



Industrial Construction

Reliable Shipbuilding and
Ship Operations Solutions

PANDUIT[®]

Every Day a Ship is not at Sea is Costly

Maintaining a ship, whether it is a cruise liner or military vessel, is an expensive process that requires efficient planning to help minimize dry dock costs, along with unnecessary spending.

On average, a ship has scheduled repair periods which occur every two to five years and can last weeks, months or even longer – with costs reaching into the millions of dollars for repair, not including revenue lost because of downtime.

The cruise ship industry incurs approximately \$400,000 in lost revenue for each day a ship is disabled.*

- What happens if **unscheduled** maintenance is required away from your home port?
- Will you be able to find the products you need locally or will this task increase your financial burden?

Return on Investment

What is Important to You:







As shipbuilders attempt to rein in costs that have doubled in recent years, they are looking into ways to:

- Increase Productivity
- Minimize “Unscheduled” Maintenance
- Extend Global Availability
- Lower Overhead Expenses

Panduit's Influence

Delivering cost-effective product solutions to customers across the globe is highly dependent on:

- Strong global supply chain that streamlines procurement
- Locally based professionals to meet unique customer challenges
- Knowledge of country specific requirements for local business
- Breadth of offering which brings to the market a portfolio that meets your unique challenges:

-  Harsh Environments
-  Space Optimization
-  Noise Mitigation
-  Efficient Deployment
-  Wire Management
-  Safety

☐ Rely on Panduit's Global Capabilities to Help Guide You Safely from Port to Port

*Source: Cruise Market Watch



No Matter where you are Building or Maintaining your Ship – Panduit is there

With over 30,000 high-quality, reliable, available parts, Panduit provides extensive shipbuilding solutions to help you achieve a faster, easier and more cost-efficient production process, no matter where you are located throughout the world.

Panduit's global product availability helps keep projects on schedule and on budget.

Global Expertise and Support

Global distribution, manufacturing, sales and technical support teams make Panduit solutions readily accessible, allowing the right products to be delivered when and where they are needed.

Worldwide Certifications

Panduit solutions hold a variety of the most common shipbuilding certifications and approvals in place worldwide- because you don't know where your ship is going next.





1 Engine Room

- Harsh Environments
- Space Optimization
- Safety

2 Pathways

- Noise Mitigation
- Wire Management
- Harsh Environments
- Space Optimization
- Efficient Deployment

3 Control Room

- Space Optimization
- Efficient Deployment
- Wire Management
- Noise Mitigation
- Safety

