

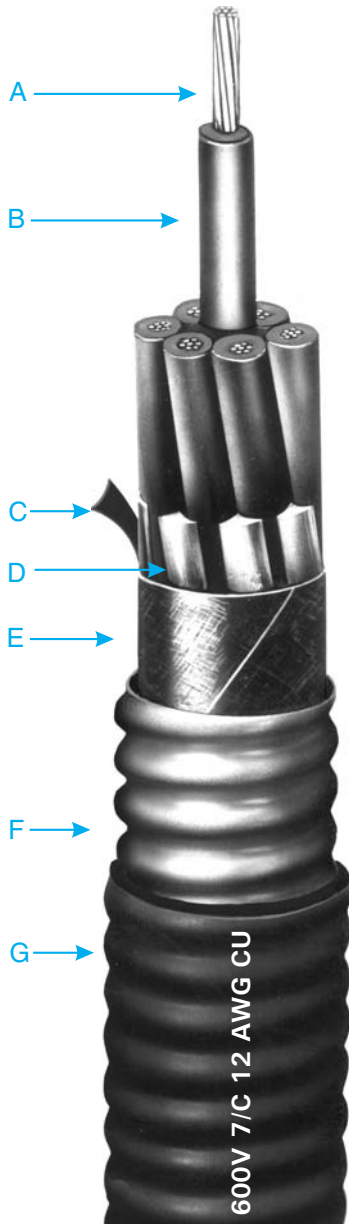


## C-L-X<sup>®</sup> Type MC (XHHW-2)

### 600V Control Cable — Aluminum Sheath 600/1000V Marine Cable

Multiple Copper Conductors/90°C Wet or Dry Rating

**For Cable Tray Use - Sunlight Resistant - For Direct Burial**



- A Bare, Stranded Copper Conductors
- B X-Olene Insulation - Color Coded for Identification
- C Marker Tape
- D Non-hygroscopic Fillers, as necessary
- E Binder Tape
- F Impervious, Continuous, Corrugated, Aluminum C-L-X Sheath
- G Black Okoseal Jacket

#### Insulation

X-Olene<sup>®</sup> is Okonite's trade name for its chemically cross-linked polyethylene, with high dielectric strength.

#### Color Coding

Conductors are color coded using base colors and tracers in accordance with the Conductor Identification Table on the back of this Data Sheet.

#### Assembly and Coverings

The individual conductors are cabled together with non-hygroscopic fillers and a binder tape overall. The C-L-X sheath exceeds the grounding conductor requirements of Table 250.122 of the NEC and UL 1569.

The impervious, continuous, corrugated aluminum C-L-X sheath provides complete protection against moisture, liquids and gases and has excellent mechanical strength. For direct burial in the ground, embedment in concrete, or for areas subjected to corrosive atmospheres, the C-L-X sheath is protected with a low temperature black Okoseal<sup>®</sup> (PVC) jacket.

#### Applications

C-L-X Type MC cables with the impervious, continuous, corrugated aluminum sheath are recommended as an economical alternate to a wire in conduit system.

They are authorized for use on services, feeders and branch circuits for power, lighting, control and signaling circuits in accordance with Articles 330 and 725 of the NEC.

C-L-X Type MC cables may be installed indoors or outdoors, in wet or dry locations, as open runs of cable secured to supports spaced not more than six feet apart, in cable tray, as aerial cable on a messenger, in any approved raceway, direct burial, or encased in concrete.

C-L-X Type MC cables are also approved for use in Class I & II, Division 2, Class III, Divisions 1 and 2, and Class I, Zone 2 hazardous locations per NEC articles 501, 502, 503 and 505; in Zone 2, Class II Div 2, Class III Div 1 and Class III Div 2 per CEC.

#### Specifications

**Conductors:** Bare soft annealed copper, Class B stranding per ASTM B-8.

**Insulation:** X-Olene per ICEA S-73-532/ NEMA WC57 and UL 44, Listed UL Type XHHW-2. Meets MIL-DTL-1377H, section 4.8.4.1.2 cold bend at -66°C and ASTM D746-04 brittle point at -76°C.

