TYPE MC - EMERGMC FIRE ALARM AND CONTROL CABLE - 600V & 30V
THHN/THWN-2 INNERS

ENGINEERING SPECIFICATIONS

Standards

Underwriters Laboratories Standards UL-83, UL-1424, UL-1569, UL-2556 for Type MC; NFPA 262; Federal Specification A-A59544; IEEE 1202 (70,000 Btu/hr) Vertical Cable Tray Flame Test; NFPA 70 (NEC®) Article 330; ARRA 2009 Section 1605 "Buy American" Compliant; MasterSpec Division 26 Sections 260519, 260523; UL Listing #E-331832

Listed E-301130

RoHS COMPLIANT

SMART COLOR ID®

EmergMC® Fire Alarm Cable

Applications

Type MC and FPLP cable shall be permitted as follows:

- Permitted use for Non-Power Limited Fire Alarm (NPLFA) and Power Limited Fire Alarm Circuits (PLFA) including alarms, horns, detecting devices and overall signaling devices;
- NFPA 262-2002 Standard Method of Test for Flame and Smoke of Wire and Cables for Use in Air Handling Spaces;
- Acceptable for power, lighting, control, and signal circuits;
- Allowable in concealed or exposed systems;
- Permitted use in dry locations and embedded in plaster finish on brick or other masonry except in damp or wet locations;
- Utilized for environmental air-handling spaces (NEC 300.22(C)(1), and 760.3(B));
- Allowable in assembly occupancies (NEC 518.4);
- Permissible in theaters, audience areas of motion pictures, television studios, and similar locations (NEC 520.5);
- Allowable installations in approved raceways and cable trays (NEC 392);
- Suitable for installation under raised floors for IT equipment (NEC 645.5(E));
- Permitted in Class I, Class II, and Class III remote control signaling, and power limited circuits;
- Listed for use with UL 1479 - 1, 2, and 3 Hour Through-Penetration Firestop Systems;
- Available in colors per State of Rhode Island Fire Systems.

CONSTRUCTION

Available in sizes 18 AWG through 12 AWG. Encore's Fire Alarm and Control Cable is constructed with soft-drawn copper and classified as type TFN (Sizes 18 & 16 AWG) conductors. Sizes with 14 AWG through 12 AWG conductors are classified as type THHN/THWN-2 conductors. Each Fire Alarm and Control Cable contains a green insulated grounding conductor. All conductors are cabled together with separator tape containing the identification print legend to form the cable core. Interlocked aluminum or galvanized lightweight steel armor is applied over the entire assembly.

1. Removable SmartColorID[1] Label
2. Interlocked Aluminum or Galvanized Lightweight Steel Armor
3. Separator Tape
4. THHN/THWN-2 Solid Copper Conductors

Conductors			Overall Diameter (in)		Approximate Net Weight (lbs/1000 ft)		Allowable Ampacity (Amps)[2]		Standard Packaging (ft)	
AWG/No.	Type	Ground	Aluminum	Steel	Aluminum	Steel	75°C	90°C	Coils	Reels
18/2[3]	Solid	18 AWG	0.352	0.351	55	90	6	6	250'	1000'
18/4[3]	Solid	18 AWG	0.394	0.393	75	116	6	6	250'	1000'
16/2[3]	Solid	16 AWG	0.374	0.373	66	104	8	8	250'	1000'
16/4[3]	Solid	16 AWG	0.423	0.421	93	137	8	8	250'	1000'
14/2	Solid	14 AWG	0.409	0.400	80	122	20	25	250'	1000'
14/4	Solid	14 AWG	0.464	0.454	115	165	20	25	250'	1000'
12/2	Solid	12 AWG	0.487	0.440	106	156	25	30	250'	1000'
12/3	Solid	12 AWG	0.495	0.471	132	186	25	30	250'	1000'
12/4	Solid	12 AWG	0.509	0.506	158	217	25	30	250'	1000'

[1] SmartColorID manufactured under Patent No. 7,954,530, 8,454,785, 8,826,960 & 8,905,108
[2] Ampacity of conductors are based on NFPA 70 (NEC) Table 310.15(B)(16). See 110.14(C), 240.4(D) and 310.15(B) for other limitations where applicable.
[3] Ampacity is based on the National Electrical Code (NFPA 70) Table 402.5.
For equipment marked for use at higher temperatures, the conductor ampacity shall be limited to the following per NEC 110.14(C):
60°C when terminated to equipment for circuits rated 100 amperes or less or marked for size 14 AWG through 1 AWG conductor.
75°C when terminated to equipment for circuits rated over 100 amperes or marked for conductors larger than 1 AWG.
90°C for ampacity derating purposes.
When the neutral is considered current-carrying conductor, the ampacity of 4/C cables shall be reduced by a factor of 0.80 per NEC 310.15(B)(3)(a).
The above data is approximate and subject to normal manufacturing tolerances.
Available with additional conductors on request.

