WATER TREATMENT

Cables for Water Treatment Facilities

Setting the Standard
Introduction

There are two main types of water treatment plants. Waste water treatment plants, speed up the natural process of cleansing waste water that can be released back into our environment. Potable water treatment plants are used to purify water to make it safe for drinking.

Millions of gallons of untreated water flow each day through treatment plants. Okonite cables are there to power the pumps, controls and instruments to ensure the whole process is fast and most importantly, reliable. Water treatment plants provide critical resources that maintain our quality of life.

Applications

Where reliable electrical systems are required for power or control equipment, Okonite cable is the solution. Whether it be cable in tray, direct buried, aerial, or in conduit, Okonite has the quality cable for your application.

Variable Frequency Drives (VFD’s) are the most popular method for controlling motors and pumps. These solid state devices typically use pulse-width modulation to achieve the desired output waveform in motor control or speed control. These VFD’s present unique challenges as they can lead to premature motor/pump bearing failure. Steps must be taken to minimize the effects of voltage impulses, common mode current and poor grounding.

(continued on page 3)
CLX armored cables have been scientifically and field proven to reduce the deleterious effects on bearings due to these attributes:

- CLX armor acts as a high conductivity return ground path (in most cases exceeding that of traditional ground paths).
- CLX armor provides superior high frequency shielding due to the continuously welded sheath.
- All 600V, 2.4kV non-shielded & 5/8kV shielded 3/c CLX cable constructions consist of three symmetrically placed ground wires, limiting the common mode current as compared to other construction types.
- Symmetrically cabled power and grounding conductors have a better balance and “EMI cancellation effect” than randomly placed conductors in conduit.

Simply put, CLX uniquely provides the best path to ground for the harmful electrical effects associated with Frequency Drives rather than the path through the motor bearings.

CLX armored cables are the perfect solution when using Variable Frequency Drives.

**Jacket Considerations**

Sunlight resistance, heat aging, low temperature conditions, abrasion, flexibility, flame retardance and chemical resistance are just some of the characteristics that should be considered when specifying a cable jacket. Common jacket types are:

- Okoseal (PVC)
- Okolon (CPE)
- Okoclear (Low Smoke Zero Halogen Polyolefin)
- Okolene (Polyethlene)

**Flame Retardancy**

Flame retardancy is a key design factor in Water Treatment plant cables. Testing protocols by UL, IEEE and ICEA dictate the method by which cables are to be tested. Okonite’s new Flame Test Chamber was recently constructed at our Orangeburg campus to provide cutting edge technology.

**Ratings**

UL, IEEE, and ICEA also provide standards on cable ratings. See page 5 for the U.L. Listing Cable Selector Chart.

**Technical Support**

Our in-house staff of expert Application Engineers and our direct sales force can provide valuable services to assist in any cable related issue. Cable design, technical engineering papers, installation calculations and training can be provided.

**Okonite Reliability**

Since 1878, Okonite has led the industry in quality and service. Our line of stock cable products, as well as special cable capabilities, can meet any cable need. Let Okonite help you make your next Water Treatment Plant a success.

Okonite is an ESOT company and has been since 1972.

See the Okonite Cable on-line catalog at www.okonite.com or contact your local Okonite office for our stock catalog Bulletin - OSL
TYPICAL WATER TREATMENT FACILITY SCHEMATIC

69 kV OKOGUARD EPR CABLE
MV-105 OKOGUARD EPR CABLE 1/C OR 3/C CLX
600 V POWER CABLE 1/C OR M/C CLX

T1 69kV/12.47kV
T2 12.47kV/480V

F1
CB1
CB2
CB3
CB4
CB5
CB6
CB7
CB8
CB9

T3 480V/208V-Y/120V
208V-Y/120V CONTROL
120V CONTROL

M1 INFLUENT PUMPS
M2 RECYCLING PUMPS
M3 MEMBRANE PUMPS
M4 CONVEYORS BLOWERS/FANS
M5 FEED PUMPS
M6 HEATERS
M7 RECIRCULATION PUMPS
M8 MIXERS

300 / 600 V INSTRUMENTATION 600 V M/C CONTROL (BOTH FURNISHED WITH OR WITHOUT CLX)

NOTE: THIS DRAWING IS INTENDED FOR GRAPHIC PURPOSES ONLY. IT IS NOT INTENDED TO PORTRAY AND ACTUAL ELECTRICAL SYSTEM.
**CABLE U.L. SELECTOR**

<table>
<thead>
<tr>
<th>CABLE TYPE</th>
<th>U.L. LISTING</th>
<th>OKONITE CATALOG SERIES</th>
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<tbody>
<tr>
<td>1/c 5/8kV</td>
<td>MV-105, CT Use</td>
<td>114-23-XXXX</td>
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<tr>
<td>1/c 15kV</td>
<td>MV-105, CT Use</td>
<td>115-23-XXXX</td>
</tr>
<tr>
<td>3/c 2.4kV non-sheilded CLX</td>
<td>MV-90 or MC-HL, CT Use</td>
<td>571-21-XXXX</td>
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<tr>
<td>3/c 5/8kV CLX</td>
<td>MV-105 or MC-HL, CT Use</td>
<td>571-22-XXXX</td>
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<tr>
<td>3/c 15kV CLX</td>
<td>MV-105 or MC-HL, CT Use</td>
<td>571-23-XXXX</td>
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<td>Multi-Conductor 600V Power &amp; Control TC</td>
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<td>202-10-XXXX</td>
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<tr>
<td>Multi-Conductor 600V Power &amp; Control TC</td>
<td>Type TC, XHHW-2</td>
<td>202-31-XXXX</td>
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<tr>
<td>Multi-Conductor 600V CLX</td>
<td>Type MC, MC-HL for CT Use, XHHW-2</td>
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<tr>
<td>Power &amp; Control MC</td>
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<tr>
<td>300V P-OS/SP-OS Instrumentation</td>
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<td>264-10/15-XXXX</td>
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<td>Type TC</td>
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* Specific applications may require select construction that are not considered stock items. Consult your Okonite representative for more information.