

Heat Shrink Ready Reckoner

Cable OD to heat shrink sizing guide | voltforge.co.uk

What this document is

This is a rough and ready reference guide for selecting heat shrink tubing to fit standard automotive cable sizes. It is not a precision engineering document. OD data is derived from averages across the range of insulation types, wall thicknesses, and constructions commonly found in automotive and marine cabling. Real-world cable OD varies significantly by manufacturer, insulation compound, temperature rating, and application — so treat every figure in these tables as a starting point, not a final answer.

How to use these tables

- Start with the cable manufacturer datasheet or OEM specification. This is always the most accurate source — it accounts for production tolerances and the specific insulation construction of that cable.
- Cross-reference with calipers. Measure the actual cable OD before ordering heat shrink.
- On larger cables (25 mm² / 2 AWG and above), take 3–4 measurements at different positions along the cable and at different orientations. Average them. Larger cables can become slightly oval in cross-section after storage or bending.
- Heat shrink unshrunk ID should be at least 1.1× the cable OD for a clean fit. Recovered ID must be smaller than the cable OD for a secure grip.

Reference standards

The authoritative standards for automotive cable construction and insulation classification are SAE J1127 (battery cables and welding cable) and SAE J1128 (low voltage primary cable). These are not freely published — they are available through SAE International — however they are not especially difficult to locate with a search engine and a few minutes of effort. If you are selecting heat shrink for a specific cable type in a regulated application, these are the references to consult for precise OD data. If you are in the UK and would prefer not to pay for access, British Standards are available free of charge through the British Library's Business & IP Centre network, based in public libraries across the UK. Individual users can read standards on site at no cost. If you are accessing as a registered business, in our experience the BIPC will email standards to you directly. A search for "Business and IP Centre" plus your nearest city will find your local access point.

Where we source heat shrink

We purchase heat shrink from RS Components, CPC, Farnell, and Hilltop Products. This is genuinely where our heat shrink comes from — we buy from all of them regularly. We have no commercial relationship with any of these suppliers beyond being customers. Your usual electrical wholesaler may stock equivalent product; always specify unshrunk internal diameter and shrink ratio when ordering.

About Voltforge

Voltforge is the retail brand of Zeromachine Ltd, an engineering business based in Blyth, Northumberland. Zeromachine's longer-term programme is the development of a hydrogen fuel cell hybrid electric powertrain for off-highway machinery — serious engineering work that needs a serious commercial foundation underneath it. Voltforge is that foundation, and also the live sandbox for it: a place where low-voltage DC system design principles, documentation standards and product development thinking get tested in the real world before they scale. The pigtailed fund the programme. That means they have to be good.

The engineering background behind Voltforge spans over 30 years of low-voltage DC and high-voltage DC electrical experience across automotive, OEM leisure vehicle, EV, and off-highway and construction machinery applications — including time spent working in OEM leisure vehicle electrical design in the North East. We build connector assemblies, pigtail kits and cable harnesses with the same thinking we apply to much larger and more complex work: correct materials, correct process, and a clear understanding of how a product will actually be used once it leaves the bench. Every assembly we make comes with a full bill of materials citing OEM part numbers, because you should always know exactly what you've got. All Voltforge-built assemblies carry a 2-year warranty.

For larger and more complex work, Zeromachine Works Studio offers bespoke harness design and production, low-voltage DC system design, B2B engineering services, and consultancy for trade and commercial customers. We also offer specialist repair, diagnosis and electrical design services for leisure vehicles, campervans, overlanders and 4x4s across the North East of England. If your system has a fault you can't trace, an install that's grown past what you originally planned, or a build that needs properly thinking through from the start, that's exactly the kind of job we're set up for.