4 Data Center

- Space Optimization
- Wire Management
- Efficient Deployment
- Noise Mitigation



5 Wheelhouse/Bridge

Wire Management
Efficient Deployment
Safety

6 Telecommunications Room

Space Optimization
Wire Management
Noise Mitigation

7 Living Quarters

Wire Management
Space Optimization
Efficient Deployment
Safety



Harsh Environments



Space Optimization



Noise Mitigation



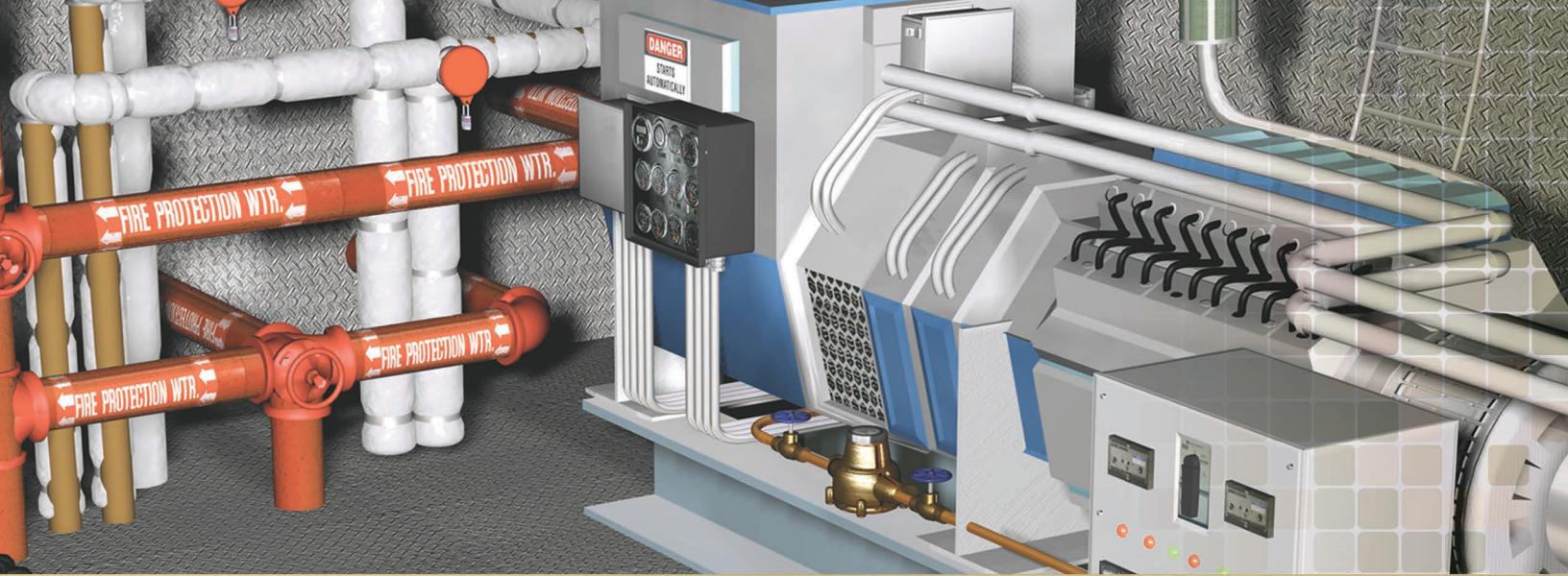
Efficient Deployment



Wire Management



Safety



Challenges

Engine Room



Engine room reliability requires solutions that withstand **corrosive forces**.



Functionality cannot be compromised simply because space is at a premium.



Workers must be made aware of **safety hazards**.

Solution Leading Product

Robust stainless steel cable ties and identification products withstand environmental extremes to deliver reliable performance because downtime is not an option.



- **Short Circuit Protection:** ensure cable containment, minimizing disruption and damage to electrical infrastructure, while reducing safety risks
- **Durable stainless steel construction:** delivers a longer useful life where strength and/or resistance to severe conditions are required
- **Locking head construction:** assures locking in any position
- **Rounded edges:** protect the integrity of bundled wires/cables and improve safety for installers
- **Innovative tooling:** reduces installation time for enhanced productivity

Supplementary Offering

Terminals



UL and CSA listed, tin-plated, vinyl-insulated, copper connectors designed for long-term reliability.

