

Insulation

Heat Shrinkable Moulded Shapes

European Product Guide

HellermannTyton



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Moving the market takes more than good ideas.

Developing the product solutions for the future, requires visionary thinking and the passion to turn ideas into reality. When visions become functional products, innovations are generated that benefit our customers.

We create the conditions for this by employing motivated people who are committed to working as a team. When only the best solutions will do, you need dedicated professionals with expert knowledge.

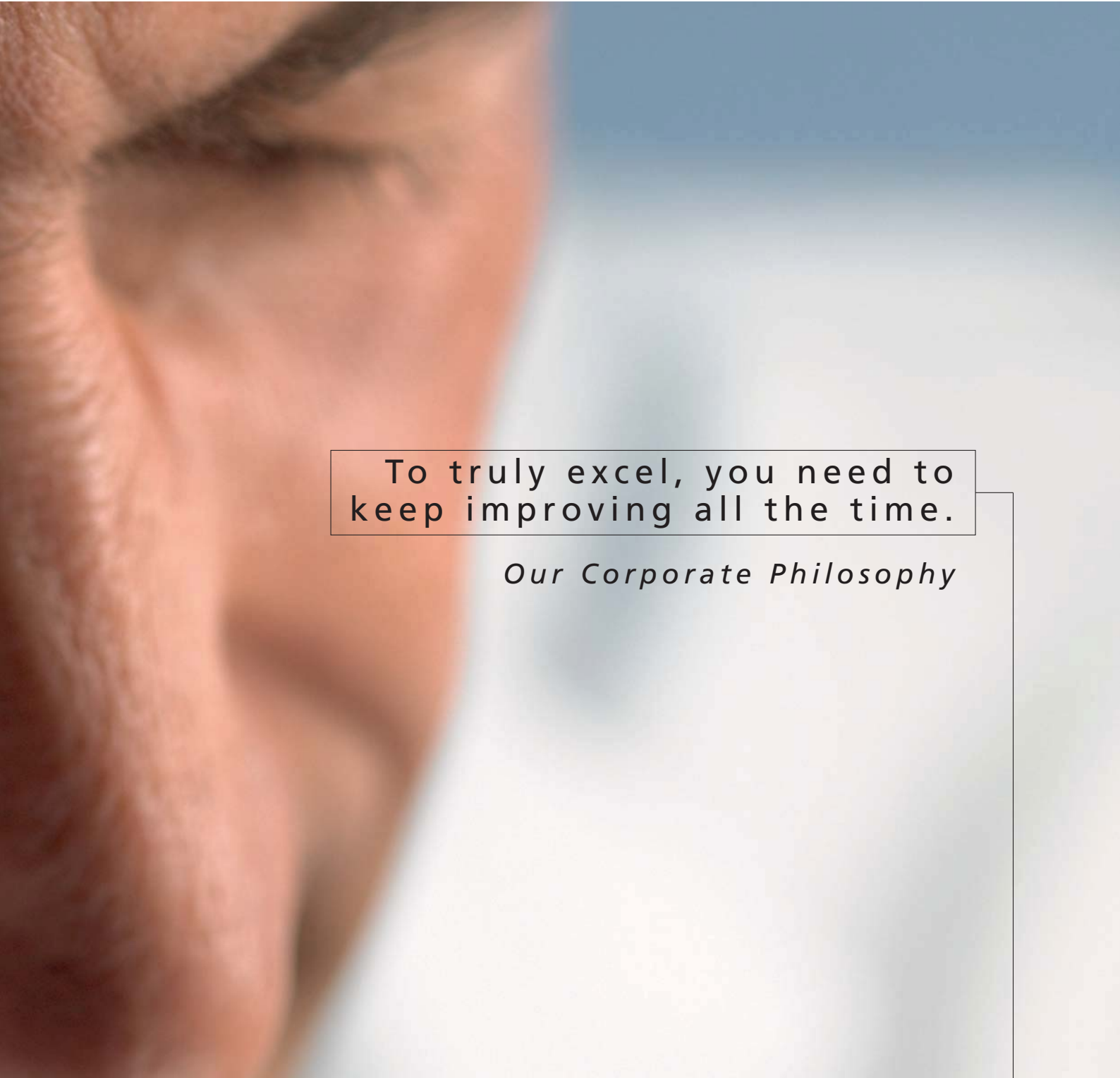
The result is product solutions that not only reshape the market but re-develop it.

We are able to offer product solutions before our customers know they need them.

We maintain good relationships with our customers and also keep a close eye on the latest market developments. This allows us to recognise trends affecting trade and industry at an early stage. And enables us to remain a step ahead of customer requirements at all times.

Meeting high expectations calls for ongoing development.

As well as paying particular attention to communicating with our customers and knowledge of the market, we invest heavily in research and development. To ensure that we can support our customers into the future by offering custom product solutions, we continually optimise our technical and logistical processes.



To truly excel, you need to
keep improving all the time.

Our Corporate Philosophy

At your service wherever – and whenever – you need us.

What use are the best product solutions if they are not available to local markets in a timely way? HellermannTyton's motto is therefore "Think global, act local". For us, this not only means responding to the needs of local markets – we also have a presence there for the benefit of our customers.

Employees on the ground allow us to cater for cultural, market-specific and linguistic factors effectively. In addition, our customers have access to a worldwide distribution network. This adds value that makes us one of the leading providers for trade and industry.

Certified processes and quality, for your security.

HellermannTyton always aim for the highest quality. To live up to this claim we have implemented a quality and environmental management systems.

Our quality management is certified to DIN EN ISO 9001:2008 and DIN EN ISO/TS 16949:2002.

In addition, our environmental management complies with the requirements of DIN EN ISO 14001:2005.

DIN EN ISO
9001:2000

DIN EN ISO/TS
16949:2002

DIN EN ISO
14001:2004

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If you have a particular problem that you would like us to help you with then please contact us.

With our vast experience and practically unlimited technical capabilities we are confident of being able to help you find a solution. Remember, we are a service provider and not just a supplier.

Give us a call! Here are your contacts for enquiries and orders

For all product information please visit our Website www.HellermannTyton.co.uk

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Heat Shrinkable Moulded Shapes Expertise

Heat Shrinkable Moulded Shapes Expertise

HellermannTyton heat shrinkable moulded shapes combine the advantages of quick, easy installation with high electric strength, mechanical toughness and superior chemical and environmental resistance. Our products offer important functional and cost saving benefits for electrical and electronic applications ranging from insulation and protection of individual components to fabrication of complete inter-connecting cable harness assemblies. Strain-relieving boots, transitions and connector backshell covers, as well as other specialised shapes, are available in a wide range of sizes and options. HellermannTyton's extensive product line includes low profile, bulbous and lipped types for use on circular and D-type connectors as well as complex multiway transitions. Only a minimum number of shapes are needed to cover a full range of applications as the products have high shrink ratios of up to 5:1.

Applications

The use of our heat shrinkable moulded shapes in conjunction with our specialist heat shrinkable tubings makes it easy to fabricate complete jacketed wire and cable harnessing and interconnection systems of the highest quality. Heat shrinkable shapes are available for the complete range of electrical and electronic harnessing applications. They can be sealed with our special adhesives and encapsulants to ensure the proper degree of mechanical support, strain relief and environmental protection. Encapsulating the complete harnessing and interconnection system to the desired configuration is easily and neatly accomplished, with minimum weight and bulk.

Choice of Materials

A range of specially formulated materials is available to meet a variety of performance requirements. Material selection can be made according to individual applications. We also have the ability to make customized materials to suit special requirements.

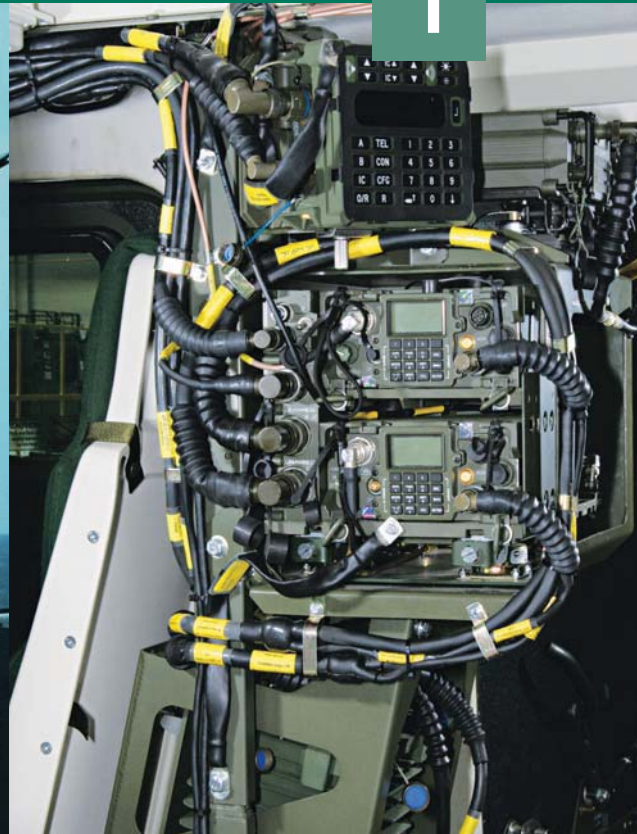
Technical Capabilities

Our materials are formulated in our own laboratory and produced in the HellermannTyton factory. We have experience and knowledge of all major applications and offer full technical support from design through to prototyping, to service.

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Technical Introduction

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This selection guide will help you to find the correct moulded shape for your application:

Step 1. Product Style

Use the Selection Guide Overview on page 12 to quickly select a suitable product profile.

Step 2. Product Size

Choose the correct dimensions to meet your application from our sizes and types table which appears on the relevant product profile page. An example of these tables is shown below:

| Sizes and Type Table | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|------------|------------|-------------|-------------|------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | non |
| 223-2 | 33.0 | 9.4 | 17.5 | 4.1 | 94.0 | 30.0 | 1.5 | 1.2 | 20.0 |
| 216-1 | 21.0 | 9.4 | 9.0 | 2.8 | 76.5 | 20.0 | 1.6 | 1.6 | 15.0 |

Step 3. Material/ Adhesive

Choose a material and adhesive to meet your application requirements from the tables on page 14/15.

Further combinations are available.

Here is an example:

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|----|
| Adhesive | Material | | | |
| | B7 | G | H | B8 |
| W | √ | √ | √ | √ |
| W2 | √ | √ | √ | √ |
| V9500 | √ | √ | - | - |
| HMT200A | √ | √ | - | √ |
| W21 | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ |

These symbols denote the material or adhesive availability for each profile type.

In this example the adhesive W21 is not available with the material B7,G, and B8 because of the "-".

But it is available with the material H because of the "√".

3.1 Material

Parts can be supplied in a choice of materials. The "combinations" table on each product page provides a quick and easy material recognition guide for the product profiled.

The standard colour is black but other colours are available on request, please contact us for further information.

On page 14 you will find detailed information on our range of materials.

3.2 Adhesive

To maximise environmental protection and strain relief we recommend the use of an adhesive from our range below.

Pre-lined hot melt adhesive:

- WM250
- W
- W2
- W8
- W21

Component adhesive:

- HMT200A
- W24
- V9500
- TSA-200


For further information on adhesives please refer to page 15.

Step 4. Standard combinations

| Standard combinations | |
|-----------------------|------------------|
| Article-No. | Type |
| 402-23058 | 223-2-B8W |
| 402-16011 | 216-1-G |
| 402-17010 | 217-1-G |
| 402-18037 | 218-1-B8W |
| 402-20008 | 220-1-B7 |
| 402-19020 | 219-2-B8 |

To help you with your decision we offer standard combinations for each product type.

In this example we offer the Type 223-2 in B8 material and with the adhesive W.



5. Special Modifications

Filler ports and drain holes are also available where the injection of potting epoxy is required.

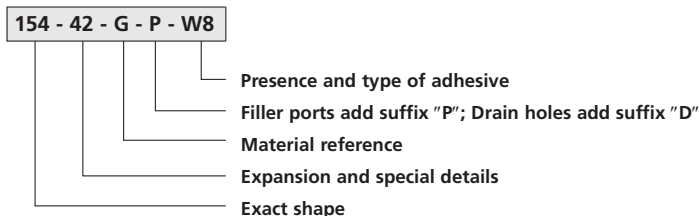
P = Filler ports for potting – 3mm Ø vent and 4.5mm Ø filler.

D = Drain holes 4 offset – 3mm Ø at H end equally spaced 90° apart.







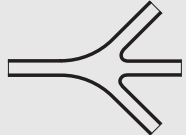
6. Ordering Procedure

When ordering heat shrinkable shapes, it is necessary to give a complete part number to enable efficient processing of your order. Part numbers can be made up of the following typical components:




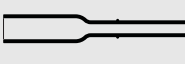










Example:





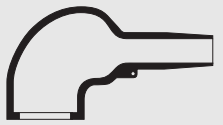
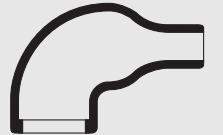



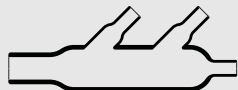
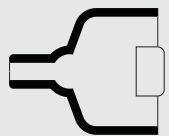

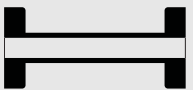
Low Profile Boots and Transitions




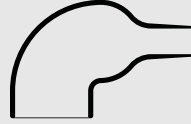



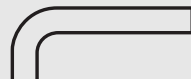

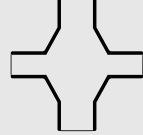

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|--|---|---------|---|---|---------|
| <p>Low Profile Convolute Boots Helashrink 313C Series, with adapter lip</p> |  | Page 22 | <p>Low Profile Shim Boots Helashrink 313E Series, without adapter lip</p> |  | Page 23 |
| <p>Low Profile Straight Boots Helashrink 313F Series, with adapter lip</p> |  | Page 24 | <p>Low Profile Right Angle Boots Helashrink 333F Series, with adapter lip, 90° angle</p> |  | Page 25 |
| <p>Low Profile Transition Boots Helashrink 412H Series, side breakout</p> |  | Page 26 | <p>Low Profile Transition Boots Helashrink 492H Series, 1 to 2 cables</p> |  | Page 27 |
| <p>Low Profile Transition Boots Helashrink 573H Series, 1 to 3 cables</p> |  | Page 28 | | | |

Bulbous Boots and Transitions

| | | | | | |
|--|---|---------|---|---|---------|
| <p>Bottle Shapes, VG style Helashrink 150 Series, with rib</p> |  | Page 29 | <p>Bottle Shapes, MIL style Helashrink 100 Series, with rib</p> |  | Page 31 |
| <p>Bottle Shapes Helashrink 100 Series, without rib</p> |  | Page 32 | <p>Bottle Shapes Helashrink 120 Series, with and without rib</p> |  | Page 34 |
| <p>Long Outlet Shape, VG style Helashrink 130 Series, with rib, low profile</p> |  | Page 35 | <p>Long Outlet Shapes Helashrink 140 Series, without rib</p> |  | Page 37 |
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| <p>Bottle Shapes, VG style Helashrink 190 Series, with external ribs</p> |  | Page 40 | <p>2-Way Outlet Shapes Helashrink 200 Series, low profile</p> |  | Page 41 |
| <p>2-Way Outlet Shapes, VG style Helashrink 200 Series</p> |  | Page 42 | <p>2-Way Outlet Shapes, Breakout Boots Helashrink 200 Series, in line, low voltage</p> |  | Page 43 |
| <p>3-Way Outlet Shapes, VG style Helashrink 300 Series</p> |  | Page 44 | <p>3-Way Outlet Shapes, Breakout Boots Helashrink 300 Series, in line, low voltage</p> |  | Page 45 |

Bulbous Boots and Transitions

| | | |
|--|---|----------------|
| <p>4-Way Outlet Shapes, VG style Helashrink 400 Series</p> |  | <p>Page 46</p> |
| <p>5-Way Outlet Shapes, Breakout Boots Helashrink 500 Series, in line, low voltage</p> |  | <p>Page 48</p> |
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| | | |
|--|---|----------------|
| <p>4-Way Outlet Shapes, Breakout Boots Helashrink 400 Series, in line, low voltage</p> |  | <p>Page 47</p> |
| <p>6-Way Outlet Shapes, Breakout Boots Helashrink 600 Series, in line, low voltage</p> |  | <p>Page 49</p> |
| <p>Right Angle Shapes, VG style Helashrink 1100 Series, without rib, thick wall</p> |  | <p>Page 51</p> |
| <p>Right Angle Shapes Helashrink 1100 Series, without rib</p> |  | <p>Page 53</p> |
| <p>Right Angle Shapes, VG style Helashrink 1100 Series, with rib, low profile, high ratio</p> |  | <p>Page 56</p> |
| <p>T-Shapes Helashrink 1200 Series, Offset</p> |  | <p>Page 58</p> |
| <p>Angled T-Shapes, VG style Helashrink 1300 Series, 30° & 45° angle</p> |  | <p>Page 60</p> |
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| <p>GSR Graduated Strain Relief Helashrink 1750 Series, with rib</p> |  | <p>Page 64</p> |
| <p>Right Angle Cross Shapes Helashrink 2000 Series, T-Joint</p> |  | <p>Page 66</p> |
| <p>Connector Cover for Min-D Series Helashrink 2100 Series, with 90° entry</p> |  | <p>Page 68</p> |

Materials for Heat Shrinkable Moulded Shapes

| Material Specifications | | | |
|-------------------------------------|--|---|---|
| Description | B7 | G | J |
| Material | Semi-rigid flame retarded polyolefin | Fluid resistant elastomer | Flexible polyolefin |
| Continuous Operating Temperature °C | -55 to +135 | -75 to +150 | -55 to +135 |
| Minimum Shrink Temperature °C | +135 | +135 | +135 |
| Specifications | MIL-I-81765/1 TYPE I DEF 59-97 BSG198 Part 5 | VG 95343 Pt6 & Pt18 DEF 59-97 BSG198 Part 5 | MIL-1-81765/1 TYPE II DEF 59-97 BSG198 Part 5 |
| Tensile Strength (MPa) | 13 | 15 | 14 |
| Ultimate Elongation (%) | 500 | 580 | 610 |
| Dielectric Strength kV/mm | 14 | 14 | 12 |
| Flammability (Self extinguishing) | Excellent | Excellent | Excellent |
| Characteristics | Good physical and chemical resistance | Excellent resistance to fuels | Flexible |
| Typical applications | Military and general high performance harnessing | | |

| Material Specifications | | | |
|-------------------------------------|---|--|--|
| Description | H | B8 | L |
| Material | Flexible limited fire hazard material | Semi-rigid flame retarded polyolefin | Flexible flame retarded fluoroelastomer |
| Continuous Operating Temperature °C | -55 to +105 | -55 to +100 | -55 to +200 |
| Minimum Shrink Temperature °C | +135 | +135 | +175 |
| Specifications | NAVSEA 5617649 DEF 59-97 VG 95343 Pt29 BSG198 Part 5 | EA-TS 09-11 | MIL-81765/4 DEF Stan 59-97 BSG198 Part 5 |
| Tensile Strength (MPa) | 10 | 15 | 12 |
| Ultimate Elongation (%) | 450 | 500 | 300 |
| Dielectric Strength kV/mm | 15 | 15 | 8 |
| Flammability (Self extinguishing) | Excellent | Good | Excellent |
| Characteristics | Low smoke Halogen free | Good physical and reasonable chemical resistance | High temperature excellent chem. resistance |
| Typical applications | Ships, submarines & railways | Power/utility shapes | Military and high performance harnessing |

| Material Specifications | | | |
|-------------------------------------|--|---------------------------------------|--|
| Description | -9 | -8 | -6 |
| Material | Modified elastomer blend | Modified fluoroelastomer | Flexible flame retarded polyolefin |
| Continuous Operating Temperature °C | -55 to +120 | -55 to +150 | -55 to +120 |
| Minimum Shrink Temperature °C | +135 | +135 | +135 |
| Specifications | SCX15112 | SCX15111 | MIL-1-81765/1 Type I + II |
| Tensile Strength (MPa) | 12 | 15 | 12 |
| Ultimate Elongation (%) | 500 | 450 | 500 |
| Dielectric Strength kV/mm | 20 | 20 | 20 |
| Flammability (Self extinguishing) | Excellent | <25mm | Excellent |
| Characteristics | Good physical and reasonable chemical resistance | Good physical and chemical resistance | Good physical and reasonable chemical resistance |
| Typical applications | Military and general high performance harnessing | | |

Adhesives for Heat Shrinkable Moulded Shapes

| Adhesive Specifications | | | |
|--------------------------------|-----------------------------------|-----------------------------------|--|
| Description | W / W2 | WM250 | W8 |
| Adhesive | General purpose hot melt adhesive | General purpose hot melt adhesive | EVA, high performance, hot melt adhesive |
| Operating Temperature Range °C | -55 to +80 | -55 to +80 | -55 to +105 |
| Softening Point °C | +95 | +95 | +110 |
| Supplied Form | pre-applied | pre-applied | pre-applied |
| Shelf Life | 5 years | 5 years | 5 years |
| Solvent Resistance | Fair under splash conditions | | |

| Adhesive Specifications | | | |
|--------------------------------|--|--|------------------------------|
| Description | W21 | W24 | TSA-200 |
| Adhesive | Modified polyamide hot melt adhesive | High performance, pre-coat, 1 part epoxy | Thermoset +125° C |
| Operating Temperature Range °C | -55 to +120 | -75 to +200 | -55 to +125 |
| Softening Point °C | +120 | - | - |
| Supplied Form | pre-applied | pre-applied | Tape |
| Shelf Life | 5 years | 5 years | 5 years |
| Solvent Resistance | Saline: Very good De-icing fluid: Good Diesel: Excellent Lubricating Oil: Good Hydraulic Oil: Good Aviation Fuel: Good Automotive Fuel: Good | De-icing fluid: Excellent Petrol: Excellent Lubricating Oil: Excellent Hydraulic Oil: Excellent | Fair under splash conditions |

| Adhesive Specifications | | |
|--------------------------------|--|------------------------------|
| Description | V9500 | HMT200A |
| Adhesive | Two part, black, epoxy adhesive | Hot melt adhesive tape |
| Operating Temperature Range °C | -75 to +150 | -55 to +105 |
| Softening Point °C | - | +110 |
| Supplied Form | Cartridge | Tape |
| Shelf Life | 18 months | 5 years |
| Solvent Resistance | De-icing fluid: Excellent Petrol: Excellent Lubricating Oil: Excellent Hydraulic Oil: Excellent | Fair under splash conditions |

Use this table to find the adhesive compatibility for your preferred material.

| Material Combinations | Material | | | |
|---|---------------------------|---------------------------------------|---------------------------------------|---|
| | G | B7 | B8 | H |
| Material Description | Fluid resistant elastomer | Semi -rigid flame retarded polyolefin | Semi -rigid flame retarded polyolefin | Flexible limited fire hazard polyolefin |
| Shape | | | | |
| Minimum Shrink Temperature °C | +135 | +135 | +135 | +135 |
| Operating Temperature Range °C | -75 to +150 | -55 to +135 | -55 to +100 | -55 to +105 |
| Shelf Life | 5 years | 5 years | 5 years | 5 years |
| Helashrink 100 Series | yes | yes | no | yes |
| Helashrink 1100 Series | yes | yes | no | yes |
| Helashrink 200 Series | yes | yes | no | yes |
| Helashrink 300 Series | yes | yes | no | yes |
| Helashrink 400 Series | yes | yes | no | yes |
| Helashrink 1200 Series | yes | yes | no | yes |
| Helashrink 1300 Series | yes | yes | no | yes |
| Low Profile Shapes (Series 313, 412, 492, 573) | no | no | no | no |
| Helashrink 1600 Series | no | no | yes | no |
| Helashrink In Line Series, low voltage | no | no | yes | no |
| Adhesive Compatibility | WM250 | WM250 | WM250 | WM250 |
| | W8 | W8 | W8 | W8 |
| | W24 | W24 | | W24 |
| | V9500 | V9500 | | W21 |
| | HMT200A | HMT200A | | |

Material & Adhesive Combinations Search

| Material Combinations | Material | | | |
|---|---|--------------------------|------------------------------------|--------------------------------|
| | L | -9 | -6 | -8 |
| Material Description | Flexible flame retarded fluoroelastomer | Modified elastomer blend | Flexible flame retarded polyolefin | Fluoro-elastomer polymer blend |
| Shape | | low profile | low profile | low profile |
| Minimum Shrink Temperature °C | +175 | +135 | +135 | +135 |
| Operating Temperature Range °C | -55 to +200 | -55 to +120 | -55 to +120 | -55 to +150 |
| Shelf Life | 5 years | | | |
| Helashrink 100 Series | yes | no | no | no |
| Helashrink 1100 Series | yes | no | no | no |
| Helashrink 200 Series | yes | no | no | no |
| Helashrink 300 Series | yes | no | no | no |
| Helashrink 400 Series | yes | no | no | no |
| Helashrink 1200 Series | yes | no | no | no |
| Helashrink 1300 Series | yes | no | no | no |
| Low Profile Shapes (Series 313, 412, 492, 573) | no | yes | yes | yes |
| Helashrink 1600 Series | no | no | no | no |
| Helashrink In Line Series, low voltage | no | no | no | no |
| Adhesive Compatibility | W24 | WM250 | WM250 | WM250 |
| | | W8 | W8 | W8 |
| | | W24 | W24 | W24 |
| | | V9500 | V9500 | V9500 |
| | | HMT200A | HMT200A | HMT200A |
| | | TSA200 | TSA200 | TSA200 |

Use this table to find the material compatibility for your preferred adhesive.

| Adhesive Combinations | Adhesive | | | |
|---------------------------------------|-----------------------------------|-----------------------------------|--|--|
| | W / W2 | WM250 | W8 | W21 |
| Adhesive Description | General purpose hot melt adhesive | General purpose hot melt adhesive | EVA, high performance, hot melt adhesive | Modified polyamide hot melt adhesive |
| Operating Temperature Range °C | -55 to +80 | -55 to +80 | -55 to +105 | -55 to +120 |
| Softening Point °C | +95 | +95 | +110 | - |
| Supplied Form | pre-applied | pre-applied | pre-applied | pre-applied |
| Shelf Life | 5 years | 5 years | 5 years | 5 years |
| Solvent Resistance | Fair under splash conditions | Fair under splash conditions | Fair under splash conditions | Saline: Very good De-icing fluid: Good Diesel: Excellent Lubricating Oil: Good Hydraulic Oil: Good Aviation Fuel: Good Automotive Fuel: Good |

| | | | | |
|---|-----|-----|-----|-----|
| Helashrink 100 Series | no | yes | yes | yes |
| Helashrink 1100 Series | no | yes | yes | yes |
| Helashrink 200 Series | no | yes | yes | yes |
| Helashrink 300 Series | no | yes | yes | yes |
| Helashrink 400 Series | no | yes | yes | yes |
| Helashrink 1200 Series | no | yes | yes | yes |
| Helashrink 1300 Series | no | yes | yes | yes |
| Low Profile Shapes (Series 313, 412, 492, 573) | no | yes | yes | yes |
| Helashrink 1600 Series | yes | yes | no | no |
| Helashrink In Line Series, low voltage | yes | yes | no | no |

| | | | | |
|-------------------------------|----|----|----|----|
| Material Compatibility | B8 | G | G | G |
| | | B7 | B7 | B7 |
| | | B8 | H | B8 |
| | | H | -6 | H |
| | | -6 | -9 | |
| | | -9 | -8 | |
| | | -8 | | |

| Adhesive Combinations | Adhesive | | | |
|--------------------------------|--|------------------------------|--|------------------------------|
| | W24 | TSA-200 | V9500 | HMT200A |
| Adhesive Description | High performance, pre-coat, 1 part epoxy | Thermoset +125°C | Two part, black, epoxy adhesive | Hot melt adhesive tape |
| Operating Temperature Range °C | -75 to +200 | -55 to +125 | -75 to +150 | -55 to +105 |
| Softening Point °C | - | - | - | + 110 |
| Supplied Form | pre-applied | Tape | Cartridge | Tape |
| Shelf Life | 5 years | 5 years | 18 months | 5 years |
| Solvent Resistance | De-icing fluid: Excellent Petrol: Excellent Lubricating Oil: Excellent Hydraulic Oil: Excellent | Fair under splash conditions | De-icing fluid: Excellent Petrol: Excellent Lubricating Oil: Excellent Hydraulic Oil: Excellent | Fair under splash conditions |

| | | | | |
|--|-----|-----|-----|-----|
| Helashrink 100 Series | yes | no | yes | yes |
| Helashrink 1100 Series | yes | no | yes | yes |
| Helashrink 200 Series | yes | no | yes | yes |
| Helashrink 300 Series | yes | no | yes | yes |
| Helashrink 400 Series | yes | no | yes | yes |
| Helashrink 1200 Series | yes | no | yes | yes |
| Helashrink 1300 Series | yes | no | yes | yes |
| Low Profile Shapes (Series 313, 412, 492, 573) | yes | yes | yes | yes |
| Helashrink 1600 Series | no | no | no | yes |
| Helashrink In Line Series, low voltage | no | no | no | yes |

| | | | | |
|------------------------|----|----|----|----|
| Material Compatibility | G | -6 | G | G |
| | B7 | -9 | B7 | B7 |
| | H | -8 | H | B8 |
| | L | | | H |
| | -6 | | | -6 |
| | -9 | | | -9 |
| | -8 | | | -8 |



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| 2.1 Low Profile Boots and Transitions | |
| Low Profile Convolute Boots | |
| • Helashrink 313C Series, with adapter lip | 22 |
| Low Profile Shim Boots | |
| • Helashrink 313E Series, without adapter lip | 23 |
| Low Profile Straight Boots | |
| • Helashrink 313F Series, with adapter lip | 24 |
| Low Profile Right Angle Boots | |
| • Helashrink 333F Series, with adapter lip, 90° angle | 25 |
| Low Profile Transition Boots | |
| • Helashrink 412H Series, side breakout | 26 |
| • Helashrink 492H Series, 1 to 2 cables | 27 |
| • Helashrink 573H Series, 1 to 3 cables | 28 |
| 2.2 Bulbous Boots and Transitions | |
| Bottle Shapes, VG style | |
| • Helashrink 150 Series, with rib | 29 |
| Bottle Shapes, MIL style | |
| • Helashrink 100 Series, with rib | 31 |
| Bottle Shapes | |
| • Helashrink 100 Series, without rib | 32 |
| • Helashrink 120 Series, with and without rib | 34 |

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| Long Outlet Shape, VG style | |
| • Helashrink 130 Series, with rib, low profile | 35 |
| Long Outlet Shapes | |
| • Helashrink 140 Series, without rib | 37 |
| Bottle Shapes | |
| • Helashrink 160 Series, without rib | 38 |
| Bottle Shapes, VG style | |
| • Helashrink 170 Series, with rib | 39 |
| • Helashrink 190 Series, with external ribs | 40 |
| 2-Way Outlet Shapes | |
| • Helashrink 200 Series, low profile | 41 |
| 2-Way Outlet Shapes, VG style | |
| • Helashrink 200 Series | 42 |
| 2-Way Outlet Shapes, Breakout Boots | |
| • Helashrink 200 Series, in line, low voltage | 43 |
| 3-Way Outlet Shapes, VG style | |
| • Helashrink 300 Series | 44 |
| 3-Way Outlet Shapes, Breakout Boots | |
| • Helashrink 300 Series, in line, low voltage | 45 |
| 4-Way Outlet Shapes, VG style | |
| • Helashrink 400 Series | 46 |



Heat Shrinkable Moulded Shapes

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|---|------|
| 4-Way Outlet Shapes, Breakout Boots | |
| • Helashrink 400 Series, in line, low voltage | 47 |
| 5-Way Outlet Shapes, Breakout Boots | |
| • Helashrink 500 Series, in line, low voltage | 48 |
| 6-Way Outlet Shapes, Breakout Boots | |
| • Helashrink 600 Series, in line, low voltage | 49 |
| Right-Angle Shapes, VG style | |
| • Helashrink 1100 Series, with rib | 50 |
| • Helashrink 1100 Series, without rib, thick wall | 51 |
| Right-Angle Shapes, MIL style | |
| • Helashrink 1100 Series, with rib | 52 |
| Right-Angle Shapes | |
| • Helashrink 1100 Series, without rib | 53 |
| Right-Angle Shapes, VG style/MIL style | |
| • Helashrink 1100 Series, with rib, low profile | 54 |
| Right-Angle Shapes, VG style/MIL style | |
| • Helashrink 1100 Series, with rib, low profile | 55 |
| Right-Angle Shapes, VG style | |
| • Helashrink 1100 Series, with rib, low profile, high ratio | 56 |
| T-Shapes, VG style | |
| • Helashrink 1200 Series | 57 |

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|---|------|
| T-Shapes | |
| • Helashrink 1200 Series, Offset | 58 |
| T-Shapes, VG style | |
| • Helashrink 1200 Series, Offset | 59 |
| Angled T Shapes, VG Style | |
| • Helashrink 1300 Series, 30° & 45° angle | 60 |
| Double T Shapes | |
| • Helashrink 1310 Series, 30° angle | 61 |
| Angle Elbow Shapes | |
| • Helashrink 1400 Series, 90° angle | 62 |
| Connector Cover for Min-D Series | |
| • Helashrink 1500 Series, with top entry | 63 |
| GSR Graduated Strain Relief | |
| • Helashrink 1750 Series, with rib | 64 |
| Angle Shapes | |
| • Helashrink 1800 Series, with rib, 30°, 45°, 60° angle | 65 |
| Right-Angle Cross Shapes | |
| • Helashrink 2000 Series - T-Joint | 66 |
| Locating Bushes | |
| • Helashrink 1760, 1790, 1820 Series | 67 |
| Connector Cover for Min-D Series | |
| • Helashrink 2100 Series, with 90° entry | 68 |

Low Profile Convolute Boots

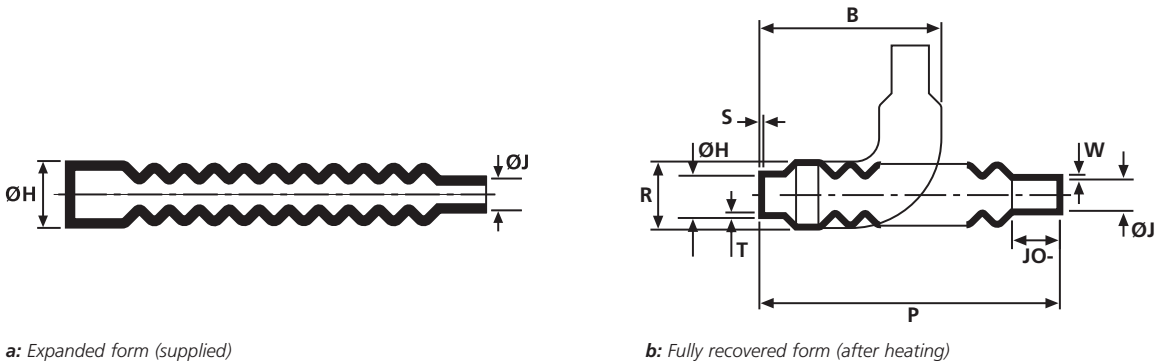
- Helashrink 313C Series, with adapter lip

This style is used with a circular grooved adapter to provide strain relief and, if adhesive is used, excellent environmental sealing can be achieved.

