



Manufacturers of High Quality Connectors and Accessories

LMA CIRCULAR BACKSHELLS

For high performance, 360° Electromagnetic Interference Shielding (EMI), strain relief and environmental sealing, when used with a heat shrink boot for connector to cable transitions.





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Lodge Group

Established in 1976, Weald Electronics is part of the privately-owned Lodge Group which includes the connector distributor FC Lane Electronics and its Autosport Division, Lane Motorsport.



Lodge Group Headquarters

Weald Electronics is predominantly known for its comprehensive selection of circular bayonet and screw coupling power and filtered circular connectors, PCB Edge Card, two-part PCB and sub-miniature plastic-bodied circular connectors.

To complete your interconnection solution, Weald manufactures protective caps and backshells for MIL-DTL-38999 and 26482 applications as well as protective caps, nut plates and gaskets for use right across motorsport.

With design, manufacturing and test facilities at its Slinfold Lodge HQ, Weald Electronics is able to tailor a connector solution to exactly meet a customer's specific requirement on surprisingly short lead times. Standard products are normally available by next day.

Products from Weald Electronics Ltd are available from FC Lane Electronics Ltd.

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e: sales@fclane.com

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LMA Range General Information

LMA 19H/D Series backshells have been developed to provide effective strain relief, environmental sealing and EMI/RFI shielding. They are compatible with MIL-DTL-38999 Series III and IV or MIL-DTL-26482 Series I connectors and can be supplied with variety of finishes and variants. They are also designed to be used with heat shrink boots to complete the connector to cable transition.

LMA 19H/D Series backshells are manufactured in accordance with the AS85049/M85049 specification however Weald Electronics also offers additional sizes, designs and finishes as well as supporting the complete customisation of a backshell solution.

Features and Benefits

- Provides strain-relief and cable support to prevent bending or overflexing
- Simple and fast termination solutions for most popular connector types
- Two-part components allow uncoupling for repairs without damaging the boot
- Overall 360° screening against EMI/RFI interference
- Provides effective environmental sealing against water and dirt ingress when used with a heat shrink boot
- Many sizes and plating finishes available from stock

| Materials | |
|-----------------------------|--|
| Body and Coupling Nut | Machined Aluminium Alloy, Stainless Steel or Nickel Aluminium Bronze |
| Seal | Silicone elastomer |
| Spring, Band Strap and Ring | Stainless Steel |

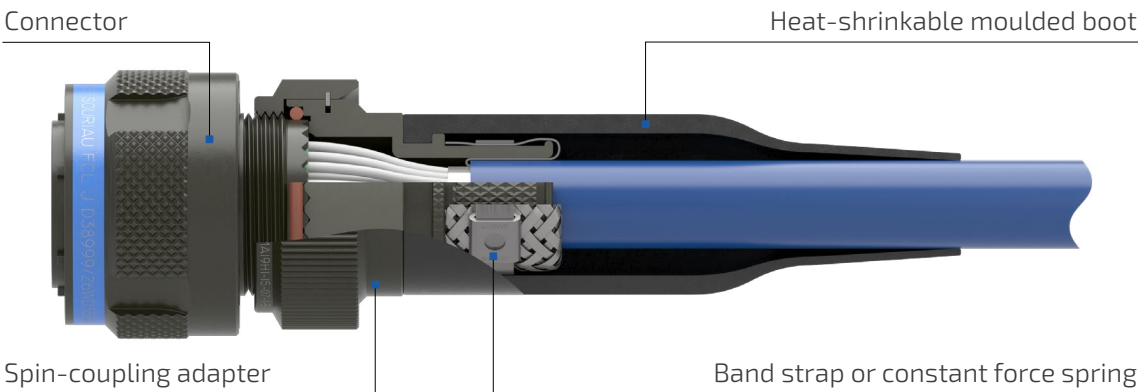
Recommended Torque Values (in Nm) *

| Backshell Series | Shell size | | | | | | | | |
|------------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | 8/9 | 10/11 | 12/13 | 14/15 | 16/17 | 18/19 | 20/21 | 22/23 | 24/25 |
| LMA 19H | 6 | 8.5 | 12 | 13 | 13 | 13 | 15 | 15 | 15 |
| LMA 19D | 4 | 4 | 4.5 | 4.5 | 6 | 6 | 9 | 9 | 9 |

* - Before tightening the spin-coupling adapter, ensure the backshell teeth are correctly aligned and meshed with the connector teeth.

