

SHAHID GHANDI COMMUNICATION CABLE CO.

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**TECHNICAL SPECIFICATION FOR
SELF SUPPORTING CABLE – FOAM SKIN
(SSC-F)**



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SELF SUPPORTING CABLE – FOAM SKIN**

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1 - GENERAL

This specification details the construction of self supporting aerial telecommunication cables. The conductors are solid copper, covered with a foam plastic insulating compound and a thin layer of solid plastic as skin. The insulated conductors are twisted into pairs which are stranded into subgroups or groups and which in turn are assembled into a cable core. After the core is wrapped, the cable structure is completed with Aluminum and LDPE jacket. The cable is fully color coded so that each pair in the cable is Distinguishable from every other pair. The color coding provides different color combinations of insulation for each pair in a 25 pair group or (subgroup) and provides colored bindings to distinguish individual groups from each other.

2 - ASSOCIATED DOCUMENTS

This specification is in accordance with REA'ASTM (American society for testing and material) , BS (British Standard Institute) , IP (Institute of Petroleum) and ISO (International Organization for Standardization) have been specified .

3 - TEMPERATURE AND ENVIRONMENT

The cables shall without detriment, perform suitably throughout a temperature range of -40 to +70 C. The cables shall suffer no deterioration from corrosive elements found naturally in the ground.

4 - CONDUCTOR

Each conductor is a solid wire of commercially pure annealed copper, smoothly drawn, circular in cross section, uniform in quality and free from defects. Conductors meet the quality requirements of ASTM B3. The maximum resistance for a cross section area of 1 mm² and a length of 1 km is 17.241 ohms when measured at 20±2 °C. The nominal conductor diameters may be 0.4 to 0.9 mm.

5 - CONDUCTOR INSULATION

Each conductor is uniformly covered with foam polyethylene conforming to ASTM D-1248. Type III class A category 4 or 5 Grade E8. The second layer of insulation will be a thin layer of solid PE. Insulation contains a suitable antioxidant system including a copper inhibitor.

The insulation will be uniform, smooth and The Eccentricity of the insulation according the procedure described in ASTM D-4565 is less than 0.1.



The insulation colors are in accordance with the following table:

TABLE (1)

PAIR NUMBER	CONDUCTOR A	CONDUCTOR B
1	White	Blue
2	White	Orange
3	White	Green
4	White	Brown
5	White	Grey
6	Red	Blue
7	Red	Orange
8	Red	Green
9	Red	Brown
10	Red	Grey
11	Black	Blue
12	Black	Orange
13	Black	Green
14	Black	Brown
15	Black	Grey
16	Yellow	Blue
17	Yellow	Orange
18	Yellow	Green
19	Yellow	Brown
20	Yellow	Grey
21	Violet	Blue
22	Violet	Orange
23	Violet	Green
24	Violet	Brown
25	Violet	Grey

6 - TWISTING

Two appropriately colored insulated conductors are uniformly twisted together to form a pair. The lays of all pairs are in the same direction and different for each pair in a unit.

7 - STRANDING

In cables having 25 pairs or less, the pairs colored according to the table (1) are stranded to form a cylindrical core. Stranding may be accomplished by using a concentric stranding or by using cross stranding where the pairs will change positions according to the change in direction of lay. In cables having more than 25 pairs the pairs colored according to table (1) form a group which are divided into two or more sub-groups according to tables (2). The colored binders are used for binding and identifying each group or subgroup according to tables (4,5). Each cable of 100 pairs will have one (1) spare pairs according to tables (3).



The cables construction are in accordance with the following tables:

TABLE (2)

pairs in cable	CENTER LAYER		FIRST LAYER		SECOND LAYER	
	subgroup or group No.	Pairs in subgroup or group	subgroup or group No.	Pairs in subgroup or group	subgroup or group No.	Pairs in subgroup or group
10	1	10	-	-	-	-
20	1	20	-	-	-	-
30	1	12	-	-	-	-
	1	13	-	-	-	-
	2	5	-	-	-	-
40	1	12	-	-	-	-
	1	13	-	-	-	-
	2	15	-	-	-	-
* 50	1	12	-	-	-	-
	1	13	-	-	-	-
	2	12	-	-	-	-
	2	13	-	-	-	-
70	1	25	-	-	-	-
	2	25	-	-	-	-
	3	20	-	-	-	-
100	1	25	-	-	-	-
	2	25	-	-	-	-
	3	25	-	-	-	-
	4	25	-	-	-	-

* 50 pairs group made by two 25 pair unit

Note:

Each cable of 100 pairs will have one (1) spare pairs according to tables (3).

