

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 EN 50183 (British)	BS
BS EN 50182 (British)	BS EN
ASTM B399 (USA)	ASTM
CAN/ CSA/C49 & C61089 (Canada)	CAN

Grease:

Drop point IP 33 Min	300°C
Operating temperature	- 20°C to 150°C

Grease weight is calculated in accordance with EN 50182 Annex B

Installation conditions

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 continuous maximum operating (°C)	75
Conductor maximum short circuit temperature (°C)	200
Conductor surface absorbcency (0.27-0.95)	0.60
Solar beam Intensity (W/m²) I _b	890
Intensity of Solar sky radiation (W/m²) I _d	7.154
Wind speed (m/s)	0.44

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

Material properties

Aluminium Alloy

Grade	6101 & 6201-T81		
Density / Specific gravity	Nom.	g/cm ³	2.703
Tensile strength (hard drawn)	Nom.	Mpa	110-130
Conductivity	Nom.	Min.	62.3
Volume resistivity @ 20°C	Nom.	Ω/mm ² .m	0.032227
Coefficient of linier expansion	Nom.	per °C	23x10 ⁻⁶
Specific heat	Nom.	KJ/kg/K	0.904
Melt point	Nom.	°C	658

Chemical properties

	Nom. %	Max. %
Cu	-	0.100
Si	0.50 - 0.9	-
Al	Remainder	
Si	-	0.100
Fe	-	0.500
B	-	0.060
Other	-	0.013

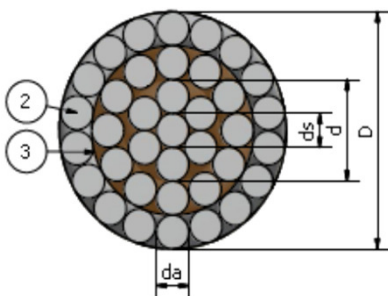
Conductor creep

Details in Annexure A

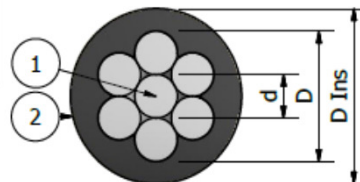
Sag and tension charts are available on request.

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.



Item	Description
1	Aluminium Wires
2	Grease



Item	Description
1	Aluminium
2	Insulation

Rev 02: 19/07/2022

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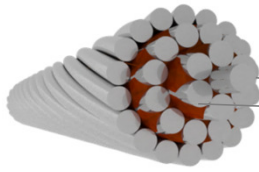
Specifications:
SANS 182-2, BS 215

Application:

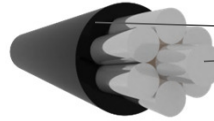
Bare Overhead transmission lines with high tensile load.

Construction:

Aluminium Alloy wires stranded, greased or dry up to the 2nd last layer Case 2 or up to the PCD of last layer Case 4 not on outer surface.



All Aluminium conductor
Grease (if applicable)



Polymeric weather covering (if applicable)
All Aluminium conductor

Specification	Conductor	All Aluminium Alloy Conductor													
		Number	Size	Diameter (D)	Area	mass	Gross mass	Standard length	Bending radius Min.	Resistance Ω /km		Current Rating (A)	Short circuit rating (kA.1s)	#Creep (nominal, calculated)	
										dc 20°C	ac 75°C				
		#	mm	mm	mm ²	kg/km	kg	m	mm			75°C		mm/km	
BS	Acacia	7	2.08	6.24	23.8	65.0	334	2 000	187	1.393	1.736	133	3.3	40	
	Almond	7	2.34	7.02	30.1	82.8	370	2 000	211	1.101	1.371	153	3.7	54	
	CODE 35	7	2.77	8.31	42.2	115.0	434	2 000	249	0.785	0.979	189	4.4	84	
	Fir	7	2.95	8.85	47.8	131.7	533	2 500	266	0.692	0.863	204	4.7	99	
	Hazel	7	3.30	9.90	59.9	164.7	533	2 000	297	0.553	0.690	235	5.3	132	
	Pine	7	3.61	10.83	71.6	196.0	742	2 000	325	0.462	0.576	262	5.8	168	
	Willow	7	4.04	12.12	89.7	246.9	720	1 500	364	0.369	0.460	302	6.4	224	
	Oak	7	4.65	13.95	118.9	325.0	1 000	2 000	419	0.279	0.347	359	7.4	323	
	Mulberry	19	3.18	15.90	150.9	415.2	1 180	2 000	477	0.220	0.274	416	8.4	440	
	Elm	19	3.76	18.80	211.0	580.5	1 511	2 000	564	0.157	0.196	513	9.9	680	
	Ash	19	3.48	17.40	180.7	497.3	1 199	2 000	522	0.183	0.228	467	9.1	556	
	Poplar	37	2.87	20.09	239.4	658.6	1 667	2 000	603	0.138	0.172	513	10.5	801	
	Sycamore	37	3.23	22.61	303.2	834.2	2 018	2 000	678	0.109	0.136	643	11.8	1 090	
	Upas	37	3.53	24.71	362.1	996.4	2 343	2 000	741	0.091	0.114	718	12.9	1 373	
	Sapphire	37	3.75	26.25	408.7	1124.5	2 599	2 000	788	0.081	0.101	776	13.8	1 615	
Yew	37	4.06	28.42	479.0	1318.1	2 327	1 500	853	0.069	0.086	853	14.9	1 974		