The convoluted design provides the flexibility to accommodate different cable outlet angles.



313C722-774 Series supplied / fully recovered.



a: Expanded form (supplied)

b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|------------|-----------|-------------|----------|-----------|------------|------------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R max. | JO ± 10% | W min | B nom. | T ± 0.5 | S ± 0.5 |
| 313C722 | 14.2 | 6.9 | 11.1 | 4.8 | 120.6 | 21.1 | 17.3 | 1.5 | 62.4 | 1.3 | 1.5 |
| 313C732 | 22.4 | 11.7 | 17.7 | 8.1 | 133.3 | 26.5 | 19.8 | 1.5 | 67.8 | 1.3 | 1.5 |
| 313C743 | 34.0 | 17.5 | 26.9 | 12.7 | 146.0 | 32.7 | 22.3 | 1.5 | 73.4 | 1.3 | 1.8 |
| 313C753 | 44.2 | 22.3 | 36.5 | 17.5 | 158.7 | 37.8 | 25.4 | 1.5 | 78.2 | 1.3 | 1.8 |
| 313C764 | 53.8 | 27.9 | 45.7 | 22.3 | 171.4 | 42.9 | 28.4 | 1.5 | 82.8 | 2.0 | 1.8 |
| 313C774 | 77.2 | 40.6 | 54.6 | 22.8 | 236.2 | 62.2 | 25.4 | 1.5 | 138.4 | 2.0 | 2.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | |
|---------------------------|----------|---|---|
| Adhesive | Material | | |
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 422-00001 | 313C722-9 |
| 422-00101 | 313C732-9 |
| 422-00201 | 313C743-9 |
| 422-00302 | 313C753-9 |
| 422-00400 | 313C764-9 |
| 422-00501 | 313C774-9 |

Low Profile Shim Boots

- Helashrink 313E Series, without adapter lip

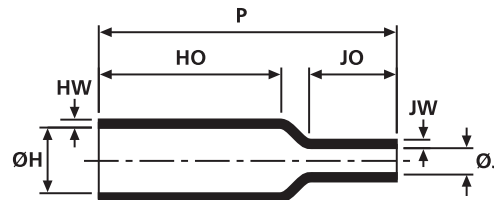
This part is normally used to build up or shim a cable diameter to facilitate a better fit for components in a cable harness.



313E445-457 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|-----------|-------------|-------------|-------------|-------------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ±10% | HO ± 10% | HW ± 25% | JW ± 25% | JO ± 10% |
| 313E445 | 12.7 | 12.7 | 11.1 | 3.3 | 63.5 | 41.1 | 1.5 | 1.5 | 15.7 |
| 313E455 | 22.1 | 22.1 | 11.2 | 3.3 | 53.3 | 27.9 | 2.3 | 1.5 | 15.7 |
| 313E447 | 20.8 | 14.7 | 20.6 | 9.9 | 63.5 | 41.1 | 1.5 | 1.5 | 16.5 |
| 313E457 | 22.1 | 22.1 | 20.6 | 9.9 | 53.3 | 27.9 | 2.3 | 1.5 | 14.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | |
|---------------------------|----------|---|---|
| Adhesive | Material | | |
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 422-10000 | 313E445-9 |
| 422-10200 | 313E455-9 |
| 422-10100 | 313E447-9 |
| 422-10300 | 313E457-9 |

Low Profile Straight Boots

- Helashrink 313F Series, with adapter lip

This boot provides strain relief in applications with partially loaded connectors, resulting in small cable diameters requiring a high shrink ratio.



313F322-396 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|-----------|------------|------------|-------------|-------------|-------------|------------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ±10% | R ± 15% | T ± 0.8 | JO ± 10% | HW ± 1.5 | JW ± 0.8 | S ± 1.5 |
| 313F322 | 23.8 | 9.9 | 17.2 | 6.6 | 105.9 | 11.6 | 1.3 | 86.3 | 1.5 | 1.5 | 1.5 |
| 313F332 | 27.1 | 13.2 | 20.8 | 7.6 | 121.1 | 12.1 | 1.3 | 98.5 | 1.5 | 1.5 | 1.5 |
| 313F343 | 30.9 | 18.5 | 24.3 | 8.9 | 138.6 | 12.1 | 1.3 | 112.7 | 1.7 | 1.5 | 1.7 |
| 313F353 | 35.6 | 22.1 | 28.7 | 10.1 | 159.5 | 12.1 | 1.3 | 130.8 | 1.7 | 1.5 | 1.7 |
| 313F364 | 38.8 | 28.2 | 31.4 | 10.9 | 177.8 | 13.9 | 1.8 | 142.2 | 1.7 | 1.5 | 1.7 |
| 313F374 | 42.2 | 32.2 | 38.3 | 12.7 | 203.2 | 15.2 | 1.8 | 163.0 | 1.7 | 1.5 | 1.7 |
| 313F385 | 51.5 | 45.4 | 45.4 | 14.9 | 203.2 | 15.2 | 1.8 | 157.7 | 1.7 | 1.7 | 1.7 |
| 313F396 | 62.7 | 45.4 | 53.3 | 16.7 | 228.6 | 16.0 | 1.8 | 153.1 | 1.7 | 1.7 | 1.7 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | |
|---------------------------|----------|---|---|
| Adhesive | Material | | |
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 422-20000 | 313F322-9 |
| 422-20100 | 313F332-9 |
| 422-20200 | 313F343-9 |
| 422-20300 | 313F353-9 |
| 422-20400 | 313F364-9 |
| 422-20500 | 313F374-9 |
| 422-20600 | 313F385-9 |
| 422-20700 | 313F396-9 |

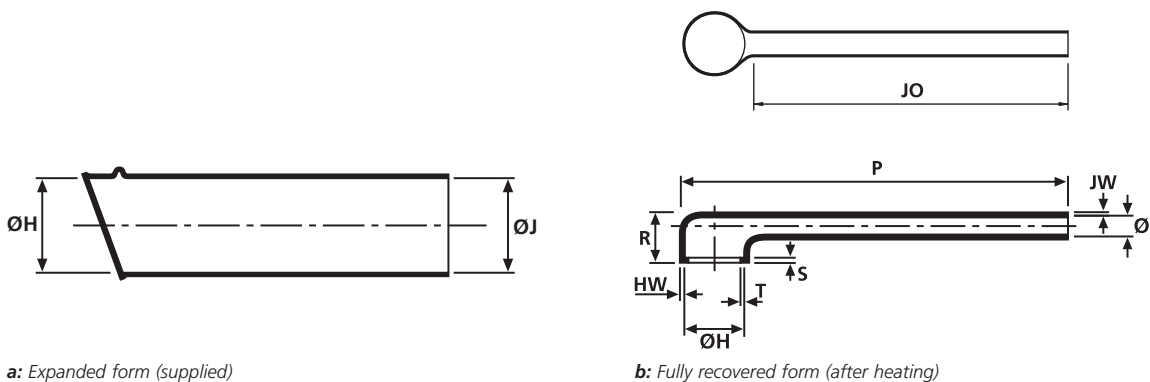
Low Profile Right Angle Boots

- Helashrink 333F Series, with adapter lip, 90° angle

The boot provides connector strain relief in applications with partially loaded connectors, resulting in small cable diameters requiring a high shrink ratio.



333F322-385 Series supplied / fully recovered.



| Sizes and Type Table | | | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|-----------|------------|------------|-------------|-------------|-------------|------------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ±10% | R ± 15% | T ± 0.8 | JO ± 10% | HW ± 1.5 | JW ± 0.8 | S ± 1.5 |
| 333F322 | 23.8 | 9.9 | 17.2 | 6.6 | 105.1 | 18.5 | 1.3 | 87.6 | 1.5 | 1.5 | 1.5 |
| 333F332 | 27.1 | 13.2 | 20.8 | 7.6 | 115.8 | 19.8 | 1.3 | 99.0 | 1.5 | 1.5 | 1.5 |
| 333F343 | 30.9 | 18.5 | 24.3 | 8.9 | 146.3 | 20.8 | 1.3 | 114.3 | 1.7 | 1.5 | 1.7 |
| 333F353 | 35.3 | 21.6 | 28.7 | 10.1 | 172.2 | 21.8 | 1.3 | 132.5 | 1.7 | 1.5 | 1.7 |
| 333F364 | 38.8 | 27.9 | 31.4 | 10.9 | 185.1 | 24.1 | 1.8 | 143.7 | 1.7 | 1.5 | 1.7 |
| 333F374 | 45.2 | 34.0 | 38.3 | 12.1 | 213.6 | 27.4 | 1.8 | 169.0 | 1.7 | 1.5 | 1.7 |
| 333F385 | 51.5 | 41.1 | 44.4 | 15.0 | 224.5 | 29.4 | 1.7 | 173.2 | 1.7 | 1.7 | 1.7 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | |
|---------------------------|----------|---|---|
| Adhesive | Material | | |
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 422-30000 | 333F322-9 |
| 422-30004 | 333F332-9 |
| 422-30100 | 333F343-9 |
| 422-30200 | 333F353-9 |
| 422-30301 | 333F364-9 |
| 422-30400 | 333F374-9 |
| 422-30500 | 333F385-9 |

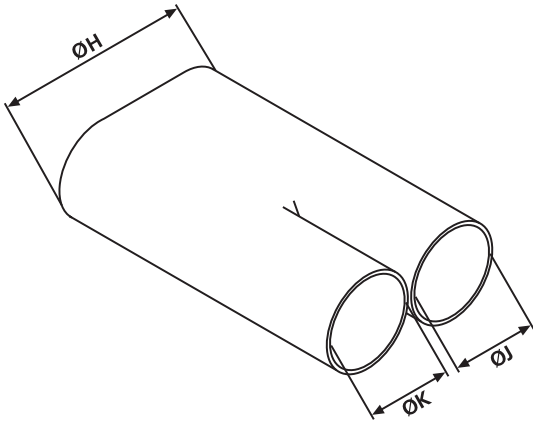
Low Profile Transition Boots

- Helashrink 412H Series, side breakout

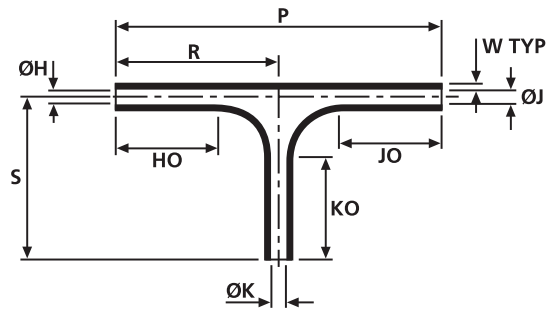
This style provides connector cable strain relief and is used in conjunction with a circular grooved adapter.



412H622-625 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ/K min. a | ØJ/K max. b | HO/JO/KO ± 10% | P nom | W nom | R/S nom |
|---------|-----------|-----------|-------------|-------------|----------------|-------|-------|---------|
| 412H622 | 19.8 | 6.6 | 13.2 | 6.6 | 25.4 | 80.7 | 1.0 | 40.3 |
| 412H623 | 34.2 | 11.4 | 22.8 | 6.6 | 41.1 | 120.3 | 1.3 | 60.1 |
| 412H624 | 60.1 | 20.0 | 40.1 | 20.0 | 63.5 | 175.7 | 1.5 | 87.8 |
| 412H625 | 83.3 | 33.2 | 54.8 | 33.2 | 88.9 | 242.3 | 1.7 | 121.1 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | |
|------------------|----------|---|---|
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 422-40000 | 412H622-9 |
| 422-40100 | 412H623-9 |
| 422-40200 | 412H624-9 |
| 422-40300 | 412H625-9 |

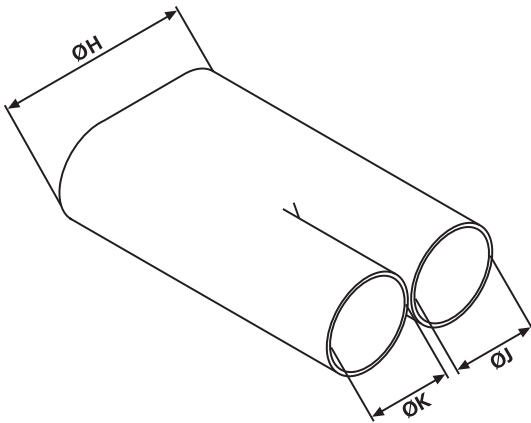
Low Profile Transition Boots

- Helashrink 492H Series, 1 to 2 cables

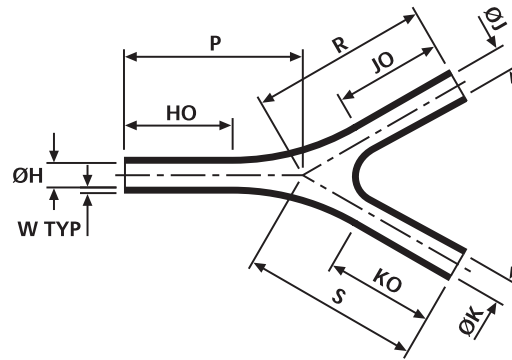
This style provides strain relief, sealing and mechanical protection on cable harness breakouts or transitions.



492H412-415 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ/K min. a | ØJ/K max. b | HO/JO/KO +/- 15% | W nom | P/R/S nom |
|---------|-----------|-----------|-------------|-------------|------------------|-------|-----------|
| 492H412 | 19.8 | 6.6 | 13.2 | 6.6 | 25.4 | 1.0 | 40.6 |
| 492H413 | 34.2 | 11.4 | 22.8 | 11.4 | 41.1 | 1.3 | 62.9 |
| 492H414 | 60.1 | 20.0 | 40.1 | 20.0 | 63.5 | 1.5 | 94.7 |
| 492H415 | 83.3 | 33.2 | 54.8 | 33.2 | 49.7 | 1.7 | 133.8 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

Combinations "On request"

| Adhesive | Material | | |
|------------------|----------|---|---|
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| W24 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 422-50000 | 492H412-9 |
| 422-50101 | 492H413-9 |
| 422-50202 | 492H414-9 |
| 422-50302 | 492H415-9 |

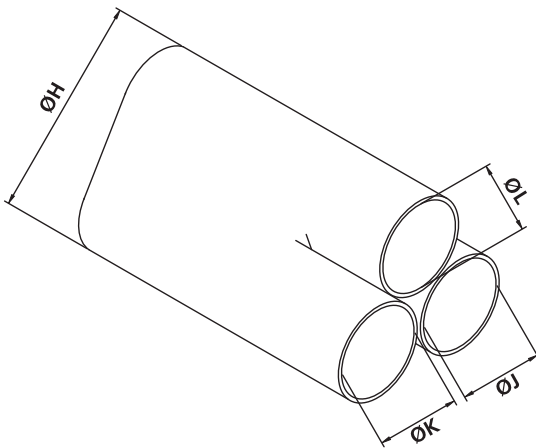
Low Profile Transition Boots

- Helashrink 573H Series, 1 to 3 cables

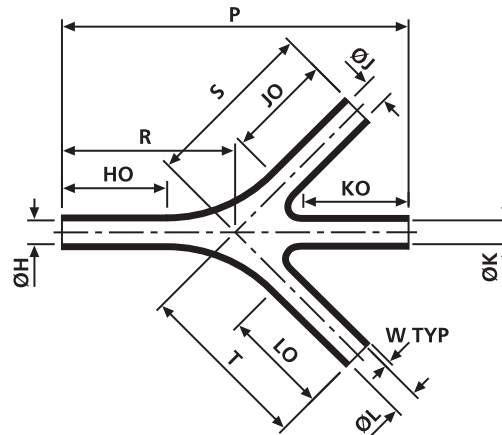
This style provides strain relief, sealing and mechanical protection on cable harness breakouts or transitions.



573H532-535 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ/K/L min. a | ØJ/K/L max. b | P nom | R/S/T nom | W nom | HO/JO/KO/LO ± 15% |
|---------|-----------|-----------|---------------|---------------|-------|-----------|-------|-------------------|
| 573H532 | 19.8 | 6.6 | 13.2 | 6.6 | 85.8 | 42.9 | 1.0 | 25.4 |
| 573H533 | 34.2 | 11.4 | 20.5 | 11.4 | 135.6 | 67.8 | 1.3 | 41.1 |
| 573H534 | 60.1 | 20.0 | 36.0 | 20.0 | 207.2 | 103.6 | 1.5 | 63.5 |
| 573H535 | 99.8 | 33.2 | 54.8 | 33.2 | 294.6 | 147.3 | 1.7 | 88.9 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | |
|------------------|----------|---|---|
| | 9 | 8 | 6 |
| TSA-200 | √ | √ | √ |
| WM250 | √ | √ | √ |
| W8 | √ | √ | √ |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| Without Adhesive | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 422-60000 | 573H532-9 |
| 422-60100 | 573H533-9 |
| 422-60202 | 573H534-9 |
| 422-60302 | 573H535-9 |

Bottle Shapes, VG style

• Helashrink 150 Series, with rib

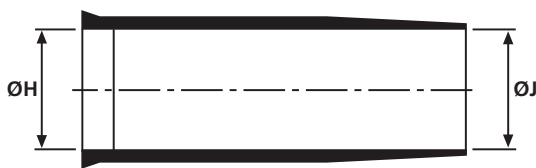
This style is used in conjunction with a circular grooved adaptor, providing strain relief and enviromental sealing. For VG shapes with portholes "P" please refer to product standards tables in the appendix.



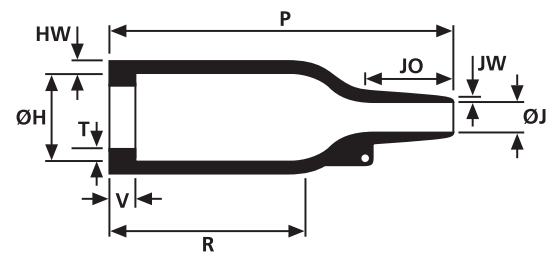
150 Series supplied.



150 Series boot recovered onto a connector.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

| Sizes and Type Table | | | | | | | | | | | | |
|----------------------|----------------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|----------|---------|---------|
| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | JO ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 20% |
| 152-42 | VG 95343 T06 B 001 A | 24.0 | 10.5 | 24.0 | 6.0 | 38.0 | 21.0 | 10.0 | 1.6 | 0.5 | 3.0 | 1.0 |
| 153-42 | VG 95343 T06 B 002 A | 25.0 | 14.0 | 9.0 | 3.5 | 55.0 | 28.0 | 16.0 | 1.8 | 0.5 | 3.0 | 1.0 |
| 154-42 | VG 95343 T06 B 003 A | 30.0 | 14.0 | 30.0 | 6.0 | 55.0 | 32.0 | 13.0 | 1.8 | 1.0 | 3.0 | 1.0 |
| 155-42 | VG 95343 T06 B 004 A | 31.0 | 18.0 | 31.0 | 7.0 | 67.0 | 35.0 | 18.0 | 1.8 | 1.0 | 3.0 | 1.0 |
| 156-42 | VG 95343 T06 B 005 A | 36.0 | 22.5 | 36.0 | 8.5 | 80.0 | 42.0 | 20.0 | 2.0 | 1.0 | 3.0 | 1.0 |
| 157-43 | VG 95343 T06 C 001 A | 43.0 | 28.0 | 43.0 | 10.0 | 99.0 | 61.0 | 20.0 | 2.2 | 1.0 | 3.0 | 1.7 |
| 158-43 | VG 95343 T06 C 002 A | 60.0 | 35.0 | 60.0 | 16.0 | 130.0 | 72.0 | 38.0 | 3.2 | 1.5 | 3.0 | 1.7 |
| 159-43 | VG 95343 T06 C 003 A | 66.0 | 45.0 | 66.0 | 17.0 | 171.0 | 90.0 | 50.0 | 3.8 | 2.0 | 3.0 | 2.0 |
| 160-43 | VG 95343 T06 C 004 A | 82.0 | 58.0 | 82.0 | 27.0 | 213.0 | 113.0 | 62.0 | 3.8 | 3.8 | 3.0 | 2.0 |
| 152-41 | VG 95343 T06 A 001 A | 24.0 | 10.5 | 24.0 | 6.0 | 26.0 | 9.0 | 10.0 | 1.6 | 0.5 | 3.0 | 1.0 |
| 153-41 | VG 95343 T06 A 002 A | 25.0 | 14.0 | 9.0 | 3.5 | 40.0 | 13.0 | 16.0 | 1.8 | 0.5 | 3.0 | 1.0 |
| 154-41 | VG 95343 T06 A 003 A | 30.0 | 14.0 | 30.0 | 6.0 | 43.0 | 20.0 | 13.0 | 1.8 | 1.0 | 3.0 | 1.0 |
| 155-41 | VG 95343 T06 A 004 A | 31.0 | 18.0 | 31.0 | 7.0 | 47.0 | 15.0 | 18.0 | 1.8 | 1.0 | 3.0 | 1.0 |
| 156-41 | VG 95343 T06 A 005 A | 36.0 | 22.5 | 36.0 | 8.5 | 60.0 | 22.0 | 20.0 | 2.0 | 1.0 | 3.0 | 1.0 |
| 159-41 | VG 95343 T06 A 008 A | 66.0 | 45.0 | 66.0 | 17.0 | 130.0 | 50.0 | 50.0 | 3.8 | 2.0 | 3.0 | 2.0 |
| 157-42 | VG 95343 T06 B 006 A | 43.0 | 28.0 | 43.0 | 10.0 | 79.0 | 41.0 | 20.0 | 2.2 | 1.0 | 3.0 | 1.7 |
| 158-41 | VG 95343 T06 A 007 A | 60.0 | 35.0 | 60.0 | 16.0 | 90.0 | 32.0 | 38.0 | 3.2 | 1.5 | 3.0 | 1.7 |
| 159-41 | VG 95343 T06 A 008 A | 66.0 | 45.0 | 66.0 | 17.0 | 130.0 | 50.0 | 50.0 | 3.8 | 2.0 | 3.0 | 2.0 |
| 159-42 | VG 95343 T06 B 008 A | 66.0 | 45.0 | 66.0 | 17.0 | 150.0 | 70.0 | 50.0 | 3.8 | 2.0 | 3.0 | 2.0 |
| 160-41 | VG 95343 T06 A 009 A | 82.0 | 58.0 | 82.0 | 27.0 | 137.0 | 37.0 | 62.0 | 3.8 | 3.8 | 3.0 | 2.0 |
| 160-42 | VG 95343 T06 B 009 A | 82.0 | 58.0 | 82.0 | 27.0 | 158.0 | 58.0 | 62.0 | 3.8 | 3.8 | 3.0 | 2.0 |

All dimensions in mm. Subject to technical changes.

Bottle Shapes, VG style

- Helashrink 150 Series, with rib



150 Series supplied.



150 Series boot recovered onto a connector.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| W21 | √ | √ | √ | √ | - |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 401-52880 | 152-42-G |
| 401-53880 | 153-42-G |
| 401-54880 | 154-42-G |
| 401-55880 | 155-42-G |
| 401-56880 | 156-42-G |
| 401-57980 | 157-43-G |
| 401-58980 | 158-43-G |
| 401-59980 | 159-43-G |
| 401-60980 | 160-43-G |
| 401-52780 | 152-41-G |
| 401-53780 | 153-41-G |
| 401-54780 | 154-41-G |
| 401-55780 | 155-41-G |
| 401-56780 | 156-41-G |
| 401-59780 | 159-41-G |
| 401-57880 | 157-42-G |
| 401-58780 | 158-41-G |
| 401-59780 | 159-41-G |
| 401-59880 | 159-42-G |
| 401-60780 | 160-41-G |
| 401-60880 | 160-42-G |

Bottle Shapes, MIL style

- Helashrink 100 Series, with rib

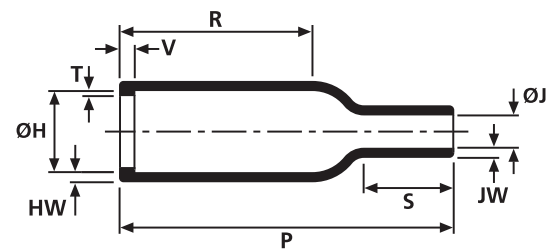
This style is used in conjunction with a circular grooved adaptor providing strain relief and environmental sealing when used in conjunction with one of our complementary adhesives.



104-4 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|------------|------------|-------------|-------------|------------|------------|----------|--|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 20% | S nom | |
| 1030-4 | 12.0 | 9.8 | 6.0 | 2.0 | 19.0 | 8.0 | 1.0 | 0.5 | 1.5 | 0.5 | 4.6 | |
| 1031-4 | 12.0 | 9.8 | 6.0 | 2.0 | 15.0 | 4.0 | 1.0 | 0.5 | 1.5 | 0.5 | 4.6 | |
| 1037-4 | 9.0 | 5.6 | 9.0 | 2.0 | 19.0 | 9.0 | 1.0 | 0.6 | 1.5 | 0.6 | 4.5 | |
| 1009-1 | 9.0 | 5.6 | 4.0 | 3.2 | 27.0 | 14.0 | 1.0 | 0.5 | 1.6 | 0.9 | 7.5 | |
| 113-4 | 10.7 | 7.9 | 4.6 | 2.0 | 25.4 | 14.5 | 1.3 | 1.0 | 3.0 | 1.0 | 4.6 | |
| 104-4 | 16.5 | 7.9 | 16.5 | 3.8 | 25.4 | 14.2 | 1.3 | 1.3 | 3.0 | 1.0 | 6.9 | |
| 105-4 | 23.4 | 10.4 | 23.4 | 5.6 | 38.1 | 14.2 | 1.5 | 1.5 | 3.0 | 1.0 | 10.2 | |
| 106-4 | 31.0 | 14.2 | 31.0 | 6.6 | 55.4 | 22.9 | 1.8 | 1.8 | 3.0 | 1.0 | 10.2 | |
| 101-4 | 31.0 | 17.8 | 31.0 | 7.1 | 67.0 | 38.1 | 2.0 | 2.0 | 3.0 | 1.0 | 17.8 | |
| 102-4 | 36.1 | 22.4 | 36.1 | 8.4 | 73.7 | 43.2 | 1.8 | 1.8 | 3.0 | 1.0 | 21.0 | |
| 103-4 | 42.7 | 28.2 | 42.7 | 9.9 | 99.1 | 54.0 | 2.0 | 2.0 | 3.0 | 1.7 | 24.0 | |
| 107-4 | 51.9 | 35.1 | 51.9 | 15.8 | 124.5 | 66.0 | 3.1 | 3.1 | 3.0 | 1.7 | 40.6 | |
| 118-4 | 66.0 | 44.4 | 66.0 | 20.3 | 160.5 | 91.4 | 3.8 | 3.8 | 3.0 | 2.0 | 48.3 | |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| W21 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| V9500 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 410-30480 | 1030-4-G |
| 410-31001 | 1031-4-G |
| 410-37001 | 1037-4-G |
| 410-09001 | 1009-1-G |
| 401-13480 | 113-4-G |
| 401-04024 | 104-4-G |
| 401-05034 | 105-4-G |
| 401-06036 | 106-4-G |
| 401-01037 | 101-4-G |
| 401-02031 | 102-4-G |
| 401-03041 | 103-4-G |
| 401-07030 | 107-4-G |
| 401-18018 | 118-4-B7 |

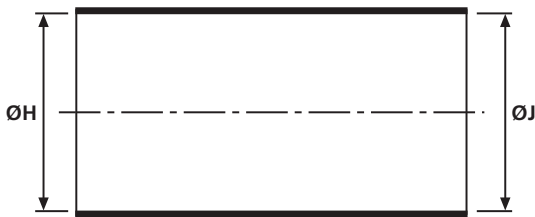
Bottle Shapes

• Helashrink 100 Series, without rib

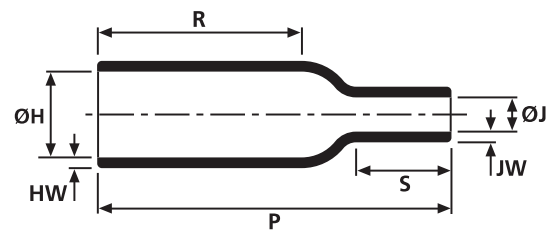
This style provides connector cable strain relief. Can be installed on the connector rear thread or plain shaft and allows easy re-entry for repair when combined with a hot melt adhesive.



109-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R max. | HW ± 20% | JW ± 30% | S nom |
|--------|--------------|--------------|--------------|--------------|------------|-----------|-------------|-------------|----------|
| 104-1 | 16.5 | 7.9 | 16.5 | 3.8 | 25.4 | 14.2 | 1.3 | 1.3 | 6.9 |
| 104-2 | 10.7 | 7.9 | 8.4 | 3.8 | 25.4 | 14.2 | 1.3 | 1.3 | 6.9 |
| 105-1 | 23.4 | 10.4 | 23.4 | 5.6 | 38.1 | 22.9 | 1.5 | 1.5 | 10.2 |
| 106-1 | 31.0 | 14.2 | 31.0 | 6.6 | 55.4 | 26.5 | 1.8 | 1.8 | 16.5 |
| 106-2 | 19.3 | 14.2 | 14.2 | 6.6 | 55.4 | 26.5 | 1.8 | 1.8 | 16.5 |
| 101-1 | 31.0 | 17.8 | 31.0 | 7.1 | 66.0 | 38.1 | 2.0 | 2.0 | 17.8 |
| 101-2 | 23.9 | 17.8 | 15.5 | 7.1 | 66.0 | 38.1 | 2.0 | 2.0 | 17.8 |
| 102-1 | 36.1 | 22.4 | 36.1 | 8.4 | 73.7 | 43.2 | 1.8 | 1.8 | 17.8 |
| 102-2 | 30.0 | 22.4 | 18.0 | 8.4 | 73.7 | 43.2 | 1.8 | 1.8 | 17.8 |
| 1006-1 | 40.0 | 20.0 | 20.0 | 6.0 | 78.8 | 30.0 | 1.5 | 1.0 | 20.0 |
| 103-1 | 42.7 | 28.2 | 42.7 | 9.9 | 95.5 | 54.0 | 2.0 | 2.0 | 24.0 |
| 103-2 | 37.8 | 28.2 | 21.3 | 9.9 | 95.5 | 54.0 | 2.0 | 2.0 | 24.0 |
| 107-1 | 51.9 | 35.1 | 51.9 | 15.8 | 124.5 | 66.0 | 3.1 | 3.1 | 40.6 |
| 107-2 | 46.9 | 35.1 | 35.6 | 15.8 | 124.5 | 66.0 | 3.1 | 3.1 | 40.6 |
| 118-1 | 66.0 | 44.4 | 66.0 | 20.3 | 150.0 | 80.0 | 3.8 | 3.8 | 48.3 |
| 119-1 | 86.4 | 57.2 | 86.4 | 26.6 | 209.6 | 118.1 | 4.6 | 4.6 | 61.0 |
| 113-1 | 10.7 | 7.9 | 4.6 | 2.0 | 25.4 | 14.5 | 1.3 | 1.0 | 4.6 |
| 113-2 | 21.6 | 7.9 | 5.8 | 2.0 | 25.4 | 14.5 | 1.3 | 1.3 | 4.6 |
| 108-1 | 13.7 | 10.4 | 6.6 | 3.1 | 38.1 | 22.9 | 1.5 | 1.0 | 7.6 |
| 108-2 | 27.9 | 10.4 | 7.9 | 3.1 | 38.1 | 22.9 | 1.5 | 1.0 | 7.6 |
| 109-1 | 19.3 | 14.2 | 8.1 | 4.1 | 53.3 | 35.6 | 2.0 | 1.3 | 7.6 |
| 109-2 | 38.1 | 14.2 | 11.7 | 4.1 | 53.3 | 35.6 | 2.0 | 1.3 | 7.6 |
| 110-1 | 23.9 | 17.8 | 11.7 | 5.6 | 63.5 | 38.1 | 2.5 | 1.5 | 12.7 |
| 110-2 | 50.8 | 17.8 | 17.0 | 5.6 | 63.5 | 38.1 | 2.5 | 1.5 | 12.7 |
| 111-1 | 30.0 | 22.4 | 14.7 | 7.1 | 76.2 | 43.2 | 3.1 | 1.8 | 15.2 |
| 111-2 | 63.5 | 22.4 | 21.3 | 7.1 | 76.2 | 43.2 | 3.1 | 1.8 | 15.2 |
| 116-1 | 59.4 | 44.5 | 43.7 | 20.8 | 158.8 | 91.4 | 5.6 | 4.6 | 41.9 |

All dimensions in mm. Subject to technical changes.

Bottle Shapes

- Helashrink 100 Series, without rib



109-1-G supplied / fully recovered.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | - |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 401-04006 | 104-1-G |
| 401-04017 | 104-2-G |
| 401-05005 | 105-1-G |
| 401-06005 | 106-1-G |
| 401-06023 | 106-2-G |
| 401-01006 | 101-1-G |
| 401-01026 | 101-2-G |
| 401-02005 | 102-1-G |
| 401-02020 | 102-2-G |
| 410-06006 | 1006-1-B7 |
| 401-03006 | 103-1-G |
| 401-03024 | 103-2-B7 |
| 401-07006 | 107-1-G |
| 401-07016 | 107-2-B7 |
| 401-18005 | 118-1-G |
| 401-19001 | 119-1-B7 |
| 401-13180 | 113-1-G |
| 401-13011 | 113-2-G |
| 401-08001 | 108-1-B7 |
| 401-08016 | 108-2-G |
| 401-09002 | 109-1-B7 |
| 401-09011 | 109-2-G |
| 401-10005 | 110-1-G |
| 401-10011 | 110-2-G |
| 401-11003 | 111-1-J |
| 401-11011 | 111-2-G |
| 401-16007 | 116-1-B7. |

For Material / Adhesive selection and other information please refer to page 10.

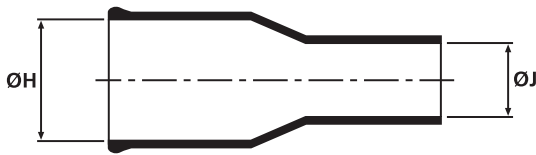
Bottle Shapes

- Helashrink 120 Series, with and without rib

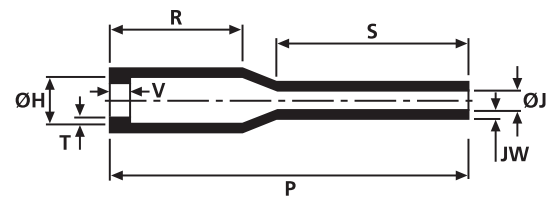
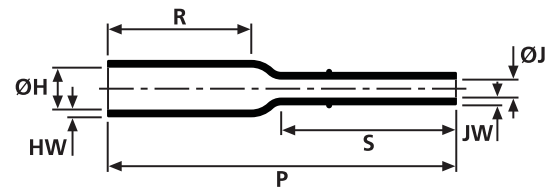
This style has a long tail providing extended strain relief for small diameter wires and can be supplied with or without rib and in various material / adhesive combinations to meet your requirement.



