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PAN-STEELTM SYSTEM FOR HARSH ENVIRONMENTS
STAINLESS STEEL CABLE TIES AND STRAPPING

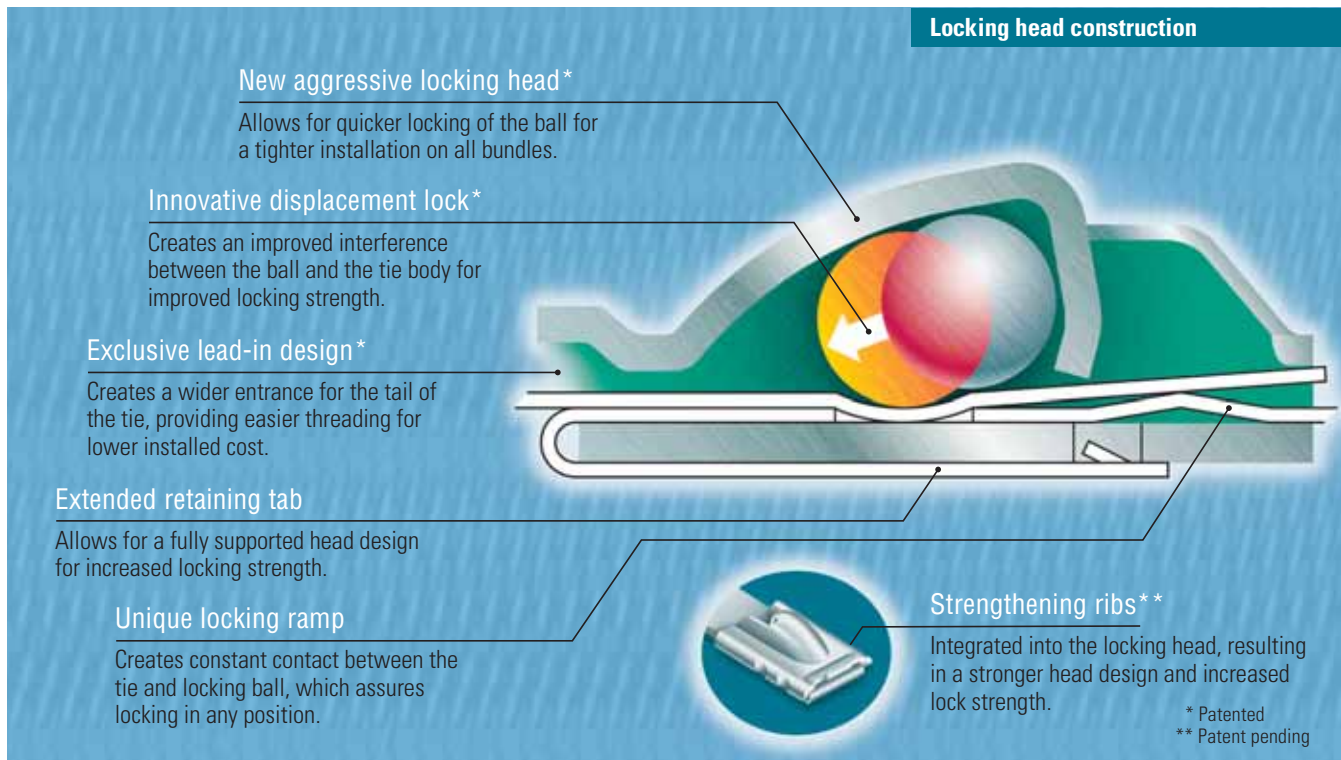


PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

A revolutionary new design in stainless steel ties!

Engineered for the most extreme applications...

- World's highest rated loop tensile strength ball locking tie for an extra margin of safety
- Aggressive head design provides higher retained tension for a more secure bundle
- Exclusive lead-in design for quick, easy threading for fastest installation time



Advantages of the Rounded Side of *PAN-STEEL™* Stainless Steel Cable Ties



Cross sectional view of other manufacturer's tie body. (Photo micrograph shown is magnified 150X).



Cross sectional view of *PANDUIT™* tie body. (Photo micrograph shown is magnified 150X).