Specification	Conductor name	Modulus of Elasticity		Coefficient of linear expansion	UTS	Grease mass calculated Nom.		Outer layer lay	PVC insulation			
		Initial	Final			Case 2	Case 4		1.6mm		5mm	
		kN/mm ²		$\times 10^{-6}/^{\circ}\text{C}$	kN			kg/km	kg/km	kg/km	OD	kg/km
		Nom.				kg/km	mm			Nom.	mm	
BS	Acacia	52.4	61.0	23.00	6.69	-	1.9	RH	60	9	-	-
	Almond	52.4	61.0	23.00	8.44	-	2.4	RH	66	10	-	-
	CODE 35	52.4	61.0	23.00	11.86	-	3.4	RH	76	12	-	-
	Fir	52.4	61.0	23.00	13.40	-	3.8	RH	80	12	-	-
	Hazel	52.4	61.0	23.00	16.80	-	4.8	RH	88	13	-	-
	Pine	52.4	61.0	23.00	20.20	-	5.7	RH	95	14	-	-
	Willow	52.4	61.0	23.00	25.15	-	7.1	RH	105	15	-	-
	Oak	52.4	61.0	23.00	33.33	-	9.9	RH	119	17	-	-
	Mulberry	49.7	59.7	23.00	42.29	9.2	18.0	RH	134	19	-	-
	Elm	49.7	59.7	23.00	59.10	12.9	26.4	RH	156	22	-	-
	Ash	49.7	59.7	23.00	50.65	11.0	21.5	RH	145	21	-	-
	Poplar	49.7	59.7	23.00	67.08	22.5	32.9	RH	166	23	599	30
	Sycamore	49.7	59.7	23.00	85.00	28.4	41.7	RH	185	26	659	33
	Upas	49.7	59.7	23.00	101.50	34.0	49.8	RH	201	28	709	35
	Sapphire	49.7	59.7	23.00	115.00	38.3	56.2	RH	213	29	746	36
Yew	49.7	59.7	23.00	134.20	44.9	69.4	RH	229	32	32	38	

Notes:

Grease and mass must be added as per relevant Case to conductor mass if greased conductor is required.

Insulation mass must be added to the conductor mass if relevant.

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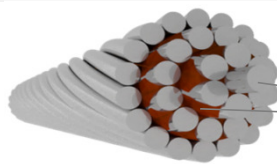
Specifications:
ASTM B232, AS 1220

Application:

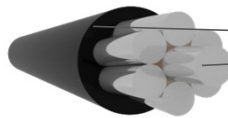
Bare Overhead transmission lines with high tensile load.

Construction:

Aluminium Alloy wires stranded, greased or dry up to the 2nd last layer Case 2 or up to the PCD of last layer Case 4 not on outer surface.



All Aluminium conductor
Grease (if applicable)



Polymeric weather covering (if applicable)
All Aluminium conductor

Construction and dimensions	Specification	Conductor	All Aluminium Alloy Conductor												
			Number	Size	Diameter (D)	Area	mass	Gross mass	Standard length	Bending radius Min.	Resistance Ω /km		Current Rating (A)	Short circuit rating (kA.1s)	#Creep (nominal, calculated) (mm/km)
											dc 20°C	ac 75°C			
ASTM	Azusa	7	3.37	10.11	62.5	171.9	548	2 000	303	0.530	0.661	262	5.4	154	
	Alliance	7	4.77	14.31	125.1	344.2	1 237	3 000	429	0.265	0.330	395	7.6	381	
	Elgin	19	4.71	23.54	330.6	911.5	1 262	1 000	706	0.100	0.125	739	12.4	1 294	
	650	37	3.37	23.56	329.2	906.4	2 173	2 000	707	0.101	0.125	789	12.3	1 249	
	800	37	3.73	26.14	405.2	1115.4	2 591	2 000	784	0.082	0.102	971	13.7	1 636	
	Greely	37	4.02	28.14	469.6	1294.8	3 046	2 000	844	0.071	0.088	908	14.7	1 982	