120-42-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|---------|----------|----------|---------|---------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | R ± 10% | W ± 20% | P ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 10% | S nom |
| 120-1 | 16.5 | 7.0 | 10.2 | 3.0 | 24.0 | 1.3 | 60.9 | 1.3 | 1.3 | - | - | 32.0 |
| 120-2 | 20.3 | 7.0 | 10.2 | 3.0 | 24.0 | 1.3 | 60.9 | 1.3 | 1.3 | - | - | 32.0 |
| 120-3 | 16.5 | 7.0 | 10.7 | 3.0 | 24.0 | 1.3 | 38.0 | 1.3 | 1.3 | - | - | 9.1 |
| 120-41* | 16.5 | 7.0 | 10.7 | 3.0 | 24.0 | 1.3 | 38.0 | 1.3 | 1.3 | 3.0 | 1.0 | 32.0 |
| 120-42* | 16.5 | 7.0 | 10.2 | 3.0 | 24.0 | 1.3 | 60.9 | 1.3 | 1.3 | 3.0 | 1.0 | - |

All dimensions in mm. Subject to technical changes.

*Note: 120-41 & 42 are with end ribs.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | - | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 401-20003 | 120-1-G |
| 401-20014 | 120-2-G |
| 401-20020 | 120-3-G |
| 401-20022 | 120-41-G |
| 401-20026 | 120-42-G |

Long Outlet Shape, VG style

- Helashrink 130 Series, with rib, low profile

This style is low profile and lightweight. Typically used on airborne harnesses. Rib locates on circular backshell. For VG shapes with portholes "P" please refer to product standards tables in the appendix.

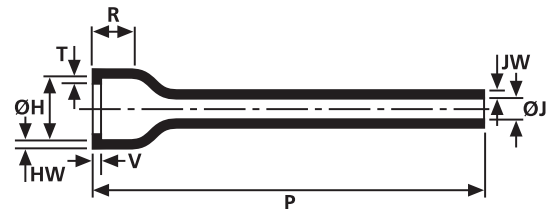


135-1 supplied / fully recovered.

For Material / Adhesive selection and other information please refer to page 10.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 10% |
|-------|----------------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|---------|---------|
| 129-1 | VG95343T06D001A | 22.0 | 12.0 | 22.0 | 6.5 | 76.0 | 12.0 | 1.5 | 1.1 | 3.0 | 1.0 |
| 130-1 | VG95343T06D002A | 25.5 | 15.0 | 25.5 | 7.5 | 83.0 | 12.0 | 1.5 | 1.1 | 3.0 | 1.0 |
| 131-1 | VG95343T06D003A | 29.0 | 19.0 | 29.0 | 8.5 | 89.0 | 12.0 | 1.8 | 1.1 | 3.0 | 1.0 |
| 132-1 | VG95343T06D004A | 34.0 | 23.0 | 34.0 | 10.0 | 102.0 | 12.0 | 1.8 | 1.1 | 3.0 | 1.0 |
| 133-1 | VG95343T06D005A | 37.0 | 30.0 | 37.0 | 11.0 | 108.0 | 14.0 | 2.0 | 1.1 | 3.0 | 1.7 |
| 134-1 | VG95343T06D006A | 43.5 | 34.0 | 43.5 | 12.0 | 114.0 | 15.0 | 2.0 | 1.1 | 3.0 | 1.7 |
| 135-1 | VG95343T06D007A | 50.0 | 41.0 | 50.0 | 14.5 | 118.0 | 15.0 | 2.3 | 1.4 | 3.0 | 1.7 |
| 136-1 | VG95343T06D008A | 62.5 | 47.0 | 62.5 | 18.0 | 121.0 | 16.0 | 2.5 | 1.4 | 3.0 | 2.0 |
| 138-1 | VG95343T06D009A | 69.0 | 60.0 | 69.0 | 20.0 | 127.0 | 16.0 | 2.5 | 1.4 | 3.0 | 2.0 |
| 187-1 | VG95343T06D010A | 81.5 | 67.0 | 81.5 | 23.0 | 133.0 | 16.0 | 2.5 | 1.4 | 3.0 | 2.0 |
| 129-4 | – | 22.3 | 11.4 | 22.3 | 6.5 | 105.9 | 11.7 | 1.5 | 1.1 | 3.0 | 1.0 |
| 130-4 | – | 25.6 | 15.0 | 25.6 | 7.4 | 121.2 | 12.2 | 1.5 | 1.1 | 3.0 | 1.0 |
| 131-4 | – | 29.4 | 18.8 | 29.4 | 8.4 | 138.7 | 12.2 | 1.8 | 1.1 | 1.0 | 1.0 |
| 132-2 | – | 34.0 | 22.9 | 34.0 | 9.7 | 35.0 | 12.2 | 1.8 | 1.1 | 3.0 | 1.0 |
| 132-4 | – | 34.0 | 22.9 | 34.0 | 9.7 | 159.5 | 12.2 | 1.8 | 1.1 | 3.0 | 1.0 |
| 133-2 | – | 37.3 | 26.9 | 37.3 | 10.4 | 47.0 | 14.0 | 2.0 | 1.1 | 3.0 | 1.7 |
| 133-3 | – | 37.3 | 29.5 | 37.3 | 10.4 | 60.0 | 14.0 | 2.0 | 1.1 | 3.0 | 1.7 |
| 133-4 | – | 37.3 | 26.9 | 37.3 | 10.4 | 177.8 | 14.0 | 2.0 | 1.1 | 3.0 | 1.7 |
| 134-4 | – | 43.7 | 34.0 | 43.7 | 12.2 | 203.2 | 15.2 | 2.0 | 1.1 | 3.0 | 1.7 |
| 135-4 | – | 50.0 | 41.2 | 50.0 | 14.2 | 203.2 | 15.2 | 2.3 | 1.4 | 3.0 | 1.7 |
| 136-2 | – | 70.0 | 47.0 | 70.0 | 17.5 | 125.0 | 16.0 | 2.5 | 1.4 | 3.0 | 2.0 |
| 136-4 | – | 62.7 | 47.0 | 62.7 | 17.5 | 203.2 | 16.0 | 2.5 | 1.4 | 3.0 | 2.0 |

All dimensions in mm. Subject to technical changes.

Long Outlet Shape, VG style

- Helashrink 130 Series, with rib, low profile



135-1 supplied / fully recovered.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|---------------|
| 401-29180 | 129-1-G |
| 401-30180 | 130-1-G |
| 401-31180 | 131-1-G |
| 401-32180 | 132-1-G |
| 401-33180 | 133-1-G |
| 401-34180 | 134-1-G |
| 401-35180 | 135-1-G |
| 401-36180 | 136-1-G |
| 401-38180 | 138-1-G |
| 401-87180 | 187-1-G |
| 401-29025 | 129-4-G |
| 401-30021 | 130-4-G |
| 401-31028 | 131-4-G |
| 401-32014 | 132-2-G |
| 401-32030 | 132-4-G |
| 401-33008 | 133-2-JWM250 |
| 401-33036 | 133-3-B7WM250 |
| 401-33021 | 133-4-G |
| 401-34015 | 134-4-G |
| 401-35009 | 135-4-G |
| 401-36024 | 136-2-JW8 |
| 401-36006 | 136-4-G |
| 401-36008 | 136-4-J |

Long Outlet Shapes

- Helashrink 140 Series, without rib

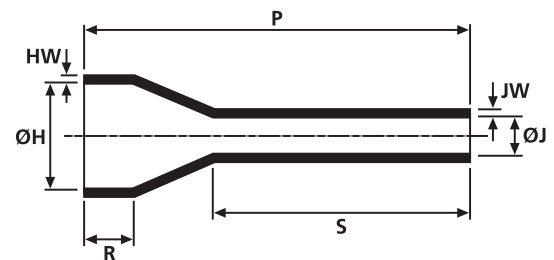
This style is low profile and lightweight, ideally suited to aerospace harness assemblies, the extended tail provides excellent strain relief and flexibility.



146-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 30% | S nom |
| 146-1 | 20.1 | 14.5 | 20.1 | 5.3 | 127.0 | 15.7 | 2.0 | 2.0 | 97.0 |
| 146-2 | 22.3 | 14.5 | 10.2 | 5.3 | 127.0 | 15.7 | 2.0 | 2.0 | 97.0 |
| 148-1 | 30.5 | 18.0 | 30.5 | 7.9 | 146.0 | 15.7 | 2.0 | 2.0 | 125.0 |
| 148-2 | 30.5 | 18.0 | 15.2 | 7.9 | 146.0 | 15.7 | 2.3 | 2.3 | 125.0 |
| 149-1 | 41.2 | 21.8 | 41.2 | 10.2 | 162.1 | 22.4 | 2.3 | 2.3 | - |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | - | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 401-46001 | 146-1-B7 |
| 401-46009 | 146-2-G |
| 401-48006 | 148-1-G |
| 401-48016 | 148-2-J |
| 401-49006 | 149-1-J |

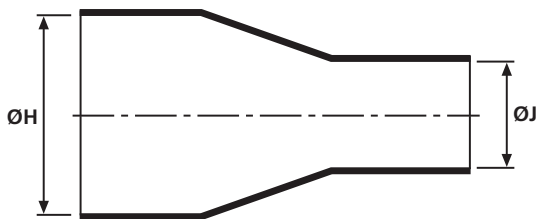
Bottle Shapes

- Helashrink 160 Series, without rib

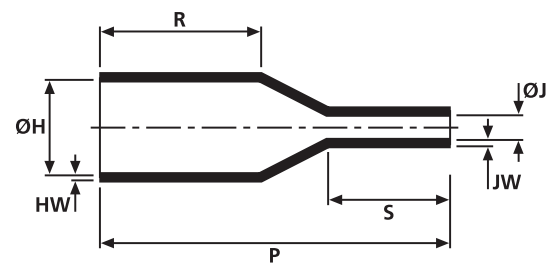
This style is a straight boot used for cable strain relief and environmental protection on many applications and is ideally suited where space is a premium.



162-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
| 162-1 | 22.0 | 14.2 | 9.0 | 4.1 | 44.0 | 15.7 | 1.8 | 1.8 | 16.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|---|
| Adhesive | Material | | | |
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|---------|
| Article-No. | Type |
| 401-62180 | 162-1-G |

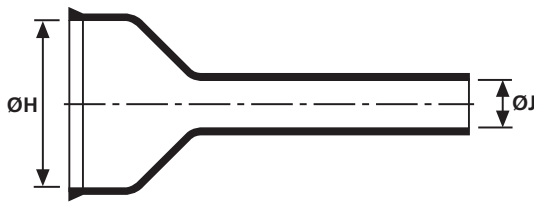
Bottle Shapes, VG style

- Helashrink 170 Series, with rib

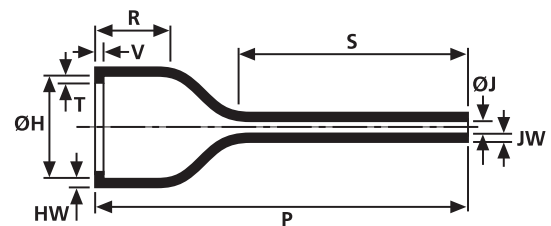
This style provides cable strain relief in applications using partially loaded connectors, resulting in small cable diameters. When used in conjunction with our W24 adhesive, excellent chemical resistance can also be achieved.



177-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH | | ØJ | | P | R | T | HW | JW | V | S |
|--------|----------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-----|-----|------|
| | | min. a | max. b | min. a | max. b | ± 10% | ± 10% | ± 20% | ± 20% | nom | max | nom |
| 1724-1 | – | 20.0 | 16.5 | 20.0 | 4.5 | 42.0 | 20.0 | – | 1.0 | 1.0 | 3.3 | 10.0 |
| 1738-1 | – | 20.0 | 16.5 | 20.0 | 4.5 | 32.0 | 10.0 | – | 1.0 | 1.0 | 3.3 | 22.0 |
| 176-1 | VG95343T06D011A | 19.3 | 13.0 | 6.3 | 2.1 | 60.0 | 11.7 | 1.0 | 1.5 | 1.1 | 3.3 | 38.0 |
| 176-2 | – | 19.0 | 13.0 | 6.0 | 2.0 | 30.0 | 11.7 | 1.0 | 1.5 | 1.1 | 3.3 | 8.0 |
| 176-3 | – | 25.0 | 13.0 | 4.0 | 2.0 | 45.0 | 11.7 | 1.0 | 1.5 | 1.1 | 3.3 | 23.0 |
| 176-4 | – | 19.0 | 13.0 | 6.0 | 2.0 | 60.0 | 11.7 | 1.0 | 1.5 | 1.1 | 3.3 | 38.0 |
| 177-1 | VG95343T06D012A | 26.1 | 19.1 | 7.6 | 2.6 | 74.0 | 12.2 | 1.0 | 1.8 | 1.1 | 3.3 | 45.0 |
| 178-1 | VG95343T06D013A | 34.2 | 26.0 | 9.6 | 3.1 | 84.0 | 12.2 | 1.0 | 1.8 | 1.1 | 3.3 | 51.0 |
| 179-1 | VG95343T06D014A | 43.6 | 34.1 | 11.4 | 3.6 | 100.0 | 12.2 | 1.7 | 1.8 | 1.1 | 3.3 | 58.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------------|
| 417-24003 | 1724-1-B7WM250B |
| 417-38002 | 1738-1-B8WM250 |
| 401-76180 | 176-1-G |
| 401-76014 | 176-2-B7 |
| 401-76018 | 176-3-G |
| 401-77023 | 177-1-G |
| 401-77180 | 177-1-G |
| 401-78180 | 178-1-G |
| 401-79180 | 179-1-G |

Bottle Shapes, VG style

- Helashrink 190 Series, with external ribs

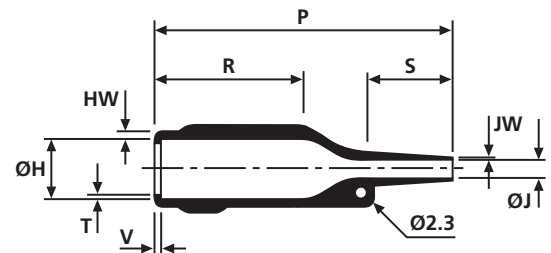
This style was developed specifically for small audio connectors with multiple external ribs to improve grip in harsh conditions.



Recovered 199-4-G, VG style shape for small audio connectors with external ribs for improved grip.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 20% | S nom |
|-------|----------------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|---------|---------|-------|
| 199-4 | VG 95343 T06 A 010 A | 17.5 | 14.0 | 7.0 | 4.3 | 70.0 | 35.0 | 1.8 | 0.5 | 1.5 | 1.0 | 20.0 |
| 199-6 | - | 18.5 | 14.0 | 18.5 | 4.3 | 70.0 | 35.0 | 1.8 | 0.5 | 1.5 | 1.0 | 20.0 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | |
|------------------|----------|---|---|---|
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|---------|
| 401-99480 | 199-4-G |
| 401-99007 | 199-6-G |

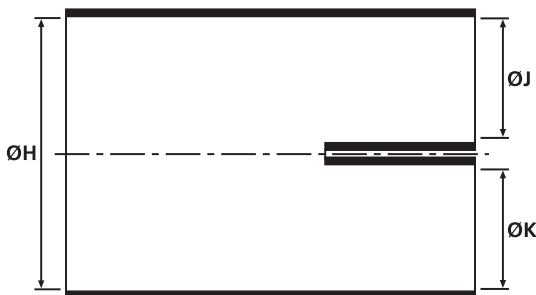
2-Way Outlet Shapes

- Helashrink 200 Series, low profile

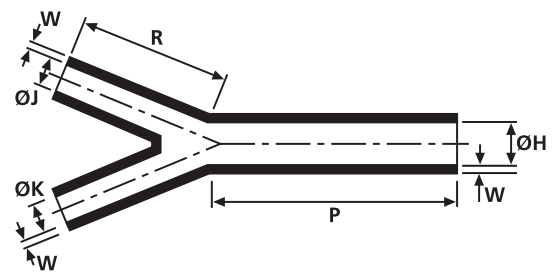
Branching parts are employed for mechanical tension relief in harnesses, where multi core cables are required to be routed out in different directions. High ratio expansion allows for quick and easy installation times.



203-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | W ± 20% |
|-------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|
| 201-1 | 19.0 | 9.4 | 6.4 | 14.0 | 6.4 | 14.0 | 50.8 | 30.5 | 1.5 |
| 201-3 | 24.5 | 9.4 | 14.0 | 6.4 | 14.0 | 6.4 | 50.8 | 30.5 | 1.5 |
| 202-1 | 19.0 | 9.4 | 7.6 | 3.8 | 7.6 | 3.8 | 50.8 | 30.5 | 1.5 |
| 202-2 | 20.0 | 9.4 | 12.5 | 3.8 | 12.5 | 3.8 | 50.8 | 30.5 | 1.5 |
| 202-3 | 24.5 | 9.4 | 16.0 | 3.8 | 16.0 | 3.8 | 50.8 | 30.5 | 1.5 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|----|
| | B7 | G | J | H | B8 |
| WM250 | √ | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | - |
| V9500 | √ | √ | √ | - | - |
| HMT200A | √ | √ | √ | - | √ |
| W21 | - | - | - | - | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|---------|
| 402-01180 | 201-1-G |
| 402-01020 | 201-3-G |
| 402-02004 | 202-1-G |
| 402-02011 | 202-2-G |
| 402-02019 | 202-3-G |

2-Way Outlet Shapes, VG style

• Helashrink 200 Series

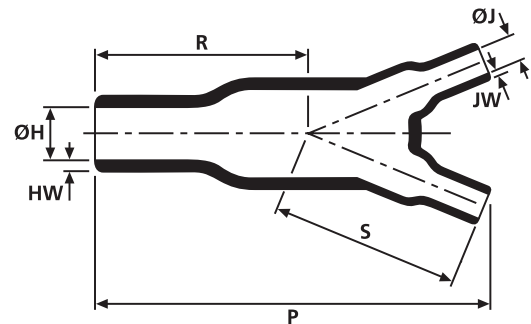
Branching parts are employed for mechanical tension relief in cable harnesses. For VG shapes with portholes "P" please refer to product standards tables in the appendix.



203-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH | ØH | ØJ | ØJ | P | R | HW | JW | S |
|-------|----------------------------|--------|--------|--------|--------|-------|-------|-------|-----|------|
| | | min. a | max. b | min. a | max. b | ± 10% | ± 10% | ± 20% | nom | nom |
| 206-1 | VG95343T08C001A | 13.0 | 6.0 | 7.0 | 3.0 | 41.0 | 19.0 | 1.5 | 1.0 | 19.0 |
| 213-1 | – | 17.3 | 7.9 | 11.1 | 7.9 | 140.0 | 83.1 | 2.3 | 1.0 | 64.0 |
| 213-2 | – | 40.0 | 8.5 | 31.8 | 7.9 | 140.0 | 83.1 | 2.3 | 2.3 | 64.0 |
| 212-1 | VG95343T08C005A | 14.5 | 8.0 | 8.5 | 5.5 | 136.0 | 83.0 | 2.3 | 2.0 | 63.0 |
| 203-1 | VG95343T08C002A | 27.0 | 12.0 | 13.0 | 6.0 | 80.0 | 43.0 | 2.5 | 1.5 | 43.0 |
| 204-1 | VG95343T08C003A | 39.0 | 18.0 | 27.0 | 12.0 | 131.0 | 81.0 | 3.1 | 2.0 | 81.0 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | - | - |
| HMT200A | √ | √ | √ | - | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|---------|
| 402-06180 | 206-1-G |
| 402-13180 | 213-1-G |
| 402-13021 | 213-2-G |
| 402-12180 | 212-1-G |
| 402-03180 | 203-1-G |
| 402-04180 | 204-1-G |

2-Way Outlet Shapes, Breakout Boots

- Helashrink 200 Series, in line, low voltage

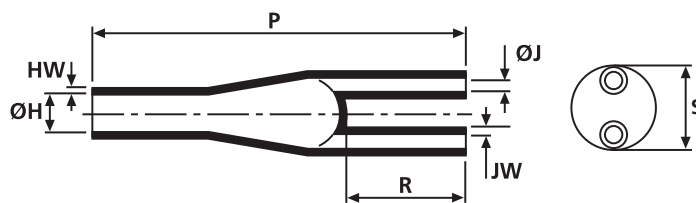
Branching parts are used for easy, time-saving insulation of the branch point of a cable where it is split into single wires. Branching parts with hot melt adhesive also serve to relieve the mechanical tension in cable harnesses.



223-2 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Cable breakouts are available for 2, 3, 4, 5 and 6 core cables.

For Material / Adhesive selection and other information please refer to page 10.

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
| 223-2 | 33.0 | 9.4 | 17.5 | 4.1 | 94.0 | 30.0 | 1.5 | 1.2 | 20.0 |
| 216-2 | 28.0 | 9.4 | 12.0 | 2.8 | 76.5 | 20.0 | 1.6 | 1.6 | - |
| 217-2 | 31.0 | 15.2 | 13.0 | 4.3 | 99.5 | 28.5 | 2.2 | 2.2 | - |
| 218-2 | 49.0 | 22.9 | 20.0 | 7.6 | 119.0 | 34.0 | 3.2 | 3.2 | - |
| 220-1 | 50.0 | 28.0 | 23.0 | 8.0 | 175.0 | 100.0 | 2.5 | 2.0 | 33.0 |
| 219-2 | 77.0 | 38.1 | 37.0 | 12.7 | 141.5 | 42.5 | 3.8 | 3.8 | 44.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|----|
| Adhesive | Material | | | |
| | B7 | G | H | B8 |
| W | √ | √ | √ | √ |
| W2 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|---------------|
| Article-No. | Type |
| 402-23058 | 223-2-B8W |
| 402-16038 | 216-2-B7WM250 |
| 402-17014 | 217-2-B7 |
| 402-18020 | 218-2-B7 |
| 402-20008 | 220-1-B7 |
| 402-19020 | 219-2-B8 |

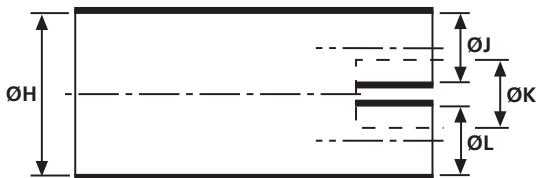
3-Way Outlet Shapes, VG style

• Helashrink 300 Series

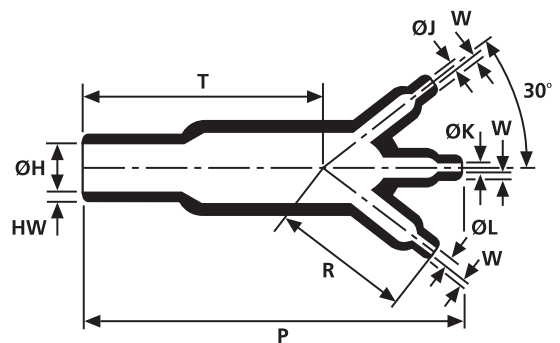
This style provides cable strain relief and mechanical protection at harness transition points, all outlets are clearly marked to aid orientation on installation.



304-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | |
|----------------------|----------------------------|-----------|-----------|---------------|---------------|---------|---------|----------|---------|---------|
| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ/K/L min. a | ØJ/K/L max. b | P ± 10% | R ± 10% | HW ± 20% | W ± 20% | T ± 10% |
| 306-1 | VG95343T08D001A | 13.0 | 6.5 | 6.5 | 3.5 | 46.0 | 25.4 | 1.3 | 1.0 | 20.3 |
| 304-1 | VG95343T08D002A | 27.0 | 13.5 | 13.0 | 7.0 | 93.0 | 50.3 | 2.5 | 1.5 | 42.9 |
| 310-1 | VG95343T08D003A | 38.5 | 19.0 | 19.0 | 10.0 | 135.0 | 73.7 | 3.1 | 1.8 | 61.0 |
| 311-1 | VG95343T08D004A | 55.5 | 25.5 | 27.0 | 12.5 | 192.0 | 103.1 | 4.6 | 3.1 | 88.9 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|---------|
| Article-No. | Type |
| 403-06180 | 306-1-G |
| 403-04180 | 304-1-G |
| 403-10180 | 310-1-G |
| 403-11180 | 311-1-G |

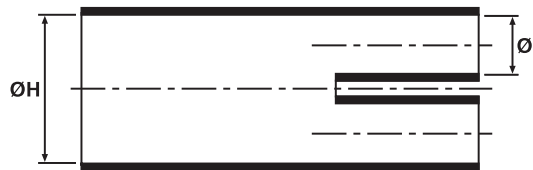
3-Way Outlet Shapes, Breakout Boots

- Helashrink 300 Series, in line, low voltage

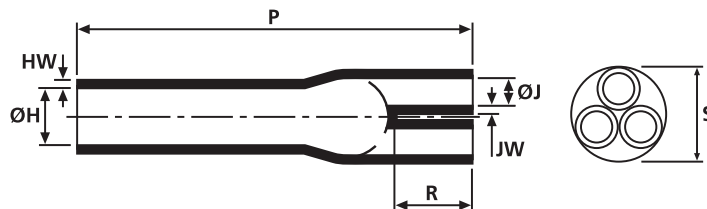
Branching parts are used for easy, time-saving insulation of the branch point of a cable where it is split into single wires. Branching parts with hot melt adhesive also serve to relieve the mechanical tension in cable harnesses.



300 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
| 318-1 | 23.0 | 9.1 | 9.0 | 3.0 | 76.5 | 20.0 | 2.5 | 2.5 | 16.0 |
| 339-2 | 39.0 | 12.7 | 17.0 | 4.1 | 102.0 | 56.0 | 2.9 | 2.9 | 26.0 |
| 319-1 | 31.0 | 17.5 | 13.0 | 4.6 | 93.5 | 28.5 | 2.9 | 2.9 | 23.0 |
| 328-2 | 44.0 | 22.8 | 21.0 | 7.6 | 99.0 | 34.0 | 3.8 | 3.8 | - |
| 342-1 | 110.0 | 35.0 | 40.0 | 17.5 | 230.0 | 45.0 | 4.0 | 3.5 | 65.0 |
| 330-2 | 61.0 | 35.5 | 32.0 | 12.7 | 144.5 | 45.5 | 3.8 | 3.8 | 47.0 |
| 340-2 | 82.0 | 50.8 | 36.0 | 19.1 | 144.5 | 45.5 | 4.5 | 4.5 | 65.0 |
| 341-1 | 125.0 | 59.0 | 50.8 | 25.4 | 283.0 | 71.0 | 3.8 | 3.8 | 75.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|----|---|
| Adhesive | Material | | | | |
| | B7 | G | H | B8 | J |
| W | √ | √ | √ | √ | √ |
| W2 | √ | √ | √ | √ | - |
| WM250 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | - | - | √ |
| HMT200A | √ | √ | - | √ | √ |
| W21 | - | - | √ | - | √ |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|---------------|
| Article-No. | Type |
| 403-18018 | 318-1-G |
| 403-39017 | 339-2-G |
| 403-19022 | 319-1-G |
| 403-28015 | 328-2-J |
| 403-42006 | 342-1-B8W2 |
| 403-30014 | 330-2-B7WM250 |
| 403-41005 | 341-1-B8W2 |

4-Way Outlet Shapes, VG style

• Helashrink 400 Series

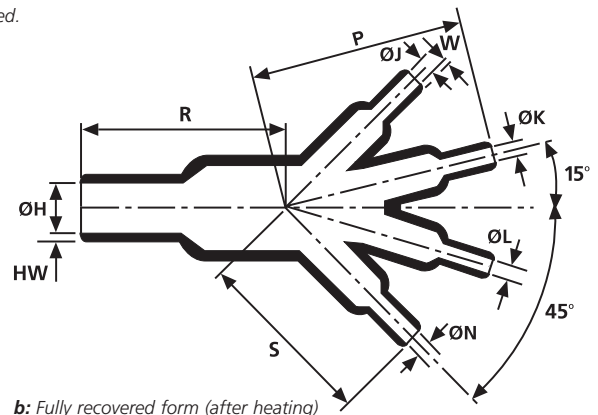
This style provides cable strain relief and mechanical protection at harness transition points, all outlets are clearly marked to aid orientation on installation.



403-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | |
|----------------------|----------------------------|-----------|-----------|-----------------|-----------------|---------|---------|---------|----------|---------|
| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ/K/L/N min. a | ØJ/K/L/N max. b | P ± 10% | R ± 10% | S ± 10% | HW ± 20% | W ± 10% |
| 411-1 | VG95343T08E002A | 19.0 | 10.0 | 9.5 | 5.5 | 36.1 | 35.6 | 32.0 | 1.8 | 1.0 |
| 403-1 | VG95343T08E004A | 27.0 | 13.0 | 13.0 | 7.0 | 51.8 | 49.0 | 45.0 | 2.5 | 1.0 |
| 413-1 | VG95343T08E005A | 38.6 | 19.0 | 19.0 | 10.0 | 74.9 | 75.0 | 65.3 | 1.8 | 1.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | H | L | J |
| WM250 | √ | √ | √ | - | √ |
| W8 | √ | √ | √ | - | √ |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | - | - |
| HMT200A | √ | √ | √ | - | - |
| W21 | - | - | √ | - | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|---------|
| Article-No. | Type |
| 404-11180 | 411-1-G |
| 404-03180 | 403-1-G |
| 404-13180 | 413-1-G |

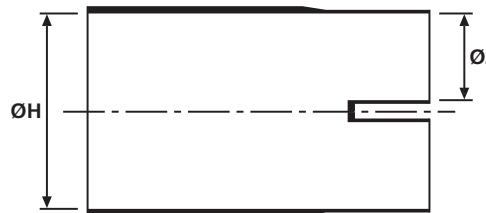
4-Way Outlet Shapes, Breakout Boots

- Helashrink 400 Series, in line, low voltage

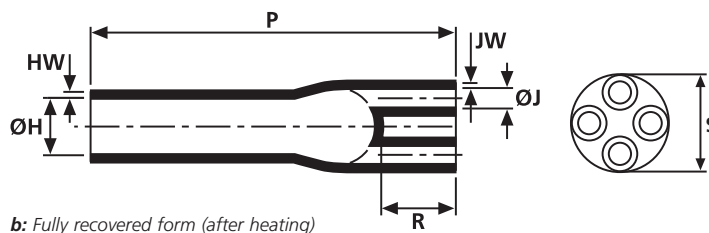
Branching parts are used for easy, time-saving insulation of the branch point of a cable where it is split into single wires. They are manufactured from a tough cross-linked flame retarded polyolefin. Branching parts with hot melt adhesive also serve to relieve the mechanical tension in cable harnesses whilst providing excellent IP ratings.



442-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
| 442-1 | 28.0 | 9.0 | 9.0 | 1.8 | 78.0 | 17.0 | 2.7 | 2.0 | 20.0 |
| 434-2 | 23.0 | 11.0 | 8.0 | 2.8 | 78.0 | 22.0 | 1.6 | 1.6 | 18.0 |
| 443-1 | 35.0 | 12.0 | 15.0 | 3.0 | 132.0 | 26.0 | 3.0 | 2.5 | 22.0 |
| 408-2 | 35.0 | 12.0 | 15.0 | 3.0 | 95.0 | 24.0 | 2.5 | 2.0 | 22.0 |
| 435-2 | 32.0 | 20.3 | 13.0 | 4.8 | 93.5 | 28.5 | 2.9 | 2.9 | 27.0 |
| 409-2 | 47.4 | 22.9 | 21.5 | 6.4 | 165.0 | 38.1 | 4.1 | 3.3 | 38.1 |
| 418-4 | 60.0 | 22.9 | 30.0 | 6.4 | 202.0 | 38.1 | 4.1 | 3.3 | 38.1 |
| 436-2 | 45.0 | 24.9 | 21.0 | 7.1 | 99.0 | 34.0 | 4.5 | 4.5 | 39.0 |
| 437-1 | 60.0 | 25.4 | 26.0 | 8.9 | 240.0 | 48.0 | 4.5 | 4.5 | 43.0 |
| 438-2 | 68.0 | 35.6 | 31.0 | 13.5 | 141.5 | 42.5 | 4.5 | 4.5 | 54.0 |
| 444-2 | 35.6 | 95.0 | 35.6 | 12.5 | 240.0 | 55.0 | 4.0 | 3.5 | 50.8 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|----|---|
| Adhesive | Material | | | | |
| | B7 | G | H | B8 | J |
| W | √ | √ | √ | √ | √ |
| W2 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | - | √ |
| V9500 | √ | √ | - | - | √ |
| HMT200A | √ | √ | - | √ | √ |
| W21 | - | - | √ | - | √ |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|------------|
| Article-No. | Type |
| 404-42022 | 442-1-B8W |
| 404-34017 | 434-2-G |
| 404-43002 | 443-1-B8 |
| 404-08022 | 408-2-B8W2 |
| 404-35007 | 435-2-J |
| 404-09021 | 409-2-B8W2 |
| 404-18020 | 418-4-B8W2 |
| 404-37001 | 437-1-B7 |
| 404-38008 | 438-2-J |
| 404-44022 | 444-2-B8W2 |

5-Way Outlet Shapes, Breakout Boots

- Helashrink 500 Series, in line, low voltage

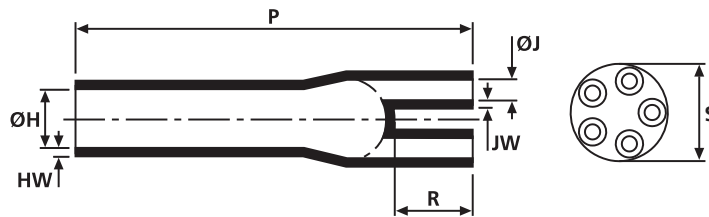
Cable breakout boots are designed for insulating and sealing a cable crotch, or conduit system, and provide excellent resistance to abrasion and weathering.



500 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
| 508-1 | 60.0 | 24.5 | 30.0 | 7.5 | 180.0 | 30.0 | 3.5 | 3.0 | 48.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | |
|---------------------------|----------|---|---|
| Adhesive | Material | | |
| | B7 | G | H |
| W | √ | √ | √ |
| W2 | √ | √ | - |
| V9500 | √ | √ | √ |
| HMT200A | √ | √ | √ |
| W21 | - | - | √ |
| Without Adhesive | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 405-08021 | 508-1-B7 |

6-Way Outlet Shapes, Breakout Boots

- Helashrink 600 Series, in line, low voltage

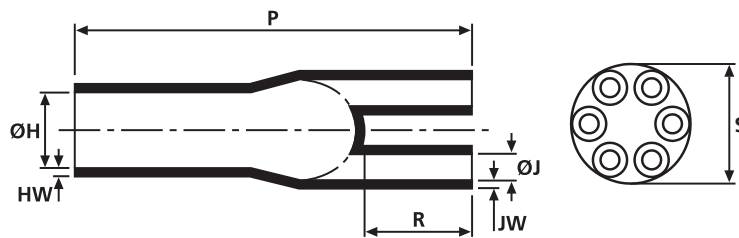
Cable breakout boots are designed for insulating and sealing a cable crotch, or conduit system, and provide excellent resistance to abrasion and weathering.



