

# Pan-Steel® Stainless Steel Systems

*Improved Productivity and Worker Safety for Bundling, Fastening, and Identification in Harsh Environments*



When strength, vibration, radiation, weathering, corrosion and temperature extremes are a factor, the Pan-Steel® System provides strong, reliable solutions for use in indoor, outdoor, and direct burial applications. This guide provides an overview of key design considerations and applications for bundling, fastening, and permanent identification in harsh environments.

## Introduction

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# PANDUIT®

## APPLICATION GUIDE

**Industrial**  
**Oil Rigs**  
**Refineries**  
**Chemical Plants**  
**Water Treatment Facilities**  
**Wind Farms**  
**Solar**  
**Nuclear**  
**Mining**  
**Ships**  
**Submarines**  
**Cell Towers**  
**Aerial Support**  
**Telecommunications**  
**Transportation**  
**OEM**

# Introduction

## Using this Guide

### **Applications**

This section includes product recommendations for typical applications, always verify product suitability based on your specific requirements and key selection criteria

### **Key Selection Criteria**

Utilize material and strength charts to help select the Panduit products required to deliver superior performance in your application

Select the appropriate tools to speed installation time, and take advantage of our lowest installed cost solutions

Consider Panduit permanent identification solutions to help provide legibility in harsh environments; the complete system includes marker plates, tags and ties and is available for use with On-site Custom Marking Tools or through our Factory Custom Marking Service

### **Selection Guides**

Organized by part number, use each chart to assist with your product selection

## Pan-Steel® System

### **Reliable system performance:**

Delivers strength, long life and resistance to chemicals, vibration, radiation, weathering, and extreme temperatures

### **Increased job site safety:**

Features rounded edges to prevent installer injury and damage to cable bundles or finished product

### **Lowest installed cost:**

Includes reliable, ergonomic tooling and an innovative cable tie design to provide fast and reliable installation

### **Effectively identified workplace:**

Offers the most comprehensive selection of on-site and factory custom marking products in the industry

### **Standards compliance:**

Meets and exceeds the most stringent industry standards





## Stainless Steel Cable Ties

This section includes product recommendations for typical applications, always verify product suitability based on your specific requirements and key selection criteria

## Retained Tension Ties

Panduit retained tension ties deliver a durable, secure fastening solution for mechanical applications. The system delivers the highest retained tension in the industry, providing tight fastening of rigid materials in high vibration and harsh environments.

## Stainless Steel Strapping

Panduit coated and uncoated stainless steel strapping is the ultimate solution for large mechanical applications. The buckle design and installation tools offer a quick and safe installation.

## Aluminum Cable Ties

Panduit aluminum cable ties are used to bundle and identify cabling or secure aluminum marker plates and tags to cabling and devices. Aluminum cable ties are a lightweight, flexible bundling, and permanent identification solution.

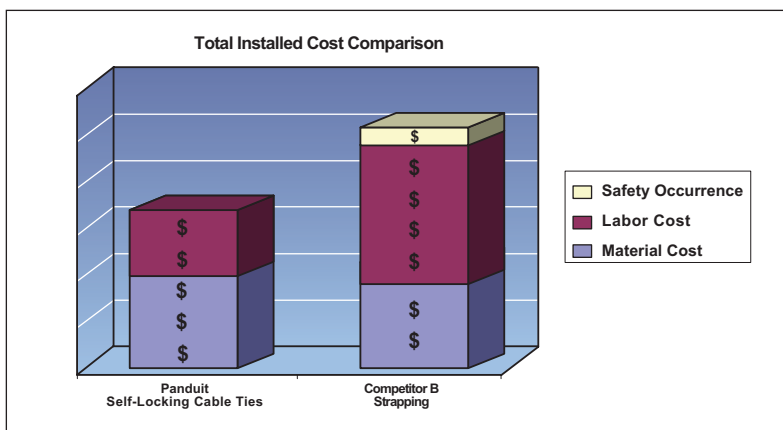
## Permanent Identification

The widest range of permanent identification solutions available includes stainless steel and aluminum cable ties, marker plates and tags in a variety of shapes and sizes. Factory custom marking service delivers embossed or laser etched identification. On-site marking tools are excellent for quick and easy identification in the field.

## Installation Tools

Panduit cable ties and industry leading installation tools work together to provide repeatable high performance at the lowest installed cost. Ergonomic tools are available for low, medium, and high volume applications. Reliability is designed into every tool.

# Strong, safe, and reliable solutions for long service life and lowest installed cost in harsh environments



Panduit stainless steel cable ties and permanent identification solutions can deliver a useable life greater than 30 years. The combined value of material cost, labor savings, and improved safety results in the lowest total installed cost.



## Applications

Panduit offers a wide variety of metal cable bundling, mechanical fastening, and permanent identification solutions to meet your specific application requirements. Common applications include:

### Cable Tray, Outdoor – *Oil Rigs, Refineries*



**Description:** Electrical or Communication Cabling secured to cable tray in harsh environment.

**Selection Criteria:** Resistance to extreme temperatures, chemicals, salt-water spray, ultra-violet light.

**Product Recommendations:**

- For Horizontal, Stainless Steel Cable Tray – Use Uncoated Heavy 316 Stainless Steel Metal Locking Tie
- For Vertical, Stainless Steel Cable Tray – Use Uncoated Extra-Heavy 316 Stainless Steel Metal Locking Tie
- For Horizontal, Aluminum Cable Tray – Use Coated Heavy 316 Stainless Steel Metal Locking Tie
- For Short Circuit – up to 112kA – Use Metal Locking Ties or MS75 Metal Strapping

### Cable Tray, Indoor – *Ships, Submarines, Chemical Plants, Industrial Facilities*



**Description:** Electrical or Communication Cabling secured to cable tray in harsh environment.

**Selection Criteria:** Resistance to extreme temperatures, chemicals, vibration, and shock.

**Product Recommendations:**

- For Horizontal, Stainless Steel Cable Tray – Use Uncoated Heavy 316 Stainless Steel Metal Locking Tie
- For Vertical, Stainless Steel Cable Tray – Use Uncoated Extra-Heavy 316 Stainless Steel Metal Locking Tie
- For Horizontal, Aluminum Cable Tray – Use Coated Heavy 316 Stainless Steel Metal Locking Tie
- For Short circuit – up to 71.5kA – Use Super-Heavy Double Loop 316 Stainless Steel Metal Locking Tie
- Cushion Sleeving available for military applications
- For Short Circuit – up to 112kA – Use Metal Locking Ties or MS75 Metal Strapping

### Instrument Tubing – *Oil Rigs, Refineries, Chemical Plants, Industrial Facilities*



**Description:** Instrument tubing secured to pipe or rail in harsh environment.

**Selection Criteria:** Retained tension, resistance to extreme temperatures, chemicals, salt-water spray, ultra-violet light.