The *PAN-STEEL™* Stainless Steel Cable Tie is designed for superior comfort and safety when handling due to its fully rounded sides and smooth surfaces, which assure cable protection and operator safety. *PANDUIT™* not only removes the burr, but actually passes the material through a secondary process which removes the top and bottom corners of the strap.



Serving you worldwide.

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Czech Republic Denmark Eastern Adriatic Ecuador Finland France Germany Greece Guam Hong Kong Hungary Iceland India
Indonesia Finland France Germany Greece Guam Hong Kong Hungary Iceland India Indonesia Ireland Israel Italy Japan
Korea Luxembourg Malaysia Mexico Middle East Morocco Netherlands New Zealand Norway Peru Philippines Poland Portugal
Puerto Rico Netherlands New Zealand Norway Peru Philippines Poland Portugal Puerto Rico Romania Russian Federation
Singapore Slovak Republic Spain Sweden Switzerland Taiwan Thailand Tunisia Turkey United Kingdom USA Venezuela***

All **PANDUIT™ PAN-NET™** non-consumable products have a 20 year warranty. When installed per TIA/EIA or ISO/IEC standards, the **PANDUIT™ PAN-NET™** System will operate the application(s) which the system was designed to support. Applications may include, but are not limited to: 10/100/1000 Mbps Ethernet (IEEE 802.3), 4/16 Mbps Token Ring (IEEE 802.5), 155/622/1.25 Gbps ATM, SONET, FDDI/CDDI and ISDN.

In order to qualify for the warranty, the system must be installed per the following: (1) Meet all TIA/EIA commercial building wiring standards; (2) **PANDUIT™** categorized product must be used in conjunction with an equivalent or higher Category UL or ETL verified cable; and (3) **PANDUIT™** products must be installed per appropriate **PANDUIT™** instruction sheets. Note: All networks shall be installed per applicable standards and manufacturer's guidelines.

If any **PANDUIT™ PAN-NET™** product fails to perform as stated above, **PANDUIT®** will provide new components at no charge. THIS WARRANTY IS MADE IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE ARE SPECIFICALLY EXCLUDED. Neither seller nor manufacturer shall be liable for any other injury, loss or damage, whether direct or consequential arising out of use of, or the inability to use, the product. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered except by an agreement signed by officers of seller and manufacturer.

All **PANDUIT™** electrical products are warranted to be free from defects in material and

workmanship at the time of sale but our obligation under this warranty is limited to the replacement of any product proved to be defective within 6 months from the date of delivery.

THIS WARRANTY IS MADE IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE ARE SPECIFICALLY EXCLUDED. Neither seller nor manufacturer shall be liable for any other injury, loss or damage, whether direct or consequential, arising out of the use of, or the inability to use, the product. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. The foregoing may not be altered except by an agreement signed by officers of seller and manufacturer.

All **PANDUIT™** tools are warranted to be free from defects in material and workmanship at the time of sale but our obligation under this warranty is limited to the replacement of any product proved to be defective within 90 days from the date of delivery. Warranty is void if **PANDUIT™** tools are modified, altered or misused in any way. Use of **PANDUIT™** tooling with any product other than the specified **PANDUIT™** products for which the tool was designed, constitutes misuse. Before using, user shall determine the suitability of the product for its intended use and user assumes all risk and liability whatsoever in connection therewith.

THIS WARRANTY IS MADE IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE ARE SPECIFICALLY EXCLUDED. Neither seller nor manufacturer shall be liable for any other injury, loss or damage, whether direct or consequential, arising out of the use of, or the inability to use, the product.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

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PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

PANDUIT™ PAN-STEEL™ Applications

Features	Benefits
Fully rounded edges. No exposed sharp cut-off	Safer to use Reduce risk of injury to installers Will not damage cable
High strength through patented ball-locking design	Increased security against shock, short circuit and vibration
Long life (>30 years)	Reduce the need for expensive periodic rework (fit and forget)
Resistant to chemicals, radiation, weather and high temperature extremes	Use in the harshest environments
Speed and ease of translation	Increased productivity and lowest installed cost

Markets



Oil and Gas (Offshore and Onshore)

