Pyrotenax fire-rated mineral insulated (MI) wiring cables provide protection of critical processes and systems in non-hydrocarbon environments in both nonhazardous and hazardous locations. In addition, System 1850 wiring cables are also used as an alternative to traditional conduit and wire methods when a gas path block is required.

System 1850 wiring cable is constructed with a copper sheath and solid copper conductors which allows continuous exposure temperatures to 482°F (250°C) and temperature excursions to 1850°F (1010°C). An optional high density polyethylene (HDPE) jacket provides additional protection where corrosives may be present.

Bare copper MI cable is made of inorganic materials and provides zero smoke generation, zero fuel contribution, and zero flame spread. Highly compacted MgO insulation prevents the flow and transmission of explosive gases through the wiring cables.

System 1850 MI cable may be used for power, control, and communication wiring in the following environments:

- Petrochemical and mining – in hazardous areas to provide a gas path block
- Manufacturing – to provide a gas path block for fuel pumps, paint shops, etc.; in areas of extreme heat in the vicinity of furnaces, etc.
- Tunnels and confined spaces – MI cables do not burn; no smoke generated
- Nuclear and fossil fuel power generation plants – for wiring to equipment where heat or radiation may be of concern
- Pulp and paper – where corrosives are present

System 1850 wiring cable is typically supplied as a factory assembled Duoterm unit complete with terminations at each end, allowing for immediate installation in the field. In hazardous areas, the simplified installation of MI cable means that conduit systems and explosion proof seals are not required; simply connect the cable directly to the equipment or junction box.

Pyrotenax System 1850 MI cable is a UL Classified/ ULC Listed 2-hour fire-resistive cable tested to the UL 2196/ULC-S139 fire test standards. System 1850 is also Factory Mutual (FM) approved as 2-hour fire-resistant. For more information on factory assembled Duoterm units, or for additional information on bulk cable and field installed terminations, contact your Pentair Industrial Heat Tracing Solutions representative or call (800) 545-6258.
CABLE CONSTRUCTION

Sheath: Seamless copper (HDPE jacket optional)
Insulation: Magnesium oxide (MgO)
Conductor type: Copper
Insulation voltage rating: 600 V
Conductor size: 16 AWG – 500 kcmil
Number of conductors: 1, 2, 3, 4, or 7 standard (Contact Pentair Industrial Heat Tracing Solutions for custom configurations)

CABLE TEMPERATURE RATING

<table>
<thead>
<tr>
<th></th>
<th>Copper sheath</th>
<th>HDPE jacket</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous exposure temperature</td>
<td>482°F (250°C)</td>
<td>194°F (90°C)</td>
</tr>
<tr>
<td>Maximum exposure temperature</td>
<td>1850°F (1010°C)</td>
<td>1850°F (1010°C)*</td>
</tr>
</tbody>
</table>

* HDPE jacket is sacrificed under fire conditions.

TERMINATION CONSTRUCTION

Gland fitting: Brass
Potting material: Epoxy resin
Tails
- Standard tail length: 12 in (300 mm) (Please specify if longer tail lengths are required)
- Maximum exposure temperature
  - Nonhazardous: 248°F (120°C), 392°F (200°C) optional
  - Hazardous: 248°F (120°C), 302°F (150°C) optional
- PVC sleeving: 220°F (105°C)
- Size: 16 AWG – 500 kcmil

For factory assembled Duoterm units, high temperature insulated stranded wire tails are standard unless otherwise noted in table below. For field installed terminations, solid wire tails with PVC sleeving is standard.

Arrangement of tails at one end

<table>
<thead>
<tr>
<th>O</th>
<th>B</th>
<th>R</th>
<th>Y</th>
<th>Br</th>
<th>W</th>
<th>B</th>
<th>R</th>
<th>Bl</th>
<th>W</th>
<th>R</th>
</tr>
</thead>
</table>

