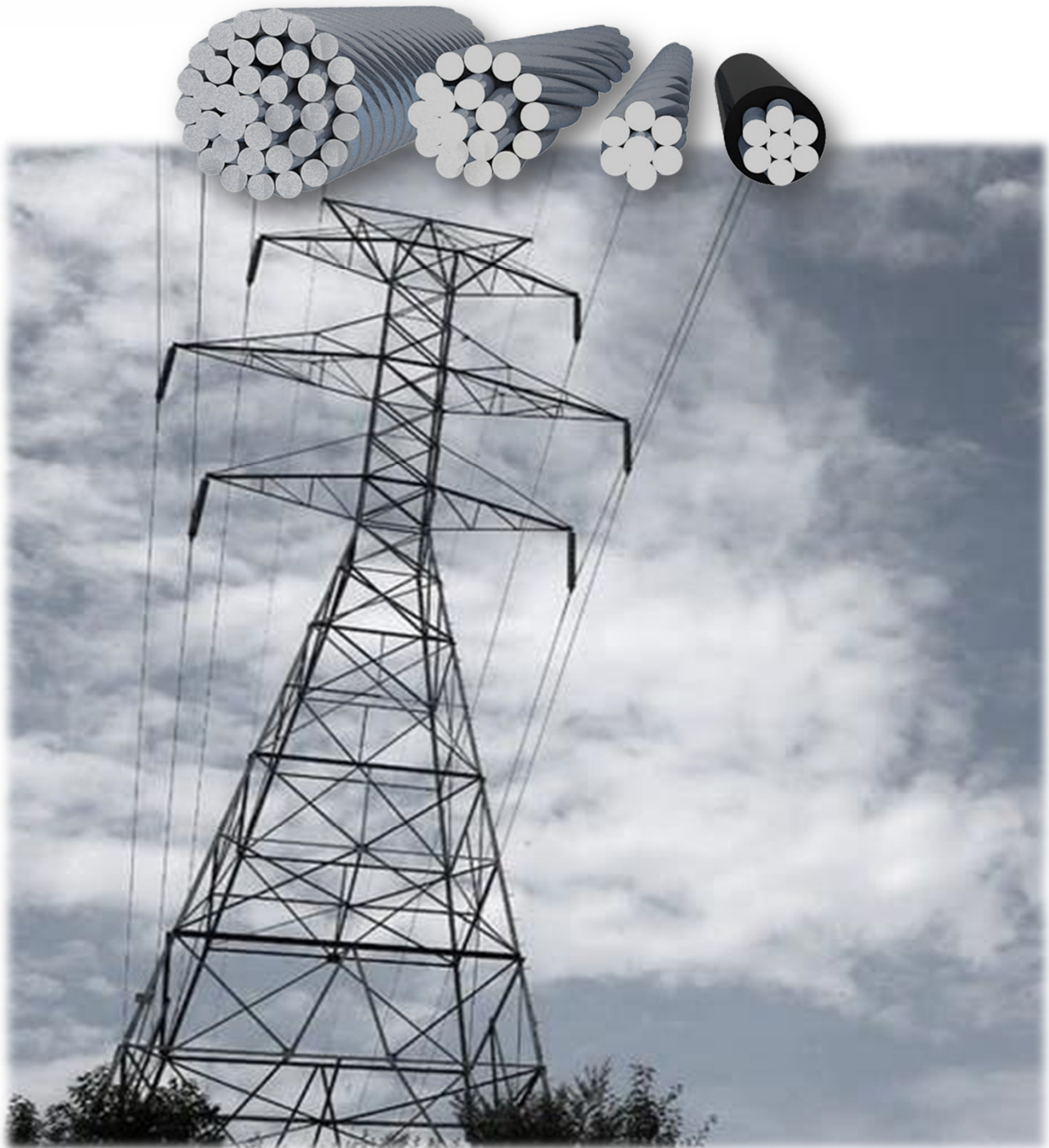


# M-TEC

## AAC

All Aluminium Conductor



### Other Aluminium products:

- AAAC (All aluminium alloy conductor)
- AACSR (All aluminium alloy conductor steel reinforced)
- OPGW (Optic fiber protection overhead conductor)
- ACSR (Aluminium conductor steel reinforced)
- Solid sector shaped aluminium conductor
- Aluminium strip
- Aluminium wire
- Aluminium alloy wire