600 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S nom |
|-------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|
| 609-1 | 30.0 | 16.0 | 8.2 | 4.0 | 75.0 | 20.0 | 2.5 | 1.5 | 25.0 |
| 609-2 | 40.0 | 16.0 | 12.0 | 4.0 | 75.0 | 20.0 | 2.5 | 1.5 | 25.0 |
| 608-1 | 61.0 | 36.8 | 21.0 | 8.9 | 152.5 | 56.5 | 3.1 | 3.2 | 50.0 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | |
|------------------|----------|---|---|
| | B7 | G | H |
| W | √ | √ | √ |
| W2 | √ | √ | - |
| V9500 | √ | √ | - |
| HMT200A | √ | √ | √ |
| W21 | - | - | √ |
| Without Adhesive | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 406-09003 | 609-1-G |
| 406-09023 | 609-2-B7 |
| 406-08007 | 608-1-G |

Right Angle Shapes, VG style

- Helashrink 1100 Series, with rib

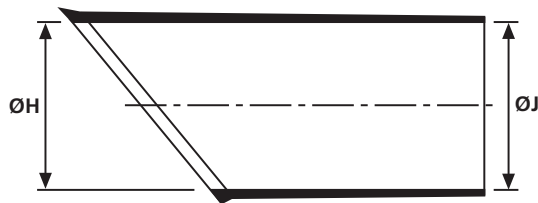
This style provides strain relief for harness systems when used in conjunction with a circular grooved adaptor. For VG shapes with portholes "P" please refer to product standards tables in the appendix.



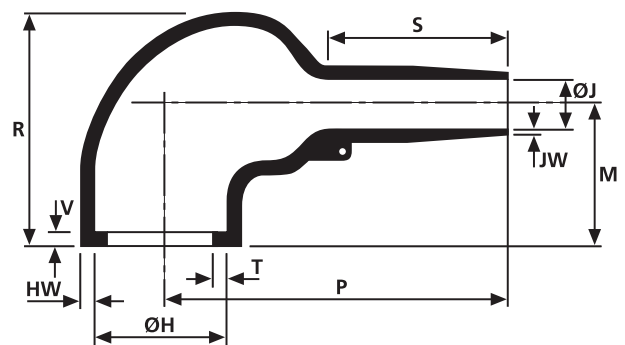
1152-4-G recovered onto a connector.



1155-4 supplied.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | V ± 10% | T ± 20% | M nom | S nom |
|--------|----------------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|---------|---------|-------|-------|
| 1152-4 | VG95343T06E001A | 24.0 | 10.5 | 24.0 | 6.0 | 26.0 | 25.0 | 1.3 | 0.5 | 3.0 | 1.0 | 19.0 | 10.0 |
| 1154-4 | VG95343T06E002A | 30.0 | 15.5 | 30.0 | 6.0 | 32.0 | 27.0 | 1.5 | 0.8 | 3.0 | 1.0 | 19.0 | 12.0 |
| 1155-4 | VG95343T06E003A | 31.0 | 18.0 | 31.0 | 7.0 | 40.0 | 31.0 | 1.8 | 1.0 | 3.0 | 1.0 | 21.0 | 15.0 |
| 1156-4 | VG95343T06E004A | 36.0 | 22.5 | 36.0 | 8.5 | 46.0 | 38.0 | 1.8 | 1.0 | 3.0 | 1.0 | 26.0 | 15.0 |
| 1157-4 | VG95343T06E005A | 43.0 | 28.5 | 43.0 | 10.0 | 55.0 | 45.0 | 2.0 | 1.0 | 3.0 | 1.7 | 30.0 | 16.0 |
| 1158-4 | VG95343T06E006A | 60.0 | 35.0 | 60.0 | 16.0 | 80.0 | 54.0 | 3.3 | 1.5 | 3.0 | 1.7 | 35.0 | 30.0 |
| 1159-4 | VG95343T06E007A | 66.0 | 45.0 | 66.0 | 17.0 | 108.0 | 68.0 | 3.8 | 2.0 | 3.0 | 2.0 | 42.0 | 51.0 |
| 1160-4 | VG95343T06E008A | 82.0 | 61.0 | 82.0 | 25.0 | 118.0 | 84.0 | 4.0 | 4.0 | 3.0 | 2.0 | 52.0 | 39.0 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | | | |
|------------------|----------|---|---|---|----|---|
| | B7 | G | J | H | B8 | L |
| WM250 | √ | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - | - |
| W24 | √ | √ | √ | √ | - | √ |
| V9500 | √ | √ | √ | √ | - | - |
| HMT200A | √ | √ | √ | √ | √ | - |
| W21 | - | - | √ | √ | - | - |
| Without Adhesive | √ | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 411-52480 | 1152-4-G |
| 411-54480 | 1154-4-G |
| 411-55480 | 1155-4-G |
| 411-56480 | 1156-4-G |
| 411-57480 | 1157-4-G |
| 411-58480 | 1158-4-G |
| 411-59480 | 1159-4-G |
| 411-60480 | 1160-4-G |

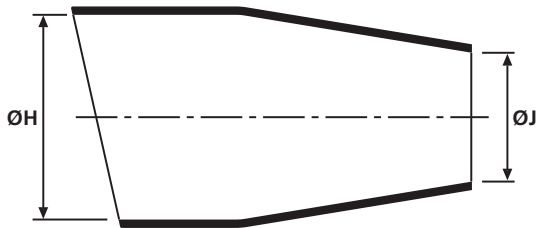
Right Angle Shapes, VG style

- Helashrink 1100 Series, without rib, thick wall

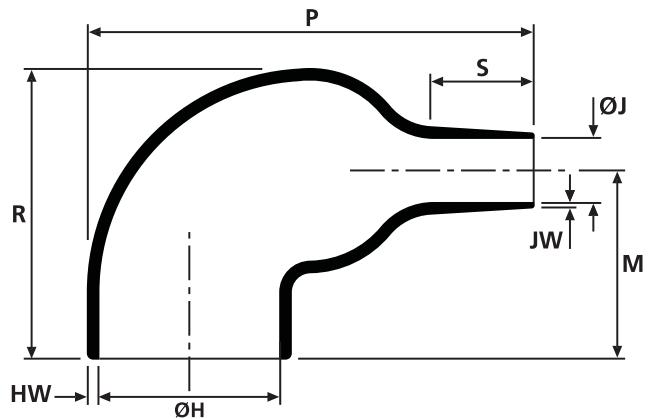
This style provides connector cable strain relief. Can be installed on the connector rear thread or plain shaft, allows easy re-entry for repair when combined with a hot melt adhesive.



1114-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | |
|----------------------|----------------------------|-----------|-----------|-----------|-----------|--------|---------|----------|----------|-------|-------|
| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ±20% | R ± 10% | HW ± 30% | JW ± 30% | M nom | S nom |
| 1113-1 | VG95343T063003A | 19.0 | 14.5 | 8.0 | 4.5 | 39.0 | 26.0 | 2.5 | 1.8 | 19.0 | 8.0 |
| 1114-1 | VG95343T063004A | 23.5 | 18.0 | 11.5 | 5.5 | 51.0 | 33.0 | 3.0 | 1.0 | 22.0 | 9.5 |
| 1118-1 | VG95343T063008A | 59.0 | 45.0 | 44.0 | 21.0 | 133.0 | 73.0 | 7.0 | 5.0 | 45.0 | 40.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|---|
| Adhesive | Material | | | |
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 411-13002 | 1113-1-G |
| 411-14004 | 1114-1-G |
| 411-18001 | 1118-1-B7 |

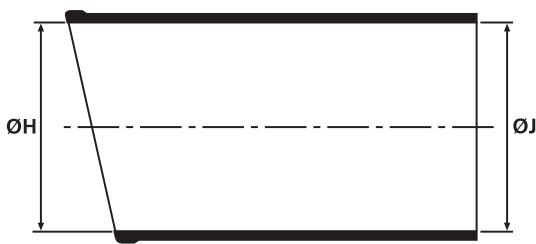
Right Angle Shapes, MIL style

- Helashrink 1100 Series, with rib

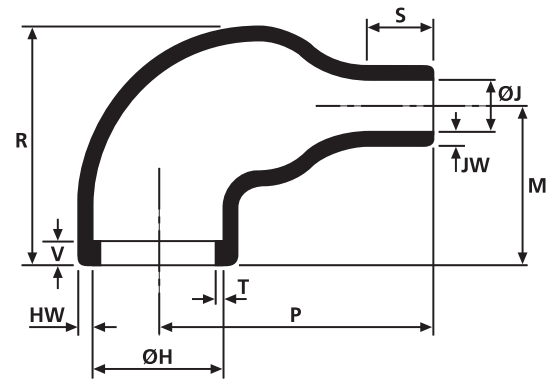
This style provides strain relief for harness systems when used in conjunction with circular grooved adaptor.



1108-4 supplied / fully recovered



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|-------|---------|-------|-------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 30% | V max | T ± 20% | M nom | S nom |
| 1181-4 | 12.0 | 9.8 | 6.0 | 2.0 | 19.0 | 13.0 | 1.0 | 0.5 | 1.5 | 0.6 | 11.0 | 6.0 |
| 1108-4 | 16.5 | 7.9 | 16.5 | 2.5 | 18.3 | 20.1 | 1.0 | 1.6 | 3.3 | 1.0 | 15.2 | 5.1 |
| 1106-4 | 23.3 | 10.4 | 23.3 | 5.6 | 20.3 | 22.9 | 1.3 | 1.3 | 3.3 | 1.0 | 15.2 | 5.8 |
| 1107-4 | 28.4 | 14.2 | 28.4 | 6.3 | 29.8 | 28.5 | 1.5 | 1.5 | 3.3 | 1.0 | 21.4 | 7.1 |
| 1104-4 | 30.9 | 17.8 | 30.9 | 7.1 | 35.6 | 30.5 | 1.8 | 1.8 | 3.3 | 1.0 | 20.6 | 8.6 |
| 1103-4 | 36.0 | 22.4 | 36.0 | 8.4 | 43.2 | 35.6 | 1.8 | 1.8 | 3.3 | 1.0 | 22.9 | 12.7 |
| 1101-4 | 42.6 | 27.9 | 42.6 | 9.7 | 53.3 | 43.2 | 2.0 | 2.0 | 3.3 | 1.7 | 27.9 | 15.7 |
| 1105-4 | 51.8 | 35.1 | 51.8 | 15.7 | 78.7 | 53.3 | 3.3 | 3.3 | 3.3 | 1.7 | 33.0 | 30.5 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | - | - |
| HMT200A | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | - |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 411-81480 | 1181-4-G |
| 411-08015 | 1108-4-B7 |
| 411-06019 | 1106-4-G |
| 411-07020 | 1107-4-G |
| 411-04032 | 1104-4-G |
| 411-03024 | 1103-4-G |
| 411-01020 | 1101-4-G |
| 411-05019 | 1105-4-J |

Right Angle Shapes

- Helashrink 1100 Series, without rib

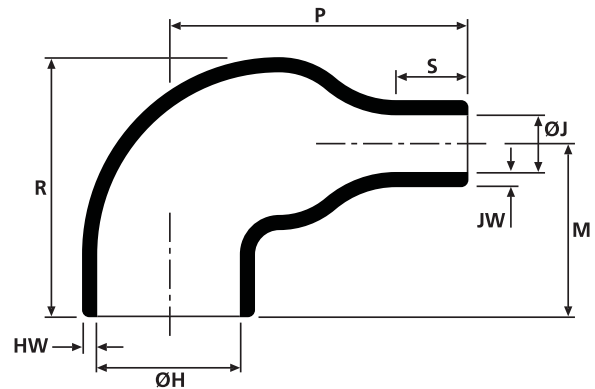
This style provides connector cable strain relief. Can be installed on the connector rear thread or plain shaft, allows easy re-entry for repair when combined with a hot melt adhesive.



1108-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

For Material / Adhesive selection and other information please refer to page 10.

Standard combinations

| Article-No. | Type |
|-------------|------------|
| 411-08002 | 1108-1-B7 |
| 411-08011 | 1108-2-G |
| 411-06003 | 1106-1-G |
| 411-06051 | 1106-2-B7 |
| 411-07004 | 1107-1-G |
| 411-07011 | 1107-2-G |
| 411-04005 | 1104-1-G |
| 411-04013 | 1104-2-G |
| 411-03003 | 1103-1-G |
| 411-03012 | 1103-2-G |
| 411-01005 | 1101-1-G |
| 411-01029 | 1101-1-GW8 |
| 411-05005 | 1105-1-G |
| 411-05010 | 1105-2-G |
| 411-09004 | 1109-1-G |
| 411-00001 | 1100-4-G |

Sizes and Type Table

| Type | ØH | | ØJ | | P | | R | | HW | | JW | | S nom | M nom |
|--------|--------|--------|--------|--------|-------|-------|-------|-------|------|------|----|--|-------|-------|
| | min. a | max. b | min. a | max. b | ± 10% | ± 10% | ± 20% | ± 30% | | | | | | |
| 1108-1 | 16.5 | 7.9 | 16.5 | 2.5 | 18.3 | 20.1 | 1.0 | 1.6 | 5.1 | 15.2 | | | | |
| 1108-2 | 10.6 | 7.9 | 8.3 | 2.5 | 18.3 | 20.1 | 1.0 | 1.6 | 5.1 | 15.2 | | | | |
| 1106-1 | 23.6 | 10.4 | 23.6 | 5.6 | 20.3 | 22.9 | 1.3 | 1.3 | 5.8 | 15.2 | | | | |
| 1106-2 | 13.7 | 10.4 | 11.6 | 5.6 | 20.3 | 22.9 | 1.3 | 1.3 | 5.8 | 15.2 | | | | |
| 1107-1 | 28.4 | 14.2 | 28.4 | 6.3 | 29.8 | 28.5 | 1.5 | 1.5 | 7.1 | 18.5 | | | | |
| 1107-2 | 19.3 | 14.2 | 14.2 | 6.3 | 29.8 | 28.5 | 1.5 | 1.5 | 7.1 | 18.5 | | | | |
| 1104-1 | 24.1 | 17.8 | 15.7 | 7.1 | 35.6 | 30.5 | 1.8 | 1.8 | 8.6 | 20.6 | | | | |
| 1104-2 | 31.7 | 17.8 | 31.7 | 7.1 | 35.6 | 30.5 | 1.8 | 1.8 | 8.6 | 20.6 | | | | |
| 1103-1 | 38.1 | 22.4 | 38.1 | 8.4 | 43.2 | 35.6 | 1.8 | 1.8 | 12.7 | 22.9 | | | | |
| 1103-2 | 30.4 | 22.4 | 19.0 | 8.4 | 43.2 | 35.6 | 1.8 | 1.8 | 12.7 | 22.9 | | | | |
| 1101-1 | 43.1 | 27.9 | 43.1 | 9.7 | 53.3 | 43.2 | 2.0 | 2.0 | 15.7 | 27.9 | | | | |
| 1101-2 | 38.1 | 27.9 | 22.8 | 9.7 | 53.3 | 43.2 | 2.0 | 2.0 | 15.7 | 27.9 | | | | |
| 1105-1 | 52.3 | 35.1 | 52.3 | 15.7 | 78.7 | 53.5 | 3.3 | 3.3 | 30.5 | 33.0 | | | | |
| 1105-2 | 46.9 | 35.1 | 35.3 | 15.7 | 78.7 | 53.5 | 3.3 | 3.3 | 30.5 | 33.0 | | | | |
| 1109-1 | 66.0 | 44.5 | 66.0 | 20.3 | 97.5 | 66.0 | 3.8 | 3.8 | 40.6 | 41.7 | | | | |
| 1100-4 | 26.0 | 15.5 | 16.0 | 4.0 | 25.0 | 17.0 | 1.8 | 1.0 | 20.0 | 17.0 | | | | |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Right Angle Shapes, VG style/MIL style

- Helashrink 1100 Series, with rib, low profile

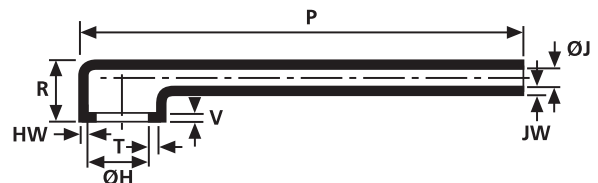
This style is typically used on airborne harnesses to achieve light weight, low profile, compact strain relief and mechanical protection.



1123-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 30% | T ± 10% | V ± 10% |
|--------|----------------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|---------|---------|
| 1121-1 | VG95343T06F001A | 22.0 | 12.0 | 22.0 | 6.5 | 70.0 | 19.0 | 1.5 | 1.1 | 1.0 | 3.0 |
| 1122-1 | VG95343T06F002A | 25.5 | 15.0 | 25.0 | 7.5 | 79.0 | 20.0 | 1.5 | 1.1 | 1.0 | 3.0 |
| 1123-1 | VG95343T06F003A | 29.0 | 19.0 | 29.0 | 8.5 | 89.0 | 21.0 | 1.8 | 1.1 | 1.0 | 3.0 |
| 1124-1 | VG95343T06F004A | 34.0 | 23.0 | 34.0 | 10.0 | 102.0 | 22.0 | 1.8 | 1.1 | 1.0 | 3.0 |
| 1125-1 | VG95343T06F005A | 37.0 | 30.0 | 37.0 | 11.0 | 108.0 | 24.0 | 2.0 | 1.1 | 1.7 | 3.0 |
| 1126-1 | VG95343T06F006A | 43.5 | 34.0 | 43.5 | 12.0 | 121.0 | 27.0 | 2.0 | 1.1 | 1.7 | 3.0 |
| 1127-1 | VG95343T06F007A | 50.0 | 41.5 | 50.0 | 14.5 | 132.0 | 30.0 | 2.3 | 1.4 | 1.7 | 3.0 |
| 1128-1 | VG95343T06F008A | 62.5 | 47.0 | 62.5 | 18.0 | 133.0 | 33.0 | 2.5 | 1.4 | 2.0 | 3.0 |
| 1129-1 | VG95343T06F009A | 69.0 | 60.0 | 69.0 | 20.0 | 137.0 | 35.0 | 2.5 | 1.4 | 2.0 | 3.0 |
| 1141-1 | VG95343T06F010A | 82.0 | 67.0 | 82.0 | 23.0 | 140.0 | 45.0 | 2.5 | 1.4 | 2.0 | 3.0 |
| 1121-4 | – | 22.3 | 11.4 | 22.3 | 6.4 | 105.2 | 18.5 | 1.5 | 1.1 | 1.0 | 3.3 |
| 1122-4 | – | 25.6 | 15.0 | 25.6 | 7.5 | 124.0 | 19.8 | 1.5 | 1.1 | 1.0 | 3.3 |
| 1123-4 | – | 29.4 | 19.0 | 29.4 | 8.5 | 146.3 | 20.8 | 1.8 | 1.1 | 1.0 | 3.3 |
| 1124-4 | – | 34.0 | 22.9 | 34.0 | 10.0 | 172.2 | 21.8 | 1.8 | 1.1 | 1.0 | 3.3 |
| 1125-4 | – | 29.5 | 37.3 | 37.3 | 11.0 | 185.2 | 24.4 | 2.0 | 1.1 | 1.7 | 3.3 |
| 1125-2 | – | 41.2 | 29.5 | 41.2 | 11.0 | 82.0 | 24.4 | 2.0 | 1.1 | 1.7 | 3.3 |
| 1126-4 | – | 43.7 | 34.0 | 43.7 | 12.0 | 213.6 | 27.0 | 2.0 | 1.1 | 1.7 | 3.3 |
| 1127-4 | – | 50.0 | 41.1 | 2.3 | 14.5 | 224.5 | 9.5 | 2.3 | 1.4 | 1.7 | 3.3 |
| 1127-3 | – | 50.0 | 41.1 | 2.3 | 14.5 | 65.0 | 29.5 | 2.3 | 1.4 | 1.7 | 3.3 |
| 1128-4 | – | 62.7 | 47.0 | 62.7 | 18.0 | 227.3 | 33.3 | 2.5 | 1.4 | 2.0 | 3.3 |
| 1129-4 | – | 69.3 | 59.7 | 69.3 | 20.0 | 233.4 | 35.1 | 2.5 | 1.4 | 2.0 | 3.3 |

All dimensions in mm. Subject to technical changes.

Right Angle Shapes, VG style/MIL style

- Helashrink 1100 Series, with rib, low profile



1123-1-G supplied / fully recovered.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 411-21180 | 1121-1-G |
| 411-22180 | 1122-1-G |
| 411-23180 | 1123-1-G |
| 411-24180 | 1124-1-G |
| 411-25180 | 1125-1-G |
| 411-26180 | 1126-1-G |
| 411-27180 | 1127-1-G |
| 411-28180 | 1128-1-G |
| 411-29180 | 1129-1-G |
| 411-41180 | 1141-1-G |
| 411-21007 | 1121-4-G |
| 411-22015 | 1122-4-G |
| 411-23013 | 1123-4-G |
| 411-24009 | 1124-4-G |
| 411-25008 | 1125-4-G |
| 411-25027 | 1125-2-G |
| 411-26008 | 1126-4-G |
| 411-27008 | 1127-4-G |
| 411-27005 | 1127-3-B7 |
| 411-28002 | 1128-4-G |
| 411-29001 | 1129-4-J |

For Material / Adhesive selection and other information please refer to page 10.

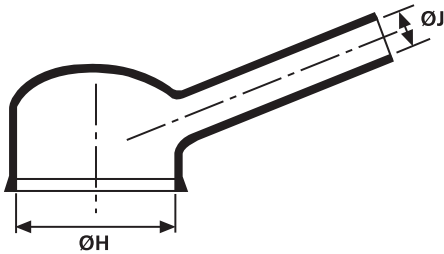
Right Angle Shapes, VG style

- Helashrink 1100 Series, with rib, low profile, high ratio

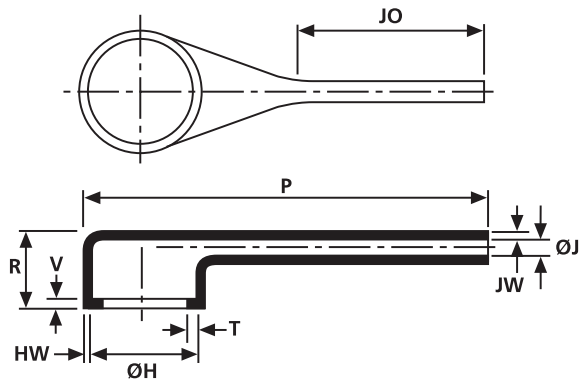
This style provides connector cable strain relief. Used in applications for partially loaded connectors with small cable diameters. The tail is designed to allow easy orientation prior to cooling.



1135-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH | ØH | ØJ | ØJ | P | R | HW | JW | JO | V | T |
|--------|----------------------------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| | | min. a | max. b | min. a | max. b | ± 10% | ± 10% | ± 20% | ± 20% | ± 10% | ± 10% | ± 20% |
| 1133-1 | VG95343T06F011A | 19.0 | 13.0 | 6.0 | 2.0 | 44.0 | 16.3 | 1.5 | 1.1 | 21.8 | 3.0 | 1.0 |
| 1133-2 | - | 19.0 | 13.0 | 6.0 | 2.0 | 30.0 | 16.0 | 1.5 | 1.1 | 1.0 | 3.3 | 1.0 |
| 1134-1 | VG95343T18H001A | 26.0 | 19.0 | 7.5 | 2.5 | 67.0 | 18.0 | 1.8 | 1.1 | 29.2 | 3.0 | 1.0 |
| 1135-1 | VG95343T06F013A | 34.0 | 26.0 | 9.5 | 3.0 | 81.0 | 18.8 | 1.8 | 1.1 | 35.3 | 3.0 | 1.0 |
| 1135-1 | VG95343T06F013A | 34.0 | 26.0 | 9.5 | 3.0 | 81.0 | 18.8 | 1.8 | 1.1 | 35.3 | 3.0 | 1.0 |
| 1136-1 | VG95343T06F014A | 43.5 | 34.0 | 11.5 | 3.5 | 116.0 | 21.3 | 1.8 | 1.1 | 47.0 | 3.0 | 1.7 |
| 1182-4 | - | 12.0 | 7.6 | 6.0 | 2.0 | 16.8 | 13.0 | 1.0 | 0.5 | 6.0 | 1.5 | 0.3 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 411-33180 | 1133-1-G |
| 411-33011 | 1133-2-G |
| 411-34180 | 1134-1-G |
| 411-35180 | 1135-1-G |
| 411-35180 | 1135-1-G |
| 411-36180 | 1136-1-G |
| 411-82001 | 1182-4-G |

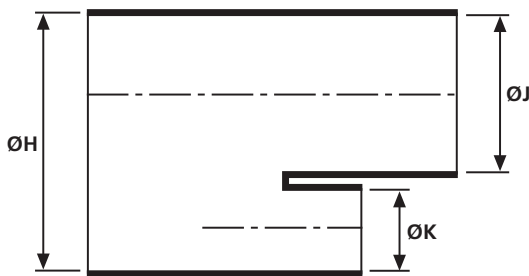
T-Shapes, VG style

• Helashrink 1200 Series

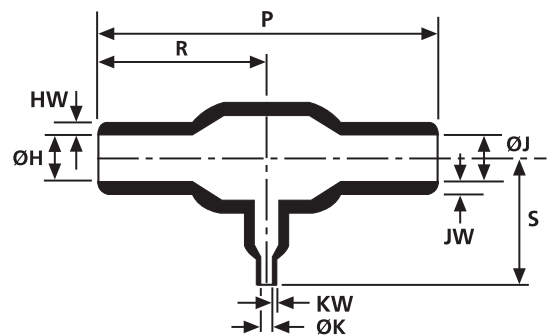
This style provides strain relief, sealing and mechanical protection on cable harnesses. For VG shapes with portholes "P" please refer to product standards tables in the appendix.



1202-1-G recovered onto a cable harness.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | Designation as per VG-Norm | ØH/J min. a | ØH/J max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | S ± 10% | KW ± 20% |
|--------|----------------------------|-------------|-------------|-----------|-----------|---------|---------|----------|----------|---------|----------|
| 1206-1 | VG95343T08A009A | 6.6 | 3.0 | 6.6 | 3.0 | 29.7 | 14.7 | 1.0 | 1.0 | 14.7 | 1.0 |
| 1203-1 | VG95343T08A001A | 13.2 | 6.0 | 6.5 | 3.0 | 52.0 | 26.0 | 1.5 | 1.5 | 19.3 | 1.0 |
| 1202-1 | VG95343T08A010A | 13.2 | 6.1 | 13.2 | 6.1 | 58.7 | 29.2 | 1.5 | 1.5 | 29.2 | 1.5 |
| 1205-1 | - | 17.7 | 8.9 | 7.6 | 3.8 | 50.8 | 25.4 | 1.5 | 1.5 | 25.4 | 1.0 |
| 1201-1 | VG95343T08A007A | 17.7 | 8.9 | 10.1 | 5.1 | 47.5 | 23.6 | 1.5 | 1.5 | 23.6 | 1.0 |
| 1209-1 | VG95343T08A002A | 27.0 | 12.4 | 13.2 | 6.0 | 108.0 | 54.0 | 2.5 | 2.5 | 38.6 | 1.5 |
| 1207-1 | VG95343T08A011A | 26.9 | 12.4 | 26.9 | 12.4 | 120.1 | 55.9 | 2.5 | 2.5 | 59.9 | 2.5 |
| 1203-1 | - | 13.0 | 6.0 | 6.5 | 3.0 | 52.0 | 26.0 | 1.5 | 1.5 | 19.3 | 1.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|-----------|
| 412-06180 | 1206-1-G |
| 412-03180 | 1203-1-G |
| 412-02180 | 1202-1-G |
| 412-05180 | 1205-1-G |
| 412-01180 | 1201-1-G |
| 412-09180 | 1209-1-G |
| 412-07180 | 1207-1-G |
| 412-03001 | 1203-1-B7 |

T-Shapes

• **Helashrink 1200 Series, Offset**

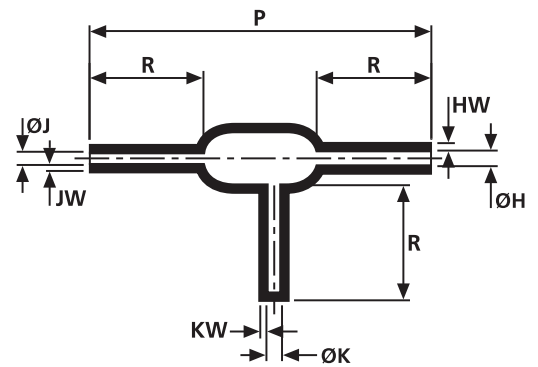
This style provides strain relief, sealing and mechanical protection where a cable transition is required on the harness, it is recommended that an adhesive be used if environmental sealing is required.



1217-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | |
|----------------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|------------|-------------|-------------|-------------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | KW ± 20% |
| 1217-1 | 10.0 | 2.6 | 6.0 | 2.2 | 6.0 | 2.6 | 57.0 | 19.0 | 1.0 | 1.0 | 1.0 |
| 1222-1 | 31.0 | 15.2 | 18.0 | 8.9 | 25.0 | 15.0 | 92.0 | 52.0 | 2.3 | 1.8 | 2.3 |
| 1223-1 | 29.5 | 16.3 | 9.6 | 5.3 | 29.5 | 16.3 | 93.2 | 56.6 | 2.5 | 1.8 | 2.5 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 412-17003 | 1217-1-G |
| 412-22002 | 1222-1-G |
| 412-23003 | 1223-1-HP |

T-Shapes, VG style

• Helashrink 1200 Series, Offset

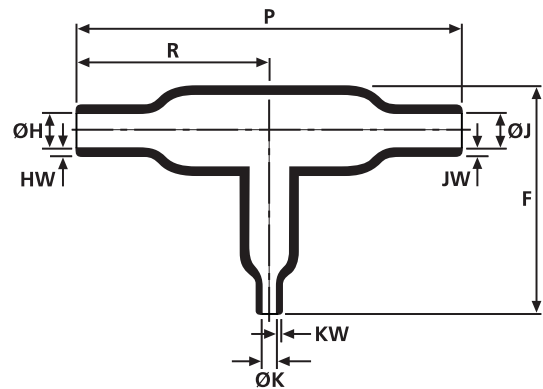
This style provides strain relief, sealing and mechanical protection where a cable transition is required on the harness, it is recommended that an adhesive be used if environmental sealing is required.



1204-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | | | | |
|----------------------|----------------------------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|
| Type | Designation as per VG-Norm | ØH | ØH | ØJ | ØJ | ØK | ØK | P | R | HW | JW | KW | S | F |
| | | min. a | max. b | min. a | max. b | min. a | max. b | ± 10% | ± 10% | ± 20% | ± 20% | ± 20% | ± 10% | ± 15% |
| 1204-1 | VG95343T08A016A | 13.0 | 7.5 | 6.5 | 4.0 | 6.5 | 4.0 | 56.0 | 33.0 | 1.5 | 1.0 | 1.0 | - | 27.0 |
| 1216-1 | VG95343T08A017A | 33.0 | 13.0 | 16.5 | 6.5 | 16.5 | 6.5 | 97.0 | 54.0 | 2.5 | 1.5 | 1.5 | 38.5 | - |
| 1226-1 | - | 30.5 | 15.2 | 17.8 | 8.9 | 17.8 | 8.9 | 81.3 | 47.5 | 2.3 | 1.3 | 1.3 | 38.1 | - |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | - | - | - | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 412-04180 | 1204-1-G |
| 412-16180 | 1216-1-G |
| 412-26002 | 1226-1-G |

Angled T-Shapes, VG style

- Helashrink 1300 Series, 30° & 45° angle

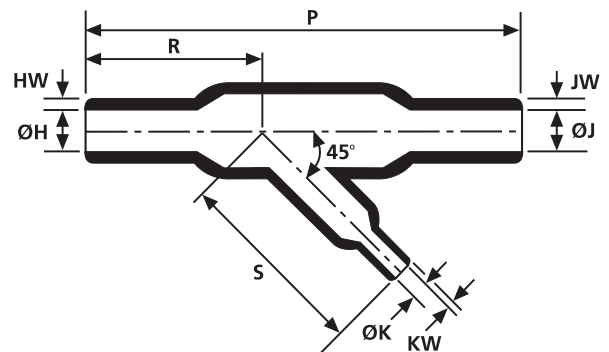
This style provides strain relief, sealing and mechanical protection on cable harnesses. For VG shapes with portholes "P" please refer to product standards tables in the appendix.



1303-1-G supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | | | | |
|----------------------|-------|----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|----------|---------|
| Type | Angle | Designation as per VG-Norm | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | HW ± 30% | JW ± 20% | KW ± 10% | S ± 10% |
| 1301-1 | 45° | VG 95343 T08 B 001 A | 13.0 | 7.0 | 13.0 | 7.0 | 7.0 | 3.5 | 50.0 | 23.0 | 1.5 | 1.5 | 1.0 | 23.0 |
| 1302-1 | 45° | VG 95343 T08 B 004 A | 27.0 | 13.0 | 27.0 | 13.0 | 7.0 | 3.5 | 93.0 | 41.0 | 2.5 | 2.5 | 1.0 | 36.0 |
| 1303-1 | 45° | VG 95343 T08 B 002 A | 27.0 | 14.0 | 27.0 | 14.0 | 13.0 | 7.5 | 145.0 | 70.0 | 1.5 | 1.5 | 1.5 | 54.0 |
| 1311-1 | 30° | - | 30.4 | 15.0 | 30.4 | 15.0 | 20.3 | 10.0 | 82.6 | 32.0 | 2.5 | 2.5 | 1.8 | 51.0 |
| 1306-1 | 45° | VG95343T06B010A | 13.0 | 6.0 | 6.5 | 3.0 | 6.5 | 3.0 | 45.0 | 23.0 | 1.5 | 1.0 | 1.5 | 21.5 |
| 1307-1 | 45° | VG95343T19B011A | 27.0 | 12.5 | 13.0 | 6.0 | 13.0 | 6.0 | 90.0 | 42.0 | 2.5 | 1.5 | 1.5 | 43.0 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|-------------|
| Article-No. | Type |
| 413-01180 | 1301-1-G |
| 413-02180 | 1302-1-G |
| 413-03180 | 1303-1-G |
| 413-11010 | 1311-1-G |
| 413-06180 | 1306-1-G |
| 413-07184 | 1307-1-GW24 |

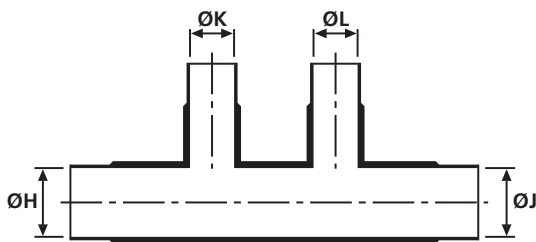
Double T-Shapes

- Helashrink 1310 Series, 30° angle

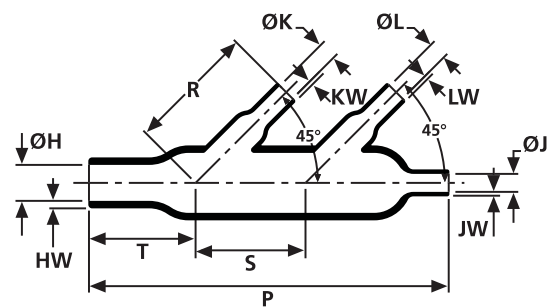
This style provides strain relief, sealing and mechanical protection on cable harnesses where a specialised orientation is required.



