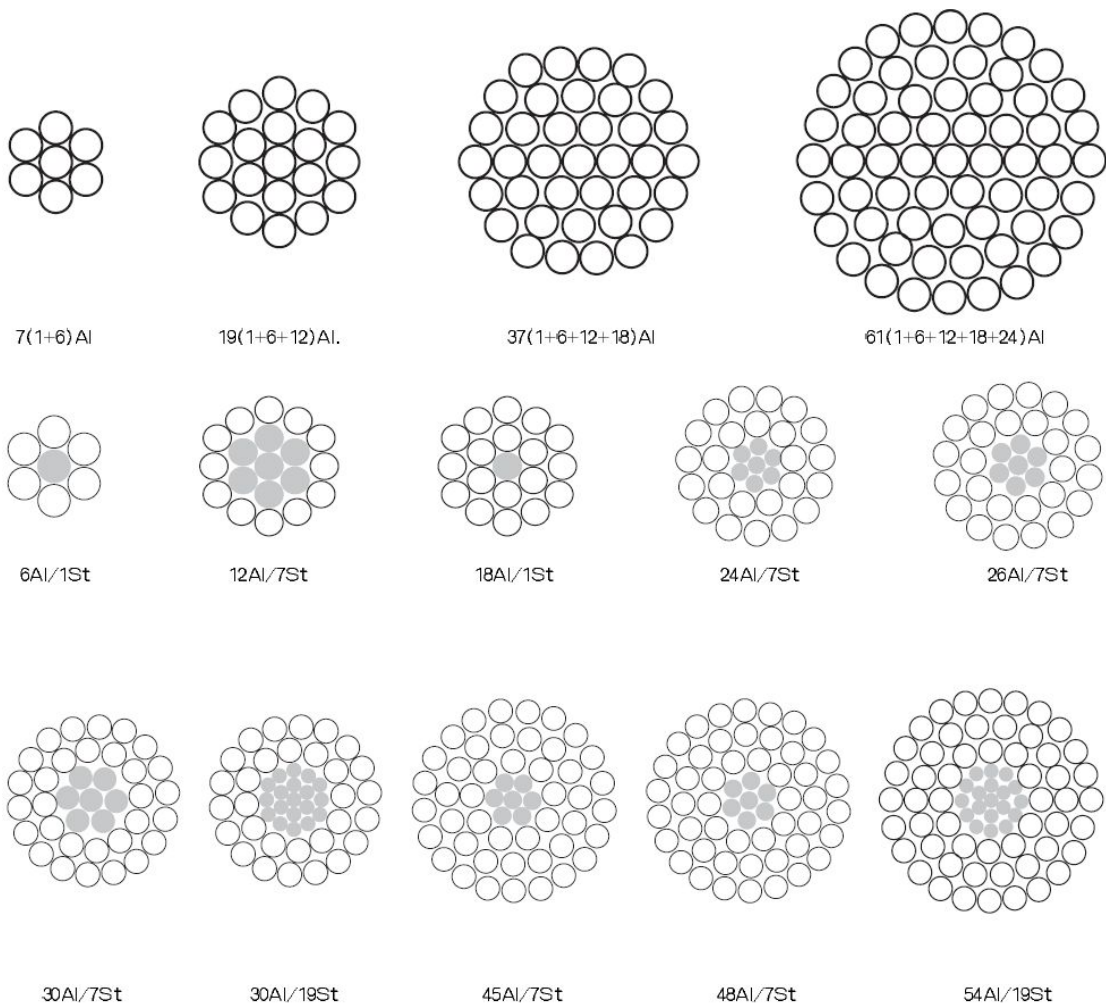


# BEAR STANDARD CONDUCTOR

## Aluminum Stranded Conductor and Aluminum Stranded Conductors Steel-reinforced



## Aluminum Stranded Conductor and

## Aluminum Stranded Conductors Steel-reinforced

The product is used in the field of aerial power line.

## Manufacturing Standards

The standard is IEC207-1966, GB1179-83 which is similar to IEC209-1966.

### Type & Specification

a. Refer to table 1 about the type of cable

table 1

Type	Name
LJ	Aluminum Stranded Conductor
LGJ	Aluminum Stranded Conductors Steel-reinforced
LGJF	Corrosion-proof Aluminum Stranded Conductors Steel-reinforced

Aluminum Stranded Conductor and Aluminum Stranded Conductors Steel-reinforced

b. Specification of cable is stipulated in table 2 and table 3.

