IMSA Spec. Cable & Wire

Since 1896, the International Municipal Signal Association (IMSA) has been concerned with many aspects of governmental public safety, communications and signaling. The majority of its members are municipal, county, state/provincial and federal officials and employees located throughout the United States and Canada.

The development of a series of electrical cable and wire specifications is one of the many services provided by IMSA. These specifications assure specifying engineers, purchasers and users that they are receiving quality cable and wire that will perform reliably within the application scope of each specification.

The cable constructions offer maximum resistance to moisture and weathering and are primarily designed for outside installations, including aerial, underground duct and direct earth burial. They are also excellent options for industrial and other users when selecting control and communications cables for outside installations.

For more information on IMSA cable specifications, see the IMSA Primer in the Appendix Section.

Table 5.1

Straight Conductor Color Code

Cables having more than 21 conductors are identifiable by their location in the concentric layers in the cable assembly.

Conductor Number	Insulation Color	Stripe Color
1	Black	-
2	White	-
3	Red	-
4	Green	-
5	Orange	-
6	Blue	-
7	White	Black
8	Red	Black
9	Green	Black
10	Orange	Black
11	Blue	Black
12	Black	White
13	Red	White
14	Green	White
15	Blue	White
16	Black	Red
17	White	Red
18	Orange	Red
19	Blue	Red
20	Red	Green
21	Orange	Green

Table 5.2

Twisted Pair Color Code

Cables containing more than 25 pairs are identifiable by color-coded binding tapes.

Pair Number	Tip Color	Ring Color
1	White	Blue
2	White	Orange
3	White	Green
4	White	Brown
5	White	Slate
6	Red	Blue
7	Red	Orange
8	Red	Green
9	Red	Brown
10	Red	Slate
11	Black	Blue
12	Black	Orange
13	Black	Green
14	Black	Brown
15	Black	Slate
16	Yellow	Blue
17	Yellow	Orange
18	Yellow	Green
19	Yellow	Brown
20	Yellow	Slate
21	Violet	Blue
22	Violet	Orange
23	Violet	Green
24	Violet	Brown
25	Violet	Slate

Current IMSA Signal and Communications Cable Specifications

Spec. No.	Voltage Rating	Conductor Application*	Type Installation	Configuration	Design Features
19-1	600	Signal, Fire	Aerial, Duct	Cabled Conductors	**PVC** Outer Jacket
19-2	600	Signal, Fire	Aerial, Duct	Twisted Pairs	**PVC** Outer Jacket, Shielded
19-3	600	Signal, Fire	Figure-8, Aerial	Cabled Conductors	**PVC** Outer Jacket, Integrated Messenger
19-4	600	Signal, Fire	Figure-8, Aerial, Self-Supporting	Twisted Pairs	**PVC** Outer Jacket, Shielded, Integrated Messenger
19-5	600	Signal, Firel	Direct Earth Burial	Cabled Conductors	**PVC** Outer Jacket , Shielded, Double Jacketed
19-6	600	Signal, Fire	Direct Earth Burial	Twisted Pairs	**PVC** Outer Jacket, Shielded, Double Jacketed
20-1	600	Signal, Fire	Aerial, Duct	Cabled Conductors	**PE** Outer Jacket
20-2	600	Signal, Fire	Aerial, Duct	Twisted Pairs	**PE** Outer Jacket, Shielded
20-3	600	Signal, Fire	Figure-8, Aerial, Self-Supporting	Cabled Conductors	**PE** Outer Jacket, Integrated Messenger
20-4	600	Signal, Fire	Figure-8, Aerial, Self-Supporting	Twisted Pairs	**PE** Outer Jacket, Shielded, Integrated Messenger
20-5	600	Signal, Fire	Direct Earth Burial	Cabled Conductors	**PE** Outer Jacket, Shielded, Double Jacketed
20-6	600	Signal, Fire	Direct Earth Burial	Twisted Pairs	**PE** Outer Jacket, Shielded, Double Jacketed
26-3	—	Signal Systems	Aerial, Hard Drawn Copper	Single Conductor	Black **PE** Insulation
28-3	—	Signal Systems	Aerial, Copper-Clad Steel	Single Conductor	Black **PE** Insulation
29-1	—	Signal Systems	Aerial, Hard Drawn Copper	Parallel "C" Line Wire	Black **PE** Insulation
29-2	—	Signal Systems	Aerial, Copper-Clad Steel	Parallel "C" Line Wire	Black **PE** Insulation
29-3	—	Signal Systems	Aerial, Hard Drawn Copper	Parallel "C" Line Wire	**Red PVC** Outer Jacket

Chart continued on next page.

*Application Terms

Signal: Traffic Signal
Fire: Fire Protection Signal
Traffic: Traffic Communications
Data: Data Acquisition
Signal Loop: Signal Loop Detector Lead-in Feeder
Inductance Loop: Inductance Loop Detector

A **PVC** (Polyvinyl Chloride) jacket is soft and pliable.
A **PE** (Polyethylene) jacket is more rigid and more resistant to moisture and weather.

