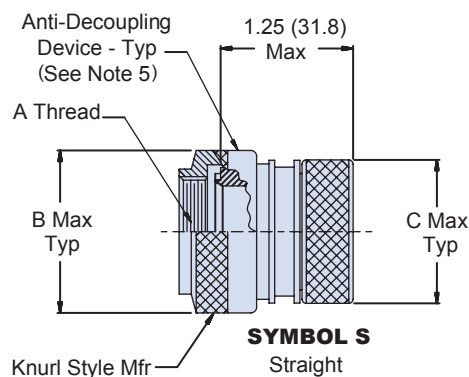
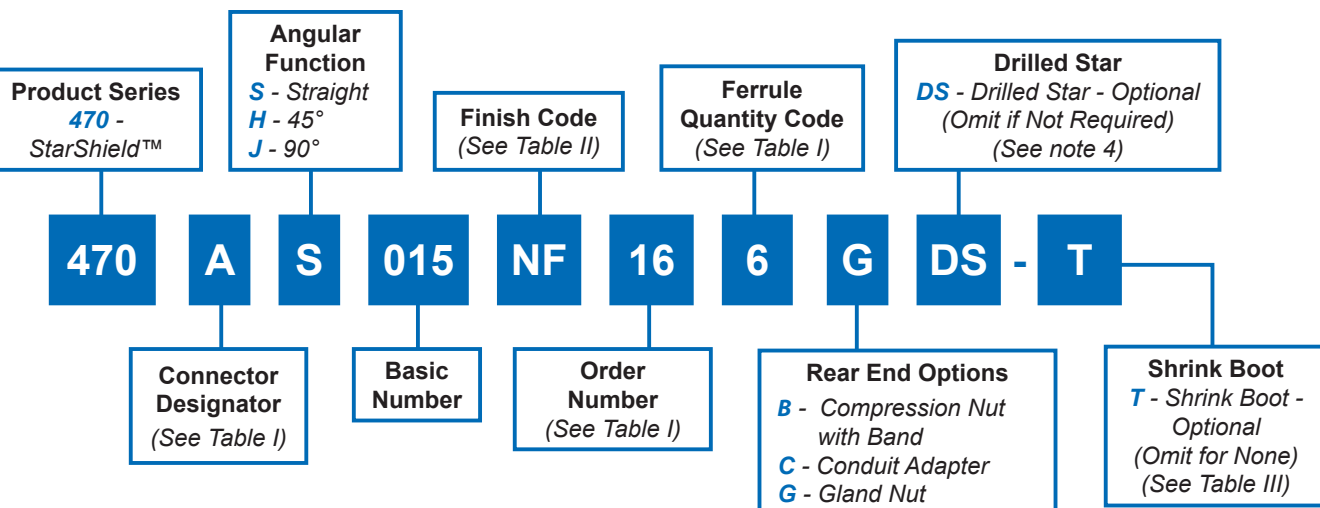
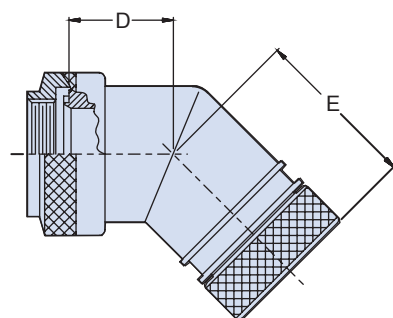


Environmental

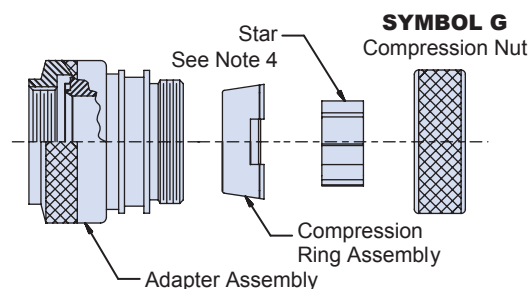
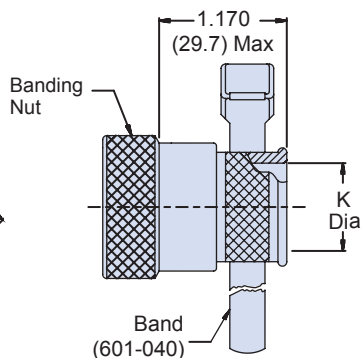
Self  
LockingRear End  
OptionsStandard  
LengthHigh  
Ferrule Count

## StarShield™ environmental backshell with self-locking coupling and rear end options

B

**SYMBOL H**45°  
Option - Typ**SYMBOL B**

Banding Nut with Band



Dimensions in inches (millimeters) and are subject to change without notice.

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Rev. 03.08.21

**470-015**  
**StarShield™ EMI/RFI Shield Termination Backshell**  
for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703  
Series 3, and MIL-C- 26482 Series 2



**Table I: Dimensions**

| Order No. | Connector Shell Size         |                            |                    |                       | A Thread Class 2 B | B Max      | C Dia Max    | D Max       | E Max         |
|-----------|------------------------------|----------------------------|--------------------|-----------------------|--------------------|------------|--------------|-------------|---------------|
|           | MIL-DTL-83723 Series I & III | MIL-DTL-5015 MS3400 Series | AS81703 Series III | MIL-C-26482 Series II |                    |            |              |             |               |
| 08        | 8                            | 8S                         | -                  | 8                     | 1/2-20 UNF         | .82(20.8)  | .690 (17.5)  | .750 (19.1) | 1.000 (25.4)  |
| 10        | 10                           | 10S, 10SL                  | -                  | 10                    | 5/8-24 UNEF        | .94(23.9)  | .850 (21.5)  | .780 (19.8) | 1.020 (26.0)  |
| 12        | 12                           | 12, 12S                    | 7                  | 12                    | 3/4-20 UNEF        | 1.06(26.9) | .890 (22.5)  | .810 (20.6) | 1.040 (26.5)  |
| 14        | 14                           | 14, 14S                    | 12                 | 14                    | 7/8-20 UNEF        | 1.17(29.7) | 1.000 (25.4) | .830 (21.1) | 1.080 (27.5)  |
| 16        | 16                           | 16, 16S                    | 19                 | 16                    | 1-20 UNEF          | 1.29(32.8) | 1.120 (28.5) | .860 (21.8) | 1.100 ((28.0) |
| 18        | 18                           | 18                         | 27                 | 18                    | 1 1/16-18 UNEF     | 1.42(36.1) | 1.240 (31.5) | .880 (22.4) | 1.120 (28.5)  |
| 20        | 20                           | 20                         | 37                 | 20                    | 1 3/16-18 UNEF     | 1.54(39.1) | 1.380 (35.0) | .910 (23.1) | 1.140 (29.0)  |
| 22        | 22                           | 22                         | -                  | 22                    | 1 5/16-18 UNEF     | 1.66(42.2) | 1.500 (38.0) | .930 (23.6) | 1.180 (30.0)  |
| 24        | 24                           | 24                         | -                  | 24                    | 1 7/16-18 UNEF     | 2.01(51.1) | 1.610 (41.0) | .940 (23.9) | 1.220 (31.0)  |

**Table I: Dimensions (Continued)**

| Order No. | F Max        | G Max        | J Thread Class 2 A | K ± .004 (.10) | Ferrule Quantity (See note 4) |      |
|-----------|--------------|--------------|--------------------|----------------|-------------------------------|------|
|           |              |              |                    |                | Std.                          | Opt. |
| 08        | .880 (22.4)  | 1.140 (29.0) | 1/2-20 UNF         | .315 (8.00)    | 1                             | -    |
| 10        | .960 (24.4)  | 1.200 (30.5) | 5/8-24 UNEF        | .531 (13.5)    | 2                             | -    |
| 12        | 1.000 (25.4) | 1.260 (32.0) | 3/4-20 UNEF        | .591 (15.0)    | 3                             | -    |
| 14        | 1.070 (27.2) | 1.320 (33.5) | 7/8-20 UNEF        | .709 (18.0)    | 5                             | -    |
| 16        | 1.130 (28.7) | 1.380 (35.0) | 1-20 UNEF          | .827 (21.0)    | 6                             | 7    |
| 18        | 1.180 (30.0) | 1.440 (36.5) | 1 1/16-18 UNEF     | .945 (24.0)    | 7                             | -    |
| 20        | 1.250 (31.8) | 1.520 (38.5) | 1 3/16-18 UNEF     | 1.063 (27.0)   | 9                             | 11   |
| 22        | 1.310 (33.3) | 1.570 (40.0) | 1 5/16-18 UNEF     | 1.181 (30.0)   | 10                            | 13   |
| 24        | 1.360 (34.5) | 1.630 (41.5) | 1 7/16-18 UNEF     | 1.299 (33.0)   | 12                            | 17   |

**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Table III: Shrink Boot**

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S1 04            |
| 11         | 770-001S1 06            |
| 13         | 770-001S1 06            |
| 15         | 770-001S1 07            |
| 17         | 770-001S1 07            |
| 19         | 770-001S1 08            |
| 21         | 770-001S1 08            |
| 23         | 770-001S1 08            |
| 25         | 770-001S1 09            |

**Material/Finish**

|                                                                      |                                 |
|----------------------------------------------------------------------|---------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| Band                                                                 | CRES/passivate                  |

**Notes:**

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Self-locking functionality, eliminates lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.





# 470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



**Non  
Environmental**



**Self  
Nestor**



**Rear End  
Options**

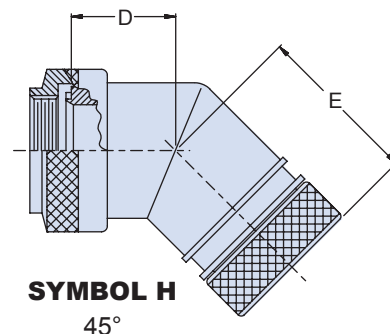
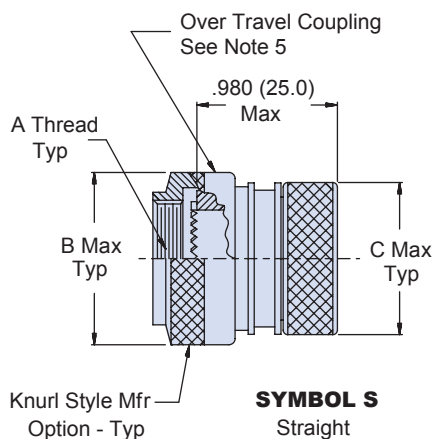
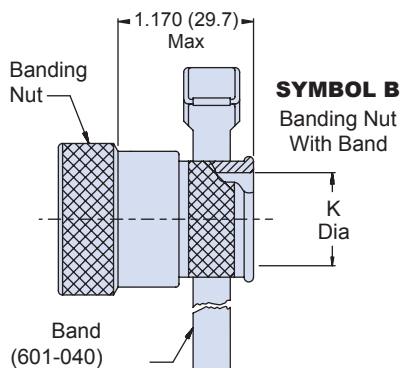
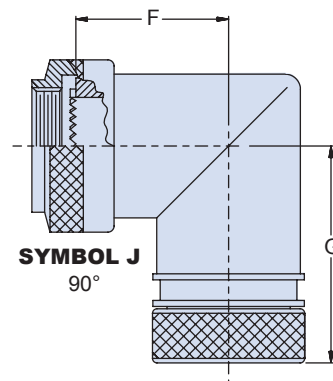
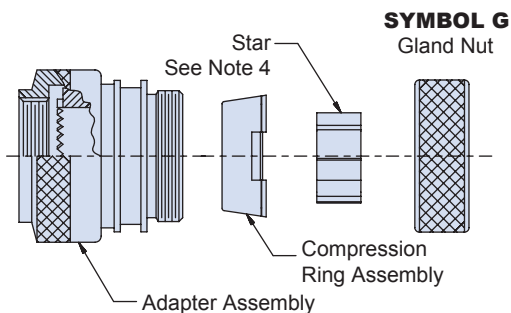
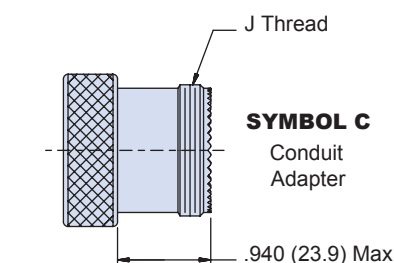
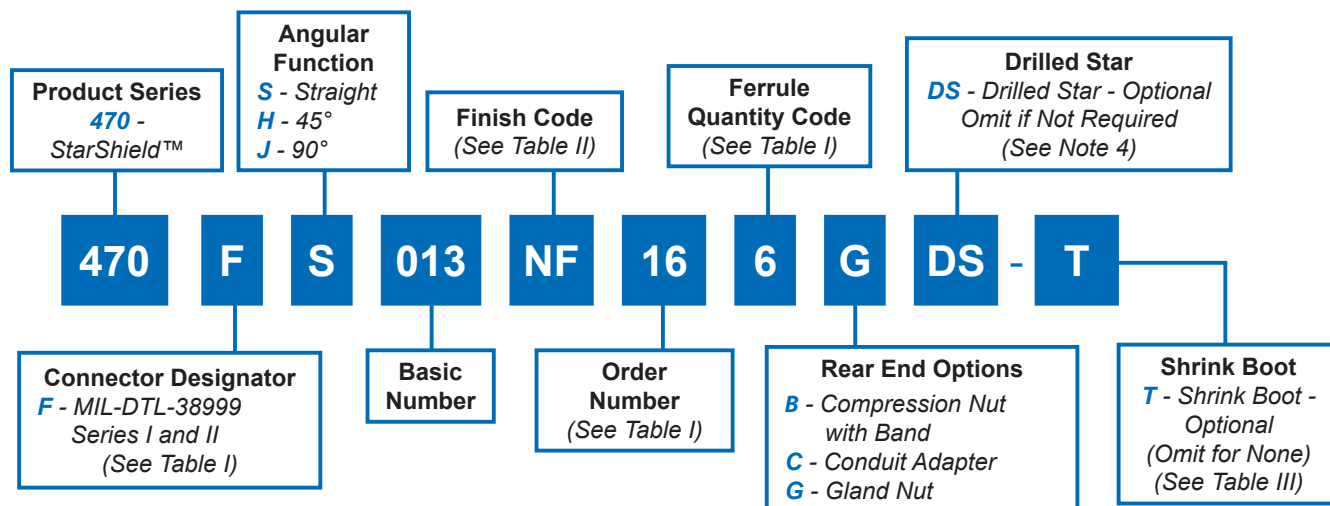


**Standard  
Length**



**High  
Ferrule Count**

**StarShield™ non-environmental, high ferrule count backshell with self-nestor coupling**



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Rev. 03.08.21

**470-013**  
**StarShield™ EMI/RFI Shield Termination Backshell**  
**for MIL-DTL-83723 Series I & III, 5015 MS400 Series, AS81703**  
**Series 3, and MIL-C- 26482 Series 2**



**Table I: Dimensions**

| Order No. | Connector Shell Size         |                            |                    |                       | A Thread Class 2 B | B Dia Max    | C Dia Max    | D Max       |
|-----------|------------------------------|----------------------------|--------------------|-----------------------|--------------------|--------------|--------------|-------------|
|           | MIL-DTL-83723 Series I & III | MIL-DTL-5015 MS3400 Series | AS81703 Series III | MIL-C-26482 Series II |                    |              |              |             |
| 08        | 8                            | 8S                         | -                  | 8                     | 1/2-20 UNF         | .660 (16.7)  | .690 (17.5)  | .490 (12.5) |
| 10        | 10                           | 10S, 10SL                  | -                  | 10                    | 5/8-24 UNEF        | .870 (22.0)  | .850 (21.5)  | .510 (13.0) |
| 12        | 12                           | 12, 12S                    | 7                  | 12                    | 3/4-20 UNEF        | 1.000 (25.4) | .890 (22.5)  | .550 (14.0) |
| 14        | 14                           | 14, 14S                    | 12                 | 14                    | 7/8-20 UNEF        | 1.180 (30.0) | 1.000 (25.4) | .570 (14.5) |
| 16        | 16                           | 16, 16S                    | 19                 | 16                    | 1-20 UNEF          | 1.300 (33.0) | 1.120 (28.5) | .590 (15.0) |
| 18        | 18                           | 18                         | 27                 | 18                    | 1 1/16-18 UNEF     | 1.460 (37.0) | 1.240 (31.5) | .610 (15.5) |
| 20        | 20                           | 20                         | 37                 | 20                    | 1 3/16-18 UNEF     | 1.500 (38.0) | 1.380 (35.0) | .650 (16.5) |
| 22        | 22                           | 22                         | -                  | 22                    | 1 5/16-18 UNEF     | 1.610 (41.0) | 1.500 (38.0) | .670 (17.0) |
| 24        | 24                           | 24                         | -                  | 24                    | 1 7/16-18 UNEF     | 1.810 (46.0) | 1.610 (41.0) | .710 (18.0) |

**Table I: Dimensions (continued)**

| Order No. | E Max        | F Max        | G Max        | J Thread Class 2 A | K ± .004 (.10) | Ferrule Quantity (See Note 4) |      |
|-----------|--------------|--------------|--------------|--------------------|----------------|-------------------------------|------|
|           |              |              |              |                    |                | Std.                          | Opt. |
| 08        | 1.000 (25.4) | .630 (16.0)  | 1.140 (29.0) | 1/2-20 UNF         | .315 (8.00)    | 1                             | -    |
| 10        | 1.020 (26.0) | .690 (17.5)  | 1.200 (30.5) | 5/8-24 UNEF        | .531 (13.5)    | 2                             | -    |
| 12        | 1.040 (26.5) | .750 (19.0)  | 1.260 (32.0) | 3/4-20 UNEF        | .591 (15.0)    | 3                             | -    |
| 14        | 1.080 (27.5) | .810 (20.5)  | 1.320 (33.5) | 7/8-20 UNEF        | .709 (18.0)    | 5                             | -    |
| 16        | 1.100 (28.0) | .870 (22.0)  | 1.380 (35.0) | 1-20 UNEF          | .827 (21.0)    | 6                             | 7    |
| 18        | 1.120 (28.5) | .930 (23.5)  | 1.440 (36.5) | 1 1/16-18 UNEF     | .945 (24.0)    | 7                             | -    |
| 20        | 1.140 (29.0) | 1.000 (25.4) | 1.520 (38.5) | 1 3/16-18 UNEF     | 1.063 (27.0)   | 9                             | 11   |
| 22        | 1.180 (30.0) | 1.060 (27.0) | 1.570 (40.0) | 1 5/16-18 UNEF     | 1.181 (30.0)   | 10                            | 13   |
| 24        | 1.220 (31.0) | 1.120 (28.5) | 1.630 (41.5) | 1 7/16-18 UNEF     | 1.299 (33.0)   | 12                            | 17   |

**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Table III: Shrink Boot**

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 08         | 770-001S103             |
| 10         | 770-001S105             |
| 12         | 770-001S105             |
| 14         | 770-001S106             |
| 16         | 770-001S106             |
| 18         | 770-001S107             |
| 20         | 770-001S107             |
| 22         | 770-001S107             |
| 24         | 770-001S108             |

**Notes:**

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 08. Drilled star is available on order numbers 14-24 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

**Material/Finish:**

|                                                                      |                                  |
|----------------------------------------------------------------------|----------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table III |
| Band                                                                 | CRES/passivate                   |

Dimensions in inches (millimeters) and are subject to change without notice.



# 470-015 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



**Non  
Environmental**



**Self  
Locking**



**Rear End  
Options**



**Standard  
Length**



**High  
Ferrule Count**

**StarShield™ non-environmental, standard length backshell with self-locking coupling**

**Product Series**  
**470 -**  
StarShield™

**470**

**Angular  
Function**  
**S - Straight**  
**H - 45°**  
**J - 90°**

**F**

**S**

**Finish Code**  
(See Table II)

**015**

**Ferrule  
Quantity Code**  
(See Table I)

**16**

**6**

**G**

**Drilled Star**  
**DS - Drilled Star -**  
**Optional**  
(Omit if Not Required)  
(See Note 4)

**DS**

**-**

**T**

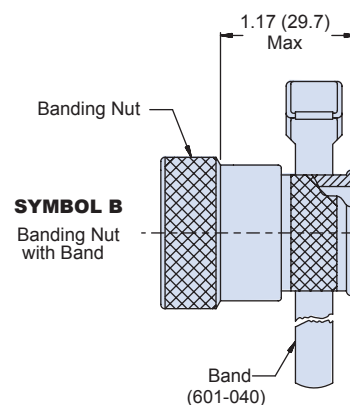
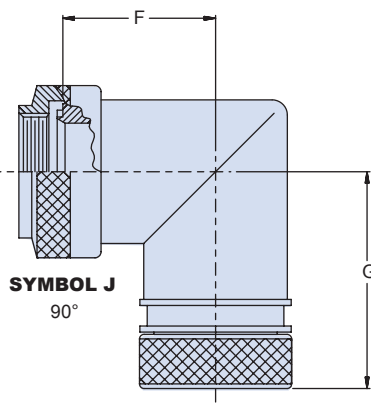
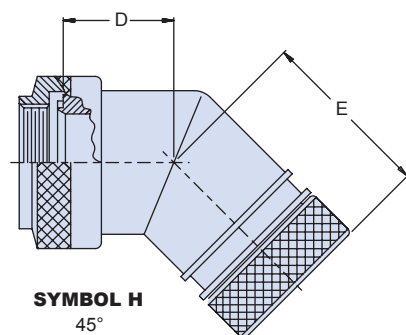
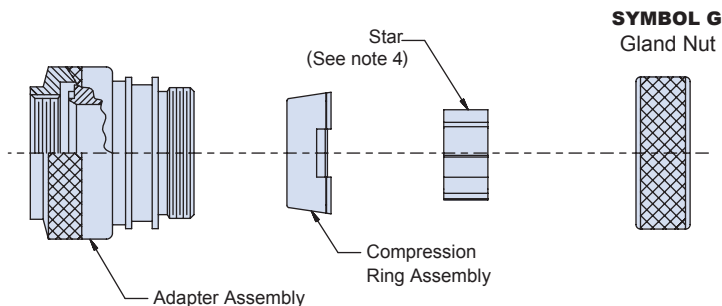
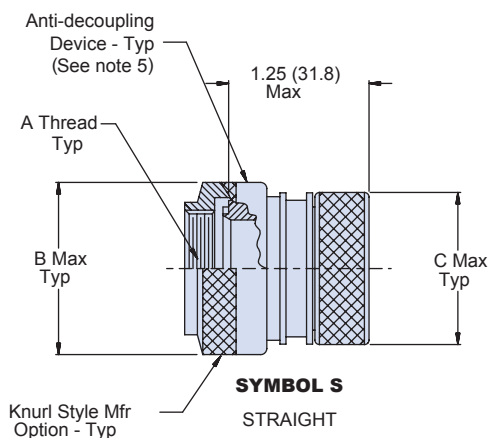
**Connector Designator**  
**F - MIL-DTL-38999**  
**Series 1 and II**

**Basic  
Number**

**Order  
Number**  
(See Table I)

**Rear End Options**  
**B - Compression Nut**  
**with Band**  
**C - Conduit Adapter**  
**G - Gland Nut**

**Shrink Boot**  
**T - Shrink Boot -**  
**Optional**  
(Omit for None)  
(See Table III)



Dimensions in inches (millimeters) and are subject to change without notice.

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Rev. 03.08.21



# 470-015

## StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series I and II Connectors



Table I : Dimensions

| Order No | Connector Shell Size    |                        | A Thread Class 2 B | B DIA MAX  | C Dia Max    | D Max       | E Max         | F Max        |
|----------|-------------------------|------------------------|--------------------|------------|--------------|-------------|---------------|--------------|
|          | MIL-DTL-38999 Series II | MIL-DTL-38999 Series I |                    |            |              |             |               |              |
| 08       | 08                      | 09                     | 7/16-28 UNEF       | .69(17.5)  | .690 (17.5)  | .750 (19.1) | 1.000 (25.4)  | .880 (22.4)  |
| 10       | 10                      | 11                     | 9/16-24 UNEF       | .81(20.6)  | .850 (21.5)  | .780 (19.8) | 1.020 (26.0)  | .960 (24.4)  |
| 12       | 12                      | 13                     | 11/16-24 UNEF      | .94(23.9)  | .890 (22.5)  | .810 (20.6) | 1.040 (26.5)  | 1.000 (25.4) |
| 14       | 14                      | 15                     | 13/16-20 UNEF      | 1.06(26.9) | 1.000 (25.4) | .830 (21.1) | 1.080 (27.5)  | 1.070 (27.2) |
| 16       | 16                      | 17                     | 15/16-20 UNEF      | 1.17(29.7) | 1.120 (28.5) | .860 (21.8) | 1.100 ((28.0) | 1.130 (28.7) |
| 18       | 18                      | 19                     | 1 1/16-18 UNEF     | 1.29(32.8) | 1.240 (31.5) | .880 (22.4) | 1.120 (28.5)  | 1.180 (30.0) |
| 20       | 20                      | 21                     | 1 3/16-18 UNEF     | 1.41(35.8) | 1.380 (35.0) | .910 (23.1) | 1.140 (29.0)  | 1.250 (31.8) |
| 22       | 22                      | 23                     | 1 5/16-18 UNEF     | 1.54(39.1) | 1.500 (38.0) | .930 (23.6) | 1.180 (30.0)  | 1.310 (33.3) |
| 24       | 24                      | 25                     | 1 7/16-18 UNEF     | 1.66(42.2) | 1.610 (41.0) | .940 (23.9) | 1.220 (31.0)  | 1.360 (34.5) |

Table I: (Continued)

| Order No. | G Max        | J Thread ISO Metric | K ± .004 (.10) | Ferrule Quantity (See Note 4) |      |
|-----------|--------------|---------------------|----------------|-------------------------------|------|
|           |              |                     |                | Std.                          | Opt. |
| 09        | 1.140 (29.0) | M12 X 1 - 6g        | .315 (8.00)    | 1                             | -    |
| 11        | 1.200 (30.5) | M15 X 1 - 6g        | .531 (13.5)    | 2                             | -    |
| 13        | 1.260 (32.0) | M18 X 1 - 6g        | .591 (15.0)    | 3                             | -    |
| 15        | 1.320 (33.5) | M22 X 1 - 6g        | .709 (18.0)    | 5                             | -    |
| 17        | 1.380 (35.0) | M25 X 1 - 6g        | .827 (21.0)    | 6                             | 7    |
| 19        | 1.440 (36.5) | M28 X 1 - 6g        | .945 (24.0)    | 7                             | -    |
| 21        | 1.520 (38.5) | M31 X 1 - 6g        | 1.063 (27.0)   | 9                             | 11   |
| 23        | 1.570 (40.0) | M34 X 1 - 6g        | 1.181 (30.0)   | 10                            | 13   |
| 25        | 1.630 (41.5) | M37 X 1 - 6g        | 1.299 (33.0)   | 12                            | 17   |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Material/Finish

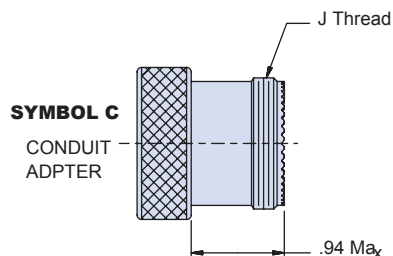
|                                                                      |                                 |
|----------------------------------------------------------------------|---------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| Anti-decoupling device                                               | Corrosion resistant material    |
| O-ring                                                               | Silicone/n.a.                   |
| Band                                                                 | CRES/passivate                  |

Table III: Shrink Boot

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S1 04            |
| 11         | 770-001S1 06            |
| 13         | 770-001S1 06            |
| 15         | 770-001S1 07            |
| 17         | 770-001S1 07            |
| 19         | 770-001S1 08            |
| 21         | 770-001S1 08            |
| 23         | 770-001S1 08            |
| 25         | 770-001S1 09            |

### Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Self-locking functionality, eliminates lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device



Dimensions in inches (millimeters) and are subject to change without notice.



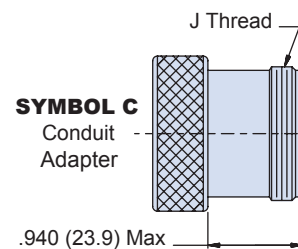
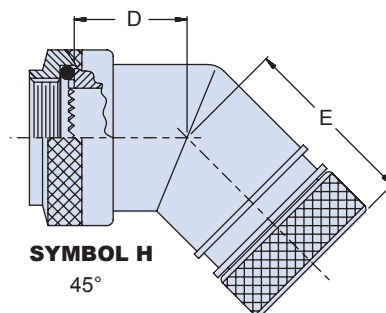
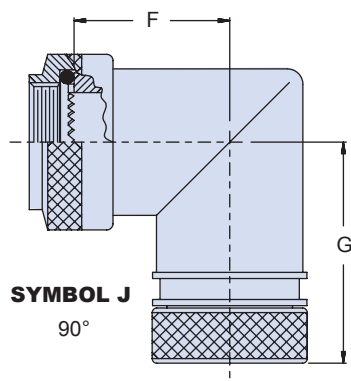
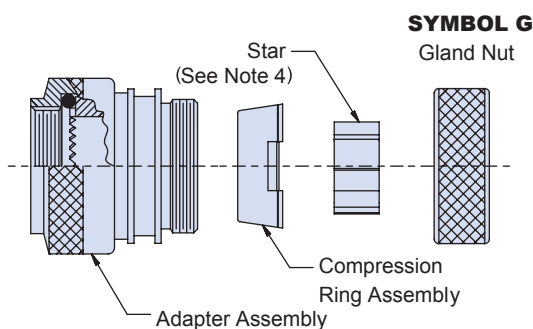
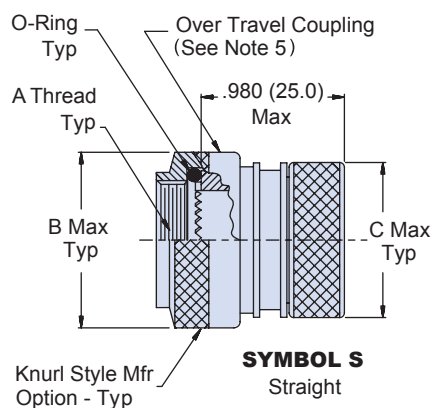
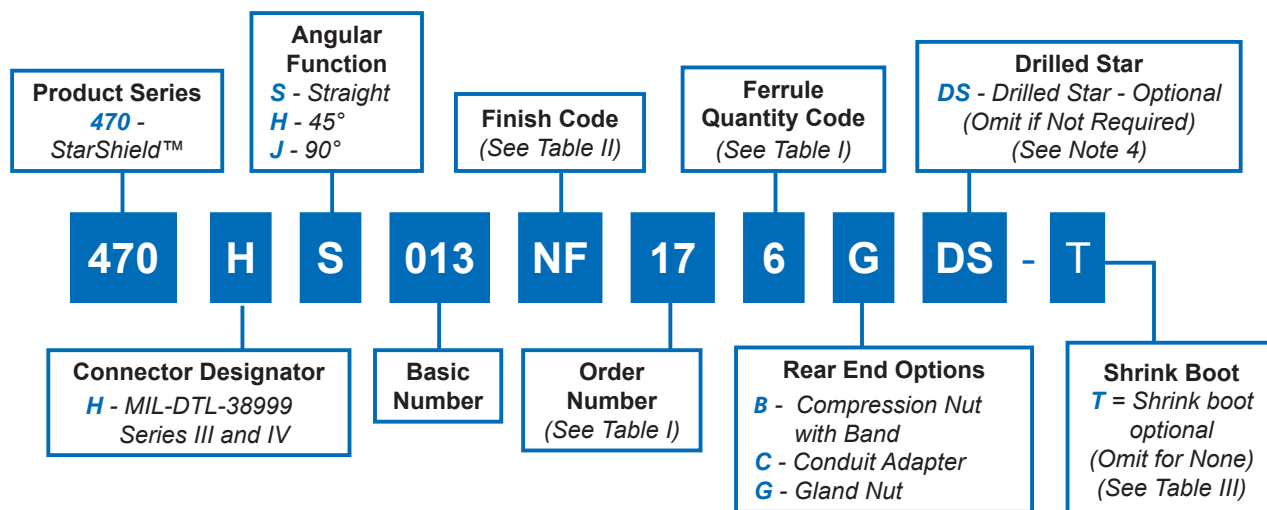
# 470-013 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Environmental

Self  
NestorRear End  
OptionsStandard  
LengthHigh  
Ferrule Count

**StarShield™ environmental backshell with self-nestor coupling and rear end options**



Dimensions in inches (millimeters) and are subject to change without notice.