Safety Signs, Photoluminescent Tapes

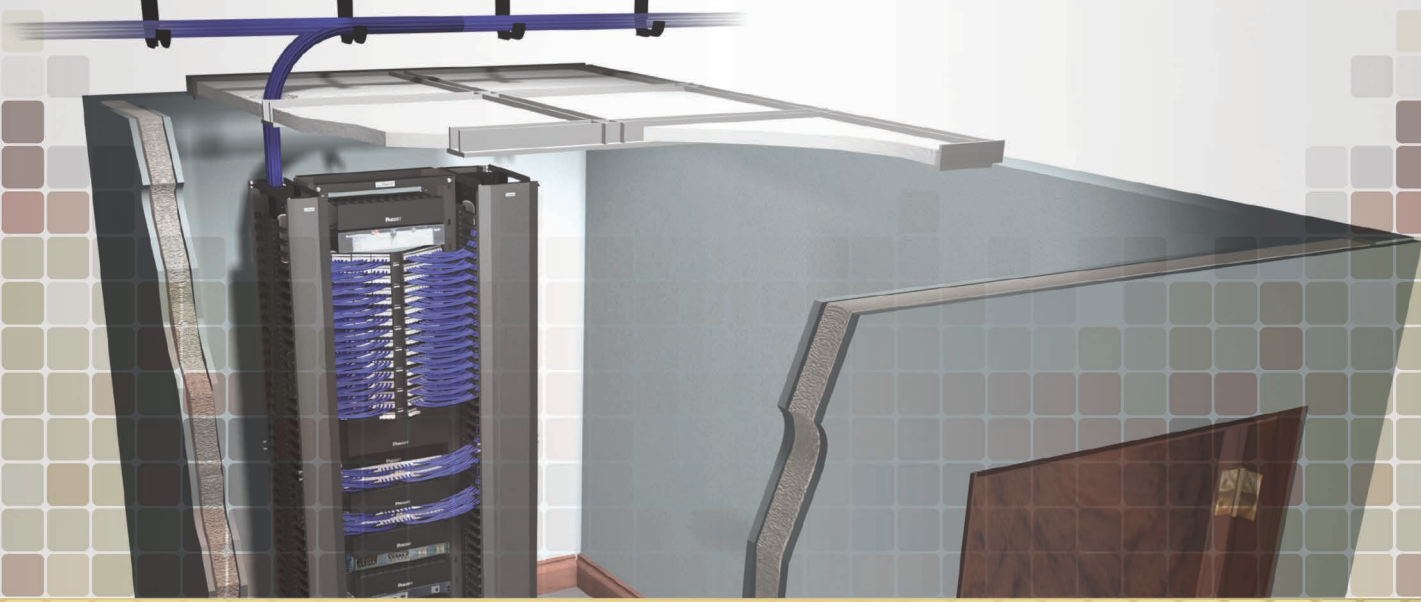


Outdoor-rated products resistant to harsh environments.

Compression Power Connectors



UL and CSA approved aluminum and copper connectors for code and flex wires with options for barrel length, one- or two-hole mounting, and straight or bent tongues to optimize installation in tight spaces. Select power connector families are available in metric and AWG, they are also ABS, DNV and IEC approved.



Challenges

Pathways



Marine environments require **reliable operation** in harsh applications.



Tight spaces and noisy equipment **mandate EMI/RFI mitigation**.



To **minimize dock time**, wire management solutions must deploy quickly, promote organization, and optimize available space.



Solution Leading Product

The durable oil- and fuel-resistant jacket used in Panduit® TX7000™ S/FTP Shielded Copper Cable makes it the ideal choice for use in marine applications.



- **Robust cable jacket:** oil- and fuel-resistant for harsh environments
- **Shielded cable construction:** eliminates EMI/RFI interference, protecting signals
- **25-year copper communication system warranty:** spans the average life of the vessel
- **Exceeds application requirements:** DNV, ABS, and Intertek/ETL

Supplementary Offering

Wyr-Grid®



Easy-to-use overhead cable management system offers speedy deployment, structural integrity, and cable protection for copper or fiber optic data cables, or power cables within data centers.

J-Pro™



Complete horizontal and vertical 1" bend radius control helps prevent degradation of cable performance.

FiberRunner®



Segregate, route and protect fiber optic and high-performance copper cabling runs to and between equipment racks within a data center and telecommunications room.



Harsh Environments



Space Optimization



Noise Mitigation



Efficient Deployment



Wire Management



Safety



Control Room

Challenges



Available space for control panels is limited.



Signal distortion can disrupt critical systems.



Protect workers by warning of **safety hazards**.



Simplifying installation and maintenance keeps deployment schedules on track.



Cable routing impacts space utilization and the operation of equipment.

Solution Leading Product

The Panduit® PanelMax™ Product Family innovations provide up to 30% space savings, increased design flexibility, and anticipate future modifications.



- **PanelMax™ Corner Wiring Duct:** utilizes typically unusable space in the enclosure corner, improving layouts with up to 20% space savings where both side and back panels are used
- **PanelMax™ DIN Rail Wiring Duct:** leverages the enclosure depth to free up valuable panel footprint space, while improving hand access with up to 30% space savings vs. conventional duct/rail layouts
- **PanelMax™ Shielded Wiring Duct and Noise Shield:** protects sensitive wiring from noise emissions, allowing pathways to be placed in closer proximity, saving panel space

Supplementary Offering

Abrasion Protection



Insulate, protect and harness electrical and electronic components and cable.

Self-Laminating Labels



Adhesive labels for wire/cable identification include a color print-on area and clear over-laminate for long-lasting, easy-to-read identification.

IndustrialNet™ Products



Provides TX5e™ and TX6™ Connectors and Patch Cords for consistent, reliable terminations in harsh environments. All Panduit® IndustrialNet™ products meet IP67/66/65 and are NEMA rated.