Backshell Design

Spin-coupling adapters are constructed from two main components; a rotatable spin coupling nut and a grooved body designed to accommodate a lipped-type heat-shrinkable boot, along with a 360 Deg screen termination. The backshell body also features teeth to mesh with the rear of the connector for security of fixing and also to provide optimum continuity of grounding through the assembly. An o-ring seal is also provided to seal against the rear of the connector, so along with the use of an appropriate heat shrink boot, the backshell adds effective environmental protection and strain relief to connector/cable terminations.



Termination Styles

Constant force spring

Wrapped around screen
(without tooling)

Band strap

Clamped with calibrated tool

No screen clamping element

For non-screened cables



| Part number | Screen clamping element | Screen termination | | | Strain relief / cable sealing |
|-------------------------|-------------------------|--------------------|-----------|-----------|---------------------------------|
| | | Overall screen | No screen | Tool free | Heat shrink boot (not included) |
| LMA 19 ** _**_**_*_* | - | | ■ | ■ | ■ |
| LMA 19 ** _**_**_*_*-01 | SPRING | ■ | | ■ | ■ |
| LMA 19 ** _**_**_*_*-02 | BAND | ■ | | | ■ |

LMA 19H Series - Circular Backshells

For use with: MIL-DTL-38999 Series III / EN3645, MIL-DTL-38999 Series IV

Features

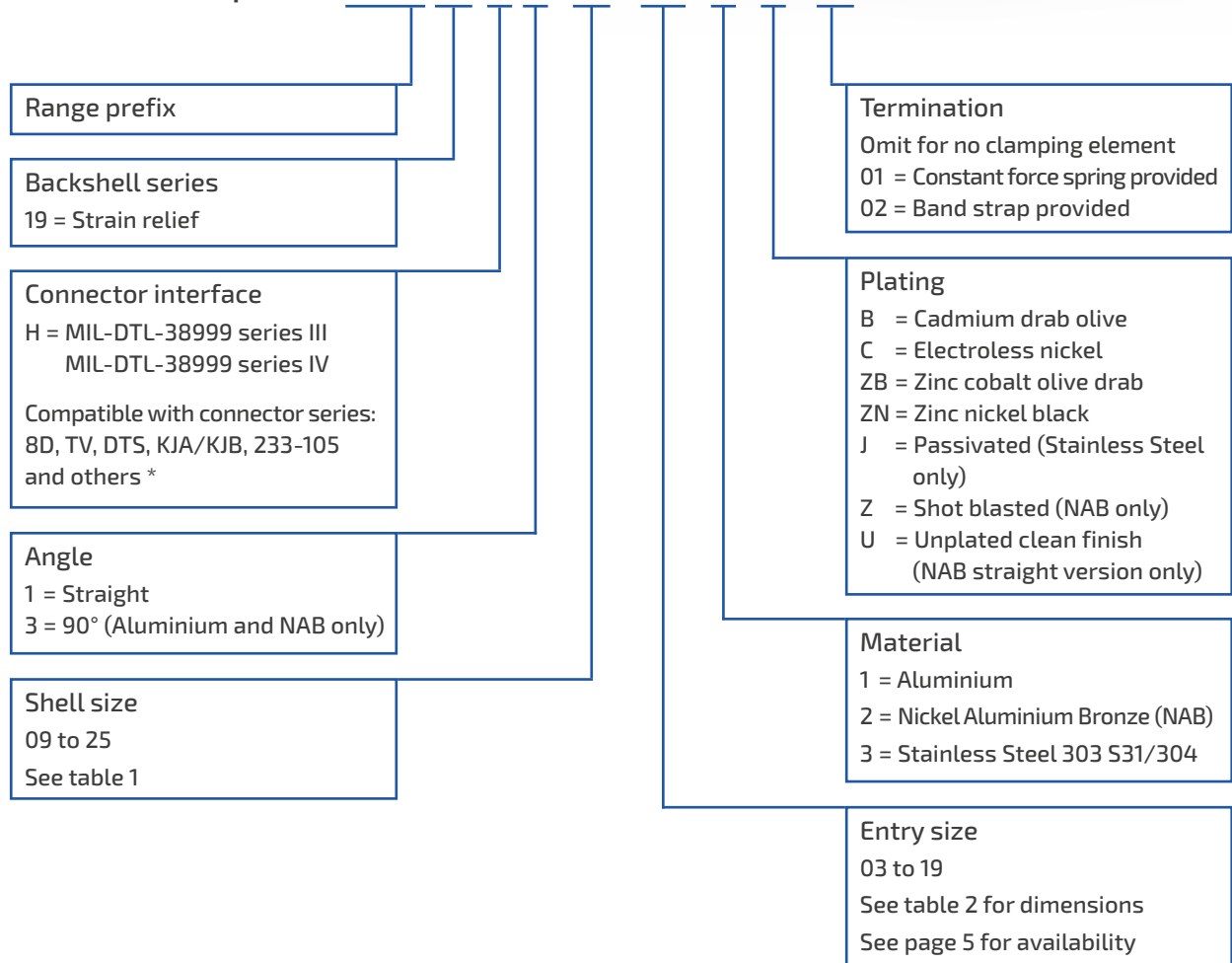
- Tool-free screen termination by stainless steel constant force spring
- Optional screen termination with a stainless steel band strap
- Sealing and strain relief of backshell by heat shrink boot