1310-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | ØL min. a | ØL max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | KW ± 20% | LW ± 20% | S ± 10% | T ± 10% |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|----------|----------|---------|---------|
| 1310-1 | 30.4 | 15.2 | 30.4 | 15.2 | 12.7 | 6.4 | 12.7 | 6.4 | 88.9 | 50.8 | 2.5 | 2.5 | 1.3 | 1.3 | 25.4 | 19.1 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

Combinations "On request"

| Adhesive | Material | | | | |
|------------------|----------|---|---|---|---|
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 413-10003 | 1310-1-G |

Angle Elbow Shapes

- Helashrink 1400 Series, 90° angle

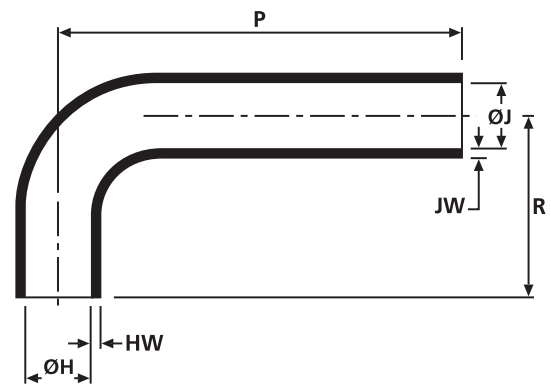
This style provides strain relief and mechanical protection on cable orientations of up to 90°, efficient design and numerous material / adhesive combinations provide quick and easy installation across a range of applications.



1403-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% |
| 1401-1 | 31.7 | 15.7 | 31.7 | 15.7 | 88.9 | 50.8 | 2.3 | 2.3 |
| 1401-2 | 38.1 | 15.7 | 38.1 | 15.7 | 88.9 | 50.8 | 2.3 | 2.3 |
| 1403-1 | 15.7 | 7.9 | 15.7 | 7.9 | 44.5 | 25.4 | 2.3 | 2.3 |
| 1405-1 | 25.0 | 7.9 | 25.0 | 7.9 | 30.0 | 15.0 | 1.5 | 1.5 |
| 1406-1 | 20.0 | 7.9 | 20.0 | 7.9 | 45.0 | 15.0 | 1.5 | 1.5 |
| 1408-2 | 19.0 | 9.0 | 19.0 | 9.0 | 44.5 | 44.5 | 1.8 | 1.8 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 414-01003 | 1401-1-G |
| 414-01006 | 1401-2-G |
| 414-03002 | 1403-1-G |
| 414-05003 | 1405-1-G |
| 414-06003 | 1406-1-G |
| 414-08004 | 1408-2-G |

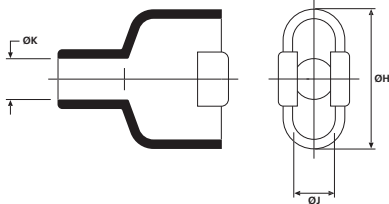
Connector Cover for Min-D Series

- Helashrink 1500 Series, with top entry

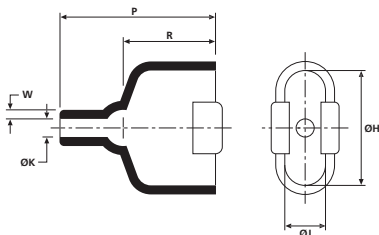
This style provides strain relief and mechanical protection for Min-D series connectors. It's unique design allows perfect orientation on installation, can be supplied with or without lips.



1505-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | W ± 20% |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|
| 1505-1 | 20.3 | 20.3 | 10.7 | 10.7 | 7.8 | 4.1 | 33.0 | 19.1 | 1.0 |
| 1505-2 | 16.0 | 20.3 | 16 | 10.7 | 16.0 | 4.1 | 33.0 | 19.1 | 1.0 |
| 1505-7 | 20.3 | 20.3 | 15.0 | 10.7 | 2.0 | 4.1 | 48.0 | 19.1 | 1.0 |
| 1506-1 | 28.1 | 28.2 | 10.7 | 10.7 | 10.1 | 5.3 | 38.9 | 22.1 | 1.0 |
| 1506-2 | 19.0 | 28.2 | 19.0 | 10.7 | 19.0 | 5.3 | 38.9 | 22.1 | 1.0 |
| 1507-1 | 42.1 | 42.2 | 10.7 | 10.7 | 13.9 | 8.1 | 45.0 | 25.4 | 1.0 |
| 1507-2 | 29.2 | 42.2 | 29.2 | 10.7 | 29.2 | 8.1 | 45.0 | 25.4 | 1.0 |
| 1507-7 | 55.0 | 42.2 | 13.9 | 10.7 | 25.0 | 8.1 | 45.0 | 25.4 | 1.0 |
| 1501-1 | 58.4 | 58.7 | 10.6 | 10.7 | 17.2 | 8.6 | 53.3 | 28.4 | 1.0 |
| 1501-2 | 34.2 | 58.7 | 34.2 | 10.7 | 34.2 | 8.6 | 53.3 | 28.4 | 1.0 |
| 1502-1 | 37.5 | 57.9 | 37.5 | 13.7 | 37.5 | 10.4 | 61.0 | 31.8 | 1.0 |
| 1502-2 | 57.9 | 57.9 | 13.7 | 3.7 | 19.0 | 10.4 | 61.0 | 31.8 | 1.0 |

All dimensions in mm. Subject to technical changes.

These types are with lips.

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | P ± 10% | R ± 10% | W ± 20% |
|--------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|
| 1505-3 | 21.0 | 20.3 | 12.4 | 10.7 | 7.8 | 4.1 | 33.0 | 19.1 | 1.0 |
| 1507-3 | 42.1 | 42.2 | 10.7 | 10.7 | 13.9 | 8.1 | 45.0 | 25.4 | 1.0 |
| 1501-3 | 59.6 | 58.7 | 12.4 | 10.7 | 17.2 | 8.6 | 53.3 | 28.4 | 1.0 |
| 1501-7 | 58.4 | 58.7 | 10.6 | 10.7 | 17.2 | 8.6 | 53.3 | 28.4 | 1.0 |
| 1502-3 | 57.4 | 57.9 | 13.7 | 13.7 | 19.0 | 10.4 | 61.0 | 31.8 | 1.0 |

All dimensions in mm. Subject to technical changes.

These types are without lips.

For Material / Adhesive selection and other information please refer to page 10.

Combinations "On request"

| Adhesive | Material | | | |
|------------------|----------|---|---|---|
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

Standard combinations with lips

| Article-No. | Type |
|-------------|------------|
| 415-05004 | 1505-1-G |
| 415-05011 | 1505-2-B7 |
| 415-05021 | 1505-7-J |
| 415-05020 | 1505-7-GW8 |
| 415-06005 | 1506-1-G |
| 415-06012 | 1506-2-B7 |
| 415-07005 | 1507-1-G |
| 415-07013 | 1507-2-B7 |
| 415-07024 | 1507-7-G |
| 415-01001 | 1501-1-B7 |
| 415-01010 | 1501-2-G |
| 415-02005 | 1502-1-J |
| 415-02009 | 1502-2-G |

Standard combinations without lips

| Article-No. | Type |
|-------------|-----------|
| 415-05015 | 1505-3-B7 |
| 415-07030 | 1507-3-G |
| 415-01016 | 1501-3-J |
| 415-01017 | 1501-7-B7 |
| 415-02020 | 1502-3-J |

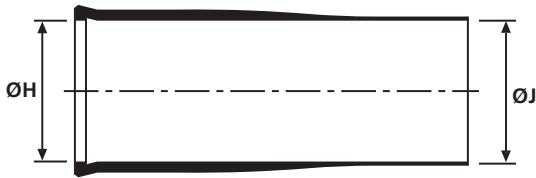
GSR Graduated Strain Relief

• Helashrink 1750 Series, with rib

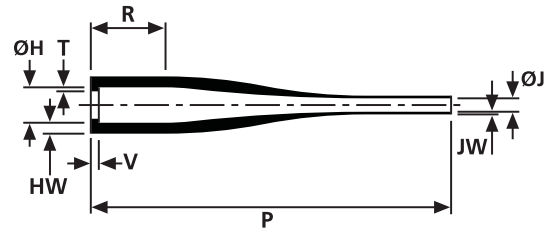
This style is ideally suited for shipboard and railway carriage cabling. The key features are: very robust, superior crush resistance and excellent strain relief. The wall thickness varies with long tail, allowing setting at varying angles through 90°.



1751-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Sizes and Type Table

| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | T ± 10% | V ± 10% |
|--------|--------------|--------------|--------------|--------------|------------|------------|-------------|-------------|------------|------------|
| 1751-1 | 25.4 | 16.5 | 25.4 | 8.3 | 152.4 | 30.5 | 4.1 | 1.5 | 1.5 | 3.0 |
| 1751-2 | 33.0 | 16.5 | 33.0 | 8.4 | 153.0 | 30.5 | 4.1 | 1.5 | 1.5 | 3.0 |
| 1752-1 | 33.1 | 20.3 | 33.1 | 10.9 | 152.4 | 30.5 | 4.1 | 1.5 | 1.5 | 3.0 |
| 1752-2 | 43.2 | 20.3 | 43.2 | 10.9 | 153.0 | 30.5 | 4.1 | 1.5 | 1.5 | 3.0 |
| 1753-1 | 43.2 | 22.8 | 43.2 | 14.2 | 175.3 | 38.1 | 4.1 | 2.0 | 1.5 | 3.0 |
| 1753-2 | 53.3 | 22.9 | 53.3 | 14.2 | 175.3 | 38.0 | 4.1 | 2.0 | 1.5 | 3.0 |
| 1754-1 | 53.4 | 27.9 | 53.4 | 17.7 | 175.3 | 38.1 | 4.1 | 2.0 | 1.5 | 3.0 |
| 1754-2 | 72.4 | 27.9 | 72.4 | 17.8 | 175.3 | 38.0 | 4.1 | 2.0 | 1.5 | 3.0 |
| 1755-1 | 72.4 | 36.8 | 72.4 | 24.1 | 182.9 | 40.6 | 4.1 | 2.5 | 1.5 | 3.0 |
| 1755-2 | 87.0 | 36.8 | 87.0 | 24.1 | 184.0 | 41.0 | 4.1 | 2.5 | 1.5 | 3.0 |

All dimensions in mm. Subject to technical changes.

Combinations "On request"

| Adhesive | Material | | | |
|------------------|----------|---|---|---|
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

Standard combinations

| Article-No. | Type |
|-------------|----------|
| 417-51001 | 1751-1-H |
| 417-51009 | 1751-2-H |
| 417-52001 | 1752-1-H |
| 417-52005 | 1752-2-H |
| 417-53001 | 1753-1-H |
| 417-53005 | 1753-2-H |
| 417-54001 | 1754-1-H |
| 417-54005 | 1754-2-H |
| 417-55001 | 1755-1-H |
| 417-55005 | 1755-2-H |

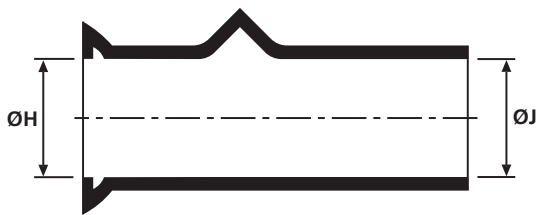
Angle Shapes

- Helashrink 1800 Series, with rib, 30°, 45°, 60° angle

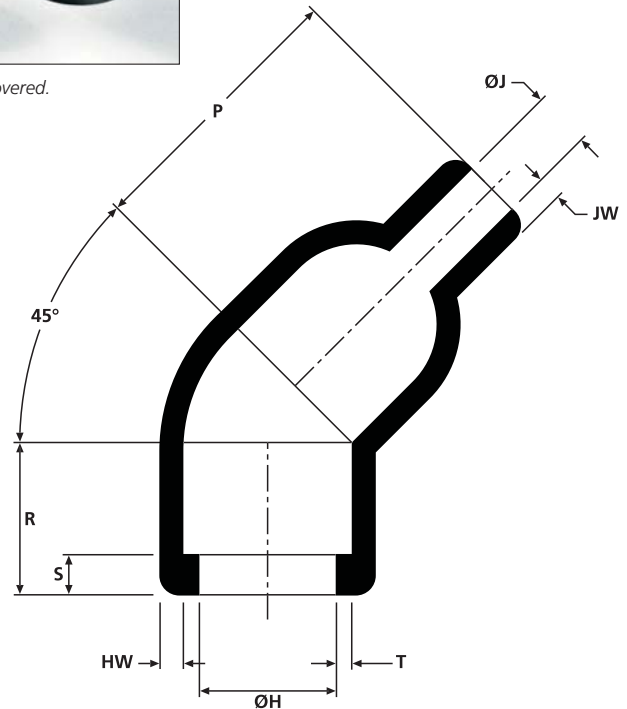
This style provides strain relief and mechanical protection for harness systems when used in conjunction with a circular grooved adaptor. Can be supplied in a range of nominal recovered angles and material / adhesive combinations to suit most applications.



1821-42 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | | | | |
|----------------------|-------|-----------|-----------|-----------|-----------|---------|---------|----------|----------|---------|---------|
| Type | Angle | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | P ± 10% | R ± 10% | HW ± 20% | JW ± 20% | T ± 10% | S ± 10% |
| 1820-4 | 30° | 36.0 | 21.4 | 36.0 | 8.3 | 46.0 | 26.0 | 1.8 | 1.0 | 8.6 | 26.0 |
| 1807-4 | 45° | 35.6 | 18.0 | 35.6 | 7.4 | 43.2 | 10.2 | 1.8 | 1.8 | 1.0 | 3.0 |
| 1805-4 | 45° | 40.0 | 18.8 | 40.0 | 7.0 | 28.0 | 11.0 | 1.5 | 1.5 | 1.0 | 3.0 |
| 1806-4 | 45° | 42.6 | 27.9 | 42.6 | 9.7 | 85.0 | 17.8 | 2.0 | 2.0 | 1.7 | 3.0 |
| 1821-42 | 45° | 20.0 | 14.2 | 20.0 | 4.1 | 24.0 | 10.0 | 2.3 | 1.8 | 1.1 | 3.0 |
| 1819-4 | 60° | 43.0 | 28.2 | 43.0 | 9.9 | 55.0 | 18.0 | 2.0 | 1.0 | 3.0 | 18.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|-----------|
| Article-No. | Type |
| 418-20001 | 1820-4-G |
| 418-07003 | 1807-4-G |
| 418-05003 | 1805-4-G |
| 418-06002 | 1806-4-G |
| 418-21013 | 1821-42-G |
| 418-19001 | 1819-4-G |

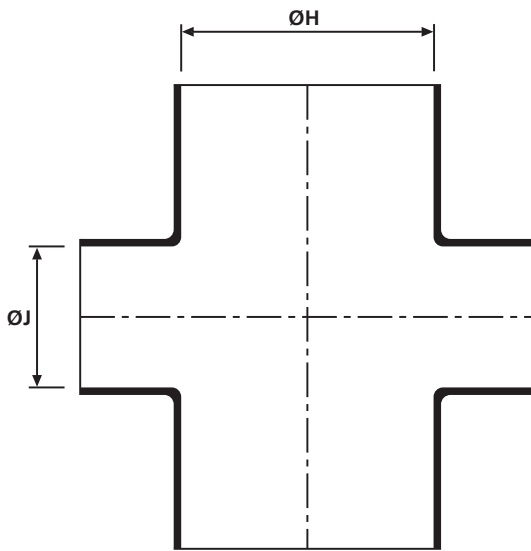
Right Angle Cross Shapes

• Helashrink 2000 Series, T-Joint

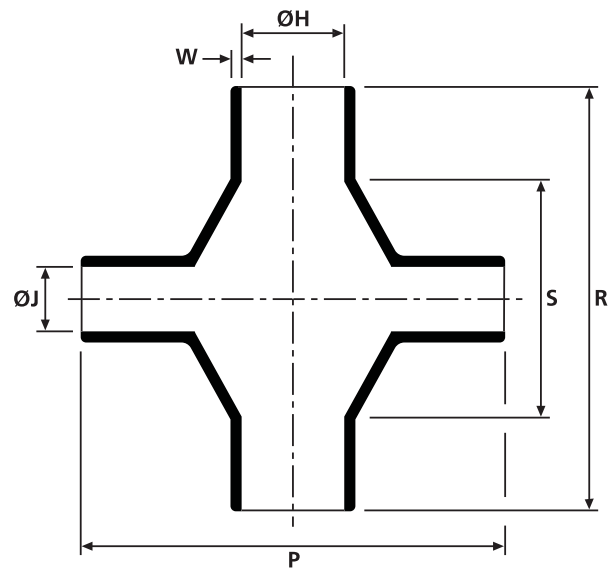
This style allows wires to be routed in four 90° directions, whilst providing strain relief and mechanical protection. Environmental sealing can be achieved when used in conjunction with one of our extensive range of adhesives.



2003-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | R ± 10% | P ± 10% | S ± 10% | W ± 20% |
| 2003-1 | 19.3 | 9.7 | 13.2 | 9.7 | 38.1 | 38.1 | 22.1 | 1.1 |

All dimensions in mm. Subject to technical changes.

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|---|
| Adhesive | Material | | | |
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 420-03002 | 2003-1-G |

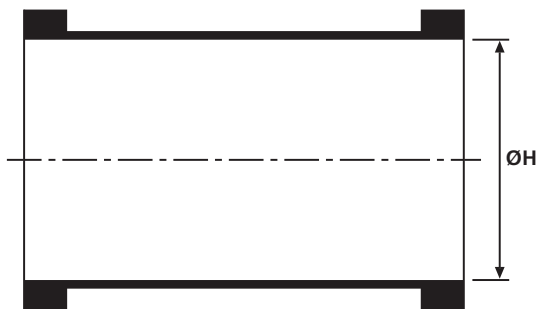
Locating Bushes

- Helashrink 1760, 1790, 1820 Series

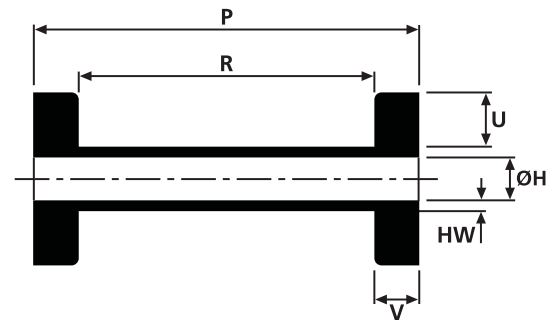
This product style provides location, cushioning, shimming and protection on cable runs through bulk head or enclosure entry points. Available in a range of materials and adhesives for most applications.



1793-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Sizes and Type Table | | | | | | | |
|----------------------|-----------|-----------|---------|---------|----------|---------|---------|
| Type | ØH min. a | ØH max. b | R ± 10% | P ± 10% | HW ± 20% | V ± 10% | U ± 20% |
| 1793-1 | 20.0 | 9.5 | 25.0 | 35.0 | 1.5 | 5.0 | 3.0 |
| 1794-1 | 30.0 | 18.0 | 25.0 | 35.0 | 2.0 | 5.0 | 3.0 |
| 1795-1 | 26.0 | 12.7 | 25.0 | 35.0 | 2.0 | 5.0 | 3.0 |
| 1796-1 | 15.0 | 6.4 | 24.0 | 29.0 | 1.5 | 2.5 | 2.0 |
| 1822-1 | 12.0 | 5.9 | 24.0 | 30.0 | 6.1 | 3.0 | 2.0 |
| 1823-1 | 16.0 | 7.8 | 24.0 | 32.0 | 6.2 | 4.0 | 2.0 |

All dimensions in mm. Subject to technical changes.

For Material / Adhesive selection and other information please refer to page 10.

| Combinations "On request" | | | | | |
|---------------------------|----------|---|---|---|---|
| Adhesive | Material | | | | |
| | B7 | G | J | H | L |
| WM250 | √ | √ | √ | √ | - |
| W8 | √ | √ | √ | √ | - |
| W24 | √ | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ | - |
| HMT200A | √ | √ | √ | √ | - |
| W21 | √ | √ | √ | √ | - |
| Without Adhesive | √ | √ | √ | √ | √ |

| Standard combinations | |
|-----------------------|----------|
| Article-No. | Type |
| 417-93001 | 1793-1-G |
| 417-94002 | 1794-1-L |
| 417-95001 | 1795-1-G |
| 417-96001 | 1796-1-G |
| 418-22001 | 1822-1-G |
| 418-23001 | 1823-1-G |

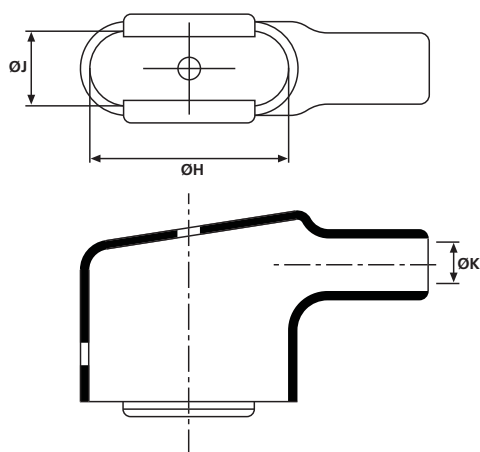
Connector Cover for Min-D Series

- Helashrink 2100 Series, with 90° entry

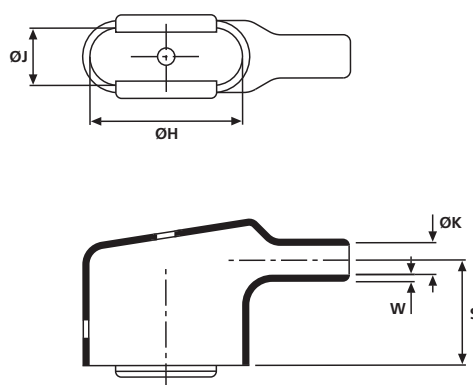
This style provides strain relief and mechanical protection for Min-D series connectors. Its unique design allows perfect 90° orientation on installation. It can be supplied with or without lips in a range of material and adhesive combinations to suit most applications.



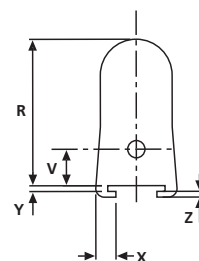
2101-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)



| Sizes and Type Table | | | | | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | R ± 10% | W ± 20% | V ± 10% | S ± 10% | X ± 10% | Y ± 10% | Z ± 10% |
| 2101-1 | 20.3 | 20.3 | 10.7 | 10.7 | 7.8 | 4.1 | 21.6 | 1.0 | 15.0 | 15.2 | 3.0 | 3.0 | 1.1 |
| 2101-2 | 16.0 | 20.3 | 10.0 | 16.0 | 16.0 | 4.1 | 21.6 | 1.0 | 15.0 | 15.2 | 3.0 | 3.0 | 1.1 |
| 2102-1 | 28.1 | 28.2 | 10.6 | 10.7 | 10.1 | 5.3 | 24.6 | 1.0 | 15.0 | 18.5 | 3.0 | 3.0 | 1.1 |
| 2102-2 | 19.0 | 28.2 | 19.0 | 10.7 | 19.0 | 5.3 | 24.6 | 1.0 | 15.0 | 18.5 | 3.0 | 3.0 | 1.1 |
| 2103-1 | 42.1 | 42.2 | 10.6 | 10.7 | 13.9 | 7.4 | 27.9 | 1.1 | 15.0 | 22.1 | 3.0 | 3.0 | 1.1 |
| 2103-2 | 29.2 | 42.2 | 29.2 | 10.7 | 29.2 | 7.4 | 27.9 | 1.1 | 15.0 | 22.1 | 3.0 | 3.0 | 1.1 |
| 2104-1 | 58.6 | 58.7 | 10.6 | 10.7 | 17.2 | 8.6 | 30.5 | 1.0 | 15.0 | 25.4 | 3.0 | 3.0 | 1.1 |
| 2105-1 | 57.9 | 57.9 | 13.7 | 13.7 | 19.0 | 10.7 | 32.3 | 1.0 | 15.0 | 25.4 | 3.0 | 3.0 | 1.1 |
| 2105-2 | 37.5 | 57.9 | 37.5 | 13.7 | 37.5 | 10.7 | 32.3 | 1.0 | 15.0 | 25.4 | 3.0 | 3.0 | 1.1 |

All dimensions in mm. Subject to technical changes.

These are with lips.

| Sizes and Type Table | | | | | | | | | | | | | |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|---------|---------|---------|---------|---------|---------|---------|
| Type | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | ØK min. a | ØK max. b | R ± 10% | W ± 20% | V ± 10% | S ± 10% | X ± 10% | Y ± 10% | Z ± 10% |
| 2103-3 | 42.9 | 42.2 | 12.4 | 10.7 | 13.9 | 7.4 | 27.9 | 1.1 | 15.0 | 22.1 | - | - | - |

All dimensions in mm. Subject to technical changes.

These are without lips.

| Combinations "On request" | | | | |
|---------------------------|----------|---|---|---|
| Adhesive | Material | | | |
| | B7 | G | J | H |
| WM250 | √ | √ | √ | √ |
| W8 | √ | √ | √ | √ |
| W24 | √ | √ | √ | √ |
| V9500 | √ | √ | √ | √ |
| HMT200A | √ | √ | √ | √ |
| W21 | - | - | - | √ |
| Without Adhesive | √ | √ | √ | √ |

| Standard combinations with lips | |
|---------------------------------|-----------|
| Article-No. | Type |
| 421-01004 | 2101-1-G |
| 421-01010 | 2101-2-G |
| 421-02004 | 2102-1-G |
| 421-02009 | 2102-2-B7 |
| 421-03004 | 2103-1-G |
| 421-03014 | 2103-2-G |
| 421-04005 | 2104-1-G |
| 421-05003 | 2105-1-G |
| 421-05010 | 2105-2-J |

| Standard combinations without lips | |
|------------------------------------|----------|
| Article-No. | Type |
| 421-03019 | 2103-3-J |



Cable Management Products

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| 3.1 Breakout Boots and End Caps | |
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2-Way Outlet Shapes, Breakout Boots

- Helashrink 200 Series, in line, low voltage

Features and Benefits

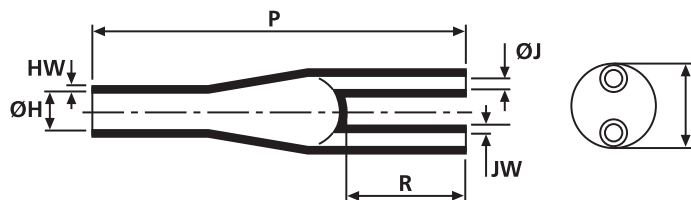
Branching parts are used for easy, time-saving insulation of the branch point of a cable where it is split into single wires. Branching parts with adhesive also serve to relieve the mechanical tension in cable harnesses whilst providing excellent IP ratings.



Breakout boot for two-core cable.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Cable breakouts are available for 2, 3, 4, 5 and 6 core cables.

| Material Data | |
|-------------------------|---|
| Material | Polyolefin, chemically cross linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | up to 3:1 |
| Dielectric Strength | 15 kV/mm |
| Min. Shrink Temperature | +135 °C |
| Operating Temperature | -55 °C to +100 °C |
| Flammability | ASTM D635 |



| Article-No. | Type | Recomm. application (mm ²) | | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | Recovered | | | | |
|-------------|-----------|--|-------|-----------|-----------|-----------|-----------|-----------|---------|-------|----------|----------|
| | | from | to | | | | | P ± 10% | R ± 10% | S nom | HW ± 20% | JW ± 20% |
| 402-16039 | 216-3-B8W | 2.5 | 10.0 | 21.0 | 9.4 | 9.0 | 2.79 | 76.5 | 20.0 | 4.0 | 1.59 | 1.59 |
| 402-23058 | 223-2-B8W | 4.0 | 35.0 | 33.0 | 9.4 | 17.5 | 4.1 | 94.0 | 30.0 | 20.0 | 1.5 | 1.2 |
| 402-18051 | 218-2-B8W | 50.0 | 150.0 | 49.0 | 22.9 | 20.0 | 7.6 | 119.0 | 34.0 | 30.0 | 3.2 | 3.2 |
| 402-19032 | 219-2-B8W | 185 | 400 | 87.0 | 38.1 | 43.0 | 12.7 | 141.5 | 42.5 | 44.0 | 3.8 | 3.8 |

All Dimensions in mm, except for "mm²". Subject to technical changes.

3-Way Outlet Shapes, Breakout Boots

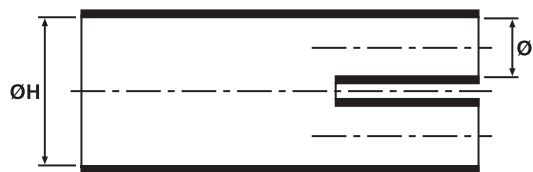
• Helashrink 300 Series, in line, low voltage

Features and Benefits

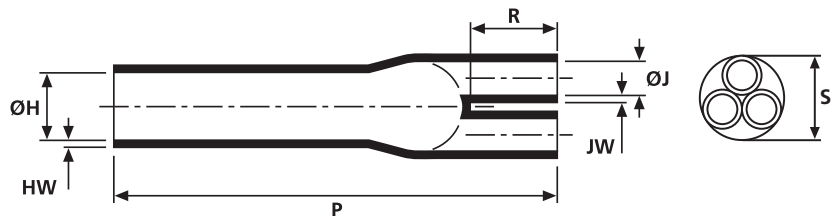
Cable breakout boots are designed for insulating and sealing of cable crutches and provide excellent resistance from abrasion and weathering. They are manufactured from a tough cross-linked flame retarded polyolefin, Branching parts with adhesive also serve to relieve the mechanical tension in cable harnesses whilst providing excellent IP ratings.



300 Series supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Cable breakouts are available for 2, 3, 4, 5 and 6 core cables.

Material Data

| | |
|-------------------------|---|
| Material | Polyolefin, chemically cross linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | up to 3:1 |
| Dielectric Strength | 15 kV/mm |
| Min. Shrink Temperature | +135 °C |
| Operating Temperature | -55 °C to +100 °C |
| Flammability | ASTM D635 |



Technical Table

| Article-No. | Type | Recomm. application (mm ²) | | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | Recovered | | | | |
|-------------|------------|--|-------|-----------|-----------|-----------|-----------|-----------|---------|-------|----------|----------|
| | | from | to | | | | | P ± 10% | R ± 10% | S nom | HW ± 20% | JW ± 20% |
| 403-54004 | 354-1-B8W | 16.0 | 45.0 | 45.0 | 10.0 | 16.0 | 4.0 | 100.0 | 25.0 | - | 3.0 | 2.0 |
| 403-20012 | 320-1-B8W | 50.0 | 150.0 | 55.8 | 22.5 | 30.4 | 9.0 | 180.0 | 44.0 | 37.0 | 3.0 | 2.0 |
| 403-55005 | 355-1-B8W | 150 | 240 | 100.0 | 28.0 | 40.0 | 13.0 | 210 | 50.0 | - | 3.5 | 2.5 |
| 403-24016 | 324-1-B8W | 150 | 300.0 | 90.0 | 35.5 | 35.0 | 14.5 | 200.0 | 50.0 | 54.0 | 3.0 | 2.0 |
| 403-42006 | 342-1-B8W2 | 185 | 400 | 110.0 | 35.0 | 40.0 | 17.5 | 230.0 | 45.0 | 65.0 | 4.0 | 3.5 |
| 403-41005 | 341-1-B8W2 | 240 | 400.0 | 125.0 | 59.0 | 50.8 | 25.4 | 283.0 | 71.0 | - | 3.8 | 3.8 |

All Dimensions in mm, except for "mm²". Subject to technical changes.

4-Way Outlet Shapes, Breakout Boots

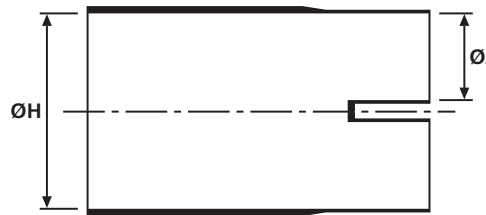
- Helashrink 400 Series, in line, low voltage

Features and Benefits

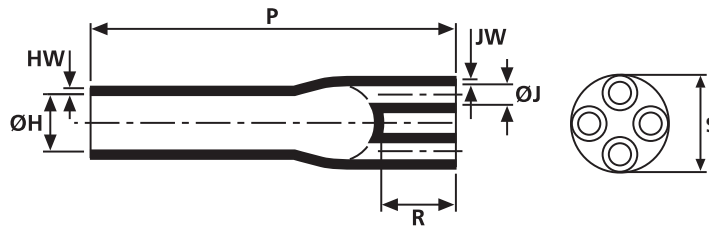
Branching parts are used for easy, time-saving insulation of the branch point of a cable where it is split into single wires. They are manufactured from a tough cross-linked flame retarded polyolefin, branching parts with hot melt adhesive also serve to relieve the mechanical tension in cable harnesses whilst providing excellent IP ratings.



442-1 supplied / fully recovered.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

Cable breakouts are available for 2, 3, 4, 5 and 6 core cables.

| Material Data | |
|-------------------------|--|
| Material | Polyolefin, chemically cross linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | up to 3:1 |
| Dielectric Strength | 15 kV/mm |
| Min. Shrink Temperature | +135 °C |
| Operating Temperature | -55 °C to +100 °C |
| Flammability | ASTM D635 |



Technical Table

| Article-No. | Type | Recomm. application (mm ²) | | ØH min. a | ØH max. b | ØJ min. a | ØJ max. b | Recovered | | | | |
|-------------|-------------------|--|-------|-----------|-----------|-----------|-----------|-----------|--------|-------|---------|---------|
| | | from | to | | | | | P ±10% | R ±10% | S nom | HW ±20% | JW ±20% |
| 404-42022 | 442-1-B8W | 2.5 | 10.0 | 28.0 | 9.0 | 9.0 | 1.8 | 78.0 | 17.0 | 20.0 | 2.7 | 2.0 |
| 404-08022 | 408-2-B8W2 | 4.0 | 35.0 | 35.0 | 12.0 | 15.0 | 3.0 | 95.0 | 24.0 | 22.0 | 2.5 | 2.0 |
| 404-09021 | 409-2-B8W2 | 35.0 | 70.0 | 47.4 | 22.9 | 21.5 | 6.4 | 165.0 | 38.1 | 22.0 | 4.1 | 3.3 |
| 404-18020 | 418-4-B8W2 | 70.0 | 150.0 | 60.0 | 22.9 | 30.0 | 6.4 | 202.0 | 38.1 | 38.1 | 4.1 | 3.3 |
| 404-44010 | 444-1-B8W2 | 150 | 400.0 | 95.0 | 35.6 | 45.0 | 12.5 | 240.0 | 55.0 | 50.8 | 4.0 | 3.5 |

All Dimensions in mm, except for "mm²". Subject to technical changes.

End Caps

• Helashrink 1600 Series, low voltage

Features and Benefits

End caps are used to seal cables during storage or transportation. Helashrink 1600 Series end caps can be used as an insulating cap for live LV cables (0.6/1kV). The adhesive lined end caps provide an excellent environmental seal. The outer end seal is marked with lightning flashes to indicate a live circuit. End caps can be fitted with air valves for certain pressurised cable applications. The high shrink ratio end caps minimise the number of end cap sizes needed.