Data Center

Challenges



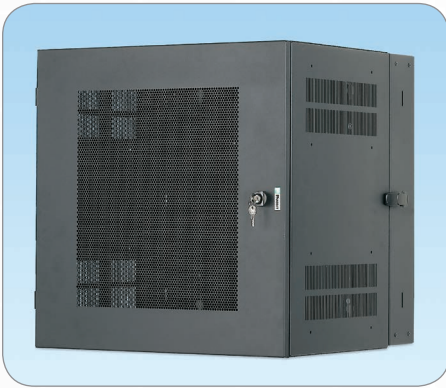
Data centers have to **provide the computing capacity** for a small city in a compact space.



Thermal management is key to reliability and energy efficiency.

Solution Leading Product

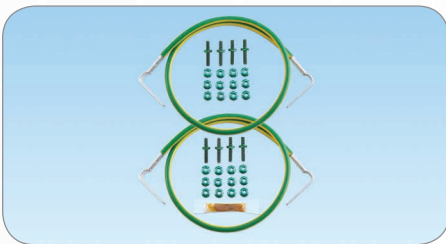
Cabinets, racks, cable management, grounding, power supplies, and thermal management are all built into a shipboard data center. Zone enclosures supplement standard cabinets and racks, delivering a full rack's worth of features into a compact space.



- **Thermal management:** designed into the enclosure to enhance reliability and energy efficiency
- **Adjustable rail mounts:** accommodates various network equipment
- **Secured access:** prevents unauthorized access to critical components

Supplementary Offering

Grounding



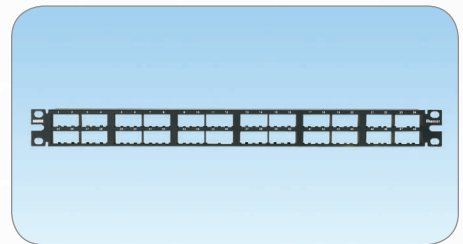
Paint-piercing serrations create a bond point between cabinet rail, grounding strip, grounding busbar and lug; no RUs required on front of cabinet for maximum cabinet density.

Cable Management



High-capacity vertical cable management system minimizes area required for network layout, frees up floor space, protects cable from bends and snags, and allows maximum airflow.

High Density Shielded Patch Panels



48-ports within a single rack unit maximize rack space with a shielded solution that reduces electromagnetic interference.



Wheelhouse/Bridge

Challenges



Secure. Route. Identify. Segregate. Bundle.
Cable management is time-consuming.



Ease of deployment, safety and cable capacity are important considerations for minimizing cost overruns on cable pathway installations.



Solution Leading Product

The Panduit® GridRunner™ Underfloor Cable Routing System – combined with cable ties, labeling, and other cable management accessories – offers a sturdy, versatile solution to route and manage data and power cabling beneath a raised floor, optimizing both space and time of deployment.



- **Wire basket design:** resists deflection over the lifetime of the application
- **Wire basket sections:** drops between floor stringers and attaches to pedestal brackets for fast, secure assembly
- **Pre-galvanized steel finish:** helps prevent corrosion and will not promote the growth of zinc whiskers that can potentially damage sensitive electronic equipment

Supplementary Offering

Cable Ties



Secure cables with a selection of cable ties developed specifically for harsh environments, including polypropylene and nylon 12 (resistant to salts, acid rain and hydrocarbons) and Tefzel[▼] and PEEK (Polyetheretherketone) (withstand high temperatures).