### Specifications:

IEC 61089	IEC
IEC 889	IEC
BS 215 (British)	BS
BS EN 50182 (British)	BS EN
ASTM B231 (USA)	ASTM
CAN/ CSA/C49 & C61089 (Canada)	CAN

### Grease:

Drop point IP 33 Min	220°C
Operating temperature	- 20°C to 80°C
Grease weight is calculated in accordance with EN 50182 Annex B	

### Material properties

#### Aluminium

Grade	99.7 EC	
Density / Specific gravity	g/cm <sup>3</sup>	2.7
Tensile strength (hard drawn)	Mpa	110-130
Conductivity	Min.	62.3
Volume resistivity @ 20°C	Ω.m	2.826x10 <sup>-8</sup>
Coefficient of linear expansion	per °C	23x10 <sup>-6</sup>
Specific heat	KJ/kg/K	0.904
Melt point	°C	658

### Chemical properties

	Min. %	Nom. %	Max. %
Al	99.650	99.700	-
Si	-	-	0.100
Fe	0.160	0.220	0.280
B	0.003	0.005	0.020
Other	-	-	0.013

### Notes:

Grease and PVC mass must be added to total mass if required.

### Installation conditions

	Value /
	Variables
Wind speed (m/sec)	0.440
Thermal conductivity Air (W m-1 K-1)	0.0264
Velocity of Air (V) (m/hr.)	16.04
Ambient (°C)	30
Conductor continues maximum operating (°C)	75
Conductor surface absorbcency (0.27-0.95)	0.6
Solar beam Intensity (W/m <sup>2</sup> ) I <sub>D</sub>	890
Intensity of Solar sky radiation (W/m <sup>2</sup> ) I <sub>d</sub>	7.15

The stated values are estimated and nominal values. The installer should verify the actual conditions for the specific location of installation.

### Conductor creep

Details in Annexure A

### Sag and tension charts are available on request.

The following information need to be supplied:

- Conductor span lengths
- Maximum design load (45% of UTS is standard)
- Nominal ambient temperature when stringing will take place.

Rev 06: 08/02/2022 (revised Spec. References)

Rev 05: 10/02/2021 (added 37/2.36: 160 conductor)

Rev 04: 31/08/2020 (added Bee conductor)

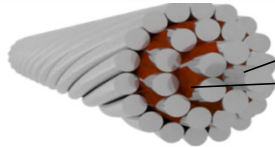
Rev 03: 09/03/2020

Rev 02: 29/08/2019

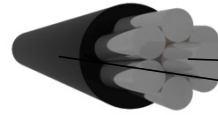
Rev 01: 31/05/2019

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All Aluminium conductor  
Weather proofing grease