Additional Component Required

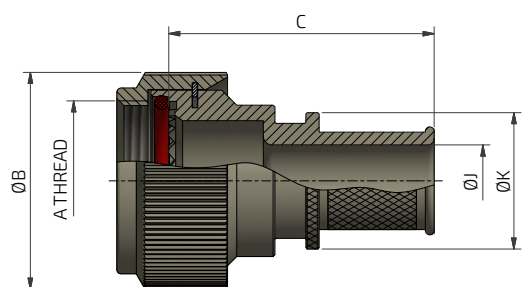
- Heat Shrink Boot
- Calibrated crimping tooling (for **02** termination only)

Part no example: **LMA 19 H 1-13-05-1-B-01**

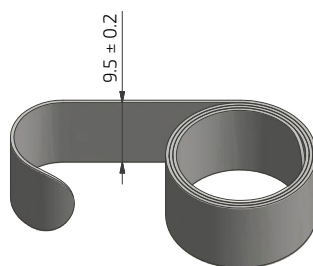


* - Contact local Sales Office for details

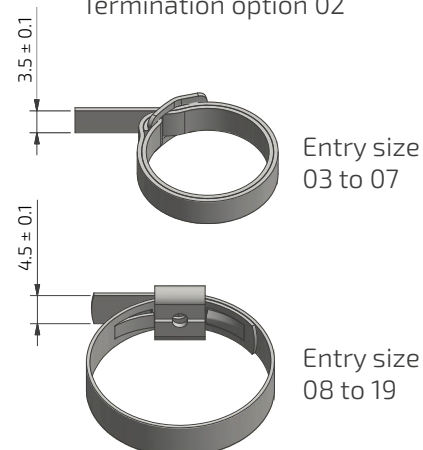
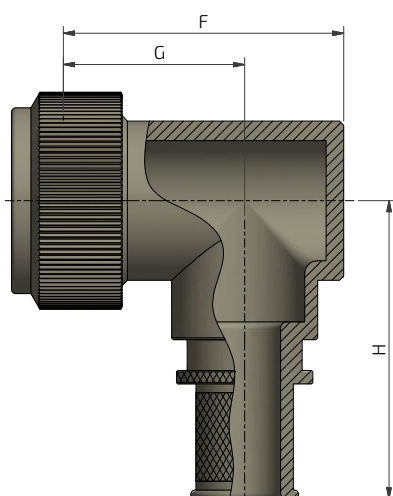
** - To determine dia. I take the maximum OD of the cable and add 0.5-1.0mm

Angle 1**Constant force spring**

Termination option 01

**Band strap**

Termination option 02

**Angle 3 (90°)**

For 45° angle we recommend a straight backshell with 45° heat shrink boot. For boot details see page 11.