Standard Tail Color Code

- B: Black
- W: White
- R: Red
- Y: Yellow
- Br: Brown
- Bl: Blue
- O: Orange
**600 V WIRING CABLE SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Cable reference number</th>
<th>Conductor size (AWG)</th>
<th>Allowable ampacity NEC 75°C/90°C (A)</th>
<th>Allowable ampacity CEC, 75°C/90°C (A)</th>
<th>Nominal coil length¹</th>
<th>Nominal weight [lb/1000 ft / (kg/km)]</th>
<th>NPT gland size (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Single conductor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1/10-277 10¹</td>
<td>50 / 55</td>
<td>50 / 55</td>
<td>1742 / [531]</td>
<td>154 / (229)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>1/8-298 8</td>
<td>70 / 80</td>
<td>70 / 80</td>
<td>1522 / [444]</td>
<td>179 / (266)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>1/6-340 6</td>
<td>95 / 105</td>
<td>95 / 105</td>
<td>1178 / [359]</td>
<td>236 / (351)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>1/4-402 4³</td>
<td>125 / 140</td>
<td>125 / 140</td>
<td>818 / [249]</td>
<td>332 / (494)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>1/3-449 3³</td>
<td>145 / 165</td>
<td>145 / 165</td>
<td>667 / [203]</td>
<td>409 / (609)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>1/2-449 2³</td>
<td>170 / 190</td>
<td>170 / 190</td>
<td>667 / [203]</td>
<td>444 / (661)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>1/1-496 1³</td>
<td>195 / 220</td>
<td>195 / 220</td>
<td>546 / [166]</td>
<td>492 / (732)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>1/2/0-580 2/0⁴</td>
<td>265 / 300</td>
<td>265 / 300</td>
<td>387 / [118]</td>
<td>771 / (1150)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>1/4/0-684 4⁰</td>
<td>360 / 405</td>
<td>360 / 405</td>
<td>455 / [139]</td>
<td>1128 / (1682)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1/350-834 350 kcmil⁶</td>
<td>505 / 570</td>
<td>505 / 570</td>
<td>284 / [86]</td>
<td>1675 / (2498)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td>1/500-1000 500 kcmil⁶</td>
<td>620 / 700</td>
<td>620 / 700</td>
<td>197 / [60]</td>
<td>2403 / (3584)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td><strong>Two conductor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/14-371 14⁴</td>
<td>20 / 25</td>
<td>20 / 25</td>
<td>957 / [292]</td>
<td>236 / (351)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>2/12-402 12⁴</td>
<td>25 / 30</td>
<td>25 / 30</td>
<td>788 / [240]</td>
<td>275 / (409)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>2/10-449 10⁴</td>
<td>35 / 40</td>
<td>35 / 40</td>
<td>635 / [194]</td>
<td>353 / (525)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>2/8-512 8</td>
<td>50 / 55</td>
<td>50 / 55</td>
<td>468 / [143]</td>
<td>473 / (704)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>2/6-590 6</td>
<td>65 / 75</td>
<td>65 / 75</td>
<td>355 / [108]</td>
<td>663 / (986)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>2/4-684 4³</td>
<td>85 / 95</td>
<td>85 / 95</td>
<td>404 / [123]</td>
<td>877 / (1305)</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2/3-768 3³</td>
<td>100 / 110</td>
<td>100 / 115</td>
<td>230 / [70]</td>
<td>1067 / (1587)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td>2/2-865 2³</td>
<td>115 / 130</td>
<td>115 / 130</td>
<td>263 / [80]</td>
<td>1353 / (2013)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td>2/1-975 1³</td>
<td>130 / 150</td>
<td>130 / 145</td>
<td>199 / [61]</td>
<td>1717 / (2555)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td><strong>Three conductor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/14-387 14⁴</td>
<td>20 / 25</td>
<td>20 / 25</td>
<td>852 / [260]</td>
<td>257 / (382)</td>
<td>1/2</td>
<td></td>
</tr>
<tr>
<td>3/12-480 12⁴</td>
<td>25 / 30</td>
<td>25 / 30</td>
<td>554 / [169]</td>
<td>395 / (588)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>3/10-480 10⁴</td>
<td>35 / 40</td>
<td>35 / 40</td>
<td>560 / [171]</td>
<td>419 / (623)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>3/8-590 8</td>
<td>50 / 55</td>
<td>50 / 55</td>
<td>371 / [113]</td>
<td>637 / (948)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>3/6-621 6</td>
<td>65 / 75</td>
<td>65 / 75</td>
<td>325 / [99]</td>
<td>738 / (1098)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>3/4-746 4³</td>
<td>85 / 95</td>
<td>85 / 95</td>
<td>225 / [69]</td>
<td>1079 / (1606)</td>
<td>1-1/4</td>
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</tr>
<tr>
<td>3/3-834 3³</td>
<td>100 / 110</td>
<td>100 / 115</td>
<td>180 / [55]</td>
<td>1339 / (1993)</td>
<td>1-1/4</td>
<td></td>
</tr>
<tr>
<td><strong>Four conductor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4/14-465 14⁴</td>
<td>20³ / 25³</td>
<td>20³ / 25³</td>
<td>589 / [180]</td>
<td>366 / (545)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>4/12-465 12⁴</td>
<td>25³ / 30³</td>
<td>25³ / 30³</td>
<td>568 / [173]</td>
<td>376 / (559)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>4/10-590 10³</td>
<td>35³ / 40³</td>
<td>35³ / 40³</td>
<td>353 / [108]</td>
<td>606 / (902)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>4/8-590 8</td>
<td>50⁵ / 55⁵</td>
<td>50⁵ / 55⁵</td>
<td>358 / [109]</td>
<td>658 / (979)</td>
<td>3/4</td>
<td></td>
</tr>
<tr>
<td>4/6-730 6</td>
<td>65⁵ / 75⁵</td>
<td>65⁵ / 75⁵</td>
<td>234 / [71]</td>
<td>1008 / (1500)</td>
<td>1-1/4</td>
<td></td>
</tr>
</tbody>
</table>
### 600 V Wiring Cable Specifications