The spare pair colors are in accordance with the following table:

TABLE (3)

SPARE PAIR NUMBER	CONDUCTOR A	CONDUCTOR B
1	White	Red

The binder colors for subgroup are in accordance with the following table (4,5):

TABLE (4)

Subgroup No.	Color of binding	Pair count
1	White -Blue	1-10 OR 1-20 OR 1-12 OR 13-25 OR 1-25
2	White - Orange	1-5 OR 1-15 OR 1-12 OR 13-25 OR 1-25
3	White -Green	1-20 OR 1-25
4	White -Brown	1-25



TABLE (5)

Subgroup No.	Color of binding	Pair count
1	White -Blue	1-25
2	White - Orange	26-50
3	White -Green	51-75
4	White -Brown	76-100

8 - CORE WRAP

The core is completely covered with one layer of non-hygroscopic non-wicking, dielectric tape. The tape may be applied helically or longitudinally and have a minimum over lap of 30% of the width of the wrapping or 5 mm whichever is the least .The core wrap provide a sufficient heat barrier to prevent visible evidence of conductor insulation deformation or adhesion between conductors caused by adverse heat transfer during the jacketing operation .

9 - ALUMINUM SHIELD

An aluminum tape with copolymer coating on both sides will be applied longitudinally with an adequate overlap for the cables with a core diameter of 20mm or less the overlap shall be 3mm minimum and for the cables with a core diameter greater them 20mm the overlap shall be 6mm minimum . The Aluminum thickness is 200 micron and the copolymer coating on each side has the thickness about 38 microns.

10 - SUSPENSION STRAND (MESSENGER)

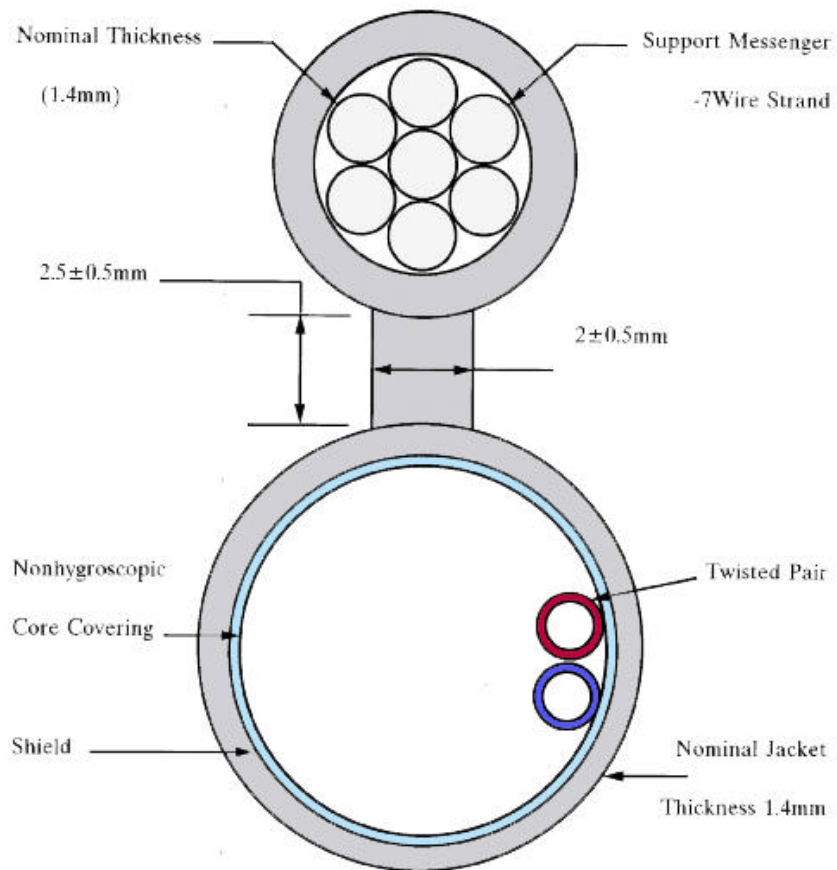
Suspension strand consist of 7 galvanized steel wires with zinc coating at least 120 gr/m² and a minimum tensile strength of 1600 N/mm². Depending on cable weight, diameter of each wire may be 0.9 mm, 1.2 mm or 1.6 mm.

11 - OUTER JACKET

A black polyethylene jacket in accordance with ASTM D-1248 type I class C. category 4 or 5 grade J-3. The nominal jacket thickness will be according the FIG1. The average thickness at any cross section shall not be less than 90% and minimum spot thickness shall not be less than 70% of the nominal thickness.