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StarShield™ Zero Length Shield Termination Catalog

CAGE Code 06324

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www.glenair.com

**B-10**

E-Mail: sales@glenair.com

Rev. 03.08.21

# 470-013

## StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Table I Dimensions

| Order No. | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max    | C Dia Max    | D Max       | E Max        | F Max        |
|-----------|--------------------------|---------------------|--------------|--------------|-------------|--------------|--------------|
| 09        | A/9                      | M12 X 1 - 6H        | .75 (19.0)   | .690 (17.5)  | .490 (12.5) | 1.000 (25.4) | .630 (16.0)  |
| 11        | B/11                     | M15 X 1 - 6H        | .870 (22.0)  | .850 (21.5)  | .510 (13.0) | 1.020 (26.0) | .690 (17.5)  |
| 13        | C/13                     | M18 X 1 - 6H        | 1.000 (25.4) | .890 (22.5)  | .550 (14.0) | 1.040 (26.5) | .750 (19.0)  |
| 15        | D/15                     | M22 X 1 - 6H        | 1.200 (30.5) | 1.000 (25.4) | .570 (14.5) | 1.080 (27.5) | .810 (20.5)  |
| 17        | E/17                     | M25 X 1 - 6H        | 1.320 (33.5) | 1.120 (28.5) | .590 (15.0) | 1.100 (28.0) | .870 (22.0)  |
| 19        | F/19                     | M28 X 1 - 6H        | 1.460 (37.0) | 1.240 (31.5) | .610 (15.5) | 1.120 (28.5) | .930 (23.5)  |
| 21        | G/21                     | M31 X 1 - 6H        | 1.520 (38.5) | 1.380 (35.0) | .650 (16.5) | 1.140 (29.0) | 1.000 (25.4) |
| 23        | H/23                     | M34 X 1 - 6H        | 1.650 (42.0) | 1.500 (38.0) | .670 (17.0) | 1.180 (30.0) | 1.060 (27.0) |
| 25        | J/25                     | M37 X 1 - 6H        | 1.830 (46.5) | 1.610 (41.0) | .710 (18.0) | 1.220 (31.0) | 1.120 (28.5) |

Table I: Dimensions (Continued)

| Order No. | G Max        | J Thread ISO Metric | K ± .004 (.10) | Ferrule Quantity (See Note 4) |      |
|-----------|--------------|---------------------|----------------|-------------------------------|------|
|           |              |                     |                | Std.                          | Opt. |
| 09        | 1.140 (29.0) | M12 X 1 - 6g        | .315 (8.00)    | 1                             | -    |
| 11        | 1.200 (30.5) | M15 X 1 - 6g        | .531 (13.5)    | 2                             | -    |
| 13        | 1.260 (32.0) | M18 X 1 - 6g        | .591 (15.0)    | 3                             | -    |
| 15        | 1.320 (33.5) | M22 X 1 - 6g        | .709 (18.0)    | 5                             | -    |
| 17        | 1.380 (35.0) | M25 X 1 - 6g        | .827 (21.0)    | 6                             | 7    |
| 19        | 1.440 (36.5) | M28 X 1 - 6g        | .945 (24.0)    | 7                             | -    |
| 21        | 1.520 (38.5) | M31 X 1 - 6g        | 1.063 (27.0)   | 9                             | 11   |
| 23        | 1.570 (40.0) | M34 X 1 - 6g        | 1.181 (30.0)   | 10                            | 13   |
| 25        | 1.630 (41.5) | M37 X 1 - 6g        | 1.299 (33.0)   | 12                            | 17   |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Material/Finish

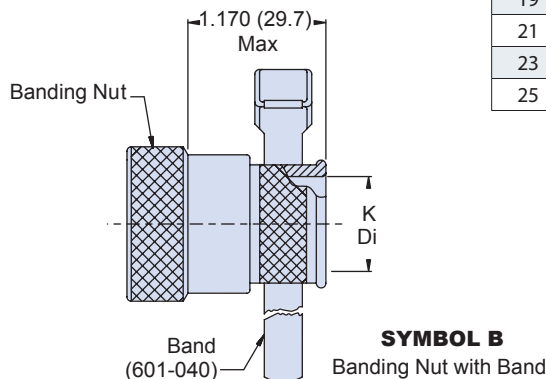
|                                                                      |                                 |
|----------------------------------------------------------------------|---------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| Band                                                                 | CRES/Passivate                  |
| O-ring                                                               | Silicone/n.a.                   |

Table III: Shrink Boot

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S1 04            |
| 11         | 770-001S1 06            |
| 13         | 770-001S1 06            |
| 15         | 770-001S1 07            |
| 17         | 770-001S1 07            |
| 19         | 770-001S1 08            |
| 21         | 770-001S1 08            |
| 23         | 770-001S1 08            |
| 25         | 770-001S1 09            |

### Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device



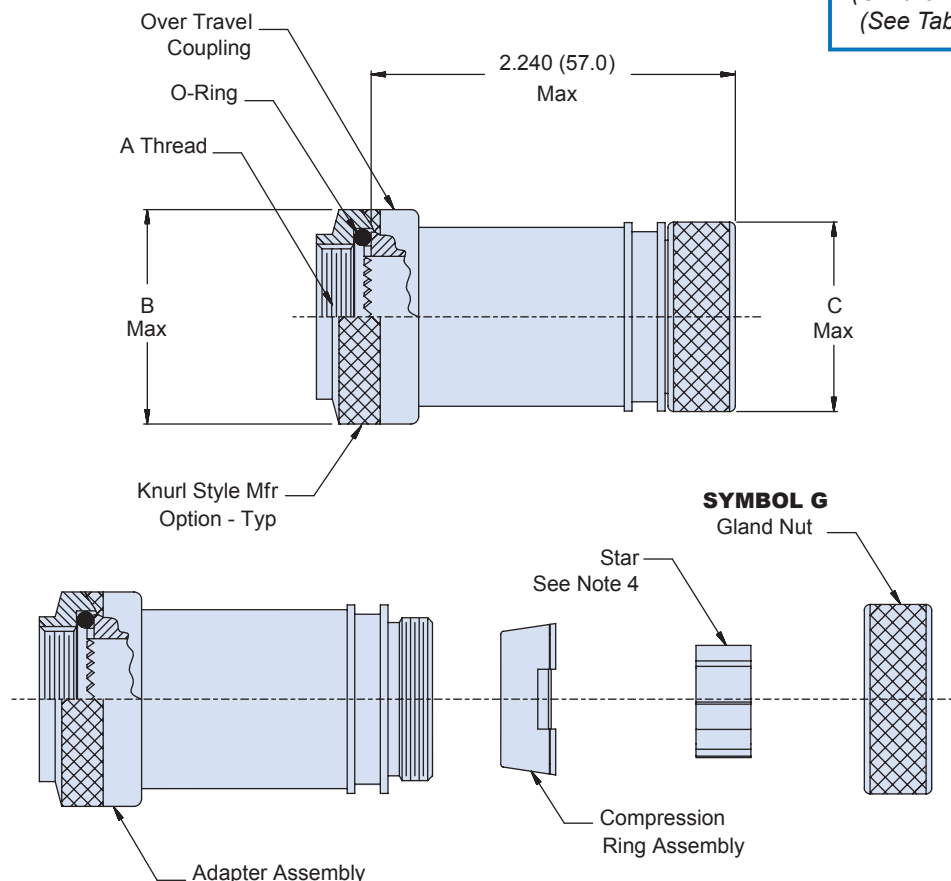
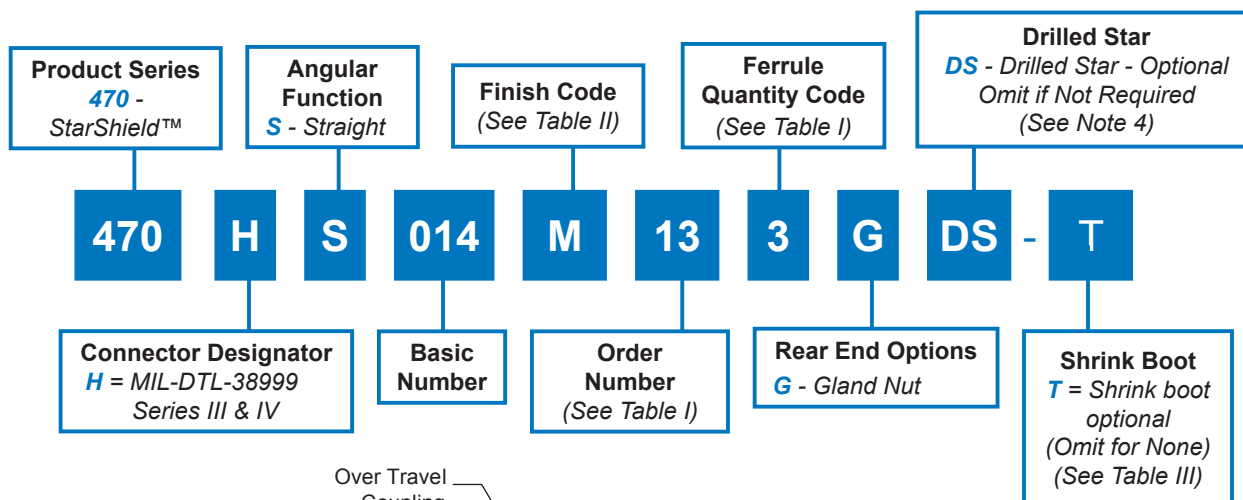
Dimensions in inches (millimeters) and are subject to change without notice.



470-014  
StarShield™ Extended Length EMI/RFI  
Shield Termination Backshell  
for MIL-DTL-38999 Series III and IV Connectors



**StarShield™ environmental, high ferrule count backshell with self-nestor**





**470-014**  
**StarShield™ Extended EMI/RFI**  
**Shield Termination Backshell**  
for MIL-DTL-38999 Series III and IV Connectors



**Table I: Dimensions**

| Order No. | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max    | C Dia Max    | Ferrule Quantity<br>(See Note 4) |      |
|-----------|--------------------------|---------------------|--------------|--------------|----------------------------------|------|
|           |                          |                     |              |              | Std.                             | Opt. |
| 09        | A/9                      | M12 X 1 - 6H        | .750 (19.0)  | .690 (17.5)  | 1                                | -    |
| 11        | B/11                     | M15 X 1 - 6H        | .870 (22.0)  | .850 (21.5)  | 2                                | -    |
| 13        | C/13                     | M18 X 1 - 6H        | 1.000 (25.4) | .890 (22.5)  | 3                                | -    |
| 15        | D/15                     | M22 X 1 - 6H        | 1.120 (30.5) | 1.000 (25.4) | 5                                | -    |
| 17        | E/17                     | M25 X 1 - 6H        | 1.320 (33.5) | 1.120 (28.5) | 6                                | 7    |
| 19        | F/19                     | M28 X 1 - 6H        | 1.460 (37.0) | 1.240 (31.5) | 7                                | -    |
| 21        | G/21                     | M31 X 1 - 6H        | 1.520 (38.5) | 1.380 (35.0) | 9                                | 11   |
| 23        | H/23                     | M34 X 1 - 6H        | 1.650 (42.0) | 1.500 (38.0) | 10                               | 13   |
| 25        | J/25                     | M37 X 1 - 6H        | 1.830 (46.5) | 1.610 (41.0) | 12                               | 17   |

**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Material/Finish**

|                                                 |                                 |
|-------------------------------------------------|---------------------------------|
| Backshell, gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| O-ring                                          | Silicone/n.a.                   |
| Coupling Nut                                    | Stainless steel passivate       |

**Notes:**

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with Order Number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device

**Table III: Shrink Boot**

| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S1 04            |
| 11         | 770-001S1 06            |
| 13         | 770-001S1 06            |
| 15         | 770-001S1 07            |
| 17         | 770-001S1 07            |
| 19         | 770-001S1 08            |
| 21         | 770-001S1 08            |
| 23         | 770-001S1 08            |
| 25         | 770-001S1 09            |

Dimensions in inches (millimeters) and are subject to change without notice.



# 470-015 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



Environmental

Rear End  
OptionsSelf  
LockingStandard  
LengthHigh  
Ferrule Count

**StarShield™ environmental, backshell with self-locking coupling nut and shrink boot**

**Product Series**  
**470 -**  
**StarShield™**

**470**

**Angular  
Function**

**S - Straight**  
**H - 45°**  
**J - 90°**

**H****S**

**Finish Code**  
(See Table II)

**015**

**Ferrule  
Quantity Code**  
(See Table I)

**17**

**Drilled Star**  
**DS - Drilled Star -**  
**Optional**  
(Omit if Not Required)  
(See Note 4)

**6****G****DS****-****T**

**Connector Designator**  
**H - MIL-DTL-38999**  
**Series III and IV**

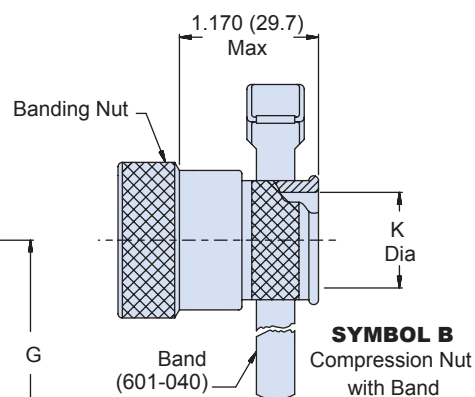
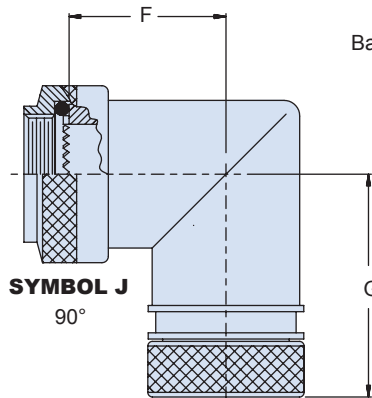
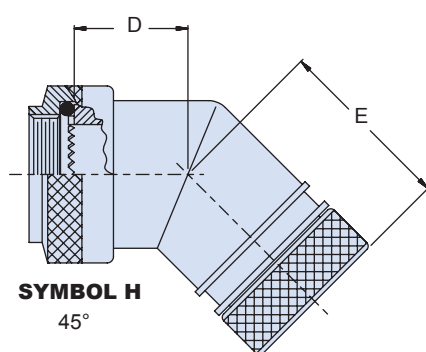
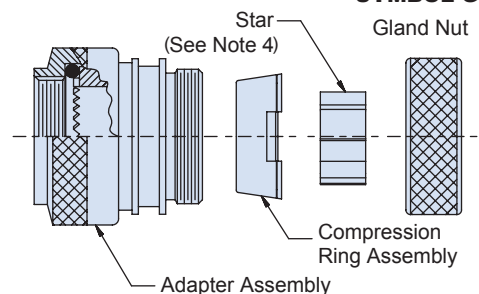
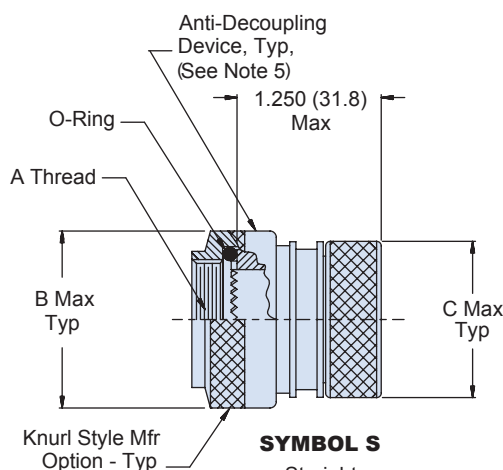
**Basic  
Number**

**Order  
Number**  
(See Table I)

**Rear End Options**

**B - Compression Nut**  
**with Band**  
**C - Conduit Adapter**  
**G - Gland Nut**  
**T - Tinel Nut with Tinel**  
**Ring for Single Braid**

**Shrink Boot**  
**T - Shrink Boot -**  
**Optional**  
(Omit for None)  
(See Table III)



Dimensions in inches (millimeters) and are subject to change without notice.

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# 470-015 StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III and IV Connectors



| Table I: Dimensions |                          |                     |              |              |             |              |              |
|---------------------|--------------------------|---------------------|--------------|--------------|-------------|--------------|--------------|
| Order No.           | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max    | C Dia Max    | D Max       | E Max        | F Max        |
| 09                  | A/9                      | M12 X 1 - 6H        | .940 (23.9)  | .690 (17.5)  | .750 (19.1) | 1.000 (25.4) | .880 (22.4)  |
| 11                  | B/11                     | M15 X 1 - 6H        | 1.060 (26.9) | .850 (21.5)  | .780 (19.8) | 1.020 (26.0) | .960 (24.4)  |
| 13                  | C/13                     | M18 X 1 - 6H        | 1.170 (29.7) | .890 (22.5)  | .810 (20.6) | 1.040 (26.5) | 1.000 (25.4) |
| 15                  | D/15                     | M22 X 1 - 6H        | 1.290 (32.8) | 1.000 (25.4) | .830 (21.1) | 1.080 (27.5) | 1.070 (27.2) |
| 17                  | E/17                     | M25 X 1 - 6H        | 1.420 (36.1) | 1.120 (28.5) | .860 (21.8) | 1.100 (28.0) | 1.130 (28.7) |
| 19                  | F/19                     | M28 X 1 - 6H        | 1.540 (39.1) | 1.240 (31.5) | .880 (22.4) | 1.120 (28.5) | 1.180 (30.0) |
| 21                  | G/21                     | M31 X 1 - 6H        | 1.670 (42.4) | 1.380 (35.0) | .910 (23.1) | 1.140 (29.0) | 1.250 (31.8) |
| 23                  | H/23                     | M34 X 1 - 6H        | 2.010 (51.1) | 1.500 (38.0) | .930 (23.6) | 1.180 (30.0) | 1.310 (33.3) |
| 25                  | J/25                     | M37 X 1 - 6H        | 2.120 (53.8) | 1.610 (41.0) | .940 (23.9) | 1.220 (31.0) | 1.360 (34.5) |

| Table I: Dimensions (Continued) |              |                |                     |                |                               |      |
|---------------------------------|--------------|----------------|---------------------|----------------|-------------------------------|------|
| Order No.                       | G Max        | H ± .003 (.08) | J Thread ISO Metric | K ± .004 (.10) | Ferrule Quantity (See Note 4) |      |
|                                 |              |                |                     |                | Std.                          | Opt. |
| 09                              | 1.140 (29.0) | .435 (11.0)    | M12 X 1 - 6g        | .315 (8.00)    | 1                             | -    |
| 11                              | 1.200 (30.5) | .623 (15.8)    | M15 X 1 - 6g        | .531 (13.5)    | 2                             | -    |
| 13                              | 1.260 (32.0) | .746 (18.9)    | M18 X 1 - 6g        | .591 (15.0)    | 3                             | -    |
| 15                              | 1.320 (33.5) | .871 (22.1)    | M22 X 1 - 6g        | .709 (18.0)    | 5                             | -    |
| 17                              | 1.380 (35.0) | .996 (25.3)    | M25 X 1 - 6g        | .827 (21.0)    | 6                             | 7    |
| 19                              | 1.440 (36.5) | 1.121 (28.5)   | M28 X 1 - 6g        | .945 (24.0)    | 7                             | -    |
| 21                              | 1.520 (38.5) | 1.245 (31.6)   | M31 X 1 - 6g        | 1.063 (27.0)   | 9                             | 11   |
| 23                              | 1.570 (40.0) | 1.371 (34.8)   | M34 X 1 - 6g        | 1.181 (30.0)   | 10                            | 13   |
| 25                              | 1.630 (41.5) | 1.371 (34.8)   | M37 X 1 - 6g        | 1.299 (33.0)   | 12                            | 17   |

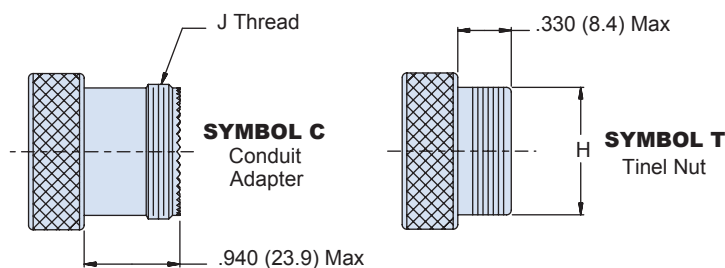
| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Code                                  | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC                                   | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1                                    | Stainless steel; passivate                                 |
| ZM                                    | Stainless steel; electroless nickel                        |

| Table III: Shrink Boot |                         |
|------------------------|-------------------------|
| Shell Size             | Shrink Boot Part Number |
| 09                     | 770-001S1 04            |
| 11                     | 770-001S1 06            |
| 13                     | 770-001S1 06            |
| 15                     | 770-001S1 07            |
| 17                     | 770-001S1 07            |
| 19                     | 770-001S1 08            |
| 21                     | 770-001S1 08            |
| 23                     | 770-001S1 08            |
| 25                     | 770-001S1 09            |

| Material/Finish                                                      |                                 |
|----------------------------------------------------------------------|---------------------------------|
| Backshell, elbows, coupling and gland nut, compression ring and star | Aluminum alloy or CRES/Table II |
| Anti-decoupling device                                               | Corrosion resistant material    |
| Tinel ring                                                           | Nickel-titanium alloy/n.a.      |
| Band                                                                 | CRES/passivate                  |

## Notes:

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule quantity per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating and self-locking functionality, eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device



Dimensions in inches (millimeters) and are subject to change without notice.



470-017

# StarShield™ EMI/RFI Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



Environmental

Standard  
Length

Composite

Self  
LockingHigh  
Ferrule Count

## StarShield™ composite backshell with self-locking coupling and shrink boot

Product Series

470 -  
StarShield™Angular  
FunctionS - Straight  
T - 45°  
W - 90°Finish Code  
(See Table II)Ferrule  
Quantity Code  
(See Table I)Drilled Star  
DS - Drilled Star -  
Optional  
(Omit if not required)  
(See Note 4)

470

H

S

017

XM

17

6

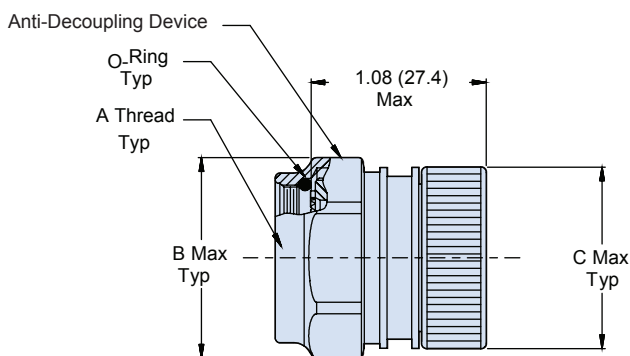
G

DS

-

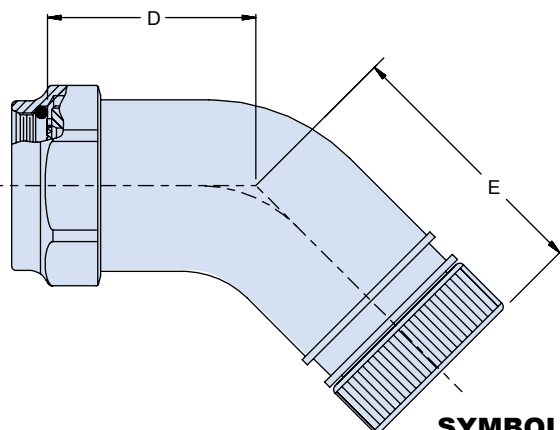
T

Connector Designator

H - MIL-DTL-38999  
Series III and IVBasic  
NumberOrder  
Number  
(See Table I)Rear End  
Options  
G - Gland NutShrink Boot  
T = Shrink Boot - Optional  
(Omit for None)  
(See Table III)

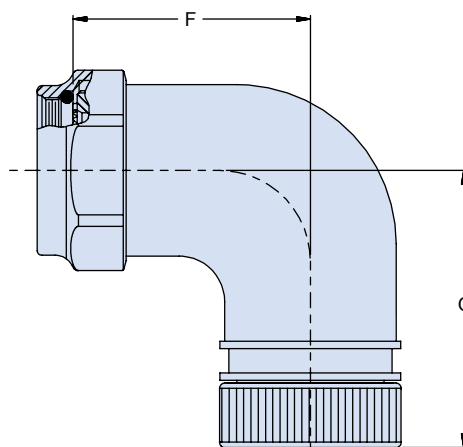
### SYMBOL S

Straight



### SYMBOL T

45°



### SYMBOL W

90°

Dimensions in inches (millimeters) and are subject to change without notice.

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# 470-017

## StarShield™ EMI/RFI Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



Table I: Dimensions

| Order Number | Connector Shell Size Reference | A Thread ISO Metric | B Dia Max   | C Dia Max     | D Max | E Max | F Max | G Max | Ferrule Quantity (See Note 4) |      |
|--------------|--------------------------------|---------------------|-------------|---------------|-------|-------|-------|-------|-------------------------------|------|
|              |                                |                     |             |               |       |       |       |       | Std.                          | Opt. |
| 09           | A/9                            | M12 X 1 - 6H        | .83 (21.1)  | .681 (17.30)  | 0.75  | 1.09  | 0.72  | 1.20  | 1                             | -    |
| 11           | B/11                           | M15 X 1 - 6H        | .96 (24.4)  | .885 (22.48)  | 0.78  | 1.12  | 0.78  | 1.26  | 2                             | -    |
| 13           | C/13                           | M18 X 1 - 6H        | 1.09 (27.7) | .917 (23.29)  | 0.78  | 1.14  | 0.85  | 1.32  | 3                             | -    |
| 15           | D/15                           | M22 X 1 - 6H        | 1.22 (31.0) | 1.055 (26.80) | 0.78  | 1.17  | 0.91  | 1.39  | 5                             | -    |
| 17           | E/17                           | M25 X 1 - 6H        | 1.35 (34.3) | 1.173 (29.79) | 0.81  | 1.20  | 0.97  | 1.45  | 6                             | 7    |
| 19           | F/19                           | M28 X 1 - 6H        | 1.48 (37.6) | 1.291 (32.79) | 0.82  | 1.21  | 1.03  | 1.51  | 7                             | -    |
| 21           | G/21                           | M31 X 1 - 6H        | 1.62 (41.1) | 1.409 (37.79) | 0.85  | 1.23  | 1.10  | 1.57  | 9                             | 11   |
| 23           | H/23                           | M34 X 1 - 6H        | 1.75 (44.5) | 1.527 (38.79) | 0.89  | 1.27  | 1.16  | 1.64  | 10                            | 13   |
| 25           | J/25                           | M37 X 1 - 6H        | 1.89 (48.0) | 1.665 (42.29) | 0.92  | 1.30  | 1.22  | 1.70  | 12                            | 17   |

Table II: Material and Finish Options

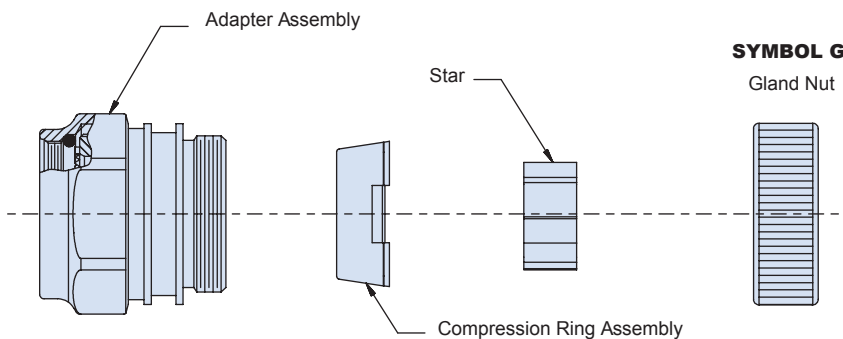
| Code | Finish Description  |
|------|---------------------|
| XM   | Electroless nickel  |
| XW   | Cadmium, olive drab |
| XZR  | Zinc nickel, Black  |

Table III: Shrink Boot

| Shell Size | Shrink Boot Ref. Part No. |
|------------|---------------------------|
| 09         | 770-001S1 04              |
| 11         | 770-001S1 06              |
| 13         | 770-001S1 06              |
| 15         | 770-001S1 07              |
| 17         | 770-001S1 07              |
| 19         | 770-001S1 08              |
| 21         | 770-001S1 08              |
| 23         | 770-001S1 08              |
| 25         | 770-001S1 09              |

Material/Finish:

|                                      |                                                     |
|--------------------------------------|-----------------------------------------------------|
| Backshell, compression ring and star | High grade engineering thermoplastic/ see Table III |
| Nuts                                 | High grade engineering thermoplastic/ color black   |
| O-ring                               | Silicone/n.a.                                       |



SYMBOL G  
Gland Nut

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
3. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied

Dimensions in inches (millimeters) and are subject to change without notice.



470-019

# StarShield™ EMI/RFI Split Termination Backshell for MIL-DTL-38999 Series III and IV Connectors

Non  
EnvironmentalStandard  
LengthHigh  
Ferrule CountSplit  
ShellSelf  
Locking

## StarShield™ split shell, high ferrule count backshell with self-locking coupling

**Product Series**  
**470 -**  
StarShield™

**Angular  
Function**  
**E - 90°**  
**F - 45°**  
**S - Straight**

**Finish Code**  
(See Table II)

**Dash Number**  
(See Table III)

**Drilled Star**  
**DS - Drilled Star - Optional**  
(Omit if Not Required)  
(See Note 4)

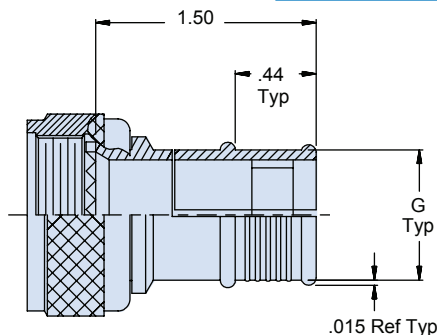
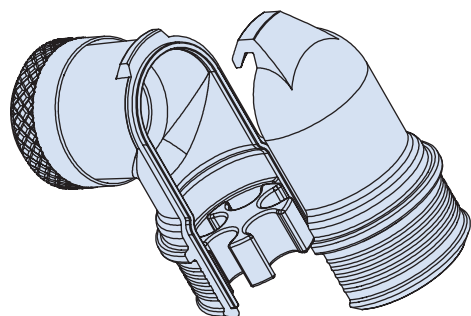
**470****H****E****019****NF****19****24****- 12****DS**

**Connector Designator**  
**H - MIL-DTL-38999**  
Series III and IV

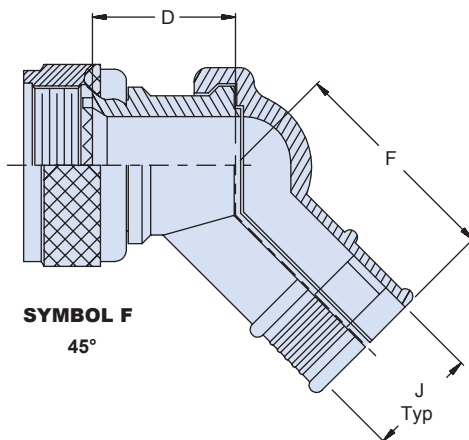
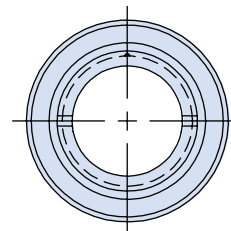
**Basic  
Number**

**Shell Size**  
(See Table I)

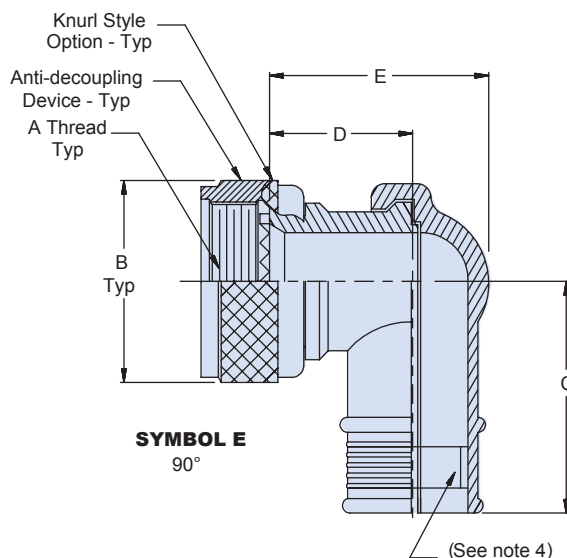
**Ferrule  
Quantity**  
(See Table III)



**SYMBOL S**  
Straight



**SYMBOL F**  
45°



**SYMBOL E**  
90°

Dimensions in inches (millimeters) and are subject to change without notice.

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CAGE Code 06324

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**470-019**  
**StarShield™ EMI/RFI Split Termination Backshell**  
**for MIL-DTL-38999 Series III and IV Connectors**



| Table I: Dimensions |                     |              |              |              |              |              |           |
|---------------------|---------------------|--------------|--------------|--------------|--------------|--------------|-----------|
| Shell Size          | A Thread ISO Metric | B Max        | C Max        | D Max        | E Max        | F Max        | Max Entry |
| 09                  | M12 X 1.0 - 6H      | .940 (23.9)  | 1.995 (50.7) | 1.030 (26.2) | 1.339 (34.0) | 1.405 (35.7) | 14        |
| 11                  | M15 X 1.0 - 6H      | 1.060 (26.9) | 2.055 (52.2) | 1.100 (27.9) | 1.465 (37.2) | 1.435 (36.4) | 14        |
| 13                  | M18 X 1.0 - 6H      | 1.170 (29.7) | 2.125 (54.0) | 1.160 (29.5) | 1.589 (40.4) | 1.465 (37.2) | 18        |
| 15                  | M22 X 1.0 - 6H      | 1.290 (32.8) | 2.185 (55.5) | 1.220 (31.0) | 1.715 (43.6) | 1.485 (37.7) | 24        |
| 17                  | M25 X 1.0 - 6H      | 1.420 (36.1) | 2.245 (57.0) | 1.310 (33.3) | 1.901 (48.3) | 1.515 (38.5) | 24        |
| 19                  | M28 X 1.0 - 6H      | 1.540 (39.1) | 2.265 (57.5) | 1.370 (34.8) | 2.025 (51.4) | 1.535 (39.0) | 24        |
| 21                  | M31 X 1.0 - 6H      | 1.670 (42.4) | 2.405 (61.1) | 1.370 (34.8) | 2.025 (51.4) | 1.565 (39.8) | 28        |
| 23                  | M34 X 1.0 - 6H      | 2.010 (51.1) | 2.435 (61.8) | 1.440 (36.6) | 2.152 (54.7) | 1.595 (40.5) | 28        |
| 25                  | M37 X 1.0 - 6H      | 2.120 (53.8) | 2.495 (63.4) | 1.560 (39.6) | 2.403 (61.0) | 1.615 (41.0) | 32        |

| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Code                                  | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC                                   | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1                                    | Stainless steel; passivate                                 |
| ZM                                    | Stainless steel; electroless nickel                        |

| Table III: Ferrule Options |              |              |                                  |    |             |
|----------------------------|--------------|--------------|----------------------------------|----|-------------|
| Dash No.                   | G Ref        | J Ref        | Ferrule Quantity<br>(See Note 4) |    |             |
|                            |              |              | Std.                             | DS | Opt.        |
| 10                         | .630 (16.0)  | .470 (11.9)  | 2                                | -  | -           |
| 14                         | .870 (22.1)  | .710 (18.0)  | 5                                | 5  | -           |
| 18                         | 1.170 (29.7) | 1.010 (25.7) | 7                                | 7  | -           |
| 24                         | 1.420 (36.1) | 1.260 (32.0) | 12                               | 12 | 13/14/15/17 |
| 28                         | 1.730 (43.9) | 1.570 (39.9) | 22                               | 14 | 14/25       |
| 32                         | 1.940 (49.3) | 1.780 (52.2) | 28                               | 18 | 18/31       |

**Notes:**

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Drilled star is available on Table III.
5. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

| Material/Finish                  |                              |
|----------------------------------|------------------------------|
| Backshell, coupling nut and star | Al alloy/Table III           |
| Anti-decoupling device           | Corrosion resistant material |



# 470-020 StarShield™ EMI/RFI Split Composite Backshell for MIL-DTL-38999 Series III and IV Connectors



**Non  
Environmental**



**Standard  
Length**



**Composite**



**High  
Ferrule Count**

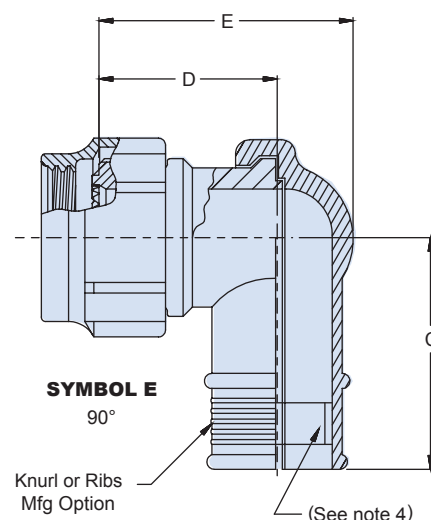
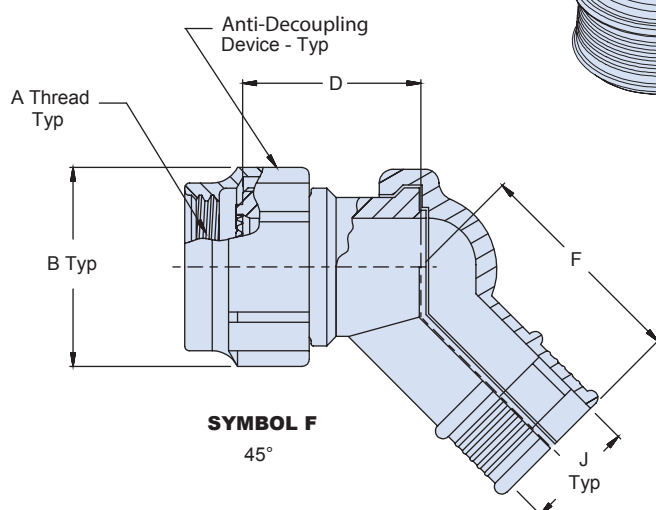
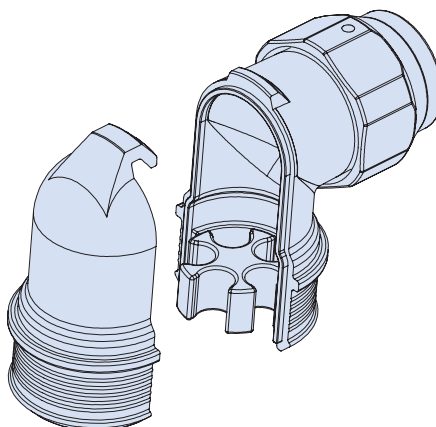
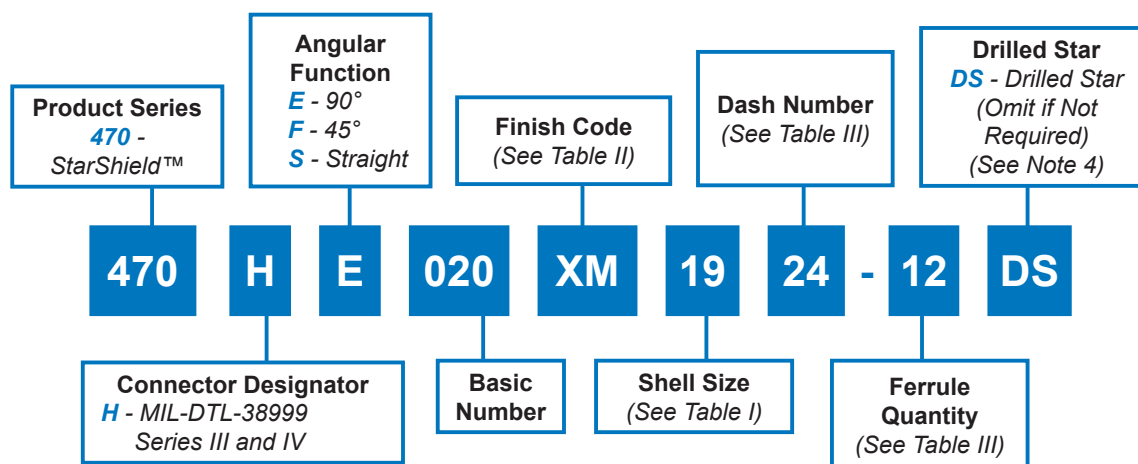


**Split  
Shell**



**Self  
Locking**

**StarShield™ split shell, non-environmental backshell with high ferrule count**



Dimensions in inches (millimeters) and are subject to change without notice.