**Product Recommendations:**

- Coated 1/2" Wide (12.7mm) 316 Stainless Steel Custom Length Strapping

## Pipe Insulation – *Chemical Plants, Refineries, Industrial Facilities*

**Description:** Secure metal shield over pipe insulation.

**Selection Criteria:** Resistance to extreme temperatures, chemicals, ultra-violet light.

**Product Recommendations:**

- Uncoated Extra-Heavy 15, 304 Stainless Steel Metal Locking Tie



## Rubber Steering Rack Boot – *Trucks, Autos*

**Description:** Securing CV boots or steering rack boots on vehicles.

**Selection Criteria:** Resistance to high temperatures, salt spray and chemicals, retained tension, liquid tight seal.

**Product Recommendations:**

- Standard or Light-Heavy 360° Radial Seal 304 Stainless Steel Retained Tension Tie



## Heat Shields – *Motorcycles, Trucks, Autos, Aircraft*

**Description:** Secure heat shields on engines.

**Selection Criteria:** Retained tension, resistance to extreme temperatures, thermal expansion, salt spray, chemicals.

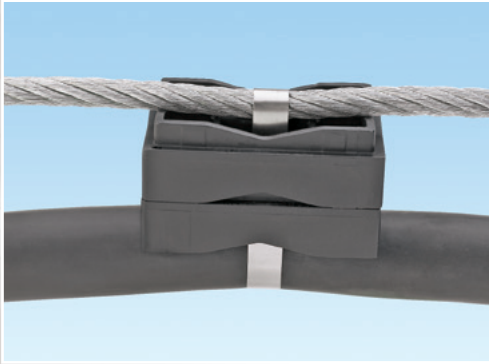
**Product Recommendations:**

- Standard, Light-Heavy, or Heavy 304 Stainless Steel Retained Tension Tie





## Aerial Support – *Railway, Power, and Communication Lines*



**Description:** Electrical or Communication Cabling secured to support structure.

**Selection Criteria:** Resistance to extreme temperatures, chemicals, ultra-violet light.

**Product Recommendations:**

- Uncoated Heavy or Extra-Heavy 304 Stainless Steel Metal Locking Tie
- Stackable spacers available

## Cable Identification – *Cell Towers, Oil Rigs, Ships, Submarines, Industrial Facilities, Mining*



**Description:** Electrical or Communication Cabling secured to support structure and identification.

**Selection Criteria:** Resistance to extreme temperatures, ultra-violet light.

**Product Recommendations:**

- 304 Stainless Steel Marker Plate (Embossed)
- Aluminum Marker Plate (Embossed)
- Uncoated Heavy 304 Stainless Steel Metal Locking Tie
- Aluminum Metal Locking Tie

## Pipe Identification – *Water Treatment Facilities, Refineries, Chemical Plants, Industrial Facilities*



**Description:** Securing stainless steel or aluminum tags onto valve, conduit, pipe, cable.

**Selection Criteria:** Resistance to chemicals, extreme temperatures, ultra-violet light.

**Product Recommendations:**

- 304 Stainless Steel Marker Plate
- Standard, Light-Heavy, or Heavy 304 Stainless Steel Metal Locking Tie

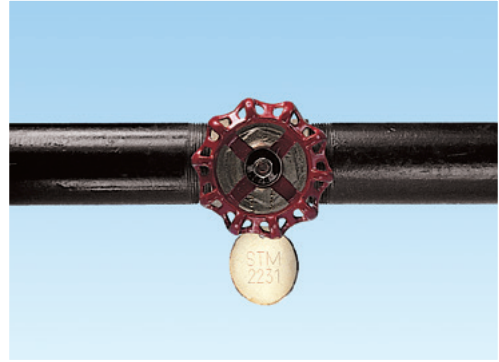
## Valve Identification – *Industrial Facilities*

**Description:** Securing stainless steel or brass tags to valve.

**Selection Criteria:** Resistance to extreme temperatures, ultra-violet light.

**Product Recommendations:**

- Brass Marker Tag
- Standard 304 Stainless Steel Metal Locking Tie



## General Mechanical – *Sign and Signal Mounting*

**Description:** Securing signs to outdoor poles.

**Selection Criteria:** High strength and secure installation.

**Product Recommendations:**

- MS75 Strapping System



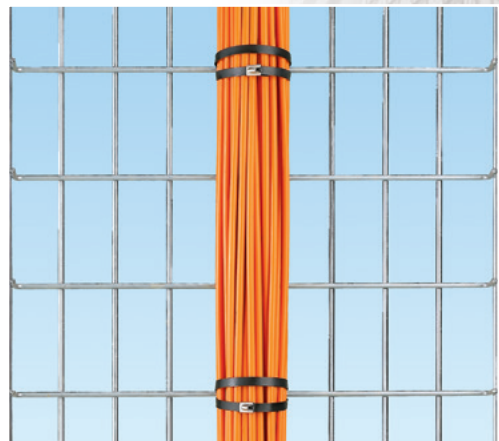
## Telecommunications Backbone – *Commercial Building*

**Description:** Bundling Fiber Optic Cabling to aluminum cable tray.

**Selection Criteria:** Strength, cable protection and corrosion resistance.

**Product Recommendations:**

- Coated Heavy 316 Stainless Steel Metal Locking Tie (apply at lowest tension setting)



**Panduit**  
**stainless steel**  
**cable ties**  
**perform**  
**exceptionally**  
**well in**  
**temperature,**  
**chemical, and**  
**environmental**  
**extremes.**

## Key Selection Criteria

Variables such as exposure to extreme temperatures, salt spray, and weather have differing effects on the performance of stainless steel and aluminum. Each of these factors contributes to the useful life of a cable tie, marker plate, or tag. Use the following sections as a guide to select the optimum Pan-Steel® Solution for your application.

- Performance in harsh environments
- Strength for application
- Workplace safety and abrasion protection
- Lowest installed cost
- Effective identification
- Compliance with industry standards

## Performance in Harsh Environments

### Materials

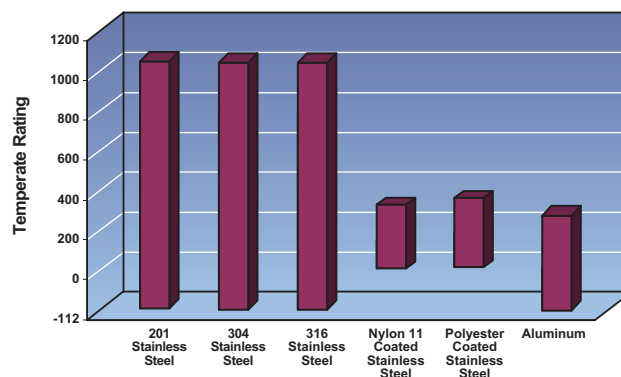
**Stainless steel:** Recommended for harsh environment and general purpose applications where strength and/or resistance to severe conditions are required.

