GRANDCABLE

OVERHEAD BARE CONDUCTOR
PRODUCT CATALOGUE

UNE 21018 · EN 50182 TYPE AL1 · L-CODE SERIES

AAC

All Aluminum Conductor — Bare, Overhead Distribution & Transmission



27.8	638	7–61	12
MM² MIN.	MM² MAX.	WIRES	CODE NAMES

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All Aluminum Conductor (AAC) — UNE 21018

AAC to UNE 21018 is a bare homogeneous conductor stranded from hard-drawn aluminum round wires in a concentric-lay construction, designated by the L-code series (L 28 to L 630). UNE 21018 is the Spanish standard for AAC — now aligned with EN 50182 as Type AL1, "Characteristics of aluminium conductors used in Spain" — and remains the reference specification on Spanish networks and Spain-influenced export markets.

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

Typical applications

Overhead distribution and sub-transmission lines on Spanish-pattern networks and in Spain-influenced markets, 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 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

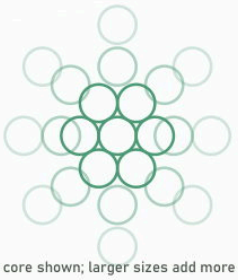
Standard	UNE 21018 — AAC, Spanish standard (aligned with EN 50182 Type AL1)
Designation	Old code L 28 – L 630; new EN 50182 code 28-AL1 – 638-AL1
Wire material	Hard-drawn aluminum, resistivity at 20 °C max. 0.028264 Ω·mm²/m
Size range	27.8 – 638.3 mm², 12 code names, each in a single stranding
Constructions	7, 19, 37 or 61 wires — according to size
Surface	Bare — no insulation or covering

Concentric-lay stranding

UNE 21018 conductors are built up in concentric layers around a central wire: 7, 19, 37 and 61-wire constructions cover the range from 27.8 to 638 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 (L 28 to L 56), 19-wire (L 80 to L 180), 37-wire (L 280) and 61-wire (L 400 to L 630). 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 UNE 21018; 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.

UNE 21018 — dimensions & technical data

Code names L 28 to L 630, sizes 27.8 to 638.3 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
L 28	7/2.25	27.8	6.75	76.2	5.00	1.0285
L 40	7/2.80	43.1	8.40	118.0	7.30	0.6641
L 56	7/3.15	54.6	9.45	149.3	9.00	0.5247
L 80	19/2.25	75.5	11.25	208.0	13.60	0.3807
L 110	19/2.80	117.0	14.00	322.0	19.70	0.2458
L 145	19/3.15	148.1	15.75	407.0	24.50	0.1942
L 180	19/3.55	188.1	17.75	517.0	30.40	0.1529
L 280	37/3.10	279.3	21.70	770.0	46.10	0.1032
L 400	61/2.82	381.0	25.38	1053.0	64.20	0.0758
L 450	61/3.08	454.5	27.72	1256.0	75.50	0.0635
L 550	61/3.38	547.3	30.42	1512.0	89.70	0.0527
L 630	61/3.65	638.3	32.85	1763.0	103.50	0.0452

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	UNE 21018
Code name and stranding	L 80 — 19/2.25, 75.5 mm² (new code 76-AL1)
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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