Application:

Used on all cable runs

Key Features:

- Increased speed of installation
- Vibration tested (Offshore)
- Short circuit tested
- Salt spray tested
- Chemical resistant
- No sharp edges



Shipbuilding

Application:

Used on all cable runs

Key Features:

- Increased speed of installation
- Vibration tested (Offshore)
- Short circuit tested
- Salt spray tested
- Chemical resistant
- No sharp edges



Automotive

Application:

Fastening heat shields
Secure boots and gaiters

Key Features:

- Increased speed of installation
- Re-cycleable material
- No sharp edges
- Long service life
- Impervious to road salts

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

PANDUIT™ PAN-STEEL™ Applications (continued)



Aerospace

Application:

Secure anti-ice ducting
Install thermal insulation
blankets on engines

Key Features:

- Withstands temperature extremes
- Increased speed of installation
- High strength
- No sharp edges



Railways

Application:

Rail car disc brake assemblies
Rolling stock cable retention
Infrastructure cable retention

Key Features:

- High strength
- Vibration tested
- Salt spray tested (JIS-C-5028)
- Long service life
- Increased speed of installation
- Weather/chemical resistant



Nuclear Power

Application:

Secure heat trace cable
Speed of installation (reduced
installer exposure to radiation)

Key Features:

- Radiation resistant
- Long service life



Tunnels

Application:

All cable runs

Key Features:

- Increased speed of installation
- High strength
- Long service life
- Chemical resistant

PAN-STEEL™ Ball-Locking Stainless Steel Cable Ties (MLT Series)

PANDUIT™ is a leading producer of stainless steel ties for harsh environments. New designs are continually introduced to meet the application challenges encountered by our customers, while providing the lowest installed cost.



- Ball-locking
- Fully rounded edges
- Low thread force
- 100% Stainless Steel construction
- Patented displacement lock
- Unique locking ramp
- Patented lead-in design
- Extended retaining tab
- Patented aggressive locking head
- Patent pending strengthening ribs
- Complete range of installation tools

PANDUIT™ offers unique products to meet customer needs:

General Purpose Ties – Excellent performance in any environment

WAVE-TY™ Stainless Steel Ties – Unique wave form spring maintains a high tension grip on non-resilient objects

Patented Nylon 11 Selectively Coated Ties – Strength of steel, protection of nylon

Fully Coated Ties – Polyester coated for additional bundle protection

Double Loop Ties – Tighter tensioning and higher loop tensile strength

Complete range of Installation Tools – Manual and pneumatic installation tools for controlled tension, automatic cut-off and lower installed cost

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Ball-Locking Head for Fast Installation



1. Place tie around bundle, pull tip through head and pull up tight by hand.



2. Use one of the PANDUIT™ PAN-STEEL™ installation tools to tension and cut off excess tail quickly.

The stainless steel metal ball-locking tie series can be fastened by hand as shown in **Photo 1**. No tools are required. Just place around bundle, pull the tip of the tail through the locking head and pull up tight by hand. The ball-locking head secures the tie in place. **Photo 2** shows the metal ball-locking tie series being installed with the PANDUIT™ GS4MT tool, which automatically tensions and cuts off excess tie. The system provides adjustable tension control and automatic cut-off for quick, consistent and secure installation with the lowest installed cost.

Part Number System Example – MLT Series

MLT	6	S	-CP	
Part Description MLT = Metal Locking Tie MLTC = Metal Locking Tie (Selectively Coated) MLTFC = Metal Locking Tie (Fully Coated)	Bundle Diameter Reference (Inches)	Cross-Section WS = Wave Ty Standard WLH = Wave Ty Light Heavy WH = Wave Ty Heavy DH = Double Wrap Heavy DEH = Double Wrap Extra Heavy DSH = Double Wrap Super Heavy S = Standard LH = Light Heavy H = Heavy EH = Extra Heavy SH = Super Heavy	Package Qty. Q = 25 L* = 50 LP** = 50 CP = 100 *Standard Cross-Section **Heavy Cross-Section	Material (blank) = 304 316 = 316

