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# Wire Management Solutions for Rail

Regulatory Compliance  
at Lower Installed Costs

**PANDUIT™**

infrastructure for a connected world



## Panduit is your partner for designing simple to complex systems

Millions of people around the world travel by rail every day. You help make that transportation safe and reliable.

Effective cable and wire management is essential to your success, but has inherent challenges.

### **You need highly durable cable and wire management systems that:**

- Comply with today's stringent safety standards
- Meet your design specifications and simplify the installation process
- Operate dependably in harsh weather conditions and operating environments

Proven rail offerings from Panduit address these challenges so you can organize, connect and protect your electrical systems with confidence.

**Products:** Securely bundle, connect and organize your electrical systems.

**Tools:** Improve safety, increase productivity and minimize your installation costs.

**Support:** Our value-added expertise helps you specify the right components, and uncover new opportunities to save space weight, and time.



## Enhance Reliability and Reduce Operating Costs



### Build With Confidence

Achieve the quality and reliability that you expect. Panduit products use highly durable materials to keep trains and subways operating in even the harshest conditions to maximize lifetime expectancy.



### Ensure Compliant Designs

Confidently meet today's most stringent flame, smoke, and toxicity requirements. Panduit products are tested and certified to meet global rail industry passenger safety standards.



### Lower Your Total Cost

Bring your designs to market cost effectively. The Panduit comprehensive product portfolio gives you the benefit of working with a single vendor for managing all of your electrical infrastructure requirements. Time-saving tools can help increase productivity and reliability.



### Innovate & Improve

Bring your new designs to life. Partner with Panduit to for organizing, connecting, and protecting electrical, mechanical, and data systems infrastructure in your next generation trains and subways. We can also work with you to address existing design or installation issues to help meet your quality, efficiency and cost goals.

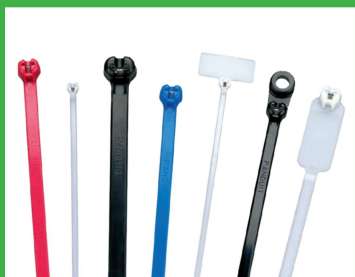


RoHS





If You Route It, Ground It,  
Connect It, Protect It or Identify It...  
Panduit Can Help You Manage It