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**470-020**  
**StarShield™ Split Composite EMI/RFI Backshell**  
**for MIL-C-38999 Series III and IV Connectors**



| Table I: Dimensions |                     |              |              |              |              |              |              |              |           |
|---------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------|
| Shell Size          | A Thread ISO Metric | B Max        | C Max        | D Max        | E Max        | F Max        | G Flats      |              | Max Entry |
|                     |                     |              |              |              |              |              | Max          | Min          |           |
| 09                  | M12 X 1.0 - 6H      | .812 (20.6)  | 1.995 (50.7) | 1.030 (26.2) | 1.339 (34.0) | 1.405 (35.7) | .750 (19.1)  | .736 (18.7)  | 14        |
| 11                  | M15 X 1.0 - 6H      | .938 (23.8)  | 2.055 (52.2) | 1.100 (27.9) | 1.465 (37.2) | 1.435 (36.4) | .875 (22.2)  | .860 (21.8)  | 14        |
| 13                  | M18 X 1.0 - 6H      | 1.125 (28.6) | 2.125 (54.0) | 1.160 (29.5) | 1.589 (40.4) | 1.465 (37.2) | 1.000 (25.4) | .980 (24.9)  | 18        |
| 15                  | M22 X 1.0 - 6H      | 1.250 (31.8) | 2.185 (55.5) | 1.220 (31.0) | 1.715 (43.6) | 1.485 (37.7) | 1.125 (28.6) | 1.100 (27.9) | 24        |
| 17                  | M25 X 1.0 - 6H      | 1.375 (34.9) | 2.245 (57.0) | 1.310 (33.3) | 1.901 (48.3) | 1.515 (38.5) | 1.250 (31.8) | 1.224 (31.1) | 24        |
| 19                  | M28 X 1.0 - 6H      | 1.500 (38.1) | 2.265 (57.5) | 1.370 (34.8) | 2.025 (51.4) | 1.535 (39.0) | 1.375 (34.9) | 1.348 (34.2) | 24        |
| 21                  | M31 X 1.0 - 6H      | 1.625 (41.3) | 2.405 (61.1) | 1.370 (34.8) | 2.025 (51.4) | 1.565 (39.8) | 1.500 (38.1) | 1.469 (37.3) | 28        |
| 23                  | M34 X 1.0 - 6H      | 1.750 (44.5) | 2.435 (61.8) | 1.440 (36.6) | 2.152 (54.7) | 1.595 (40.5) | 1.625 (41.3) | 1.581 (40.2) | 28        |
| 25                  | M37 X 1.0 - 6H      | 1.875 (47.6) | 2.495 (63.4) | 1.560 (39.6) | 2.403 (61.0) | 1.615 (41.0) | 1.750 (44.5) | 1.690 (42.9) | 32        |

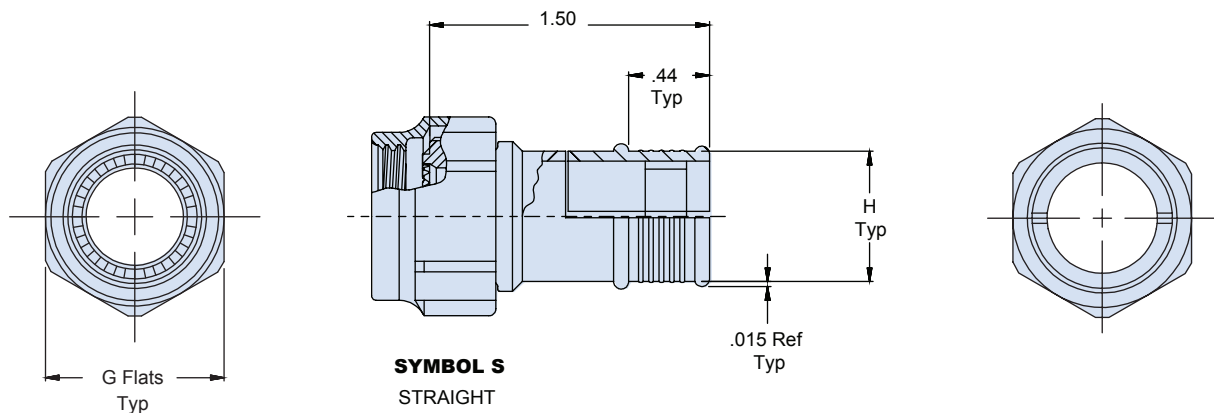
| Table II: Finish Options |                    |
|--------------------------|--------------------|
| Code                     | Finish             |
| XM                       | Electroless nickel |
| XW                       | Cadmium/olive drab |

| Table III: Ferrule Options |              |              |                                  |    |             |
|----------------------------|--------------|--------------|----------------------------------|----|-------------|
| Dash No.                   | H Ref        | J Ref        | Ferrule Quantity<br>(See Note 4) |    |             |
|                            |              |              | Std.                             | DS | Opt.        |
| 10                         | .630 (16.0)  | .470 (11.9)  | 2                                | -  | -           |
| 14                         | .870 (22.1)  | .710 (18.0)  | 5                                | 5  | -           |
| 18                         | 1.170 (29.7) | 1.010 (25.7) | 7                                | 7  | -           |
| 24                         | 1.420 (36.1) | 1.260 (32.0) | 12                               | 12 | 13/14/15/17 |
| 28                         | 1.730 (43.9) | 1.570 (39.9) | 22                               | 14 | 14/25       |
| 32                         | 1.940 (49.3) | 1.780 (52.2) | 28                               | 18 | 18/31       |

**Notes:**

1. Assembly identified with manufacturer's name, part number and date code, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 Series Backshell Assembly Tools are recommended for assembly and installation.
4. Drilled star is available on Table III.
5. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

| Material/Finish                         |                                                    |
|-----------------------------------------|----------------------------------------------------|
| Backshell                               | High-grade engineering thermoplastic/<br>Table III |
| Coupling nut and anti-decoupling device | Hi-grade engineering thermoplastic/n.a.            |
| Star                                    | Aluminum alloy/Table II                            |



Dimensions in inches (millimeters) and are subject to change without notice.



# 477-004 StarShield™ Enviromental EMI/RFI Extended Length Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors



Environmental

Extended  
LengthSelf  
NestorRear End  
OptionsHigh  
Ferrule Count

**StarShield™ environmental, extended length, backshell with self-nestor coupling**

Product  
Series

477

Angular Function  
*S* = Straight  
*H* = 45°  
*J* = 90°

H

S

Finish Code  
(See Table II)

004

NF

Ferrule  
Quantity  
Code  
(See Table I)

17

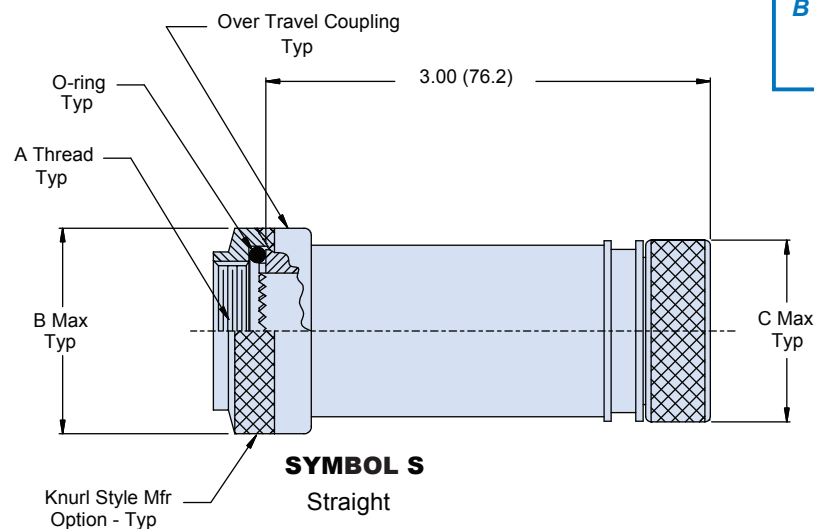
6

G

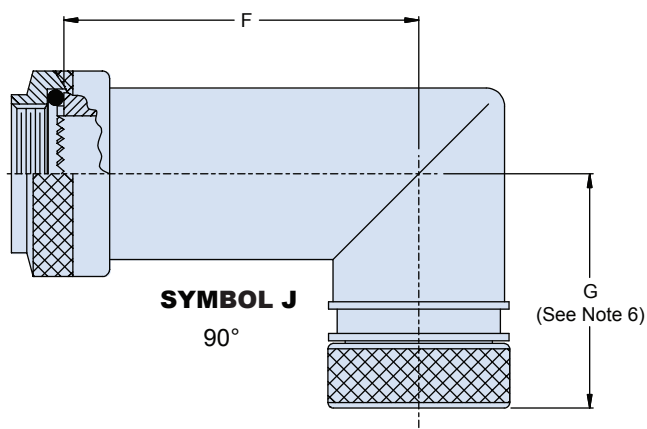
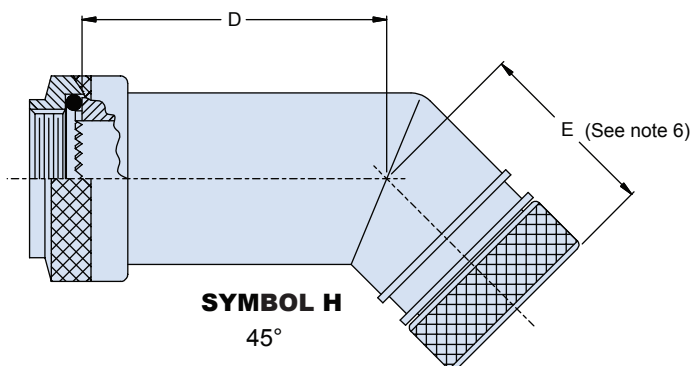
*D* = Drilled Star  
Optional  
(See note 4)

DS

- T

Connector Designator  
*H* = MIL-DTL-38999 Series  
III & IVBasic  
NumberOrder No.,  
(See Table I)Rear End  
Options  
*G* = Gland nut  
*B* = Banding nut  
with band  
(see note 6)Shrink Boot  
*T* = Shrink Boot - Optional  
(Omit for None)  
(See Table III)

| Material/Finish                                                              |                               |
|------------------------------------------------------------------------------|-------------------------------|
| Backshell, elbows, coupling & gland nut, compression ring, star, banding nut | Al alloy or CRES/<br>Table II |
| O-ring                                                                       | Silicone/n.a.                 |
| Band                                                                         | CRES/passivate                |



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**477-004**  
**StarShield™ Enviromental EMI/RFI Extended Length**  
**Shield Termination Backshell**  
**For MIL-DTL-38999 Series III & IV Connectors**

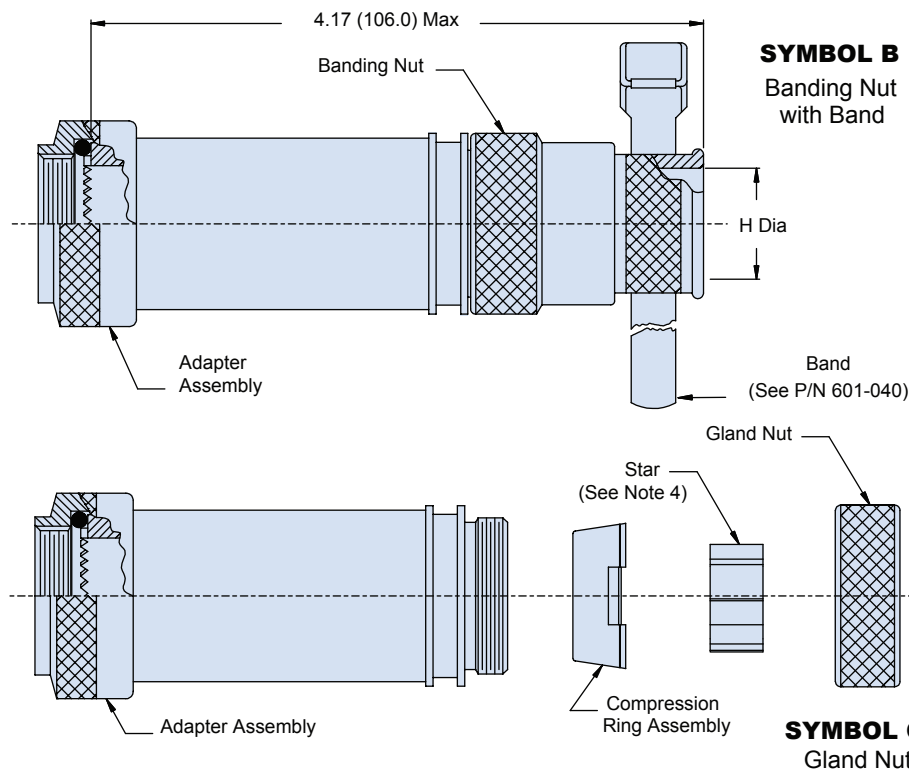


**Table I: Dimensions**

| Order No | Connector Shell Size Ref | A Thread Iso Metric | B Dia Max   | C Dia Max   | D Max       | E Max (See Note 6) | F Max       | G Max (See Note 6) | H ±.004 (0.10) | Ferrule Quantity (See Note 4) |      |
|----------|--------------------------|---------------------|-------------|-------------|-------------|--------------------|-------------|--------------------|----------------|-------------------------------|------|
|          |                          |                     |             |             |             |                    |             |                    |                | Std.                          | Opt. |
| 09       | A/9                      | M12 X 1 - 6H        | .75 (19.0)  | .69(17.5)   | 2.49 (63.3) | 1.00 (25.4)        | 2.63 (66.8) | 1.14 (29.0)        | .315 ( 8.00)   | 1                             | -    |
| 11       | B/11                     | M15 X 1 - 6H        | .87 (22.0)  | .85(21.5)   | 2.51 (63.8) | 1.02 (26.0)        | 2.69 (68.3) | 1.20 (30.5)        | .531 (13.50)   | 2                             | -    |
| 13       | C/13                     | M18 X 1 - 6H        | 1.00 (25.5) | .89(22.5)   | 2.55 (64.8) | 1.04 (26.5)        | 2.75 (69.8) | 1.26 (32.0)        | .591 (15.00)   | 3                             | -    |
| 15       | D/15                     | M22 X 1 - 6H        | 1.20 (30.5) | 1.00(25.5)  | 2.57 (65.3) | 1.08 (27.5)        | 2.81 (71.3) | 1.32 (33.5)        | .709 (18.00)   | 5                             | -    |
| 17       | E/17                     | M25 X 1 - 6H        | 1.32 (33.5) | 1.12(28.5)  | 2.59 (65.8) | 1.10 (28.0)        | 2.87 (72.8) | 1.38 (35.0)        | .827 (21.00)   | 6                             | 7    |
| 19       | F/19                     | M28 X 1 - 6H        | 1.46 (37.0) | 1.24(31.5)  | 2.61 (66.3) | 1.12 (28.5)        | 2.93 (74.3) | 1.44 (36.5)        | .945 (24.00)   | 7                             | -    |
| 21       | G/21                     | M31 X 1 - 6H        | 1.52 (38.5) | 1.38(35.0)  | 2.65 (67.3) | 1.14 (29.0)        | 3.00 (76.3) | 1.52 (38.5)        | 1.063 (27.00)  | 9                             | 11   |
| 23       | H/23                     | M34 X 1 - 6H        | 1.65 (42.0) | 1.50 (38.0) | 2.67 (67.8) | 1.18 (30.0)        | 3.06 (77.8) | 1.57 (40.0)        | 1.181 (30.00)  | 10                            | 13   |
| 25       | J/25                     | M37 X 1 - 6H        | 1.83 (46.5) | 1.61 (41.0) | 2.71 (68.8) | 1.22 (31.0)        | 3.12 (79.3) | 1.63 (41.5)        | 1.299 (33.00)  | 12                            | 17   |

**Notes:**

- Assembly identified with manufacturer's name and P/N, space permitting.
- For effective grounding, connector with conductive finish should be used.
- Glenair 600 series backshell assembly tools are recommended for assembly and installation.
- Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per table 1 is selected, one split and one solid star will be supplied
- Ferrule kit sold separately.
  - 687-764 ferrule and HST device kit
  - 687-748 solder ferrule
  - 687-809 ferrule and sealing device kit
  - 687-841-01 HST flex device
- Selection of banding nut option (B) will add 1.17(29.7) to indicated dimensions



**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC  | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Table III: Shrink Boot**

| Shell Size | Shrink Boot Ref. Part No. |
|------------|---------------------------|
| 09         | 770-001S1 04              |
| 11         | 770-001S1 06              |
| 13         | 770-001S1 06              |
| 15         | 770-001S1 07              |
| 17         | 770-001S1 07              |
| 19         | 770-001S1 08              |
| 21         | 770-001S1 08              |
| 23         | 770-001S1 08              |
| 25         | 770-001S1 09              |

Dimensions in inches (millimeters) and are subject to change without notice.



# 477-005

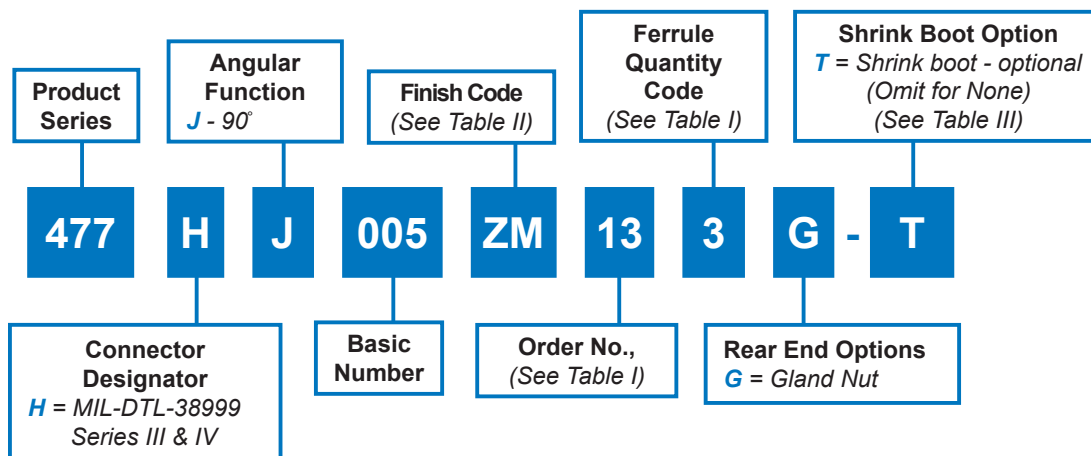
## StarShield™ 90° EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors



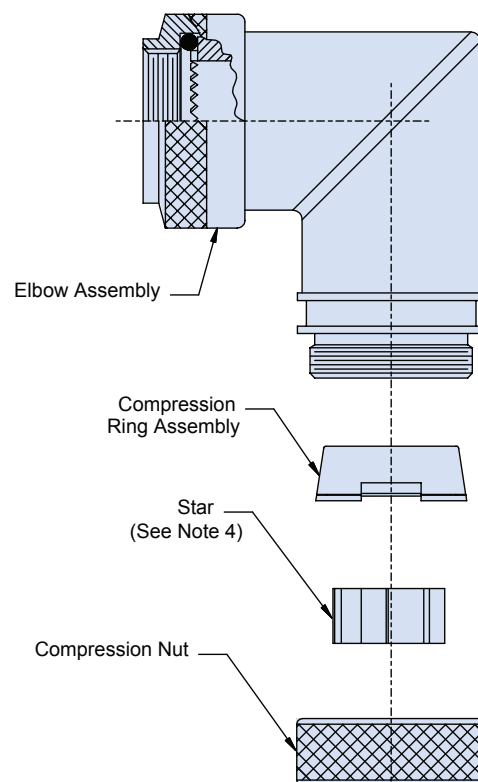
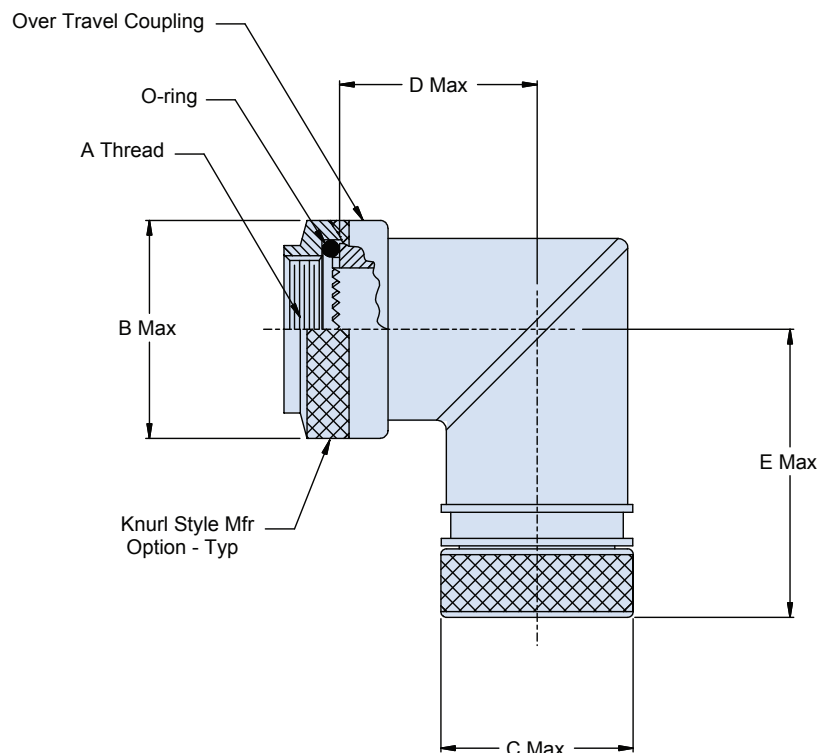
Environmental

Self  
NestorExtended  
Length

**StarShield™ 90°, extended length, environmental backshell with self-nestor coupling**



**SYMBOL G**  
Gland Nut



Dimensions in inches (millimeters) and are subject to change without notice.

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**477-005**  
**StarShield™ 90° EMI/RFI Shield Termination Backshell**  
**For MIL-DTL-38999 Series III & IV Connectors**



| Table I: Dimensions |                          |                     |             |           |             |             |                  |
|---------------------|--------------------------|---------------------|-------------|-----------|-------------|-------------|------------------|
| Order No            | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max   | C Dia Max | D Max       | E Max       | Ferrule Quantity |
|                     |                          |                     |             |           |             |             | Standard         |
| 09 <sup>4</sup>     | A/9                      | M12X 1 - 6H         | .75 (19.0)  | .69(17.5) | .88 (22.5)  | 1.20 (30.5) | 1                |
| 11                  | B/11                     | M15X 1 - 6H         | .87 (22.0)  | .85(21.5) | .94 (24.0)  | 1.26 (32.0) | 2                |
| 13                  | C/13                     | M18 X 1 - 6H        | 1.00 (25.4) | .89(22.5) | 1.02 (26.0) | 1.34 (34.0) | 3                |

| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Code                                  | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1                                    | Stainless steel; passivate                                 |
| ZM                                    | Stainless steel; electroless nickel                        |

| Table III: Shrink Boot |                      |
|------------------------|----------------------|
| Shell Size             | Shrink Boot Part No. |
| 09                     | 770-001S1 04         |
| 11                     | 770-001S1 06         |
| 13                     | 770-001S1 06         |

| Material/Finish                                     |                           |
|-----------------------------------------------------|---------------------------|
| Elbow, coupling & gland nut, compression ring, star | CRES or Al alloy/Table II |
| O-ring                                              | Silicone/n.a.             |

**Notes:**

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09.
5. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device



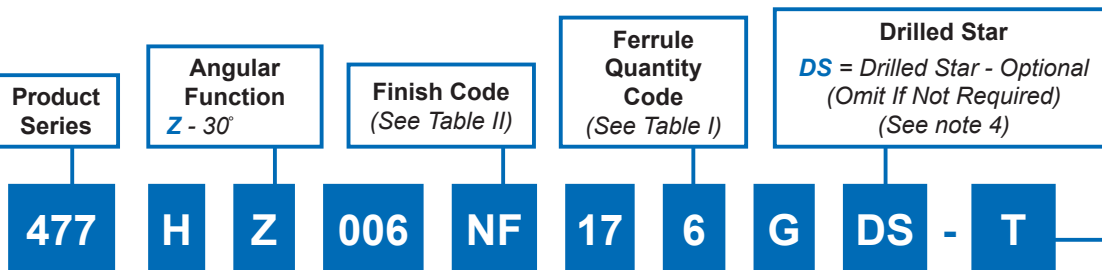
**477-006**  
**StarShield™ 30° EMI/RFI Shield Termination**  
**Backshell**  
 For MIL-DTL-38999 Series III & IV Connectors



Environmental

Self  
NestorStandard  
LengthRear End  
OptionsHigh  
Ferrule Count

**StarShield™ 30° environmental, high ferrule count backshell with self-nestor coupling**



Connector Designator

H = MIL-DTL-38999 Series III &amp; IV

Basic Number

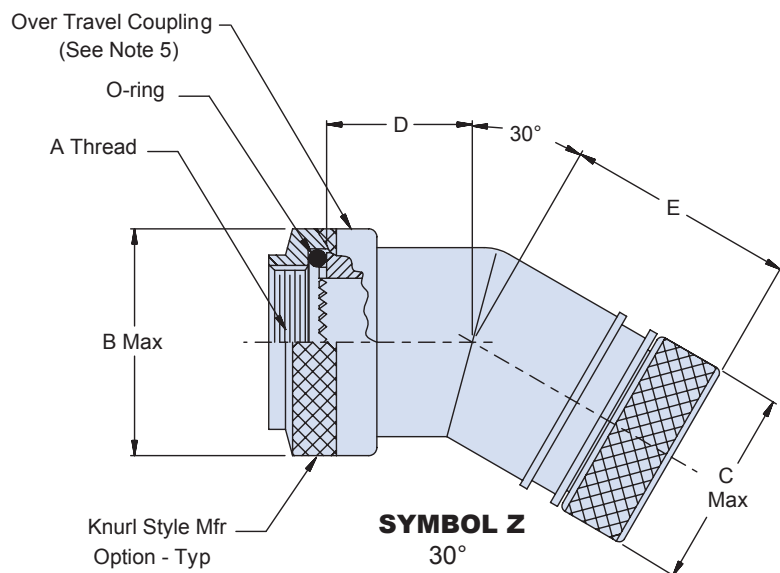
Order No.,  
(See Table I)

Rear End Options

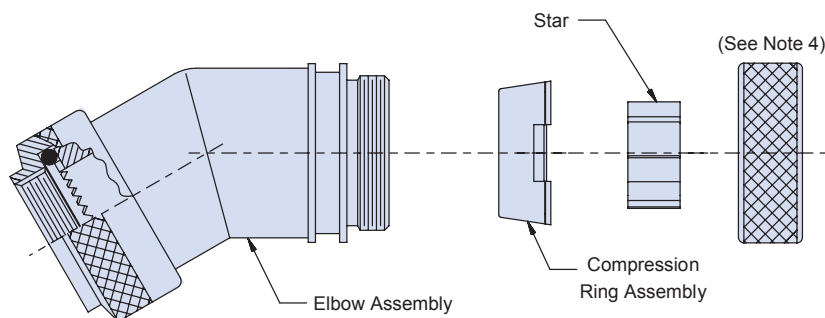
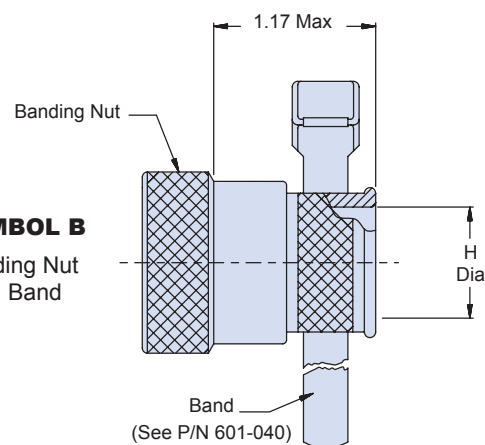
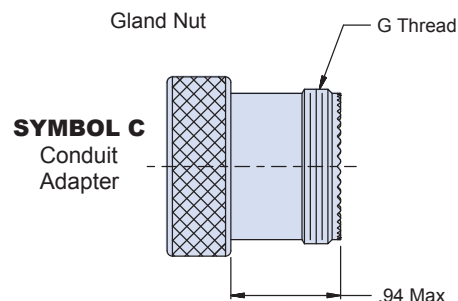
B = Banding Nut With Band  
 C = Conduit Backshell  
 G = Gland Nut

Shrink Boot Option

T = Shrink boot - optional  
 (Omit for None)  
 (See Table III)

**SYMBOL B**

Banding Nut with Band

**SYMBOL G****SYMBOL C**  
Conduit Adapter

Dimensions in inches (millimeters) and are subject to change without notice.

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**477-006**  
**StarShield™ 30° EMI/RFI Shield Termination**  
**Backshell**  
**For MIL-DTL-38999 Series III & IV Connectors**



**Table I: Dimensions**

| Order No | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max   | C Dia Max   | D Max     | E Max       | G Thread ISO Metric | H ±.004 (0.10) | Ferrule Quantity (See Note 4) |                |
|----------|--------------------------|---------------------|-------------|-------------|-----------|-------------|---------------------|----------------|-------------------------------|----------------|
|          |                          |                     |             |             |           |             |                     |                | Std.                          | Optional       |
| 09       | A/9                      | M12 X 1 - 6H        | .75 (19.0)  | .69 (17.5)  | .45(11.5) | .94 (24.0)  | M12X 1 - 6g         | .315 ( 8.00)   | 1                             | -              |
| 11       | B/11                     | M15 X 1 - 6H        | .87 (22.0)  | .85 (21.5)  | .47(12.0) | .96 (24.5)  | M15X 1 - 6g         | .531 (13.50)   | 2                             | -              |
| 13       | C/13                     | M18 X 1 - 6H        | 1.00 (25.5) | .89 (22.5)  | .49(12.5) | .98 (25.0)  | M18 X 1 - 6g        | .591 (15.00)   | 3                             | -              |
| 15       | D/15                     | M22 X 1 - 6H        | 1.20 (30.5) | 1.00 (25.5) | .51(13.0) | 1.00 (25.5) | M22 X 1 - 6g        | .709 (18.00)   | 5                             | -              |
| 17       | E/17                     | M25 X 1 - 6H        | 1.32 (33.5) | 1.12 (28.5) | .53(13.5) | 1.02 (26.0) | M25 X 1 - 6g        | .827 (21.00)   | 6                             | 7              |
| 19       | F/19                     | M28 X 1 - 6H        | 1.46 (37.0) | 1.24 (31.5) | .55(14.0) | 1.04 (26.5) | M28 X 1 - 6g        | .945 (24.00)   | 7                             | -              |
| 21       | G/21                     | M31 X 1 - 6H        | 1.52 (38.5) | 1.38 (35.0) | .57(14.5) | 1.06 (27.0) | M31 X 1 - 6g        | 1.063 (27.00)  | 9                             | 11             |
| 23       | H/23                     | M34 X 1 - 6H        | 1.65 (42.0) | 1.50 (38.0) | .59(15.0) | 1.08 (27.5) | M34 X 1 - 6g        | 1.181 (30.00)  | 10                            | 11,12,13,15    |
| 25       | J/25                     | M37 X 1 - 6H        | 1.83 (46.5) | 1.61 (41.0) | .61(15.5) | 1.10 (28.0) | M37 X 1 - 6g        | 1.299 (33.00)  | 12                            | 13,14,15,17,18 |

**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Table III: Shrink Boot**

| Shell Size | Shrink Boot Ref. Part Number |
|------------|------------------------------|
| 09         | 770-001S1 04                 |
| 11         | 770-001S1 06                 |
| 13         | 770-001S1 06                 |
| 15         | 770-001S1 07                 |
| 17         | 770-001S1 07                 |
| 19         | 770-001S1 08                 |
| 21         | 770-001S1 08                 |
| 23         | 770-001S1 08                 |
| 25         | 770-001S1 09                 |

**Materials/Finish**

|                                                                 |                             |
|-----------------------------------------------------------------|-----------------------------|
| Backshell, elbows, coupling & gland nut, compression ring, star | Al alloy or CRES/ Table III |
| O-ring                                                          | Silicone/n.a.               |
| Band                                                            | CRES/passivate              |

**Notes:**

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.