If you know what you need, you can go straight to the shop. If the job is bigger or less straightforward, talk to us. **Tell us what you're building and where you're stuck.**

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Heat Shrink Ready Reckoner — Metric Cable (mm²) to Metric Heat Shrink

Unshrunk internal diameter (ID) required for 2:1, 3:1, and 4:1 heat shrink ratios | voltforge.co.uk

Cable CSA (mm ²)	Typical Cable OD	2:1 Unshrunk ID	3:1 Unshrunk ID	4:1 Unshrunk ID
0.5 mm ²	2.0–2.5 mm	3.2 mm	6.4 mm	6.4 mm
0.75 mm ²	2.2–2.7 mm	3.2 mm	6.4 mm	6.4 mm
1.0 mm ²	2.5–3.0 mm	4.8 mm	6.4 mm	6.4 mm
1.5 mm ²	2.8–3.5 mm	4.8 mm	9.5 mm	6.4 mm
2.5 mm ²	3.5–4.5 mm	6.4 mm	9.5 mm	6.4 mm
4.0 mm ²	4.5–5.5 mm	9.5 mm	9.5 mm	6.4 mm
6.0 mm ²	5.5–7.0 mm	9.5 mm	12.7 mm	9.5 mm
10.0 mm ²	7.0–9.0 mm	12.7 mm	19.1 mm	12.7 mm
16.0 mm ²	9.0–11.0 mm	19.1 mm	25.4 mm	19.1 mm
25.0 mm ²	11.0–14.0 mm	25.4 mm	38.1 mm	25.4 mm
35.0 mm ²	13.0–16.0 mm	25.4 mm	38.1 mm	25.4 mm
50.0 mm ²	16.0–20.0 mm	38.1 mm	50.8 mm	38.1 mm
70.0 mm ²	19.0–24.0 mm	50.8 mm	63.5 mm	50.8 mm
95.0 mm ²	22.0–28.0 mm	63.5 mm	76.2 mm	50.8 mm
120 mm ²	26.0–32.0 mm	76.2 mm	101.6 mm	63.5 mm
150 mm ²	29.0–36.0 mm	76.2 mm	101.6 mm	76.2 mm
185 mm ²	33.0–41.0 mm	101.6 mm	127.0 mm	76.2 mm
240 mm ²	38.0–47.0 mm	127.0 mm	152.4 mm	101.6 mm

Heat Shrink Ready Reckoner — AWG Cable to Metric Heat Shrink (mm)

Unshrunk internal diameter (ID) required for 2:1, 3:1, and 4:1 heat shrink ratios | voltforge.co.uk

Cable Size (AWG)	Typical Cable OD	2:1 Unshrunk ID	3:1 Unshrunk ID	4:1 Unshrunk ID
28 AWG	1.0–1.5 mm	3.2 mm	3.2 mm	3.2 mm
26 AWG	1.2–1.7 mm	3.2 mm	3.2 mm	3.2 mm
24 AWG	1.4–1.9 mm	3.2 mm	3.2 mm	3.2 mm
22 AWG	1.6–2.2 mm	3.2 mm	6.4 mm	3.2 mm
20 AWG	2.0–2.7 mm	3.2 mm	6.4 mm	6.4 mm
18 AWG	2.5–3.3 mm	4.8 mm	6.4 mm	6.4 mm
16 AWG	3.0–4.0 mm	6.4 mm	9.5 mm	6.4 mm
14 AWG	3.5–4.8 mm	6.4 mm	9.5 mm	6.4 mm
12 AWG	4.0–5.5 mm	9.5 mm	9.5 mm	6.4 mm
10 AWG	5.0–6.5 mm	9.5 mm	12.7 mm	9.5 mm
8 AWG	6.0–8.0 mm	12.7 mm	19.1 mm	12.7 mm
6 AWG	7.5–9.5 mm	12.7 mm	19.1 mm	12.7 mm
4 AWG	9.0–11.5 mm	19.1 mm	25.4 mm	19.1 mm
2 AWG	11.0–14.0 mm	25.4 mm	38.1 mm	25.4 mm
1 AWG	12.0–15.5 mm	25.4 mm	38.1 mm	25.4 mm
1/0 AWG	13.5–17.0 mm	25.4 mm	38.1 mm	25.4 mm
2/0 AWG	15.0–19.0 mm	38.1 mm	50.8 mm	38.1 mm
3/0 AWG	17.0–21.5 mm	38.1 mm	50.8 mm	38.1 mm
4/0 AWG	19.0–24.0 mm	50.8 mm	63.5 mm	50.8 mm
250 kcmil	22.0–27.5 mm	63.5 mm	76.2 mm	50.8 mm
300 kcmil	24.0–30.0 mm	76.2 mm	101.6 mm	63.5 mm
350 kcmil	26.0–32.5 mm	76.2 mm	101.6 mm	76.2 mm
400 kcmil	28.0–34.5 mm	101.6 mm	127.0 mm	76.2 mm
500 kcmil	31.0–38.5 mm	101.6 mm	127.0 mm	76.2 mm