**Aluminum:** Recommended in applications where light weight and flexibility are required. It is also well suited for use with aluminum cable tray to avoid corrosion from dissimilar metals.

| Material                   | Loop Tensile Strength | UV Resistance | Extreme Temps | Salt Spray | Chemicals | Contact with Aluminum | Flammability |
|----------------------------|-----------------------|---------------|---------------|------------|-----------|-----------------------|--------------|
| 201 Stainless Steel        | Best                  | Best          | Best          | Good       | Good      | Not Recommended       | None         |
| 304 Stainless Steel        | Best                  | Best          | Best          | Good       | Better    | Not Recommended       | None         |
| 316 Stainless Steel        | Best                  | Best          | Best          | Best       | Best      | Not Recommended       | None         |
| Coated 316 Stainless Steel | Better                | Good          | Better        | Good       | Good      | Best                  | UL94V-2      |
| Aluminum                   | Good                  | Best          | Good          | Good       | Good      | Best                  | None         |

## Material Selection for Temperature Resistance

The following are recommended operating temperature ranges for stainless steel and aluminum. The operating temperature for uncoated and coated stainless steel is -112°F (-80°C) to 1,000°F (538°C) (Uncoated), -76°F (-60°C) – 572°F (300°C) (Nylon) and -40°F (-40°C) to 302°F (150°C) (Polyester). The operating temperature for Aluminum is -112°F (-80°C) to 212°F (100°C).





## Material Selection for Salt Spray Resistance

Panduit cable ties were subjected to salt spray testing for 2,000 hours at 95°F (35°C). Both materials showed no signs of corrosion. The 316 Stainless Steel had trace surface staining and is recommended for mission critical applications. The 304 Stainless Steel had moderate surface staining and is recommended for general applications.



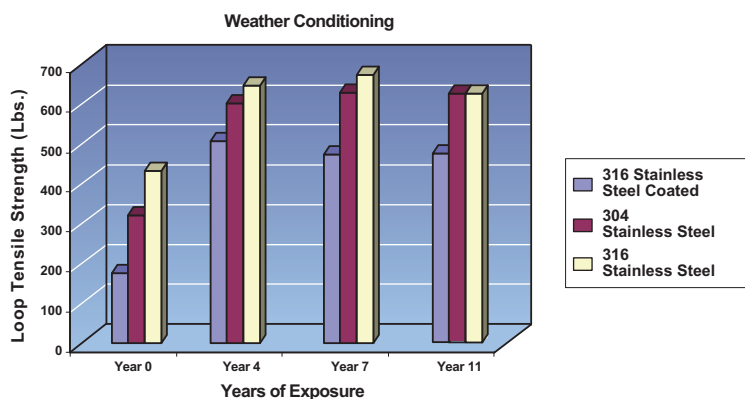
2,000 Hours



95°F (35°C)

## Material Selection for Weather Exposure

Panduit cable ties were exposed to weather for prolonged lengths of time outside our manufacturing facility in Illinois, USA, without loss of performance or signs of corrosion. Loop tensile strength increased from year one to year four and remained stable over time.



## Effective Identification

Panduit offers the broadest range of permanent identification solutions in the industry to withstand and provide legibility in harsh environments. Safe, quick, and easy to install, permanent identification solutions include stainless steel and aluminum marker plates, tags, marking tools, and ties to deliver improved productivity and workplace safety.

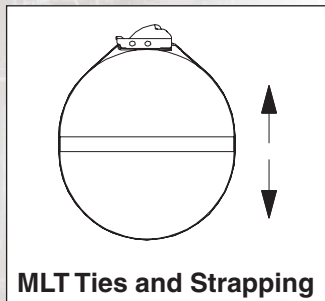
On-site Custom Marking Tools provide portability for permanent identification and demand. Panduit also offers a Factory Custom Marking Service for embossed or laser etched marker plates, tags, and ties to speed installation time and reduce labor costs. This global custom marking service provides rapid response and quick product availability to keep projects on schedule and within budget.



## Split Mandrel

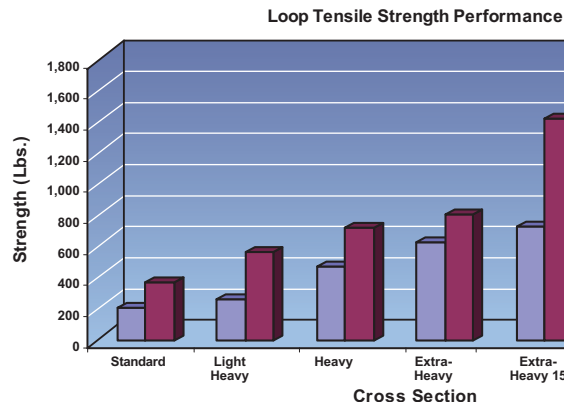
The split mandrel test fixture is used to measure loop tensile strength and retained tension of an installed cable tie.

### Loop Tensile Strength



## Strength for Application

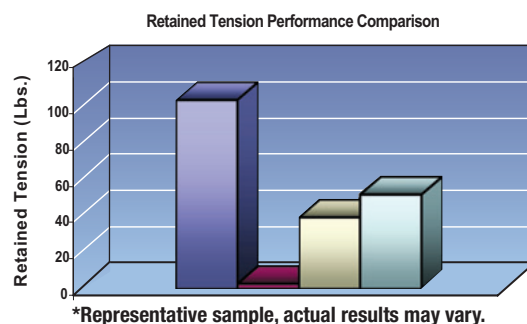
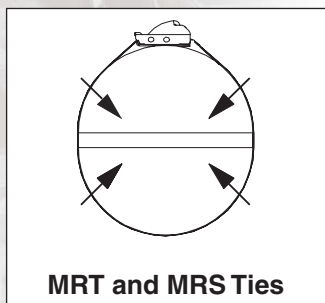
Cable tie design, material selection, and installation tooling determine the resulting strength of a system. Use the following table as a guide to determine the strength of various Panduit stainless steel cable ties and strapping for your applications.



### Loop Tensile Strength:

Rated load based on statistical analysis with additional margin. Tested mean based on sum of loop tensile strength over sample size.

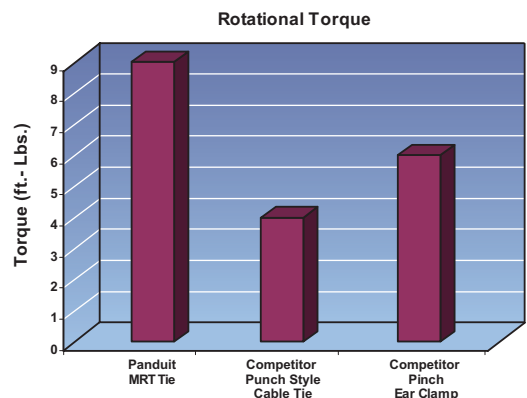
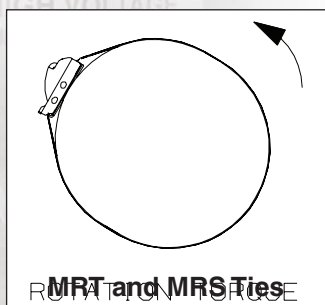
### Retained Tension



### Retained Tension:

Measured in pounds of residual force remaining on object after tie is installed.