All Aluminium conductor  
PVC covering

Construction and dimensions

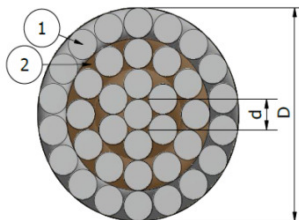
Specification	Conductor name	Number/ Size	area mm <sup>2</sup> Nom.	Conductor mass kg/km Nom.	Nom. dia. mm	Standard Length m	Drum Gross mass kg	Bending radius mm Min.	PVC insulation				Grease mass (Optional)	
									1.6mm		5mm		Case 4	Case 2
									kg/km Nom.	OD mm	kg/km Nom.	OD mm		
<b>1 Aluminium wire + 6 Aluminium wires</b>														
EN 50182	Midge	7/2.06	23.3	64	6.18	3 000	735	185	59.4	9.4			2.1	
	Gnat	7/2.21	26.9	74	6.63	3 000	764	199	62.9	9.8			2.5	
	Ladybird	7/2.79	42.8	118	8.37	2 500	836	251	76.2	11.6			3.9	
	Ant	7/3.10	52.8	145	9.30	2 500	905	279	83.3	12.5			4.8	
	Fly	7/3.40	63.6	175	10.20	2 500	979	306	90.2	13.4			5.8	
	Wasp	7/4.39	106.0	292	13.17	1 500	979	395	120.2	16.5			9.7	
	Bee	7/4.90	132.0	362	14.70	1 500	1 086	441	124.5	17.9			7.7	
<b>1 Aluminium wire + 6 +12 Aluminium wires</b>														
EN 50182	Hornet	19/3.25	157.6	435	16.25	2 000	1 412	488			507.4	26.3		10.7
	Caterpillar	19/3.53	185.9	512	17.65	2 000	1 565	530			540.8	27.7		12.6
	Chafer	19/3.78	213.2	587	18.90	2 000	1 715	567			570.6	28.9		14.4
	Cockroach	19/4.22	265.7	731	21.10	1 500	1 639	633			623.2	31.1		18.0
	Butterfly	19/4.65	322.7	888	23.25	1 000	1 430	698			674.5	33.3		21.9
	Locust	19/5.36	428.7	1180	26.80	1 000	1 722	804			759.3	36.8		21.9
<b>1 Aluminium wire + 6 + 12 + 18 Aluminium wires</b>														
182-2	160	37/2.36	161.9	446	16.52	500	323	578						
EN 50182	Centipede	37/3.78	415.2	1150	26.46	1 000	1 692	794			751.1	36.5		43.2
	Maybug	37/4.09	486.1	1338	28.63	1 000	1 880	859			803.0	38.6		21.9
	Scorpion	37/4.27	529.8	1460	29.89	1 000	2 002	897			833.0	39.9		43.2
	Cicada	37/4.65	628.3	1729	32.55	1 000	2 233	977			896.5	42.6		65.3
<b>1 Aluminium wire + 6 + 12 + 18 + 24 Aluminium wires</b>														
ASTM	Columbine	61/3.78	684.5	1884	34.02	1 000	2 426	1021			931.6	44.0		86.3
	Bull	61/4.25	865.4	2400	38.25	1 000	2 942	1148			1032.6	48.3		109.1

Physical properties

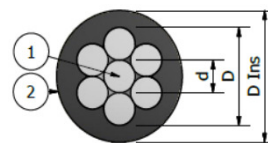
Specification	Conductor name	Modulus of Elasticity		Coefficient of linear expansion	UTS	Outer layer Lay direction
		Initial	Final			
		kN/mm <sup>2</sup> Nom.		x10 <sup>-6</sup> /°C	kN	
<b>1 Aluminium wire + 6 Aluminium wires</b>						
EN 50182	Midge	52.40	61.00	23.00	3.99	RH
	Gnat	52.40	61.00	23.00	4.59	RH
	Ladybird	52.40	61.00	23.00	6.99	RH
	Ant	52.40	61.00	23.00	8.28	RH
	Fly	52.40	61.00	23.00	9.90	RH
	Wasp	52.40	61.00	23.00	16.00	RH
	Bee	52.40	61.00	23.00	21.00	RH
<b>1 Aluminium wire + 6 +12 Aluminium wires</b>						
EN 50182	Hornet	49.65	59.65	23.00	26.00	RH
	Caterpillar	49.65	59.65	23.00	28.62	RH
	Chafer	49.65	59.65	23.00	32.40	RH
	Cockroach	49.65	59.65	23.00	40.40	RH
	Butterfly	49.65	59.65	23.00	48.75	RH
	Locust	48.25	58.60	23.00	64.76	RH
<b>1 Aluminium wire + 6 + 12 + 18 Aluminium wires</b>						
182-2	160	48.25	58.60	23.00	26.00	RH
EN 50182	Centipede	48.25	58.60	23.00	67.20	RH
	Maybug	48.25	58.60	23.00	73.89	RH
	Scorpion	48.25	58.60	23.00	80.03	RH
	Cicada	48.25	58.60	23.00	94.91	RH
<b>1 Aluminium wire + 6 + 12 + 18 + 24 Aluminium wires</b>						
ASTM	Columbine	46.20	57.57	23.00	111.00	RH
	Bull	46.20	57.57	23.00	139.00	RH

