

**SHAHID GHANDI COMMUNICATION CABLE CO.**

**CODE: 0112-000**

**TECHNICAL SPECIFICATION FOR  
MAIN DISTRIBUTION FRAME (MDF)  
AND  
INDOOR CABLES**



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## **SPECIFICATION FOR MDF AND INDOOR CABLE**

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## **1 - GENERAL**

This specification details the construction of Indoor cable which is used as MDF terminating cable. The conductors are solid copper, covered with a polyvinyl chloride (PVC insulation). The insulated conductors are twisted into pairs which are stranded into sub groups and then assembled to make cable core. The core will be wrapped with polyester tape and aluminum foil. A tinned copper wire as earth continuity will be applied under aluminum foil. The cable structure is completed with PVC jacket. The cable is fully color coded so that each pair in the cable is distinguishable from every other pair.

## **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 tinned 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 mm<sup>2</sup> and a length of 1 km is 17.241 ohms when measured at 20 °C. The nominal conductor diameters may be 0.4 to 0.8mm.

## **5 - CONDUCTOR INSULATION**

Each conductor is uniformly covered with polyvinyl chloride (PVC) conforming to DIN VDE 0207 part 4 designating YI3 table 2.



5-1- The insulation colors are in accordance with the following table (1):

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 groups which are divided into two or more sub-groups according to table (2). The colored binders are used for binding and identifying each group or subgroup according to tables (3).



7-1- The cable construction is in accordance with the following table (2):

TABLE (2)

Number of pairs in cable	Number of pairs in subgroups or groups	CENTER LAYER	FIRST LAYER	SECOND LAYER
<=25	Total pairs in one group	-	-	-
30	12+13+5	-	-	-
32	12+13+7			
40	12+13+15	-	-	-
50	(12+13)+(12+13)	-	-	-
	2×25	-	-	-
70	(2×25)+20	-	-	-
100	4×25	-	-	-
150	6×25	1	2-6	-
200	8×25	1-2	3-8	-

**NOTE:** Can replace 12-13 subgroups with 25 pair groups for all cable construction.

7-2-The binder colors for subgroups or groups are in accordance with the following table (3):

TABLE (3)

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
5	White - Grey	101-125
6	Red -Blue	126-150
7	Red - Orange	151-175
8	Red -Green	176-200

**7-3 – SPARE PAIRS**

Each length of cable of 100 pairs and larger will have one (1) percent of spare pairs up to a value of 20 pairs. For 150 pair's cable, 2 spare pairs will be including. The spare pairs can be in any subgroup or group .The spare pair's colors according to tables (4).

TABLE (4)

SPARE PAIR NUMBER	CONDUCTOR A	CONDUCTOR B
1	White	Red
2	White	Black

## 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 .

A tinned copper wire as earth continuity will be applied over core wrap with diameter of 0.6mm.

## 9 - ALUMINUM SHIELD

An aluminum foil with copolymer coating on one side will 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 Aluminum thickness is 35 micron.

## 10 - OUTER JACKET

A flame retardant grey polyvinyl chloride (PVC) compound according to DIN-VDE 0207 will be extruded over the aluminum tape.

**10-1-**The nominal jacket thickness is in accordance with the following table (5):

TABLE (5)

Number of Pairs in cable	Thickness of jacket in mm
N < 20	1
20 <= N < 40	1.2
40 <= N < 70	1.4
70 <= N < 100	1.5
100 <= N < 200	1.6
N >= 200	1.8

## 11 - ELECTRICAL PARAMETERS

TABLE (6)

PARAMETERS		UNIT	0.4 mm	0.5 mm	0.6 mm	0.8 mm
<b>Resistance</b>	Max. Ind	W/km	147	90.2	65	36
	*Max. Ave	W/km	139	87.6	62	35
<b>Resistance Unbalance</b>	Max. Ind	%	5	4.5	4.5	4.5
	*Max. Ave	%	2	1.5	1.5	1.5
<b>Dielectric strength</b> KV DC / 1 minute	Conductor to conductor	Kv	0.7	0.7	0.7	0.7
	Conductor to shield	Kv	2	2	2	2
<b>Capacitance</b>	Max. Ind	NF/km	110	110	110	110
<b>Capacitance unbalance</b>	Pair to pair Max. Ind	PF/500m	300	300	300	300
<b>Insulation Resistance</b>	At 20°C – 500V DC	MO/KM	500	500	500	500