### Rotational Torque

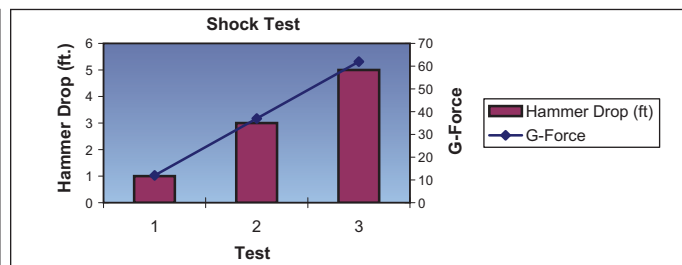
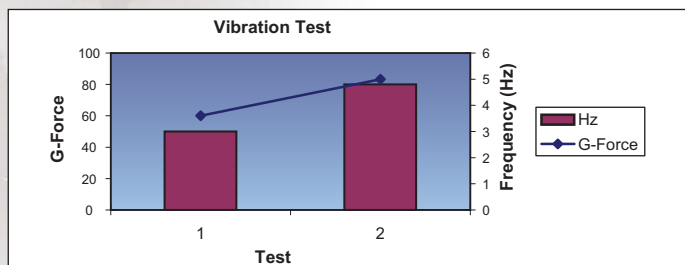


### Rotational torque:

Measured in pounds of force required to cause deflection of the tie or strapping when applied to a non-resistant object.

### Vibration and Shock:

Electrical cables were secured to cable tray using Panduit stainless steel cable ties. The cable assemblies were subjected to multiple levels of severe vibration and shock loading. No damage occurred to the cable ties or cable insulation jacket, which prevented short circuits from occurring.

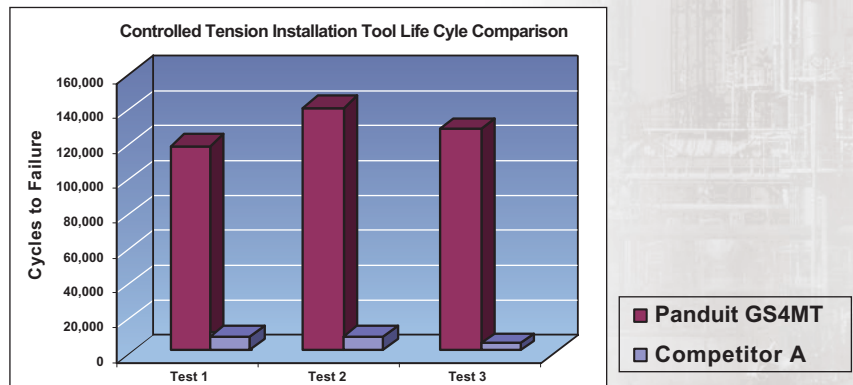


## Lowest Installed Cost

Factors that influence installation time include assembly time, thread force, and reliability of tooling. Panduit tools and ties combine to speed installation time and deliver the lowest installed cost. Use the following tables as a guide to select Pan-Steel® solutions and tooling.

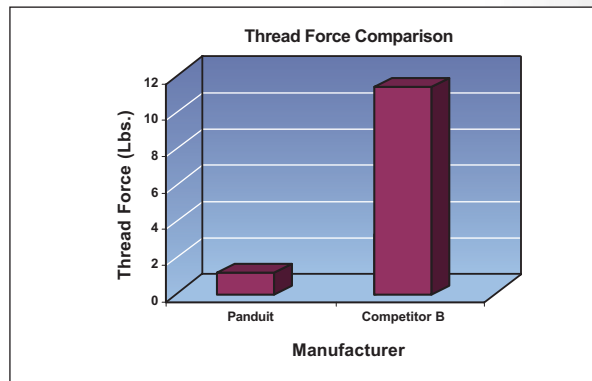
## Reliability

The following is an example of Life Cycle Comparison Data demonstrating the superiority of Panduit tooling, with a very low failure rate, versus a leading competitor. Life Cycle Performance may vary depending on environment and use.



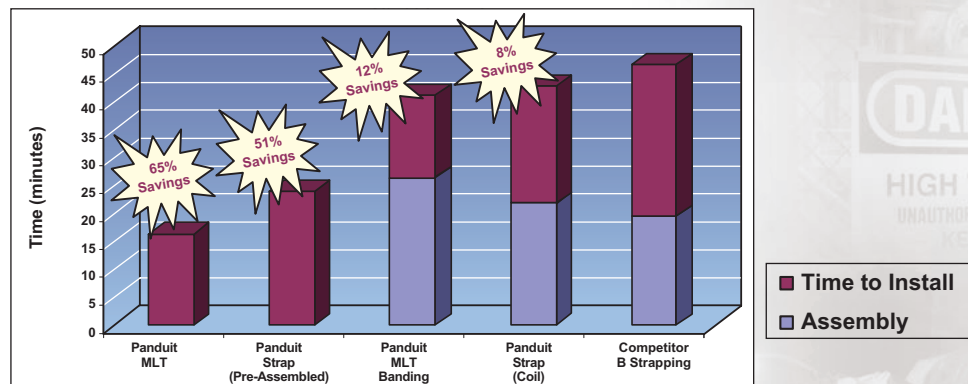
## Thread Force

Thread force is the measurement of force required to insert the end of a cable tie into the head. Panduit cable ties feature low thread force for extremely fast installation, improved productivity, and worker safety.



## Assembly Time

Panduit ties, strap, and banding are fast to assemble and install versus standard banding.



## Workplace Safety and Abrasion Protection

Panduit stainless steel solutions feature fully rounded edges and a flush cutoff to protect the bundle from abrasion during and after installation. Both of these features are also critical to ensuring worker safety.

On the job injuries due to laceration caused by a sharp edge or poor cut-off have several associated costs. The Occupational Health and Safety Organization (OSHA) reports that dollars spent on direct injuries are a fraction of the total costs of a lost time incident, other costs includes:

- Productive time lost by an injured employee and impacted supervisors
- Cost of continuing all or part of the employee's wages
- Increased workers' compensation insurance rates
- Time to hire or to retrain other individuals to replace the injured worker
- Time and cost for repair or replacement of any damaged equipment or materials
- Clean up and start up of operations interrupted by the accident



Panduit



Competitor A

Cross sectional view of Panduit tie body versus competitor - magnified 150X -

The costs associated with these factors can approach \$10,000 per laceration.