Electrical Properties

Resistance		Current Rating	Short circuit rating (kA.1s)	Creep (nominal, calculated) mm/km
dc 20°C	ac 75°C			
Ω/km		A		
1.2272	1.4992	139	3.06	775
1.0663	1.3026	152	3.30	775
0.6690	0.8173	203	4.22	775
0.5419	0.6620	231	4.72	775
0.4505	0.5504	259	5.21	775
0.2702	0.3301	356	6.82	775
0.2169	0.2650	408	7.65	775
<b>1 Aluminium wire + 6 + 12 + 18 + 24 Aluminium wires</b>				
0.1825	0.2219	457	8.42	709
0.1540	0.1881	506	9.17	709
0.1343	0.1640	551	9.86	709
0.1077	0.1316	632	11.07	709
0.0887	0.1084	713	12.26	709
0.0668	0.0816	713	14.24	677
<b>1 Aluminium wire + 6 + 12 + 18 + 24 Aluminium wires</b>				
0.1781	0.2161	469	8.53	677
0.0694	0.0842	833	14.05	677
0.0589	0.0720	713	15.21	677
0.0544	0.0660	967	15.93	677
0.0456	0.0557	1069	17.41	677
<b>1 Aluminium wire + 6 + 12 + 18 + 24 Aluminium wires</b>				
0.0418	0.0511	1212	18.21	630
0.0334	0.0404	1300	20.67	630



Item	Description
1	Aluminium wires
2	Grease



Item	Description
1	Aluminium
2	Insulation

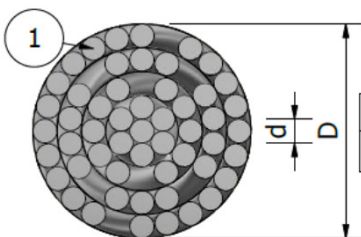
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All Aluminium conductor

Construction and dimensions	Specification	Conductor name	Number/ Size	area mm <sup>2</sup> Nom.	Conductor mass kg/km Nom.	Nom. dia. mm	Standard Length m	Drum Gross mass kg	Bending radius mm Min.
	BS 215-1	Sail 1	53/4.36	791.3	2177	39.24	500	1 398	1177
		Sail 2	33/3.93	400.3	1101	27.51	500	776	825

Physical properties	Specification	Conductor name	Modulus of Elasticity		Coefficient of linear expansion x10 <sup>-6</sup> /°C	UTS kN	Outer layer Lay direction	Resistance		Current Rating A	Short circuit rating (kA.1s)	Creep (nominal, calculated) mm/km
			Initial	Final				dc 20°C	ac 75°C			
			kN/mm <sup>2</sup>					Ω/km				
			Nom.									
BS 215-1	Sail 1	46.20	57.57	23.00	126.61	RH	0.0362	0.0442	1187	19.65	630	
	Sail 2	48.25	58.60	23.00	64.05	RH	0.0715	0.0874	640	13.74	677	



Item	Description
1	Aluminium

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$$\text{Creep} = m \times 7.8 \times 10^{-6} \times t^{0.3} \times \sigma^{1.3} \times e^{0.03(t-20)}$$

m = length of conductor span (in mm)

t = time in years (20 years)

T = maximum continuous conductor temperature (90°C)

e = Coefficient of linear expansion

$\sigma$  = Conductor RTS stress in (MPa)