



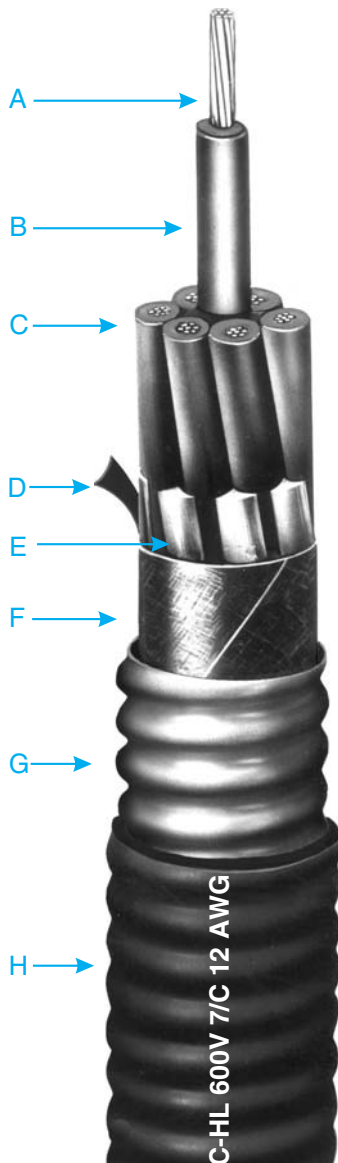
# C-L-X® Type MC-HL (XHHW-2)

## 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 Stranded copper, green insulated grounding conductor
- D Marker Tape
- E Non-hygroscopic Fillers, as necessary
- F Binder Tape
- G Impervious, Continuous, Corrugated, Aluminum C-L-X Sheath
- H Black Okoseal Jacket

#### Insulation

X-Olene® 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 UL1569.

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® (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. 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 in non-HL areas.

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-HL 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-HL cables are also approved for Classes I, II, and III Division 1 and 2 and Class I, Zones 1 and 2 hazardous locations per NEC Articles 501, 502, and 503 and UL 2225; in Zone 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 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 -40°C.

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

**Grounding Conductor:** Green insulated stranded copper per ASTM B-8, Class B. Meets or exceeds requirements of NEC Table 250.122.

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

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

Exceeds grounding conductor requirements of NEC Table 250.122.

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

#### Product Features

- UL Listed as Type MC-HL cable and Marine Shipboard Cable, E38916 (UL 1569) and E137931 (UL1309).
- UL Listed for cable tray use, direct burial and sunlight resistant.
- UL 1309 listed (CWCMC) & UL classified in accord with IEEE 1580 as Marine Shipboard Cable rated 600/1000V
- CSA C22.2 No. 123 listed as RA90, FT4, HL and LTGG (-40°C).
- Passes the IEEE 383-1974 and IEEE 1202/FT4 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, gasses 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.
- Complies with NEC Articles 501, 502 and 503 for hazardous locations.
- UL and American Bureau of Shipping listed as CWCMC Type MC-HL.
- CSA Type RA 90-HL complies with CEC Zone 1, Zone 2, Class II Div 2, Class III Div 1 and Class III Div 2 Hazardous Locations.

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## Product Data Section 4: Sheet 15

