

Busbar Sizing Guide

Busbar Sizes (mm)	Heatshrink Code	Heatshrink Layflat size (mm)	Airshrink Code	Airshrink Dimensions (mm)		
				Expanded ID	Shrunk ID	Nom. Wall Thickness
12 X 1.5 / 12.5 X 3	ATW12.7	20	AS0807	10.40	8.00	0.75
14 X 4	ATW19	30	AS0907	11.70	9.00	0.75
15 X 3	ATW19	30	AS1007	13.00	10.00	0.75
16 X 3	ATW19	30	AS1107	14.30	11.00	0.75
16 X 4	ATW19	30	AS1210	15.60	12.00	1.00
20 X 3 / 20 X 4 / 20 X 6	ATW19	30	AS1410	18.20	14.00	1.00
25 X 3	ATW25.4	40	AS1610	20.80	16.00	1.00
25 X 5 / 25 X 6 / 25 X 6.3	ATW25.4	40	AS1810	23.40	18.00	1.00
30 X 3 / 30 X 6 / 30 X 6.3	ATW38.1	60	AS1910	25.70	19.00	1.00
30 X 10 / 30 X 12 / 31.5 X 6.3	ATW38.1	60	AS2210	28.60	22.00	1.00
40 X 4 / 40 X 6 / 40 X 6.3 / 40 X 10	ATW38.1	60	AS2510	32.50	25.00	1.00
50 X 6 / 50 X 6.3	ATW38.1	60	AS3010	39.00	30.00	1.00
50 X 10 / 50 X 12 / 50 X 16 / 60 X 3 / 60 X 6	ATW50.8	80	AS3510	45.50	35.00	1.00
60 X 10 / 63 X 6 / 63 X 6.3	ATW50.8	80	AS4010	52.00	40.00	1.00
80 X 6 / 80 X 8 / 80 X 10 / 80 X 12	ATW76	120	AS5010	65.00	50.00	1.00
100 X 6 / 100 X 10 / 100 X 12 / 100 X 16	ATW76	120	AS6010	78.00	60.00	1.00
120 X 10 / 120 X 16.5	ATW100	160	AS7010	91.00	70.00	1.00

Calculations**Busbars**

How to calculate / determine the correct size Airshrink or Heatshrink for your busbar dimensions.

1. Add all four sides.
2. Divide by 3.1415
3. This result gives the actual OD of your busbar and thus the min ID that your Airshrink / Heatshrink needs to shrink down to.
4. Add 10% to this result to allow sufficient clearance. This will ensure that your Airshrink / Heatshrink slips over easily.

Example

Busbar Size: 50 x 10
 $= (50+50+10+10) / 3.1415$
 $= 120 / 3.1415$
 $= 38.198$



$= 42.02\text{mm (+10\%)} \rightarrow$ This is the most suitable diameter (ID) for your application. Now choose the Airshrink / Heatshrink size that suits this busbar size. (AS3510 / 50.8)

Cable Sizing Guide

Cable Size (mm ²)	Approx. Core OD (mm) Including Insulation	Airshrink Code	Heatshrink Code	Heatshrink Layflat Size (mm)
630	42.8	AS3510	50.8	80
500	36.5	AS3010	50.8	80
300	30.0	AS2510	38.1	60
240	27.0	AS2210	38.1	60
185	23.5	AS1910	25.4	40
150	22.0	AS1910	25.4	40
120	18.5	AS1810 / AS1910	25.4	40
95	16.5	AS1610	19	30
70	14.5	AS1410	19	30
50	12.6	AS1210	19	30
35	10.8	AS1007	12.7	20
25	9.0	AS0907	12.7	20
16	6.9	AS0607 / AS0707	9.5	15
10	6.0	AS0607	9.5	15
6	5.1	AS0505	6.4	10
4	4.5	AS0505 / AS0405	6.4	10
2.5	3.7	AS0505 / AS0406	4.8	7.5
1.5	3.2	AS0305	4.8	7.5
1	2.6	AS0205	3.2	5
0.5	2.1	AS0205	2.4	3.8

- Insulation thickness depends on cable rating. The above refers to 600 - 1000v PVC insulated cable
- The information detailed above is intended as a guide only
- Cable dimensions depend on the rating and therefore accurate measurement of outside diameter is recommended before order is placed. This will ensure that correct size is supplied

1. Selection:

- Confirm the OD (Outside Diameter) of the cable/ object you need to cover.
- Decide on the wall thickness you require. Based on the thickness you may need to choose one size up or select a heatshrink with a higher shrink ratio. Standard thin wall heatshrink has a 2:1 ratio which means it will shrink to half its supplied size. **(Example: 25.4 will shrink to 12.7).**
- Take note that all heatshrink sizes are given as the ID (Inside Diameter) and not in mm² or layflat (see pictures page 6/8). Should you not have the ID refer to page 3/7 and see the calculation necessary to determine the ID. Also refer to our dimensions table on page 8.
- When choosing the heatshrink always allow for at least a 20% shrink and a maximum of 80% as this will ensure the product performs according to specifications stated.
- Will the heatshrink be placed onto the cable before or after a lug or ferrule has been crimped into place? If afterwards confirm that the heatshrink size is suitable to fit over the lug/ferrule and if it will still recover to the OD of the cable. If not a heatshrink with a higher shrink ratio must be selected.
- Other considerations Include:
 - Do you need a moisture seal/watertight connection, this will require an adhesive lined heatshrink (see page 6).
 - Will it be exposed to cleaning fluids, fuel, oils or more aggressive chemicals? This may require diesel resistant, Kynar, Viton or Teflon heatshrink.
 - What will the minimum or maximum operating temperature be? Typically diesel resistant, Kynar and Teflon material offer higher operating temperatures, up to 330°C.
 - Are you covering identification labels that must be clearly visible after shrink and must it be moisture free (See page 6)? Various grades of clear heatshrink exist, including adhesive lined.
 - Do you need any specific specifications, approvals and accreditations? This may include Military, Halogen Free, RoHS, Flame Retardant, REACH, UL, IEC, UV stability etc.
 - What will the operating voltage be?
 - Do you require high abrasion properties?
 - Standard or specialised colours. (Standard - Black, Clear, White, Red, Blue, Yellow, Green/Yellow) see page 6.

