



## Alloy 825 sheathed mineral insulated fire-rated wiring cable

**Pyrotenax® fire-rated mineral insulated (MI) wiring cables facilitate the controlled shutdown of critical processes and systems in the event of a hydrocarbon flash fire in both nonhazardous and hazardous locations.**

Using the electrical test procedure described in UL2196, System 2000 MI cable maintains electrical circuit integrity for 30 minutes during exposure to the UL 1709 fire test. The UL 1709 test, referenced in API 2218, replicates an intense hydrocarbon fire, reaching 2000°F (1093°C) in 5 minutes when subjected to a heat flux of 65,000 BTU/ft<sup>2</sup> hr (200 kW/m<sup>2</sup>) in an enclosed furnace.

System 2000™ wiring cable is constructed with an Alloy 825 sheath and nickel-clad copper conductors which allows continuous exposure temperatures to 670°C and withstands rapid-rise temperature excursions to 1093°C. In addition, the sheath provides durability in areas where corro-

sives may be present, and the nickel-clad copper conductors permit higher current ratings compared with nickel conductors.

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

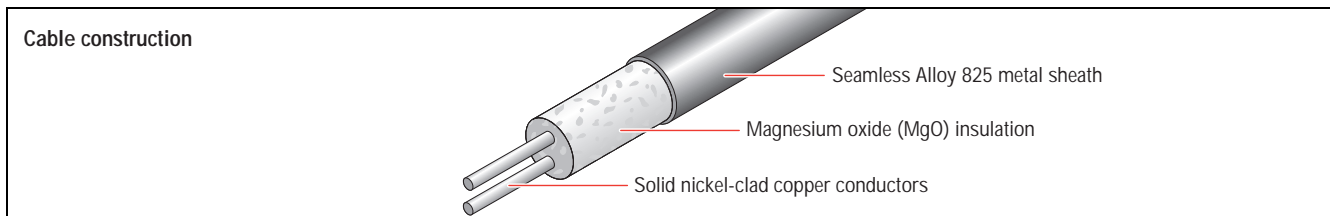
System 2000 MI cable may be used for power, control, and communication wiring in the following environments:

- Petrochemical – to protect critical systems in the event of a hydrocarbon flash fire
- Petrochemical and mining – in hazardous areas to provide a gas path block
- Manufacturing – in areas of extreme heat, around 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 2000 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 2000 meets the requirements of national electrical standards. For additional information on factory assembled Duoterm units, or bulk cable and field installed terminations, please visit our web site, [www.tycothermal.com](http://www.tycothermal.com).



### Cable Construction

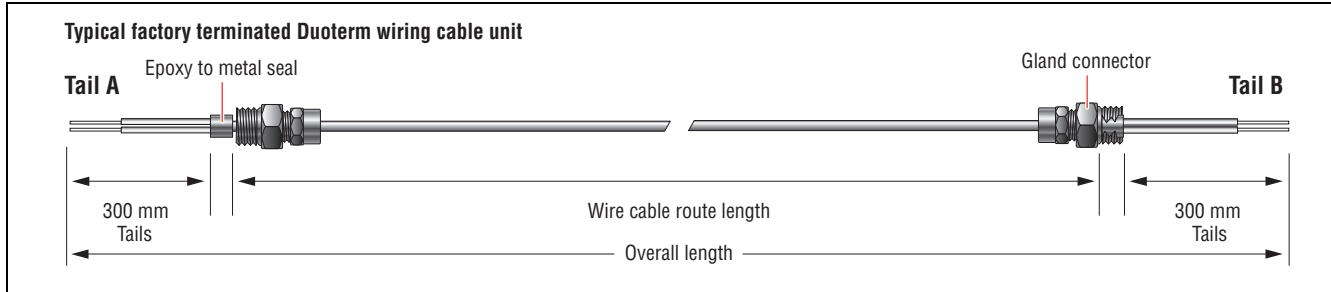
Sheath	Seamless Alloy 825
Insulation	Magnesium oxide (MgO)
Conductor type	Nickel-clad copper
Insulation voltage rating	600 V
Copper conductor cross sectional area	1.0 – 35.0 mm <sup>2</sup> [Physical conductor cross sectional area is larger due to nickel cladding (see Table)]
Number of conductors	1, 2, 3, 4 or 7 standard (Contact Tyco Thermal Controls for custom configurations)

### Bending Radius

Minimum bending radius	6 times cable diameter
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### Cable Temperature Rating

Continuous exposure temperature	670°C
Maximum exposure temperature	1093°C

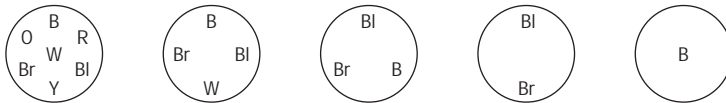


**Termination Construction**

Gland connector	Stainless steel
Potting material	Epoxy resin
Tails	
Standard tail length	300 mm (Please specify if longer tail lengths are necessary)
Maximum exposure temperature <sup>a</sup>	Nonhazardous 120°C; 200°C optional
MFA insulated stranded wire	Hazardous 120°C; 150°C optional
PVC sleeving	105°C

<sup>a</sup> Factory terminated Duoterm units from 1.0 mm<sup>2</sup> to 10.0 mm<sup>2</sup> are supplied with MFA insulated stranded wire tails; units from 16.0 mm<sup>2</sup> to 35.0 mm<sup>2</sup> are supplied with PVC insulated solid wire tails. For field installed terminations, solid wire tails with PVC sleeving is standard and the tail size is the same as the physical conductor cross sectional area (see Table).