Physical properties	Specification	Conductor name	Modulus of Elasticity		Coefficient of linear expansion	UTS	Grease mass calculated Nom.		Outer layer Lay direction	PVC insulation			
			Initial	Final			Case 2	Case 4		1.6mm		5mm	
										kN/mm ²		kg/km Nom.	OD mm
			Nom.				$\times 10^{-6}/^{\circ}\text{C}$			kN		kg/km	kg/km
ASTM	Azusa	49.7	59.7	23.00	18.88	-	5.0	(Z) RH	89	13	-	-	
	Alliance	49.7	59.7	23.00	37.83	-	9.9	(Z) RH	122	18	-	-	
	Elgin	49.7	59.7	23.00	96.98	60.41	88.6	(Z) RH	192	27	681	34	
	650	49.7	59.7	23.00	94.38	30.9	45.3	(Z) RH	192	27	682	34	
	800	49.7	59.7	23.00	116.14	38.01	55.8	(Z) RH	212	29	743	36	
	Greely	49.7	59.7	23.00	134.62	44.1	64.6	(Z) RH	227	31	791	38	

Notes:

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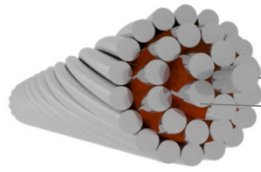
Specifications:
IEC 60189.

Application:

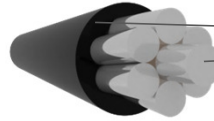
Bare Overhead transmission lines with high tensile load.

Construction:

Aluminium Alloy wires stranded, greased or dry up to the 2nd last layer Case 2 or up to the PCD of last layer Case 4 not on outer surface.



All Aluminium conductor
Grease (if applicable)



Polymeric weather covering (if applicable)
All Aluminium conductor

Construction and dimensions	Specification	Conductor	All Aluminium Alloy Conductor													
			Number	Size	Diameter (D)	Area	mass	Gross mass	Standard length	Bending radius Min.	Electrical Properties	Resistance Ω /km		Current Rating (A)	Short circuit rating (kA.1s)	#Creep (nominal, calculated) (mm/km)
												dc 20°C	ac 75°C			
#	mm	mm	mm ²	kg/km	kg	m	mm									
IEC	160	19	3.51	17.55	183.8	506.1	1 372	2 000	527	0.1798	0.2241	355	9.2	609		
	200	19	3.93	19.65	230.5	634.5	1 629	2 000	590	0.1439	0.1793	513	10.3	814		
	315	37	3.53	24.71	362.1	998.9	2 358	2 000	741	0.0916	0.1141	671	12.9	1 470		
	400	37	3.98	27.86	460.3	1268.4	2 897	2 000	836	0.0721	0.0898	829	14.6	2 005		
	450	37	4.22	29.54	517.5	1426.9	3 214	2 000	886	0.0641	0.0798	987	15.5	2 337		
	500	37	4.45	31.15	575.5	1585.5	3 531	2 000	935	0.0577	0.0718	1 145	16.3	2 679		
	560	61	3.67	33.03	645.3	1778.4	3 917	2 000	991	0.0516	0.0643	1 303	17.2	3 105		
	630	61	3.89	35.01	725.0	2000.7	4 361	2 000	1050	0.0458	0.0571	1 461	18.3	3 618		
	710	61	4.13	37.17	817.2	2254.8	4 870	2 000	1115	0.0407	0.0507	1 619	19.4	4 227		
800	61	4.38	39.50	921.0	2540.6	5 441	2 000	1185	0.0361	0.0449	1 777	20.6	4 936			

Physical properties	Specification	Conductor name	Modulus of Elasticity		Coefficient of linear expansion	UTS	Grease mass calculated Nom.		Outer layer Lay direction	PVC insulation			
			Initial	Final			Case 2	Case 4		1.6mm		5mm	
										kN/mm ²		kg/km Nom.	OD mm
			Nom.	$\times 10^{-6}/^{\circ}\text{C}$			kN	kg/km		kg/km			
IEC	160	49.7	59.7	23.00	54.32	11.2	21.9	(Z) RH	146	21	538	28	
	200	49.7	59.7	23.00	67.91	14.1	27.4	(Z) RH	162	23	589	30	
	315	49.7	59.7	23.00	106.95	11.4	22.1	(Z) RH	201	28	709	35	
	400	49.7	59.7	23.00	135.81	14.4	28.1	(Z) RH	225	31	785	38	
	450	49.7	59.7	23.00	152.79	16.2	31.6	(Z) RH	238	33	825	40	
	500	49.7	59.7	23.00	169.76	18.1	35.2	(Z) RH	250	34	863	41	
	560	49.7	59.7	23.00	190.14	12.3	23.9	(Z) RH	265	36	908	43	
	630	49.7	59.7	23.00	213.90	13.8	26.9	(Z) RH	280	38	955	45	
	710	49.7	59.7	23.00	241.07	15.6	30.3	(Z) RH	296	40	1007	47	
800	49.7	59.7	23.00	271.62	17.5	34.1	(Z) RH	314	43	1062	50		

Notes:

Grease and mass must be added as per relevant Case to conductor mass if greased conductor is required.

Insulation mass must be added to the conductor mass if relevant.

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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

σ = Conductor RTS stress in (MPa)

R02: Reviewed TDS Data (2022/07/19)

R01: Added Sapphire(2021/11/08)

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