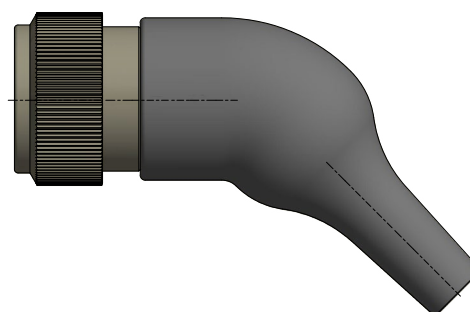


Table 1

| Shell size | A thread | ØB max | C ± 0.25 | F max | G max | H max |
|------------|-----------|--------|----------|-------|-------|-------|
| 09 | M12 x 1.0 | 18.25 | 30.0 | 25.7 | 18.3 | 30.5 |
| 11 | M15 x 1.0 | 21.25 | 30.0 | 26.7 | 18.0 | 32.5 |
| 13 | M18 x 1.0 | 24.75 | 30.0 | 31.2 | 20.5 | 33.7 |
| 15 | M22 x 1.0 | 29.75 | 30.0 | 37.2 | 25.0 | 35.5 |
| 17 | M25 x 1.0 | 33.25 | 30.0 | 40.2 | 26.4 | 37.3 |
| 19 | M28 x 1.0 | 35.75 | 30.0 | 43.0 | 27.5 | 38.8 |
| 21 | M31 x 1.0 | 37.55 | 30.0 | 47.8 | 31.0 | 41.6 |
| 23 | M34 x 1.0 | 40.25 | 30.0 | 51.0 | 32.0 | 42.1 |
| 25 | M37 x 1.0 | 44.25 | 30.0 | 51.1 | 30.0 | 45.1 |

Table 2

| Entry size | ØJ min ** | ØK max | Entry size | ØJ min ** | ØK max |
|------------|-----------|--------|------------|-----------|--------|
| 03 | 4.7 | 13.9 | 12 | 19.0 | 26.7 |
| 04 | 6.3 | 13.9 | 13 | 20.6 | 28.3 |
| 05 | 7.9 | 15.5 | 14 | 22.2 | 29.9 |
| 06 | 9.5 | 17.2 | 15 | 23.8 | 31.5 |
| 07 | 11.1 | 18.7 | 16 | 25.4 | 33.1 |
| 08 | 12.7 | 20.3 | 17 | 27.0 | 34.7 |
| 09 | 14.2 | 21.9 | 18 | 28.6 | 36.3 |
| 10 | 15.8 | 23.5 | 19 | 30.2 | 37.9 |
| 11 | 17.4 | 25.1 | | | |

Features

- Tool-free screen termination by stainless steel constant force spring
- Optional screen termination with a stainless steel band strap
- Sealing and strain relief of backshell by heat shrink boot

- Heat Shrink Boot
- Calibrated crimping tooling (for **02** termination only)



Range prefix

Backshell series
19 = Strain relief

Connector interface
D = MIL-DTL-26482 series I
PAT 105 / PAT 603

Compatible with connector series:
LMH, 62GB, AB05, KPT, 851, IPT
and others **

Angle
1 = Straight
3 = 90° (Aluminium only)

Shell size
08 to 24
See table 1

Termination

Omit for no clamping element
01 = Constant force spring provided
02 = Band strap provided

Plating

B = Cadmium drab olive
C = Electroless nickel
ZB = Zinc cobalt olive drab
ZN = Zinc nickel black
J = Passivated (Stainless Steel only)
Z = Shot blasted (NAB only)
U = Unplated clean finish (NAB only)

Material

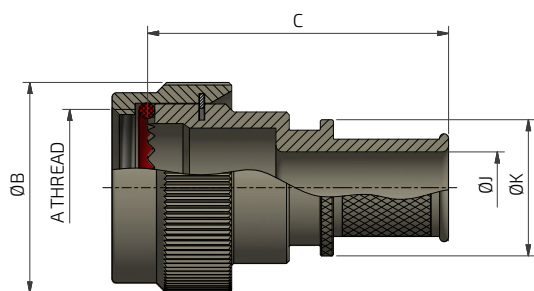
1 = Aluminium
2 = Nickel Aluminium Bronze (NAB)
3 = Stainless Steel 303 S31/304

Entry size

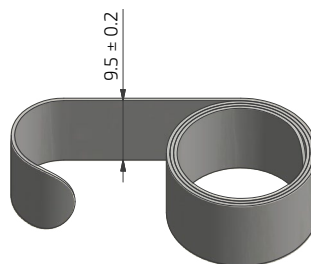
03 to 19
See table 2 for dimensions
See page 5 for availability

