Aluminium Conductor Steel Reinforced, Extra High Strength - ACSR

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ACSR

Conductor formed by a steel core (extra high strength) and aluminium wires layers.

STANDARDS

Product ABNT NBR 7270/88

APPLICATIONS

The use of Aluminium as a material for electrical conductors has greatly developed mainly due to its electrical properties. However, Aluminium conductors for most of transmission lines which spans are quite long, it is necessary an additional mechanical support. Commonly it is used galvanized steel wires for cores of ACSR.

APPLICATIONS

Widely used as bare cable for overhead transmission lines and also as primary and secondary bare cable for distribution lines.

CONSTRUCTION

ACSR is concentrically stranded conductor with one or more layers of Aluminium wire hard-drawn 1350-H19 on the galvanized steel wire core. The core may be single wire or stranded depending on the size. Steel wire is available in Class A or B galvanization as corrosion protection.

ACSR is according to electrical and mechanical strength requirements of transmission or distribution lines, can provides an appropriate design combining the quantity of Aluminium and galvanized steel wires.

Conditions for Ampacity calculation

Conductor temperature = 75 °C;

Room temperature = 25 °C;

Wind speed = 1 m/sec, sunny.

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CHARACTERISTICS

Construction characteristics	
Conductor material	aluminum / Steel Core
Conductor shape	Circular non compacted
Dimensional characteristics	
Number of cores	1
Number of round wires	-

TECHNICAL DATA I

Conductor cross-section [kcmil]	N° aluminium wires	Diameter of aluminium wires [mm]	Number of steel wires	Diam. Steel Wire [mm]	Aluminium cross-section [mm²]	Cross section [mm²]	Type of cable
80	8	2.54	1	2.54	40.54	54.66	Grouse
101.8	12	2.34	7	2.34	51.61	81.71	Petrel
110.8	12	2.44	7	2.44	56.11	88.84	Minorca
134.6	12	2.69	7	2.69	68.2	107.98	Leghorn
159	12	2.92	7	2.92	80.36	127.24	Guinea
176.9	12	3.08	7	3.08	89.41	141.56	Dotterel
190.8	12	3.2	7	3.2	96.51	152.81	Dorking
203	8	4.046	7	4.046	102.86	130.64	Auk
203.2	16	2.86	19	2.86	102.79	194.57	Brahma
211.3	12	3.37	7	3.37	107.04	169.48	Cochin

TECHNICAL DATA II

Conductor diam. [mm]	Diameter of steel core [mm]	Alu content [kg/km]	Steel content [kg/km]	Approx. weight [kg/km]	Rated breaking load (Class A) [kgf]	Rated breaking load (Class B) [kgf]	Type of cable
9.32	4.24	111.8	109.9	221.7	2355	2258	Grouse
11.7	7.02	142.4	235.1	377.5	4711	4505	Petrel
12.2	7.32	155.5	255.7	411.2	5123	4898	Minorca
13.45	8.07	188.3	310.7	499.1	6179	5907	Leghorn
14.6	8.76	222.6	366.2	588.8	7258	6937	Guinea
14.8	6.74	285	217	502	5228	5043	Auk
15.4	9.24	246.9	407.3	654.3	7835	7478	Dotterel
16.0	9.6	267.4	439.8	707.2	8459	8073	Dorking
16.85	10.11	295.6	487.7	783.6	9381	8954	Cochin
18.12	12.4	284.8	718.3	1003.1	12909	12307	Brahma

TECHNICAL DATA III

Ampacity [A]	Average geometric radius [m]	Max. DC Resist. Cond. 20°C [Ohm/km]	Max. electric resisrance AC 60Hz 75°C [Ohm/km]	Inductive reactance [Ohm/km]	Capacitive reactance [MOhm.km]	Type of cable
210.0	0.004	0.711	0.858	0.425	0.256	Grouse
240.0	0.005	0.5613	0.786	0.408	0.245	Petrel
250.0	0.005	0.5163	0.733	0.404	0.243	Minorca
280.0	0.005	0.4248	0.622	0.397	0.239	Leghorn
300.0	0.006	0.3605	0.543	0.391	0.235	Guinea
310.0	0.006	0.324	0.497	0.387	0.232	Dotterel
330.0	0.006	0.3002	0.467	0.384	0.23	Dorking
340.0	0.006	0.2707	0.43	0.38	0.228	Cochin
340.0	0.006	0.281	0.443	0.39	0.234	Auk
340.0	0.007	0.2818	0.442	0.348	0.224	Brahma