477-007

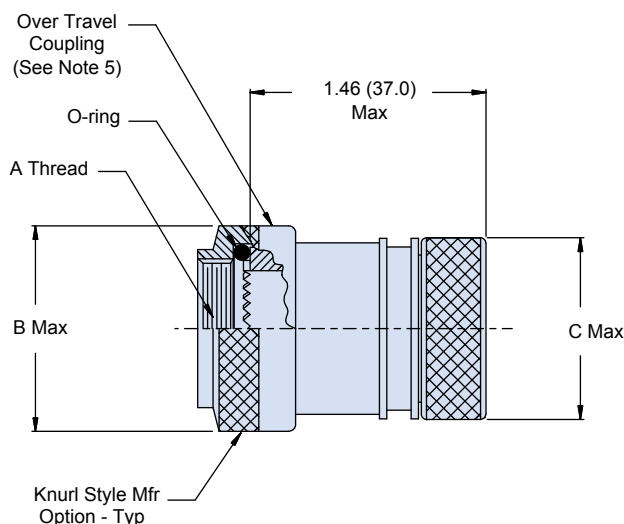
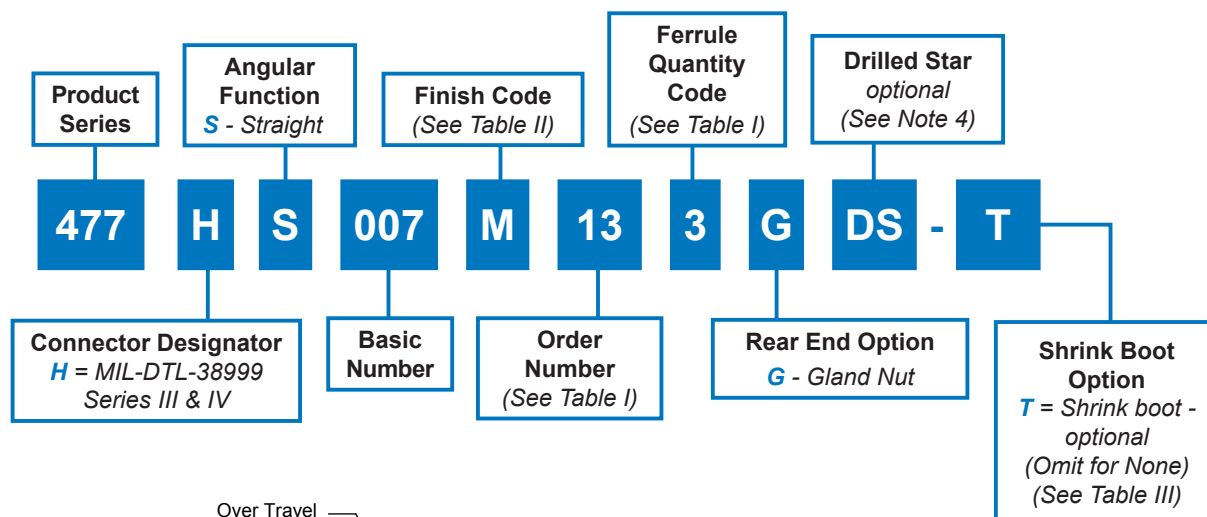
# StarShield™ EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV connectors



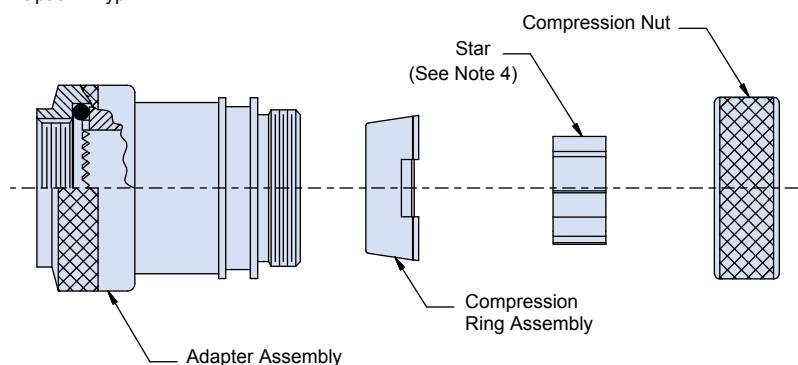
Environmental

Self  
NestorExtended  
LengthRear End  
OptionsHigh  
Ferrule Count

**StarShield™ environmental, extended length backshell with self-nestor coupling**



**SYMBOL S**  
Straight



**SYMBOL G**  
Gland Nut

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# 477-007

## StarShield™ EMI/RFI Shield Termination Backshell

### For MIL-DTL-38999 Series III & IV connectors



Table I: Dimensionsw

| Order No | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max   | C Dia Max   | Ferrule Quantity<br>(See Note 4) |      |
|----------|--------------------------|---------------------|-------------|-------------|----------------------------------|------|
|          |                          |                     |             |             | Std.                             | Opt. |
| 09       | A/9                      | M12 X 1 - 6H        | .75 (19.0)  | .69(17.5)   | 1                                | -    |
| 11       | B/11                     | M15 X 1 - 6H        | .87 (22.0)  | .85 (21.5)  | 2                                | -    |
| 13       | C/13                     | M18 X 1 - 6H        | 1.00 (25.5) | .89 (22.5)  | 3                                | -    |
| 15       | D/15                     | M22 X 1 - 6H        | 1.20 (30.5) | 1.00 (25.5) | 5                                | -    |
| 17       | E/17                     | M25 X 1 - 6H        | 1.32 (33.5) | 1.12 (28.5) | 6                                | 7    |
| 19       | F/19                     | M28 X 1 - 6H        | 1.46 (37.0) | 1.24 (31.5) | 7                                | -    |
| 21       | G/21                     | M31 X 1 - 6H        | 1.52 (38.5) | 1.38 (35.0) | 9                                | 11   |
| 23       | H/23                     | M34 X 1 - 6H        | 1.65 (42.0) | 1.50 (38.0) | 10                               | 13   |
| 25       | J/25                     | M37 X 1 - 6H        | 1.83 (46.5) | 1.61 (41.0) | 12                               | 17   |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Table III: Shrink Boots

| Shell Size | Shrink Boot Ref. Part Number |
|------------|------------------------------|
| 09         | 770-001S1 04                 |
| 11         | 770-001S1 06                 |
| 13         | 770-001S1 06                 |
| 15         | 770-001S1 07                 |
| 17         | 770-001S1 07                 |
| 19         | 770-001S1 08                 |
| 21         | 770-001S1 08                 |
| 23         | 770-001S1 08                 |
| 25         | 770-001S1 09                 |

Material/Finish

|                                                  |                           |
|--------------------------------------------------|---------------------------|
| Backshell, gland nut, compression ring, and star | Al alloy/Table II         |
| Coupling nut                                     | Stainless steel/passivate |
| O-ring                                           | Silicone/n.a.             |

### Notes:

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table I is selected, one split and one solid star will be supplied.
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device

Dimensions in inches (millimeters) and are subject to change without notice.



477-008

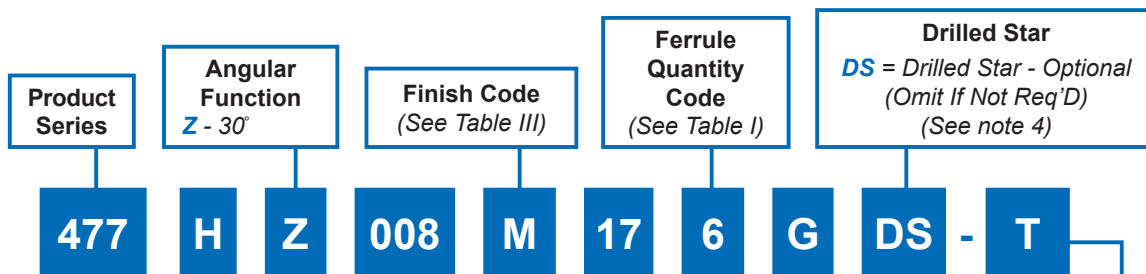
# StarShield™ 30° Environmental EMI/RFI Shield Termination Backshell for MIL-DTL-38999 Series III & IV Connectors



Environmental

Self  
NestorRear End  
OptionsStandard  
LengthHigh  
Ferrule Count

## StarShield™ 30°, environmental, high ferrule count backshell with self-nestor coupling



### Connector Designator

H = MIL-DTL-38999 Series III &amp; IV

### Basic Number

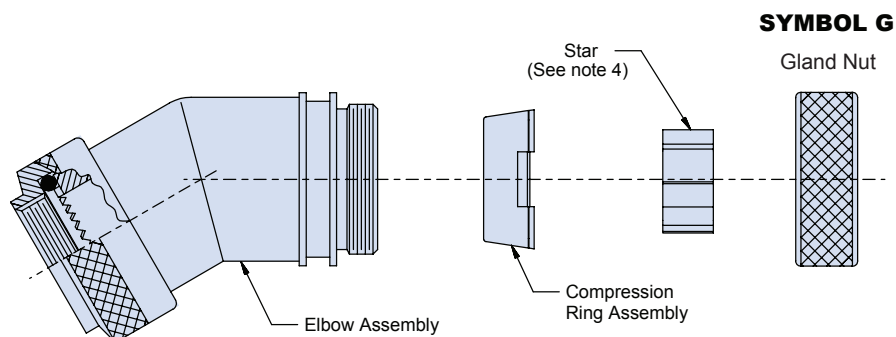
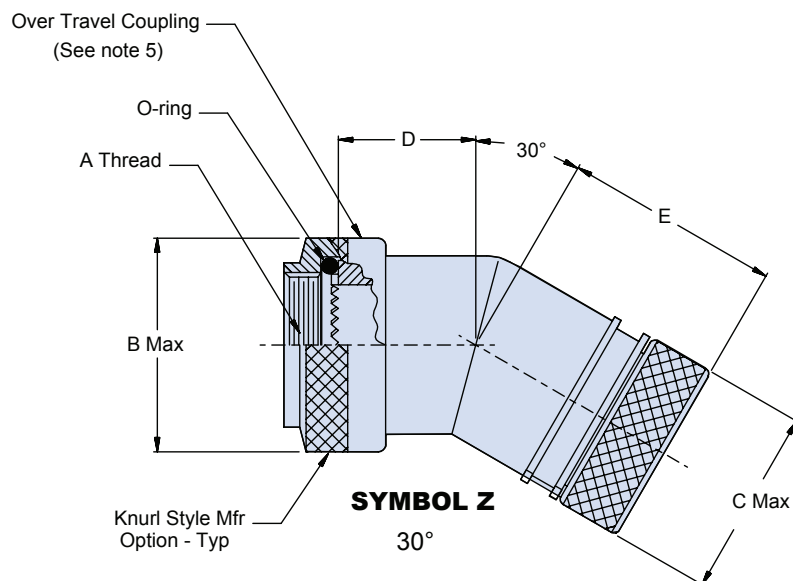
### Order No. (See Table I)

### Rear End Options

B = Banding Nut  
With Band  
C = Conduit  
Adapter  
G = Gland Nut

### Shrink Boot Option

T = Shrink boot  
- optional  
(Omit for None)  
(See Table III)



Dimensions in inches (millimeters) and are subject to change without notice.

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**477-008**  
**StarShield™ 30° Environmental EMI/RFI Shield**  
**Termination Backshell**  
**for MIL-DTL-38999 Series III & IV Connectors**



Table I: Dimensions

| Order No | Connector Shell Size Ref | A Thread Iso Metric | B Dia Max   | C Dia Max  | D Max     | E Max      | G Thread ISO Metric | H ±.004 (0.10) | Ferrule Quantity<br>(See Note 4) |                |
|----------|--------------------------|---------------------|-------------|------------|-----------|------------|---------------------|----------------|----------------------------------|----------------|
|          |                          |                     |             |            |           |            |                     |                | Std.                             | Optional       |
| 09       | A/9                      | M12 X 1 - 6H        | .75 (19.0)  | .69(17.5)  | .45(11.5) | .94(24.0)  | M12X 1 - 6g         | .315 (8.00)    | 1                                | -              |
| 11       | B/11                     | M15 X 1 - 6H        | .87 (22.0)  | .85(21.5)  | .47(12.0) | .96(24.5)  | M15X 1 - 6g         | .531 (13.50)   | 2                                | -              |
| 13       | C/13                     | M18 X 1 - 6H        | 1.00 (25.5) | .89(22.5)  | .49(12.5) | .98(25.0)  | M18 X 1 - 6g        | .591 (15.00)   | 3                                | -              |
| 15       | D/15                     | M22 X 1 - 6H        | 1.20 (30.5) | 1.00(25.5) | .51(13.0) | 1.00(25.5) | M22 X 1 - 6g        | .709 (18.00)   | 5                                | -              |
| 17       | E/17                     | M25 X 1 - 6H        | 1.32 (33.5) | 1.12(28.5) | .53(13.5) | 1.02(26.0) | M25 X 1 - 6g        | .827 (21.00)   | 6                                | 7              |
| 19       | F/19                     | M28 X 1 - 6H        | 1.46 (37.0) | 1.24(31.5) | .55(14.0) | 1.04(26.5) | M28 X 1 - 6g        | .945 (24.00)   | 7                                | -              |
| 21       | G/21                     | M31 X 1 - 6H        | 1.52 (38.5) | 1.38(35.0) | .57(14.5) | 1.06(27.0) | M31 X 1 - 6g        | 1.063 (27.00)  | 9                                | 11             |
| 23       | H/23                     | M34 X 1 - 6H        | 1.65 (42.0) | 1.50(38.0) | .59(15.0) | 1.08(27.5) | M34 X 1 - 6g        | 1.181 (30.00)  | 10                               | 11,12,13,15    |
| 25       | J/25                     | M37 X 1 - 6H        | 1.83 (46.5) | 1.61(41.0) | .61(15.5) | 1.10(28.0) | M37 X 1 - 6g        | 1.299 (33.00)  | 12                               | 13,14,15,17,18 |

**Notes:**

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with order number 09. Drilled star is available on order numbers 15-25 only. If optional ferrule qty per Table 1 is selected, one split and one solid star will be supplied
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

Table II: Material and Finish Options

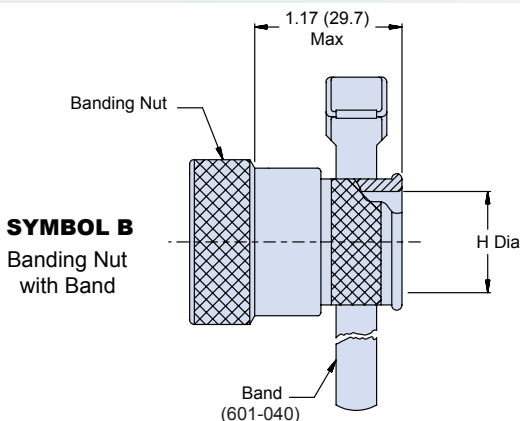
| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Table III: Shrink Boots

| Shell Size | Shrink Boot Ref. Part No. |
|------------|---------------------------|
| 09         | 770-001S1 04              |
| 11         | 770-001S1 06              |
| 13         | 770-001S1 06              |
| 15         | 770-001S1 07              |
| 17         | 770-001S1 07              |
| 19         | 770-001S1 08              |
| 21         | 770-001S1 08              |
| 23         | 770-001S1 08              |
| 25         | 770-001S1 09              |

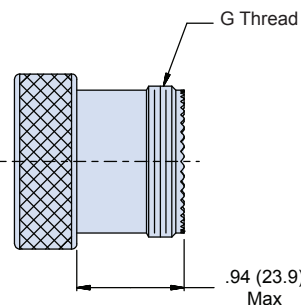
Material/Finish

|                                                      |                                  |
|------------------------------------------------------|----------------------------------|
| Backshell, elbows, gland nut, compression ring, star | Aluminum alloy or CRES/Table III |
| Coupling nut                                         | Stainless steel/passivate        |
| O-ring                                               | Silicone/n.a.                    |
| Band                                                 | CRES/passivate                   |



**SYMBOL C**

Conduit Adapter



Dimensions in inches (millimeters) and are subject to change without notice.



477-009

# StarShield™ EMI/RFI Shield Termination Backshell For MIL-DTL-38999 Series III & IV Connectors

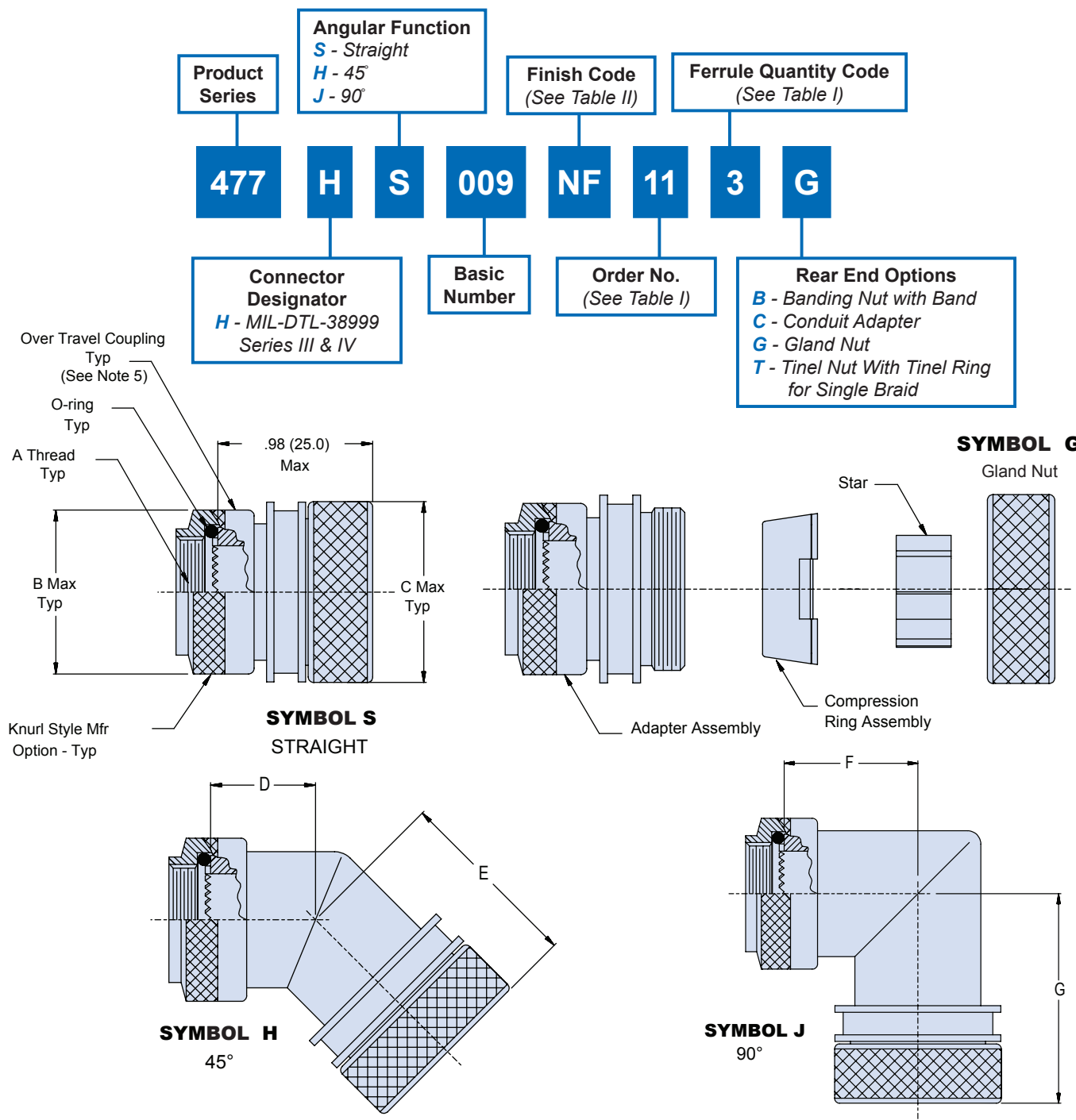


Environmental

Standard  
LengthSelf  
NestorRear End  
Options

## StarShield™ environmental backshell with self-nestor and rear end options

B



Dimensions in inches (millimeters) and are subject to change without notice.

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Rev. 03.08.21

**477-009**  
**StarShield™ EMI/RFI Shield Termination Backshell**  
**For MIL-DTL-38999 Series III & IV Connectors**



Table I: Dimensions

| Order No | Connector Shell Size Ref | A Thread ISO Metric | B Dia Max  | C Dia Max  | D Max      | E Max       | F Max      | G Max       | J Thread ISO Metric | K ± .004 (0.10) | Ferrule Quantity |
|----------|--------------------------|---------------------|------------|------------|------------|-------------|------------|-------------|---------------------|-----------------|------------------|
| 11       | B/11                     | M15 x 1 - 6H        | .87 (22.0) | .85 (21.5) | .51 (13.0) | 1.02 (26.0) | .69 (17.5) | 1.20 (30.5) | M18 X 1 - 6g        | .591 (15.00)    | 3                |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel passivate                                  |
| ZM   | Stainless steel/electroless nickel                         |

Material/Finish:

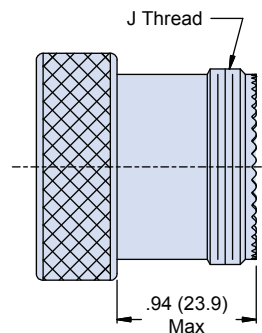
|                                                                 |                           |
|-----------------------------------------------------------------|---------------------------|
| Backshell, Elbows, Coupling & Gland Nut, Compression Ring, Star | Al alloy or CRES/Table II |
| O-Ring                                                          | Silicone/n.a.             |
| Band                                                            | CRES/passivate            |

**Notes:**

1. Assembly identified a manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Shrink boot reference part number 770-001S106
5. Over-travel coupling design provides self-seating & self-locking functionality eliminating lock-wire requirements.
6. Ferrules sold separately. See part number 687-858 in this catalog.
7. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

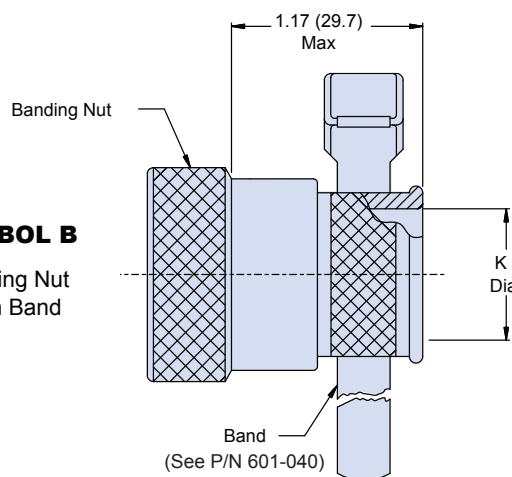
**SYMBOL C**

Conduit Adapter



**SYMBOL B**

Banding Nut with Band



Dimensions in inches (millimeters) and are subject to change without notice.

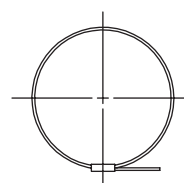
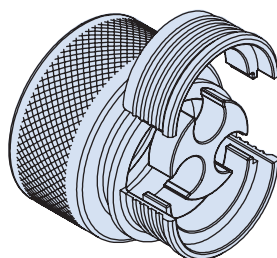
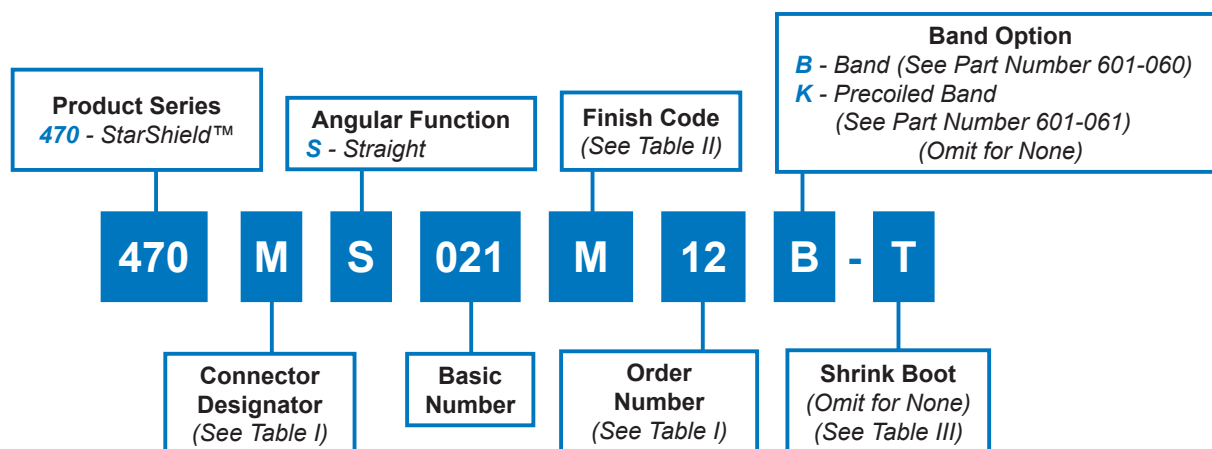




# 470-021 StarShield™ environmental EMI/RFI Shield Termination Backshell for 800 Series Mighty Mouse Connectors

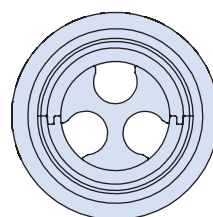
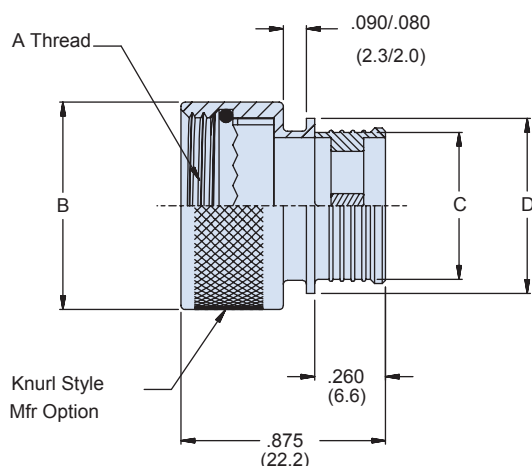


**StarShield™ direct coupling, Mighty Mouse backshell with split banding porch**



**SYMBOL K**

Band



**470-021**  
**StarShield™ environmental EMI/RFI Shield**  
**Termination Backshell**  
**for 800 Series Mighty Mouse Connectors**



| Table I: Dimensions |                    |       |                       |              |             |              |                    |
|---------------------|--------------------|-------|-----------------------|--------------|-------------|--------------|--------------------|
| Order No            | Shell Size Ref     |       | A Thread Class<br>-2B | B Dia Max    | C Dia       | D Dia        | No. Of<br>Ferrules |
|                     | 800/801<br>803/804 | 805   |                       |              |             |              |                    |
| 07 see Note 3       | 07                 | 09    | 7/16-28 UNEF          | 0.530 (13.4) | .414 (10.5) | .516 (13.1)  | 1                  |
| 09 see Note 3       | 09                 | 11    | 9/16-24 UNEF          | 0.650 (16.5) | .414 (10.5) | .516 (13.1)  | 1                  |
| 10                  | 10                 | 12    | 5/8-24 UNEF           | 0.715 (13.0) | .539 (13.7) | .641 (16.3)  | 2                  |
| 12                  | 11/12/13           | 13    | 11/16-24 UNEF         | 0.785 (19.9) | .601 (15.3) | .703 (17.9)  | 3                  |
| 13                  | N/A                | 15    | 3/4-20 UNEF           | 0.830 (21.0) | .601 (15.3) | .703 (17.9)  | 3                  |
| 14                  | 14/15/16/17        | 18/19 | 15/16-20 UNEF         | 1.020 (25.9) | .851 (21.6) | .953 (24.2)  | 7                  |
| 17                  | 21                 | 23    | 1 3/16-18 UNEF        | 1.280 (32.5) | .914 (23.2) | 1.016 (25.8) | 12                 |

| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Code                                  | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| ZRC                                   | Aluminum; zinc nickel over electroless nickel (RoHS)       |
| Z1                                    | Stainless steel; passivate                                 |
| ZM                                    | Stainless steel; electroless nickel                        |

| Table III: Shrink Boot |                 |
|------------------------|-----------------|
| Order No               | Shrink Boot Ref |
| 07                     | 809S060 -3      |
| 09                     | 809S060 -3      |
| 10                     | 809S060 -4      |
| 12                     | 809S060 -4      |
| 13                     | 809S060 -4      |
| 14                     | 809S060 -5      |
| 17                     | 809S060 -6      |

| Material/Finish      |                            |
|----------------------|----------------------------|
| Adapter, Star, Clamp | See Table II               |
| O-ring               | Silicone/n.a.              |
| Band                 | Stainless steel/passivate. |

**Notes:**

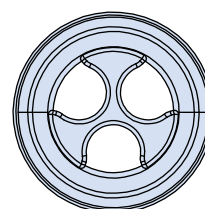
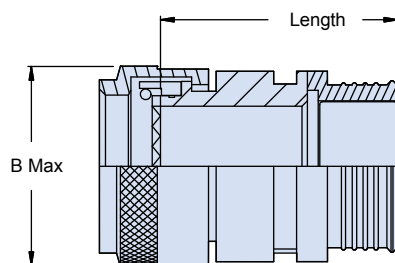
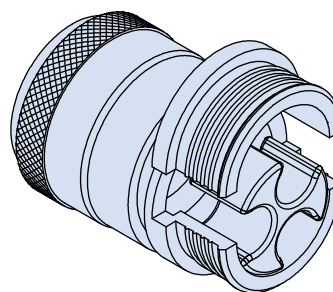
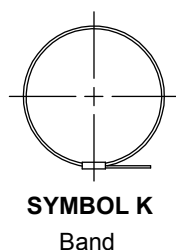
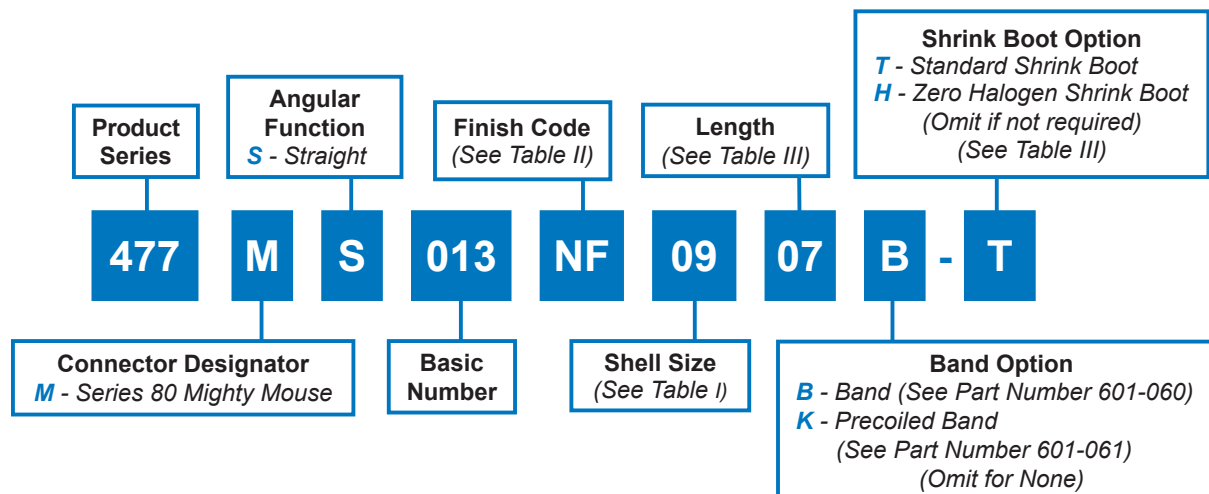
1. Assembly identified with manufacturer's name and P/N space permitting.
2. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
3. Star not supplied with order number 07 & 09.
4. Ferrule kit sold separately. See part number 687-858 in this catalog.



# 477-013 StarShield™ Extended Length EMI/RFI Shield Termination Backshell for 800 Series Mighty Mouse Connectors



**StarShield™ direct coupling, Mighty Mouse backshell with split banding porch**



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**477-013**  
**StarShield™ Extended Length EMI/RFI Shield**  
**Termination Backshell**  
**for 800 Series Mighty Mouse Connectors**



| Table I: Dimensions |                    |       |                       |              |         |
|---------------------|--------------------|-------|-----------------------|--------------|---------|
| Order No            | Shell Size Ref     |       | A Thread Class<br>-2B | B Max        | Ferrule |
|                     | 800/801<br>803/804 | 805   |                       |              |         |
| 05                  | 05                 | N/A   | 1/4-32 UNEF           | .470 (11.9)  | 01      |
| 06                  | 06                 | N/A   | 5/16-32 UNEF          | .530 (13.5)  | 01      |
| 11                  | N/A                | 08    | 3/8-32 UNEF           | .570 (14.5)  | 01      |
| 07                  | 07                 | 09    | 7/16-28 UNEF          | .637 (16.2)  | 01      |
| 08                  | 08                 | 10    | 1/2-28 UNEF           | .700 (17.8)  | 01      |
| 09                  | 09                 | 11    | 9/16-24 UNEF          | .758 (19.3)  | 02      |
| 10                  | 10                 | 12    | 5/8-24 UNEF           | .819 (20.8)  | 03      |
| 12                  | 11/12/13           | 13    | 11/16-24 UNEF         | .896 (22.8)  | 03      |
| 13                  | N/A                | 15    | 3/4-20 UNEF           | .930 (23.6)  | 05      |
| 14                  | 14/15/16/17        | 18/19 | 15/16-20 UNEF         | 1.137 (28.9) | 06      |
| 17                  | 21                 | 23    | 1 3/16-18 UNEF        | 1.387 (35.2) | 09      |

| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Code                                  | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1                                    | Stainless steel passivate                                  |
| ZM                                    | Stainless steel/electroless nickel                         |

| Table III: Shrink Boot |        |
|------------------------|--------|
| Length Code            | Length |
| 07                     | 0.88   |
| 08                     | 1.00   |
| 09                     | 1.13   |
| 10                     | 1.25   |
| 11                     | 1.38   |
| 12                     | 1.50   |
| 13                     | 1.63   |
| 14                     | 1.75   |
| 15                     | 1.88   |
| 16                     | 2.00   |

### Notes

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device

| Material/Finish                         |                           |
|-----------------------------------------|---------------------------|
| Backshell, clamp, coupling nut and star | Aluminum alloy/Table II   |
| O-rings                                 | Silicone/n.a.             |
| Band                                    | Stainless steel/passivate |

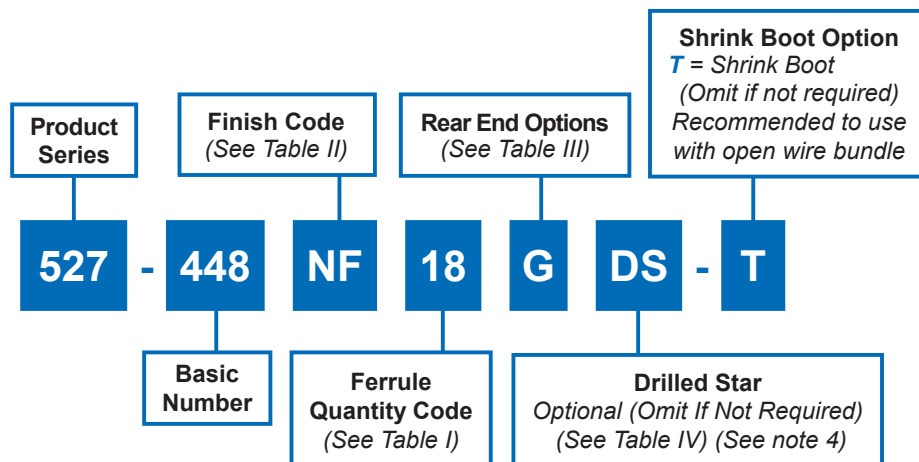
Dimensions in inches (millimeters) and are subject to change without notice.