LS8EQ Hand-Held Printer



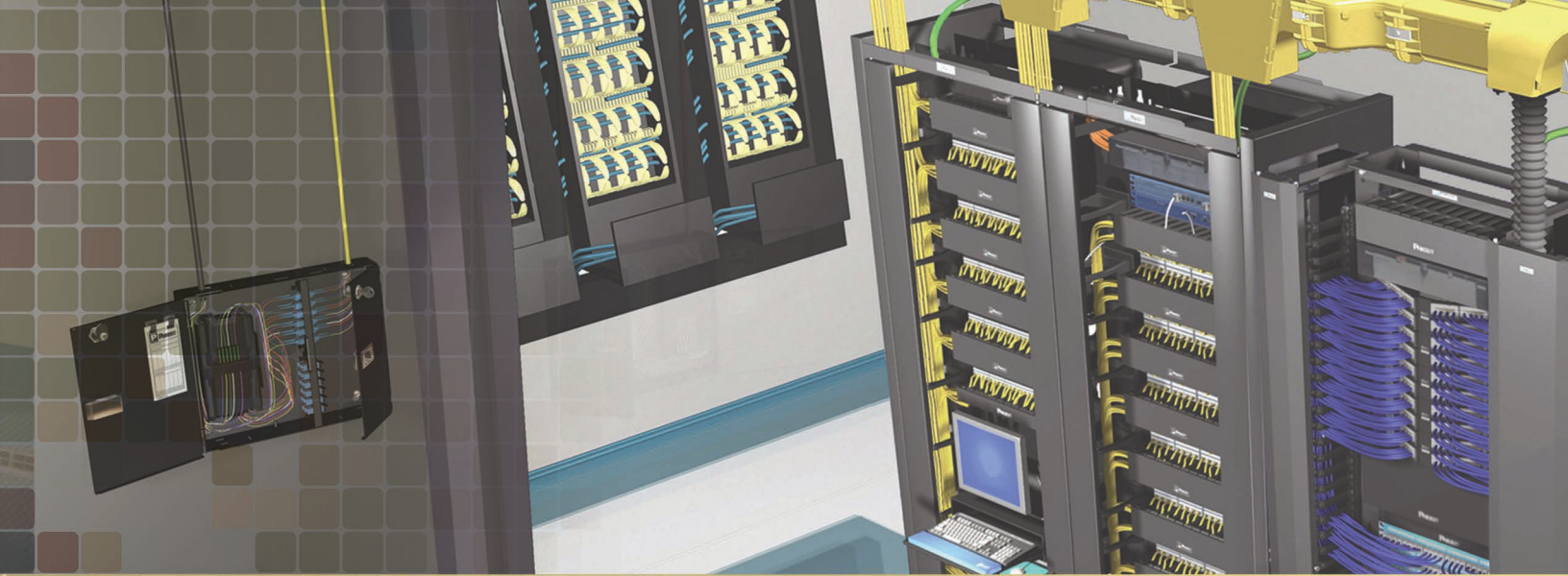
Produce high-quality, industrial labels on a variety of label materials for applications such as wire/cable, components, safety, and facility identification.

Heat Shrink Labels



Standard labeling options include a variety of materials and coatings, many optimized for indoor/outdoor use including heat shrink labels that meet military specifications.

[▼]Tefzel is a registered trademark of E. I. du Pont de Nemours and Company.



Telecommunications Room

Challenges



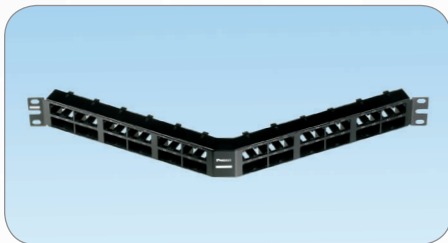
Space constraints make it difficult to maintain TIA bend radius and cable management requirements.



Noisy equipment dictates the need for EMI mitigation.

Solution Leading Product

High density, shielded, angled patch panels answer critical needs for space optimization, improved cable management, and equipment and signal protection. Patent-pending thread-forming bonding screws bond shielded panels to the rack; angled panels direct cable to vertical cable managers, saving space.



- **48-ports in 1 RU:** more connectivity in a smaller space
- **Angled design:** helps route cables to cable management
- **Shielded solution:** accepts shielded jacks for a shielded solution
- **Panduit® StructuredGround™ Bonding Hardware Kit:** protects systems and reduces EMI impact with the panel bonded directly to the rack

Supplementary Offering Corrosive Resistant Jacks



Protect electrical contacts and internal components by reducing the ingress of moisture and other corrosive elements, such as salt.

2 Post Racks



Ideal for telecommunications equipment rooms, optimizes space; electrically bonded construction facilitates grounding to reduce EMI impact.

Cable Management



Combined with 2 post racks, maximizes space while maintaining cable integrity.