Application

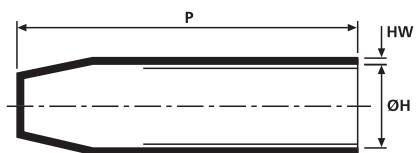
End caps are suitable for use on both polymeric and paper insulated, lead jacketed cables which may include aluminium or steel armouring.



The appropriate end cap for any diameter and type of cable.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Material Data | |
|-------------------------|---|
| Material | Polyolefin, chemically cross linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | up to 3:1 |
| Min. Shrink Temperature | +135 °C |
| Operating Temperature | -55 °C to +100 °C |
| Dielectric Strength | 15 kV/mm |
| Flammability | ASTM D635 |



Technical Table

| Article-No. | Type | Recomm. application | | ØH min. a | ØH max. b | Fully recovered | |
|----------------|-------------|---------------------|-------|-----------|-----------|-----------------|----------|
| | | from | to | | | P ±10% | HW ± 20% |
| Standard Range | | | | | | | |
| 416-12046 | 1612-1-B8W | 4.0 | 8.0 | 10.0 | 4.0 | 33.5 | 2.0 |
| 416-13054 | 1613-1-B8W | 6.5 | 16.0 | 20.0 | 6.0 | 55.3 | 2.3 |
| 416-14047 | 1614-1-B8W2 | 16.0 | 32.0 | 40.0 | 15.0 | 90.0 | 3.0 |
| 416-15035 | 1615-1-B8W2 | 26.0 | 51.0 | 63.0 | 25.0 | 143.0 | 3.3 |
| 416-17033 | 1617-1-B8W2 | 32.0 | 61.0 | 76.0 | 30.0 | 158.0 | 4.0 |
| 416-16053 | 1616-1-B8W2 | 48.0 | 80.0 | 100.0 | 45.0 | 162.0 | 4.0 |
| 416-09000 | 1609-1-B5W2 | 65.0 | 110.0 | 120.0 | 60.0 | 150.0 | 4.0 |
| Special Range | | | | | | | |
| 416-01013 | 1601-1-B8W | 10.0 | 19.0 | 23.8 | 9.4 | 89.0 | 2.0 |
| 416-20025 | 1620-1-B5W2 | 13.0 | 28.0 | 35.0 | 12.7 | 185.0 | 3.5 |
| 416-10000 | 1610-1-B5W2 | 90.0 | 135.0 | 160.0 | 82.0 | 146.0 | 4.0 |

All dimensions in mm. Subject to technical changes.

Pinched End Caps

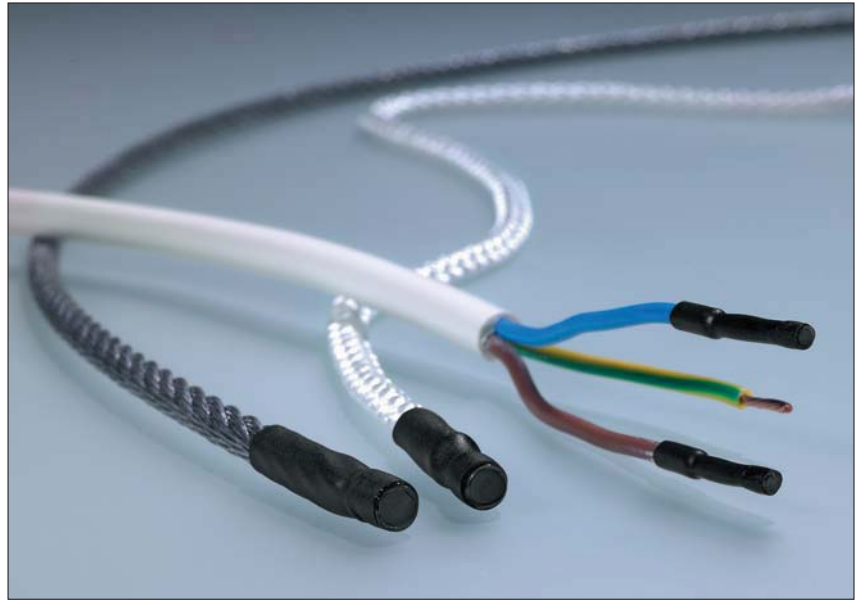
- Helashrink PEC Series, low voltage

Features and Benefits

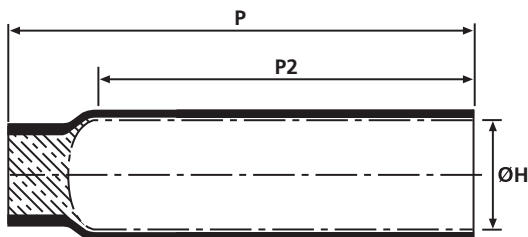
The PEC-Series can be applied quickly and easily like a standard heat shrinkable tube. The inner adhesive liner and the adhesive plug provide excellent bond and protection from water ingress. The optimal shrink ratio of 3:1 and different diameters allow a wide range of applications. Other diameters and lengths are available on request.

Application

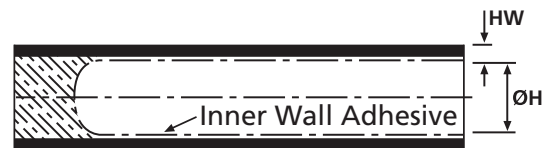
Pinched End Caps can be used for mechanical and environmental protection of stub splices in electrical harnesses. Due to the quick and easy installation, these caps can be used for non-electrical applications as well.



The appropriate end cap for any diameter and type of cable.



a: Expanded form (supplied)



b: Fully recovered form (after heating)

| Material Data | |
|-------------------------|--|
| Material | Polyolefin, cross-linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | 3:1 |
| Min. Shrink Temperature | +120 °C |
| Operating Temperature | -45 °C to +125 °C |
| Dielectric Strength | 15 kV/mm according to IEC 684 P2 |
| Flammability | self extinguishing in 30 seconds according to SAE-AMS-DTL-23053/4 |



Technical Table

| Article-No. | Type | ØH min. a | ØH max. b | HW ± 20% | P nom | P2 nom | Pack Cont. |
|-------------|--------------------|-----------|-----------|----------|-------|--------|------------|
| 416-00000 | PEC-3/1 | 3.0 | 1.0 | 1.0 | 25.0 | 20.0 | 50 |
| 416-00003 | PEC-4.8/1.5 | 4.8 | 1.5 | 1.0 | 30.0 | 25.0 | 50 |
| 416-00001 | PEC-6/2 | 6.0 | 2.0 | 1.0 | 30.0 | 25.0 | 50 |
| 416-00002 | PEC-9/3 | 9.0 | 3.0 | 1.4 | 35.0 | 27.0 | 50 |

All dimensions in mm. Subject to technical changes.

Heat Shrinkable Tubing 2:1 - Fluororubber

• Viton®-E

Features and Benefits

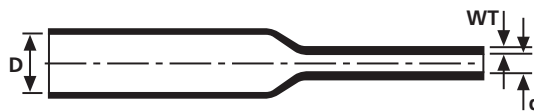
Viton®-E is a fluoroelastomeric heat shrinkable tubing. It remains flexible even at very low temperatures. It has extremely high resistance to chemicals and maintains its excellent mechanical strength and flexibility even after long term exposure to high temperatures. Viton®-E tubing is approved to VG 95343/5E.

Application

Viton®-E is used for reliable protection against aggressive chemicals in high temperature environments like engine compartments and turbines. It is also used when protective tubings are required to remain flexible at low temperatures.



Viton®-E for flexibility and protection against aggressive chemicals.



Viton®-E

| Material Data | |
|-------------------------------------|-----------------------------------|
| Material | Fluoropolymer cross-linked (FPMX) |
| Colour | Black (BK) |
| Shrink Ratio | 2:1 |
| Longitudinal change after shrinkage | -10% max. |
| Min. Shrink Temperature | +175 °C |
| Operating Temperature | -55 °C to +200 °C |
| Dielectric Strength | 15 kV/mm |
| Flammability | VG 95343 |
| Specification | VG 95343 |



Cut lengths available on request. Please contact us!

| Technical Table | | | | | | |
|-----------------|--------------------|----------------------------|-------------------|-----------------|----------------|-----------------|
| Article-No. | Type | Designation as per VG-Norm | Supplied Ø D min. | Recov. Ø d max. | Wall (WT) nom. | Reel Length (m) |
| 330-00320 | VITON®-E-3.2/1.6 | VG 95343 T 05 E 001 A | 3.2 | 1.6 | 0.7 | 50 |
| 330-00480 | VITON®-E-4.8/2.4 | VG 95343 T 05 E 002 A | 4.8 | 2.4 | 0.8 | 50 |
| 330-00640 | VITON®-E-6.4/3.2 | VG 95343 T 05 E 003 A | 6.4 | 3.2 | 0.9 | 50 |
| 330-00950 | VITON®-E-9.5/4.8 | VG 95343 T 05 E 004 A | 9.5 | 4.8 | 1.0 | 50 |
| 330-01270 | VITON®-E-12.7/6.4 | VG 95343 T 05 E 005 A | 12.7 | 6.4 | 1.2 | 25 |
| 330-01900 | VITON®-E-19.0/9.5 | VG 95343 T 05 E 006 A | 19.0 | 9.5 | 1.4 | 25 |
| 330-02540 | VITON®-E-25.4/12.7 | VG 95343 T 05 E 007 A | 25.4 | 12.7 | 1.8 | 25 |
| 330-03810 | VITON®-E-38.0/19.0 | VG 95343 T 05 E 008 A | 38.0 | 19.0 | 2.4 | 15 |
| 330-05080 | VITON®-E-50.8/25.4 | VG 95343 T 05 E 009 A | 50.8 | 25.4 | 2.8 | 15 |

All dimensions in mm. Subject to technical changes.

Viton® is a registered trademark of DuPont.



Please note! Not all products listed on this page may have this approval. For product specific approvals please refer to the Appendix.

Heat Shrinkable Tubing 2:1 - Elastomer

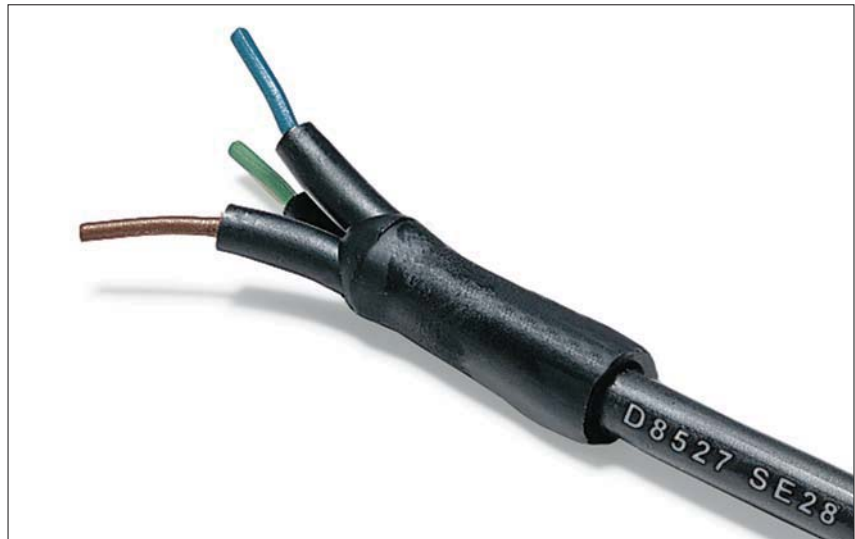
• SE28

Features and Benefits

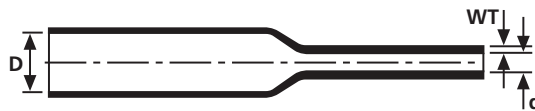
SE28 is a flexible, high performance elastomeric tubing. This tubing is used in aerospace, defence, railway and automotive applications. SE28 is resistant to diesel fuel, aviation and hydraulic fluids. It provides reliable protection against abrasion and mechanical damage and is very suitable for protecting cables and wire harnesses.

Application

SE28 is used for long-term protection of cables and wire harnesses in military equipment, motor sports, and aviation.



SE28 tubing with breakout boot.



SE28

| Material Data | |
|-------------------------------------|---------------------------------|
| Material | Elastomer, cross-linked (POA) |
| Colour | Black (BK) |
| Shrink Ratio | 2:1 |
| Longitudinal change after shrinkage | -10% max |
| Min. Shrink Temperature | +170 °C |
| Operating Temperature | -75 °C to +150 °C |
| Dielectric Strength | 20 kV/mm |
| Flammability | VG 95343 |
| Certification | VG 95343, SAE - AMS - DTL-23053 |

Cut lengths available on request. Please contact us!



Technical Table

| Article-No. | Type | Designation as per VG-Norm | Supplied Ø D min. | Recov. Ø d max. | Wall (WT) nom. | Reel Length (m) |
|-------------|-----------------|----------------------------|-------------------|-----------------|----------------|-----------------|
| 342-20000 | SE28 3,2/1,6 | VG 95343 T 05 D 001 A | 3.2 | 1.6 | 0.7 | 150 |
| 342-20010 | SE28 4,8/2,4 | VG 95343 T 05 D 002 A | 4.8 | 2.4 | 0.8 | 60 |
| 342-20020 | SE28 6,4/3,2 | VG 95343 T 05 D 003 A | 6.4 | 3.2 | 0.9 | 60 |
| 342-20030 | SE28 9,5/4,8 | VG 95343 T 05 D 004 A | 9.5 | 4.8 | 1.0 | 60 |
| 342-20040 | SE28 12,7/6,4 | VG 95343 T 05 D 005 A | 12.7 | 6.4 | 1.2 | 60 |
| 342-20050 | SE28 19,0/9,5 | VG 95343 T 05 D 006 A | 19.0 | 9.5 | 1.4 | 30 |
| 342-20060 | SE28 25,4/12,7 | VG 95343 T 05 D 007 A | 25.4 | 12.7 | 1.8 | 30 |
| 342-20070 | SE28 38,0/19,0 | VG 95343 T 05 D 008 A | 38.0 | 19.0 | 2.4 | 30 |
| 342-20080 | SE28 51,0/25,4 | VG 95343 T 05 D 009 A | 51.0 | 25.4 | 2.8 | 30 |
| 342-20090 | SE28 76,0/38,0 | VG 95343 T 05 D 010 A | 76.0 | 38.0 | 3.2 | 15 |
| 342-20100 | SE28 101,2/51,0 | VG 95343 T 05 D 011 A | 102.0 | 51.0 | 3.5 | 10 |

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval. For product specific approvals please refer to the Appendix.

Heat Shrinkable Tubing 2:1 - Elastomer

• TE28 - light weight

Features and Benefits

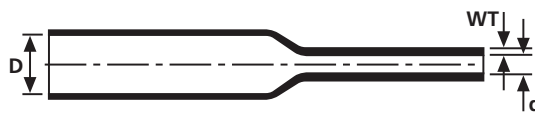
The benefit of the thin walled and very flexible TE28 tubing is in its lighter weight. It is used in areas where weight is a key factor, for example in aerospace applications or motorsport.

Application

TE28 is used for long-term protection of cables and wire harnesses in military equipment, motor sports, and aviation



Thin wall TE28 tubing with a boot.



TE28

| Material Data | |
|-------------------------------------|-------------------------------|
| Material | Elastomer, cross-linked (POA) |
| Colour | Black (BK) |
| Shrink Ratio | 2:1 |
| Longitudinal change after shrinkage | -10% max. |
| Min. Shrink Temperature | +170 °C |
| Operating Temperature | -75 °C to +150 °C |
| Dielectric Strength | 20 kV/mm |
| Flammability | VG 95343 |
| Certification | VG 95343 |

Cut lengths available on request. Please contact us!



Technical Table

| Article-No. | Type | Designation as per VG-Norm | Supplied Ø D min. | Recov. Ø d max. | Wall (WT) nom. | Reel Length (m) |
|-------------|----------------|----------------------------|-------------------|-----------------|----------------|-----------------|
| 342-30000 | TE28 2,4/1,2 | VG 95343 T 05 D 012 A | 2.4 | 1.2 | 0.5 | 150 |
| 342-30010 | TE28 3,2/1,6 | VG 95343 T 05 D 013 A | 3.2 | 1.6 | 0.5 | 150 |
| 342-30020 | TE28 4,8/2,4 | VG 95343 T 05 D 014 A | 4.8 | 2.4 | 0.5 | 60 |
| 342-30030 | TE28 6,4/3,2 | VG 95343 T 05 D 015 A | 6.4 | 3.2 | 0.6 | 60 |
| 342-30040 | TE28 9,5/4,8 | VG 95343 T 05 D 016 A | 9.5 | 4.8 | 0.6 | 60 |
| 342-30050 | TE28 12,7/6,4 | VG 95343 T 05 D 017 A | 12.7 | 6.4 | 0.6 | 60 |
| 342-30060 | TE28 19,0/9,5 | VG 95343 T 05 D 018 A | 19.0 | 9.5 | 0.8 | 30 |
| 342-30070 | TE28 25,4/12,7 | VG 95343 T 05 D 019 A | 25.4 | 12.7 | 0.9 | 30 |
| 342-30080 | TE28 38,0/19,0 | VG 95343 T 05 D 020 A | 38.0 | 19.0 | 1.0 | 30 |
| 342-30090 | TE28 51,0/25,4 | VG 95343 T 05 D 022 A | 51.0 | 25.4 | 1.1 | 30 |

All dimensions in mm. Subject to technical changes.



Please note! Not all products listed on this page may have this approval. For product specific approvals please refer to the Appendix.

Heat Shrinkable Tubing up to 4:1 - 1 m lengths

- MU47 - medium wall unlined
- MA47 - medium wall adhesive lined

Features and Benefits

MA47 has been designed to protect cable joints and terminations in low voltage applications. The adhesive lining makes it especially suitable for cable applications above and below ground.

This medium wall tubing is flexible yet has robust insulation characteristics. MA47 tubing is coated with a thermoplastic adhesive on the inside, which protects against humidity and other kinds of environmental impacts after shrinking.

Application

Insulation and protection of low voltage cable joints and terminations above and below ground.



MA47 and MU47 medium wall tubing - lined and unlined.

Material Data

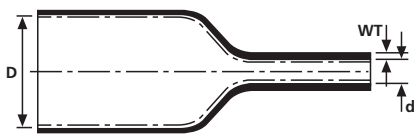
| | |
|-------------------------------------|--|
| Material | Polyolefin, cross-linked (POX) |
| Colour | Black (BK) |
| Shrink Ratio | up to 4:1 |
| Operating Temperature | MA47-55 °C to +110 °C MU47-55 °C to +110 °C |
| Min. Shrink Temperature | +120 °C |
| Softening Point Adhesive | +85 °C |
| Longitudinal change after shrinkage | -10% max. |
| Dielectric Strength | 20 kV/mm |



Technical Table

| Article-No. | Type | Supplied Ø D min. | Recov. Ø d max. | Wall (WT) nom. | Length (L) (m) |
|-----------------------------------|-------------------|----------------------|--------------------|-------------------|-------------------|
| MA47 - medium wall adhesive lined | | | | | |
| 323-20120 | MA47-12/3 | 12.0 | 3.0 | 2.0 | 1.0 |
| 323-20190 | MA47-19/6 | 19.0 | 6.0 | 2.5 | 1.0 |
| 323-20300 | MA47-30/8 | 30.0 | 8.0 | 2.5 | 1.0 |
| 323-20400 | MA47-40/12 | 40.0 | 12.0 | 2.5 | 1.0 |
| 323-20500 | MA47-50/16 | 50.0 | 16.0 | 2.7 | 1.0 |
| 323-20630 | MA47-63/19 | 63.0 | 19.0 | 2.8 | 1.0 |
| 323-20750 | TREDUX-MA47-75/22 | 75.0 | 22.0 | 3.0 | 1.0 |
| 323-20950 | MA47-95/30 | 95.0 | 30.0 | 3.0 | 1.0 |
| 323-21150 | MA47-115/34 | 115.0 | 34.0 | 3.0 | 1.0 |
| 323-21400 | MA47-140/42 | 140.0 | 42.0 | 3.0 | 1.0 |
| MU47 - medium wall unlined | | | | | |
| 323-10120 | MU47-12/3 | 12.0 | 3.0 | 2.0 | 1.0 |
| 323-10190 | MU47-19/6 | 19.0 | 6.0 | 2.2 | 1.0 |
| 323-10300 | MU47-30/8 | 30.0 | 8.0 | 2.5 | 1.0 |
| 323-10400 | MU47-40/12 | 40.0 | 12.0 | 2.5 | 1.0 |
| 323-10500 | MU47-50/16 | 50.0 | 16.0 | 2.7 | 1.0 |
| 323-10630 | MU47-63/19 | 63.0 | 19.0 | 2.8 | 1.0 |
| 323-10750 | MU47-75/22 | 75.0 | 22.0 | 3.0 | 1.0 |
| 323-10950 | MU47-95/30 | 95.0 | 30.0 | 3.0 | 1.0 |
| 323-11150 | MU47 115/34 | 115.0 | 34.0 | 3.0 | 1.0 |
| 323-11400 | MU47-140/42 | 140.0 | 42.0 | 3.0 | 1.0 |

All dimensions in mm. Subject to technical changes.



MA47, MU47

Cut lengths available on request. Please contact us!

Constant Force Spring Adaptor

• Zetalok

Features and Benefits

Zetalok is a unique re-enterable termination system for connecting a cable shielding braid to a circular connector. When used in conjunction with our Heatshrink moulded shape, a sealed enviromental termination system is achieved. The main feature is that the termination can be re-entered when required. It is there by possible to effect repairs to connector pins/sockets without the need to discard any part of the shielding system. Due to the self-tensioning nature of the spring, it provides excellent resistant to vibration and shock.

Application

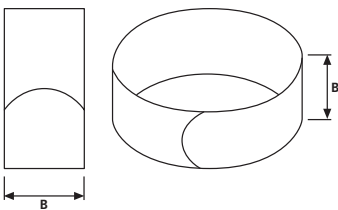
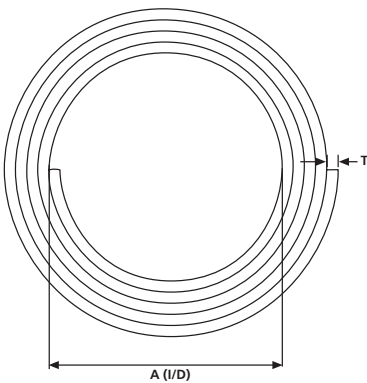
Predominantly used in the Aerospace, Defence and Professional Electronics sectors.



The various spring sizes.



Zetalok installation system.



| Material Data | |
|---------------|----------------------|
| Material | Stainless Steel (SS) |
| Colour | Silver (SR) |

| Technical Table | | | | | |
|-----------------|----------|--------------|--------------------|------------|---------------|
| Article-No. | Type | Inside Ø (A) | Material Width (B) | Length (L) | Thickness (T) |
| 425-00002 | HE-050 | 7.34 | 9.53 | 107.9 | 0.1016 |
| 425-00003 | HE-050-2 | 7.14 | 6.53 | 108.0 | 0.1016 |
| 425-00004 | HE-100-1 | 9.10 | 9.53 | 119.0 | 0.1016 |
| 425-00005 | HE-200-2 | 14.40 | 9.53 | 127.0 | 0.1775 |
| 425-00007 | HE-300-4 | 18.51 | 9.53 | 232.0 | 0.2540 |
| 425-00008 | HE-300-3 | 18.64 | 6.35 | 260.3 | 0.2540 |
| 425-00009 | HE-400-4 | 24.86 | 9.53 | 217.5 | 0.3048 |

All dimensions in mm. Subject to technical changes.

Two-component Adhesive for Heat Shrinkable Tubing and Shapes

• **V9500 Dosing Gun**

The V9500 dosing gun allows for clean processing and individual metering. It is employed in conjunction with the dual cartridges 627-95002. The V9500 lockable cartridges are available with or without the processing set. The processing set is available in two versions (see table for contents). The cartridges can be re-used, even after a lapse of several days, because the closure prevents the adhesive from hardening.



Two-component epoxy adhesive V9500.

| Material Data | |
|-----------------------|---------------------------------------|
| Material | Epoxy resins (EP) |
| Colour | Black (BK) |
| Curing Temperature | +135 °C |
| Curing Time | 24 hours at +25 °C, 2 hours at +85 °C |
| Operating Temperature | -75 °C to +150 °C |
| Specification | VG 95343 T15 DA |



• **V9500**

This high performance, VG-approved, two part epoxy adhesive has been developed to meet the military requirements associated with heat shrinkable components for wire and cable harnesses. It has very good resistance to most solvents and fuels, even at higher temperatures. The two part epoxy adhesive is available in two different packages.

When heat is applied during the shrinking of the moulded shape, the two part components react, producing a high performance bond.



The V9500 applicator gun guarantees the clean and precise coating of special fittings.

| Technical Table | | | |
|-----------------|---------------------------------|----------------------------|--|
| Article-No. | Type | Designation as per VG-Norm | Content |
| 627-95001 | V9500 epoxy adhesive kit | VG 95343 T15 A 001 A | 1 x dual cartridge (50g), 5 x mixing pots, 5 x mixing sticks, 5 x emery papers |
| 627-95002 | V9500 Duo pack | VG 95343 T15 A | Two component adhesive cartridge |
| 627-95003 | V9500 Applicator gun | VG 95343 T15 DA | Applicator gun |
| 627-95004 | V9500 Nozzle | VG 95343 T15 MA | Mixing nozzle |

Subject to technical changes.

VG Please note! Not all products listed on this page may have this approval. For product specific approvals please refer to the Appendix.

Hot Melt Tape for Heat Shrinkable Tubing and Shapes

• HMT200A

Features and Benefits

The hot melt tape flows when heated and provides permanent airtight and watertight seals.

Application

Designed for use with heat shrinkable sleeving and mouldings.

Application Method

1. Clean and prepare the bonding areas.*
2. Wrap the tape around the part and overlap.*
3. Put the tubing or heat shrinkable shape over the tape and shrink down.*

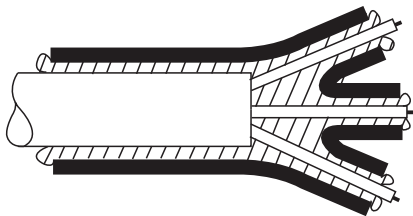
*As per installation guide



HMT200A tape.



Adhesive tape HMT200A for sealing against humidity.



HMT200A

| Material Data | |
|-----------------------|----------------------------|
| Material | Ethylenevinylacetate (EVA) |
| Colour | Transparent (CL) |
| Operating Temperature | -55 °C to +105 °C |
| Melting Point | starting from +95 °C |



| Technical Table | | | | |
|-----------------|---------|---------------|-----------|-----------------|
| Article-No. | Type | Thickness (T) | Width (W) | Reel Length (m) |
| 354-02259 | HMT200A | 0.25 | 25.0 | 50 |
| 354-02260 | HMT200A | 0.25 | 25.0 | 10 |

All dimensions in mm. Subject to technical changes.

High Temperature Hot Melt Adhesive Tape for Low Profile Products

- **TSA-200**

Features and Benefits

A high temperature hot melt adhesive that bonds well to polyethylene and metals. Compliments -9 and -8 material (SCX15112 and SCX15111) whilst having good resistance to water ingress. The hot melt tape flows when heated to provide a permanent environmental seal. Store below 40°C and away from direct sunlight.

Application

Designed for use with our -9 and -8 heat shrinkable materials.

Application Method

1. Clean and prepare bonding areas.*
2. Wrap the tape around the part and overlap.*
3. Put the tubing or heat shrinkable shape over the tape and shrink down.*

* As per installation guide



Hot melt adhesive TSA-200.

Material Data

| | |
|-----------------------|--------------------------|
| Material | Polyester blend |
| Colour | Black (BK) |
| Operating Temperature | -55 °C to +125 °C |



Technical Table

| Article-No. | Type | Thickness (T) | Width (W) | Reel Length (m) |
|-------------|----------------|---------------|-----------|-----------------|
| 354-03000 | TSA-200 | 0.6 | 22.0 | 25 |

All dimensions in mm. Subject to technical changes.

DEF STAN

VG

MIL

Appendix

| | Page |
|---|------|
| 4.1 HellermannTyton Product Standards | |
| Standards for HellermannTyton Heat Shrinkable Tubing and Heat Shrinkable Moulded Shapes according to VG Norm | 84 |
| Standards for HellermannTyton Heat Shrinkable Tubing | 85 |
| VG/MIL Specification Cross Reference | 86 |
| HellermannTyton Shapes for use with MIL Connectors | 87 |
| MIL Specification Slash Sheet Cross Reference | 88 |
| 4.2 Terms and Conditions | 95 |

Standards for HellermannTyton Heat Shrinkable Tubing and Heat Shrinkable Moulded Shapes according to VG Norm

| Description VG-Norm | Description HellermannTyton |
|----------------------|-----------------------------|
| VG 95343 T05 D 001 A | SE28 3,2/1,6 |
| VG 95343 T05 D 002 A | SE28 4,8/2,4 |
| VG 95343 T05 D 003 A | SE28 6,4/3,2 |
| VG 95343 T05 D 004 A | SE28 9,5/4,8 |
| VG 95343 T05 D 005 A | SE28 12,7/6,4 |
| VG 95343 T05 D 006 A | SE28 19,0/9,5 |
| VG 95343 T05 D 007 A | SE28 25,4/12,7 |
| VG 95343 T05 D 008 A | SE28 38,0/19,0 |
| VG 95343 T05 D 009 A | SE28 51,0/25,4 |
| VG 95343 T05 D 010 A | SE28 76,0/38,0 |
| VG 95343 T05 D 011 A | SE28 101,2/51,0 |
| VG 95343 T05 D 012 A | TE28 2,4/1,2 |
| VG 95343 T05 D 013 A | TE28 3,2/1,6 |
| VG 95343 T05 D 014 A | TE28 4,8/2,4 |
| VG 95343 T05 D 015 A | TE28 6,4/3,2 |
| VG 95343 T05 D 016 A | TE28 9,5/4,8 |
| VG 95343 T05 D 017 A | TE28 12,7/6,4 |
| VG 95343 T05 D 018 A | TE28 19,0/9,5 |
| VG 95343 T05 D 019 A | TE28 25,4/12,7 |
| VG 95343 T05 D 020 A | TE28 38,0/19,0 |
| VG 95343 T05 D 022 A | TE28 51,0/25,4 |
| VG 95343 T05 E 001A | VITON®-E-1/8-BK |
| VG 95343 T05 E 002A | VITON®-E-3/16-BK |
| VG 95343 T05 E 003A | VITON®-E-1/4-BK |
| VG 95343 T05 E 004A | VITON®-E-3/8-BK |
| VG 95343 T05 E 005A | VITON®-E-1/2-BK |
| VG 95343 T05 E 006A | VITON®-E-3/4-BK |
| VG 95343 T05 E 007A | VITON®-E-1-BK |
| VG 95343 T05 E 008A | VITON®-E-1.1/2-BK |
| VG 95343 T05 E 009A | VITON®-E-2-BK |
| VG 95343 T06 A 001 A | 152-41-G |
| VG 95343 T06 A 002 A | 153-41-G |
| VG 95343 T06 A 003 A | 154-41-G |
| VG 95343 T06 A 004 A | 155-41-G |
| VG 95343 T06 A 005 A | 156-41-G |
| VG 95343 T06 A 006 A | 157-41-G |
| VG 95343 T06 A 007 A | 158-41-G |
| VG 95343 T06 A 008 A | 159-41-G |
| VG 95343 T06 A 009 A | 160-41-G |
| VG 95343 T06 A 010 A | 199-4-G |
| VG 95343 T06 B 001 A | 152-42-G |
| VG 95343 T06 B 002 A | 153-42-G |
| VG 95343 T06 B 003 A | 154-42-G |
| VG 95343 T06 B 004 A | 155-42-G |
| VG 95343 T06 B 005 A | 156-42-G |
| VG 95343 T06 B 006 A | 157-42-G |
| VG 95343 T06 B 007 A | 158-42-G |
| VG 95343 T06 B 008 A | 159-42-G |
| VG 95343 T06 B 009 A | 160-42-G |
| VG 95343 T06 C 001 A | 157-43-G |
| VG 95343 T06 C 002 A | 158-43-G |
| VG 95343 T06 C 003 A | 159-43-G |
| VG 95343 T06 C 004 A | 160-43-G |
| VG 95343 T06 D 001 A | 129-1-G |
| VG 95343 T06 D 002 A | 130-1-G |
| VG 95343 T06 D 003 A | 131-1-G |
| VG 95343 T06 D 004 A | 132-1-G |
| VG 95343 T06 D 005 A | 133-1-G |
| VG 95343 T06 D 006 A | 134-1-G |
| VG 95343 T06 D 007 A | 135-1-G |
| VG 95343 T06 D 008 A | 136-1-G |

| Description VG-Norm | Description HellermannTyton |
|----------------------|-----------------------------|
| VG 95343 T06 D 009 A | 138-1-G |
| VG 95343 T06 D 011 A | 176-1-G |
| VG 95343 T06 D 012 A | 177-1-G |
| VG 95343 T06 D 013 A | 178-1-G |
| VG 95343 T06 D 014 A | 179-1-G |
| VG 95343 T06 E 001 A | 1152-4-G |
| VG 95343 T06 E 002 A | 1154-4-G |
| VG 95343 T06 E 003 A | 1155-4-G |
| VG 95343 T06 E 004 A | 1156-4-G |
| VG 95343 T06 E 005 A | 1157-4-G |
| VG 95343 T06 E 006 A | 1158-4-G |
| VG 95343 T06 E 007 A | 1159-4-G |
| VG 95343 T06 E 008 A | 1160-4-G |
| VG 95343 T06 F 001 A | 1121-1-G |
| VG 95343 T06 F 002 A | 1122-1-G |
| VG 95343 T06 F 003 A | 1123-1-G |
| VG 95343 T06 F 004 A | 1124-1-G |
| VG 95343 T06 F 005 A | 1125-1-G |
| VG 95343 T06 F 006 A | 1126-1-G |
| VG 95343 T06 F 007 A | 1127-1-G |
| VG 95343 T06 F 008 A | 1128-1-G |
| VG 95343 T06 F 009 A | 1129-1-G |
| VG 95343 T06 F 010 A | 1141-1-G |
| VG 95343 T06 F 011 A | 1133-1-G |
| VG 95343 T06 F 012 A | 1134-1-G |
| VG 95343 T06 F 013 A | 1135-1-G |
| VG 95343 T06 F 014 A | 1136-1-G |
| VG 95343 T06 J 001 A | 1111-1-G |
| VG 95343 T06 J 002 A | 1112-1-G |
| VG 95343 T06 J 003 A | 1113-1-G |
| VG 95343 T06 J 004 A | 1114-1-G |
| VG 95343 T06 J 006 A | 1116-1-G |
| VG 95343 T06 J 007 A | 1117-1-G |
| VG 95343 T06 J 008 A | 1118-1-G |
| VG 95343 T06 K 001 A | 1505-1-G |
| VG 95343 T06 K 002 A | 1506-1-G |
| VG 95343 T06 K 003 A | 1507-1-G |
| VG 95343 T06 K 004 A | 1501-1-G |
| VG 95343 T06 K 005 A | 1502-2-G |
| VG 95343 T06 K 006 A | 1502-2-G |
| VG 95343 T06 K 007 A | 1506-2-G |
| VG 95343 T06 K 008 A | 1507-2-G |
| VG 95343 T06 K 009 A | 1501-2-G |
| VG 95343 T06 K 010 A | 1502-1-G |
| VG 95343 T06 L 001 A | 2101-1-G |
| VG 95343 T06 L 002 A | 2102-1-G |
| VG 95343 T06 L 003 A | 2103-1-G |
| VG 95343 T06 L 004 A | 2104-1-G |
| VG 95343 T06 L 005 A | 2105-1-G |
| VG 95343 T06 L 006 A | 2101-2-G |
| VG 95343 T06 L 007 A | 2102-2-G |
| VG 95343 T06 L 008 A | 2103-2-G |
| VG 95343 T06 L 009 A | 2105-2-G |
| VG 95343 T07 A 001 A | 152-41-GP |
| VG 95343 T07 A 002 A | 153-41-GP |
| VG 95343 T07 A 003 A | 154-41-GP |
| VG 95343 T07 A 004 A | 155-41-GP |
| VG 95343 T07 A 005 A | 156-41-GP |
| VG 95343 T07 A 006 A | 157-41-GP |
| VG 95343 T07 A 007 A | 158-41-GP |
| VG 95343 T07 A 008 A | 159-41-GP |
| VG 95343 T07 A 009 A | 160-41-GP |

| Description VG-Norm | Description HellermannTyton |
|----------------------|-----------------------------|
| VG 95343 T07 B 001 A | 152-42-GP |
| VG 95343 T07 B 002 A | 153-42-GP |
| VG 95343 T07 B 003 A | 154-42-GP |
| VG 95343 T07 B 004 A | 155-42-GP |
| VG 95343 T07 B 005 A | 156-42-GP |
| VG 95343 T07 B 006 A | 157-42-GP |
| VG 95343 T07 B 007 A | 158-42-GP |
| VG 95343 T07 B 008 A | 159-42-GP |
| VG 95343 T07 B 009 A | 160-42-GP |
| VG 95343 T07 C 001 A | 157-43-GP |
| VG 95343 T07 C 002 A | 158-43-GP |
| VG 95343 T07 C 003 A | 159-43-GP |
| VG 95343 T07 C 004 A | 160-43-GP |
| VG 95343 T07 D 001 A | 129-1-GP |
| VG 95343 T07 D 002 A | 130-1-GP |
| VG 95343 T07 D 003 A | 131-1-GP |
| VG 95343 T07 D 004 A | 132-1-GP |
| VG 95343 T07 D 005 A | 133-1-GP |
| VG 95343 T07 D 006 A | 134-1-GP |
| VG 95343 T07 D 007 A | 135-1-GP |
| VG 95343 T07 D 008 A | 136-1-GP |
| VG 95343 T07 D 009 A | 138-1-GP |
| VG 95343 T07 D 010 A | 187-1-GP |
| VG 95343 T07 E 001 A | 1152-4-GP |
| VG 95343 T07 E 002 A | 1154-4-GP |
| VG 95343 T07 E 003 A | 1155-4-GP |
| VG 95343 T07 E 004 A | 1156-4-GP |
| VG 95343 T07 E 005 A | 1157-4-GP |
| VG 95343 T07 E 006 A | 1158-4-GP |
| VG 95343 T07 E 007 A | 1159-4-GP |
| VG 95343 T07 E 008 A | 1160-4-GP |
| VG 95343 T07 F 002 A | 1122-1-GP |
| VG 95343 T07 F 003 A | 1123-1-GP |
| VG 95343 T07 F 004 A | 1124-1-GP |
| VG 95343 T07 F 005 A | 1125-1-GP |
| VG 95343 T07 F 006 A | 1126-1-GP |
| VG 95343 T07 F 007 A | 1127-1-GP |
| VG 95343 T07 F 008 A | 1128-1-GP |
| VG 95343 T07 F 009 A | 1129-1-GP |
| VG 95343 T07 F 010 A | 1141-1-GP |
| VG 95343 T08 A 001 A | 1203-1-G |
| VG 95343 T08 A 002 A | 1209-1-G |
| VG 95343 T08 A 007 A | 1201-1-G |
| VG 95343 T08 A 009 A | 1206-1-G |
| VG 95343 T08 A 010 A | 1202-1-G |
| VG 95343 T08 A 011 A | 1207-1-G |
| VG 95343 T08 A 016 A | 1204-1-G |
| VG 95343 T08 A 017 A | 1216-1-G |
| VG 95343 T08 B 001 A | 1301-1-G |
| VG 95343 T08 B 002 A | 1303-1-G |
| VG 95343 T08 B 003 A | 1311-1-G |
| VG 95343 T08 B 004 A | 1302-1-G |
| VG 95343 T08 B 005 A | 1304-1-G |
| VG 95343 T08 B 006 A | 1305-1-G |
| VG 95343 T08 B 007 A | 1312-1-G |
| VG 95343 T08 B 008 A | 1316-1-G |
| VG 95343 T08 B 009 A | 1313-1-G |
| VG 95343 T08 B 010 A | 1306-1-G |
| VG 95343 T08 B 011 A | 1307-1-G |
| VG 95343 T08 B 012 A | 1308-1-G |
| VG 95343 T08 C 001 A | 206-1-G |
| VG 95343 T08 C 002 A | 203-1-G |