# 527-448 StarShield™ Non-Environmental EMI/RFI Backshell Assembly for size 2 ARINC 600 series connector

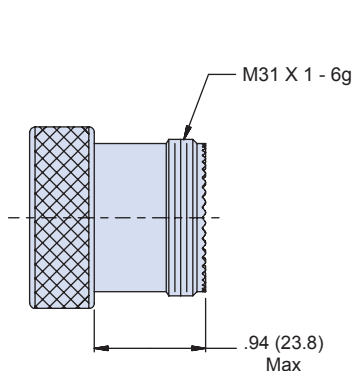


## StarShield™ non-environmental backshell assembly with rear end options



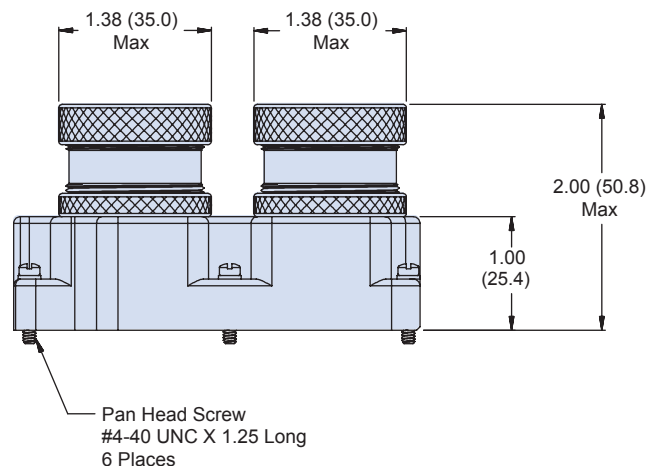
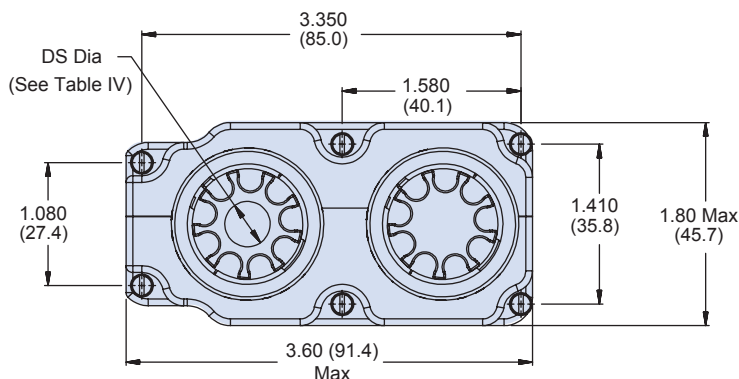
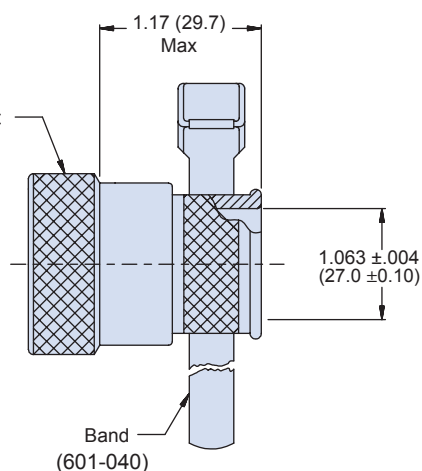
### SYMBOL C

Conduit  
Adpater



### SYMBOL B

Banding Nut  
with Band



Dimensions in inches (millimeters) and are subject to change without notice.

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Rev. 03.08.21



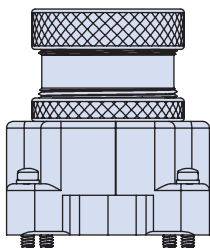
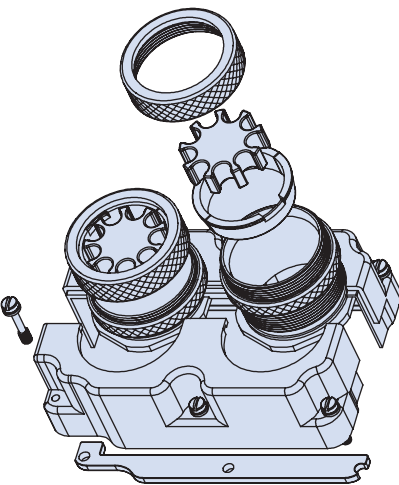
527-448  
**StarShield™ Non-Enviromental  
EMI/RFI Backshell Assembly**  
for size 2 ARINC 600 series connector



| Table I: Ferrule Quantity |   |   |                 |   |   |                 |
|---------------------------|---|---|-----------------|---|---|-----------------|
| Cavity                    | A |   |                 | B |   |                 |
| Ferrule Quantity Code     | 0 | 9 | 11 <sup>5</sup> | 0 | 9 | 11 <sup>5</sup> |
| 9                         |   | x |                 | x |   |                 |
| 11                        |   |   | x               | x |   |                 |
| 18                        |   | x |                 |   | x |                 |
| 20                        |   | x |                 |   |   | x               |
| 22                        |   |   | x               |   |   | x               |

| Table II: Material and Finish Options |                                                            |
|---------------------------------------|------------------------------------------------------------|
| Symbol                                | Material; Finish Description                               |
| M                                     | Aluminum; electroless nickel                               |
| MT                                    | Aluminum; nickel - PTFE                                    |
| NF                                    | Aluminum; CAD/O. D. over electroless nickel                |
| ZN                                    | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR                                    | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1                                    | Stainless steel passivate                                  |
| ZM                                    | Stainless steel/electroless nickel                         |

| Table III: Backend Styles |                       |
|---------------------------|-----------------------|
| Code                      | Description           |
| B                         | Banding nut with band |
| C                         | Conduit adapter       |
| G                         | Gland nut             |



| Table IV: Drilled Star Dimensions |                            |
|-----------------------------------|----------------------------|
| Ferrule Quantity                  | DS Dia Max<br>(See note 4) |
| 9                                 | .47 (9.9)                  |

| Material/Finish:                                                                        |                       |
|-----------------------------------------------------------------------------------------|-----------------------|
| Backshell, adapters, nuts,<br>coupling & gland nuts,<br>compression rings, clips, stars | Al alloy/see Table II |
| Hardware                                                                                | CRES/passivate        |

**Notes:**

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Drilled star option is not available for stars holding 11 ferrules.
5. 11 ferrule star contains a split 8 ferrule star and a 3 ferrule star.
6. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device
7. Shrink boot ref. P/N 770-001S108.



## Non Environmental

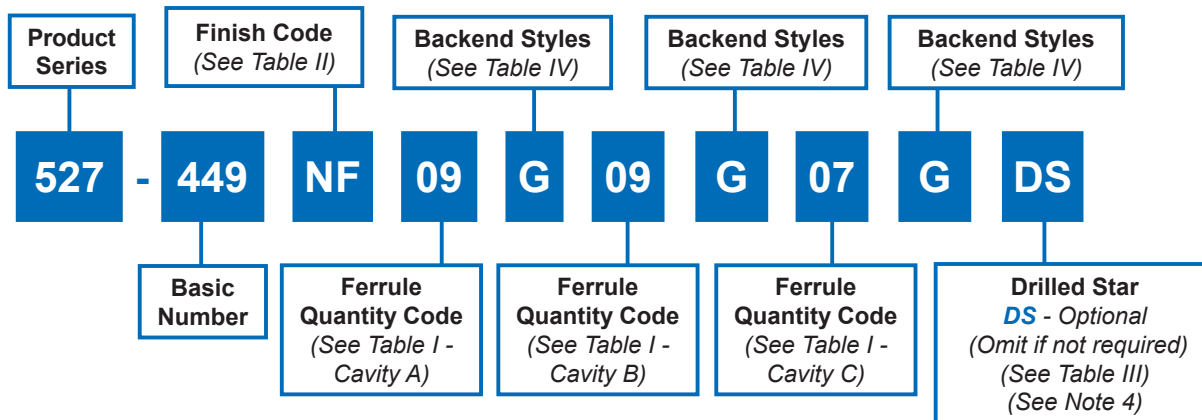


## Rear End Options



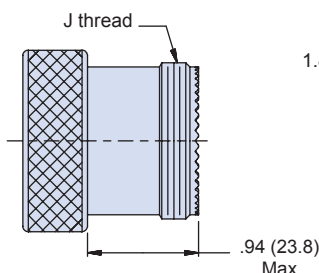
### High Ferrule Count

***StarShield™ non-environmental, high ferrule count, backshell assembly with rear end options***



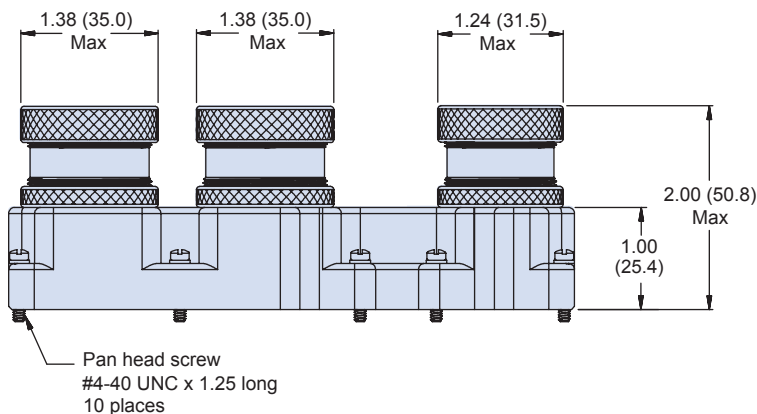
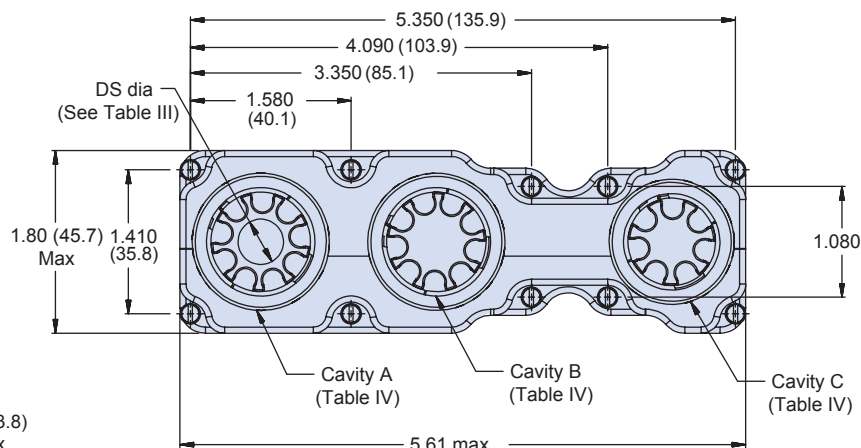
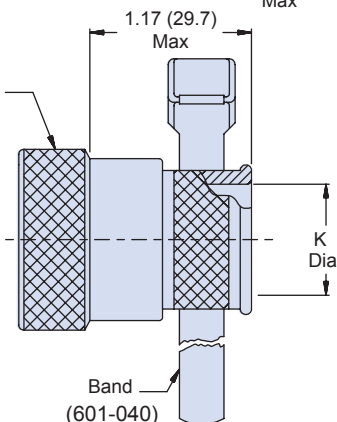
**SYMBOL C**

### Conduit Adapter



**SYMBOL B**

Banding N  
with Band



Dimensions in inches (millimeters) and are subject to change without notice.

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Rev. 03.08.21

527-449  
StarShield™ EMI/RFI Backshell Assembly  
for size 2 ARINC 600 series connector



Table I: Dimensions

| Cavity | Ferrule Quantity Code |    |                 | H ±.003      | J Thread ISO Metric | K ±.004      | Cable Range |             |
|--------|-----------------------|----|-----------------|--------------|---------------------|--------------|-------------|-------------|
|        |                       |    |                 |              |                     |              | Min         | Max         |
| A & B  | 00                    | 09 | 11 (See note 5) | 1.245 (31.6) | M31 X 1 - 6g        | 1.063 (27.0) | .687 (17.4) | .875 (22.2) |
| C      | 00                    | 07 |                 | 1.121 (28.5) | M28 X 1 - 6g        | .945 (24.0)  | .562 (14.3) | .750 (19.1) |

Table II: Material and Finish Options

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

Table III: Drilled Star Options

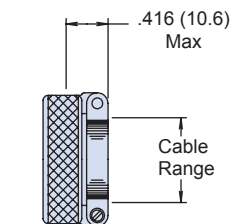
| Ferrule Quantity | DS Dia Max (See note 4) |
|------------------|-------------------------|
| 7                | .35 (8.9)               |
| 9                | .47 (11.9)              |

Table IV: Backend Styles

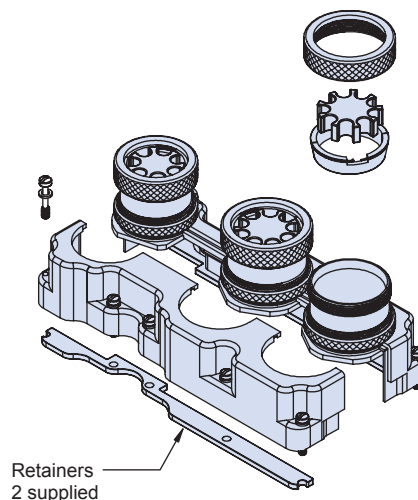
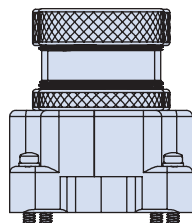
| Symbol | Description                         |
|--------|-------------------------------------|
| B      | Banding nut with band               |
| C      | Conduit adapter                     |
| F      | Light duty cable clamp (see note 6) |
| G      | Gland nut                           |
| P      | Plug cover (see note 6)             |

Material/Finish

|                                                                                           |                       |
|-------------------------------------------------------------------------------------------|-----------------------|
| Backshell, adapters, nuts, backend styles (Table IV), compression rings, retainers, stars | Al alloy/see Table II |
| Hardware                                                                                  | CRES/passivate        |



**SYMBOL F**  
Light Wt. Clamp



**Notes:**

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Drilled star option is not available for stars that hold 11 ferrules.
5. 11 ferrule star is composed of a split 8 ferrule star and a 3 ferrule star.
6. When ordering Type F clamp use 00 for ferrule quantity code. Compression rings and star are not supplied.
7. Ferrule kit sold separately.  
687-764 ferrule and HST device kit  
687-809 ferrule and sealing device kit  
687-748 solder ferrule  
687-841-01 HST flex device
8. Shrink boot ref. Part number 770-001S108.

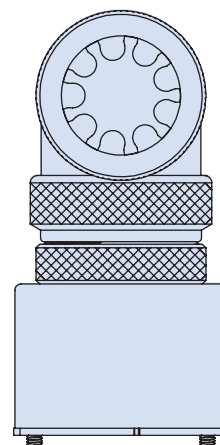
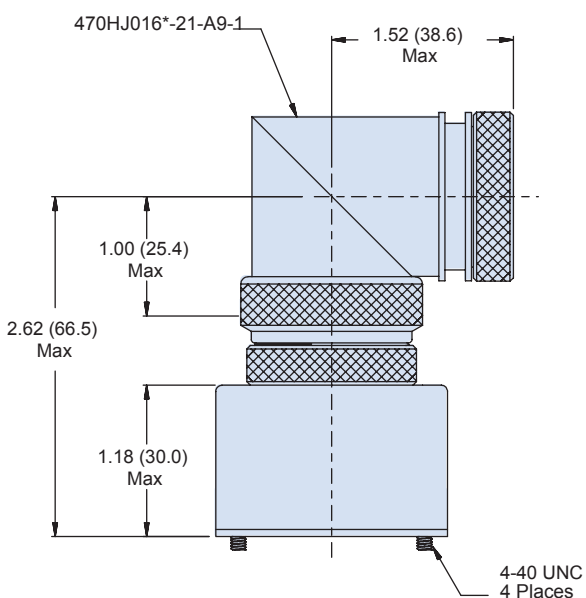
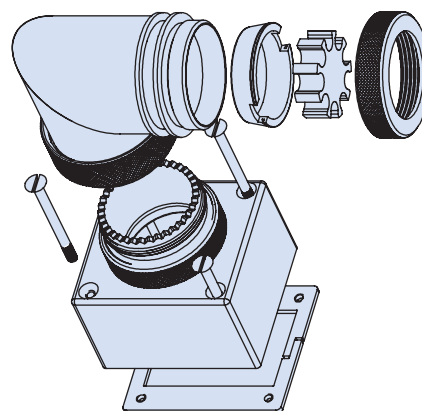
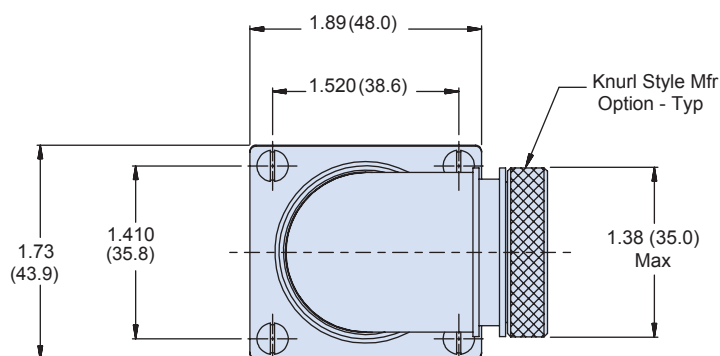
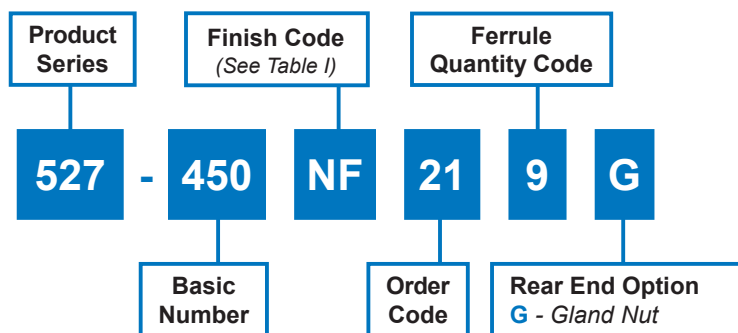
Dimensions in inches (millimeters) and are subject to change without notice.



# 527-450 StarShield™ EMI/RFI Shield Termination Backshell Assembly For Collins SGA3 Connector



## StarShield™ shield termination backshell with banding porch



Dimensions in inches (millimeters) and are subject to change without notice.

**527-450**  
**StarShield™ EMI/RFI Shield Termination**  
**Backshell Assembly**  
**For Collins SGA3 Connector**



**Table II: Material and Finish Options**

| Code | Material; Finish Description                               |
|------|------------------------------------------------------------|
| M    | Aluminum; electroless nickel                               |
| MT   | Aluminum; nickel - PTFE                                    |
| NF   | Aluminum; CAD/O. D. over electroless nickel                |
| ZN   | Aluminum; zinc nickel/O. D. over electroless nickel        |
| ZR   | Aluminum; zinc nickel/black over electroless nickel (RoHS) |
| Z1   | Stainless steel; passivate                                 |
| ZM   | Stainless steel; electroless nickel                        |

**Material/Finish**

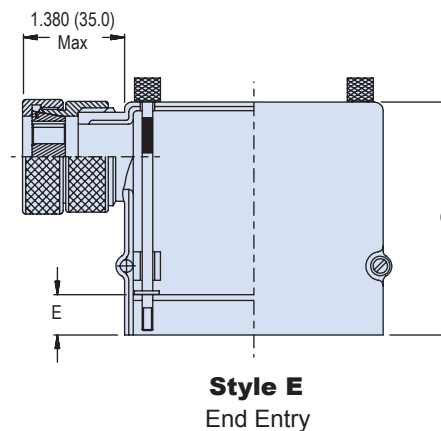
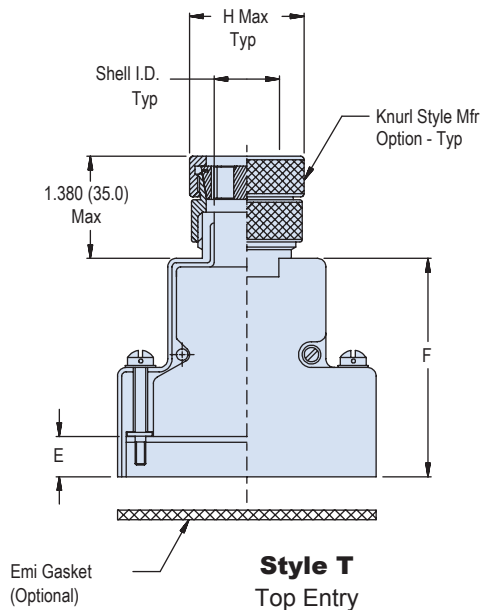
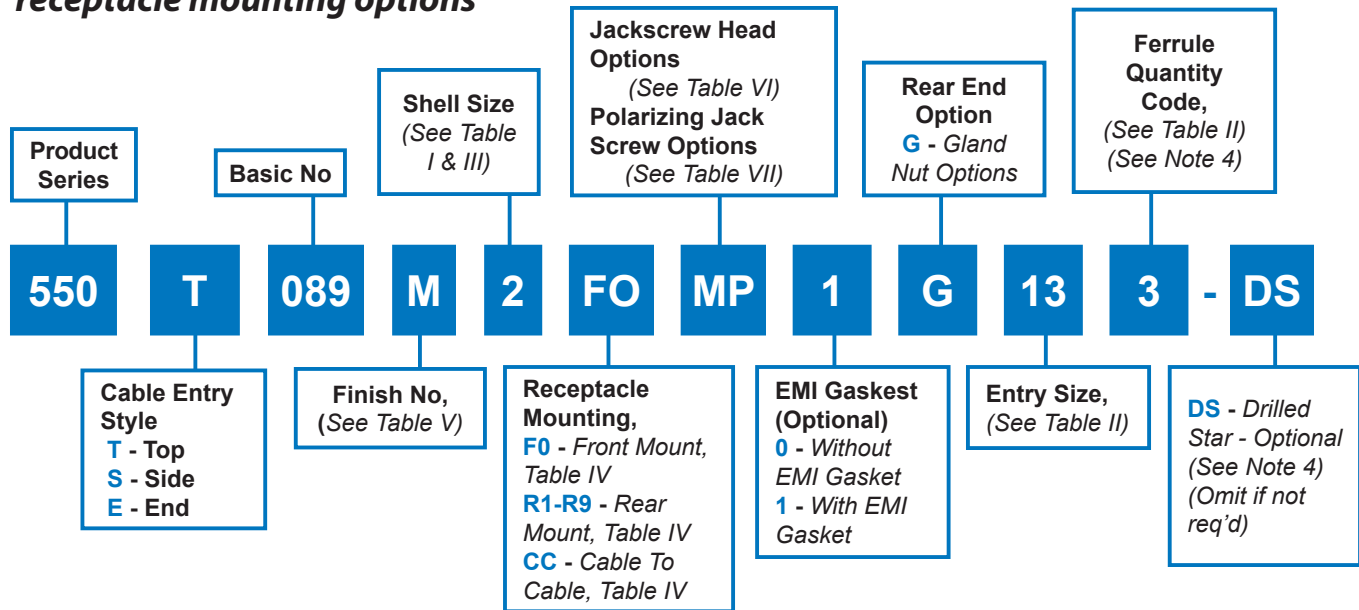
|                                                                                     |                      |
|-------------------------------------------------------------------------------------|----------------------|
| Backshell, adapter, elbow, nut, coupling & gland nut, compression ring, clips, star | Al alloy/see Table I |
| Hardware                                                                            | CRES/passivate       |

1. Assembly identified with manufacturer's name and P/N, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Ferrule kit sold separately.  
 687-764 ferrule and HST device kit  
 687-809 ferrule and sealing device kit  
 687-748 solder ferrule  
 687-841-01 HST flex device





**StarShield™ non-environmental shield termination backshell with cable entry and receptacle mounting options**



Dimensions in inches (millimeters) and are subject to change without notice.

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StarShield™ Zero Length Shield Termination Catalog

CAGE Code 06324

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**www.glenair.com**

**B-44**

**E-Mail: [sales@glenair.com](mailto:sales@glenair.com)**

550-089  
**StarShield™ EMI/RFI Shield Termination  
 Backshell Assembly**  
 for MIL-DTL-24308 D-Subminiature

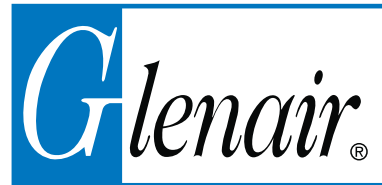


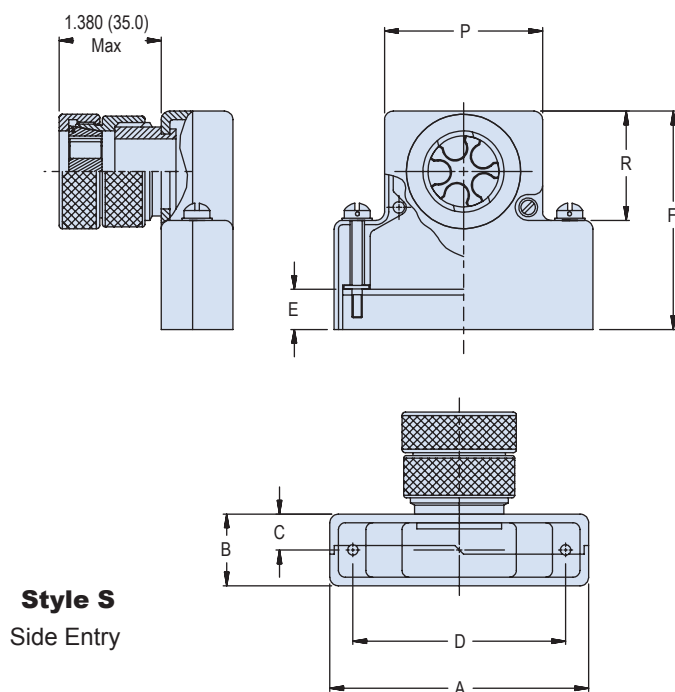
Table I: Dimensions

| Shell Size | Com'l Shell Size Ref | Entry Style T Shell I.D. | Entry Style E Shell I.D. | Max Entry |
|------------|----------------------|--------------------------|--------------------------|-----------|
| 1          | E/09                 | 0.250 (6.40)             | 0.375 (9.50)             | 13        |
| 2          | A/15                 | 0.375 (9.50)             | 0.375 (9.50)             | 15        |
| 3          | B/25                 | 0.475 (12.10)            | 0.475 (12.10)            | 17        |
| 4          | C/37                 | 0.475 (12.10)            | 0.475 (12.10)            | 21        |
| 5          | D/50                 | 0.575 (14.60)            | 0.575 (14.60)            | 21        |
| 6*         | F/104                | 1.000 (25.40)            | 1.000 (25.40)            | 23        |

\* Shell size 6 available in top and end entry only.

Table II: Ferrule Quantity

| Entry Size | H Dia Max    | Ferrule Quantity (See Note 4) |      |
|------------|--------------|-------------------------------|------|
|            |              | Std.                          | Opt. |
| 9          | 0.69 (17.50) | 1                             | -    |
| 11         | 0.85 (21.50) | 2                             | -    |
| 13         | 0.89 (22.50) | 3                             | -    |
| 15         | 1.00 (25.50) | 5                             | -    |
| 17         | 1.12 (28.50) | 6                             | 7    |
| 19         | 1.24 (31.50) | 7                             | -    |
| 21         | 1.38 (35.00) | 9                             | 11   |
| 23         | 1.50 (38.00) | 10                            | 13   |



**Notes:**

1. Assembly identified with manufacturer's name and p/n, space permitting.
2. For effective grounding, connector with conductive finish should be used.
3. Glenair 600 series backshell assembly tools are recommended for assembly and installation.
4. Star not supplied with entry size 09. Drilled star is available on entry sizes 15-23 only. If optional ferrule qty per Table II is selected, one split and one solid star will be supplied.
5. Ferrules sold separately.

**Material/finish:**

6. Adapter, backshell, gland nut, compression ring, star - Al alloy/see Table V
7. Hardware - cres/passivate
8. Gasket - metex/n.a.
9. Washer - nylon/n.a.

Dimensions in inches (millimeters) and are subject to change without notice.



# 550-089

## StarShield™ EMI/RFI Shield Termination Backshell for MIL-DTL-24308 D-Subminiature

Table III: Common Backshell Dimensions

| Shell Size | Com'l Shell Size Ref | A Max         | B Max         | C Ref         | D $\pm .005(.1)$ | P             | R Ref         |
|------------|----------------------|---------------|---------------|---------------|------------------|---------------|---------------|
| 1          | E/09                 | 1.393 (35.40) | 0.624 (15.80) | 0.312 (7.90)  | 0.984 (25.00)    | 0.730 (18.50) | 0.719 (18.30) |
| 2          | A/15                 | 1.706 (43.30) | 0.624 (15.80) | 0.312 (7.90)  | 1.312 (33.30)    | 1.050 (26.70) | 0.719 (18.30) |
| 3          | B/25                 | 2.265 (57.50) | 0.624 (15.80) | 0.312 (7.90)  | 1.852 (47.00)    | 1.594 (40.50) | 0.938 (23.80) |
| 4          | C/37                 | 2.900 (73.70) | 0.624 (15.80) | 0.312 (7.90)  | 2.500 (63.50)    | 2.240 (56.90) | 0.938 (23.80) |
| 5          | D/50                 | 2.800 (71.10) | 0.750 (19.10) | 0.375 (9.50)  | 2.406 (61.10)    | 2.140 (54.40) | 0.938 (23.80) |
| 6          | F/104                | 2.900 (73.70) | 0.844 (21.40) | 0.422 (10.70) | 2.500 (63.50)    | 2.240 (56.90) | 1.094 (27.80) |

Table IV : Cable Mounting Dimensions

| Dash No | Panel Thickness | E            | F $\pm .031$  |               |               | G $\pm .031$  |               |
|---------|-----------------|--------------|---------------|---------------|---------------|---------------|---------------|
|         |                 |              | Size 1 & 2    | Size 3 - 5    | Size 6        | Size 1 & 2    | Size 3 - 6    |
| CC      | N/A             | 0.174 (4.40) | 1.451 (36.90) | 1.671 (42.40) | 1.820 (46.20) | 1.583 (40.20) | 1.831 (46.70) |
| F0      | N/A             | 0.343 (8.70) | 1.625 (41.30) | 1.844 (46.80) | 2.000 (50.80) | 1.750 (44.50) | 2.000 (50.80) |
| R1      | 0.031 (0.80)    | 0.247 (6.30) | 1.525 (38.70) | 1.745 (44.30) | 1.890 (48.00) | 1.656 (42.10) | 1.904 (48.40) |
| R2      | 0.047 (1.20)    | 0.231 (5.90) | 1.509 (38.30) | 1.728 (43.90) | 1.875 (47.60) | 1.640 (41.70) | 1.888 (48.00) |
| R3      | 0.062 (1.60)    | 0.216 (5.50) | 1.500 (38.10) | 1.720 (43.70) | 1.860 (47.20) | 1.625 (41.30) | 1.873 (47.60) |
| R4      | 0.093 (2.40)    | 0.185 (4.70) | 1.470 (37.30) | 1.690 (42.90) | 1.829 (46.50) | 1.594 (40.50) | 1.842 (46.80) |
| R5      | 0.104 (2.60)    | 0.174 (4.40) | 1.451 (36.90) | 1.671 (42.40) | 1.820 (46.20) | 1.583 (40.20) | 1.831 (46.50) |
| R6      | 0.125 (3.20)    | 0.153 (3.90) | 1.430 (36.30) | 1.650 (41.90) | 1.798 (45.70) | 1.563 (39.70) | 1.811 (46.00) |
| R7      | 0.156 (4.00)    | 0.125 (3.20) | 1.400 (35.60) | 1.620 (41.10) | 1.767 (44.90) | 1.531 (38.90) | 1.781 (45.20) |
| R8      | 0.135 (3.40)    | 0.140 (3.60) | 1.417 (36.00) | 1.637 (41.60) | 1.805 (45.80) | 1.550 (39.40) | 1.798 (45.70) |
| R9      | 0.188 (4.80)    | 0.094 (2.40) | 1.368 (34.70) | 1.590 (40.60) | 1.740 (44.20) | 1.500 (38.10) | 1.750 (44.50) |

Table V: Finish Description

| Sym | Finish Description                                       |
|-----|----------------------------------------------------------|
| A   | Cadmium/bright dip                                       |
| B   | Cadmium plate/olive drab                                 |
| E   | Iridite/gold                                             |
| J   | Gold iridite over cadmium plate over nickel              |
| M   | Electroless nickel                                       |
| MB  | Electroless nickel matte finish                          |
| N   | Cadmium plate/olive drab over nickel                     |
| NC  | Zinc cobalt with/olive drab chromate                     |
| NF  | Cad/o.d. Over electroless nickel (1000 hour salt spray)" |
| T   | Cadmium plate/bright dip over nickel                     |
| Y   | Gold iridite over cadmium plate                          |

Table VI: Male Jackscrew Head Options

| Style T and S                | Style T and S                   | Style T and S                              | Style T and S             | Style T and S                          | E Style                                  |
|------------------------------|---------------------------------|--------------------------------------------|---------------------------|----------------------------------------|------------------------------------------|
|                              |                                 |                                            |                           |                                        |                                          |
| <b>Type A</b><br>Socket Head | <b>Type B</b><br>Fillister Head | <b>Type D</b><br>Drilled<br>Fillister Head | <b>Type H</b><br>Hex Head | <b>Type K</b><br>Knurl Slotted<br>Head | <b>Type J</b><br>Knurled<br>Slotted Head |

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550-089  
**StarShield™ EMI/RFI Shield Termination Backshell**  
 for MIL-DTL-24308 D-Subminiature



StarShield™  
Backshells

Table VII: Polarizing Jackscrew Options

|                                                     |                                                |                                          |
|-----------------------------------------------------|------------------------------------------------|------------------------------------------|
|                                                     |                                                |                                          |
| <b>Type EF</b><br>Extended Turnable - Male & Female | <b>Type EL</b><br>Extended Turnable Females    | <b>Type F</b><br>Turnable Male & Female  |
|                                                     |                                                |                                          |
| <b>Type L</b><br>Turnable Females                   | <b>Type M</b><br>Turnable Males                | <b>Type E</b><br>Extended Turnable Males |
|                                                     |                                                |                                          |
| <b>Type N</b><br>Fixed Male & Female                | <b>Type P</b><br>Fixed Females                 | <b>Type R</b><br>Fixed Males             |
|                                                     |                                                |                                          |
|                                                     | <b>Type MP</b><br>Turnable Male & Fixed Female |                                          |

B

# STARSHIELD™ AND SWING ARM™ – A WINNING COMBINATION

## FOR EMI/RFI PROTECTION AND FLEXIBLE CABLE ROUTING

StarShield™ dramatically reduces EMI/RFI distortion and maintains signal integrity by eliminating standing antennas created in the EMI shield termination process. Swing Arm™ is a revolutionary cable clamp and backshell design that allows multiple cable routing configurations in a single part. By marrying the shielding properties of StarShield™ to the versatility and ease-of-use of the Swing Arm™, Glenair delivers the ultimate in versatility and performance: Swing Arm™ reduces SKU's and complexity in cable harness design, and StarShield™ delivers unrivaled performance in EMI/RFI shield termination. And as always, Glenair delivers the premier customer service and technical support you depend on in a key supplier. Our engineering team is the best (and biggest) in the industry. And we offer same-day delivery on thousands of popular part numbers and unmatched capacity for volume production. For more information on Glenair "Out of this World Interconnect Solutions," please call or visit our factory, or see us online at [www.glenair.com](http://www.glenair.com).