2. Application and Shrinking:

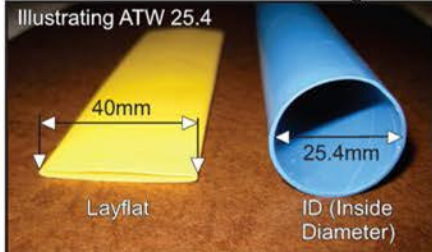
- Always keep the work area and cables/application as clean as possible.
- When cutting the heatshrink to the required size bear the following in mind.
 - Always cut with a sharp knife/guillotine. Make sure that there are no jagged edges as this will lead to the heatshrink splitting/tearing during application of heat (see page 6). Should you need to trim the heatshrink to size after shrunk, allow sufficient time for the product to cool down first.
 - In order to allow for continuation of insulation determine a suitable overlap.
 - Allow for the longitudinal shrinkage by cutting slightly longer. This could be as much as 5% (see page 6).
- Slide the heatshrink sleeve into place by positioning it centrally over the ferrules/object.
- Before shrinking:
 - Carefully read the installation instructions first as improvements & amendments may have been introduced.
 - Confirm that all other heatshrink or components have been placed over the cable and that all ferrules/lugs are crimped.
 - Remove all sharp edges that may cause the heatshrink to split.
 - Ensure that the surface has been abraded (if required) and that it is clean and de-greased.
 - If an adjustable heat gun is used, confirm the suitable setting/temperature. Incorrect temperature may lead to uneven shrinkage/wall thickness, incorrect insulation properties, damage to heatshrink and undesired air entrapment.

General tips Continued:

2. Application and Shrinking continued:

- Commence shrinking by starting from the middle working towards the outer ends applying heat circumferentially outwards until the internal sealant (adhesive) has melted, sleeves have a uniform wall thickness and are fully recovered (see below).
- When shrinking long lengths of heatshrink tubing (on cables for example), commence shrinking at one end and gradually move towards the other end.
- When shrinking thicker wall heatshrink (shrinks at higher temperatures) you may also use a propane gas torch (see below). When doing this keep the following in mind:
 - Ensure that this is done in a well ventilated area.
 - Use a "clean burning torch" e.g. A Propane gas torch which does not have any deposits of conductive contaminants.
 - Adjust the torch to a soft blue flame with an orange/yellow tip, "pencil-like" blue flame should be avoided (see below).
 - As this heatshrink has a very thick wall the torch/flame has to be moved continuously to ensure proper shrink and avoid damage due to overheating in one place.
- Keep the following in mind during the shrinking process:
 - Keep the heat aimed in the shrink direction to pre-heat the material (see below).
 - Always apply the heat circumferentially around and outwards on all tubes, this ensures correct heat application which results in the correct material wall thickness.
 - Shrink the tubing and molded parts as recommended and indicated in the instructions & manufacturers guidelines.
- Once shrunk, all of the tubing should be smooth and free of any wrinkles. Signs of wrinkles indicate incorrect heating and possible air entrapment. With regards to Medium Voltage(MV) applications this may lead to failure over time.
- Allow the heatshrink to cool before applying any mechanical strain or trimming/cutting it to size.

Inside Diameter vs. Layflat



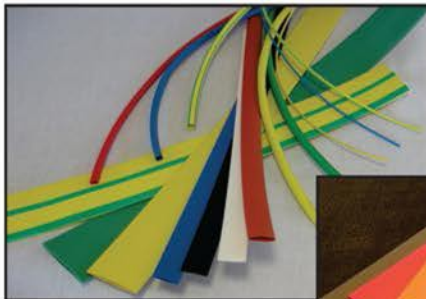
Adhesive Lined



Moisture Free ID Label



Standard Colours



Special Colours



Split When Nicked



Hand Held Heat Gun



Longitudinal Shrinkage



Gas Torch Orange/ Yellow Tip



Heatshrink

1. Busbar

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2. Layflat to Diameter

Heatshrink sizes are given as the internal diameter (ID) as supplied and **NOT** the layflat (LF) size. If you are not sure of the correct ID you can calculate as follow:

Example

Heatshrink size: 25.4mm
 $D = (LF \times 2) / 3.1415$
 = $(40 \times 2) / 3.1415$
 = $80 / 3.1415$
 $D = \underline{25.46mm}$



3. Circumference to Layflat

To calculate the Layflat if you have the diameters (D) It can be done as follow:

Example:

Heatshrink Size: 25.4mm
 Circumference (C) is the same as 2 x Layflat (LF)
 $C = 3.1415 \times D$
 $2LF = 3.1415 \times D$
 $2LF = 3.1415 \times 25.4$
 $2LF = 79.79$
 $LF = \frac{79.79}{2}$
 $LF = \underline{39.9mm}$

4. Imperial to Metric

Inch	1/32"	3/64"	1/16"	5/64"	3/32"	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1 1/4"	1 1/2"	2"	3"	4"
mm	0.8	1.2	1.6	2	2.4	3.2	4.8	6.4	9.5	12.7	15.9	19.1	25.4	31.8	38.1	50.8	76.2	101.6