HellermannTyton Product Standards

| Description VG-Norm | Description HellermannTyton |
|------------------------|--------------------------------|
| VG 95343 T08 C 003 A | 204-1-G |
| VG 95343 T08 C 004 A | 211-1-G |
| VG 95343 T08 C 005 A | 212-1-G |
| VG 95343 T08 D 001 A | 306-1-G |
| VG 95343 T08 D 002 A | 304-1-G |
| VG 95343 T08 D 003 A | 310-1-G |
| VG 95343 T08 D 004 A | 311-1-G |
| VG 95343 T08 E 002 A | 411-1-G |
| VG 95343 T08 E 004 A | 403-1-G |
| VG 95343 T08 E 005 A | 413-1-G |
| VG 95343 T09 A 001 A | 1203-1-GP |
| VG 95343 T09 A 002 A | 1209-1-GP |
| VG 95343 T09 A 003 A | 1214-1-GP |
| VG 95343 T09 B 001 A | 1301-1-GP |
| VG 95343 T09 B 002 A | 1303-1-GP |
| VG 95343 T09 B 003 A | 1311-1-GP |
| VG 95343 T09 C 001 A | 206-1-GP |
| VG 95343 T09 C 002 A | 203-1-GP |
| VG 95343 T09 C 003 A | 204-1-GP |
| VG 95343 T15 A 001 A | V9500 PK |
| VG 95343 T15 A 002 B | V9500 B |
| VG 95343 T15 A | V9500 P |
| VG 95343 T15 DA | P9500 |
| VG 95343 T15 MA | M9500 |
| VG 95343 T18 A 001 A | 152-41-GW24 |
| VG 95343 T18 A 002 A | 153-41-GW24 |
| VG 95343 T18 A 003 A | 154-41-GW24 |
| VG 95343 T18 A 004 A | 155-41-GW24 |
| VG 95343 T18 A 005 A | 156-41-GW24 |
| VG 95343 T18 A 006 A | 157-41-GW24 |
| VG 95343 T18 A 007 A | 158-41-GW24 |
| VG 95343 T18 A 008 A | 159-41-GW24 |
| VG 95343 T18 A 009 A | 160-41-GW24 |
| VG 95343 T18 A 010 A | 199-41-GW24 |
| VG 95343 T18 E 001 A | 1505-1-GW24 |
| VG 95343 T18 E 002 A | 1506-1-GW24 |
| VG 95343 T18 E 003 A | 1507-1-GW24 |
| VG 95343 T18 E 004 A | 1501-1-GW24 |
| VG 95343 T18 E 005 A | 1502-2-GW24 |
| VG 95343 T18 E 006 A | 1505-2-GW24 |
| VG 95343 T18 E 007 A | 1506-2-GW24 |
| VG 95343 T18 E 008 A | 1507-2-GW24 |
| VG 95343 T18 E 009 A | 1501-2-GW24 |
| VG 95343 T18 E 010 A | 1502-1-GW24 |
| VG 95343 T18 B 001 A | 152-42-GW24 |
| VG 95343 T18 B 002 A | 153-42-GW24 |
| VG 95343 T18 B 003 A | 154-42-GW24 |
| VG 95343 T18 B 004 A | 155-42-GW24 |
| VG 95343 T18 B 005 A | 156-42-GW24 |
| VG 95343 T18 B 006 A | 157-42-GW24 |
| VG 95343 T18 B 007 A | 158-42-GW24 |
| VG 95343 T18 B 008 A | 159-42-GW24 |
| VG 95343 T18 B 009 A | 160-42-GW24 |
| VG 95343 T18 C 001 A | 157-43-GW24 |
| VG 95343 T18 C 002 A | 158-43-GW24 |
| VG 95343 T18 C 003 A | 159-43-GW24 |
| VG 95343 T18 C 004 A | 160-43-GW24 |
| VG 95343 T18 D 001 A | 1152-4-GW24 |
| VG 95343 T18 D 002 A | 1154-4-GW24 |
| VG 95343 T18 D 003 A | 1155-4-GW24 |
| VG 95343 T18 D 004 A | 1156-4-GW24 |
| VG 95343 T18 D 005 A | 1157-4-GW24 |

| Description VG-Norm | Description HellermannTyton |
|------------------------|--------------------------------|
| VG 95343 T18 D 006 A | 1158-4-GW24 |
| VG 95343 T18 D 007 A | 1159-4-GW24 |
| VG 95343 T18 D 008 A | 1160-4-GW24 |
| VG 95343 T18 G 001 A | 2101-1-GW24 |
| VG 95343 T18 G 003 A | 2102-1-GW24 |
| VG 95343 T18 G 005 A | 2103-1-GW24 |
| VG 95343 T18 G 006 A | 2104-1-GW24 |
| VG 95343 T18 G 007 A | 2105-1-GW24 |
| VG 95343 T18 G 008 A | 2101-2-GW24 |
| VG 95343 T18 G 010 A | 2102-2-GW24 |
| VG 95343 T18 G 012 A | 2103-2-GW24 |
| VG 95343 T18 G 014 A | 2105-2-GW24 |
| VG 95343 T18 H 001 A | 1133-2-GW24 |
| VG 95343 T18 H 002 A | 1133-1-GW24 |
| VG 95343 T19 A 001 A | 1203-1-GW24 |
| VG 95343 T19 A 002 A | 1209-1-GW24 |
| VG 95343 T19 A 003 A | 1214-1-GW24 |
| VG 95343 T19 A 004 A | 1210-1-GW24 |
| VG 95343 T19 A 006 A | 1212-1-GW24 |
| VG 95343 T19 A 007 A | 1201-1-GW24 |
| VG 95343 T19 A 008 A | 1213-1-GW24 |
| VG 95343 T19 A 009 A | 1206-1-GW24 |
| VG 95343 T19 A 010 A | 1202-1-GW24 |
| VG 95343 T19 A 011 A | 1207-1-GW24 |
| VG 95343 T19 A 012 A | 1208-1-GW24 |
| VG 95343 T19 A 016 A | 1204-1-GW24 |
| VG 95343 T19 A 017 A | 1216-1-GW24 |
| VG 95343 T19 A 018 A | 1220-1-GW24 |
| VG 95343 T19 E 002 A | 411-1-GW24 |
| VG 95343 T19 E 003 A | 412-1-GW24 |
| VG 95343 T19 E 004 A | 403-1-GW24 |
| VG 95343 T19 E 005 A | 413-1-GW24 |
| VG 95343 T19 E 009 A | 414-1-GW24 |
| VG 95343 T19 B 001 A | 1301-1-GW24 |
| VG 95343 T19 B 002 A | 1303-1-GW24 |
| VG 95343 T19 B 003 A | 1311-1-GW24 |
| VG 95343 T19 B 004 A | 1302-1-GW24 |
| VG 95343 T19 B 006 A | 1305-1-GW24 |
| VG 95343 T19 B 007 A | 1312-1-GW24 |
| VG 95343 T19 B 008 A | 1316-1-GW24 |
| VG 95343 T19 B 009 A | 1313-1-GW24 |
| VG 95343 T19 B 010 A | 1306-1-GW24 |
| VG 95343 T19 B 011 A | 1307-1-GW24 |
| VG 95343 T19 B 012 A | 1308-1-GW24 |
| VG 95343 T19 C 001 A | 206-1-GW24 |
| VG 95343 T19 C 002 A | 203-1-GW24 |
| VG 95343 T19 C 003 A | 204-1-GW24 |
| VG 95343 T19 C 004 A | 211-1-GW24 |

| Description VG-Norm | Description HellermannTyton |
|------------------------|--------------------------------|
| VG 95343 T19 C 005 A | 212-1-GW24 |
| VG 95343 T19 D 001 A | 306-1-GW24 |
| VG 95343 T19 D 002 A | 304-1-GW24 |
| VG 95343 T19 D 003 A | 310-1-GW24 |
| VG 95343 T19 D 004 A | 311-1-GW24 |
| VG 95343 T19 D 005 A | 312-1-GW24 |
| VG 95343 T29 A 001 A | 152-61-HW21 |
| VG 95343 T29 A 002 A | 153-61-HW21 |
| VG 95343 T29 A 003 A | 154-61-HW21 |
| VG 95343 T29 A 004 A | 155-61-HW21 |
| VG 95343 T29 A 005 A | 156-61-HW21 |
| VG 95343 T29 A 006 A | 157-61-HW21 |
| VG 95343 T29 B 001 A | 152-62-HW21 |
| VG 95343 T29 B 002 A | 153-62-HW21 |
| VG 95343 T29 B 003 A | 154-62-HW21 |
| VG 95343 T29 B 004 A | 155-62-HW21 |
| VG 95343 T29 B 005 A | 156-62-HW21 |
| VG 95343 T29 B 006 A | 157-62-HW21 |
| VG 95343 T29 B 007 A | 158-62-HW21 |
| VG 95343 T29 C 001 A | 157-63-HW21 |
| VG 95343 T29 C 002 A | 158-63-HW21 |
| VG 95343 T29 D 001 A | 1152-6-HW21 |
| VG 95343 T29 D 002 A | 1154-6-HW21 |
| VG 95343 T29 D 003 A | 1155-6-HW21 |
| VG 95343 T29 D 004 A | 1156-6-HW21 |
| VG 95343 T29 D 005 A | 1157-6-HW21 |
| VG 95343 T29 D 006 A | 1158-6-HW21 |
| VG 95343 T30 A 001 A | 1203-1-HW21 |
| VG 95343 T30 A 002 A | 1209-1-HW21 |
| VG 95343 T30 A 007 A | 1201-1-HW21 |
| VG 95343 T30 A 009 A | 1206-1-HW21 |
| VG 95343 T30 A 010 A | 1202-1-HW21 |
| VG 95343 T30 A 011 A | 1207-1-HW21 |
| VG 95343 T30 A 016 A | 1204-1-HW21 |
| VG 95343 T30 A 017 A | 1216-1-HW21 |
| VG 95343 T30 B 001 A | 1301-1-HW21 |
| VG 95343 T30 B 002 A | 1303-1-HW21 |
| VG 95343 T30 B 003 A | 1311-1-HW21 |
| VG 95343 T30 B 004 A | 1302-1-HW21 |
| VG 95343 T30 C 001 A | 206-1-HW21 |
| VG 95343 T30 C 002 A | 203-1-HW21 |
| VG 95343 T30 C 003 A | 204-1-HW21 |
| VG 95343 T30 C 004 A | 211-1-HW21 |
| VG 95343 T30 C 005 A | 212-1-HW21 |
| VG 95343 T30 D 001 A | 306-1-HW21 |
| VG 95343 T30 D 002 A | 304-1-HW21 |
| VG 95343 T30 D 003 A | 310-1-HW21 |
| VG 95343 T30 D 004 A | 311-1-HW21 |

Standards for HellermannTyton Heat Shrinkable Tubing

| Type | VG 95343 T05 |
|----------|--------------|
| SE28 | ● |
| TE28 | ● |
| Viton®-E | ● |

VG Style/MIL Specification Style Cross Reference

Products listed below in VG style or MIL specification style can be substituted with each other, to achieve similar fit and function.

| VG Parts | MIL Specification Parts |
|----------|-------------------------|
| 152-42 | 105-4 |
| 153-42 | N/A |
| 154-42 | 106-4 |
| 155-42 | 101-4 |
| 156-42 | 102-4 |
| 157-43 | 103-4 |
| 158-43 | 107-4 |
| 159-43 | 118-4 |
| 1152-4 | 1106-4 |
| 1154-4 | 1107-4 |
| 1155-4 | 1104-4 |
| 1156-4 | 1103-4 |
| 1157-4 | 1101-4 |
| 1158-4 | 1105-4 |
| 1159-4 | 1109-4 |
| 129-1 | 129-4* |
| 130-1 | 130-4* |
| 131-1 | 131-4* |
| 132-1 | 132-4* |
| 133-1 | 133-4* |
| 134-1 | 134-4* |
| 135-1 | 135-4* |
| 136-1 | 136-4* |
| 138-1 | 138-4* |
| 187-1 | 187-4* |
| 1122-1 | 1122-4* |
| 1123-1 | 1123-4* |
| 1124-1 | 1124-4* |
| 1125-1 | 1125-4* |
| 1126-1 | 1126-4* |
| 1127-1 | 1127-4* |
| 1128-1 | 1128-4* |
| 1129-1 | 1129-4* |
| 1141-1 | 1141-4* |

* Note: These have a longer overall length than VG parts

HellermannTyton Shapes for use with circular MIL Specification Connectors MS 5015 AB



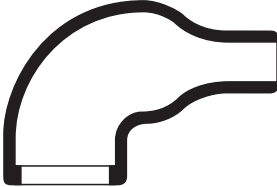

| Connector Shell Size | Knurl Dia (mm) | Orientation | | Cable Dia (mm) | |
|----------------------|----------------|--------------|----------------|----------------|------|
| | | Straight | 90° | Min | Max |
| 10 SL* | 15.7 | 153-42 | 1152-4/1106-4* | 4.2 | 7.7 |
| 14 S | 19.3 | 154-42/106-4 | 1154-4/1107-4 | 7.2 | 10.6 |
| 16 S | 24.1 | 155-42/101-4 | 1155-4/1104-4 | 8.4 | 13.5 |
| 16 | 24.1 | 155-42/101-4 | 1155-4/1104-4 | 8.4 | 13.5 |
| 18 | 24.1 | 155-42/101-4 | 1155-4/1104-4 | 8.4 | 14.6 |
| 20 | 29.8 | 156-42/102-4 | 1156-4/1103-4 | 10.2 | 18.7 |
| 22 | 29.8 | 156-42/102-4 | 1156-4/1103-4 | 10.2 | 20.8 |
| 24 | 38.0 | 157-43/103-4 | 1157-4/1101-4 | 12.0 | 24.6 |
| 28 | 38.0 | 157-43/103-4 | 1157-4/1101-4 | 12.0 | 27.0 |
| 32 | 48.0 | 158-43/107-4 | 1158-4/1105-4 | 19.2 | 33.3 |
| 36 | 48.0 | 158-43/107-4 | 1158-4/1105-4 | 19.2 | 38.5 |

* Note: Shell 10 SL for 90° moulded part min cable diameter 6.6 mm

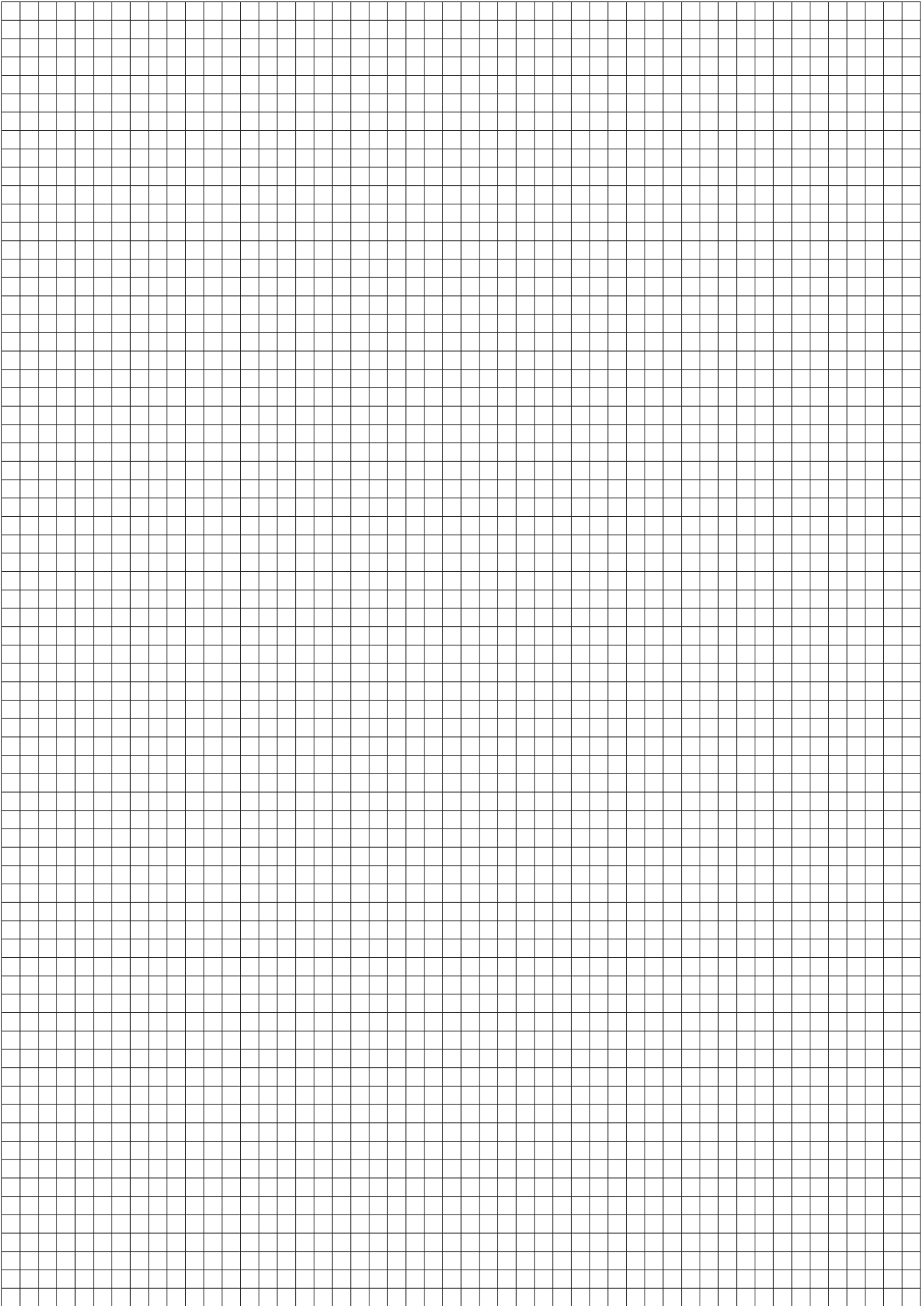
HellermannTyton Shapes for use with MIL-C-26482-I/II and 38999/Series I, II, III, IV

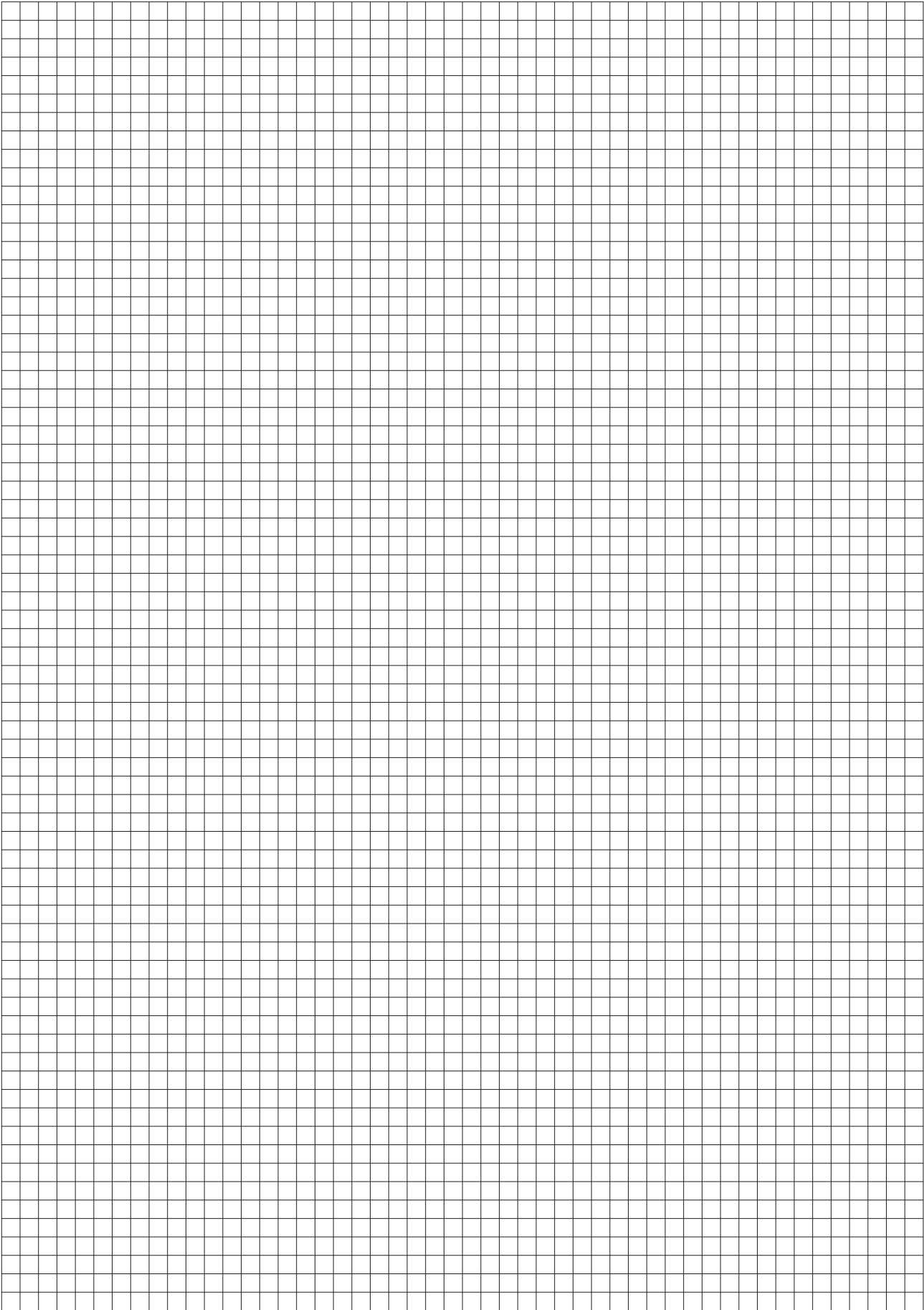
| Connector Shell Size | Knurl Dia (mm) | Orientation | | Cable Dia (mm) | |
|----------------------|----------------|--------------|---------------|----------------|-----------|
| | | Straight | 90° | Min | Max |
| 8/9 | 13.0 | 152-42/105-4 | 1152-4/1106-4 | 7.2 | 7.0 |
| 10/11 | 15.0 | 152-42/105-4 | 1152-4/1106-4 | 7.2 | 10.0 |
| 10/12 | 15.0/19.0 | 153-42/NA | - | 7.2 | 10.0/13.5 |
| 12/13 | 19.0 | 154-42/106-4 | 1154-4/1107-4 | 7.2 | 13.5 |
| 14/15 | 21.0 | 155-42/101-4 | 1155-4/1104-4 | 8.4 | 16.5 |
| 16/17 | 24.0 | 155-42/101-4 | 1155-4/1104-4 | 8.4 | 19.5 |
| 18/19 | 26.5 | 156-42/102-4 | 1156-4/1103-4 | 10.2 | 22.0 |
| 20/21 | 30.5 | 156-42/102-4 | 1156-4/1103-4 | 10.2 | 25.0 |
| 22/23 | 34.0 | 157-43/103-4 | 1157-4/1101-4 | 12.0 | 28.5 |
| 24/25 | 36.0 | 157-43/103-4 | 1157-4/1101-4 | 12.0 | 31.0 |

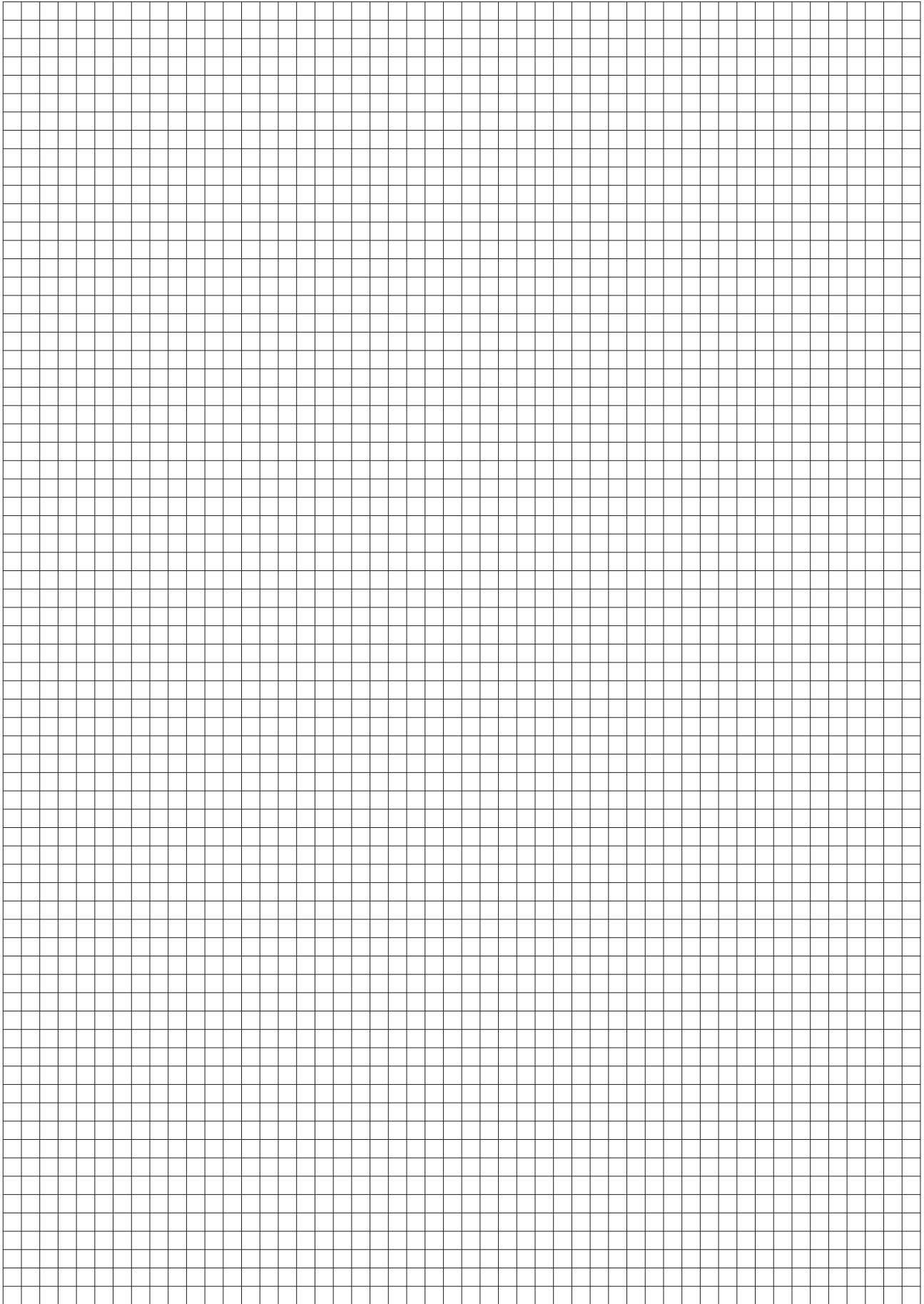
MIL Specification Slash Sheet Cross Reference

