AS 1531 · ALUMINUM 1350 · ASTRONOMICAL CODE NAMES

AAC

All Aluminum Conductor — Bare, Overhead Distribution & Transmission



34.4	673	7–61	16
MM² MIN.	MM² MAX.	WIRES	CODE NAMES

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Overhead Bare Conductor · Yixing, Jiangsu, China

All Aluminum Conductor (AAC) — AS 1531

AAC to AS 1531 is a bare homogeneous conductor stranded from hard-drawn aluminum (1350) round wires in a concentric-lay construction, identified by the celestial code names listed in Appendix C of the standard. AS 1531-1991 "Conductors — Bare overhead — Aluminium and aluminium alloy" is the current Australian specification for homogeneous bare conductors and remains identical in New Zealand as NZS/AS 1531:1991.

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 | UNE 21018 | SANS 182-2 | JIS C 3109 | GOST 839

Typical applications

Overhead distribution and sub-transmission lines across Australian and Asia-Pacific networks, on short to medium spans where the span is supported at frequent intervals; 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 aluminum round wires of 2.50 to 4.75 mm — the exact wire range of the standard — 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.

Construction summary

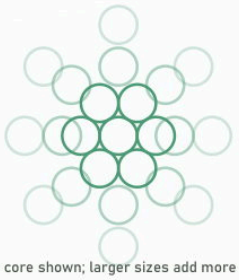
Standard	AS 1531-1991 — Conductors, bare overhead, aluminium and aluminium alloy
Designation	Code name + stranding, e.g. LEO — 7/2.50
Wire material	Hard-drawn aluminum, resistivity at 20 °C max. 0.028264 Ω·mm²/m
Size range	34.36 – 673.40 mm², 16 code names, each in a single stranding
Constructions	7, 19, 37 or 61 wires — according to size
Surface	Bare — no insulation or covering

Concentric-lay stranding

AS 1531 conductors are built up in concentric layers around a central wire: 7, 19, 37 and 61-wire constructions cover the range from 34.4 to 673 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 (LEO to MOON), 19-wire (NEPTUNE to PLUTO and TAURUS), 37-wire (SATURN, SIRIUS, TRITON) and 61-wire (URANUS to VENUS). Each code name 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 AS 1531; 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.

AS 1531 — dimensions & technical data

Code names LEO to VENUS, sizes 34.36 to 673.40 mm². The section column gives the calculated cross-section of the wires.

Code Name	Stranding No. × Ø mm	Section mm²	Overall Dia. mm	Weight kg/km	Breaking Load kN	D.C. Resistance at 20 °C, Ω/km
LEO	7/2.50	34.36	7.50	94.3	5.71	0.833
LEONIDS	7/2.75	41.58	8.25	113.0	6.72	0.689
LIBRA	7/3.00	49.48	9.00	135.0	7.98	0.579
MARS	7/3.75	77.28	11.30	211.0	11.80	0.37
MERCURY	7/4.50	111.30	13.50	304.0	16.90	0.258
MOON	7/4.75	124.00	14.30	339.0	18.90	0.232
NEPTUNE	19/3.25	157.60	16.30	433.0	24.70	0.183
ORION	19/3.50	182.80	17.50	503.0	28.70	0.157
PLUTO	19/3.75	209.80	18.80	576.0	31.90	0.137
SATURN	37/3.00	261.60	21.00	721.0	42.20	0.11
SIRIUS	37/3.25	307.00	22.80	845.0	48.20	0.094
TAURUS	19/4.75	336.70	23.80	924.0	51.30	0.0857
TRITON	37/3.75	408.50	26.30	1120.0	62.20	0.0706
URANUS	61/3.25	506.10	29.30	1400.0	75.20	0.0572
URSULA	61/3.50	586.90	31.50	1620.0	87.30	0.0493
VENUS	61/3.75	673.40	33.80	1860.0	97.20	0.0429

Electrical resistance: maximum D.C. values at 20 °C for hard-drawn aluminum. Weights nominal. Breaking load = sum of wire minimum breaking loads. 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 sum of the wire breaking loads — 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	AS 1531
Code name and stranding	LEO — 7/2.50, 34.36 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.

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