### Aluminum stranded conductor

Table 2

Nominal Cross-sectional Area mm <sup>2</sup>	Construction(N O./Dia) mm	Outer Dia. mm	D.C .Resis tance at 20°C (no more than) Ω /km	Calculated Breaking Load N	Calculated Weight kg/km	Delivery Length (no less than) m	Continuous Carrying Capacity A
16	7/1.70	5.10	1.802	2840	44	4000	111
25	7/2.15	6.45	1.127	4355	70	3000	147
35	7/2.50	7.50	0.8332	5760	94	2000	180
50	7/3.00	9.00	0.5786	7930	136	1500	227
70	7/3.60	10.80	0.4018	10950	195	1250	284
95	7/4.16	12.48	0.3009	14450	261	1000	338
120	19/2.85	14.25	2.373	19420	334	1500	390
150	19/3.15	15.75	0.1943	23310	407	1250	454
185	19/3.50	17.50	0.1574	28440	503	1000	518
210	19/3.75	18.75	0.1371	32260	577	1000	575
240	19/4.00	20.00	0.1205	36260	657	1000	610
300	37/3.20	22.40	0.09689	46850	820	1000	707
400	37/3.70	25.90	0.07247	61150	1097	1000	851
500	37/4.16	29.12	0.06733	76370	1387	1000	982
630	61/3.63	32.67	0.04577	91940	1744	800	1140
800	61/4.10	36.90	0.03588	115900	2225	800	1340

### Aluminum stranded conductor steel-reinforced

Table 3

Nominal Cross-sectional Area mm <sup>2</sup>	Construction No./Dia mm		Outer Dia. mm	D.C .Resistance at 20°C (no more than) Ω /km	Calculated Breaking Load N	Calculated Weight kg/km	Delivery Length (no less than) m	Continuous Carrying Capacity A
	Al.	St.						
10/2	6/1.50	1/1.50	4.50	2.706	4120	13	3000	87
16/3	6/1.85	1/1.85	5.55	1.779	6130	65	3000	110
25/4	6/2.32	1/2.32	6.96	1.131	9290	103	3000	125
35/6	6/2.72	1/2.72	8.16	0.8230	12630	141	3000	145
50/8	6/3.20	1/3.20	9.60	0.5946	16870	195	2000	212
50/30	12/2.32	7/2.32	11.60	0.5692	42620	372	3000	250
70/10	6/3.80	1/3.80	11.40	0.4217	23390	275	2000	255
70/40	12/2.72	7/2.72	13.60	0.4141	58300	511	2000	340
95/15	26/2.15	7/1.67	13.61	0.3058	35000	381	2000	350
95/20	7/4.16	7/1.85	13.87	0.3019	37200	409	2000	360
95/55	12/3.20	7/3.20	16.00	0.2990	78110	708	2000	420
120/7	18/2.90	1/2.90	14.50	0.2422	27570	379	2000	380
120/20	26/2.38	7/1.85	15.07	0.2496	41000	467	2000	390
120/25	7/4.72	7/2.10	15.74	0.2345	47880	527	2000	400
120/70	12/3.60	7/3.60	18.00	0.2364	98370	896	2000	505
150/8	18/3.20	1/3.20	16.00	0.1989	32860	461	2000	442
150/20	24/2.78	7/1.85	16.67	0.1980	46630	549	2000	450
150/25	26/2.70	7/2.10	17.10	0.1939	54110	601	2000	470
150/35	30/2.5	7/2.50	17.50	0.1962	65020	676	2000	500
185/10	18/3.60	1/3.60	18.00	0.1572	40880	584	2000	497
185/25	24/3.15	7/2.10	16.67	0.1542	59420	706	2000	525
185/30	26/2.98	7/2.32	18.88	0.1592	64320	733	2000	525
185/45	30/2.80	7/2.80	19.60	0.1564	80190	848	2000	522
210/10	18/3.80	1/3.80	19.00	0.1411	45140	651	2000	523
210/25	24/3.33	7/2.22	19.98	0.1380	65990	789	2000	560
210/35	26/3.22	7/2.50	20.38	0.1363	74250	854	2000	590
210/50	30/2.98	7/2.98	20.86	0.1381	90830	961	2000	600
240/30	24/3.60	7/2.40	21.60	0.1181	75620	922.2	2000	610
240/40	22/3.42	7/2.66	21.66	0.1209	83370	964.3	2000	610
240/55	30/3.20	7/3.20	22.40	0.1198	102100	1108	2000	640
300/15	42/3.00	7/1.67	23.01	0.09724	68060	940	2000	650
300/20	45/2.93	7/1.95	23.43	0.09520	75680	1002	2000	655
300/25	48/2.85	7/2.22	23.76	0.09433	83410	1058	2000	690
300/40	24/3.99	7/2.66	23.94	0.09614	92220	1133	2000	705
300/50	26/3.83	7/2.98	24.26	0.09636	103400	1210	2000	725
300/70	30/3.60	7/3.60	25.20	0.09463	128000	1402	2000	740
400/20	42/3.51	7/1.95	26.91	0.07104	88850	1286	1500	800
400/25	45/3.33	7/2.22	26.64	0.07370	95940	1295	1500	800