* - Contact local Sales Office for details

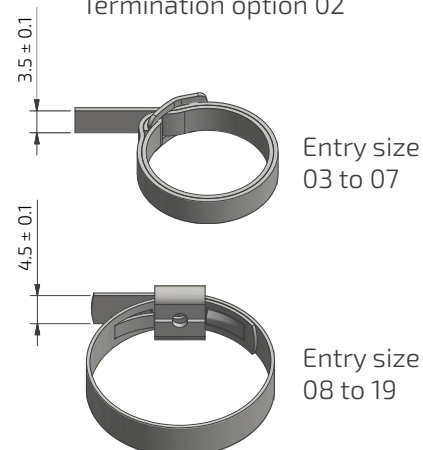
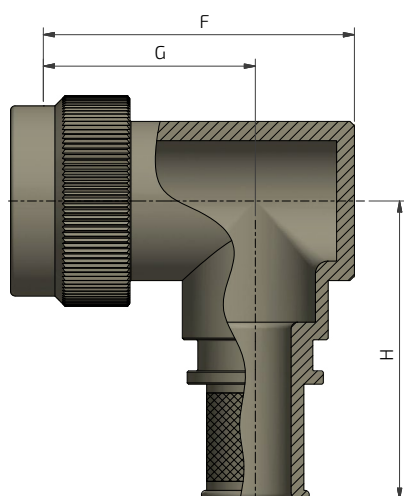
** - To determine dia. I take the maximum OD of the cable and add 0.5-1.0mm

Angle 1**Constant force spring**

Termination option 01

**Band strap**

Termination option 02

**Angle 3 (90°)**

For 45° angle we recommend a straight backshell with 45° heat shrink boot. For boot details see page 11.

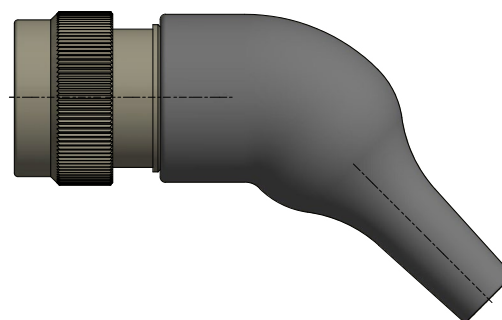


Table 1

| Shell size | A thread | ØB max | C ± 0.25 | F max | G max | H max |
|------------|----------------|--------|----------|-------|-------|-------|
| 08 | 7/16-28 UNEF | 17.4 | 34.0 | 27.5 | 20.0 | 30.5 |
| 10 | 9/16-24 UNEF | 20.4 | 34.0 | 31.0 | 22.0 | 32.5 |
| 12 | 11/16-24 UNEF | 23.9 | 34.0 | 34.0 | 23.0 | 33.7 |
| 14 | 13/16-20 UNEF | 26.9 | 34.0 | 37.0 | 24.6 | 35.5 |
| 16 | 15/16-20 UNEF | 29.9 | 34.0 | 40.4 | 26.5 | 37.3 |
| 18 | 11/16-18 UNEF | 33.4 | 34.0 | 43.5 | 27.8 | 38.8 |
| 20 | 1 3/16-18 UNEF | 36.4 | 34.0 | 46.8 | 29.8 | 41.6 |
| 22 | 1 5/16-18 UNEF | 39.9 | 34.0 | 49.8 | 30.8 | 42.1 |
| 24 | 1 7/16-18 UNEF | 42.9 | 34.0 | 52.8 | 31.8 | 45.1 |

Table 2

| Entry size | ØJ min ** | ØK max | Entry size | ØJ min ** | ØK max |
|------------|-----------|--------|------------|-----------|--------|
| 03 | 4.7 | 13.9 | 12 | 19.0 | 26.7 |
| 04 | 6.3 | 13.9 | 13 | 20.6 | 28.3 |
| 05 | 7.9 | 15.5 | 14 | 22.2 | 29.9 |
| 06 | 9.5 | 17.2 | 15 | 23.8 | 31.5 |
| 07 | 11.1 | 18.7 | 16 | 25.4 | 33.1 |
| 08 | 12.7 | 20.3 | 17 | 27.0 | 34.7 |
| 09 | 14.2 | 21.9 | 18 | 28.6 | 36.3 |
| 10 | 15.8 | 23.5 | 19 | 30.2 | 37.9 |
| 11 | 17.4 | 25.1 | | | |