Harsh Environments



Space Optimization



Noise Mitigation



Efficient Deployment



Wire Management



Safety



Living Quarters

Challenges



Securely route cables to provide amenities in passenger and crew cabins.



Routing of data and power cabling needs to be **safe and secure, yet aesthetically pleasing and easy to access** for repairs.



Solution Leading Product

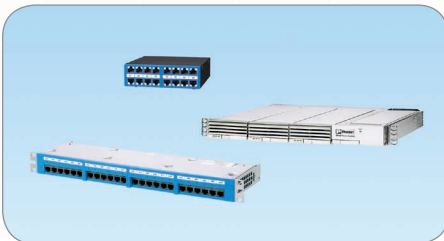
LD Profile Surface Raceway is available in single- and multi-channel solutions to safely and securely route copper, fiber, and power cabling into staterooms.



- **Multi-channel raceway:** route data and power
- **Tamper-resistant design:** increases safety benefits, discourages unauthorized access, and protects sensitive cabling from accidental damage
- **Full complement of fittings:** for power and data, bend radius control

Supplementary Offering

Power Over Ethernet (PoE)



Reliable, scalable, modular, cost-effective solutions for the deployment of PoE for onboard security, wireless, and other systems.

Outlets



A wide range of faceplates, adapters and surface mount boxes for network connectivity, and faceplates designed specifically for Panduit raceway.

Network Security



Keyed copper and fiber cabling systems, and component lock-ins and block-outs prevent unintentional connection to network infrastructure and help prevent network access to unauthorized users.



Shipwide Identification

Each standard body has different requirements regarding the labeling of power and data cables and connectivity onboard a ship. Meeting all of those standards – in an environment that is not always friendly to standard labeling materials – can result in a labor-intensive and costly endeavor. With a diverse selection of stainless steel cable ties and labeling, as well as printable label materials, Panduit helps shipbuilders and operators stay in compliance.



Pan-Alum™ MMP Series Marker Plates – Embossable cable marker plates are available in stainless steel, aluminum and brass for durability in harsh environments.



Portable Embossing System – Emboss plates as needed to deliver maximum visibility for medium- to high-volume applications.



Aluminum Cable Tie – Mount marker plates safely and securely with stainless steel or aluminum cable ties.



Metal Embossing Hand Tool – Allows users to create custom-length embossed marker plates on demand at remote job sites.



Thermal Transfer Labels – Standard labeling options include a variety of materials and coatings to ensure clear, long-lasting, easy-to-read identification in a wide range of shipboard applications.



Thermal Transfer Printers – Desktop and handheld printers make labeling efficient and economical.



Let Us Help!

Panduit backs all products with world class customer service and technical support to insure a seamless process from order inquiry to installation. Whether the vessel is in a shipyard, in port, or at sea, service and support are available throughout the world.

Comprehensive Panduit shipbuilding solutions include everything necessary to bundle, identify, route, protect and terminate wire/cables, supporting the most demanding application requirements and delivering customer benefits:

- **Reduced installation time**
- **Decreased operator error**
- **Lower total installed costs**
- **Adherence to industry standards**
- **Promoting safer working conditions**
- **Minimized operator fatigue**

Everything is Easier With the Right Tool for the Job!

Prep

- Ergonomic design of cable cutting and stripping tools allows for easy one-hand operation
- Optimized design for cutting the largest conductors with minimal force
- Low friction stripping of difficult insulations such as rubber and silicon
- All parts made of high-tempered special steel for long-term durability



Crimp

- Battery-powered and manual power and grounding tools minimize operator effort
- Controlled cycle mechanisms ensure reliability and repeatability in every crimp
- Color-coded crimping dies easily match the compression connector to the proper die
- Complete system ensures compliance with UL and CSA optimal performance



Terminate

- Copper and fiber termination tools designed to improve productivity
- Single-handed terminations in significantly less time compared to traditional on-site methods
- Visual indication of proper termination simplifies tooling and virtually eliminates operator error
- No adhesive or electricity required for termination



Bundle

- Full line of ergonomic manual and battery-powered nylon and stainless steel cable tie tools
- Used in maintenance and construction applications
- Highest reliability in the industry
- Flush cut-off of ties limits exposure to sharp edges





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