Heat Shrink Ready Reckoner — AWG Cable to Imperial Heat Shrink (inches)

Unshrunk internal diameter (ID) required for 2:1, 3:1, and 4:1 heat shrink ratios | voltforge.co.uk

Cable Size (AWG)	Typical Cable OD (in)	2:1 Unshrunk ID	3:1 Unshrunk ID	4:1 Unshrunk ID
28 AWG	0.040"–0.059"	1/8"	1/8"	1/8"
26 AWG	0.047"–0.067"	1/8"	1/8"	1/8"
24 AWG	0.055"–0.075"	1/8"	3/16"	1/8"
22 AWG	0.063"–0.087"	1/8"	1/4"	1/8"
20 AWG	0.079"–0.106"	1/8"	1/4"	1/4"
18 AWG	0.098"–0.130"	3/16"	1/4"	1/4"
16 AWG	0.118"–0.157"	1/4"	3/8"	1/4"
14 AWG	0.138"–0.189"	1/4"	3/8"	1/4"
12 AWG	0.157"–0.217"	3/8"	3/8"	1/4"
10 AWG	0.197"–0.256"	3/8"	1/2"	3/8"
8 AWG	0.236"–0.315"	1/2"	3/4"	1/2"
6 AWG	0.295"–0.374"	1/2"	3/4"	1/2"
4 AWG	0.354"–0.453"	3/4"	1"	3/4"
2 AWG	0.433"–0.551"	1"	1-1/2"	1"
1 AWG	0.472"–0.610"	1"	1-1/2"	1"
1/0 AWG	0.531"–0.669"	1"	1-1/2"	1"
2/0 AWG	0.591"–0.748"	1-1/2"	2"	1-1/2"
3/0 AWG	0.669"–0.846"	1-1/2"	2"	1-1/2"
4/0 AWG	0.748"–0.945"	2"	2-1/2"	2"
250 kcmil	0.866"–1.083"	2-1/2"	3"	2"
300 kcmil	0.945"–1.181"	3"	4"	2-1/2"
350 kcmil	1.024"–1.280"	3"	4"	3"
400 kcmil	1.102"–1.358"	4"	5"	3"
500 kcmil	1.220"–1.516"	4"	5"	3"

Notes

⚠ OD VERIFICATION: Always consult the cable manufacturer datasheet or OEM specification first — this accounts for production tolerances and insulation wall variation between manufacturers and cable types (automotive, marine, welding). Verify with calipers before ordering. On larger cables (25 mm² / 2 AWG and above) take 3–4 measurements at different positions and orientations along the cable and average them — cables can become slightly oval after storage or bending. Unshrunk ID should be $\geq 1.1 \times$ cable OD for easy fitting; recovered ID must be smaller than cable OD for secure grip. 25 mm² and 35 mm² share the same heat shrink size in all ratios. AWG OD values are indicative only. kcmil = thousand circular mils (US large conductor sizing). Imperial heat shrink sizes are nominal unshrunk internal diameter in fractional inches.

This document is provided for general reference and educational purposes only. The figures and guidance contained in it are derived from published industry standards and averaged data across commonly available cable constructions — they are not a substitute for measurement of the specific cable you are working with. Heat shrink selection involves variables that no general reference document can fully account for: cable OD variation by manufacturer, insulation wall thickness, insulation compound, and storage or installation conditions all affect the correct choice. It is the responsibility of the installer to verify sizing against the actual cable before committing to a purchase or installation. Voltforge and Zeromachine Ltd accept no liability for loss, damage, or consequential loss arising from the use of or reliance on the information in this document. If in doubt, measure first.