1

Cable Ties



2

Cable  
Accessories



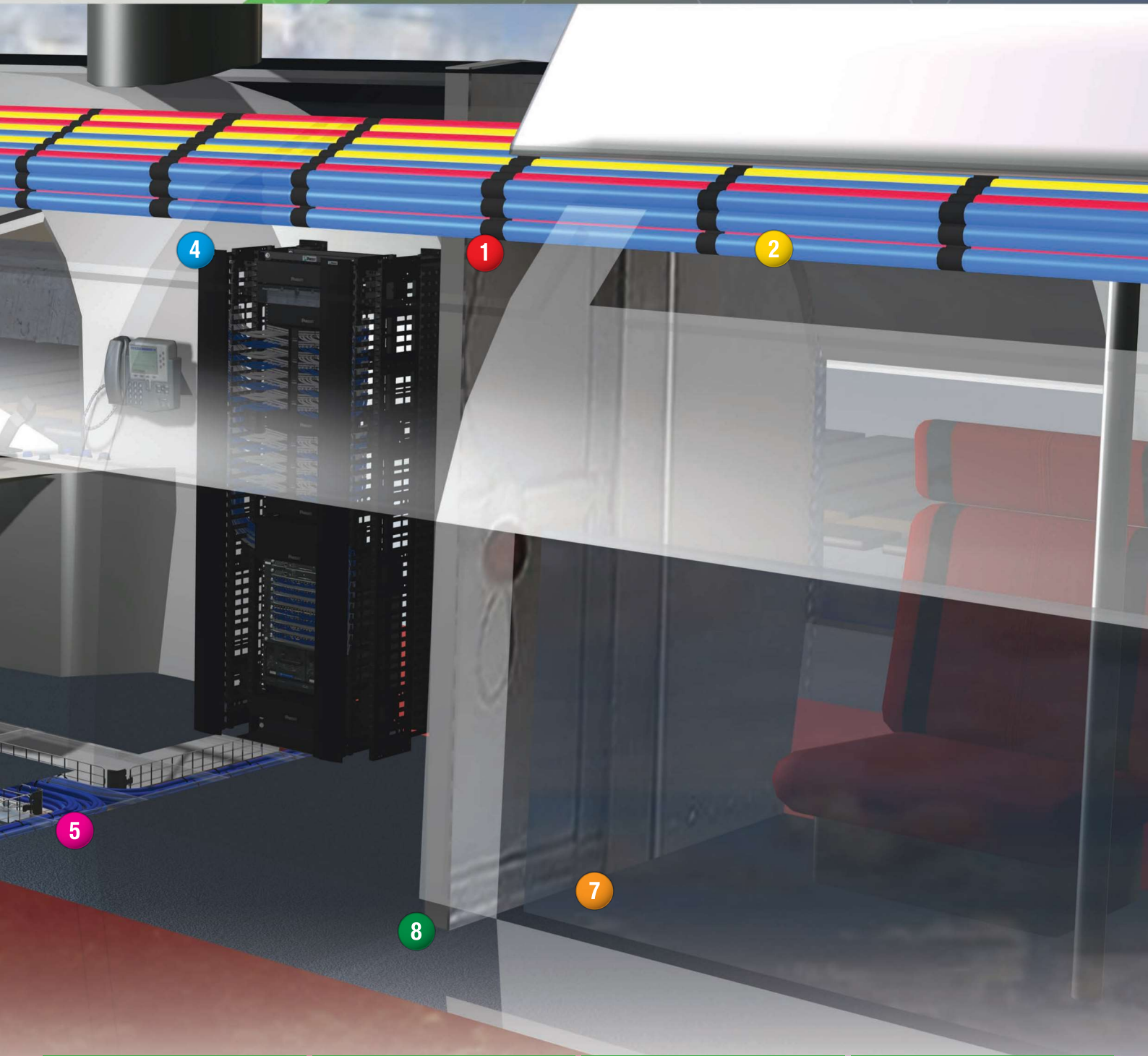
3

Identification



4

Abrasion  
Protection



**5** Stainless Steel Cable Ties



**6** Wiring Duct



**7** Power Connectors and Grounding



**8** Terminals and Ferrules



**Products engineered to organize, connect and protect electrical systems at the lowest total cost.**

**Automatic Cable Tie Installations are engineered for high-volume e**

### 1. Cable Ties

Standard and heavy-duty ties exceed industry standards for use in high vibration and high flame areas. Available in a wide range of materials, styles, and sizes to meet your internal and external environmental applications.

- Halogen-free and low smoke
- External tooth design for improved abrasion-resistance to wires
- Metal barb tie design for added tensile strength and increased bundle diameter variations
- Push mount and fir tree barb style ties for special applications



### 3. Cable Identification

Complete labeling systems – including time-saving labeling software, easy to use printers, and high end metal marker plates and heat shrink labels – help minimize installation time and ensure high quality cabling identification in demanding environments.

- Software simplifies label creation
- Halogen-free and water-resistant label options available
- Handheld and desktop printers allow for fast and high quality label production
- Custom imprinted cable ties available in multiple styles, sizes, and colors



### 2. Cable Accessories

Mounts and other securing devices help secure cable bundles, and make cable installation more efficient and cost effective.

- Halogen-free and low smoke
- Multiple installation options help tailor cable routing and management
- Multiple adhesive options for mounting to surfaces



### 4. Abrasion Protection

A broad range of abrasion protection products meet your unique application requirements and today's most demanding fire safety standards.

- Halogen-free spiral wrap and braided expandable sleeving protect your cables, wires, and tubing from abrasion
- Heat shrink tubing insulates and protects larger cables



## Systems and Reel-Fed Cable Ties Efficiency and operator ease



### 5. Stainless Steel Cable Ties

Stainless steel cable ties bundle, fasten and secure your cables and hoses that are exposed to corrosive or harsh conditions. Highly durable ties are built to last and can help reduce periodic rework.

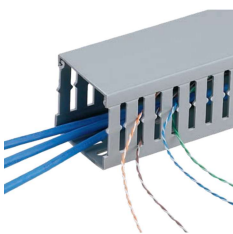
- Self-locking cable ties enable faster installation
- Fully coated ties help prevent corrosion between dissimilar metals



### 7. Power Connectors and Grounding

Copper and aluminum compression connectors and mechanical connectors provide critical electrical grounding and reliable wire terminations.

- Compression and mechanical lugs and splices are designed for demanding power applications
- Compression connectors support direct burial grounding



### 6. Wiring Duct

Halogen-free wiring duct meets a range of international safety standards to provide secure wiring protection.

- NE and NNC wiring duct offer better performance than PVC duct for outside control panels
- Low-smoke TNC wiring duct complies with more stringent standards inside passenger railcars



### 8. Terminals and Ferrules

Fast assembly and reliable performance for wire termination needs.

- Terminals available for a variety of applications, wire sizes from #26 - 2 AWG
- Ferrules make termination of flex cable fast and reliable; made for wire sizes from #26 - 1 AWG



### Create Greater Efficiencies with Tools

Promote worker safety, reduce installation time, and increase productivity to lower your costs, with Panduit tools:

- Cable tie tools with ergonomic and lightweight designs and easily adjustable tension settings for simple operation
- Stainless steel installation tools, available in hand and battery operated options, for low, medium or high volume applications
- Crimping tools available in manual, powered, dieless, and pneumatic options for consistent and reliable terminations for power connections

# Standards, Approvals and Support



## Rail Industry Standards Approvals

Panduit offers a wide range of wire management products in materials that have been tested and certified to be compliant with the smoke generation and toxicity requirements of industry standards all over the world.



**North America:** Panduit product certifications include the ASTM E 162 and ASTM E 662 tests to meet NFPA 130, Fire Test to Railway Components, and Federal Railroad Administration requirements of 49 CFR Part 238, Passenger Equipment Safety Standards.



**Europe:** Panduit product is tested and certified to the requirements of the Standard EN 45545-2, European Union Standard Fire Testing to Railway Components, for categories R22, R23 and R24.



**France:** Panduit product is tested and certified to the requirements of French Standard NF F 16-101 Rolling Stock, Fire Behaviour Choice of Materials, for classifications I and F.

For more information, visit [www.panduit.com/rail](http://www.panduit.com/rail) for details of product performance related to these industry standards. All trademarks, service marks, trade names, product names, and logos are the property of their respective owners.

## Support

Continuous improvement is essential to staying competitive and growing your business. Whether you're specifying a new design, improving an existing one, or seeking to make production more efficient, Panduit can help.

Developing new trains and subways, or upgrading existing designs, involves numerous considerations, from the quality and reliability of your systems to compliance with the latest standards. Turn to Panduit experts during the design process to specify, develop, and test products against the hazards common in rail applications.

Our support specialists can help review your cable and wire management systems and installation processes, and identify potential product or process improvements for greater efficiencies and a lower total cost.

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