[www.panduit.com](http://www.panduit.com)



# Product Selection Guides

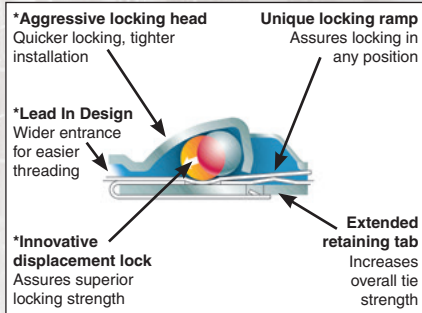
## Cable Ties

Variables such as chemical concentration, temperature, stress and ultra-violet light have differing effects on stainless steel. Each of these factors contributes to the useful life of a cable tie or tag.

Cable tie selection depends on the resiliency of the object in your application. MLT ties are ideally suited for resilient Cable Bundling Applications. MRT application ties, MRS ties and strapping are recommended for non-resilient Mechanical Fastening Applications.

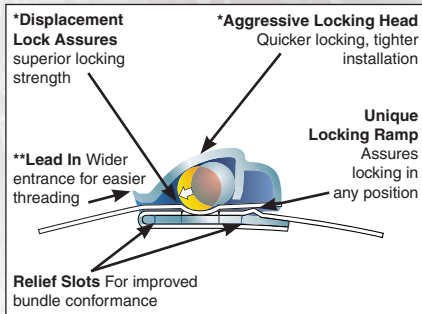
Use the following table as a guide to select the appropriate tie for your applications.

### Pan-Steel® Stainless Steel Ties Self-Locking Head Construction



\*Patented

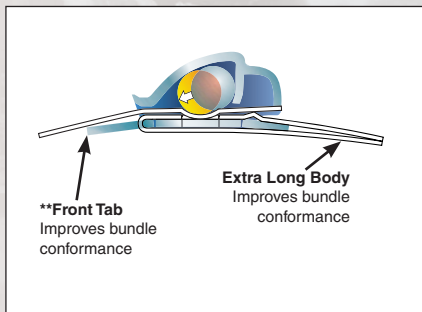
### Retained Tension Ties (MRT and MRS Series)



\*Patented

\*\*Patent Pending

### Additional Features of 360° Radial Seal Retained Tension Ties (MRS Series Only)



\*\*Patent Pending

| Part Number | Material | Length |    | Width |    | Min. Loop Tensile Strength |   | Application |
|-------------|----------|--------|----|-------|----|----------------------------|---|-------------|
|             |          | In.    | mm | In.   | mm | Lbs.                       | N |             |

#### Stainless Steel Self-Locking Cable Ties

##### Standard Cross Section

|             |       |      |     |      |     |     |     |                                            |
|-------------|-------|------|-----|------|-----|-----|-----|--------------------------------------------|
| MLT2S-CP    | 304SS | 7.9  | 201 | 0.18 | 4.6 | 200 | 890 | Identification                             |
| MLT2S-CP316 | 316SS | 7.9  | 201 | 0.18 | 4.6 | 200 | 890 | Identification, extra corrosion resistance |
| MLT4S-CP    | 304SS | 14.3 | 362 | 0.18 | 4.6 | 200 | 890 | Identification                             |
| MLT4S-CP316 | 316SS | 14.3 | 362 | 0.18 | 4.6 | 200 | 890 | Identification, extra corrosion resistance |

##### Heavy Cross Section

|             |       |      |     |      |     |     |      |                                                 |
|-------------|-------|------|-----|------|-----|-----|------|-------------------------------------------------|
| MLT2H-LP    | 304SS | 7.9  | 201 | 0.31 | 7.9 | 450 | 2000 | General Purpose, Aerial support, Identification |
| MLT2H-LP316 | 316SS | 7.9  | 201 | 0.31 | 7.9 | 450 | 2000 | Cable tray (indoors/outdoors)                   |
| MLT4H-LP    | 304SS | 14.3 | 362 | 0.31 | 7.9 | 450 | 2000 | General Purpose, Aerial support, Identification |
| MLT4H-LP316 | 316SS | 14.3 | 362 | 0.31 | 7.9 | 450 | 2000 | Cable tray (indoors/outdoors)                   |

##### Extra-Heavy Cross Section

|              |       |      |     |      |      |     |      |                                               |
|--------------|-------|------|-----|------|------|-----|------|-----------------------------------------------|
| MLT4EH-LP    | 304SS | 17.1 | 434 | 0.50 | 12.7 | 600 | 2670 | Aerial support, Cable tray (indoors/outdoors) |
| MLT4EH-LP316 | 316SS | 17.1 | 434 | 0.50 | 12.7 | 600 | 2670 | Cable tray (indoors/outdoors)                 |
| MLT6EH-LP    | 304SS | 23.4 | 594 | 0.50 | 12.7 | 600 | 2670 | Aerial support, Cable tray (indoors/outdoors) |
| MLT6EH-LP316 | 316SS | 23.4 | 594 | 0.50 | 12.7 | 600 | 2670 | Cable tray (indoors/outdoors)                 |

##### Extra-Heavy 15 Cross Section

|             |       |      |      |      |      |     |      |                 |
|-------------|-------|------|------|------|------|-----|------|-----------------|
| MLT8EH15-LP | 304SS | 29.7 | 754  | 0.50 | 12.7 | 700 | 3115 | Pipe insulation |
| MLT12EH15-Q | 304SS | 42.2 | 1072 | 0.50 | 12.7 | 700 | 3115 | Pipe insulation |

##### Super-Heavy Cross Section

|              |       |      |      |      |      |      |      |                                          |
|--------------|-------|------|------|------|------|------|------|------------------------------------------|
| MLT4SH-LP316 | 316SS | 17.1 | 434  | 0.63 | 15.9 | 900  | 4005 | Shipboard Cable Bundling                 |
| MLT6SH-LP316 | 316SS | 23.4 | 594  | 0.63 | 15.9 | 900  | 4005 | Shipboard Cable Bundling                 |
| MLT6DSH-Q316 | 316SS | 41.5 | 1054 | 0.63 | 15.9 | 1200 | 5340 | Double Loop short circuit – up to 71.5kA |
| MLT8DSH-Q316 | 316SS | 53.5 | 1359 | 0.63 | 15.9 | 1200 | 5340 | Double Loop short circuit – up to 71.5kA |

#### Stainless Steel Retained Tension Ties

##### Heavy Cross Section

|          |       |      |     |      |     |     |      |                                     |
|----------|-------|------|-----|------|-----|-----|------|-------------------------------------|
| MRT2H-L4 | 304SS | 11.3 | 287 | 0.31 | 7.9 | 400 | 1780 | Heat Shields and General Mechanical |
| MRT4H-L4 | 304SS | 17.6 | 447 | 0.31 | 7.9 | 400 | 1780 | Heat Shields and General Mechanical |