400/30	48/3.22	7/2.50	26.82	0.07389	103900	1349	1500	810
400/50	54/3.07	7/3.07	27.63	0.07232	123400	1511	1500	815
400/65	26/4.42	7/3.44	28.00	0.07236	135200	1611	1500	850
400/95	30/4.16	19/2.50	29.14	0.07087	171300	1860	1500	873
500/35	45/3.75	7/2.50	30.00	0.05712	119500	1642	1500	920
500/45	38/3.60	7/2.80	30.00	0.05912	128100	1688	1500	920
500/65	54/3.44	7/3.44	30.96	0.05760	154000	1897	1500	935
630/45	45/4.20	7/2.80	33.60	0.04633	148700	2060	1500	1025
630/55	48/4.12	7/3.20	34.32	0.04514	164400	2209	1500	1060
630/80	54/3.87	19/2.32	34.32	0.04551	192900	2388	1500	1120
800/55	45/4.80	7/3.20	38.40	0.03547	191500	2690	1200	1220
800/70	48/4.63	7/3.60	38.58	0.03574	207000	2791	1200	1223
800/100	54/4.33	19/2.60	38.98	0.03635	241100	2991	1200	1240

### Main Mechanical Performance of Cable

- a. Refer to table 4 about the mechanical performance of round aluminum wire  
b. The mechanical property of galvanized steel wire and the technical requirement of zinc coating. (see Table 5)

Table 4

Nominal Diameter mm	Min. Tensile Strength				Max. Resistivity at 20°C $\Omega\text{mm}^2/\text{m}$	Wrapping Test
	Before Stranding		After Stranding			
	N/mm <sup>2</sup>	kgf/mm <sup>2</sup>	N/mm <sup>2</sup>	kgf/mm <sup>2</sup>		
1.25	200	20.4	190	19.4	0.028264	Wind test sample at round rod whose diameter is equal to that of sample eight turns, then unwind six turns, then wind sample at the rod tightly again. There should be no
1.26~1.50	193	19.7	183	18.7		
1.51~1.75	188	19.2	178	18.2		
1.76~2.00	184	18.8	176	17.9		
2.01~2.25	180	18.4	172	17.5		
2.26~2.50	176	18.0	168	17.1		
2.51~2.75	173	17.6	164	16.7		
2.76~3.00	169	17.2	160	16.3		
3.01~3.25	166	16.9	157	16.0		
3.26~3.50	164	16.7	154	15.9		

3.51~3.75	162	16.5	152	15.7	breaking on aluminum stranded conductors when checked by visual examination.
3.76~4.20	160	16.3	153	15.5	
4.26~5.00	159	16.2	151	15.4	

Table 5

Nominal Diameter mm	Min. Stress at 1% N/mm <sup>2</sup>	Min. Tensile Strength N/mm <sup>2</sup>		Min. Weight of Zinc Coating g/mm <sup>2</sup>	No. of Immersion In 1 minute (No less than)	Adhesion of Coating	
		Before Stranding	After Stranding g			Dia. Of Test Rodmm	Wrapping
1.25~1.50	1172	1310	1244	183	2	4d	(1) Wind 8 turns tightly. (2) Winding result: No crack on coating dropped off when rubbed by finger.
1.51~1.75	1172	1310	1244	198	2		
1.76~2.25	1172	1310	1244	214	2.5		
2.26~2.75	1138	1310	1244	229	3		
2.76~3.00	1138	1310	1244	244	3.5		
3.01~3.50	1103	1310	1244	244	3.5	5d	
3.51~3.80	1103	1310	1244	259	4		

Thermal Resistant Aluminum Alloy Stranded Conductor and Thermal Resistant Aluminum Alloy Stranded Conductor Steel-reinforced

## Manufacturing Standards

Q/09TDL030-1999

## Uses and Characteristics

The product is used in aerial transmission line. Max. Continuous operating temperature can be 150 . The transmission capacity of this product increases 60%.

