C-L-X® Type MC-HL (XHHW-2)
600V Power MC-HL Cable—Aluminum Sheath
600/1000V Marine Cable
3/C VFD & 4/C Copper Conductors/90°C Wet or Dry Rating
For Cable Tray Use - Sunlight Resistant - For Direct Burial

Insulation
X-Olene® is Okonite’s trade name for its chemically cross-linked polyethylene, with high dielectric strength.

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. A bare stranded copper grounding conductor(s), located in the outer interstices, is provided for grounding. The impervious, continuous, welded, 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-HL 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 Article 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, 503 and 505; in Zone 1, Zone 2, Class II Div 2, Class III Div 1 and Class III Div 2 per CEC.

Specifications
Conductors: Uncoated soft copper per ASTM B-3. Sizes smaller than #8 are compact stranded per ASTM B-8. Sizes #8 and larger are compact stranded per ASTM B-496.

Insulation: X-Olene per ICEA S-95-658/ NEMA WC70 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 brittle point at -76°C.

Conductor Identification: Control Sizes, #9 AWG and smaller, color coded insulation. Power Sizes, #8 AWG and larger, black with printed words of number and color.

Grounding Conductor(s): One or three bare soft copper per ASTM B-3. Stranded in accordance with UL 1581. Meets or exceeds requirements of NEC Table 250.122.

Sheath: Close fitting, impervious, continuous, welded, corrugated aluminum C-L-X per UL 1569. Exceeds grounding conductor requirements of NEC Table 250.122.

Jacket: Black Okoseal (PVC) per UL1569. Meets ASTM D746 brittle point at -40°C.

Product Features
• UL Listed as Type MC-HL cable per UL 2225 (E38416).
• UL Listed for cable tray use, direct burial and sunlight resistant.
• UL 1309 (CWMC) listed & UL classified in accord with IEEE 1580 as Marine Shipboard Cable rated 600/1000 volts.
• Passes the IEEE 383-1974 and IEEE 1202 vertical tray flame tests.
• Passes the 210.000 BTU 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.
• Complies with NEC Articles 501, 502 and 503 for hazardous locations.
• American Bureau of Shipping Type approved as CWMC Type MC-HL.
• Three symmetrical grounding conductors with the CLX sheath provide a superior low resistance return path for VFD and other modern ac drive/motor applications.
• CSA C22.2 No. 123 Type RA90.
• CSA C22.2 No. 174 Type HL.
• CSA listed as FT4 and LTGG (-40°C).
• CSA Type RA90 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 1

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Conductor Size AWG</th>
<th>Number of Conductors</th>
<th>Insulation Thickness - mils</th>
<th>Grounding Conductor(s)</th>
<th>Core O.D. - inches</th>
<th>Core O.D. - mm</th>
<th>C-L-X O.D. - inches</th>
<th>C-L-X O.D. - mm</th>
<th>Jacket Thickness - mils</th>
<th>Approx. O.D. - inches</th>
<th>Approx. O.D. - mm</th>
<th>NEC Ampacity</th>
<th>NEC Ampacity</th>
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</thead>
<tbody>
<tr>
<td>546-31-3403</td>
<td>14(7X) (2.08mm²)</td>
<td>3</td>
<td>3 #18</td>
<td>0.33</td>
<td>8.4</td>
<td>0.53</td>
<td>13.5</td>
<td>0.64</td>
<td>16.3</td>
<td>50</td>
<td>1.27</td>
<td>85</td>
<td>1.04</td>
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<tr>
<td>546-31-3404</td>
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<td>4</td>
<td>3 #18</td>
<td>0.37</td>
<td>9.3</td>
<td>0.58</td>
<td>14.7</td>
<td>0.69</td>
<td>17.5</td>
<td>50</td>
<td>1.27</td>
<td>85</td>
<td>1.06</td>
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<td>546-31-3453</td>
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<td>3 #16</td>
<td>0.37</td>
<td>9.3</td>
<td>0.58</td>
<td>14.7</td>
<td>0.69</td>
<td>17.5</td>
<td>50</td>
<td>1.27</td>
<td>85</td>
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<td>4</td>
<td>3 #16</td>
<td>0.45</td>
<td>11.4</td>
<td>0.67</td>
<td>16.9</td>
<td>0.78</td>
<td>19.7</td>
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<td>1.27</td>
<td>85</td>
<td>1.06</td>
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</table>

Okonite's website, www.okonite.com contains the most up to date information.
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600V Composite Power and Control Cable — Aluminum Sheath
Okoseal Jacket: 50 mils (1.27mm)

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Power Conductors Number x Size</th>
<th>Insulation Thickness - mils</th>
<th>Control Conductors Number x Size</th>
<th>Insulation Thickness - mils</th>
<th>Grounding Conductor (AWG)</th>
<th>CL-X O.D. - Inches</th>
<th>CL-X O.D. - mm</th>
<th>Cross-Sectional Area (sq. In.)</th>
<th>NEC Ampacity (1) 75°C Wet</th>
<th>NEC Ampacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>▲ 546-31-3984</td>
<td>3X10</td>
<td>30</td>
<td>4X12</td>
<td>30</td>
<td>10</td>
<td>0.75</td>
<td>19.0</td>
<td>0.86</td>
<td>21.9</td>
<td>0.58</td>
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<tr>
<td>▲ 571-31-3657</td>
<td>3X8</td>
<td>45</td>
<td>4X12</td>
<td>30</td>
<td>10</td>
<td>0.89</td>
<td>22.6</td>
<td>0.99</td>
<td>25.1</td>
<td>0.77</td>
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<tr>
<td>▲ 571-31-3667</td>
<td>3X6</td>
<td>45</td>
<td>4X12</td>
<td>30</td>
<td>8</td>
<td>0.93</td>
<td>23.6</td>
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<td>▲ 571-31-3677</td>
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<td>45</td>
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<td>30</td>
<td>8</td>
<td>0.97</td>
<td>24.7</td>
<td>1.08</td>
<td>27.5</td>
<td>0.92</td>
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</table>

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▲ Authorized Stock Item - Available from our Service Centers.
Copper or Bronze C-L-X is available on special order.
Jackets
Optional jacket types available - consult local sales office.

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

(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 (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.
## Conductor Color Coding Sequence

<table>
<thead>
<tr>
<th>Conductor Number</th>
<th>Base Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>Red</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
</tr>
<tr>
<td>4</td>
<td>Orange</td>
</tr>
</tbody>
</table>

### 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.

### Purpose

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Base Color</th>
<th>Tracer Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment Grounding</td>
<td>Uninsulated Green</td>
<td>1 or more continuous yellow stripes</td>
</tr>
<tr>
<td>Green</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>Grounded</td>
<td>White</td>
<td>Black continuous stripe</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
<td>Red continuous stripe</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
<td>Blue continuous stripe</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
<td>Orange continuous stripe</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
<td>Brown continuous stripe</td>
</tr>
<tr>
<td>White</td>
<td>White</td>
<td>Numeric Printing</td>
</tr>
</tbody>
</table>

### Sizes 14, 12 & 10 AWG:
Color Coding per ICEA Method 1, E-2 color sequence.

### Sizes 8 AWG and larger:
Surface Printing of Numbers and color descriptions per ICEA Method 3, E-2 color sequence.