#### Stainless Steel 360° Radial Seal Retained Tension Ties

##### Standard Cross Section

|          |       |      |     |      |     |     |     |                     |
|----------|-------|------|-----|------|-----|-----|-----|---------------------|
| MRS1S-C4 | 304SS | 10.6 | 269 | 0.18 | 4.4 | 180 | 800 | Rubber Boots, Hoses |
| MRS4S-C4 | 304SS | 18.5 | 470 | 0.18 | 4.4 | 180 | 800 | Rubber Boots, Hoses |

##### Light-Heavy Cross Section

|             |       |      |     |      |     |     |      |                     |
|-------------|-------|------|-----|------|-----|-----|------|---------------------|
| MRS1.5LH-L4 | 304SS | 9.7  | 246 | 0.25 | 6.4 | 225 | 1000 | Rubber Boots, Hoses |
| MRS4LH-L4   | 304SS | 18.5 | 470 | 0.25 | 6.4 | 225 | 1000 | Rubber Boots, Hoses |

#### Pan-Alum® Aluminum Self-Locking Cable Ties

##### Heavy Cross Section

|            |          |      |     |      |     |    |     |                |
|------------|----------|------|-----|------|-----|----|-----|----------------|
| MLT1H-LPAL | Aluminum | 5.5  | 140 | 0.31 | 7.9 | 50 | 222 | Identification |
| MLT2H-LPAL | Aluminum | 7.9  | 201 | 0.31 | 7.9 | 50 | 222 | Identification |
| MLT4H-LPAL | Aluminum | 14.3 | 362 | 0.31 | 7.9 | 50 | 222 | Identification |

Refer to tool selection guide on page 13 for recommended tool.

Representative offering only, consult [www.panduit.com](http://www.panduit.com) for complete listing of products.

## Cable Ties (continued)

| Part Number                                               | Material                                       | Length   |        | Width |      | Min. Loop Tensile Strength |       | Application                                       |
|-----------------------------------------------------------|------------------------------------------------|----------|--------|-------|------|----------------------------|-------|---------------------------------------------------|
|                                                           |                                                | In.      | mm     | In.   | mm   | Lbs.                       | N     |                                                   |
| Fully Coated Stainless Steel Self-Locking Cable Ties      |                                                |          |        |       |      |                            |       |                                                   |
| Standard Cross Section                                    |                                                |          |        |       |      |                            |       |                                                   |
| MLTFC2S-CP316                                             | Coated 316SS                                   | 7.9      | 201    | 0.18  | 4.6  | 100                        | 445   | Cable tray (indoor/ outdoor), Telco backbone      |
| MLTFC4S-CP316                                             | Coated 316SS                                   | 14.3     | 362    | 0.18  | 4.6  | 4100                       | 445   | Cable tray (indoor/ outdoor), Telco backbone      |
| Heavy Cross Section                                       |                                                |          |        |       |      |                            |       |                                                   |
| MLTFC2H-LP316                                             | Coated 316SS                                   | 7.9      | 201    | 0.31  | 7.9  | 250                        | 1112  | Cable tray (indoors/outdoors)                     |
| MLTFC4H-LP316                                             | Coated 316SS                                   | 14.3     | 362    | 0.31  | 7.9  | 250                        | 1112  | Cable tray (indoors/outdoors)                     |
| Extra-Heavy Cross Section                                 |                                                |          |        |       |      |                            |       |                                                   |
| MLTFC4EH-LP316                                            | Coated 316SS                                   | 17.1     | 434    | 0.50  | 12.7 | 300                        | 1335  | Shipboard Cable Bundling                          |
| MLTFC6EH-LP316                                            | Coated 316SS                                   | 23.4     | 594    | 0.50  | 12.7 | 300                        | 1335  | Shipboard Cable Bundling                          |
| Super-Heavy Cross Section                                 |                                                |          |        |       |      |                            |       |                                                   |
| MLTFC4SH-LP316                                            | Coated 316SS                                   | 17.1     | 434    | 0.63  | 15.9 | 450                        | 2000  | Shipboard Cable Bundling                          |
| MLTFC6SH-LP316                                            | Coated 316SS                                   | 23.4     | 594    | 0.63  | 15.9 | 450                        | 2000  | Shipboard Cable Bundling                          |
| Discrete and Custom Length Strapping and Loose Piece Head |                                                |          |        |       |      |                            |       |                                                   |
| MS6W75T30-Q6                                              | 316SS                                          | 26.5     | 673    | 0.75  | 19.1 | 2400                       | 10656 | Sign and Signal Mounting                          |
| MS8W75T30-Q6                                              | 316SS                                          | 32.7     | 831    | 0.75  | 19.1 | 2400                       | 10656 | Sign and Signal Mounting                          |
| MS10W75T30-Q6                                             | 316SS                                          | 39.0     | 991    | 0.75  | 19.1 | 2400                       | 10656 | Sign and Signal Mounting                          |
| MSCNW50T15-QR6                                            | Coated 316SS                                   | 82.5 Ft. | 25.0 m | 0.50  | 12.7 | 700                        | 3115  | Instrument tubing                                 |
| MSW75T30-CR2                                              | 201SS                                          | 100 Ft.  | 30.5 m | 0.75  | 19.1 | 2400                       | 10656 | Sign and Signal Mounting                          |
| MSBW50-C6                                                 | 316SS                                          | N/A      | N/A    | N/A   | N/A  | N/A                        | N/A   | Instrument tubing                                 |
| MSBW75-C2                                                 | 201SS                                          | N/A      | N/A    | N/A   | N/A  | N/A                        | N/A   | Sign and Signal Mounting                          |
| Cushion Sleeve                                            |                                                |          |        |       |      |                            |       |                                                   |
| PCSSH-B-CR                                                | Neoprene                                       | 100 Ft.  | 30.5 m | 0.91  | 23.1 | N/A                        | N/A   | Cable tray (indoor/outdoor) military applications |
| PCSLSH-B-CR                                               | TPE Low Smoke Halogen-Free and Flame Retardant | 100 Ft   | 30.5   | 1.05  | 26.5 | N/A                        | N/A   | Cable tray (indoor/outdoor) military applications |

Representative offering only, consult [www.panduit.com](http://www.panduit.com) for complete listing of products.