Entry Size Availability (Aluminium only)

Straight backshells

LMA 19H1 Series

| Shell size | Entry Size | | | | | | | | | | | | | | | | |
|------------|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 09 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |

LMA 19D1 Series

| Shell size | Entry Size | | | | | | | | | | | | | | | | |
|------------|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 08 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | |

- Stocked items
- Other recommended items

90° backshells

LMA 19H3 Series

| Shell size | Entry Size | | | | | | | | | | | | | | | | |
|------------|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 09 | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | | | | |
| 17 | | | | | | | | | | | | | | | | | |
| 19 | | | | | | | | | | | | | | | | | |
| 21 | | | | | | | | | | | | | | | | | |
| 23 | | | | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | | | | |

LMA 19D3 Series

| Shell size | Entry Size | | | | | | | | | | | | | | | | |
|------------|------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 08 | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | | | | | | |
| 16 | | | | | | | | | | | | | | | | | |
| 18 | | | | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | | | | |
| 22 | | | | | | | | | | | | | | | | | |
| 24 | | | | | | | | | | | | | | | | | |

- Stocked items (held in piece-part form)
- Other recommended items

Please check availability with your local Sales Office.

Heat shrinkable boots and LMA backshells – Ensuring the perfect match

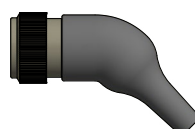
Weald LMA 19H/D Series backshells are designed to work in partnership with a heat shrinkable boot to provide mechanical and environmental protection to the completed assembly. The design of Weald's LMA backshells is compatible with the Hellermann Tyton ranges of heat shrink boots so matching the right boot to a Weald backshell is a simple process.

For the perfect match, the size of the heat shrinkable boot is best selected to ensure it attains most but not all of its recovered form and wall thickness without restriction. Then, during the final stages of recovery, the boot provides a clamping force over the backshell and cable OD.

The example part numbers indicated below provide a reference only to dimensional suitability with the associated backshell dimensions. **As many different cable types, materials and dimensions can be used within any given backshell assembly, it is important that the end-user carefully considers all aspects of the final assembly requirements when selecting and specifying appropriate part numbers.**

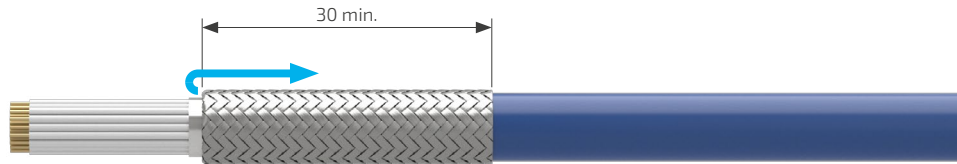
For full part number details, see the Hellermann Tyton catalogue at fclane.com website. Heat shrink boots and adhesive options are available from FC Lane Electronics Ltd.

| Entry size | Part numbers (HellermannTyton) | | |
|------------|---|-------------------|--|
| | Straight (150 Series) Recommended for use in straight and 90° backshells | 45° (1800 Series) | 90° (1100 Series) Where space permits, 90 degree boots can be used on straight backshells |
| 03 | 152-42 | N/A | 1152-4 |
| 04 | 152-42 | N/A | 1152-4 |
| 05 | 154-42 | N/A | 1154-4 |
| 06 | 154-42 | N/A | 1154-4 |
| 07 | 155-42 | 1803-4 | 1155-4 |
| 08 | 155-42 | 1803-4 | 1155-4 |
| 09 | 155-42 | 1807-4 | 1155-4 |
| 10 | 156-42 | 1807-4 | 1156-4 |
| 11 | 156-42 | 1807-4 | 1156-4 |
| 12 | 156-42 | 1807-4 | 1156-4 |
| 13 | 157-42 | 1806-4 | 1156-4 |
| 14 | 157-42 | 1806-4 | 1157-4 |
| 15 | 157-42 | 1806-4 | 1157-4 |
| 16 | 157-42 | 1806-4 | 1157-4 |
| 17 | 157-42 | 1806-4 | 1158-4 |
| 18 | 158-42 | 1806-4 | 1158-4 |
| 19 | 158-42 | 1806-4 | 1158-4 |

