GRANDCABLE

GB/T 1179-2017 · HARD-DRAWN ALUMINUM · JL SERIES

AAC

All Aluminum Conductor — Bare, Overhead Distribution & Transmission



10	1500	7–91	34
MM² MIN.	MM² MAX.	WIRES	NOMINAL SIZES

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Overhead Bare Conductor · Yixing, Jiangsu, China

All Aluminum Conductor (AAC) — GB/T 1179-2017 (JL)

AAC to GB/T 1179-2017 is a bare conductor stranded from hard-drawn aluminium round wires in a concentric-lay construction, in the recommended range from 10 to 1500 mm². GB/T 1179-2017 *Round wire concentric lay overhead electrical stranded conductors* is the current Chinese national standard for bare overhead conductors — a modified adoption of IEC 61089:1991 (incl. Amendment 1:1997), replacing GB/T 1179-2008. Its recommended size list follows the same R-series as IEC, so JL sizes map one-to-one onto IEC 61089 code names.

Chinese designation: conductors are ordered as **type + nominal section + wire count + standard number**, e.g. **JL 150-19 GB/T 1179-2017** — JL stands for stranded aluminium. The pre-1999 designation under GB 1179-83 was **LJ** (e.g. LJ-240), still widely used on Chinese drawings. The steel-reinforced equivalents are **JL/G1A, JL/G2A, JL/G3A** (ACSR), aluminium alloy versions are **JLHA1–JLHA4**, and the aluminium-clad-steel-reinforced versions are JL/LB14 and JL/LB20A.

Also manufactured to

The same construction is available to other national and international AAC standards on request:

IEC 61089 | ASTM B 231 / B 231M | DIN 48 201-5 | BS 215-1 | AS 1531 | UNE 21018 | SANS 182-2 | JIS C 3109 | GOST 839-2019

Typical applications

Overhead distribution and transmission lines across Chinese and export networks built to Chinese specifications, on short to medium spans; river and valley crossings; busbar and jumper connections in substations. As a homogeneous aluminum conductor, the ampacity of AAC is used to best advantage.

Wire material

Hard-drawn aluminium round wires to GB/T 17048-2017 (modified adoption of IEC 60889), with a maximum resistivity of 0.028264 Ω·mm²/m at 20 °C (equivalent to 61.0 % IACS conductivity). Wires are concentric-lay stranded in successive layers with opposite lay direction; the outermost layer is right-hand (Z) lay.

Construction summary

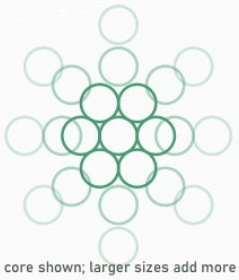
Standard	GB/T 1179-2017 — Round wire concentric lay overhead electrical stranded conductors (MOD IEC 61089:1991; supersedes GB/T 1179-2008)
Designation	JL 150-19 GB/T 1179-2017 (formerly LJ under GB 1179-83)
Wire material	Hard-drawn aluminium to GB/T 17048-2017, resistivity at 20 °C max. 0.028264 Ω·mm²/m
Size range	10 – 1500 mm², 34 nominal sizes (R-series), each in a single stranding
Constructions	7, 19, 37, 61 or 91 wires — according to size
Surface	Bare — no insulation or covering

Concentric-lay stranding

GB/T 1179-2017 conductors are built up in concentric layers around a central wire: 7, 19, 37, 61 and 91-wire constructions cover the range from 10 to 1500 mm². Successive layers are laid up with opposite directions of lay, and the outermost layer is right-hand (Z) lay as standard.

1. **Central wire** — single hard-drawn aluminium wire at the core.
2. **Concentric layers** — 6, 12, 18, 24 and 30 wires added per layer, giving the 7 / 19 / 37 / 61 / 91-wire series.
3. **Lay direction** — successive layers opposite; outer layer right-hand (Z) as standard. Left-hand outer lay on request.

> Constructions follow the fixed geometries of the standard: 7-wire (10 to 95), 19-wire (100 to 250), 37-wire (300 to 560), 61-wire (630 to 1000) and 91-wire (1120 to 1500), one stranding per size.



7-wire core shown; larger sizes add more layers

Concentric-lay stranding — schematic; numbers refer to the layers listed opposite.

Design options

Stranding	Standard geometries per GB/T 1179-2017; compressed or compacted constructions on request
Lay direction	Right-hand outer layer (Z) standard; left-hand (S) on request
Jointing	Fully compatible with standard compression fittings and automatic splices
Packaging	Returnable steel or wooden reels, lengths to suit project stringing plans

Why homogeneous aluminum

With no steel core there is no bi-metallic corrosion cell, no magnetic loss and no need for grease — the full cross-section conducts, and the ampacity of AAC is used to best advantage. The trade-off is lower rated strength, which is why AAC is normally chosen for shorter spans.