## Installation Tools



PPTMT

PBTMT

GS4MT

RT2HT

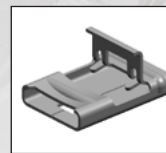
RT2HTN

| Part Number | Tie/Strap Size                                 | Best for Annual Usage | Controlled Tension | Cut-off                   | Manual/ Powered | Time to Install |
|-------------|------------------------------------------------|-----------------------|--------------------|---------------------------|-----------------|-----------------|
| PPTMT       | Standard, Light-Heavy, Heavy, MLT              | Over 50,000           | Yes                | Auto Cut-Off              | Powered         | Best            |
| PBTMT       | Heavy, Extra-Heavy, Super-Heavy, MLT           | Over 50,000           | Yes                | Auto Cut-Off              | Powered         | Best            |
| GS4MT       | Standard, Light-Heavy, Heavy, MLT              | Under 50,000          | Yes                | Auto Cut-Off              | Manual          | Better          |
| RT2HT       | Extra-Heavy and Super-Heavy, MLT               | Under 50,000          | Yes                | Lever Cut-Off             | Manual          | Better          |
| RT2HTN      | Extra-Heavy and Super-Heavy, MLT               | Under 50,000          | Yes                | Narrow Nose Lever Cut-Off | Manual          | Better          |
| ST2MT       | Standard, Light-Heavy, Heavy, Extra Heavy, MLT | Under 10,000          | No                 | Twist Cut-Off             | Manual          | Better          |
| MTRTH       | Heavy, MRT/MRS                                 | Under 50,000          | Yes                | Lever Cut-Off             | Manual          | Good            |
| BT2HT       | 3/8, 1/2 and 5/8 Wide Strapping                | Under 50,000          | Yes                | Auto Cut-Off              | Manual          | Good            |
| BT75SDT     | 3/4, Wide Strapping                            | Under 50,000          | No                 | Lever Cut-Off             | Manual          | Good            |

\*Contact customer service for high volume applications.

**Panduit**  
**stainless steel**  
**cable ties and**  
**tooling deliver**  
**safe, fast, and**  
**reliable**  
**installations.**

**Pan-Steel® Stainless Steel Strapping Unique Locking Methods\***



\*Patented



\*Patent Pending

The buckle design and tension controlled installation tool offers a quick and safe installation for all harsh environments.

HIGH VOLTAGE  
UNAUTHORIZED PERSONNEL  
KEEP OUT



ST2MT



MTRTH



BT2HT

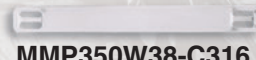


BT75SDT

**Panduit**  
permanent  
identification  
solutions offer  
flexibility and  
long service life.



MMP350-C316



MMP350W38-C316



MMP350H-C



MTB150D-Q



MEHT187



MIM



PES197

## Permanent Identification System

| Part Number | Material | Color | Length |    | Width |    | Max.<br>3/16"<br>(4.77mm)<br>Characters<br>per Line | Max.<br>Lines | Recommended<br>Tie Cross<br>Section |       |
|-------------|----------|-------|--------|----|-------|----|-----------------------------------------------------|---------------|-------------------------------------|-------|
|             |          |       | In.    | mm | In.   | mm |                                                     |               | Standard                            | Heavy |

### Metal Marker Plates – Dual Cable Tie Installation

#### Stainless Steel Marker Plates

|                |       |         |      |      |      |      |    |   |   |   |
|----------------|-------|---------|------|------|------|------|----|---|---|---|
| MMP350-C       | 304SS | Natural | 3.50 | 89.0 | 0.75 | 19.0 | 23 | 3 | X |   |
| MMP350-C316    | 316SS | Natural | 3.50 | 89.0 | 0.75 | 19.0 | 23 | 3 | X |   |
| MMP350H-C      | 304SS | Natural | 3.50 | 89.0 | 0.75 | 19.0 | 20 | 3 |   | X |
| MMP350H-C316   | 316SS | Natural | 3.50 | 89.0 | 0.75 | 19.0 | 20 | 3 |   | X |
| MMP350W38-C    | 304SS | Natural | 3.50 | 89.0 | 0.38 | 10.0 | 20 | 1 | X |   |
| MMP350W38-C316 | 316SS | Natural | 3.50 | 89.0 | 0.38 | 10.0 | 20 | 1 | X |   |
| MMP172-C       | 304SS | Natural | 1.72 | 44.0 | 0.75 | 19.0 | 8  | 3 | X |   |
| MMP172-C316    | 316SS | Natural | 1.72 | 44.0 | 0.75 | 19.0 | 8  | 3 | X |   |
| MMP172W38-C    | 304SS | Natural | 1.72 | 44.0 | 0.38 | 10.0 | 8  | 1 | X |   |
| MMP172W38-C316 | 316SS | Natural | 1.72 | 44.0 | 0.38 | 10.0 | 8  | 1 | X |   |

#### Aluminum Marker Plates

|                |          |         |      |      |      |      |    |   |  |   |
|----------------|----------|---------|------|------|------|------|----|---|--|---|
| MMP350H-CAL    | Aluminum | Natural | 3.50 | 89.0 | 0.75 | 19.0 | 20 | 3 |  | X |
| MMP350HW54-MAL | Aluminum | Natural | 3.50 | 89.0 | 0.54 | 13.7 | 16 | 2 |  | X |

### Metal Tags – Single Cable Tie Installation

#### Stainless Steel Tags

|            |       |         |       |        |      |      |          |   |   |  |
|------------|-------|---------|-------|--------|------|------|----------|---|---|--|
| MT350-C    | 304SS | Natural | 3.50  | 89.0   | 0.75 | 19.0 | 26       | 3 | X |  |
| MT350-C316 | 316SS | Natural | 3.50  | 89.0   | 0.75 | 19.0 | 26       | 3 | X |  |
| MT172-C    | 304SS | Natural | 1.72  | 44.0   | 0.75 | 19.0 | 10       | 3 | X |  |
| MT172-C316 | 316SS | Natural | 1.72  | 44.0   | 0.75 | 19.0 | 10       | 3 | X |  |
| MT1D-Q     | 304SS | Natural | 1.00* | 25.0** | N/A  | N/A  | 5        | 1 | X |  |
| MT150D-Q   | 304SS | Natural | 1.50* | 38.0** | N/A  | N/A  | 5, 6, 5  | 3 | X |  |
| MT213D-Q   | 304SS | Natural | 2.13* | 54.0** | N/A  | N/A  | 6, 12, 8 | 3 | X |  |

#### Brass Tags

|           |       |       |       |        |     |     |          |   |   |  |
|-----------|-------|-------|-------|--------|-----|-----|----------|---|---|--|
| MTB1D-Q   | Brass | Brass | 1.00* | 25.0** | N/A | N/A | 5        | 1 | X |  |
| MTB150D-Q | Brass | Brass | 1.50* | 38.0** | N/A | N/A | 5, 6, 5  | 3 | X |  |
| MTB213D-Q | Brass | Brass | 2.13* | 54.0** | N/A | N/A | 6, 12, 8 | 3 | X |  |

\*Diameter (In.) \*\*Diameter (mm).

Representative offering only, consult [www.panduit.com](http://www.panduit.com) for complete listing of product.