600V Control Cable—Aluminum Sheath

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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 Ungrounded | Green Insulated Grounding Conductor AWG | 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 |
|----------------|----------------------------------|----------------------|---|--------------------|----------------|---------------------|-----------------|-------------------------|-----------------------|-----------------------|-------------------|----------------------------------|------------------------------|-------------------------------|----------------------------------|-----------------------|
| ▲ 546-31-3402  | 14(7X)<br>(2.08mm <sup>2</sup> ) | 2                    | #14 (7X)                                | 0.30               | 7.6            | 0.49                | 12.4            | 0.60                    | 15.2                  | 0.28                  | 7.1               | 163                              | 202                          | 15                            | 15                               |                       |
| ▲ 546-31-3406  |                                  | 6                    |   | 0.41               | 10.4           | 0.62                | 15.8            | 0.73                    | 18.5                  | 0.42                  | 10.7              | 267                              | 347                          | 15                            | 14                               |                       |
| ▲ 546-31-3408  |                                  | 8                    |   | 0.49               | 12.4           | 0.71                | 18.0            | 0.82                    | 20.8                  | 0.53                  | 13.5              | 321                              | 401                          | 15                            | 14                               |                       |
| ▲ 546-31-3411  | 12(7X)<br>(3.31mm <sup>2</sup> ) | 11                   | #12 (7X)                                | 0.57               | 14.5           | 0.80                | 20.3            | 0.91                    | 23.1                  | 0.65                  | 16.5              | 395                              | 475                          | 12                            | 10                               |                       |
| ▲ 546-31-3418  |                                  | 18                   |   | 0.69               | 17.5           | 0.93                | 23.6            | 1.04                    | 26.4                  | 0.85                  | 21.6              | 554                              | 634                          | 12                            | 10                               |                       |
| ▲ 546-31-3436  |                                  | 36                   |   | 0.97               | 24.6           | 1.24                | 31.5            | 1.35                    | 34.3                  | 1.43                  | 36.3              | 948                              | 1038                         | 10                            | 8                                |                       |
| ▲ 546-31-3452  | 10(7X)<br>(5.26mm <sup>2</sup> ) | 2                    | #10 (7X)                                | 0.34               | 8.6            | 0.53                | 13.5            | 0.64                    | 16.3                  | 0.32                  | 8.1               | 200                              | 239                          | 20                            | 20                               |                       |
| ▲ 546-31-3456  |                                  | 6                    |   | 0.47               | 11.9           | 0.67                | 17.0            | 0.78                    | 19.7                  | 0.48                  | 12.2              | 338                              | 418                          | 20                            | 17                               |                       |
| ▲ 546-31-3458  |                                  | 8                    |   | 0.56               | 14.2           | 0.80                | 20.3            | 0.91                    | 23.1                  | 0.65                  | 16.5              | 426                              | 506                          | 20                            | 17                               |                       |
| ▲ 546-31-3461  | 10(7X)<br>(5.26mm <sup>2</sup> ) | 11                   | #10 (7X)                                | 0.65               | 16.5           | 0.89                | 22.6            | 1.00                    | 25.4                  | 0.79                  | 20.0              | 519                              | 599                          | 15                            | 12                               |                       |
| ▲ 546-31-3468  |                                  | 18                   |   | 0.78               | 19.8           | 1.02                | 25.9            | 1.13                    | 28.7                  | 1.00                  | 25.4              | 739                              | 819                          | 15                            | 12                               |                       |
| ▲ 546-31-3486  |                                  | 36                   |   | 1.10               | 27.9           | 1.37                | 34.8            | 1.48                    | 37.6                  | 1.72                  | 43.8              | 1302                             | 1445                         | 12                            | 10                               |                       |
| ▲ 546-31-3502  | 10(7X)<br>(5.26mm <sup>2</sup> ) | 2                    | #10 (7X)                                | 0.39               | 9.9            | 0.58                | 14.7            | 0.69                    | 17.5                  | 0.37                  | 9.4               | 253                              | 292                          | 30                            | 30                               |                       |
| ▲ 546-31-3506  |                                  | 6                    |   | 0.54               | 13.7           | 0.75                | 19.1            | 0.86                    | 21.8                  | 0.58                  | 14.7              | 451                              | 531                          | 28                            | 24                               |                       |
| ▲ 546-31-3508  |                                  | 8                    |   | 0.65               | 16.5           | 0.89                | 22.6            | 1.00                    | 25.4                  | 0.79                  | 20.0              | 568                              | 648                          | 28                            | 24                               |                       |
| ▲ 546-31-3511  | 10(7X)<br>(5.26mm <sup>2</sup> ) | 11                   | #10 (7X)                                | 0.75               | 19.1           | 0.97                | 24.6            | 1.08                    | 27.4                  | 0.92                  | 23.4              | 704                              | 784                          | 20                            | 17                               |                       |

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

▲ **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.

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

(1) **Ampacities** are based on 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 (86°F). 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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## Product Data Section 4: Sheet 15

### Conductor Color Coding Sequence

| Ungrounded 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<br>Green<br>Green                          | 1 or more continuous yellow stripes   |
| Grounded            | White<br>White<br>White<br>White<br><br>White<br>White | Black continuous stripe<br>Red continuous stripe<br>Blue continuous stripe<br>Orange continuous stripe<br>Brown continuous stripe<br>White stripe<br>Numeric printing |