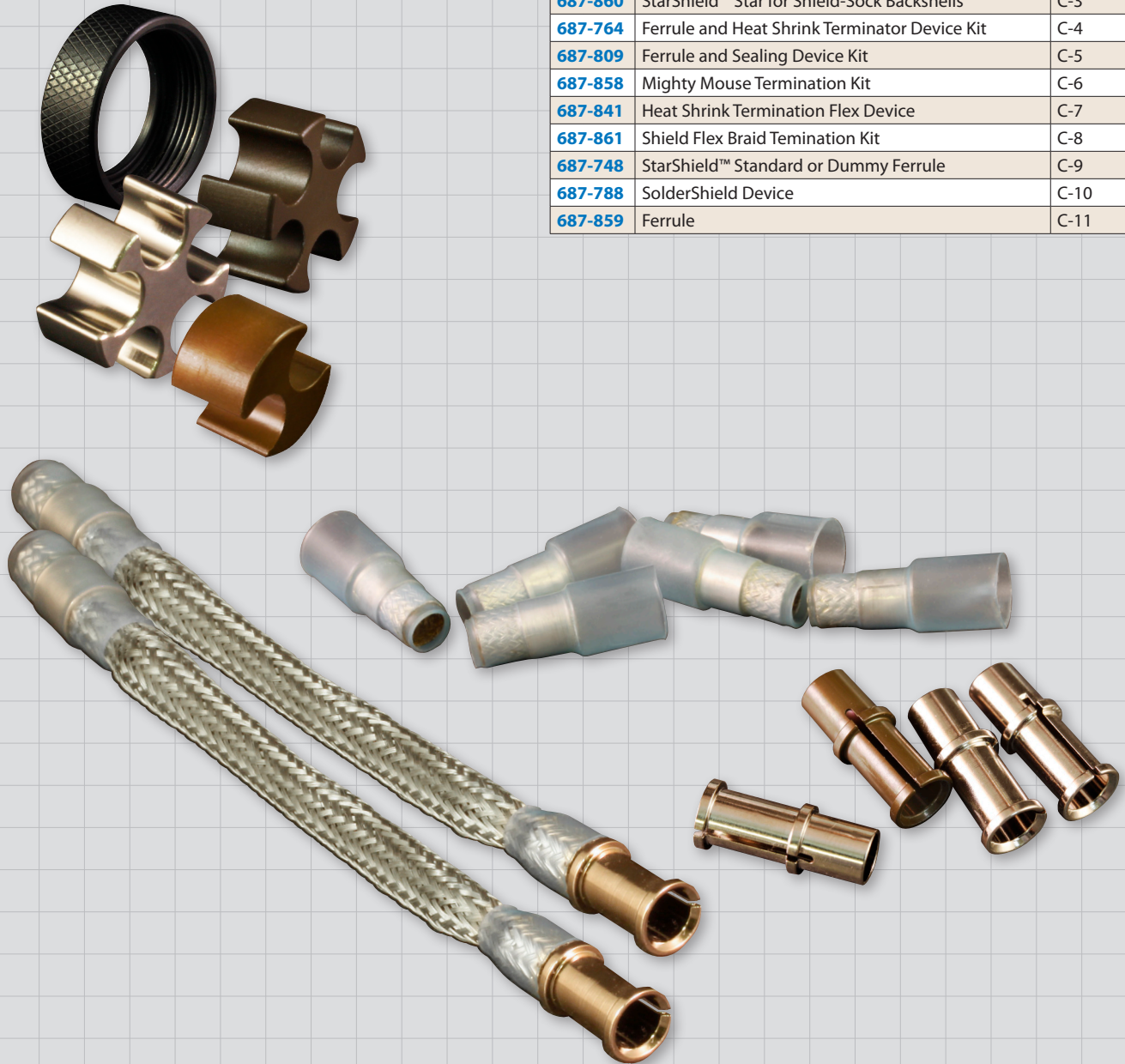


# StarShield™ Components General Information



StarShield™  
Components

**StarShield™ zero length termination components** - Replacement parts and accessories



| Part No.                | Description                                   | Page No. |
|-------------------------|-----------------------------------------------|----------|
| <a href="#">687-763</a> | StarShield™ "Star"                            | C-2      |
| <a href="#">687-860</a> | StarShield™ Star for Shield-Sock Backshells   | C-3      |
| <a href="#">687-764</a> | Ferrule and Heat Shrink Terminator Device Kit | C-4      |
| <a href="#">687-809</a> | Ferrule and Sealing Device Kit                | C-5      |
| <a href="#">687-858</a> | Mighty Mouse Termination Kit                  | C-6      |
| <a href="#">687-841</a> | Heat Shrink Termination Flex Device           | C-7      |
| <a href="#">687-861</a> | Shield Flex Braid Termination Kit             | C-8      |
| <a href="#">687-748</a> | StarShield™ Standard or Dummy Ferrule         | C-9      |
| <a href="#">687-788</a> | SolderShield Device                           | C-10     |
| <a href="#">687-859</a> | Ferrule                                       | C-11     |

C

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**C-1**

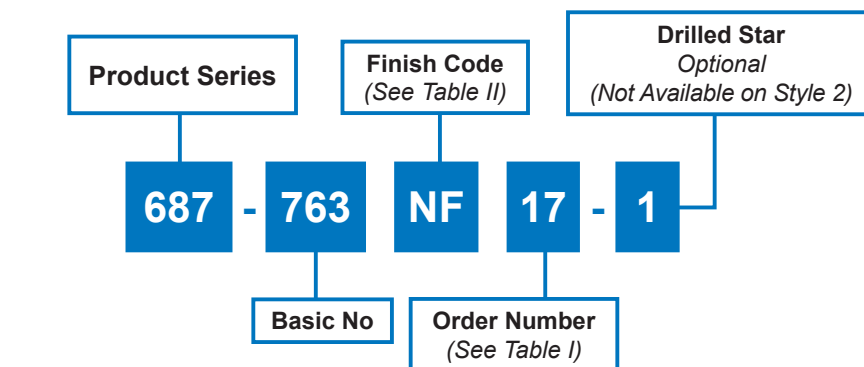
E-Mail: [sales@glenair.com](mailto:sales@glenair.com)



# 687-763 StarShield™ “Star” for StarShield™ Backshells

## StarShield™ “Star”

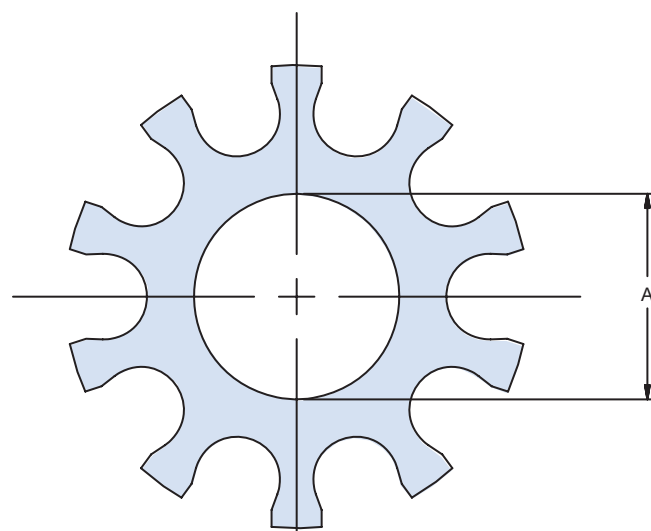
| Table I   |                                  |            |                 |       |
|-----------|----------------------------------|------------|-----------------|-------|
| Order No. | Shell/Entry Size<br>(See note 3) | A Dia Max  | No. of Cavities | Style |
| 11        | 10/11                            | -          | 2               | 1     |
| 13        | 12/13                            | -          | 3               |       |
| 15        | 14/15                            | .118 (3)   | 5               |       |
| 17        | 16/17                            | .236 (6)   | 6               |       |
| 19        | 18/19                            | .354 (9)   | 7               |       |
| 21        | 20/21                            | .472 (12)  | 9               |       |
| 218       | 20/21                            | .472 (12)  | 8               |       |
| 23        | 22/23                            | .591 (15)  | 10              |       |
| 25        | 24/25                            | .708 (18)  | 12              |       |
| 2914      | 28/29                            | .979 (25)  | 14              |       |
| 3318      | 32/33                            | 1.097 (28) | 18              | 2     |
| 177       | 16/17                            |            | 7               |       |
| 2111      | 20/21                            |            | 11              |       |
| 2313      | 22/23                            |            | 13              |       |
| 2514      | 24/25                            |            | 14              |       |
| 2515      | 24/25                            |            | 15              |       |
| 2517      | 24/25                            |            | 17              |       |
| 2922      | 28/29                            |            | 22              |       |
| 2925      | 28/29                            |            | 25              |       |
| 3328      | 32/33                            |            | 28              |       |
| 3331      | 32/33                            |            | 31              |       |



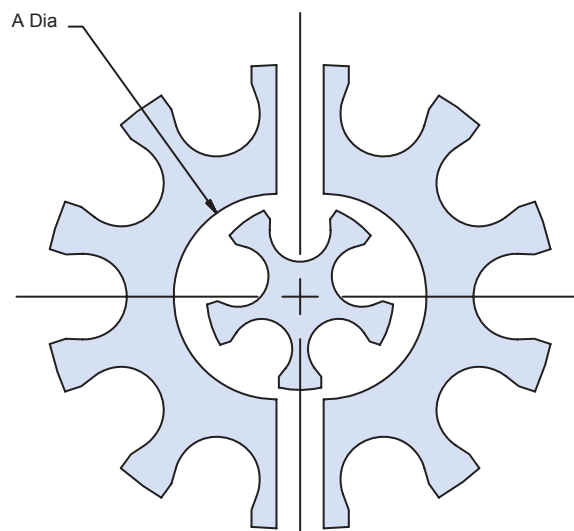
| Table II |                                                          |
|----------|----------------------------------------------------------|
| Code     | Finish Description                                       |
| M        | Electroless nickel                                       |
| NF       | Cad/O. D. Over electroless nickel (1000 hour salt spray) |
| Z1       | Stainless steel/passivate                                |
| ZR       | Aluminum/zinc-nickel, black                              |
| ZM       | Stainless steel/ electroless nickel                      |

### Notes:

1. Assembly to be bagged and tagged with manufacturer's name and part number.
2. Material/finish: Al alloy or CRES/see Table I
3. Shell size shall be used for 470-013. Entry size shall be used for 470-019/020
4. 687-763 series star to be used with : 687-841-01M, 687-764-02M, 687-764-04M, and 687-809-03M. These stars will fit a .200 outer diameter.



**STYLE 1**  
Single Solid Star



**STYLE 2**  
Split Outer Star and  
Solid Inner Star

Dimensions in inches (millimeters) and are subject to change without notice.

**687-860**  
**StarShield™ “Star”**  
for StarShield™ Shield-Sock Backshells



StarShield™  
Components

**StarShield™ “Star” for Shield Sock backshells**

**Table I**

| No. Of Cavities | Style | A Dia      | B Dia Max   | C Dia Max   | D Dia Max  |
|-----------------|-------|------------|-------------|-------------|------------|
| 3               | 1     | -          | .643(16.3)  | -           | -          |
| 4               | 1     | -          | .726(18.4)  | -           | -          |
| 5               | 1     | .141(3.6)  | .818(20.8)  | -           | -          |
| 6               | 1     | .240(6.1)  | .913(23.2)  | -           | -          |
| 7               | 1     | .335(8.5)  | 1.010(25.7) | -           | -          |
| 8               | 1     | .385(9.8)  | 1.109(28.2) | -           | -          |
| 9               | 1     | .533(13.5) | 1.208(30.7) | -           | -          |
| 10              | 1     | .633(16.1) | 1.307(33.2) | -           | -          |
| 14              | 2     | -          | 1.470(37.3) | .798(20.3)  | -          |
| 15              | 2     | .141(3.6)  | 1.476(37.5) | .890(22.6)  | -          |
| 18              | 2     | .240(6.1)  | 1.570(39.9) | .985(25.0)  | -          |
| 19              | 2     | .330(8.4)  | 1.670(42.4) | 1.081(27.5) | -          |
| 20              | 2     | .385(9.8)  | 1.741(44.2) | 1.181(30.0) | -          |
| 25              | 3     | -          | 1.957(49.7) | 1.374(34.9) | .715(18.2) |
| 30              | 3     | -          | 2.038(51.8) | 1.456(37.0) | .788(20.0) |

**Table II**

| Code | Finish Description                                          |
|------|-------------------------------------------------------------|
| M    | Electroless nickel                                          |
| NF   | Cad/O. D. Over electroless nickel<br>(1000 hour salt spray) |
| ZM   | Stainless steel/ electroless nickel                         |
| ZR   | Aluminum/zinc-nickel, black                                 |

**Product Series**

**Finish Code**  
(See Table II)

**687**

**- 860**

**M**

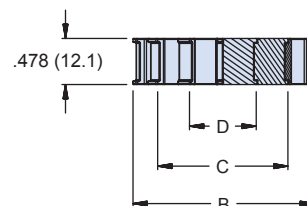
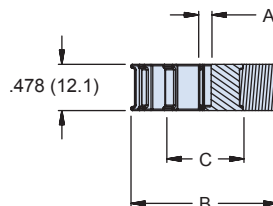
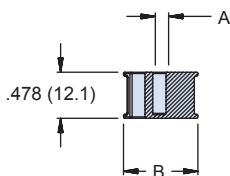
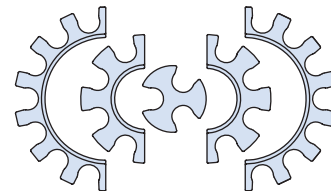
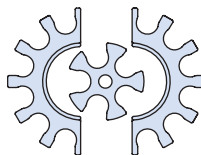
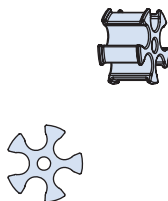
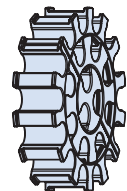
**10**

**Basic No**

**Number of Cavities**  
(See Table I)

**Notes:**

1. Assembly to be bagged and tagged with manufacturer's name and part number.
2. Used with 687-859/861.
3. Material/Finish: Al alloy or CRES/see Table I
4. 687-860 series of star to be used with 687-999-01M, 687-999-01MS, and 687-841-02M . These stars will fit a .230 outer diameter ferrule.



**STYLE 1**  
(Single Solid Star)

**STYLE 2**  
(Split Outer Star and Solid Inner Star)

**STYLE 3**  
(2 Split Outer Stars and Solid Inner Star)

Dimensions in inches (millimeters) and are subject to change without notice.

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**C-3**

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**C**



687-764

# Ferrule and Heat Shrink Terminator Device Kit for StarShield™ Backshells

## Ferrule and heat shrink terminator device kit

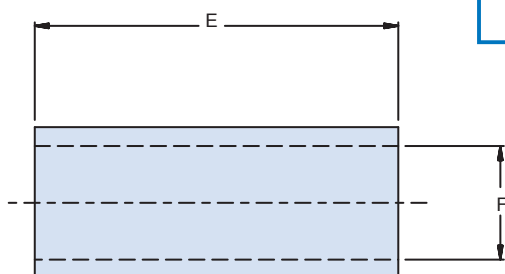
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SeriesSize  
(See Table I)

687

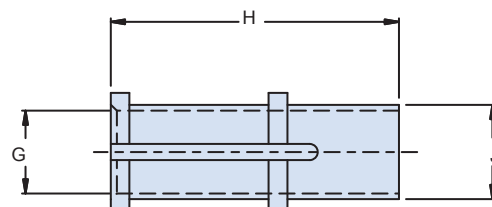
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02

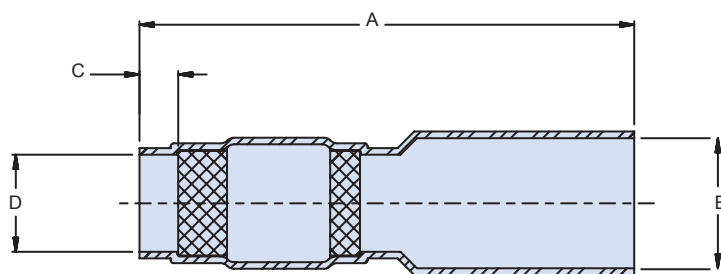
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Basic  
NumberFinish Code  
(See Table II)

INSULATION SLEEVE



FERRULE



HEAT SHRINK TERMINATOR (HST) DEVICE

## Material/Finish

|                                                                            |                                                                          |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Ferrule                                                                    | Copper alloy/see Table II                                                |
| Insulation sleeve                                                          | Heat-shrinkable, radiation cross-linked modified polyvinylidene fluoride |
| <b>Radiation cross-linked modified polyvinylidene fluoride HST Device:</b> |                                                                          |
| Heat shrinkable insulation sleeve.                                         | Radiation cross-linked modified polyvinylidene fluoride                  |
| Aarmorlite or copper braid                                                 | Pre-tinned with Sn96Ag3.5Cu.5 solder alloy with activated rosin flux.    |
| Solder preform                                                             | Sn96Ag3.5Cu.5 solder alloy with activated rosin flux.                    |

Table I

| Order No. | A Dia Max       | B Dia Min       | C Max         | D Dia Min     | E Min           | F Dia Min     | G Dia Min     | H Max           | J Ref         |
|-----------|-----------------|-----------------|---------------|---------------|-----------------|---------------|---------------|-----------------|---------------|
| 02        | 1.045<br>(26.5) | .275<br>(7.00)  | .080<br>(2.0) | .205<br>(5.2) | .768<br>(19.5)  | .240<br>(6.1) | .170<br>(4.3) | .620<br>(15.7)  | .200<br>(5.1) |
| 04        | 1.181<br>(30.0) | .354<br>(9.00)  | .098<br>(2.5) | .205<br>(5.2) | .768<br>(19.5)  | .240<br>(6.1) | .170<br>(4.3) | .620<br>(15.7)  | .200<br>(5.1) |
| 05        | 1.850<br>(47.0) | .475<br>(12.07) | .118<br>(3.0) | .362<br>(9.5) | 1.000<br>(25.4) | .370<br>(9.4) | .300<br>(7.6) | 1.004<br>(25.5) | .354<br>(9.0) |

Table II

| Code | Finish Description                                          |
|------|-------------------------------------------------------------|
| M    | Electroless nickel                                          |
| NF   | CAD/O. D. Over electroless nickel<br>(1000 Hour salt spray) |
| ZRC  | Aluminum/zinc-nickel                                        |

**Notes:**

1. Identified by bag and tag in suitable quantities.
2. The Ferrule and the HST Device are used on Glenair StarShield™ adapters.
3. Temperature range: -65°C to +175°C

Dimensions in inches (millimeters) and are subject to change without notice.

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C-4

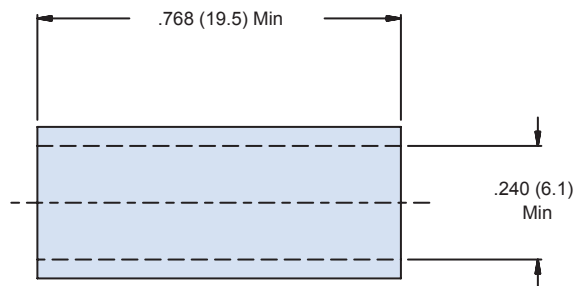
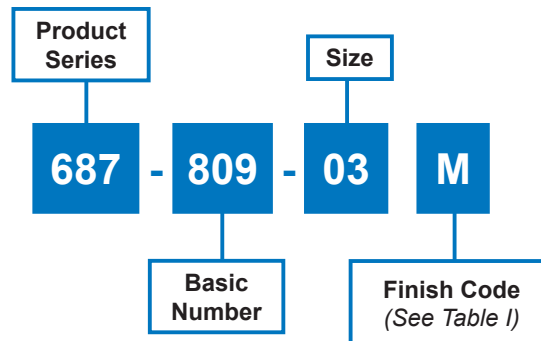
E-Mail: sales@glenair.com

**687-809**  
**Ferrule and Sealing Device Kit**  
**for StarShield™ Backshells**



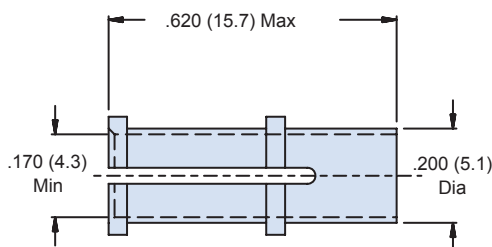
StarShield™  
Components

**Ferrule and sealing device kit**

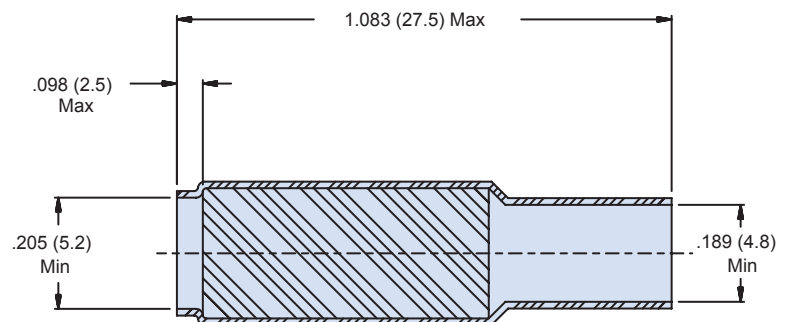


**INSULATION SLEEVE**

| Table I |                                                         |
|---------|---------------------------------------------------------|
| Code    | Finish Description                                      |
| M       | Electroless Nickel                                      |
| NF      | CAD/O.D. Over Electroless Nickel (1000 Hour Salt Spray) |
| ZRC     | Aluminum/zinc-nickel                                    |



**FERRULE**



**SEALING DEVICE**

| Material/Finish:  |                                                                                              |
|-------------------|----------------------------------------------------------------------------------------------|
| Ferrule           | Copper alloy/see Table I                                                                     |
| Insulation Sleeve | Heat-shrinkable, radiation cross-linked modified polyvinylidene fluoride.                    |
| Sealing Device    | Heat shrinkable insulation sleeve (radiation cross-linked modified polyvinylidene fluoride). |

**Notes:**

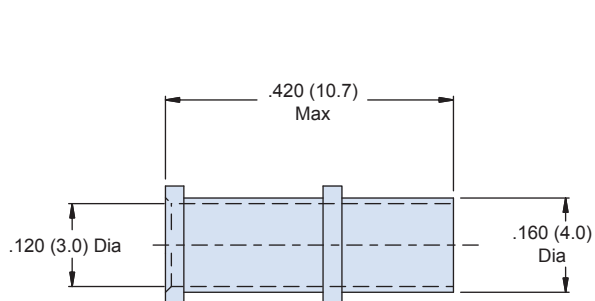
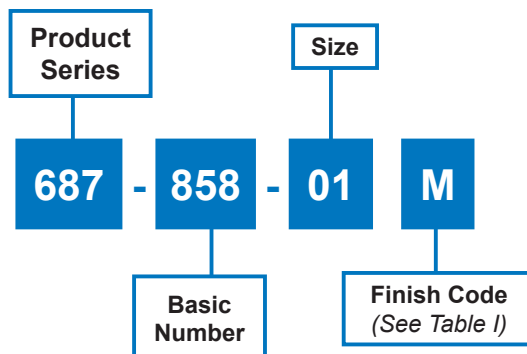
1. Identified by bag and tag in suitable quantities.
2. The ferrule and sealing device are used on Glenair StarShield™ Backshells.
3. Temperature range: -65°C to +175°C.



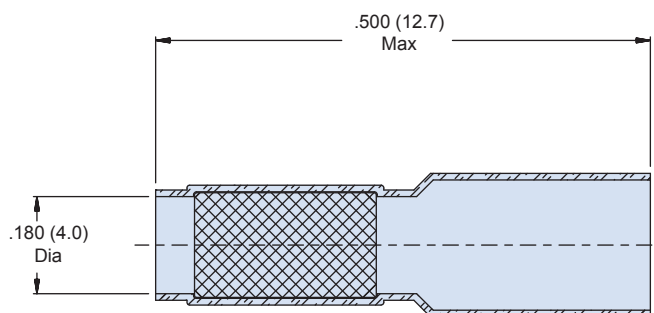


# 687-858 Mighty Mouse Termination Kit for StarShield™ Backshells

## Mighty Mouse Termination Kit



**FERRULE**



**HEAT SHRINK TERMINATOR (HST) DEVICE**

**Table I**

| Code | Finish Description                                       |
|------|----------------------------------------------------------|
| M    | Electroless nickel                                       |
| NF   | CAD/O. D. over electroless nickel (1000 hour salt spray) |
| ZRC  | Aluminum/zinc-nickel                                     |

**Material/Finish:**

|                                     |                                                         |
|-------------------------------------|---------------------------------------------------------|
| Ferrule                             | Al Alloy/See Table I                                    |
| Heat Shrinkable Sleeve (HST) Device | Radiation Cross-Linked Modified Polyvinylidene Fluoride |

### Notes:

1. Identified by bag and tag in suitable quantities.
2. The ferrule and the hst device are used on Glenair StarShield™ backshells for Mighty Mouse connectors 470MS021.
3. Temperature range: -65°C to +175°C.

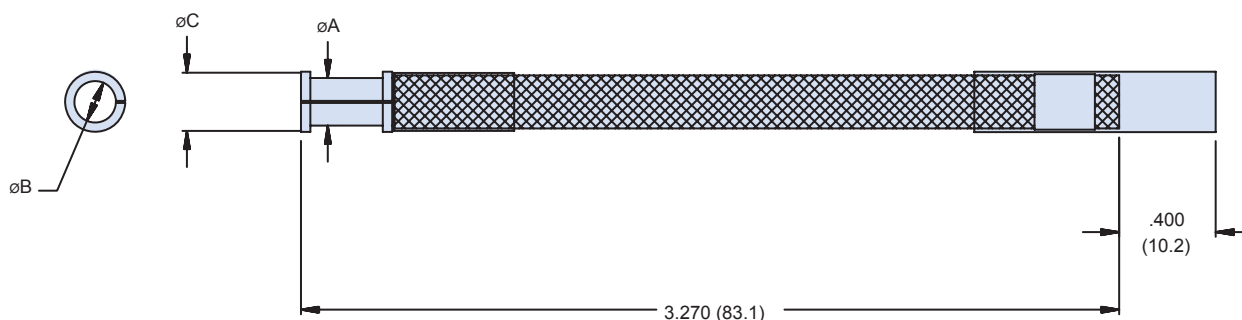
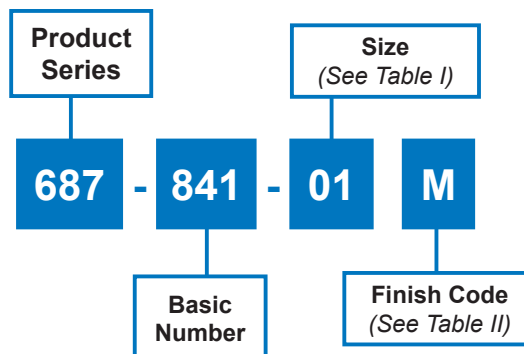
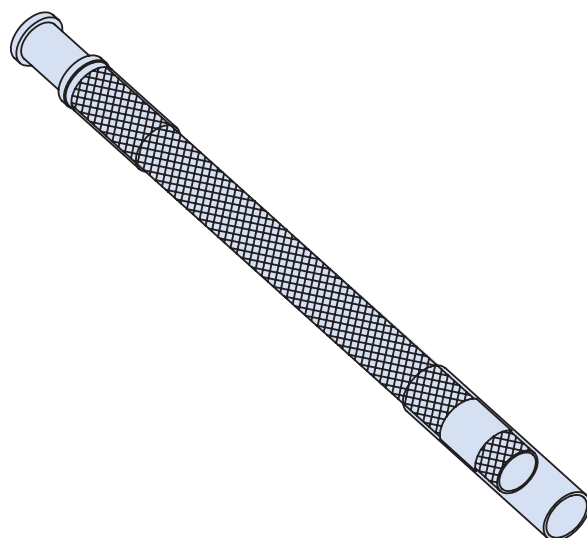
Dimensions in inches (millimeters) and are subject to change without notice.

# 687-841 Heat Shrink Termination Flex Device for StarShield™ Backshells



StarShield™  
Components

## HST-flex device



| Table I |            |            |           |
|---------|------------|------------|-----------|
| Size    | $\phi A$   | $\phi B$   | $\phi C$  |
| 01      | .200 (5.1) | .172 (4.4) | .25 (6.4) |
| 02      | .230 (5.8) | .204 (5.2) | .27 (6.9) |

| Table II |                                                          |
|----------|----------------------------------------------------------|
| Code     | Finish Description                                       |
| M        | Electroless nickel                                       |
| NF       | CAD/O. D. over electroless nickel (1000 hour salt spray) |

| Material/Finish                                                                   |                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------------------------|
| Ferrule                                                                           | Copper alloy/see Table I                                |
| <b>Heat-shrinkable radiation cross-linked polyvinylidene fluoride HST Device:</b> |                                                         |
| Heat Shrinkable Insulation Sleeve                                                 | Radiation cross-linked modified polyvinylidene fluoride |
| Solder Preform                                                                    | Sn96Ag3.5Cu.5 solder alloy with activated rosin flux    |
| Braid                                                                             | ArmorLite™                                              |

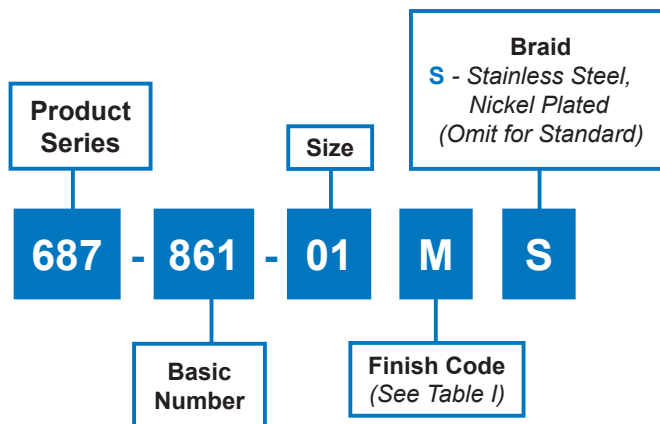
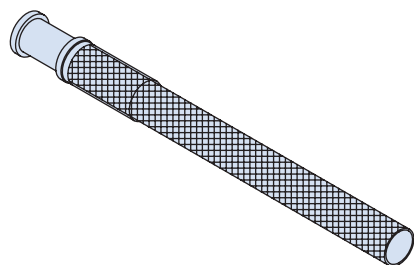
### Notes:

1. Identified by bag and tag in suitable quantities.
2. The HST-Flex Device is used on Glenair StarShield™ Adapters.
3. Temperature range: -65°C to +175°C.

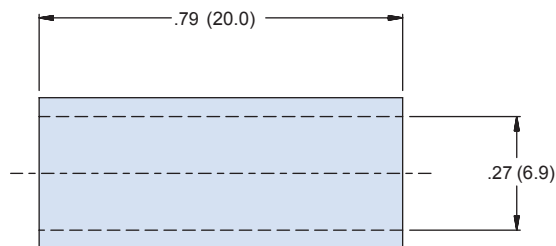


# 687-861 Shield Flex Braid Termination Kit for Glenair StarShield™ Shield-Sock Termination

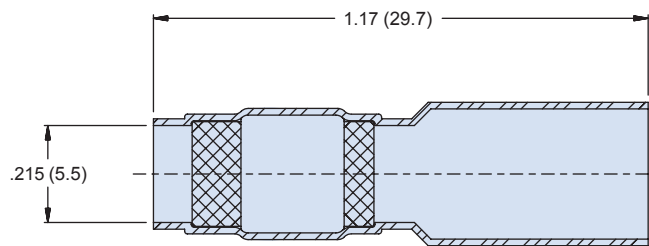
## Shield flex braid termination kit



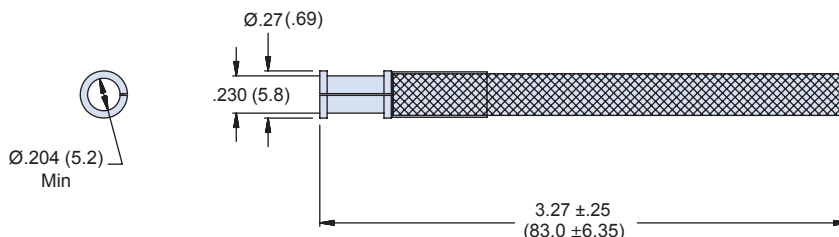
Please contact the factory for additional information



**INSULATION SLEEVE**



**HEAT SHRINK TERMINATOR (HST) DEVICE**



**Table I**

| Code | Finish Description                                          |
|------|-------------------------------------------------------------|
| M    | Electroless nickel                                          |
| NF   | CAD/O. D. over electroless nickel<br>(1000 hour salt spray) |

### Notes

1. Identified by bag and tag in suitable quantities.
2. HST-flex device are used on Glenair StarShield™ Backshells.
3. Temperature range: -55°C to +200°C.
4. Material and Finish
  - Ferrule - Copper alloy/see Table I
  - Radiation cross-linked modified polyvinylidene fluoride HST Device:
    - Heat Shrinkable Insulation Sleeve: Radiation cross-linked modified polyvinylidene fluoride
    - Solder Preform: Sn96Ag3.5Cu.5 solder alloy with activated rosin flux
    - Braid: Silver Plated Copper Per AA 59569 Form R. Strand Coating S, Armorlite for "S" option

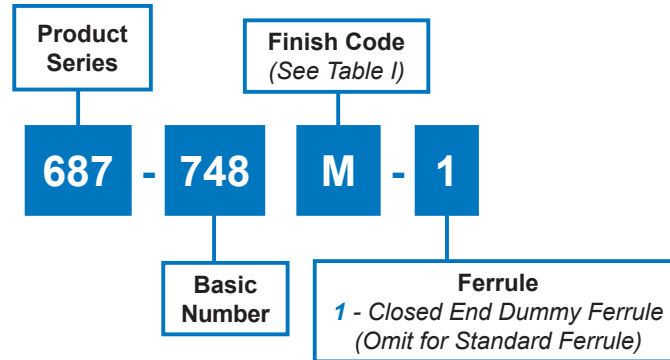
Dimensions in inches (millimeters) and are subject to change without notice.