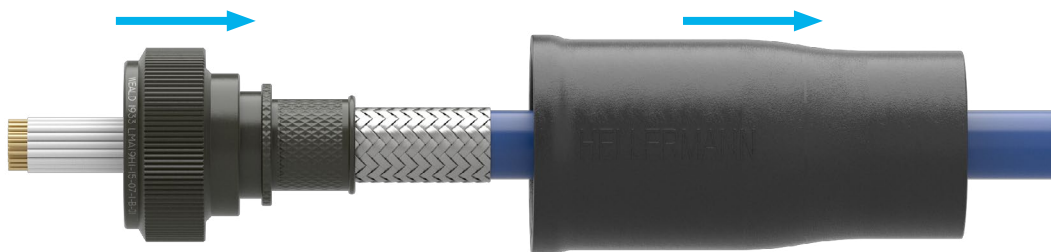


Assembly Instruction

- Prepare the cable making sure that min. 30 mm of shield braid is available to go inside the Backshell and under the constant force spring band. Fold back the shielding braid as shown.



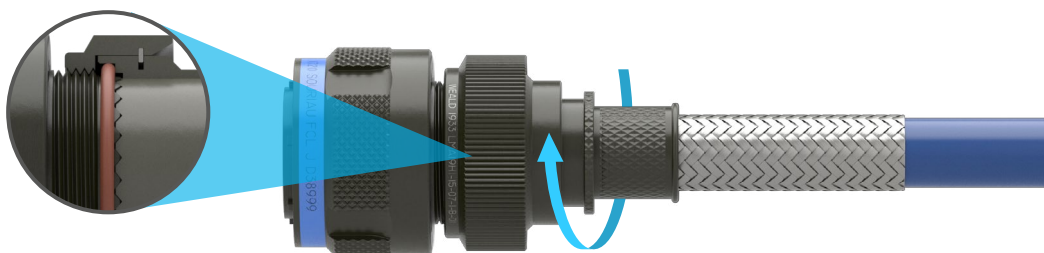
- Before inserting the connector contacts, slide the heat shrinkable boot onto the cable followed by the Backshell.



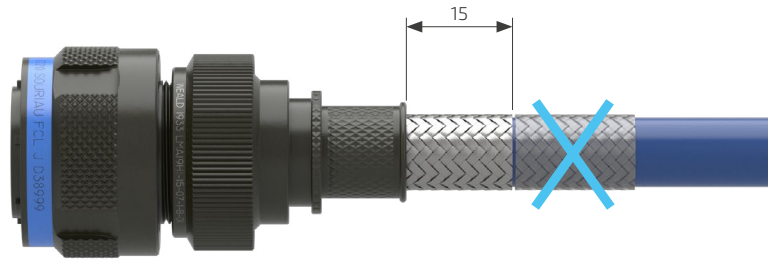
- Crimp and insert the connector contacts or solder wires onto the solder buckets (depending on the connector and contact type).



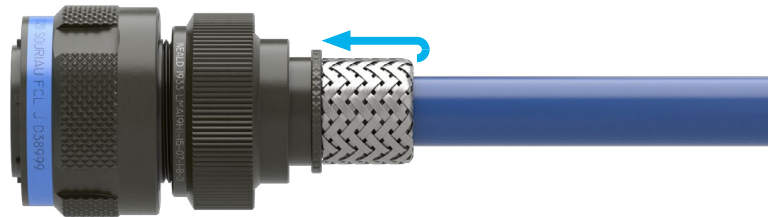
- Screw the Backshell onto the connector shell and tighten to the torque value specified on page 4. The adapter should be initially hand tightened to ensure proper thread and teeth alignment and then tightened with a strap wrench and torque meter to the specified torque.



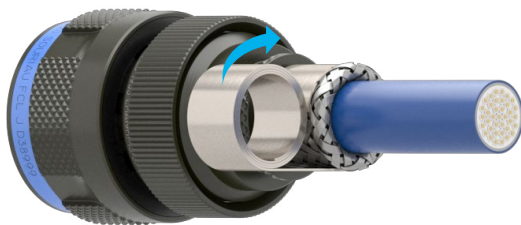
- Trim the cable shield to approximately 15 mm from the back of the Backshell with side cutters.