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Current IMSA Signal and Communications Cable Specifications

Spec. No.	Voltage Rating	Conductor Application*	Type Installation	Configuration	Design Features
29-4	—	Signal Systems	Aerial, Copper-Clad Steel	Parallel "C" Line Wire	**Red PVC** Outer Jacket
39-2	300	Fire, Traffic, Data	Aerial, Duct	Twisted Pairs	**PVC** Outer Jacket, Shielded
39-4	300	Traffic, Data	Figure-8, Aerial, Self-Supporting	Twisted Pairs	**PVC** Outer Jacket, Shielded, Integrated Messenger
39-6	300	Fire, Traffic, Data	Direct Earth Burial	Twisted Pairs	**PVC** Outer Jacket, Shielded, Double Jacketed
40-2	300	Fire, Traffic, Data	Aerial, Duct	Twisted Pairs	**PE** Outer Jacket, Shielded
40-4	300	Traffic, Data	Figure-8, Aerial, Self-Supporting	Twisted Pairs	**PE** Outer Jacket, Shielded, Integrated Messenger
40-6	300	Fire, Traffic, Data	Direct Earth Burial	Twisted Pairs	**PE** Outer Jacket, Shielded, Double Jacketed
50-2[1]	600	Signal Loop	Direct Earth Burial[1]	Twisted Pair	Black **PE** Outer Jacket, Shielded
51-1	600	Inductance Loop	Saw Cut, Duct	Single Conductor	Clear Nylon Jacket Black **PVC** Insulation
51-3	600	Inductance Loop	Saw Cut, Duct	Single Conductor	Black Cross-Linked **PE** Jacket
51-5	600	Inductance Loop	Saw Cut, Duct	Single Conductor	Overall **PVC** or **PE** tube, Black **PVC** Insulation
51-7	600	Inductance Loop	Saw Cut, Duct	Single Conductor	Overall **PE** tube, Black **XLP** Insulation
59-2	300	Communications	Aerial, Duct	Communications	**PVC** Outer Jacket, Shielded, **Filled**
59-4	300	Communications	Figure-8, Aerial, Self-Supporting	Communications	**PVC** Outer Jacket, Shielded, Integrated Messenger, **Filled**
59-6	300	Communications	Direct Earth Burial	Communications	**PVC** Outer Jacket, Shielded, Double Jacketed, **Filled**
60-2	300	Communications	Aerial, Duct	Communications	**PE** Outer Jacket, Shielded, **Filled**
60-4	300	Communications	Figure-8, Aerial, Self-Supporting	Communications	**PE** Outer Jacket, Shielded, Integrated Messenger, **Filled**
60-6	300	Communications	Direct Earth Burial	Communications	**PE** Outer Jacket, Shielded, Double Jacketed, **Filled**

Chart continued from previous page.

[1] **Should not be under traffic and a cushion of sand or clay should be placed around the cable.**

Signal Cable, Aerial and Duct, 600V

IMSA Spec. 19-1 and 20-1

Specifications

Conductors	Solid bare copper (customer may specify otherwise)
Insulation	PE, 600V
Color Code	Per Table 5.1 (see page 1 in this section)
Conductor Configuration	Straight lay, *not* twisted pairs
Shield	None
Jacket	IMSA 19-1 PVC IMSA 20-1 PE

P/N	No. Conductors	Conductor Availability	Nominal Outside Dia. (in)	Approx. Cable Area (in)	Nominal Jacket Thickness (in)	Approximate Cable Weight (lbs/M-ft)
	6 AWG					
	2	Stranded	.480	.18	.045	205
	8 AWG					
	2	Solid/Stranded	.450	.16	.045	184
	10 AWG					
	2	Solid/Stranded	.430	.15	.040	120
	12 AWG					
	2	Solid/Stranded	.405	.13	.045	90
	3	Solid/Stranded	.425	.14	.045	115
	4	Stranded	.480	.16	.045	151
	5	Solid/Stranded	.505	.20	.045	170
	7	Solid/Stranded	.575	.26	.060	240
	9	Solid/Stranded	.725	.41	.060	300
	12	Solid/Stranded	.745	.44	.060	400
	16	Solid/Stranded	.875	.60	.060	490
	14 AWG					
2C14B7I191	2	Solid/Stranded	.345	.10	.045	70
3C14B7I191	3	Solid/Stranded	.365	.11	.045	85
	4	Solid/Stranded	.395	.13	.045	100
5C14B7I191	5	Solid/Stranded	.425	.14	.045	120
7C14B7I191	7	Solid/Stranded	.465	.17	.045	160
9C14B7I191	9	Solid/Stranded	.615	.29	.060	200
10C14B7I191	10	Solid/Stranded	.615	.29	.060	230
	12	Solid/Stranded	.635	.33	.060	270
	15	Solid/Stranded	.685	.38	.060	310
16C14B7I191	16	Solid/Stranded	.715	.41	.060	330
	19	-	.735	.44	.060	40
	20	Solid/Stranded	.750	.44	.060	440
	24	-	.885	.64	.080	500
	25	Solid	.895	.64	.080	520
	30	-	.935	.71	.080	650
	37	-	1.045	.87	.080	680

Power & Tel is the largest stocking distributor of IMSA cables in the U.S. Please call for price and availability. Non-stocked items are subject to factory lead times and manufacturer minimums.

See referenced pages in the Hardware & Supplies section:

Installation Hardware

- **Messenger and Guy Strand** - *A-6*

Suggested Prep Tools

- **MK01A Outer Jacket Cable Stripper** - *I-11*
- **100 Adjustable Wire Stripper/Cutter** - *I-8*
- **103-S Adjustable Wire Stripper/Cutter** - *I-11*
- **MAXISTRIP®** - *I-11*

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