## Properties

- a.Relative conductance: 58%IACS Max. resistivity at 20°C:0.029726  $\Omega \cdot \text{mm}^2/\text{m}$
- b.After heating to 230 °C for 1h, and cooling to room temperature, the tensile strength remained should not less than 90%.
- c.Linear expansion coefficient is 0.000023 1/°C
- d.Temperature coefficient of resistance is 0.0039 1/°C

## ***Aluminum Stranded Conductor and Aluminum Stranded Conductors***

### ***Steel-reinforced***

## Specification

a.thermal resistant aluminum alloy stranded conductor

Table 6

Nominal Cross-section $\text{mm}^2$	Construction (No./ Dia.) mm	Calculated Cross-section $\text{mm}^2$	Overall Diameter mm	Max. D.C. Resistance at 20°C $\Omega/\text{k}^\circ$	Calculated Breaking Load N	Calculated Weight kg/km	Min. Delivery Length m
35	7/2.50	34.36	7.50	0.8763	5125	94.2	2000
50	7/3.00	49.48	9.00	0.6085	7380	135.7	1500
70	7/3.60	71.25	10.80	0.4226	10289	195.4	1250
95	7/4.16	95.14	12.48	0.3165	13287	260.9	1000
120	19/2.85	121.21	14.25	0.2496	18079	334.0	1500
150	19/3.15	148.07	15.75	0.2043	21381	408.0	1250
185	19/3.50	182.80	17.50	0.1655	26396	503.7	1000
210	19/3.75	209.85	18.75	0.1442	30302	578.2	1000
240	19/4.00	238.76	20.00	0.1267	33343	657.9	1000
300	37/3.20	297.57	22.40	0.1019	42969	821.6	1000
400	37/3.70	397.83	25.90	0.07622	57447	1098.5	1000
500	37/4.16	502.90	25.12	0.06030	70230	1388.6	1000
630	41/3.63	631.30	32.67	0.04803	86362	1746.8	800
800	61/4.10	805.36	36.90	0.03765	106549	2228.4	800

b.thermal resistant aluminum alloy stranded conductor steel-reinforced

Table 7

Nominal Cross-Section mm <sup>2</sup>	Construction (No./Dia.) mm		Calculated Cross-section mm <sup>2</sup>			Overall Diameter mm	Max. D.C. Resistance at 20°C Ω/km	Calculated Breaking Load N	Calculated Weight kg/km	Min. Delivery Length m
	Al.	St.	Al.	St.	Total					
240/30	24/3.60	7/2.40	244.29	31.67	257.06	21.60	0.1242	73170	923	2000
240/40	26/3.42	7/2.66	238.85	38.90	277.75	21.66	0.1271	80570	965	2000
240/50	30/3.20	7/3.20	241.27	56.30	297.57	22.40	0.1260	98770	1109	2000
300/15	42/3.00	7/1.67	296.88	15.33	312.21	23.01	0.1032	64580	941	2000
300/20	45/2.93	7/1.95	303.42	20.91	324.33	23.43	0.1001	72140	1003	2000
300/25	45/2.85	7/2.22	306.21	27.10	333.31	23.76	0.0992	79840	1060	2000
300/40	24/3.99	7/2.65	300.09	38.90	338.99	23.94	0.1011	89880	1134	2000
300/50	26/3.83	7/2.98	299.54	48.82	348.36	24.26	0.1013	101100	1211	2000
300/70	30/3.60	7/3.60	305.36	71.25	376.61	25.20	0.09953	125000	1403	2000
400/20	42/3.51	7/1.95	406.40	20.91	427.31	26.91	0.07471	86280	1287	1500
400/25	45/3.33	7/2.22	391.91	27.10	419.01	26.64	0.07751	91330	1297	1500
400/35	48/3.22	7/2.50	390.88	34.36	425.24	26.82	0.07772	98520	1351	1500
400/50	24/3.07	7/3.07	399.73	51.82	451.55	26.73	0.07606	117920	1513	1500
400/65	26/4.42	7/3.44	398.94	65.06	464.00	28.00	0.07610	130400	1612	1500
400/95	30/4.16	19/2.50	407.75	93.27	501.02	29.14	0.07454	166100	1961	1500
500/35	45/3.75	7/2.50	497.01	34.36	531.37	30.00	0.06112	114700	1644	1500
500/45	48/3.60	7/2.80	488.58	41.10	531.68	30.00	0.06218	123300	1690	1500
500/65	54/3.44	7/3.44	501.88	65.06	566.94	30.96	0.0606	148000	1899	1500
630/45	45/4.20	7/2.80	623.45	41.10	666.55	33.60	0.04873	140700	2601	1500
630/55	48/4.12	7/3.44	639.92	56.30	696.22	34.32	0.04747	156200	2210	1200
630/80	54/3.87	7/2.80	635.19	80.32	715.51	34.82	0.0479	187800	2190	1200
800/55	45/4.80	7/3.20	639.92	56.30	870.60	38.40	0.03731	181800	2691	1200
800/70	48/4.63	7/3.60	808.15	71.25	379.40	33.53	0.03759	197400	2793	1000
800/100	54/4.33	19/2.60	795.17	100.88	896.05	38.98	0.0383	231600	2995	1000
1440/120	84/4.67	19/2.80	1438.81	116.99	1555.80	51.36	0.0213	344500	4928	700