**Conductor Identification:** Base Colors and tracers.

**Assembly:** Per UL 1569 with binder tape overall.

**Sheath:** Close fitting, impervious, continuous, corrugated aluminum C-L-X per UL 1569.

In addition, the aluminum CLX sheath exceeds the equipment grounding requirements of NEC Section 250.118 and 250.122, and can be used as the equipment grounding conductor.

**Jacket:** Black Okoseal (PVC) per UL requirements for Type MC Cables. Meets ASTM D746-04 brittle point at -40°C.

#### Product Features

- UL Listed as Type MC cable and Marine Shipboard Cable, E38916 (UL 1596) and E137931 (UL 1309).
- UL Listed for cable tray use, direct burial and sunlight resistant.
- UL 1309 (CWCMC) listed & UL classified in accord with IEEE 1580 as Marine Shipboard Cable rated 600/1000 volts.
- CSA C22.2 No. 123 listed as RA90, FT4 and LTGG (-40°C).
- Passes the IEEE 383-1974 and IEEE 1202 vertical tray flame tests.
- Passes the 210,000 BTU/hr ICEA T-29-520 Vertical Tray Flame Test.
- Complete pre-packaged, factory-tested wiring system — color coded.
- C-L-X cables are quality control inspected to meet or exceed applicable UL standards.
- 90°C continuous operating temperature in all types of installations
- 130°C emergency rating
- 250°C short circuit rating.
- Good EMI shielding characteristics.
- Impervious, continuous metallic sheath excludes moisture, gases and liquids.
- Lower installed system cost than conduit or EMT systems.
- Provides excellent grounding safety
- Excellent compression and impact resistance.
- Continuous long lengths.
- Installation temperature of -40°C or °F.
- UL and American Bureau of Shipping Type approved as CWCMC Type MC.
- CSA Type RA90 complies with CEC Zone 2, Class II Div 2, Class III Div 1, Class III Div 2 Hazardous Locations.

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## Product Data Section 4: Sheet 14

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Multiple Copper Conductors/90°C Wet or Dry Rating

For Cable Tray Use - Sunlight Resistant - For Direct Burial

Catalog Number	Conductor Size AWG	Number of Conductors	Insulation Thickness - mils	Core O.D. - Inches	Core O.D. - mm	C-L-X O.D. - Inches	C-L-X O.D. - mm	Jacket Thickness - mils	Jacket Thickness - mm	Approx. O.D. - Inches	Approx. O.D. - mm	Cross-Sectional Area (sq. in.) †	Approx. Net Weight lbs./1000'	Approx. Ship Weight lbs./1000'	90°C Wet or Dry (1)	NEC Ampacity 75°C Wet	NEC Ampacity			
546-31-3002	14(7X) (2.08mm <sup>2</sup> )	2	0.28	7.1	0.49	12.3	50	1.27	0.60	15.1	0.28	142	174	15	15					
▲ 546-31-3003		3	0.30	7.6	0.49	12.4			0.60	15.2	0.32	153	185	15	15					
▲ 546-31-3004		4	0.33	8.4	0.53	13.5			0.64	16.3	0.36	181	214	15	15					
▲ 546-31-3005		5	0.37	9.4	0.58	14.7			0.69	17.5	0.41	210	242	15	15					
▲ 546-31-3007		7	0.41	10.4	0.62	15.7			0.73	18.5	0.46	254	309	15	14					
▲ 546-31-3009		9	0.50	12.7	0.71	18.0			0.82	20.8	0.57	308	363	15	14					
*▲ 546-31-3012		12	0.57	14.4	0.80	20.3			0.91	23.1	0.71	381	448	12	10					
*▲ 546-31-3019		19	0.69	17.5	0.93	23.6			1.04	26.4	0.84	537	604	12	10					
*▲ 546-31-3037		37	0.96	24.4	1.24	31.5			1.35	34.3	1.43	946	1036	10	8					
546-31-3082		12(7X) (3.31mm <sup>2</sup> )	2	0.31	7.8	0.53			13.5	50	1.27	0.64	16.3	0.32	164	196	20	20		
▲ 546-31-3083			3	0.34	8.6	0.53			13.5			0.64	16.3	0.32	189	221	20	20		
▲ 546-31-3084			4	0.38	9.6	0.58			14.7			0.69	17.5	0.38	226	258	20	20		
▲ 546-31-3085	5		0.42	10.6	0.62	15.7	0.73	18.5	0.42			262	317	20	20					
▲ 546-31-3087	7		0.47	11.9	0.67	17.0	0.78	19.8	0.48			324	379	20	17					
▲ 546-31-3089	9		0.56	14.2	0.80	20.3	0.91	23.1	0.65			405	472	20	17					
*▲ 546-31-3092	12		0.65	16.5	0.89	22.6	0.99	25.4	0.79			503	570	15	12					
*▲ 546-31-3099	19		0.78	19.8	1.02	25.9	1.13	28.7	1.00			721	801	15	12					
*▲ 546-31-3117	37		1.08	27.4	1.37	34.8	1.48	37.6	1.72			1301	1444	12	10					
546-31-3162	10(7X) (5.26mm <sup>2</sup> )		2	0.36	9.1	0.58	14.7	50	1.27			0.69	17.5	0.38	202	234	30	30		
▲ 546-31-3163			3	0.39	9.9	0.58	14.7					0.69	17.5	0.38	238	270	30	30		
▲ 546-31-3164			4	0.44	11.1	0.67	17.0					0.78	19.8	0.48	297	352	30	28		
546-31-3165		5	0.48	12.2	0.71	18.0	0.82			20.8	0.53	348	403	30	28					
▲ 546-31-3167		7	0.54	13.7	0.75	19.1	0.86			21.8	0.58	436	491	28	24					
546-31-3169		9	0.65	16.5	0.89	22.6	1.00			25.4	0.79	544	611	28	24					
546-31-3172*		12	0.74	18.8	0.97	24.6	1.08			27.4	0.85	684	751	20	17					