687-748  
StarShield™ Standard or Dummy Ferrule

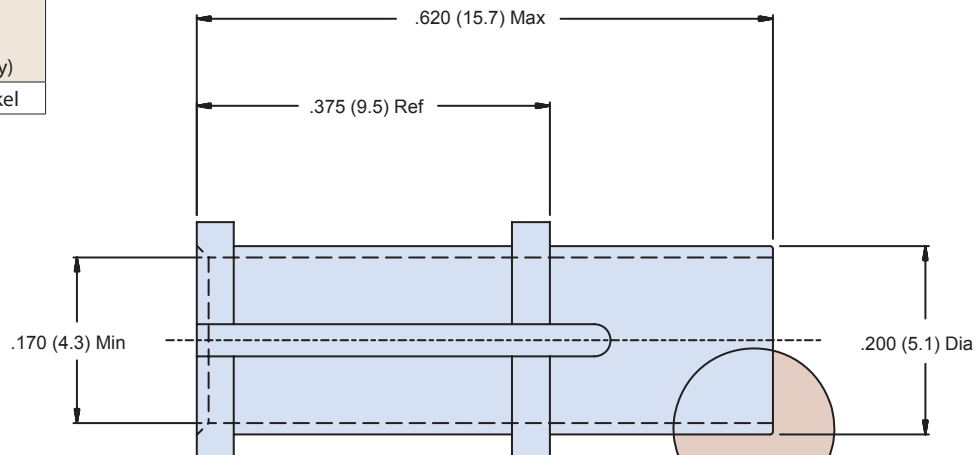


StarShield™  
Components

**StarShield™ ferrule - standard or dummy**



| Table I |                                                         |
|---------|---------------------------------------------------------|
| Code    | Finish Description                                      |
| M       | Electroless Nickel                                      |
| NF      | CAD/O.D. over electroless nickel (1000 hour salt spray) |
| ZRC     | Aluminum/zinc-nickel                                    |

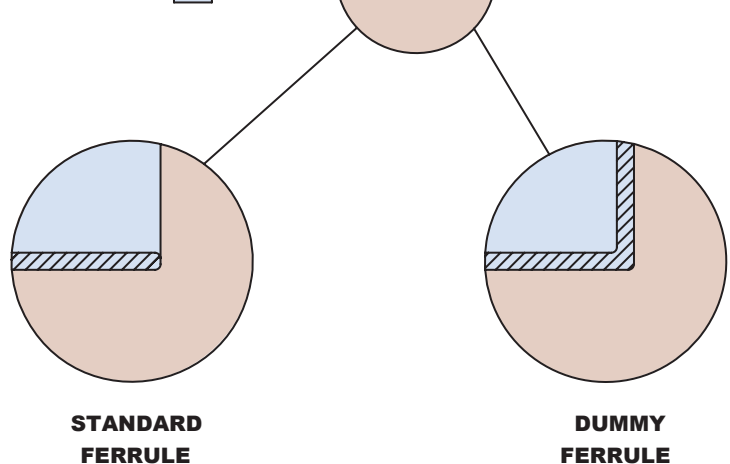


**Notes:**

1. Identified by bag and tag in suitable quantities.
2. Solder tube used with Glenair backshells.

**Material/Finish:**

3. Copper alloy/see Table I



**STANDARD  
FERRULE**

**DUMMY  
FERRULE**

Dimensions in inches (millimeters) and are subject to change without notice.

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## 687-788 SolderShield Device for StarShield™ Backshells

### SolderShield device

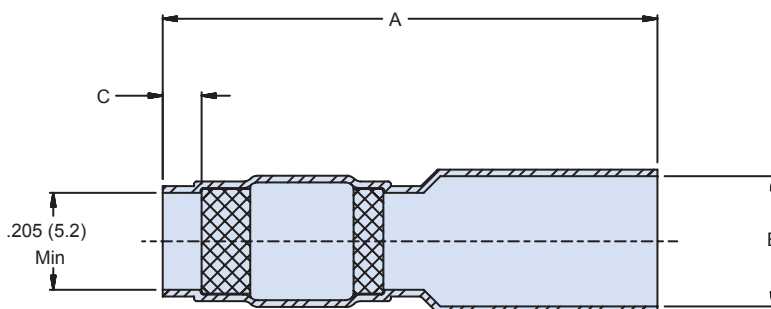
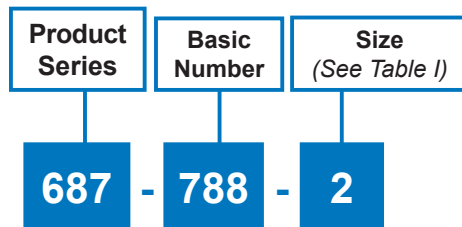


Table I

| Size | A Dia Max    | B Dia       | C Max      |
|------|--------------|-------------|------------|
| 02   | 1.045 (26.5) | .275 (7.00) | .080 (2.0) |
| 04   | 1.181 (30.0) | .354 (9.00) | .098 (2.5) |

#### Material/Finish:

##### Solder Shield Device:

|                                   |                                                                     |
|-----------------------------------|---------------------------------------------------------------------|
| Heat shrinkable insulation sleeve | Radiation cross-linked modified polyvinylidene fluoride             |
| ArmorLite or Copper Braid         | Pre-tinned with Sn9Ag3.5Cu.5 solder alloy with activated rosin flux |
| Solder Preform                    | Sn9Ag3.5Cu.5 solder alloy with mildly activated rosin flux          |

#### Notes:

1. Identified by bag and tag in suitable quantities.
2. The SolderShield Device is used on Glenair StarShield™ backshells.
3. Temperature range: -65°C to +175°C

Dimensions in inches (millimeters) and are subject to change without notice.

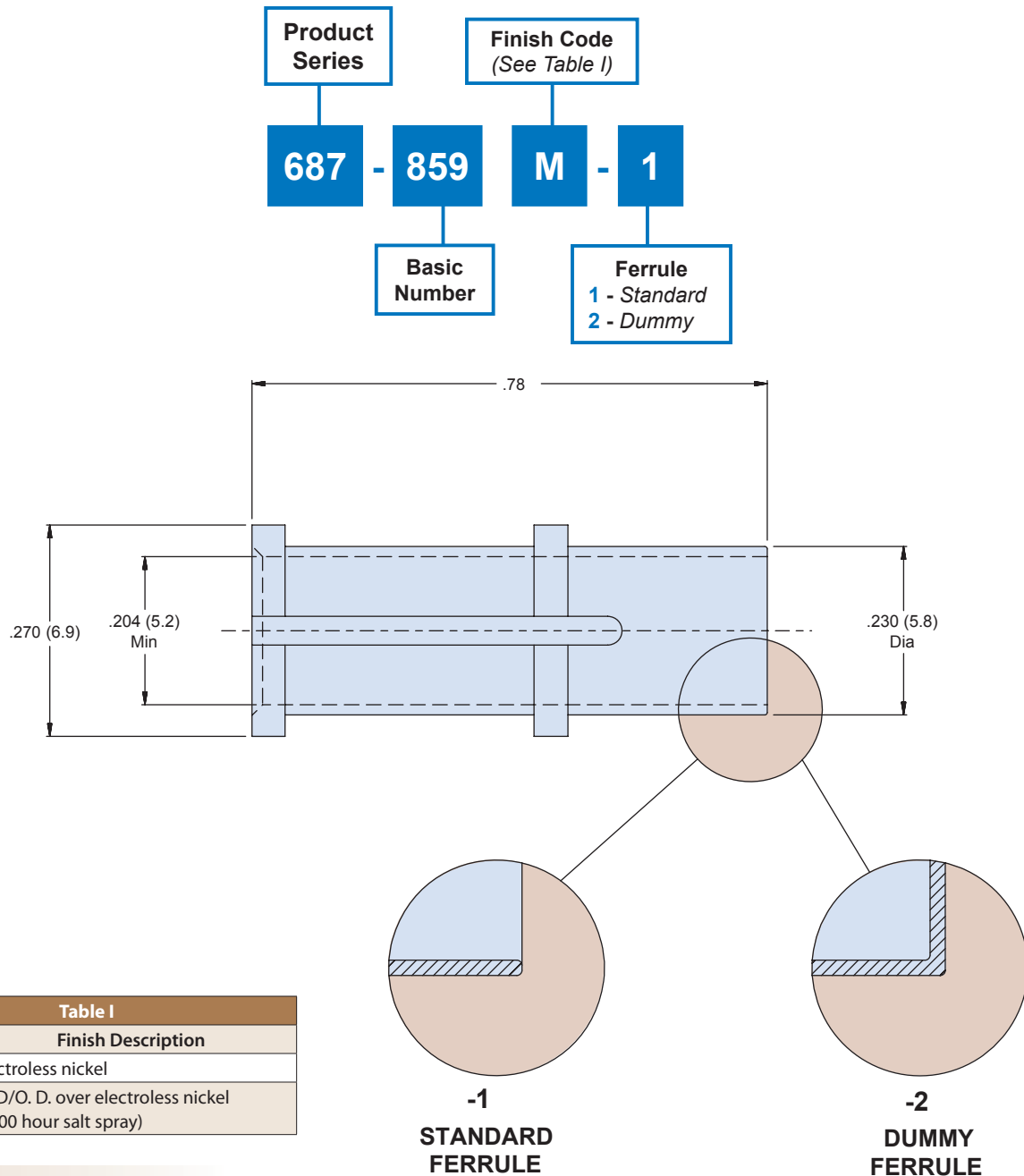


687-859  
Ferrule  
for StarShield™ Shield-Sock Termination



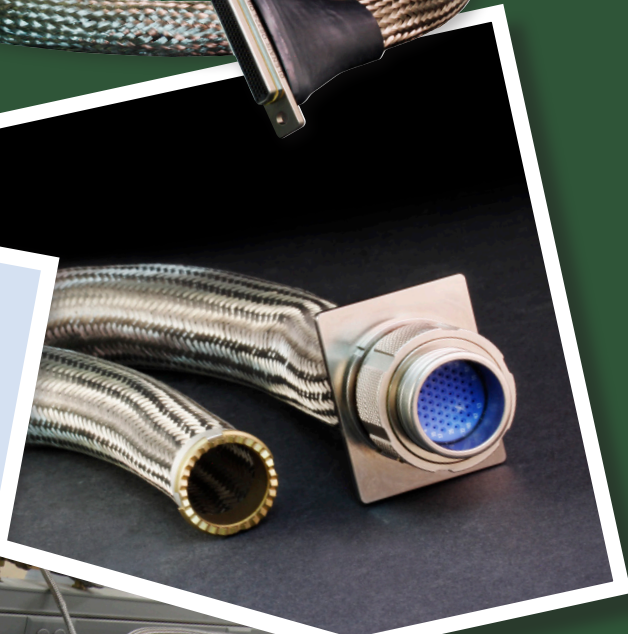
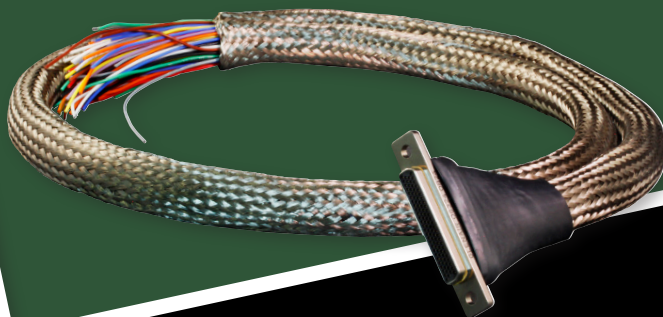
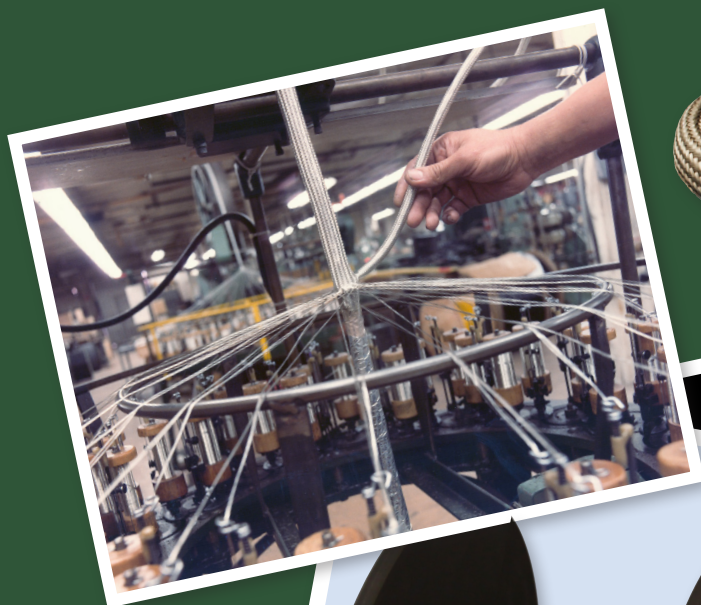
StarShield™  
Components

## Ferrule



# ARMORLITE™

## THE SMART WAY TO REDUCE LAUNCH AND FLIGHT WEIGHTS MICROFILAMENT NICKEL CLAD STAINLESS STEEL BRAID



- Microfilament stainless steel: 70% lighter than NiCu A-A-59569
- Outstanding EMI/RFI shielding and conductivity
- Reduce shielding weight up to 70% and more
- Superior flexibility and "windowing resistance"



# Series 77 Shrink Boots

## Lipped Straight Adapter Shrink Boots

### General Information

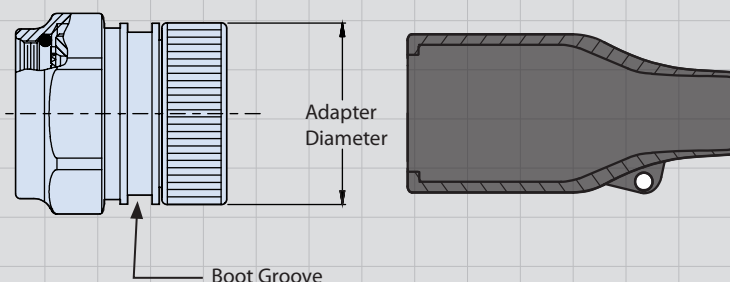


## Lipped Straight Adapter Shrink Boots, Standard



StarShield™ Zero Length Shield Termination Backshells are equipped with boot grooves for the utilization of standard Glenair environmental lipped shrinkboots. After shrinking, the boot lip locks into the StarShield™ adapter groove. Eyelet hole allows attachment of dust caps or protective covers. Type 1 high performance elastomer boots for extreme temperatures and excellent resistance to fuels and oils, may be specified by adding a -T modifier to the StarShield™ part number. Choose boot size based on the tables provided on each StarShield™ catalog page.

- Easy attachment to StarShield™ backshell shrink boot adapters
- With or without eyelets



**Table 1: Boot Size Selection Guide**

| Table 1: Boot Size Selection Guide |                  |       |             |       |                     |       |
|------------------------------------|------------------|-------|-------------|-------|---------------------|-------|
| Boot Size                          | Adapter Diameter |       |             |       | Min. Cable Diameter |       |
|                                    | Inches           |       | Millimeters |       |                     |       |
|                                    | Min              | Max   | Min         | Max   | In.                 | mm.   |
| 04                                 | .600             | 1.000 | 15.24       | 25.40 | .275                | 6.99  |
| 05                                 | .750             | 1.200 | 19.05       | 30.48 | .300                | 7.62  |
| 06                                 | .900             | 1.350 | 22.86       | 34.29 | .375                | 9.53  |
| 07                                 | 1.250            | 1.650 | 31.75       | 41.91 | .425                | 10.80 |
| 08                                 | 1.400            | 2.250 | 35.56       | 57.15 | .625                | 15.88 |
| 09                                 | 1.870            | 2.470 | 47.50       | 62.70 | .660                | 16.80 |

**Table 2: Material Attributes**

| Attribute                  | Type 1<br>High-Performance Semi-Rigid Elastomer |
|----------------------------|-------------------------------------------------|
| Continuous Operating Temp. | -75° to +150°C                                  |
| Resistance to Fuels, Oils  | Excellent                                       |
| Low Toxicity, Zero Halogen | No                                              |

**Table 3: Pre-Coated Boots Adhesive Information**

| Attribute                             | W1<br>High Temperature<br>Hot Melt Adhesive | W2<br>Standard Hot Melt<br>Adhesive | R<br>High: Performance<br>Epoxy Adhesive |
|---------------------------------------|---------------------------------------------|-------------------------------------|------------------------------------------|
| Boot Material Compatibility           | Types 1, 2 and 3                            | Types 1, 2 and 3                    | Type 1                                   |
| Continuous Operating Temp.            | -55° to +125°C                              | -40° to +80°C                       | -75° to +150°C                           |
| Resistance to Fuels, Oils, and Fluids | Good                                        | Good                                | Excellent                                |
| Low Toxicity, Zero Halogen            | Yes                                         | Yes                                 | Yes                                      |

**Table 4: StarShield™  
Shell Sizes and Boot Part  
Numbers**

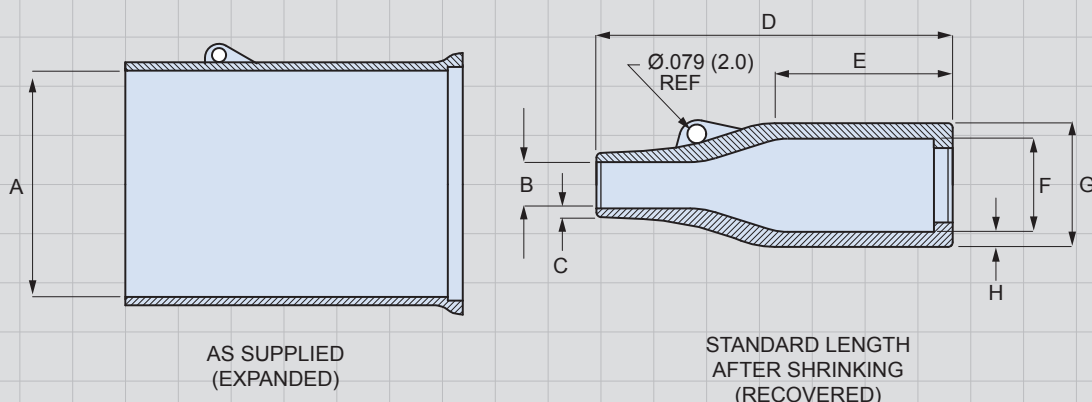
| Shell Size | Shrink Boot Part Number |
|------------|-------------------------|
| 09         | 770-001S1 04            |
| 11         | 770-001S1 06            |
| 13         | 770-001S1 06            |
| 15         | 770-001S1 07            |
| 17         | 770-001S1 07            |
| 19         | 770-001S1 08            |
| 21         | 770-001S1 08            |
| 23         | 770-001S1 08            |
| 25         | 770-001S1 09            |

Dimensions in inches (millimeters) and are subject to change without notice.



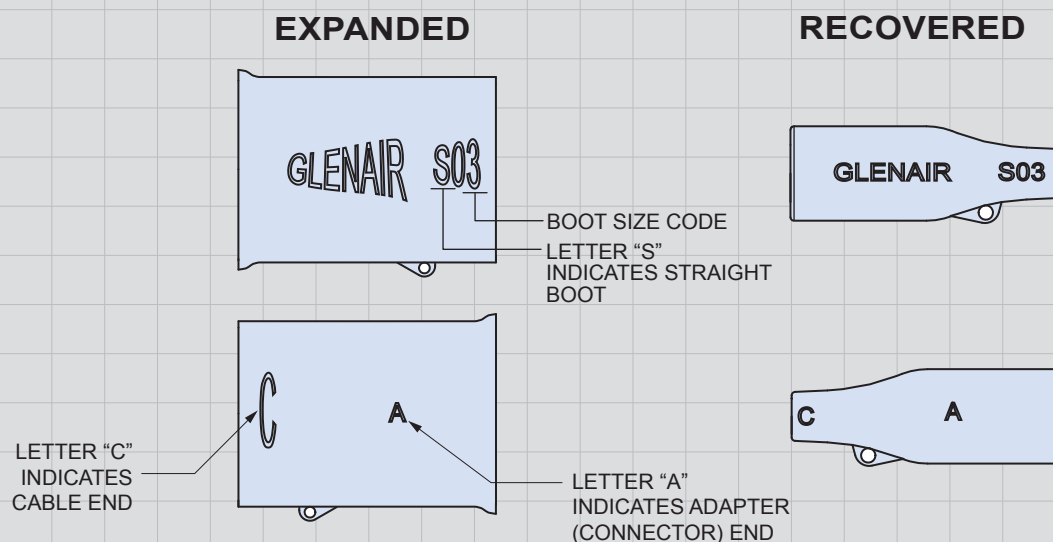
## Series 77 Shrink Boots Lipped Straight Adapter Shrink Boots, Standard Dimensions

### Lipped Straight Adapter Shrink Boots, Standard: Dimensions



| Boot Size | A Min. |      | B Max. |      | C $\pm 20\%$ |     | D $\pm 10\%$ |       | E Ref. |      | F Max. |      | G Ref. |      | H $\pm 30\%$ |     |
|-----------|--------|------|--------|------|--------------|-----|--------------|-------|--------|------|--------|------|--------|------|--------------|-----|
|           | In.    | mm.  | In.    | mm.  | In.          | mm. | In.          | mm.   | In.    | mm.  | In.    | mm.  | In.    | mm.  | In.          | mm. |
| 04        | 1.181  | 30.0 | .236   | 6.0  | .039         | 1.0 | 2.165        | 55.0  | 1.181  | 30.0 | .551   | 14.0 | .693   | 17.6 | .071         | 1.8 |
| 05        | 1.260  | 32.0 | .276   | 7.0  | .047         | 1.2 | 2.638        | 67.0  | 1.299  | 33.0 | .709   | 18.0 | .850   | 21.6 | .071         | 1.8 |
| 06        | 1.417  | 36.0 | .335   | 8.5  | .047         | 1.2 | 3.150        | 80.0  | 1.575  | 40.0 | .866   | 22.0 | .945   | 24.0 | .079         | 2.0 |
| 07        | 1.693  | 43.0 | .394   | 10.0 | .051         | 1.3 | 3.898        | 99.0  | 2.165  | 55.0 | 1.102  | 28.0 | 1.276  | 32.4 | .087         | 2.2 |
| 08        | 2.362  | 60.0 | .591   | 15.0 | .063         | 1.6 | 5.118        | 130.0 | 1.969  | 50.0 | 1.378  | 35.0 | 1.638  | 41.6 | .130         | 3.3 |
| 09        | 2.599  | 66.0 | .661   | 16.8 | .079         | 2.0 | 6.693        | 170.0 | 3.543  | 90.0 | 1.750  | 44.5 | 2.050  | 52.0 | .150         | 3.8 |

### Lipped Straight Shrink Boots: Part Marking, Raised Lettering



Dimensions in inches (millimeters) and are subject to change without notice.

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# 770-001S1 Type 1 High-Performance Elastomer Straight Lipped Adapter Shrink Boots, Standard



## Type 1 High-Performance Elastomer Boots for Advanced Temperature and Chemical Tolerance



Semi-rigid high performance boots combine excellent resistance to fuels, oils and solvents with superior performance at extreme temperatures. Rated for 3000 hours continuous operation at +150° C, these boots fit most standard boot adapters for circular connectors. Material meets the requirements of VG95343 Type 6, BSG 198-5-DE, EN62329-102 and SAE AS5258 Type H. These boots are recommended for demanding applications such as military vehicles and petrochemical exploration. Boots come standard in black, see table below for optional colors.

- -75° C to +150° C
- Excellent resistance to fuels, oils, solvents and heat.
- Ten available colors

| Boot Size | Part Number with Eyelet | Part Number without Eyelet |
|-----------|-------------------------|----------------------------|
|           | No Adhesive Lining      | No Adhesive Lining         |
| 04        | 770-001S104             | 770-003S104                |
| 06        | 770-001S106             | 770-003S106                |
| 07        | 770-001S107             | 770-003S107                |
| 08        | 770-001S108             | 770-003S108                |
| 09        | 770-001S109             | 770-003S109                |

Add "-DH" to the end of any part number for drain holes.  
Add "-PP" to the end of any part number for potting ports.

### Material Color Options for Type 1 High Performance Elastomer Only Add Optional Color Mod Code to End of Any Type 1 Material Product

| Mod Code | Color  | Similar to (Reference) | Mod Code | Color  | Similar to (Reference) |
|----------|--------|------------------------|----------|--------|------------------------|
| 632 B    | Blue   | PANTONE 3005U          | 632 R    | Red    | PANTONE 1797U          |
| 632 E    | Grey   | FED-STD-595; #36270    | 632 T    | Tan    | FED-STD-595; #33446    |
| 632 G    | Green  | PANTONE 355U           | 632 W    | White  | FED-STD-595; #37875    |
| 632 P    | Purple | FED-STD-595; #37100    | 632 Y    | Yellow | PANTONE YELLOW U       |
| 632 O    | Orange | FED-STD-595; #32300    | Standard | Black  | FED-STD-595; #37038    |

Dimensions in inches (millimeters) and are subject to change without notice.





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

# AmberStrand®

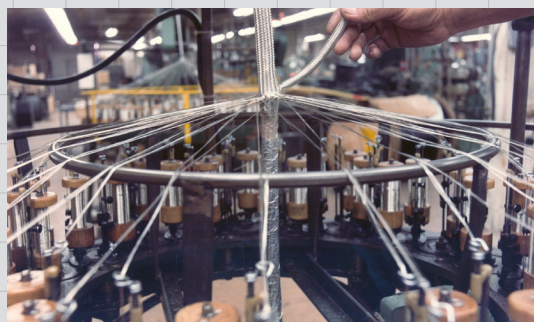


AmberStrand® is  
ultra-lightweight  
microfilament metal clad  
EMI/RFI composite braiding

- Metal-clad EMI/RFI Shielding with a lightweight composite thermoplastic base material
- Highly conductive surface plating
- Reduce shielding weight up to 80% and more
- Reduce operation costs by permanently reducing launch and aircraft all-up weights
- Superior high frequency shielding compared to tinned and/or nickel plated copper
- Exceptional tensile strength: 590,000 psi (min)



**AmberStrand®: The smart way to reduce launch  
and flight weights in aerospace systems**



Glenair can also offer AmberStrand® users direct factory overbraiding services for both point-to-point as well as multi-branch interconnect assemblies.

Composite strain-relief backshell with integrated AmberStrand® lightweight composite metal-clad braid shield sock.



100%  
AmberStrand®

103 - 026 - 024

Diameter Dash  
Number

75%/25%  
AmberStrand® Blend

103 - 027 - 024

Diameter Dash  
Number

### How does Amberstrand® compare, in terms of mechanical performance, to other materials?

| Material Type                | AmberStrand® Thermoplastic | PEEK (Monofil)  | Fluoro-polymer (Yarn) | Kevlar (Yarn)   | Dacron (Yarn)   | Halar (Monofil) | Fluoro-polymer FEP (Monofil) | Nomex (Yarn)    | Polyester Type FR (Monofil) | Ryton Type R-7 (Monofil) | PTFE-Glass (Yarn) |
|------------------------------|----------------------------|-----------------|-----------------------|-----------------|-----------------|-----------------|------------------------------|-----------------|-----------------------------|--------------------------|-------------------|
| Glenair P/N                  | 103-026<br>103-027         | 102-051         | 102-061               | 102-071         | 102-073         | 102-023         | 102-060                      | 103-013         | 102-001<br>102-002          | 102-080                  | 100-022           |
| Temperature Range            | -65°C to +200°C            | -65°C to +260°C | -55°C to +200°C       | -73°C to +175°C | -62°C to +150°C | -65°C to +200°C | -55°C to +260°C              | -55°C to +125°C | -55°C to +200°C             | -65°C to +200°C          | -75°C to +525°C   |
| Tensile Strength (PSI) Yield | 590,000                    | 780,000         | 40,000                | 400,000         | 160,000         | 35,000          | 14,000                       | 90,000          | 50,000                      | 19,000                   | 450,000           |
| Elongation Percentage        | 2.5%                       | 38%             | 19%                   | 3.6%            | 12%             | 15%             | 50%                          | 25%             | 20%                         | 35%                      | 5%                |
| Chemical Resistance          | Excellent                  | Excellent       | Excellent             | Excellent       | Good            | Excellent       | Excellent                    | Excellent       | Good                        | Excellent                | Excellent         |
| Abrasion Resistance          | Good                       | Excellent       | Good                  | Good            | Excellent       | Excellent       | Good                         | Good            | Good                        | Excellent                | Excellent         |
| Specific Gravity             | 1.45                       | 1.30            | 2.10                  | 1.44            | 1.38            | 1.68            | 2.17                         | 1.58            | 1.38                        | 1.25                     | 2.50              |
| Flammability                 | Will Not Burn              | Very Low        | Will Not Burn         | Will Not Melt   | Flammable       | Flammable       | Very Low                     | Will Not Melt   | Very Low                    | Very Low                 | Will Not Burn     |

Dimensions in inches (millimeters) and are subject to change without notice.

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**D-4**

E-Mail: sales@glenair.com

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



Supplemental  
Product Information

## Aircraft Utilization Analysis

Comparison of AmberStrand® Composite EMI/RFI braid to 36 AWG A-A-59569 Ni/Cu Braid results in 60+ pounds weight savings in a typical commercial carrier

Where is all the EMI/RFI braid deployed in a typical commercial aircraft?

| Diameter (in) | L Wing | R Wing | Fwd Belly | Aft Belly | HYD Bay | Aft Barrel | Tail   | V/H Stab | Totals (in) |
|---------------|--------|--------|-----------|-----------|---------|------------|--------|----------|-------------|
| 0 - 0.25      | 1852.2 | 1852.2 | 0         | 2811.4    | 168.2   | 2015.2     | 2480.6 | 1385     | 12564.8     |
| 0.25 - 0.5    | 434.8  | 434.8  | 511.6     | 1034.6    | 257.4   | 506.2      | 958.2  | 1121.7   | 5259.3      |
| 0.5 - 0.75    | 0      | 0      | 260.9     | 223       | 0       | 184.2      | 392.4  | 152.1    | 1212.6      |
| 0.75 - 1.0    | 0      | 0      | 77.2      | 0         | 0       | 1198       | 162.2  | 0        | 1437.4      |
| 1.0 - 1.5     | 0      | 0      | 0         | 0         | 0       | 446        | 21     | 0        | 467         |

How much would all this braid weigh if it was made of  
36 AWG A-A-59569 NiCu?

| Diameter (in) | Weight (Lb/ft) | Length (in)  | Weight (Lb) |
|---------------|----------------|--------------|-------------|
| 0 - 0.25      | 0.02           | 12564.8      | 21.08       |
| 0.25 - 0.5    | 0.05           | 5259.3       | 21.17       |
| 0.5 - 0.75    | 0.07           | 1212.6       | 7.12        |
| 0.75 - 1.0    | 0.14           | 1437.4       | 16.88       |
| 1.0 - 1.5     | 0.18           | 467          | 7.05        |
|               |                | Total weight | 73.30 lbs   |

How much would all this braid weigh if it was made of  
lightweight composite AmberStrand®?

| Diameter (in) | Weight (Lb/ft) | Length (in)  | Weight (Lb) |
|---------------|----------------|--------------|-------------|
| 0 - 0.25      | 0.003          | 12564.8      | 4.16        |
| 0.25 - 0.5    | 0.008          | 5259.3       | 3.58        |
| 0.5 - 0.75    | 0.011          | 1212.6       | 1.16        |
| 0.75 - 1.0    | 0.018          | 1437.4       | 2.11        |
| 1.0 - 1.5     | 0.034          | 467          | 1.30        |
|               |                | Total weight | 12.31 lbs   |

Expressed in percentages, how does 100% and 75% metal clad AmberStrand® compare against tin-coated copper?

| Braid Diameter | AmberStrand® 100%<br>103-026 | Tinned Copper<br>100-001 | % Weight Savings/Foot | AmberStrand® 75/25<br>NiCu%<br>103-027 | Tinned Copper<br>100-001 | % Weight Savings/<br>Foot |
|----------------|------------------------------|--------------------------|-----------------------|----------------------------------------|--------------------------|---------------------------|
| .062           | .6                           | 1.9                      | 68%                   | .9                                     | 1.9                      | 52%                       |
| .125           | 1.0                          | 4.8                      | 79%                   | 1.5                                    | 4.8                      | 68%                       |
| .250           | 1.8                          | 16.1                     | 88%                   | 2.4                                    | 16.1                     | 85%                       |
| .375           | 2.3                          | 18.5                     | 87%                   | 3.9                                    | 18.5                     | 79%                       |
| .500           | 3.7                          | 22.3                     | 83%                   | 5.4                                    | 22.3                     | 76%                       |
| .625           | 4.4                          | 27.7                     | 84%                   | 6.4                                    | 27.7                     | 77%                       |
| .750           | 5.2                          | 34.3                     | 85%                   | 7.2                                    | 34.3                     | 79%                       |
| 1.000          | 8.0                          | 35.0                     | 77%                   | 11.0                                   | 35.0                     | 69%                       |

## 103-031 AmberStrand® Lightweight Metal-Clad Spooled Fiber



Product Series

103 - 031

- 1

Plating

N = Nickel Plating

S = Silver Plating

N

Dash No.  
(Table I)

Table I

| Part Number | Spool Specification                   |
|-------------|---------------------------------------|
| 103-031-1   | Single End Spooled 3000 FT. Per Spool |
| 103-031-2   | Double End Spooled 1250 FT. Per Spool |
| 103-031-3   | Three End Spooled 833 FT. Per Spool   |
| 103-031-4   | Four End Spooled 625 FT. Per Spool    |
| 103-031-5   | Double End Spooled 500 FT. Per Spool  |
| 103-031-6   | Six End Spooled 400 FT. Per Spool     |

D

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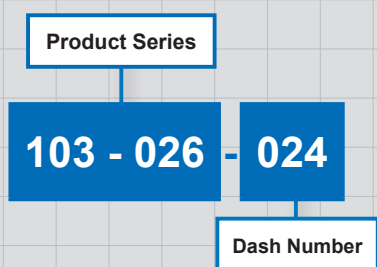


## AmberStrand® Lightweight Composite Metal-Clad EMI/RFI Braided Shielding

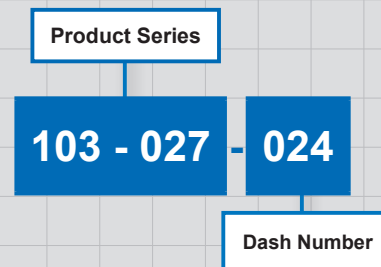
# AmberStrand®

**103-026 and -027 AmberStrand® EMI/RFI Microfilament  
Composite Braided Shielding 100% Composite and  
75%/25% Blended Versions**

### EMI/RFI Braid: How-To-Order



100% AmberStrand®



75%/25% AmberStrand®/Nickel Copper

| 103-026 100% Composite AmberStrand® |                |                        |                            |
|-------------------------------------|----------------|------------------------|----------------------------|
| Part No.                            | Inner Diameter | Ref. Wire Bundle Range | Approximate Grams Per Foot |
| 103-026-004                         | .125 (3.2)     | .093 (2.4)             | 1.0                        |
|                                     |                | .140 (3.5)             |                            |
| 103-026-008                         | .250 (6.4)     | .125 (3.2)             | 1.8                        |
|                                     |                | .312 (7.9)             |                            |
| 103-026-012                         | .375 (9.5)     | .325 (8.2)             | 2.3                        |
|                                     |                | .437 (11.1)            |                            |
| 103-026-016                         | .500 (12.7)    | .375 (9.5)             | 3.7                        |
|                                     |                | .560 (14.2)            |                            |
| 103-026-020                         | .625 (15.9)    | .375 (9.5)             | 4.4                        |
|                                     |                | .700 (17.8)            |                            |
| 103-026-024                         | .750 (19.1)    | .500 (12.7)            | 5.2                        |
|                                     |                | .830 (21.1)            |                            |
| 103-026-032                         | 1.000 (25.4)   | .780 (19.8)            | 8.0                        |
|                                     |                | 1.100 (27.94)          |                            |
| 103-026-040                         | 1.250 (31.8)   | .938 (23.8)            | 10.0                       |
|                                     |                | 1.312 (33.3)           |                            |
| 103-026-048                         | 1.500 (38.1)   | 1.187 (30.1)           | 15.2                       |
|                                     |                | 1.590 (40.37)          |                            |
| 103-026-064                         | 2.000 (50.8)   | 1.312 (33.3)           | 22.0                       |
|                                     |                | 2.090 (53.08)          |                            |

| 103-027 75%/25% Blended Composite AmberStrand®/Nickel Copper |                |                        |                            |
|--------------------------------------------------------------|----------------|------------------------|----------------------------|
| Part No.                                                     | Inner Diameter | Ref. Wire Bundle Range | Approximate Grams Per Foot |
| 103-027-004                                                  | .125 (3.2)     | .093 (2.4)             | 1.5                        |
|                                                              |                | .140 (3.5)             |                            |
| 103-027-008                                                  | .250 (6.4)     | .125 (3.2)             | 2.4                        |
|                                                              |                | .312 (7.9)             |                            |
| 103-027-012                                                  | .375 (9.5)     | .250 (6.4)             | 3.9                        |
|                                                              |                | .437 (11.1)            |                            |
| 103-027-016                                                  | .500 (12.7)    | .375 (9.5)             | 6.0                        |
|                                                              |                | .550 (13.9)            |                            |
| 103-027-020                                                  | .625 (15.9)    | .375 (9.5)             | 6.4                        |
|                                                              |                | .700 (17.8)            |                            |
| 103-027-024                                                  | .750 (19.1)    | .500 (12.7)            | 7.2                        |
|                                                              |                | .830 (21.1)            |                            |
| 103-027-032                                                  | 1.000 (25.4)   | .780 (19.8)            | 11.0                       |
|                                                              |                | 1.100 (27.94)          |                            |
| 103-027-040                                                  | 1.250 (31.8)   | .938 (23.8)            | 15.0                       |
|                                                              |                | 1.312 (33.3)           |                            |
| 103-027-048                                                  | 1.500 (38.1)   | 1.187 (30.1)           | 25.2                       |
|                                                              |                | 1.590 (40.37)          |                            |
| 103-027-064                                                  | 2.000 (50.8)   | 1.312 (33.3)           | 32.0                       |
|                                                              |                | 2.090 (53.08)          |                            |

Specify length on purchase order. No minimums!  
Additional sizes and configurations- consult factory

Dimensions in inches (millimeters) and are subject to change without notice.