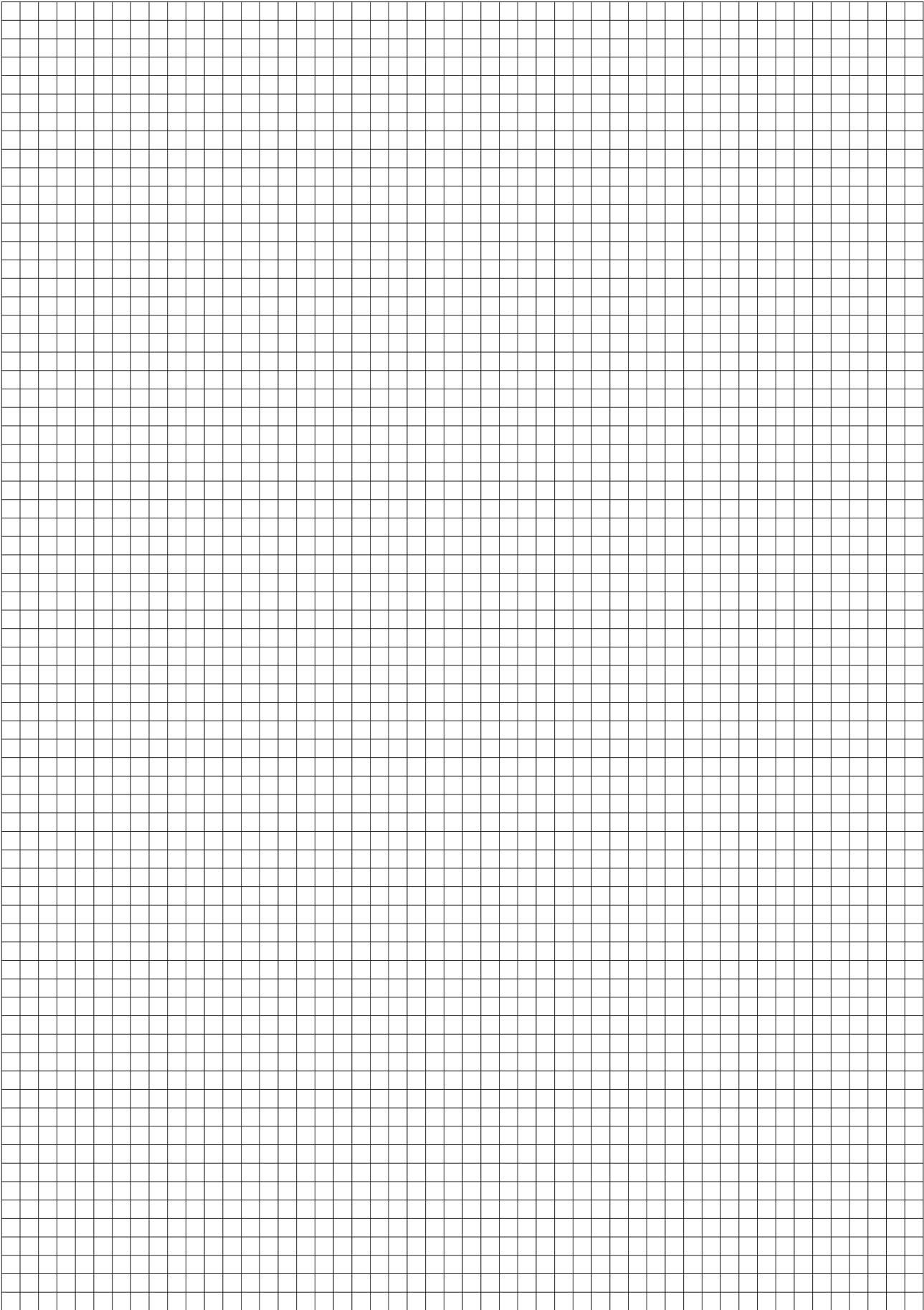
| HellermannTyton | MS3109 | Description | Style |
|-----------------|--------|---|--|
| 105-4-JL | -11AU | Bottle Shapes with rib "J" or "B7" material J = Red stripe B7 = White stripe Optional drainholes (D) |  |
| 105-4-B7L | -11BU | | |
| 106-4-JL | -12AU | | |
| 106-4-B7L | -12BU | | |
| 101-4-JL | -13AU | | |
| 101-4-B7L | -13BU | | |
| 102-4-JL | -14AU | | |
| 102-4-B7L | -14BU | | |
| 103-4-JL | -15AU | | |
| 103-4-B7L | -15BU | | |
| 107-4-JL | -16AU | | |
| 107-4-B7L | -16BU | | |
| 118-4-JL | -17AU | | |
| 118-4-B7L | -17BU | | |
| 129-4-JDL | -01AU | Low profile long outlet bottle shape with rib "J" or "B7" material J = Red stripe B7 = White stripe Supplied with drainholes (D) |  |
| 129-4-B7DL | -01BU | | |
| 130-4-JDL | -02AU | | |
| 130-4-B7DL | -02BU | | |
| 131-4-JDL | -03AU | | |
| 131-4-B7DL | -03BU | | |
| 132-4-JDL | -04AU | | |
| 132-4-B7DL | -04BU | | |
| 133-4-JDL | -05AU | | |
| 133-4-B7DL | -05BU | | |
| 134-4-JDL | -06AU | | |
| 134-4-B7DL | -06BU | | |
| 135-4-JDL | -07AU | | |
| 135-4-B7DL | -07BU | | |
| 136-4-JDL | -08AU | | |
| 136-4-B7DL | -08BU | | |
| 138-4-JDL | -09AU | | |
| 138-4-B7DL | -09BU | | |
| 187-4-JDL | -10AU | | |
| 187-4-B7DL | -10BU | | |
| HellermannTyton | MS3117 | Description | Style |
| 1106-4-JL | -11AU | Right angle shape with rib "J" or "B7" material J = Red stripe B7 = White stripe Optional drainholes (D) |  |
| 1106-4-B7L | -11BU | | |
| 1107-4-JL | -12AU | | |
| 1107-4-B7L | -12BU | | |
| 1104-4-JL | -13AU | | |
| 1104-4-B7L | -13BU | | |
| 1103-4-JL | -14AU | | |
| 1103-4-B7L | -14BU | | |
| 1101-4-JL | -15AU | | |
| 1101-4-B7L | -15BU | | |
| 1105-4-JL | -16AU | Right angle shapes Low profile with rib "J" or "B7" material J = Red stripe B7 = White stripe Supplied with drainholes (D) |  |
| 1105-4-B7L | -16BU | | |
| 1109-4-JL | -17AU | | |
| 1109-4-B7L | -17BU | | |
| 1121-4-JDL | -01AU | | |
| 1121-4-B7DL | -01BU | | |
| 1122-4-JDL | -02AU | | |
| 1122-4-B7DL | -02BU | | |
| 1123-4-JDL | -03AU | | |
| 1123-4-B7DL | -03BU | | |
| 1124-4-JDL | -04AU | | |
| 1124-4-B7DL | -04BU | | |
| 1125-4-JDL | -05AU | | |
| 1125-4-B7DL | -05BU | | |
| 1126-4-JDL | -06AU | | |
| 1126-4-B7DL | -06BU | | |
| 1127-4-JDL | -07AU | | |
| 1127-4-B7DL | -07BU | | |
| 1128-4-JDL | -08AU | | |
| 1128-4-B7DL | -08BU | | |
| 1129-4-JDL | -09AU | | |
| 1129-4-B7DL | -09BU | | |
| 1141-4-JDL | -10AU | | |
| 1141-4-B7DL | -10BU | | |

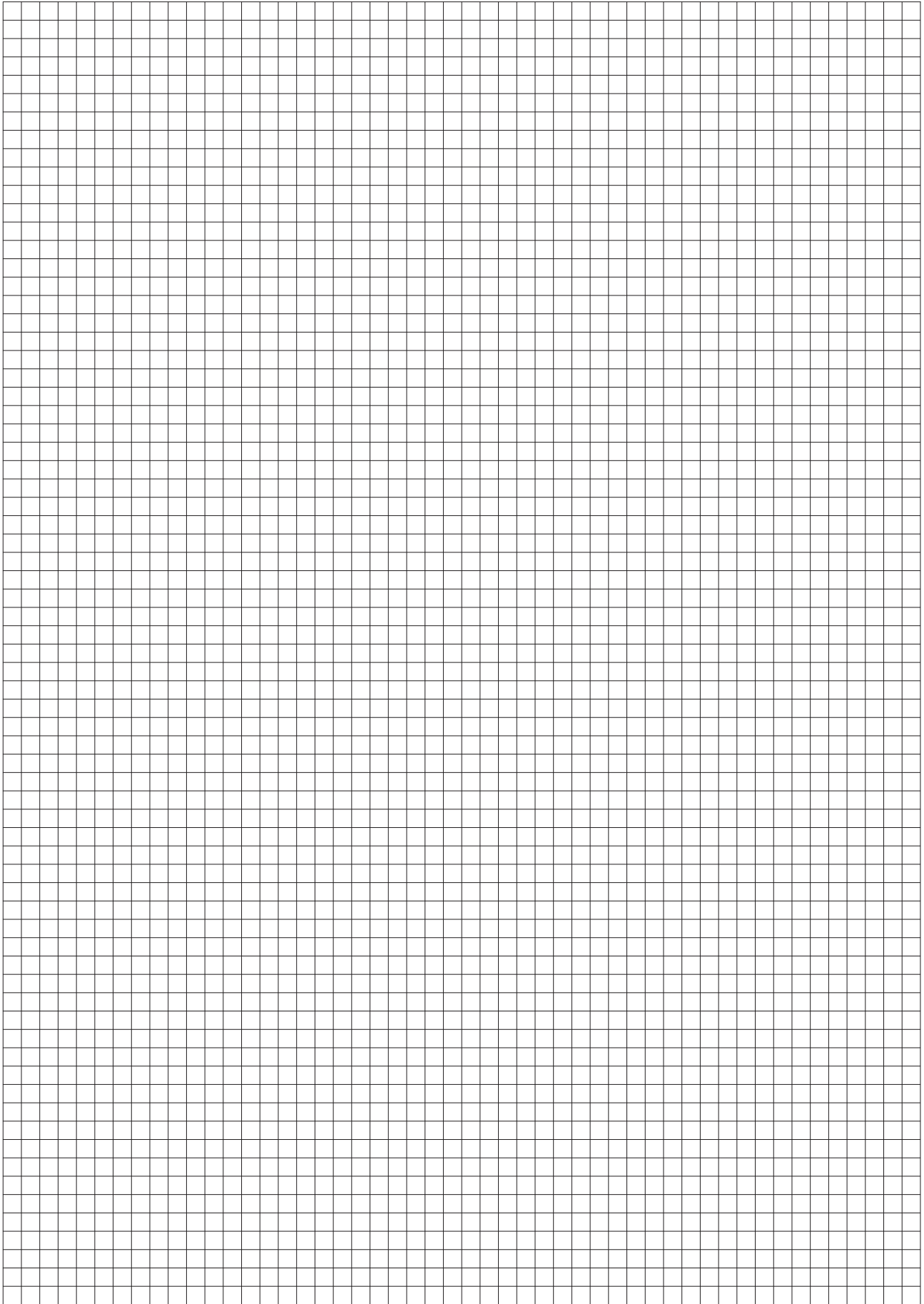
L denotes the MIL Specification Stripes.

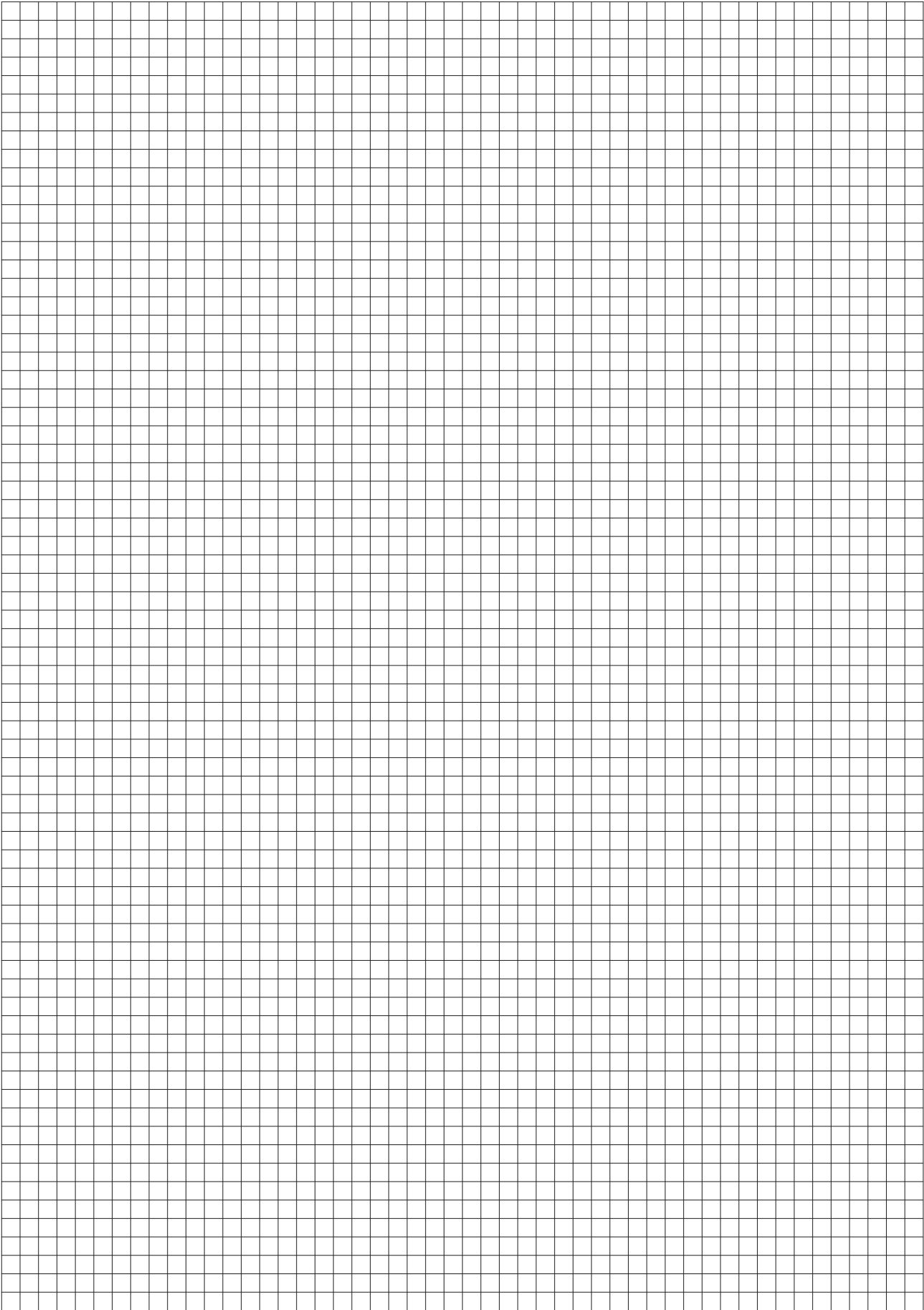












1. Interpretation

1.1 In these Conditions:

"ACKNOWLEDGEMENT OF ORDER" shall mean the document by which the Seller's authorised representative accepts the Order.

"BUYER" shall mean the purchaser of the Goods from the Seller.

"CONDITIONS" means the terms and conditions of sale set out herein and includes any special terms and conditions included in the Acknowledgement of Order.

"CONTRACT" shall mean the contract for the sale and purchase of the Goods made pursuant to these Conditions.

"DELIVERY" shall mean delivery of the Goods or any part of them in accordance with clause 6.1 of these Conditions.

"DELIVERY DATE" shall mean the date or period for Delivery set out in an Acknowledgement of Order or which is otherwise agreed by the Seller and the Buyer.

"FORCE MAJEURE" shall mean any circumstances beyond the reasonable control of the Seller.

"GOODS" shall mean the goods which the Seller has agreed to supply to the Buyer pursuant to these Conditions.

"INFORMATION" shall mean any and all IPR, technical or commercial data, know-how, show-how, formulae, processes, designs, photographs, drawings, specifications, samples, details of customers and suppliers, pricing information, samples, prototypes and other sensitive business information and any other information of a confidential nature together with any experimental or test data and results produced by the Seller as a result of it carrying out necessary tests for the purposes of performing the Contract which either directly or indirectly is disclosed by or on behalf of the Seller to the Buyer or to any person on behalf of the Buyer orally, in writing, by physical embodiment, by data transmission or in any other way.

"INTELLECTUAL PROPERTY RIGHTS" ("IPR") shall mean all patents, trade marks, service marks, design rights (whether patentable, registrable or otherwise), applications for any of the foregoing copyright, know-how, trade or business names, rights in databases, topography rights and other similar rights or obligations whether registrable or not in any country (including, but not limited to the United Kingdom). "LOSS" shall mean all actions, claims, demands, losses (direct, indirect, consequential or otherwise), expenses, costs, actions and proceedings.

"ORDER" shall mean the Buyer's order for Goods.

"SELLER" shall mean Hellermann Tyton, a Division of Spirent PLC, a company registered in England and Wales under company number 470893 and having its registered office at Crawley Business Quarter, Fleming Way, Crawley, West Sussex RH10 9QL.

"SPECIFICATION" shall mean the description of the Goods set out in the Acknowledgement of Order pursuant to clause 3.4.

1.2 Any reference in these Conditions to any provision of a statute shall be construed as a reference to that provision as amended re-enacted or extended at the relevant time.

1.3 The headings in these Conditions are for convenience only and shall not affect their interpretation.

1.4 In these Conditions "Incoterms" means the international rules for the interpretation of trade terms of the International Chamber of Commerce 2000. Unless the Contract otherwise requires any terms or expression which is defined in or given a particular meaning by the provisions of Incoterms shall have the same meaning in these Conditions, but if there is any conflict between the provisions of Incoterms and these Conditions the latter shall prevail.

2. Basis of Sale

2.1 These Conditions together with the Seller's Acknowledgement of Order apply to all Contracts between the Seller and the Buyer and shall prevail and be effective notwithstanding any variations or additions whether contained or referred to in the Buyer's order, or other document submitted by the Buyer including without limitation any standard conditions of purchase of the Buyer, acceptance of quotation or in correspondence or elsewhere, or implied by trade, custom, practice or course of dealing, and shall supersede all other and any prior promises, representations or undertakings.

2.2 No variation to these Conditions shall be binding unless agreed in writing by an authorised representative of the Seller.

2.3 The Seller's employees or agents are not authorised to make any representations or recommendations concerning the Goods unless confirmed by a duly authorised representative of the Seller in writing. In entering into the Contract the Buyer acknowledges that it does not rely on and waives any claim for breach of any such representations which are not so confirmed. For the avoidance of doubt, nothing herein contained shall be deemed to exclude the Seller's liability due to fraudulent misrepresentation.

2.4 Any typographical clerical or other error or omission in any sales literature quotation price list Acknowledgement of Order invoice or other documentation or information issued by the Seller shall be subject to correction without any liability on the part of the Seller.

3. Orders and Specifications

3.1 Every acceptance by the Buyer of any quotation given by the Seller shall be deemed an offer by the Buyer to purchase Goods from the Seller and will not be deemed to be accepted by the Seller until a duly authorised representative of the Seller has provided an Acknowledgement of Order in relation to such offer by the Buyer.

3.2 No Order submitted by the Buyer shall be deemed to be accepted by the Seller unless and until confirmed by an Acknowledgement of Order.

3.3 The Buyer shall be responsible to the Seller for ensuring the accuracy of the terms of any Order (including any applicable specification) submitted by the Buyer and for giving the Seller any necessary information relating to the Goods within a sufficient time to enable the Seller to perform the Contract in accordance with its terms.

3.4 The quantity quality and description of and any specification for the Goods shall be those set out in the Seller's Acknowledgement of Order.

3.5 If the Goods are to be manufactured by the Seller in accordance with a specification or instructions submitted by the Buyer:

3.5.1 The Buyer shall indemnify the Seller against all Loss suffered by the Seller in connection with any claim by a third party that the manufacture and/or supply of the Goods to such specification or instructions infringes the rights of any third party; and

3.5.2 The Buyer shall be responsible for supplying reliable and accurate information to the Seller (including, without limitation, drawings, plans and designs) to enable the Seller to manufacture the Goods. The Seller shall be entitled to assume that all information supplied by the Buyer is true, accurate, complete and fit for the purpose for which it is supplied and that the Seller can rely on the same. The Seller shall not be liable for any Loss or delay in Delivery of the Goods which directly or indirectly arises from the Buyer's failure to supply accurate information at all or on time.

3.6 The Seller reserves the right to make any changes in the Specification of the Goods which are required to conform with any applicable UK safety or other statutory requirements and/or where such changes do not materially affect the quality or performance of the Goods. For the avoidance of doubt and subject to clause 10.1, the Seller provides no implied warranties in relation to Goods supplied to the Buyer's specification.

3.7 No Order which has been accepted by the Seller by an Acknowledgement of Order may be cancelled by the Buyer except with the agreement in writing of the Seller and on terms that the Buyer shall indemnify the Seller in full against all Loss incurred by the Seller as a result of cancellation.

4. Price of the Goods

4.1 The price shall be the price in the Acknowledgement of Order ("Price").

4.2 The Seller reserves the right by giving notice to the Buyer at any time before Delivery to increase the Price to reflect any increase in the cost to the Seller which is due to any factor beyond the control of the Seller (such as without limitation any foreign exchange fluctuation, currency regulation alteration of duties significant increase in the costs of labour materials or other costs of manufacture), any change in Delivery Dates quantities or specifications for the Goods which is requested by the Buyer or any delay caused by any instructions of the Buyer or failure of the Buyer to give the Seller adequate information or instructions.

4.3 Except as otherwise stated in an Acknowledgement of Order all prices are given by the Seller for Delivery as defined in clause 6.1. Where the Seller agrees to deliver the Goods otherwise than as defined in clause 6.1 the Buyer shall be liable to pay the Seller's charges for transport packaging and insurance where requested.

4.4 The price is exclusive of any applicable value added tax (which will be applied in accordance with the legislation in force at the tax point date) and which the Buyer shall be additionally liable to pay to the Seller.

5. Terms of Payment

5.1 Subject to any special terms agreed in an Acknowledgement of Order the Seller shall be entitled to invoice the Buyer for the Price on Delivery immediately the Goods have been despatched, when they are ready for despatch but are prevented or delayed from being

despatched due to Force Majeure or the day the Goods are put out ready for collection (whichever event occurs the earliest).

5.2 The Buyer shall pay the Price without deduction within 30 days of the date of the Seller's invoice notwithstanding that Delivery may not have taken place and the property in the Goods has not passed to the Buyer. The time of payment of the Price shall be of the essence of the Contract. Receipts for payment will be issued only upon request.

5.3 If the Buyer fails to make any payment in accordance with clause 5.2 then without prejudice to any other right or remedy available to the Seller the Seller shall be entitled to:-

5.3.1 Cancel the contract or suspend any Deliveries to the Buyer;

5.3.2 Appropriate any payment made by the Buyer to such of the Goods (or the goods supplied under any other contract between the Buyer and the Seller) as the Seller may think fit (notwithstanding any purported appropriation by the Buyer);

5.3.3 Charge the Buyer interest on the amount unpaid at the rate of 3 percent per annum above HSBC Bank base rate from time to time until payment in full is made (a part of a month being treated as a full month for the purpose of calculating interest); and

5.3.4 Demand payment of all outstanding balances from the Buyer whether due or not and/or cancel all outstanding Orders and/or decline to make further Deliveries (under this or any other contract between the Buyer and the Seller) or provision of services.

5.4 Except where insolvency laws provide otherwise the Buyer shall not be entitled to withhold or set off payment for Goods for any reason whatsoever. All Goods for which payment has not been made in accordance with clause 5.2 and which are held by the Seller at its premises are so held at the Buyer's risk.

6. Delivery

6.1 Except as otherwise stated in an Acknowledgement of Order delivery shall take place when the Seller places the Goods at the disposal of the Buyer at the Seller's premises and not loaded on any collecting vehicle.

6.2 Any Delivery Date is approximate only. The Seller shall not be liable for any Loss arising from any failure to deliver the Goods on the Delivery Date howsoever caused. Time for delivery shall not be of the essence unless previously agreed by the Seller in writing. The Goods may be delivered by the Seller in advance of the quoted delivery date upon giving reasonable notice to the Buyer.

6.3 The Buyer shall not be entitled to change the Delivery Date without the consent of a duly authorised representative of the Seller.

6.4 Where delivery of the Goods is to be made by the Seller, the Seller reserves the right to deliver up to 10 per cent more or 10 per cent less than the quantity ordered provided that there is a pro rata adjustment to the Price to reflect the Goods actually delivered and the quantity so delivered shall be deemed to be the quantity ordered. Goods delivered in excess of such tolerance may be rejected by the Buyer provided that it serves notice of rejection within 10 working days of Delivery.

6.5 Where the Goods are to be delivered in installments each delivery shall constitute a separate contract and failure by the Seller to deliver any one or more of the installments in accordance with these Conditions or any claim by the Buyer in respect of any one or more installments shall not entitle the Buyer to treat the Contract as a whole as repudiated.

6.6 Subject to clause 10.6 if the Seller fails to deliver the Goods for any reason other than Force Majeure or the Buyer's fault and the Seller is accordingly liable to the Buyer the Seller's only liability shall be limited to the excess (if any) of the cost to the Buyer (having used its best endeavours to replace the Goods by purchasing them in the cheapest available market) of purchasing similar goods to replace those not delivered.

6.7 If the Buyer fails to take Delivery on the Delivery Date then without prejudice to any other right or remedy available to the Seller the Seller may:

6.7.1 store the Goods until actual delivery and charge the Buyer for the costs (including insurance) of storage; or

6.7.2 treat the Contract as repudiated by the Buyer and without prejudice to any other right it may have against the Buyer the Seller shall be entitled to resell the Goods and be indemnified by the Buyer for any Loss which it suffers.

7. Risk and Property

7.1 Risk of damage to or loss of the Goods shall pass to the Buyer on Delivery of the Goods;

7.2 Notwithstanding Delivery and the passing of risk in the Goods or any other provision of these Conditions the property in the Goods shall remain with the Seller until the Seller has received in cash or cleared funds payment in full of the Price and any other monies due to the Seller in respect of the Goods and all other goods agreed to be sold by the Seller to the Buyer for which payment is then due under the Contract or any other contract between the Seller and the Buyer (including without limitation costs of Delivery).

7.3 Until such time as the property in the Goods passes to the Buyer the Buyer shall hold the goods as the Seller's fiduciary agent and bailee and shall keep the Goods separate from those of the Buyer and third parties and properly stored protected and insured and identified as the Seller's property.

7.4 Until such time as the property in the Goods passes to the Buyer the Buyer shall be entitled to resell or use the Goods in the ordinary course of its business but shall account to the Seller for the proceeds of sale or otherwise of the Goods whether tangible or intangible including insurance proceeds and shall keep all such proceeds separate from any monies or property of the Buyer and third parties and in the case of tangible proceeds properly stored protected and insured.

7.5 If the Goods are prior to sale by the Buyer made up or incorporated in or mixed with other goods, then if they remain separately identifiable the Seller shall retain property and title thereof and if they do not remain separately identifiable the Seller shall become a joint owner of the goods in or which the Goods are incorporated or mixed in such proportion as the value of the Goods bears to the value of the Goods in which the Goods are so incorporated or mixed.

7.6 If the Buyer sells the Goods or the goods in which the Goods have been incorporated or mixed the sale shall be on behalf of the Seller as the joint owner thereof as the case may be and the proceeds of any such sale for the Seller's share thereof if the sale is of jointly owned property shall be held on trust for the Seller and in a separate identified account.

7.7 Until such time as the property in the Goods passes to the Buyer (and provided the Goods are still in existence and have not been resold) the Seller shall be entitled at

any time to require the Buyer to deliver up the Goods to the Seller and if the Buyer fails to do so forthwith to enter the premises of the Buyer or any third party where the Goods are stored and take possession of any Goods in which property remains in the Seller and remove and dispose of them as the Seller thinks fit. The Seller shall apply the proceeds of disposal (after deduction of all expenses) in discharge of the amount unpaid by the Buyer.

7.8 The Buyer shall not be entitled to pledge or in any way charge by way of security for any indebtedness any of the Goods which remain the property of the Seller without the Seller's consent but if the Buyer does so all moneys owing by the Buyer to the Seller shall (without prejudice to any other right or remedy of the Seller) forthwith become due and payable.

8. Confidentiality and IPR

8.1 The Buyer agrees and undertakes that it will keep confidential and will not disclose or use for any purpose (other than to perform its obligations under the Contract) any Information. Any Information supplied to the Buyer by the Seller shall at all times remain the property of the Seller. The Buyer shall not acquire any rights in the Information, which shall be returned to the Seller immediately upon request.

8.2 Unless otherwise agreed in writing all IPR in relation to the Goods including without limitation their method of manufacture shall vest in the Seller and remain the property of the Seller notwithstanding the purchase of the Goods by the Buyer and the Buyer undertakes to do all acts and/or enter into such agreements or deeds as the Seller shall require to vest any such IPR in the Seller.

8.3 Unless otherwise agreed in writing and notwithstanding that the Buyer may have contributed towards the costs of such items all tooling (and all IPR in relation to such tooling) produced or acquired by the Seller in relation to the manufacture of the Goods shall be and remain the property of the Seller.

9. Lien

9.1 In addition to any other right or lien to which the Seller may by law or pursuant to these Conditions be entitled, the Seller shall be entitled to a general lien on all the goods and the property of the Buyer in the Seller's possession and a right of sale of such goods and property at the Seller's sole discretion for any unpaid money due under the terms of the same or any other Contract between the Seller and the Buyer.

9.2 In addition and without prejudice to its other rights, the Seller shall have the right on fourteen days notice to the Buyer to put any goods or property over which it has a lien into a saleable state by any means whatsoever and (without prior notice to the Buyer) to sell such goods and shall be deemed the Buyer's agent for the purposes of effecting such sale. Out of the proceeds of the sale the Seller shall be entitled to retain a sum equivalent to all unpaid monies due to it from the Buyer as aforesaid together with the cost of putting the goods into a saleable state and the expenses of sale without prejudice to the Seller's right to recover the balance thereof from the Buyer.

10. Warranties and Liability

10.1 The Seller warrants that at Delivery the Goods will be free from defect in materials, workmanship and design (where designed by the Seller) provided that subject as aforesaid and expressly provided in these Conditions, and except where the Goods are sold to a person dealing as a consumer (within the meaning of the Unfair Contract Terms Act 1977) all warranties conditions or other terms implied by statute and/or common law are excluded to the fullest extent permitted by law.

10.2 Where the Goods are sold under a consumer transaction (as defined by the Consumer Transactions (Restrictions on Statements) Order 1976) the statutory rights of the Buyer are not affected by these Conditions.

10.3 Any specification supplied by the Seller in any estimate or quotation shall be approximate only and for information and guidance only and shall not form part of the Contract.

10.4 Any claim based upon the quality or condition of the Goods or any failure of the Goods to meet the Specification ("Claim") by the Buyer shall (whether or not delivery is refused by the Buyer) be notified to the Seller in writing within 7 days from the date of delivery or (where the defect or failure was not apparent on reasonable inspection) within one month after discovery of the defect or failure. If delivery is not refused and the Buyer does not notify the Seller accordingly, the Buyer shall not be entitled to reject the Goods and the Seller shall have no liability in respect of such a Claim and the Buyer shall be bound to pay the Price as if the Goods had been delivered in accordance with the Contract. The Buyer shall not be entitled to make any Claim after the expiration of six months from the date of Delivery of the Goods.

10.5 Where any valid Claim in respect of any of the Goods is notified to the Seller in accordance with clause 10.4 the Seller shall be entitled to replace the Goods (or the part in question) free of charge or at the Seller's sole discretion refund to the Buyer the Price (or a proportionate part of the Price) but the Seller shall have no further liability to the Buyer and the Buyer shall have no other remedy.

10.6 The Seller shall have no liability to the Buyer in relation to non-delivery or short delivery of the Goods unless such non-delivery or short delivery is notified to the Seller in writing within fourteen days of the Delivery Date.

10.7 Where any valid claim in respect of the Goods is notified to the Seller in accordance with clause 10.6 the Seller shall be entitled to deliver the Goods or the shortfall of the Goods, but the Buyer shall have no other remedy

10.8 Except in respect of death or personal injury caused by the Seller's negligence the Seller's total liability to the Buyer under these Conditions shall not exceed the total price of all Goods supplied hereunder.

10.9 The Seller shall have no liability to the Buyer under or arising out of or otherwise in connection with the Contract or the supply of Goods by the Seller to the Buyer and/or their use or resale by the Buyer in contract tort (including negligence or breach of statutory duty) or otherwise for loss of profit, business, contracts, revenues or anticipated savings or for any special indirect or consequential damage or loss of any nature or for the costs of recall of any Goods except as may otherwise be expressly provided for in these Conditions.

10.10 Notwithstanding any provision of these Conditions the Seller shall have no liability to the Buyer in respect of any defect in the quality of the Goods or the failure of the Goods to meet Specification where the defect or failure has arisen as a result of improper storage or any act or omission of the Buyer.

10.11 For the avoidance of doubt nothing herein contained shall be deemed to exclude or restrict the Seller's liability for death or personal injury arising due to the Seller's negligence.

10.12 Where any claim is made under this clause 10 the Buyer grants the Seller or its agents the right to enter upon the Buyer's premises to inspect the Goods Unless and until the Seller has been afforded an opportunity to examine the Goods no claim will be accepted.

10.13 The Seller shall not be liable to the Buyer or be deemed to be in breach of the

Contract by reason of any delay in performing or any failure to perform any of the Seller's obligations in relation to the Goods if the delay or failure was due to Force Majeure.

10.14 The Buyer shall indemnify the Seller against all Loss suffered by the Seller which arises as a result of the breach by the Buyer of any provision of the Contract or the negligence of the Buyer or any of its representatives.

11. Insolvency of Buyer

11.1 In the event that:

11.1.1 The Buyer makes any voluntary arrangement with its creditors or becomes subject to an administration order or (being an individual or firm) becomes bankrupt or (being a company) goes into liquidation (otherwise than for the purposes of amalgamation or reconstruction);

11.1.2 An encumbrancer takes possession or a receiver or administrator is appointed of any of the property or assets of the Buyer;

11.1.3 the Buyer ceases or threatens to cease to carry on business;

11.1.4 the Seller reasonably apprehends that any of the events mentioned above is about to occur in relation to the Buyer and notifies the Buyer accordingly; or

11.1.5 if the Buyer's jurisdiction is not in England and Wales any events similar to those described in clauses 11.1.1 to 11.1.4 occur then without prejudice to any other right or remedy available to the Seller the Seller shall be entitled to suspend further performance of the Contract for such time as it shall in its absolute discretion see fit or treat the Contract as wrongfully repudiated by the Buyer and forthwith terminate the Contract (either with or without notice to the Buyer) without any liability to the Buyer and if the Goods have been delivered but not paid for the Price shall become immediately due and payable notwithstanding any previous agreement or arrangement to the contrary.

12. Export Terms

12.1 Where the Goods are supplied for export from the United Kingdom the provision of this clause 12 shall (subject to any special and the Seller) terms agreed in writing between the Buyer apply notwithstanding any other provision of these Conditions.

12.2 The Buyer shall be responsible for complying with any legislation or regulations governing the importation of the Goods into the country of destination and for the payment of any duties thereon. In particular, if any licence or consent of any government or other authority shall be required for

the acquisition, carriage or use of the Goods by the Buyer the Buyer shall obtain the same at its own expense and if necessary produce evidence of the same to the Seller on demand. Failure to do so shall not entitle the Buyer to withhold or delay payment of the Price. Any additional expenses or charges incurred by the Seller resulting from such failure shall be for the Buyer's account.

12.3 Unless otherwise agreed in writing between the Buyer and the Seller the Goods shall be delivered ex-works and the Seller shall be under no obligation to give the Buyer notice under section 32(3) of the Sale of Goods Act 1979.

12.4 Notwithstanding clause 5.2 payment of all amounts due to the Seller shall be made by irrevocable letter of credit opened by the Buyer in favour of the Seller and confirmed by a bank in the United Kingdom acceptable to the Seller or if the Seller has agreed in writing on or before acceptance of the Buyer's order to waive this requirement for any other agreed method of payment

13. General

13.1 The Seller shall be entitled to assign or subcontract all or any of its rights and obligations hereunder. The Buyer shall not be entitled to assign, transfer, subcontract or otherwise delegate any of its rights or obligations hereunder.

13.2 Any notice required or permitted to be given by either party to the other under these Conditions shall be given in writing at its registered office or principal place of business or such other address as may be notified for such purpose to the party giving notice.

13.3 No waiver by the Seller of any breach of Contract by the Buyer shall be considered as a waiver of any subsequent breach of the same or any other provision.

13.4 If any provision of these Conditions is held by any competent authority to be invalid or unenforceable in whole or in part the validity of the other provisions of these Conditions and the remainder of the provision in question shall not be affected thereby.

13.5 The parties hereto intend that no term of the Contract may be enforced by any person, entity or body that is not a party to the Contract.

13.6 The Contract shall be governed by the laws of England and Wales and the Buyer and the Seller hereby submit to the exclusive jurisdiction of the English Courts save with respect to enforcement where their jurisdiction shall be non-exclusive.

W24 - High performance one part epoxy adhesive

W24 - Features

- Operating Temperature -75°C to +200°C
- Can be factory pre-coated into all HellermannTyton range of small electronic Heatshrink shapes
- W24 is a low tack gel, and does not need excessive initial heating in order to melt the adhesive, before surface wetting and subsequent bonding
- W24 is not susceptible to moisture absorption, therefore delamination from the surface will not take place
- Product does not need to be kept in sealed packaging

W24 - Benefits

- Handling strength achieved after initial recovery 80% cure. Cable can be bent when cool at 90° around mandrel 6 x dia of cable
- Harness can be moved immediately, ultimate properties in 7 days
- Stored at normal temperatures, and away from direct sunlight W24 adhesive lined shapes have a 5 year shelf life
- W24 also flows when the shape is shrunk, enabling the customer to form a smooth fillet of adhesive between the tail of the heatshrink shape and jacket





For further information please contact

06/2011

HellermannTyton

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