- Fold the cable braid back onto the adapter body so that it fits against the shoulder of the boot groove.



- Open up the constant force spring and wrap it around the cable braid. This is most easily accomplished by lifting up the end of the spring and trapping the braid covered adapter between the spring coil and raised end. The spring will now stay in place and can be installed by simply rolling the spring coil around the braid covered Backshell. For band strap application use calibrated crimping tool (contact your local Sales Office for details). If necessary, trim the excess of the braid with side cutters.

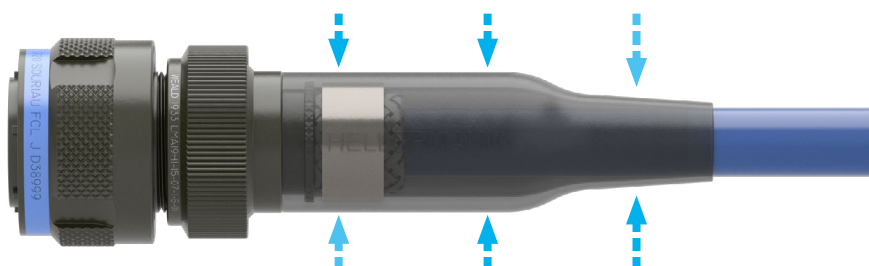


Constant force spring assembly



Band strap assembly

- If utilizing a heat shrink boot (already on the cable), move boot all the way to the front of the boot groove on the Backshell. Shrink so the lip of the boot lands in the groove area, forming a seal with the body of the adapter, and conforming to the banding surface and wire bundle or jacketed cable. To achieve the highest level of strain relief, we recommend the use of one of the adhesive options as per the Hellermann Tyton catalogue at fclane.com website.



Product Safety Information

These notes are intended to be used in conjunction with the Product Catalogue and Product Specification. Products may be safely used in the applications for which they have been designed and within the specified rating and environments. If products are exposed to conditions outside the performance ratings or specified environments they may constitute a hazard. In particular it should be noted that:

1. Material Content

Circular Connectors generally use metalwork parts made of brass, aluminium, phosphor-bronze or steel, which, dependant on the particular application, may be passivated and protected with cadmium or zinc plate – in conjunction with chromated or anodised surface finishes. The insulating materials can either be natural or synthetic rubber, together with plastic or glass-filled plastic moulded parts. Contact materials vary but are usually made of brass, phosphor-bronze, alumeL or chromel.

2. Electric Shock, Burns and Fire

Hazard can occur if the product is used outside the specified parameters or if the product is damaged, wrongly wired, poorly assembled, poorly integrated into larger equipments, or contaminated with conductive fluids. Live circuit terminations must be protected and live circuits never broken by disconnecting products.

Hot spots may be created when resistance is increased due to damage or incorrect integration particularly soldering, or loose terminations. Overheating can cause breakdown of insulation, electric shock, burns or, ultimately, fire. In the event of fire noxious and/or toxic fumes may be released and, in these circumstances, any fire involving the product should be dealt with by personnel properly equipped. Connectors with exposed terminations or contacts should not be used on the current supply side of a circuit with exposed contacts on an unmated product. Before making a circuit live, the product and wiring should be checked to ensure there is no electrically conducting debris present. Circuit resistance checks should also be conducted before making the circuit live. Always ensure that connectors are assembled and wired by properly trained personnel.

3. Use, Transport and Storage of Products

Care must be exercised to avoid damage to any part of the products during transporting, storage or use. Abnormal transit or storage conditions and abuse during installation can give rise to damage. Products should not be used in a damaged condition.

Improper storage (particularly of damaged products) can give rise to additional hazards particularly corrosion. Attention is specifically drawn to the need for proper storage of products containing cadmium and you are advised to see the Guidance Note from the Health and safety Executive on Cadmium – Health and Safety Precautions.

4. Disposal of Products

Product should not be burnt.

Safety Rules

- Follow the guidelines given
- Always protect live circuits and never disconnect a live connector
- Never use a damaged connector
- Never burn discarded connectors

Lodge Group

FC Lane Electronics Ltd

Franchised connector
distributor

+44 (0) 1403 790 661
fclane.com



Weald Electronics Ltd

Manufacturers of high quality
connectors and accessories

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Lane Motorsport

Division of FC Lane dedicated
to motorsport industry

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