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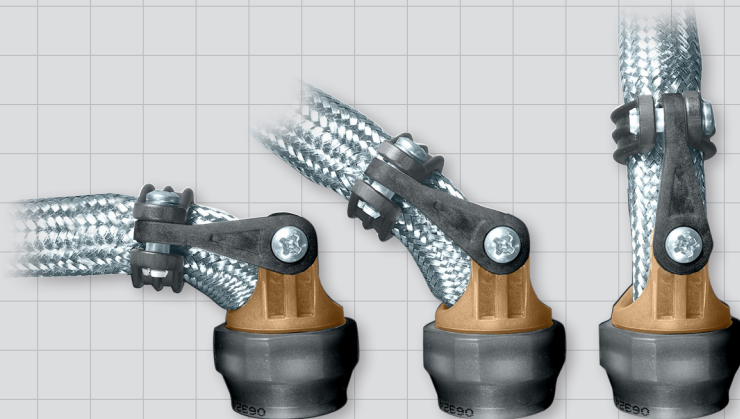


# ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding



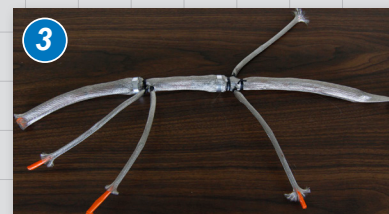
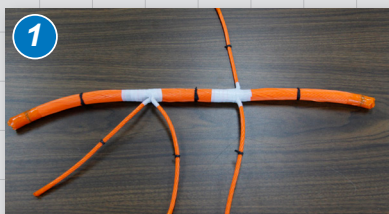
Supplemental  
Product Information

## ARMORLITE™

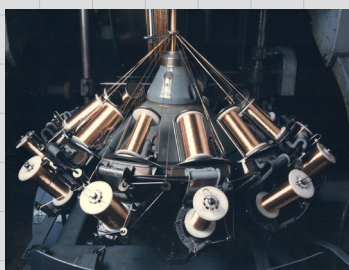


- Ultra-lightweight EMI/RFI braiding for high-temperature applications -80°C to +260°C
- Microfilament stainless steel: 70% lighter than NiCu A-A-59569
- Outstanding EMI/RFI shielding and conductivity
- Reduce shielding weight up to 70% and more
- Superior flexibility and "windowing" resistance:  
90 to 95% optical coverage
- 220,000 psi (min) tensile strength
- Best performing metallic braid during lightning tests (Run to ANSI/EIA-364-75-1997 Waveform 5B)

**Save weight and money every time you fly! Aircraft All-Up-Weight (AUW) has met its match: ArmorLite™ microfilament stainless steel braid saves pounds compared to standard QQ-B-575/A-A-59569 EMI/RFI shielding.**



Choose user-installable microfilament tubular braid in twelve standard diameters Assemble per standard multi-branch cable shielding processes, as above.



Glenair can also offer ArmorLite™ users direct factory overbraiding services for both point-to-point as well as multi-branch assemblies.

100%  
ArmorLite™

103 - 051 - 024

Diameter Dash  
Number



**A single layer of ArmorLite™  
Shields from 40dB to 80dB  
in Frequency Ranges from  
30kHz to 2.5GHz**



# ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding

## Aircraft Utilization Analysis

Comparison of ArmorLite™ nickel clad stainless steel braid to A-A-59569 Ni/Cu braid

Where is all the EMI/RFI braid deployed in a typical commercial aircraft?

| Diameter (in) | L Wing | R Wing | Fwd Belly | Aft Belly | HYD Bay | Aft Barrel | Tail   | V/H Stab | Totals (in) |
|---------------|--------|--------|-----------|-----------|---------|------------|--------|----------|-------------|
| 0 - 0.25      | 1852.2 | 1852.2 | 0         | 2811.4    | 168.2   | 2015.2     | 2480.6 | 1385     | 12564.8     |
| 0.25 - 0.5    | 434.8  | 434.8  | 511.6     | 1034.6    | 257.4   | 506.2      | 958.2  | 1121.7   | 5259.3      |
| 0.5 - 0.75    | 0      | 0      | 260.9     | 223       | 0       | 184.2      | 392.4  | 152.1    | 1212.6      |
| 0.75 - 1.0    | 0      | 0      | 77.2      | 0         | 0       | 1198       | 162.2  | 0        | 1437.4      |
| 1.0 - 1.5     | 0      | 0      | 0         | 0         | 0       | 446        | 21     | 0        | 467         |

How much would all this braid weigh if it was made of  
36 AWG A-A-59569 NiCu?

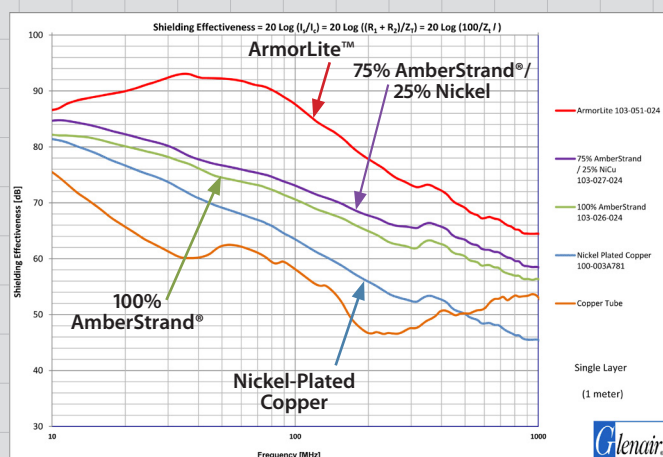
| Diameter (in) | Weight (Lb/ft) | Length (in)         | Weight (Lb)      |
|---------------|----------------|---------------------|------------------|
| 0 - 0.25      | 0.02           | 12564.8             | 21.08            |
| 0.25 - 0.5    | 0.05           | 5259.3              | 21.17            |
| 0.5 - 0.75    | 0.07           | 1212.6              | 7.12             |
| 0.75 - 1.0    | 0.14           | 1437.4              | 16.88            |
| 1.0 - 1.5     | 0.18           | 467                 | 7.05             |
|               |                | <b>Total weight</b> | <b>73.30 Lbs</b> |

How much would all this braid weigh if it was made of  
ArmorLite™ Micro Stainless Steel Braided Shielding?

| Diameter (in) | Weight (Lb/ft) | Length (in)         | Weight (Lb)       |
|---------------|----------------|---------------------|-------------------|
| 0 - 0.25      | .00507         | 12564.8             | 5.309             |
| 0.25 - 0.5    | .0097          | 5259.3              | 4.251             |
| 0.5 - 0.75    | .0178          | 1212.6              | 1.737             |
| 0.75 - 1.0    | .0256          | 1437.4              | 3.063             |
| 1.0 - 1.5     | .0368          | 467                 | 1.434             |
|               |                | <b>Total weight</b> | <b>15.794 Lbs</b> |

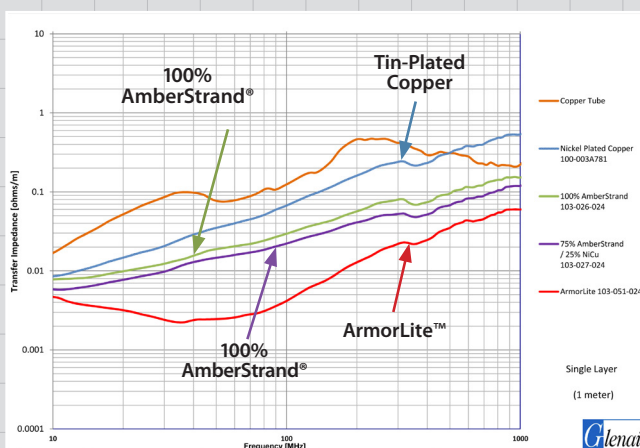
## Shielding Effectiveness

For EMI/RFI Braiding Solutions - 0 MHz to 2500 MHz Range



## Surface Transfer Impedance

For EMI/RFI Braiding Solutions - 0 MHz to 2500 MHz Range



Dimensions in inches (millimeters) and are subject to change without notice.

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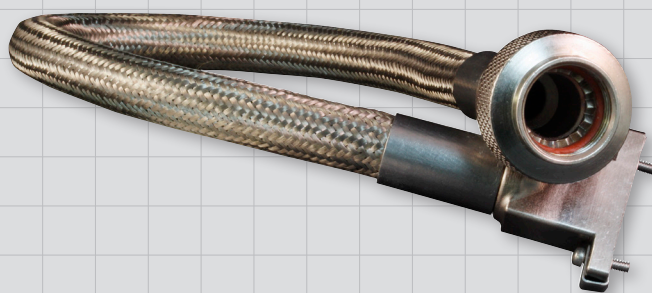
# ArmorLite™ Microfilament Nickel Clad Stainless Steel EMI/RFI Braided Shielding



Supplemental  
Product Information



## EMI/RFI Braid: How-To-Order



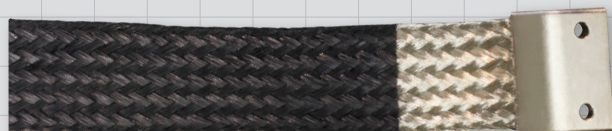
Product Series

**103 - 051 - 024**

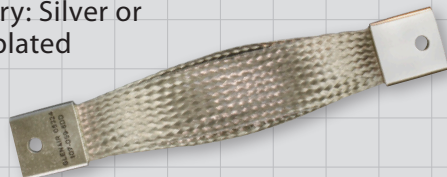
Dash No.  
(Table I)

*Specify length on purchase order. No minimums!*  
Additional sizes and configurations- consult factory

Glenair 107 series ground straps with ArmorLite.



The lightest ground straps  
in the industry: Silver or  
nickel plated



## 103-051 ArmorLite™ Lightweight EMI/RFI Microfilament Stainless Steel Braided Shielding

- Thermal Cycling: No Adverse Effects
- Flame: Self Extinguishing
- Flex Test: 50,000 Cycles
- Salt Spray: 500 Hours
- 70+% Lighter than NiCu QQ-B-575/A-A-59569
- Enhanced EMI/RFI Electrical Performance (DC resistance 1 Ohm/ft).

Table I

| Part Number | Inner Diameter | Ref. Wire Bundle Range | Approximate Grams Per Foot |
|-------------|----------------|------------------------|----------------------------|
| 103-051-001 | .031 (0.8)     | .016 (0.4)             | .5                         |
|             |                | .047 (1.2)             |                            |
| 103-051-002 | .062 (1.6)     | .040 (1.0)             | 1.15                       |
|             |                | .075 (1.9)             |                            |
| 103-051-004 | .125 (3.2)     | .093 (2.4)             | 1.5                        |
|             |                | .140 (3.5)             |                            |
| 103-051-008 | .250 (6.4)     | .125 (3.2)             | 2.2                        |
|             |                | .312 (7.9)             |                            |
| 103-051-012 | .375 (9.5)     | .250 (6.4)             | 2.9                        |
|             |                | .406 (10.3)            |                            |
| 103-051-016 | .500 (12.7)    | .375 (9.5)             | 4.4                        |
|             |                | .560 (14.2)            |                            |
| 103-051-020 | .625 (15.9)    | .375 (9.5)             | 4.8                        |
|             |                | .700 (17.8)            |                            |
| 103-051-024 | .750 (19.1)    | .500 (12.7)            | 5.8                        |
|             |                | .800 (20.3)            |                            |
| 103-051-032 | 1.000 (25.4)   | .780 (19.8)            | 11.5                       |
|             |                | 1.100 (27.9)           |                            |
| 103-051-040 | 1.250 (31.8)   | .938 (23.8)            | 14.0                       |
|             |                | 1.312 (33.3)           |                            |
| 103-051-048 | 1.500 (38.1)   | 1.187 (30.1)           | 17.3                       |
|             |                | 1.590 (40.4)           |                            |
| 103-051-064 | 2.000 (50.8)   | 1.312 (33.3)           | 22.8                       |
|             |                | 2.090 (53.1)           |                            |

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**D**

## Finishes

**Electroless Nickel**

|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +200°C  |
| Glenair Code          | M              |

Aluminum plated with electroless nickel offers excellent conductivity, wear resistance, and adequate corrosion resistance. Typically specified on electrical connectors and accessories used in avionics boxes, exoatmospheric equipment, and missiles, electroless nickel is a good choice when exposure to marine or corrosive atmospheres is not a primary concern. The plating process is purely chemical, and once started, is autocatalytic (it runs by itself).

**Stainless Steel**

|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +200°C  |
| Glenair Code          | Z1, ZM         |

Stainless steel offers unbeatable strength and protection from environmental stress if durability and corrosion resistance are more important than cost and weight. Typically found on aircraft engines, landing gear, geophysical equipment, armored vehicles and marine applications, passivated stainless steel is widely specified throughout the interconnect industry. Also offered with nickel and cadmium plating for improved conductivity, stainless steel is an obvious alternative to cadmium if cost and weight are not an issue.

**Zinc Nickel, Black**

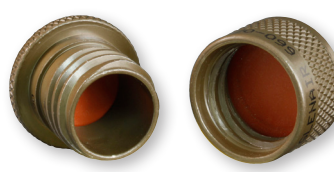
|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +175°C  |
| Glenair Code          | ZR             |

RoHS-compliant black zinc-nickel is approved for MIL-DTL-38999, AS85049 and other major military specifications as a replacement for cadmium and hexavalent chromium platings. The non-reflective finish and good conductivity make the Glenair ZR finish a leading choice for cadmium-free tactical systems. Corrosion resistance is comparable to cadmium, and the ZR finish is backward-compatible with cad-plated connectors and accessories.

**Nickel-PTFE**

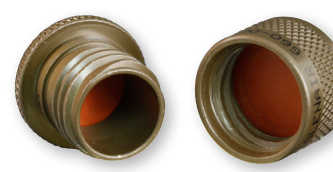
|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +175°C  |
| Glenair Code          | MT             |

Now approved for MIL-DTL-38999 and MIL-DTL-83513, Glenair's 1000 Hour Grey™ meets the need for a cadmium replacement with excellent conductivity, wear resistance and corrosion protection. This extremely durable finish is gun-metal gray. A proprietary preliminary undercoat is followed with a composite coating of electroless nickel phosphorus and polytetra-fluoroethylene (PTFE). An organic topcoat provides sealing and added resistance to SO<sub>2</sub> salt fog. Ni-PTFE is approved for the Joint Strike Fighter and offers extremely good lubricity.

**Cadmium Olive Drab**

|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +175°C  |
| Glenair Code          | NF             |

Cadmium plated aluminum has been the unchallenged workhorse of the defense/aerospace industry. Offering up to 1000 hours of salt spray protection when deposited over electroless nickel, cadmium is highly conductive, and provides good lubricity and resistance to galling. As plated, cadmium has a silvery appearance. A subsequent chromic acid passivation bath creates a chromate topcoat over the cadmium, enhancing corrosion protection. Olive drab chromate is widely used, followed by gold chromate and clear chromate.

**Zinc-Nickel Olive Drab**

|                       |                |
|-----------------------|----------------|
| Cost                  | \$ \$ \$ \$ \$ |
| Conductivity          | ++ ++ ++ ++    |
| Corrosion Resistance  | ⌘ ⌘ ⌘ ⌘ ⌘      |
| Operating Temperature | -65 to +175°C  |
| Glenair Code          | ZN             |

Recently added to MIL-DTL-38999 and MIL-DTL-83513, zinc-nickel plated aluminum has become a cost-effective alternative to cadmium. Available with olive drab or black chromate conversion coatings, zinc-nickel plated aluminum is commonly found on soldier systems and military airframe applications.

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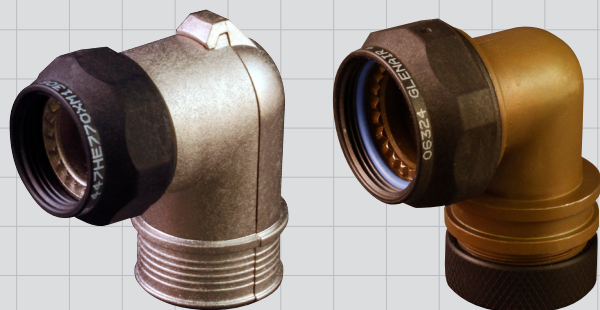
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## About Composite Materials



- High temperature, high strength engineering composite thermoplastics for maximum strength and durability
- Total immunity to galvanic corrosion
- Up to 70% weight reduction compared to standard metal connectors and accessories
- Hundreds of innovative, tooled designs
- All popular part numbers in stock and ready for immediate, same-day shipment

### Corrosion resistance, weight reduction, durability and design innovation

Glenair composite interconnect components are principally manufactured from 30% glass fiber polyetherimide (PEI), an amorphous thermoplastic with outstanding heat and chemical resistance and high strength. At room temperature the 30% glass filled PEI exhibits strength far beyond that of most engineering thermoplastics, with a tensile strength yield of over 15,000 psi. The PEI material meets all outgassing and flammability requirements.



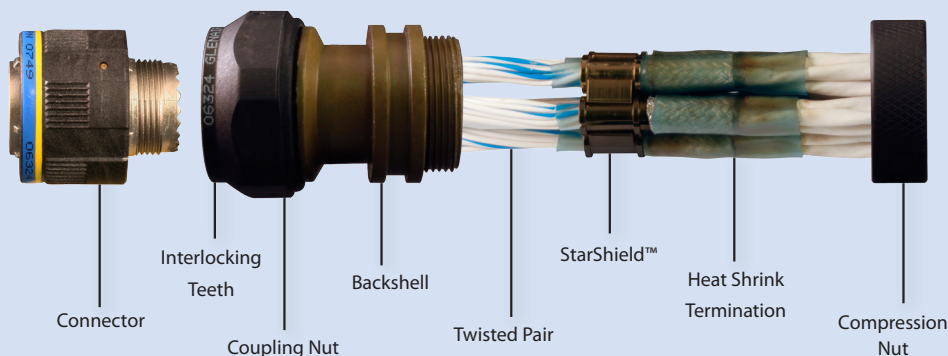
#### Composite Thermoplastic Vs. Common Metal Materials

| Material        | Specific Gravity | Density (lbs. Inch <sup>3</sup> ) | Salt Spray   |
|-----------------|------------------|-----------------------------------|--------------|
| Composite       | 1.27 - 1.51      | .055                              | 2000+ Hrs    |
| Aluminum        | 2.55 - 2.80      | .098                              | 48-1000 Hrs  |
| Titanium        | 4.51 - 4.62      | .162                              | 500-1000 Hrs |
| Stainless Steel | 7.70 - 7.73      | .284                              | 500-1000 Hrs |
| Brass           | 8.40 - 8.70      | .305                              | 500-1000 Hrs |

#### Standard Finishes

| Sym | Material                | Finish                                           |
|-----|-------------------------|--------------------------------------------------|
| XO  | Composite Thermoplastic | No Plating, Natural                              |
| XB  |                         | No Plating, Black                                |
| XZR |                         | Conductive, Zinc Nickel, Black                   |
| XM  |                         | Conductive, Electroless Nickel                   |
| XMT |                         | Conductive, Ni-PTFE 1000 Hour Grey™              |
| XW  |                         | Conductive, Cadmium O.D. Over Electroless Nickel |

#### Ultra-Lightweight Composite Thermoplastic StarShield™ Termination



Dimensions in inches (millimeters) and are subject to change without notice.

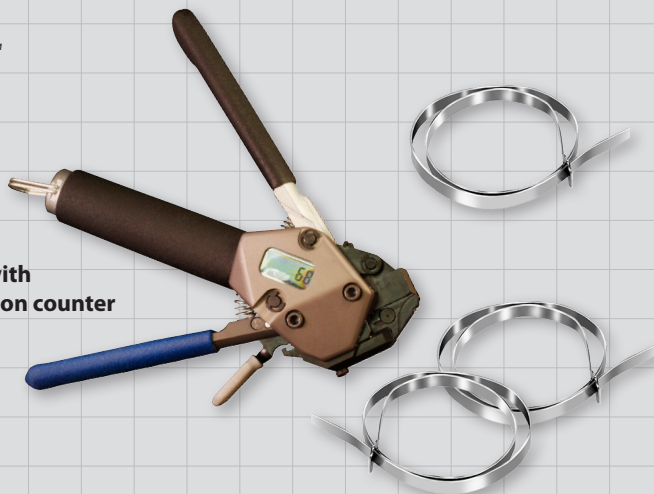




## Back Shell Assembly Tools Band-Master™ ATS EMI/RFI Shield Termination Equipment

New Band-Master™  
ATS Hand Banding  
Tool

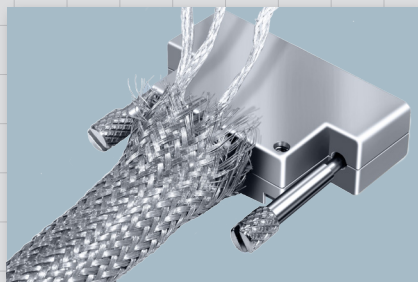
Now available with  
built-in calibration counter



- Fast, cost-effective cable shielding termination
- Precision hand-held tool and bands deliver reliable, repeatable performance
- Single piece stainless steel bands in various sizes and lengths
- Clamp both small and large diameters easily and reliably
- Pneumatic banding tool for high-speed mass production
- Qualified for both military and commercial aviation

***The Band-Master™ ATS provides quick, easy, cost-effective and highly reliable termination of braided metallic shielding or fabric braid to connectors and backshells.***

The unique low profile and smooth inside diameter of the one-piece type 304 austenitic stainless steel clamping band virtually eliminates RFI/EMI/EMP leakage paths. The lock maintains constant tension under extreme environmental conditions. *Band-Master™ ATS* bands have passed severe shock, vibration and thermal cycle testing with negligible deterioration of shell conductivity.



### Step One: Cable Prep

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



### Step Two: Install Band

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 band from the tool by closing the small grey handle.



### Step Three: Trim Braid

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



**Series 687-749  
banding split  
support rings for  
use with shield sock  
band termination**

Dimensions in inches (millimeters) and are subject to change without notice.

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StarShield™ Zero Length Shield Termination Catalog

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# Back Shell Assembly Tools Band-Master™ ATS EMI/RFI Shield Termination Equipment



Supplemental  
Product Information

## Band-Master™ ATS Advanced Termination System



Series 601-104 (standard)  
and 601-105 (micro)  
bench-mountable  
pneumatic banding tool

Save time and tool maintenance costs  
with the Glenair Band-Master™ ATS  
calibration system



| Band-Master™ ATS Band Selection |        |       |             |            |                |                     |                       |      |
|---------------------------------|--------|-------|-------------|------------|----------------|---------------------|-----------------------|------|
| Bands                           | Length |       | Part Number |            |                |                     | Accommodates Diameter |      |
|                                 | in.    | mm.   | Flat        | Pre-Coiled | 100 Count Flat | 100 Count Precoiled | in.                   | mm.  |
| Short Standard Band             | 9.0    | 228.6 | 601-005     | 601-006    | 601-007        | 601-008             | 1.0                   | 25.4 |
| Medium Standard Band            | 14.25  | 362.1 | 601-040     | 601-041    | 601-042        | 601-043             | 1.8                   | 45.7 |
| Long Standard Band              | 18.0   | 457.2 | 601-049     | 601-050    | 601-051        | 601-052             | 2.5                   | 63.5 |
| Short Micro Band                | 5.0    | 127.0 | 601-024     | 601-025    | 601-026        | 601-027             | 0.5                   | 12.7 |
| Medium Micro Band               | 8.125  | 206.4 | 601-060     | 601-061    | 601-062        | 601-063             | .88                   | 22.4 |
| Long Micro Band                 | 14.25  | 362.0 | 601-064     | 601-065    | 601-066        | 601-067             | 1.88                  | 47.8 |

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**D**





## Backshell-to-Connector Assembly Tools



***Glenair offers a complete family of backshell assembly tools for most Mil-Standard circular connectors, as well as connector wrenches, strap wrenches, and universal connector holding tools***

- Backshell-to-connector holding tools for all cylindrical connectors and accessories in current use
- Special composite thermoplastic coupling nut holding tools
- Discrete tools and complete sets available
- Popular Glenair strap wrenches
- Hand-held and bench-mountable digital torque wrenches
- Cutting shears and other special-purpose cable assembly tools

### Torque Values for Cable Clamp Screws

Torque Requirements in Inch-Pounds  
for Corrosion-Resistant Steel Screws Only\*

| Screw Size | Recommended Torque |
|------------|--------------------|
| 2-56       | 2+.5               |
| 4-40       | 4+.5               |
| 6-32       | 6+1.0              |
| 8-32       | 8+1.0              |
| 10-32      | 10+1.0             |
| .250-20    | 12+1.0             |

## Glenair Offers a Complete Family of Backshell Assembly Tools

### Connector Holding Wrenches for Most Military Standard Circular Connectors

**TG47** • MIL-DTL-22992

**TG48** • MIL-DTL-38999 Series II

**TG52** • MIL-DTL-81511 Series II and IV

**TG60** • MIL-DTL-27599 and MIL-DTL-38999 Series I

**TG61** • MIL-DTL-81511 Series I and II

**TG83** • (LN29729) for SJT Connectors

**TG90** • MIL-DTL-38999 Series III



**TG69**  
Soft Jaw Pliers

**Glenair TG70 Strap Wrench with Square Drive for Torque Wrench**

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## Backshell-to-Connector Assembly Tools



Supplemental  
Product Information

### Installation Torque Values for Circular Electrical Connector Accessories

Accessory Thread Torque:  $\pm 5$  inch pounds

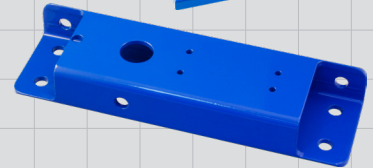
| Shell Sizes        | Group 1                                                                                                                                                                                           | Group 2                                                                                                                                                                                       | Group 2                                                                |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
|                    | Light & Medium<br>MIL-C-5015<br>(MS3100 Series)<br>MIL-C-26482 Series I<br>MIL-C-26500<br>MIL-C-27599<br>MIL-C-38999 Series I, II<br>MIL-C-81511<br>Series I, II, III, IV<br>MIL-C-81703 Series I | Duty Heavy Duty<br>MIL-C-5015 (MS3400 Series)<br>MIL-C-22992<br>MIL-C-26482 Series II<br>MIL-C-28840<br>MIL-C-38999 Series III, IV<br>MIL-C-81703 Series III<br>MIL-C-83723 Series I, II, III | Values for<br>Hand Held Tool<br>Applications<br>Field Repair<br>Torque |
| 8, 9, A            | 35                                                                                                                                                                                                | 56                                                                                                                                                                                            | 40-50                                                                  |
| 3, 10, 10SL, 11, B | 35                                                                                                                                                                                                | 76                                                                                                                                                                                            | 40-50                                                                  |
| 7, 12, 12S, 13, C  | 40                                                                                                                                                                                                | 108                                                                                                                                                                                           | 40-50                                                                  |
| 14, 14S, 15, D     | 40                                                                                                                                                                                                | 116                                                                                                                                                                                           | 50-60                                                                  |
| 16, 16S, 17, E     | 40                                                                                                                                                                                                | 116                                                                                                                                                                                           | 50-60                                                                  |
| 18, 19, 27, F      | 40                                                                                                                                                                                                | 116                                                                                                                                                                                           | 50-60                                                                  |
| 20, 21, 37, G      | 80                                                                                                                                                                                                | 136                                                                                                                                                                                           | 80-90                                                                  |
| 22, 23, H          | 80                                                                                                                                                                                                | 136                                                                                                                                                                                           | 80-90                                                                  |
| 24, 25, 61, J      | 80                                                                                                                                                                                                | 136                                                                                                                                                                                           | 80-90                                                                  |
| 28, 29             | 120                                                                                                                                                                                               | 148                                                                                                                                                                                           | 120-130                                                                |
| 32, 33             | 120                                                                                                                                                                                               | 148                                                                                                                                                                                           | 120-130                                                                |
| 36                 | 120                                                                                                                                                                                               | 148                                                                                                                                                                                           | 120-130                                                                |
| 40                 | 160                                                                                                                                                                                               | 164                                                                                                                                                                                           | 150-170                                                                |
| 44                 | 160                                                                                                                                                                                               | 164                                                                                                                                                                                           | 150-170                                                                |
| 48                 | 160                                                                                                                                                                                               | 164                                                                                                                                                                                           | 150-170                                                                |

### Torque Wrenches and Bench Stands

#### Digital Torque Wrench 600-161

#### Bench Stand For Digital Torque Wrench 600-162BV 600-162B

Vertical (BV) and  
Horizontal Mounting (B)  
Options



#### Hand-Held Torque Wrench 600-076 High Torque 600-004 Standard Torque

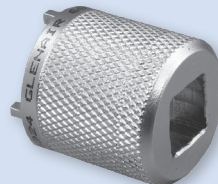
### Backshell Coupling Nut Wrenches



600-006 Standard  
600-079 Anti-Decoupling  
600-102 Standard (Stainless Steel)  
Circular Backshell Composite  
Assembly Wrenches



600-091 Composite-Hex-Coupling  
Wrench for Backshells



#### Spanner Tool for Tightening Series 80 Jam Nuts

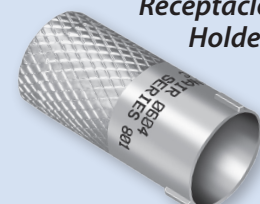
#### Backshell Assembly and Repair Tool Kits

The **TG80 Tool Kit** is designed  
for field use with circular  
electrical connectors. Tool Kits  
conforming to the requirements  
of **MIL-T-83507** are also available

### Plug and Receptacle Holding Tools for Backshell-to- Connector Assembly



Plug  
Holder



Receptacle  
Holder

D

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# Why Choose **GLENAIR?**



Plenty of Raw Materials!



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Huge "Same-Day" Inventory!

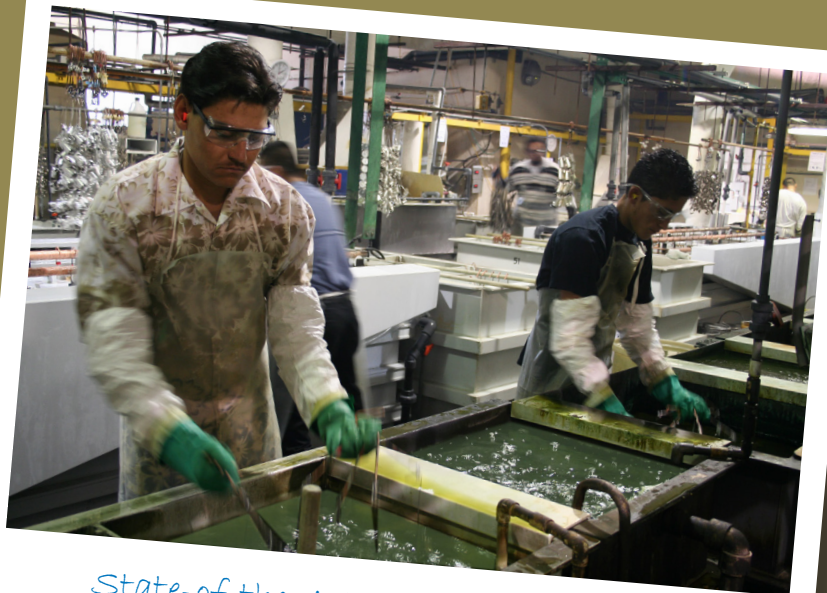


One of North America's  
and Machining





High-Production Injection Molding Equipment



State-of-the-Art Plating Capabilities



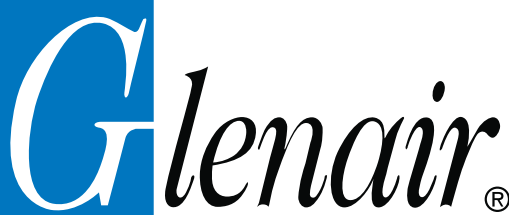
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Clean Rooms for Filter Array and Printed Circuit Board Assembly



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