**Material**

a. Thermal resistant aluminum alloy round wire should be in accordance with the

standard Q/09TDL029-1999 Thermal Resistant Aluminum Alloy Round Wire of Relative Conductance 58% IACS.

b. Galvanized steel wire should be in accordance with the standard GB3428-82 Galvanized Steel Wire which is used in Aluminum Stranded Conductors Steel-reinforced.

## Hard Copper Stranded Conductor

### Manufacturing Standards

Q/09TDL016

### Uses and Characteristics

The product is used in aerial power line and power system of electrical railway.

## *Aluminum Stranded Conductor and Aluminum Stranded Conductors*

### *Steel-reinforced*

### Name and Manufacturing Range

Name: Hard Copper Stranded Conductor

Type: TJ

Manufacturing Range: 10-500mm<sup>2</sup>

### Properties

Main Properties of Round Copper Single Wire (see Table 8)

Table 8

Dia. Of Single Wire mm		Cross-section of Conductor mm <sup>2</sup>	Tensile Strength N/mm <sup>2</sup>		Conductor Resistivity at 20°C Ω.mm <sup>2</sup> /m	Weight kg/km
Normal Value	Tolerance		Min. Value before Stranding	Min. Value after Stranding		
1.35	±0.03	1.43	422	392	0.01796	12.7
1.50		1.77				15.3
1.75		2.41				21.5
2.00		3.14			0.01777	28.0
.225		3.98				35.4



2.50		4.41				43.7
2.70		5.94				52.9
3.00		7.07				62.9
3.25	±0.04	8.30				73.8

*Note: 1. The diameter is allowed to have a middle value. Its deviation is allowed one of the next bigger diameter.*

*Resistivity of the conductor at 20° shall be selected 0.01796 $\pi^2$ mm<sup>2</sup>/m, if the normal diameter is less than 2.00mm.*

## The Construction

Specification, Construction and Technical Data. (see Table 9) Table 9

Nominal Cross-section mm <sup>2</sup>	Single Wire		Overall Diameter of the Strand mm	Calculated Breaking Load KN	Conductor D.C. Resistance at 20°C $\Omega$ ./km	Continuous Carrying Capacity A	Calculated Weight kg/km
	No.	Dia. mm					
50	19	1.80	9.0	19.38	0.3781	250	437
70	19	2.10	10.5	26.38	0.2747	310	596
95	19	2.50	12.5	37.79	0.1939	380	845
120	19	2.80	14.0	46.90	0.1546	440	1060
127	19	2.92	14.6	51.00	0.1422	470	1163
150	37	2.25	15.8	58.98	0.1232	510	1337
185	37	2.50	17.5	72.81	0.09981	585	1649
240	61	2.25	20.3	97.23	0.07490	700	2209
300	61	2.50	22.5	120.04	0.06067	800	2725
400	61	2.89	26.0	160.42	0.04540	960	3640
500	61	3.23	29.1	200.38	0.03635	1110	4545

*Note: 1. The weight of stranded conductor is calculated with the density 8.9kg/dm<sup>3</sup> and average lay ratio.*

*2. Refer to the line, the wind speed is 0.6m/s, the ambient temperature is 35 , max. temperature of aerial transmission strand is 70 ,*

*60Hz and below. In the special laying situation of static air, the capacity shall reduce about 30% in average.*

## Delivery Length

a.the delivery length of stranded conductors shall be as stipulated in the tables. The allowed tolerance for delivery length of any strands is within 5% of the total length signed in the contract, the length for each short strand shall be not less than 1/3 of the] standard delivery one. The delivery length can be decided through negotiation by both parties.

b.The strands shall be delivered in drum and packed carefully. The short strands shall

be delivered in coiling and tied up at least three points and packed carefully.

**Ordering Method**

Please indicate the type, size, number and product standard when ordering. For example, if ordering 20T steel-reinforced aluminum stranded conductor with a cross-sectional area of 50/8mm<sup>2</sup> can be indicated as: LGJ-50/8mm<sup>2</sup> 20T GB1179-83.