

>> Did You Know...

Underwriters Laboratories Inc. (UL) is celebrating its 100th anniversary in standards development this year. UL's first Standard for Safety – UL 10A for Tin-Clad Fire Doors – has since expanded into the 886 UL standards available today. The organization tests more than 18,000 types of products annually through its network of 55 laboratories and other facilities. For more information, visit www.ul.com/info/standard.htm.

"That promise put simply is that Encompass Partner products will feature preferred compatibility with Rockwell Automation products. We continue to embrace our Encompass Partners and strive for ways in which we can demonstrate to our common customers preferred compatibility. Technology partnering activities like the RSLogix 5000 Sample Project program are simple mechanisms that both Rockwell Automation and our Encompass partners offer that show our combined customer commitment to deliver on our promise," says Wylie.

RSLogix 5000 now includes 28 Sample Project files for products ranging from ControlLogix I/O and communication modules to EtherNet/IP-connected vision products. Spectrum Controls Inc., Prosoft Technology Inc. and DVT Corporation currently participate in the RSLogix 5000 Sample Project File program.

Over time, Rockwell Automation's goal is to expand Sample Project participation to all connected Encompass Partners who market chassis-based modules or stand-alone ControlNet or EtherNet/IP networked products.

For more information on the RSLogix 5000 Sample Project Files, look no further than the most current version of RSLogix 5000.

Inside, a special Help Menu item called "Vendor Sample Projects" launches into the Sample Projects vendor and project file index. From there, find those illusive "37 special rungs of ladder logic" as well as other preferred partner Sample Projects in other languages supported by RSLogix 5000, each designed to help customers finish their projects on time and on schedule.

RSLogix 5000:

www.ab.com/catalogs/b113/controllogix/software.html

Circle 602

Select the Proper Wiring Duct

Different wiring duct features offer different benefits to meet the true demands of your application.

by Chris L. Meadows, Panduit Corp.



With the increasing complexity of industrial control systems, it is easy to overlook the importance of selecting the proper wiring duct for managing wiring and cabling in specific applications. Wiring duct is used in an almost limitless number of equipment types,

sizes and environments, and from that variation comes a wide selection of wiring duct styles, sizes and materials. Some of the key areas to evaluate to ensure the proper selection of wiring duct include application environment, size selection and regulatory requirements

Application Environment

Polyvinyl chloride (PVC) is the oldest and by far the most widely used material for wiring duct. PVC is abundant, relatively inexpensive and has excellent mechanical and flame-retardant characteristics. Although PVC meets the environmental requirements of most applications, sometimes other materials may be required.

In applications that require a continuous-use temperature above 122°F (50°C), it will be necessary to use wiring duct made of a material with greater heat resistance, such as modified polyphenylene oxide (PPO). Wiring duct made from these materials provide higher mechanical strength for extended periods of time at elevated temperatures.

The best way to determine if a particular wiring duct is suitable for long term exposure at a given temperature is to find the UL (Underwriters Laboratory) Recognized Continuous-Use Temperature for the product. This is typically available in the manufacturer's literature, Web site or by looking up the manufacturer's UL certification online at www.ul.com. If the UL continuous-use temperature exceeds the temperature required by the application, then you can be assured the wiring duct is suitable for that particular application.

Certain extreme applications require a very high level of fire/smoke protection. For example, all materials used in subway cars must meet stringent federal low-smoke and low-

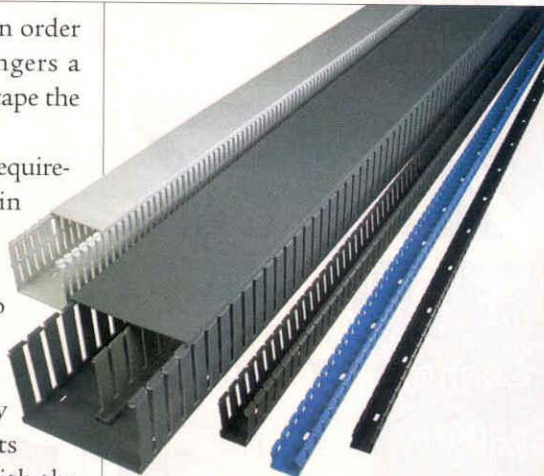
flammability requirements in order to adequately allow passengers a greater amount of time to escape the confined area.

Standards and regulatory requirements for special materials in these types of applications can vary widely from country to country and industry to industry. When dealing with a specification that contains flame, smoke or toxicity requirements for components like wiring duct, consult with the manufacturer to determine the appropriate product to use. Similarly, companies that have initiated voluntary programs to eliminate or reduce environmentally harmful substances from their supply chain and use so-called "green" materials should confirm with the manufacturer the lead-free and/or halogen-free status of wiring duct material.

Size

Determining the correct size of wiring duct for your application requires an understanding of the wire fill needs of the duct channel and the space constraints of the panel.

In NFPA 79, the National Fire Protection Agency Electrical Standard for Industrial Machinery, Section 14.5.2 states that the maximum permitted wire fill amount for wiring duct is 50 percent. In other words, the total of the individual wiring cross-sectional areas should not exceed one half of the area of the wiring duct. This is the amount of wiring the duct can hold in actual practice, given the empty space that exists between the wires. Most manufacturers supply a wire-fill chart in their catalogs and Web sites based on the 50-percent fill rule. These charts can be used to estimate the appropri-



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ate size duct to use given the number and size of wires to be used.

Note that not all wiring duct sizes are created equal and, therefore, wire-fill capacity does vary from supplier to supplier. The footprint, or width of wiring duct, can vary by as much as ± 0.25 inches from the nominal value. For example, 2-inch wide by 2-inch high ductwork can be anywhere from 1.75 inches to 2.25 inches wide. When you are ready to select the wiring duct size, pay close attention to the footprint as well as the wire fill capacity of the wiring duct. The space constraints of your panel layout may dictate a maximum allowable footprint. What you sacrifice for a larger footprint, you usually gain in wire-fill capacity.

Regulatory Approvals and Standards

The minimum approvals and standards that apply to wiring duct used in industrial equipment enclosures are governed by UL and NFPA 79. You should be aware of these in your wiring duct selection.

Good practice recommends use of UL-recognized wiring duct in equipment that is intended to be UL-listed. Recognition from Underwriters Laboratory means that the wiring duct meets the minimum requirements defined in UL Standard 1565 for Positioning Devices. In addition, use of UL-recognized components in equipment that is UL-listed reduces time and hassle for the equipment builder in gaining the UL listing.

NFPA 79-2002, Section 14.3.1 now contains a requirement for flame-retardant material that references this text: "Nonmetallic ducts shall be permitted only when they are made with a flame-retardant insulating material." The standard references an international test standard IEC 60332-1, not UL 94, for determining if a material is flame-retardant. Again, consult the wiring duct manufacturer if you are unsure if the wiring duct you are using meets the necessary requirements.

Certainly, with the broad scope of applications for wiring duct, each situation can present its own set of unique requirements. Different wiring duct features offer different benefits to meet the true demands of your application. Along with your existing best practices, you can use these guidelines to help tackle proper selection of wiring duct for almost any application.

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Circle 603