## On-Site Custom Marking Tools

| Part Number | Hand or<br>Tabletop | Volume | Marking Type | Marker Materials                                        | Character Fonts |
|-------------|---------------------|--------|--------------|---------------------------------------------------------|-----------------|
| MEHT187     | Hand                | Low    | Embossing    | Metal Tape: Stainless Steel, Aluminum                   | 3/16 (4.77mm)   |
| MIM094      | Tabletop            | Medium | Indenting    | Marker Plates or Tags: Stainless Steel, Aluminum, Brass | 3/32 (2.38mm)   |
| MIM125      |                     |        |              |                                                         | 1/8 (3.18mm)    |
| MIM187      |                     |        |              |                                                         | 3/16 (4.77mm)   |
| PES197      | Tabletop            | High   | Embossing    | Marker Plates: Stainless Steel, Aluminum                | 3/16 (4.77mm)   |



## Custom Marking Service

Panduit Factory Custom Marking Service simplifies identification with high quality, made-to-order custom embossed marker plates and tags or laser etched cable ties, marker plates, and tags. To select and order custom embossed marker plates and tags use on-line order form (C2-0677) at [www.panduit.com/permanentid](http://www.panduit.com/permanentid). Panduit offers fast turn around on custom marking orders worldwide. Partner with Panduit to create an effectively identified workplace.



# Compliance with Industry Standards

Panduit stainless steel cable ties, strapping, and installation tools meet and exceed the most stringent industry standards. Refer to the following chart for approvals and corresponding products. Contact Panduit for additional information and approvals.

## Pan-Steel® System Approvals



| Logo (Symbol) | Agency                          | Spec/Approval                                                                                            | Requirement                                                                                                                                                                                                                               | Applicable Products                                                                                                                                                                                                                                     |
|---------------|---------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|               | Underwriters Laboratories, Inc. | Listing E56854                                                                                           | Dimensional, tensile, temp., cycling, humidity                                                                                                                                                                                            | MLT-S, MLT-LH, MLT-H, MLT-EH15, MLT-SH, MLTDEH, MLTDSH IN 304 and 316. MSW38T15, MTW50T15, MSW63T15, MSBW38, MSBW50, MSBW63 IN 304 and 316. MSCW38T15, MSCW50T15, MSCW63T15, MLTFCFS, MLTFCSH, MLTCH, MSCNW38T15, MSCNW5015, MSCNW63T15 in 316 material |
|               | Conformite European             | Low Voltage Directive 2006/95/EC<br>MLT cable ties and MS straps also meet the requirements from EN62275 | CE Marking is required for products sold within the European Union. CE Marking Directives specify the minimum performance of these products. Applying the CE mark signifies compliance with essential requirements of specific directives | All MLT, MRT, MRS ties and MS straps                                                                                                                                                                                                                    |
|               | Amer. Bureau of Shipping        | Cert. # HS118592C<br>HS373867<br>HS152579<br>HS476898<br>HS118592A<br>HS118592B                          | Mechanical                                                                                                                                                                                                                                | All MLT ties and MS straps                                                                                                                                                                                                                              |
|               | Bureau Veritas                  | Cert. # 04048/E1                                                                                         | Material specification, dimensional, visual                                                                                                                                                                                               | All coated and uncoated MLT ties. All MS Straps uncoated and nylon coated                                                                                                                                                                               |
|               | Det Norske Veritas              | Cert. # E-12387<br>E-12388                                                                               | Salt mist test, tensile test, accelerated aging, vibration tests                                                                                                                                                                          | All uncoated MLTS, MLTH, MLTE15, MLTDEH15, MLMTSH, and MS strap coated and uncoated 316 material                                                                                                                                                        |
|               | Germanischer Lloyd              | Cert. # 32666-83HH<br>51796-89HH                                                                         | Mechanical                                                                                                                                                                                                                                | All coated and uncoated Stainless Steel MLT ties. MS Straps uncoated and nylon coated 316 material                                                                                                                                                      |
|               | Lloyd's Register of Shipping    | Cert. # 89/60123                                                                                         | Material specification, tensile test, vibration tests                                                                                                                                                                                     | All coated and uncoated stainless steel MLT ties and MS strap                                                                                                                                                                                           |
|               | SAE Int'l formerly US MIL       | AS23190 formerly MS23109E                                                                                | Dimensional, visual, vibration, temp. cycling, immersion                                                                                                                                                                                  | MLT-S and MLT-H ties in 304 and 316 material                                                                                                                                                                                                            |
|               | US Coast Guard                  | File No. 16703/46                                                                                        | Mechanical                                                                                                                                                                                                                                | MLT-H series cable ties                                                                                                                                                                                                                                 |
|               | US Military                     | MIL-T-81306A/MS90387-3                                                                                   | Mechanical                                                                                                                                                                                                                                | GS4MT installation tools                                                                                                                                                                                                                                |

**Panduit®**  
**Pan-Steel®**  
**Stainless Steel**  
**Systems meet**  
**and exceed the**  
**most stringent**  
**industry**  
**standards.**

**DANGER**  
HIGH VOLTAGE  
UNAUTHORIZED PERSONNEL  
KEEP OUT



- Industrial
- Oil Rigs
- Refineries
- Chemical Plants
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- Wind Farms
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- Nuclear
- Mining
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- Aerial Support
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## Panduit Difference

At Panduit, servicing customers is a top priority. Our world-class sales force and comprehensive customer service and technical support provide dedicated and market-focused expertise to assist you in evaluating, designing, implementing, and purchasing the products and services you need to solve your unique business challenges.

Customers count on the Panduit service advantage and global product availability to keep their projects on schedule and on budget. Whether you need product information, on-site application guidance, answers to technical questions, or a referral to one of our best-in-class partners, Panduit representatives are highly trained to provide the required assistance.

The Panduit website ([www.panduit.com](http://www.panduit.com)) provides access to interactive roadmaps, design tools, product specifications, technical guides and extensive downloads to help you select, design, and install Panduit solutions. The website also helps you connect with local Panduit service experts and distributors.

## Complete Solutions from Panduit

Panduit harsh environment solutions include the Pan-Steel® System, power and grounding connectors, identification and safety, abrasion protection, heat shrink, wiring duct, industrial ethernet, and cable tie solutions. These solutions feature Panduit world-class quality, rigorously tested to deliver the highest performance, and lowest total cost of ownership.



**Stainless Steel System**



**Power Connectors**



**Grounding System**



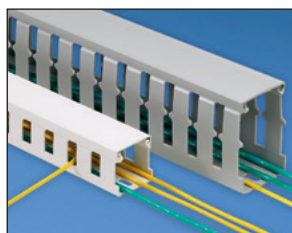
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and Safety**



**Abrasion Protection**



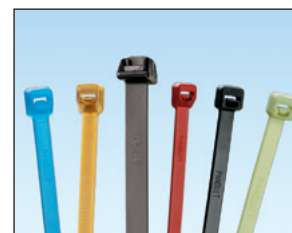
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**Cable Ties**