FEATURES

Installation costs reduced up to 50% over raceway and wire. Weight of aluminum armor is as much as 45% less than steel. Insulating anti-short bushings are supplied with each reel or coil, but not required per Section 330.40 of the NEC. SmartColorID labels are spaced at regular intervals on the exterior of the metal sheathing and are removable. For ease of installation and pulling, cable is reverse wound on reels. Coils are designed to be pulled from the inside.

Standard Conductor Color Coding

No.	120V/208V/240V
2	Black/White
3	Black/Red/White
4	Black/Red/Blue/White

Rhode Island Color Coding

No.	120V/208V/240V
2	Black/Red
2	Blue/White

SmartColorID Legend:

THESE VALUES ARE APPROXIMATE AND SUBJECT TO MANUFACTURING TOLERANCES.
BASED ON ALL SOLID COPPER WIRE @ 75C* (~ = APPROXIMATE VALUES)

DC RESISTANCE (SOLID COPPER WIRE) = 75C*

Size	Ohms per 1000 ft.
18 AWG	~7.77 Ohms per 1000' or 0.00777 per ft. at 75C (DC Current) [1]
16 AWG	~4.89 Ohms per 1000' or 0.00489 per ft. at 75C (DC Current) [1]
14 AWG	~3.07 Ohms per 1000' or 0.00307 per ft. at 75C (DC Current) [1]
12 AWG	~1.93 Ohms per 1000' or 0.00489 per ft. at 75C (DC Current) [1]

[1] Based on Chapter 9, Table 8 of the National Electric Code

EFFECTIVE IMPEDANCE (TO NEUTRAL AT 80% POWER FACTOR) = 75C*

Size	Ohms per 1000 ft.
18 AWG	~6.216 Ohms per 1000' or ~0.006216 per ft. at 75C
16 AWG	~3.91 Ohms per 1000' or ~0.00391 per ft. at 75C
14 AWG	~2.456 Ohms per 1000' or ~0.002456 per ft. at 75C
12 AWG	~1.54 Ohms per 1000' or ~0.00154 per ft. at 75C

REACTANCE (TO NEUTRAL) = 75C*

Size	Ohms per 1000 ft.
18 AWG	~0.0381 Ohms per 1000' or ~0.0000381 per ft. at 75C
16 AWG	~0.03597 Ohms per 1000' or ~0.00003597 per ft. at 75C
14 AWG	~0.03322 Ohms per 1000' or ~0.00003322 per ft. at 75C
12 AWG	~0.03078 Ohms per 1000' or ~0.00003078 per ft. at 75C

CAPACITANCE (UNSHIELDED CONDUCTORS) = 75C (80% POWER FACTOR)

Size	pF per 1000 ft.
18 AWG	~25-29 pF per ft.
16 AWG	~29-31 pF per ft.
14 AWG	~31-36 pF per ft.
12 AWG	~36-39 pF per ft.

LENGTH OF LAY = (TWISTED PAIR FOR OUR (2) CONDUCTOR AND (1) EQUIPMENT GROUND)

Size	Twists per ft.
18/2 AWG	2.55 in and 4.705 Twists Per Foot
16/2 AWG	2.90 in. and 4.137 Twists Per Foot
14/2 AWG	3.80 in. and 3.16 Twists Per Foot
12/2 AWG	4.20 in. and 2.8571 Twists Per Foot

LENGTH OF LAY = (TWISTED PAIR FOR OUR (4) CONDUCTOR AND (1) EQUIPMENT GROUND)

Size	Twists per ft.
18/4 AWG	3.40 in and 3.5294 Twists Per Foot
16/4 AWG	3.40 in. and 3.5294 Twists Per Foot
14/4 AWG	4.40 in. and 2.7272 Twists Per Foot
12/4 AWG	5.00 in. and 2.4 Twists Per Foot

- To convert from 75C to 90C, multiply by 1.048
- Inductance = Inductance (L) to neutral, per 1000 feet is typically 0.0002mH for these size cables-up to 250 KCMIL
- Aluminum Armor provides slightly lower values but are considered negligible for evaluation purposes