Arrangement of tails at one end



Standard Tail Colour Code

B	Black	Y	Yellow
W	White	Br	Brown
R	Red	O	Orange
Bl	Blue		

**600 V Wiring Cable Specifications**

Cable size reference	Nominal copper conductor cross sectional area (mm <sup>2</sup> )	Nominal conductor resistance at 20°C (Ω/km)	Current ratings (70°C sheath temperature) (amps)	Cable diameter (mm)	Nominal coil length <sup>b</sup> (m)	Nominal weight (kg/km)	Physical conductor cross sectional area <sup>c</sup> (mm <sup>2</sup> )	Gland connector size (mm)
<b>Single conductor</b>								
215/1NC1.0/825	1	16.5	22	5.5	898	116	1.4	20
240/1NC1.5/825	1.5	9.7	27	6.1	723	147	2.3	20
253/1NC2.5/825	2.5	6.5	36	6.4	655	170	3.4	20
286/1NC4.0/825	4	3.9	47	7.3	516	225	5.7	20
340/1NC6.0/825	6	2.6	59	8.6	365	320	8.6	20
387/1NC10.0/825	10	1.6	81	9.8	284	433	14.3	20
434/1NC16.0/825	16	1.0	107	11.0	229	571	22.9	25
480/1NC25.0/825	25	0.6	139	12.2	190	752	37.0	25
527/1NC35.0/825	35	0.5	168	13.4	158	915	46.2	25
<b>Two conductor</b>								
371/2NC1.0/825	1	14.3	17	9.4	301	340	1.6	20
402/2NC1.5/825	1.5	9.4	23	10.2	257	405	2.4	25
434/2NC2.5/825	2.5	6.8	32	11.0	221	479	3.3	25
496/2NC4.0/825	4	4.2	42	12.6	170	636	5.3	25
543/2NC6.0/825	6	2.8	54	13.8	142	783	8.1	25
684/2NC10.0/825	10	1.5	74	17.4	90	1262	14.6	32

**600 V Wiring Cable Specifications**

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<b>Three conductor</b>								
402/3NC1.0/825	1	15.7	15	10.2	256	403	1.4	25
465/3NC1.5/825	1.5	10.0	20	11.8	192	545	2.2	25
480/3NC2.5/825	2.5	6.5	27	12.2	181	598	3.4	25
527/3NC4.0/825	4	4.2	36	13.4	151	741	5.3	25
590/3NC6.0/825	6	2.8	46	15.0	121	954	8.1	32
714/3NC10.0/825	10	1.6	62	18.1	83	1435	14.1	40
<b>Four conductor</b>								
402/4NC1.0/825	1	16.3	15 <sup>d</sup>	10.2	257	409	1.4	25
449/4NC1.5/825	1.5	10.8	20 <sup>d</sup>	11.4	207	519	2.1	25
527/4NC2.5/825	2.5	6.7	27 <sup>d</sup>	13.4	151	726	3.3	25
590/4NC4.0/825	4	4.0	36 <sup>d</sup>	15.0	121	942	5.6	32
637/4NC6.0/825	6	2.7	46 <sup>d</sup>	16.2	104	1139	8.2	32
714/4NC10.0/825	10	1.7	62 <sup>d</sup>	18.1	84	1500	13.4	40
<b>Seven conductor</b>								
496/7NC1.0/825	1	15.2	15 <sup>d</sup>	12.6	170	635	1.5	25
543/7NC1.5/825	1.5	10.4	20 <sup>d</sup>	13.8	142	775	2.1	32
637/7NC2.5/825	2.5	6.4	27 <sup>d</sup>	16.2	104	1091	3.5	32
714/7NC4.0/825	4	3.9	36 <sup>d</sup>	18.1	83	1421	5.7	40
750/7NC6.0/825	6	2.7	46 <sup>d</sup>	19.1	76	1646	8.2	40

<sup>b</sup> For longer lengths, please contact Tyco Thermal Controls.

<sup>c</sup> Physical conductor cross sectional area is larger than nominal copper conductor cross sectional area due to nickel cladding

<sup>d</sup> 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.

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## Approvals

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### Bulk Cable

#### Ordinary Locations / Hazardous Locations



Class I, Div. 1 and 2, Groups A, B, C, D  
Class II, Div. 1 and 2, Groups E, F, G  
Class III, Div. 1 and 2



Class I, Div. 1 and 2, Groups A, B, C, D  
Class II, Div. 1 and 2, Groups E, F, G  
Class III, Div. 1 and 2

#### MI Cable Seal Assembly



II 2G EEx e II  
Baseefa02ATEX0194U

#### Cable Glands



II 2GD EEx d IIC  
Baseefa03ATEX0347X  
CE 1180



American Bureau of Shipping Type Approved

### Factory Assembled Duoterm Units and Field Installed Termination Kits

#### Ordinary Locations / Hazardous Locations



Class I, Div. 1 and 2, Groups A, B, C, D  
Class II, Div. 1 and 2, Groups E, F, G  
Class III, Div. 1 and 2

**Note:** Approvals shown for Factory Assembled Duoterm Units and Field Installed Termination Kits apply to cables terminated with manufacturer supplied epoxy seal. Contact Tyco Thermal Controls for approvals on other available termination kits.



American Bureau of Shipping Type Approved

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### Additional Performance Information for MI Cable

- Passes IEC 60331 flame test – modified to 1100°C (2000°F) for 3 hours (normally 750°C or 830°C) with mechanical shock every 5 minutes.
- Passes customer specified rapid rise open flame test for 45 minutes at 1100°C (2000°F).

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

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