<table>
<thead>
<tr>
<th>Cable reference number</th>
<th>Conductor size (AWG)</th>
<th>Allowable ampacity NEC 75°C/90°C (A)</th>
<th>Allowable ampacity CEC, 75°C/90°C (A)</th>
<th>Nominal coil length</th>
<th>Nominal weight [lb/1000 ft / (kg/km)]</th>
<th>NPT gland size (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven conductor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7/16-449</td>
<td>16</td>
<td>– / 18³</td>
<td>– / –</td>
<td>605 / (184)</td>
<td>338 / (503)</td>
<td>3/4</td>
</tr>
<tr>
<td>7/14-496</td>
<td>14³</td>
<td>20³ / 25³</td>
<td>20³ / 25³</td>
<td>499 / (152)</td>
<td>428 / (637)</td>
<td>3/4</td>
</tr>
<tr>
<td>7/12-543</td>
<td>12³</td>
<td>25³ / 30³</td>
<td>25³ / 30³</td>
<td>419 / (128)</td>
<td>528 / (786)</td>
<td>3/4</td>
</tr>
<tr>
<td>7/10-621</td>
<td>10³</td>
<td>35³ / 40³</td>
<td>35³ / 40³</td>
<td>335 / (102)</td>
<td>716 / (1065)</td>
<td>1</td>
</tr>
<tr>
<td>7/8-710</td>
<td>8</td>
<td>50³ / 55³</td>
<td>50³ / 55³</td>
<td>257 / (78)</td>
<td>982 / (1461)</td>
<td>1-1/4</td>
</tr>
</tbody>
</table>

³ For longer lengths, please contact Pentair Industrial Heat Tracing Solutions.
² For factory assembled Duoterm units, tail is stranded wire with PVC sleeving.
⁴ For factory assembled Duoterm units, tail is solid wire with PVC sleeving.
² Based on 3 conductors supplying current to the load; other conductor(s) used as neutral or for control signal. Derating factors apply if 4 or more conductors are used as current-carrying conductors.
⁵ For 14 AWG, 12 AWG and 10 AWG, refer to appropriate sections of NEC and CEC governing conductor overcurrent protection limitations.

**Note:** To obtain cable diameter: use last three digits in the cable reference number and move decimal point three places to the left; result is cable diameter in inches. Example: cable reference 4/12-465 is 0.465” diameter.

### Approvals

**Bulk Cable**

<table>
<thead>
<tr>
<th>Nonhazardous Locations</th>
<th>Hazardous Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL Listed</td>
<td>UL Classified, 2-hour fire-resistant cable, tested to UL 2196</td>
</tr>
<tr>
<td>ULC Listed</td>
<td>ULC Listed, 2-hour fire-resistant cable, tested to ULC-S139</td>
</tr>
</tbody>
</table>

**Terminated Cable**

**Quickterm Kit**

<table>
<thead>
<tr>
<th>Nonhazardous Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>PYROPAK KIT (MASTIC COMPOUND SEAL)</td>
</tr>
</tbody>
</table>

**Pyrotenax KIT**

<table>
<thead>
<tr>
<th>Nonhazardous Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>PYROPAK KIT (EPOXY RESIN SEAL)</td>
</tr>
</tbody>
</table>

**Pyrotenax IW**

<table>
<thead>
<tr>
<th>Hazardous Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I, Div. 1 and 2, Groups A, B, C, D</td>
</tr>
<tr>
<td>Class II, Div. 1 and 2, Groups E, F, G</td>
</tr>
<tr>
<td>Class III</td>
</tr>
</tbody>
</table>

**Pyrotenax IW System 1850**

<table>
<thead>
<tr>
<th>Hazardous Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I, Div. 1 and 2, Groups A, B, C, D</td>
</tr>
<tr>
<td>Class II, Div. 1 and 2, Groups E, F, G</td>
</tr>
<tr>
<td>Class III</td>
</tr>
</tbody>
</table>

**Note:** Overall approval of the terminated cable depends on the termination kit used.

### Additional Performance Information for MI Cable

- Passes IEC 60331 flame test – modified to 1100°C (2000°F) for 4 hours (normally 750°C or 830°C) with mechanical shock every 30 seconds.

**Note:** Caution should be exercised when comparing open flame tests with enclosed furnace tests as the heat flux conditions are very different.