\* Only for 10 pairs or more

## 12 - CABLE SIZES

Cable sizes for 0.4mm are in accordance with the following table:

TABLE (7-1)

SIZE of CABLE	WEIGHT (kg/km)	DIAMETER (mm)	REEL LENGHT (m)
2 × 2 × 0.4	27	4.5	1010 - 1020
4 × 2 × 0.4	38	5.5	1010 - 1020
6 × 2 × 0.4	48	6	1010 - 1020
8 × 2 × 0.4	57	6.5	1010 - 1020
10 × 2 × 0.4	66	7	1010 - 1020
20 × 2 × 0.4	118	9.5	1010 - 1020
25 × 2 × 0.4	140	10.5	1010 - 1020
30 × 2 × 0.4	161	11	1010 - 1020
32 × 2 × 0.4	170	11.5	1010 - 1020
40 × 2 × 0.4	212	12.5	1010 - 1020
50 × 2 × 0.4	253	13.5	1010 - 1020
70 × 2 × 0.4	339	16	1010 - 1020
100 × 2 × 0.4	464	18	1010 - 1020
200 × 2 × 0.4	866	23.5	1010 - 1020

Cable sizes for 0.5mm are in accordance with the following table:

TABLE (7-2)

SIZE of CABLE	WEIGHT (kg/km)	DIAMETER (mm)	REEL LENGHT (m)
2 × 2 × 0.5	31	5	1010 - 1020
4 × 2 × 0.5	45	6	1010 - 1020
6 × 2 × 0.5	59	6.5	1010 - 1020
8 × 2 × 0.5	72	7	1010 - 1020
10 × 2 × 0.5	84	7.5	1010 - 1020
20 × 2 × 0.5	151	10.5	1010 - 1020
25 × 2 × 0.5	180	11	1010 - 1020
30 × 2 × 0.5	210	12	1010 - 1020
32 × 2 × 0.5	220	12.2	1010 - 1020
40 × 2 × 0.5	278	14	1010 - 1020
50 × 2 × 0.5	334	15	1010 - 1020
70 × 2 × 0.5	451	17.5	1010 - 1020
100 × 2 × 0.5	627	20.5	1010 - 1020
200 × 2 × 0.5	1187	27	1010 - 1020

Cable sizes for 0.6mm are in accordance with the following table:

TABLE (7-3)

SIZE of CABLE	WEIGHT (kg/km)	DIAMETER (mm)	REEL LENGHT (m)
2 × 2 × 0.6	39	5.5	1010 - 1020
4 × 2 × 0.6	59	6.5	1010 - 1020
6 × 2 × 0.6	78	7.5	1010 - 1020
8 × 2 × 0.6	96	8.5	1010 - 1020
10 × 2 × 0.6	113	9	1010 - 1020
20 × 2 × 0.6	208	12	1010 - 1020
25 × 2 × 0.6	250	13.5	1010 - 1020
30 × 2 × 0.6	292	14.5	1010 - 1020
32 × 2 × 0.6	302	14.5	1010 - 1020
40 × 2 × 0.6	387	16.5	1010 - 1020
50 × 2 × 0.6	468	18	1010 - 1020
70 × 2 × 0.6	635	21	1010 - 1020
100 × 2 × 0.6	884	24	1010 - 1020
200 × 2 × 0.6	1695	33	1010 - 1020

Cable sizes for 0.8mm are in accordance with the following table:

TABLE (7-4)

SIZE of CABLE	WEIGHT (kg/km)	DIAMETER (mm)	REEL LENGHT (m)
2 × 2 × 0.8	54	6.5	1010 - 1020
4 × 2 × 0.8	87	8	1010 - 1020
5 × 2 × 0.8	103	9	1010 - 1020
6 × 2 × 0.8	118	9.5	1010 - 1020
8 × 2 × 0.8	148	10.5	1010 - 1020
10 × 2 × 0.8	177	11.5	1010 - 1020
20 × 2 × 0.8	330	15.5	1010 - 1020
25 × 2 × 0.8	400	17	1010 - 1020
30 × 2 × 0.8	470	18.5	1010 - 1020
32 × 2 × 0.8	480	18.5	1010 - 1020
40 × 2 × 0.8	624	21.5	1010 - 1020
50 × 2 × 0.8	760	23.5	1010 - 1020
70 × 2 × 0.8	1039	27.5	1010 - 1020
100 × 2 × 0.8	1445	30	1010 - 1020
200 × 2 × 0.8	2802	41.5	505 - 510

The reel length may be increased as request.