GRANDCABLE

JIS C 3109 · HARD-DRAWN ALUMINUM · JAPANESE SIZES

AAC

All Aluminum Conductor — Bare, Overhead Distribution & Transmission



30	1260	7–91	14
MM² MIN.	MM² MAX.	WIRES	NOMINAL SIZES

Jiangsu Grand Cable Co., Ltd.
Overhead Bare Conductor · Yixing, Jiangsu, China

All Aluminum Conductor (AAC) — JIS C 3109

AAC to JIS C 3109 is a bare conductor stranded from hard-drawn aluminum round wires in a concentric-lay construction, specified by nominal section from 30 to 1260 mm². JIS C 3109 "Hard-drawn aluminium stranded conductors" is the Japanese national standard, widely referenced on Japanese distribution networks and in Japanese-standard export markets across Southeast Asia.

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 | GOST 839

Typical applications

Overhead distribution lines, feeders and busbars on Japanese-pattern networks, on short to medium spans; river and valley crossings; substation busbars where a homogeneous aluminum conductor is preferred. The ampacity of AAC is used to best advantage.

Wire material

Hard-drawn aluminum round wires 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

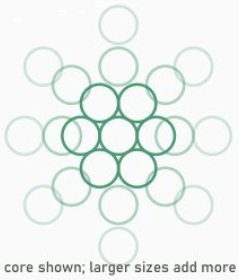
Standard	JIS C 3109 — Hard-drawn aluminium stranded conductors
Designation	Nominal section + stranding, e.g. 150 mm² — 19/3.2
Wire material	Hard-drawn aluminum, resistivity at 20 °C max. 0.028264 Ω·mm²/m
Size range	29.1 – 1261.0 mm² calculated, 14 nominal sizes, each in a single stranding
Constructions	7, 19, 37, 61 or 91 wires — the 91-wire geometry serves the 1260 mm² size
Surface	Bare — no insulation or covering

Concentric-lay stranding

JIS C 3109 conductors are built up in concentric layers around a central wire: 7, 19, 37, 61 and 91-wire constructions cover the range from 30 to 1260 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 aluminum wire at the core.
2. **Concentric layers** — 6, 12, 18 and 24 wires added per layer, giving the 7 / 19 / 37 / 61-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 (30 to 95), 19-wire (150 to 240), 37-wire (300 to 510), 61-wire (660 and 850) and 91-wire (980 and 1260). Each nominal size is listed in a single stranding.



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 JIS C 3109; 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.

JIS C 3109 — dimensions & technical data

Nominal sections 30 to 1260 mm². The section column gives the calculated cross-section; breaking loads are the standard minimum tensile values.

Code Name	Stranding No. × Ø mm	Section mm²	Overall Dia. mm	Weight kg/km	Breaking Load min., kN	D.C. Resistance at 20 °C, Ω/km
30	7/2.3	29.1	6.9	79.5	4.60	0.983
38	7/2.6	37.2	7.8	102.0	5.65	0.769
55	7/3.2	56.3	9.6	154.0	8.21	0.507
95	7/4.2	97.0	12.6	265.0	13.9	0.295
150	19/3.2	153.0	16.0	419.0	22.3	0.188
200	19/3.7	204.0	18.5	560.0	29.8	0.140
240	19/4.0	239.0	20.0	655.0	34.2	0.120
300	37/3.2	298.0	22.4	820.0	43.4	0.0969
400	37/3.7	398.0	25.9	1097.0	58.0	0.0726
510	37/4.2	513.0	29.4	1413.0	73.3	0.0563
660	61/3.7	656.0	33.3	1812.0	95.6	0.0441
850	61/4.2	845.0	37.8	2334.0	120.9	0.0342
980	91/3.7	978.0	40.7	2716.0	142.7	0.0297
1260	91/4.2	1261.0	46.2	3499.0	180.3	0.023

Electrical resistance: maximum D.C. values at 20 °C for hard-drawn aluminum. Weights nominal. Breaking load = standard minimum tensile value of the conductor. For A.C. ratings add skin and proximity effects per project conditions.

Reading the table

Stranding is the number of aluminum wires and their individual diameter. **Breaking load** is the standard minimum tensile value — 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 — All Aluminum Conductor, bare
Standard	JIS C 3109
Size and stranding	150 mm² — 19/3.2, 153.0 mm²
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.

CONTACT

Jiangsu Grand Cable Co., Ltd.

TEL +86-510-80711619

EMAIL sales@grandcable.com sales@grandcable.cn

WEB www.grandcable.com www.grandcable.cn