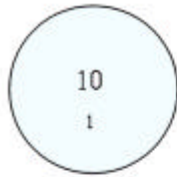


FIG1

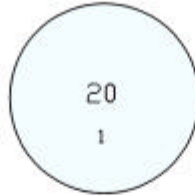




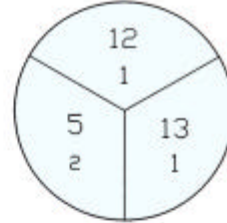
14 - CABLE FORMATION



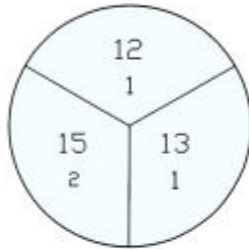
10 Pair



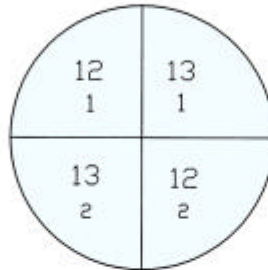
20 Pair



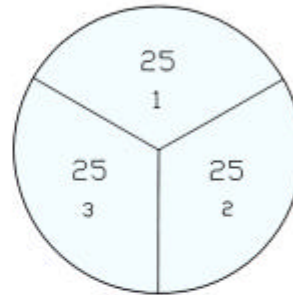
30 Pair



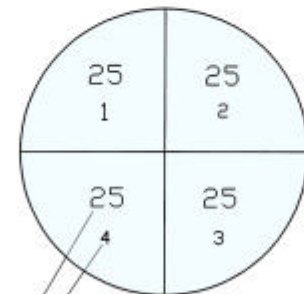
40 Pair



50 Pair



70 Pair



100 Pair

Pairs in cable

Subgroup or group No.

Pairs in subgroup or group

Note:

The spare pairs can be in any subgroup or group.



13 - ELECTRICAL PARAMETERS

TABLE (10)

PARAMETERS		UNIT	0.4 mm	0.6 mm	0.8 mm
Resistance	Max. Ind	Ω/km	147	65	36
	Max. Ave	Ω/km	139	62	35
Resistance Unbalance	Max. Ind	%	4.5	4.5	4.5
	Max. Ave	%	1.5	1.5	1.5
Dielectric	Conductot to conductor	Kv/ 3 sec	4.5	4.5	4.5
Strength	Conductor to ground	Kv/ 3 sec	15	15	15
Mutual Capacitanc	Max. Ind	Nf/km	57	57	57
	* Ave	Nf/km	52 ± 2	52 ± 2	52 ± 2
Capacitanc Unbalance	Pair to ground Max. Ind	Pk/km	2625	2625	2625
	Pair to ground Max. Ave	Pk/km	574	574	574
	Pair to pair Max. Ind	Pk/km	145	145	145
	Pair to pair Max. Rms	Pk/km	45	45	45
Attenuation	Ave 1024 KHz	dB/Km	25.7	17.3	12.7
	Ave 1500 KHz	dB/Km	31.2	21	15.4
Crosstalk	Worst power-sum 1024	dB/Km	35	35	37
	Mean power-sum 1024	dB/Km	39	41	43
	Worst power-sum 3150	dB/Km	26	26	28
	Mean power-sum 3150	dB/Km	30	32	34

* (For cables less than 12 pairs 52 ± 4)



12 - CABLE SIZES

Cable sizes are in accordance with the following table:

TABLE (6)

SIZE of CABLE	WEIGHT (kg/km)	DIAMETER (mm)	REEL LENGHT (m)
10 x 2 x 0.4	130	8.5	1010 - 1020
20 x 2 x 0.4	164	10	1010 - 1020
30 x 2 x 0.4	197	11	1010 - 1020
40 x 2 x 0.4	229	12	1010 - 1020
50 x 2 x 0.4	292	13	1010 - 1020
70 x 2 x 0.4	353	14	1010 - 1020
100 x 2 x 0.4	446	16	505 - 510
10 x 2 x 0.6	175	10.5	1010 - 1020
20 x 2 x 0.6	245	12.5	1010 - 1020
30 x 2 x 0.6	344	14	1010 - 1020
40 x 2 x 0.6	411	15.5	1010 - 1020
50 x 2 x 0.6	479	17	1010 - 1020
70 x 2 x 0.6	607	19	505 - 510
100 x 2 x 0.6	860	21.5	505 - 510
10 x 2 x 0.8	229	12.5	1010 - 1020
20 x 2 x 0.8	377	15	1010 - 1020
30 x 2 x 0.8	491	17	1010 - 1020
40 x 2 x 0.8	603	18.5	1010 - 1020
50 x 2 x 0.8	718	20	1010 - 1020
70 x 2 x 0.8	990	23	505 - 510
100 x 2 x 0.8	1326	26	505 - 510