\* These items are not CSA listed. CSA listing available as special order.

Visit Okonite's web site, [www.okonite.com](http://www.okonite.com) for the most up to date dimensions.

▲ **Authorized Stock Item** - Available from our Service Centers.

**Copper or Bronze C-L-X** - is available on special order.

† **Cross-sectional** area for calculation of cable tray fill in accordance with NEC Section 392.22.

**Jackets** - Optional jacket types available - consult local sales office.

### (1) Ampacities

Ampacities are based on Table 310.15(B)(16) of the National Electrical Code for XHHW-2 conductors rated 90°C, in a multi-conductor cable, at an ambient temperature of 30°C (86F). The 75°C column is provided for additional information.

The ampacities shown apply to open runs of cable, installation in any approved raceway, direct burial in the earth, or as aerial cable on a messenger. Derating for more than three current carrying conductors within the cable is in accordance with NEC Section 310.15(B)(3)(a).

The ampacities shown also apply to cables installed in cable tray in accordance with NEC Section 392.80.

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### Conductor Color Coding Sequence

Conductor Number	Base Color	Tracer Color
1	Black	
2	Red	
3	Blue	
4	Orange	
5	Yellow	
6	Brown	
7	Red	Black
8	Blue	Black
9	Orange	Black
10	Yellow	Black
11	Brown	Black
12	Black	Red
13	Blue	Red
14	Orange	Red
15	Yellow	Red
16	Brown	Red
17	Black	Blue
18	Red	Blue
19	Orange	Blue
20	Yellow	Blue
21	Brown	Blue
22	Black	Orange
23	Red	Orange
24	Blue	Orange
25	Yellow	Orange
26	Brown	Orange
27	Black	Yellow
28	Red	Yellow
29	Blue	Yellow
30	Orange	Yellow
31	Brown	Yellow
32	Black	Brown
33	Red	Brown
34	Blue	Brown
35	Orange	Brown
36	Yellow	Brown
37	Black	

Color Coding per ICEA  
Method 1, E-2

**Special Order:** Any or all of the following conductors may be added when specifically requested by the customer to meet his specific application requirements. These conductor codings comply with UL and NEC requirements.

<u>Purpose</u>	<u>Base Color</u>	<u>Tracer Color</u>
Equipment Grounding	Uninsulated Green Green	1 or more continuous yellow stripes
Grounded	White White White White White White	Black continuous stripe Red continuous stripe Blue continuous stripe Orange continuous stripe Brown continuous stripe Numeric printing