Quality & testing

Wire samples are tested for resistivity, elongation and torsional ductility before stranding; finished conductor is checked for lay length, diameter and D.C. resistance on every production lot. Third-party inspection on request.

GB/T 1179-2017 — dimensions & technical data

Nominal sections 10 to 1500 mm². Sizes and parameters follow the recommended list of the standard.

Code Name	Stranding No. × Ø mm	Section mm²	Overall Dia. mm	Weight kg/km	Rated Tensile Strength kN	D.C. Resistance at 20 °C, Ω/km
10	7/1.35	10.0	4.05	27.4	1.95	2.8578
16	7/1.71	16.1	5.13	44.0	3.05	1.7812
25	7/2.13	24.9	6.39	68.3	4.49	1.1480
35	7/2.50	34.4	7.50	94.1	6.01	0.8333
40	7/2.70	40.1	8.10	109.8	6.81	0.7144
50	7/3.00	49.5	9.00	135.5	8.41	0.5787
63	7/3.39	63.2	10.2	173.0	10.42	0.4532
70	7/3.60	71.3	10.8	195.1	11.40	0.4019
95	7/4.16	95.1	12.5	260.5	15.22	0.3010
100	19/2.59	100	13.0	275.4	17.02	0.2874
120	19/2.85	121	14.3	333.5	20.61	0.2374
125	19/2.89	125	14.5	343.0	21.19	0.2309
150	19/3.15	148	15.8	407.4	24.43	0.1943
160	19/3.27	160	16.4	439.1	26.33	0.1803
185	19/3.50	183	17.5	503.0	30.16	0.1574
200	19/3.66	200	18.3	550.0	31.98	0.1439
210	19/3.75	210	18.8	577.4	33.58	0.1371
240	19/4.00	239	20.0	657.0	38.20	0.1205
250	19/4.09	250	20.5	686.9	39.94	0.1153
300	37/3.20	298	22.4	820.7	49.10	0.0969
315	37/3.29	315	23.0	867.6	51.90	0.0917
400	37/3.71	400	26.0	1103.2	64.00	0.0721
450	37/3.94	451	27.6	1244.2	72.18	0.0639
500	37/4.16	503	29.1	1387.1	80.46	0.0573
560	37/4.39	560	30.7	1544.7	89.61	0.0515
630	61/3.63	631	32.7	1743.8	101.0	0.04587
710	61/3.85	710	34.7	1961.5	113.6	0.0407
800	61/4.09	801	36.8	2213.7	128.2	0.03609
900	61/4.33	898	39.0	2481.1	143.7	0.0322
1000	61/4.57	1001	41.1	2763.8	160.1	0.0289
1120	91/3.96	1121	43.6	3099.2	170.4	0.0258
1250	91/4.18	1249	46.0	3453.1	189.8	0.0232
1400	91/4.43	1403	48.7	3878.5	213.2	0.0206
1500	91/4.58	1499	50.4	4145.6	227.9	0.0193

Source: GB/T 1179-2017 Annex A, Table A.1 (JL aluminium stranded conductor performance). Nominal sections follow the R5/R10/R20 preferred number series. Rated tensile strength (RTS) per 5.7.1: the sum of the minimum tensile strengths of all wires — for 91-wire builds (1120 mm² and above) a 95 % stranding factor applies, while IEC 61089 rates the same sizes at the full wire sum. Resistance: maximum D.C. values at 20 °C. Weights nominal.

Reading the table

Stranding is the number of aluminium wires and their individual diameter. **RTS** is the standard's calculated rated tensile strength — for engineering use apply the stringing limits of the project. **Resistance** is the maximum D.C. value at 20 °C.

Ampacity

Steady-state ampacity of bare AAC depends on ambient temperature, wind and emissivity and is calculated per IEEE 738 on request for the specific span conditions. As a homogeneous aluminum conductor, AAC gives the highest ampacity per unit weight of any stranded overhead type.

How to specify

Information needed	Example
Type designation	AAC (JL) — All Aluminum Conductor, bare
Standard	GB/T 1179-2017
Size and stranding	JL 150-19 — 19/3.15, 148 mm² (Chinese designation JL 150-19; formerly LJ-150)
Lay direction	Concentric lay, right-hand outer layer
Options and delivery	Reel lengths to suit stringing plans · left-hand outer lay on request

Quality & testing

Routine tests — every production lot

Wire samples: resistivity, elongation and torsional ductility. Finished conductor: lay length, overall diameter and D.C. resistance measured on every production lot before despatch.

Certification & documentation

Mill certificates for the wire, routine test reports and inspection certificates issued on request. Third-party inspection (SGS, BV or nominated) welcome before shipment.

Packing & delivery

Reels & lengths

Supply on returnable steel or wooden reels in single lengths to suit the project stringing plan. Conductor ends are secured and tagged; reels are battened and marked for identification.

Export packing

Reel lagging and additional weather protection available for sea freight and long-term outdoor storage. Delivery ex works or CIF — Incoterms 2020 — as agreed.

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