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS



Ball-Locking Stainless Steel Cable Ties



- Strong, durable method of bundling and fastening
- Can be used in virtually all indoor, outdoor and underground (including direct burial) applications
- Well suited for network bundling of data and power cables
- Fully rounded edges and exclusive lead-in design
- Provides ultimate support for network cables
- Available in 304 grade material for general purposes and 316 grade material for most harsh corrosive environments

Part Number†			Max. Bundle Diameter	Length	Min. Loop Tensile Strength*	Min. Bundle Diameter	Width	Thickness	Recommended PANDUIT™ Installation Tool**	Std. Pkg. Qty.	Std. Ctn. Qty.	
	304	316	mm	mm	N	mm	mm	mm				
Standard Cross Section												
MLT1S-CP	304	316	25	127	890	12.7	4.3	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	100	500	
MLT2S-CP	304	316	51	201	890	12.7	4.3	0.25		100	500	
MLT2S-L	304	–	51	201	890	12.7	4.3	0.25		50	500	
MLT2.7S-CP	304	316	69	259	890	12.7	4.3	0.25		100	500	
MLT4S-CP	304	316	102	362	890	12.7	4.3	0.25		100	500	
MLT4S-L	304	–	102	362	890	12.7	4.3	0.25		50	500	
MLT6S-CP	304	316	152	521	890	12.7	4.3	0.25		100	500	
MLT8S-CP	304	316	203	679	890	12.7	4.3	0.25		100	500	
MLT10S-CP	304	316	254	838	890	12.7	4.3	0.25		100	500	
MLT12S-Q	304	–	304	998	890	12.7	4.3	0.25		25	125	
MLT14S-Q	304	–	355	1156	890	12.7	4.3	0.25		25	125	
MLT15S-Q	304	–	380	1250	890	12.7	4.3	0.25		25	125	
Light-Heavy Cross Section												
MLT2LH-LP	304	316	51	201	1112	12.7	6.4	0.25		GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLT4LH-LP	304	316	102	362	1112	12.7	6.4	0.25			50	250
MLT6LH-LP	304	316	152	521	1112	12.7	6.4	0.25	50		250	
MLT8LH-LP	304	316	203	679	1112	12.7	6.4	0.25	50		250	
Heavy Cross Section												
MLT2H-LP	304	316	51	201	2000	12.7	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250	
MLT2.7H-LP	304	316	69	259	2000	12.7	7.9	0.25		50	250	
MLT4H-LP	304	316	102	362	2000	12.7	7.9	0.25		50	250	
MLT6H-LP	304	316	152	521	2000	12.7	7.9	0.25		50	250	
MLT8H-LP	304	316	203	679	2000	12.7	7.9	0.25		50	250	
MLT10H-LP	304	316	254	838	2000	12.7	7.9	0.25		50	250	
MLT12H-Q	304	–	304	998	2000	12.7	7.9	0.25		25	125	
MLT14H-Q	304	–	355	1156	2000	12.7	7.9	0.25		25	125	
Extra-Heavy Cross Section												
MLT4EH-LP	304	316	102	434	2670	25.4	12.7	0.25		RT1HT or ST3MT	50	250
MLT6EH-LP	304	316	152	594	2670	25.4	12.7	0.25	50		250	
MLT8EH-LP	304	316	203	754	2670	25.4	12.7	0.25	50		250	
MLT10EH-LP	304	–	254	912	2670	25.4	12.7	0.25	50		250	
MLT12EH-Q	304	–	305	1072	2670	25.4	12.7	0.25	25		125	
MLT4EH15-LP	304	316	102	434	3115	25.4	12.7	0.38	50		250	
MLT6EH15-LP	304	316	152	594	3115	25.4	12.7	0.38	50		250	
MLT8EH15-LP	304	316	203	754	3115	25.4	12.7	0.38	50		250	
MLT10EH15-LP	304	–	254	912	3115	25.4	12.7	0.38	50		250	
MLT12EH15-Q	304	–	305	1072	3115	25.4	12.7	0.38	25		125	
Super-Heavy Cross Section												
MLT4SH-LP	304	316	102	434	4005	25.4	15.9	0.38	RT1HT		50	250
MLT6SH-LP	304	316	152	594	4005	25.4	15.9	0.38		50	250	
MLT8SH-LP	304	316	203	754	4005	25.4	15.9	0.38		50	250	
MLT10SH-LP	304	–	254	912	4005	25.4	15.9	0.38		50	250	
MLT12SH-Q	304	–	305	1072	4005	25.4	15.9	0.38		25	125	

†Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, if available shown e.g. MLT1S-CP316

*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

**For information on installation tools, refer to pages 11-13.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

WAVE-TY™ Superior Grip Stainless Steel Ball-Locking Ties



- Patented wave-form spring maintains greater installed tension on non-resilient objects
- Tightly clamps on applications where other stainless steel ties will not function
- Retains tension on a solid bundle with minimal applied force
- All sizes available in 316 material for the most corrosive environments
- Guarantees performance in critical applications
- Self-locking with low thread force

Part Number†	Max. Bundle Diameter		Length**	Min. Loop Tensile Strength*	Min. Bundle Diameter	Width	Thickness	Recommended PANDUIT™ Installation Tool***	Std. Pkg. Qty.	Std. Ctn. Qty.
	mm	mm								

Standard Cross Section

MLT2.7WS-LP	304	316	69	259	890	51	4.6	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLT4WS-LP	304	316	102	362	890	51	4.6	0.25		50	250
MLT6WS-LP	304	316	152	521	890	51	4.6	0.25		50	250
MLT8WS-LP	304	316	203	679	890	51	4.6	0.25		50	250

Light-Heavy Cross Section

MLT2.7WLH-LP	304	316	69	259	1112	51	6.4	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLT4WLH-LP	304	316	102	362	1112	51	6.4	0.25		50	250
MLT6WLH-LP	304	316	152	521	1112	51	6.4	0.25		50	250
MLT8WLH-LP	304	316	203	679	1112	51	6.4	0.25		50	250

Heavy Cross Section

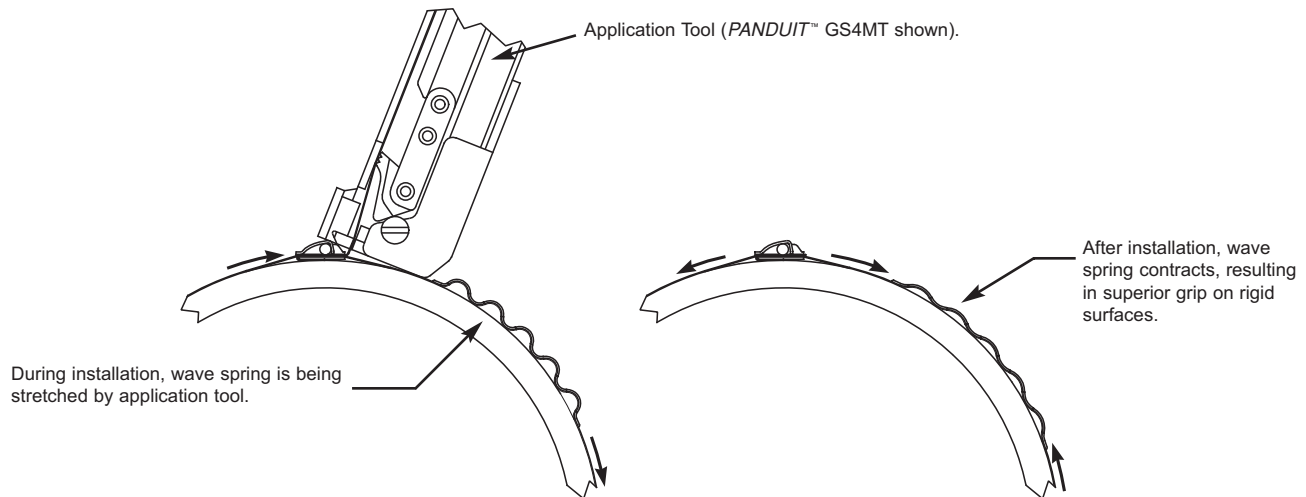
MLT2.7WH-LP	304	316	69	259	2000	51	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLT4WH-LP	304	316	102	362	2000	51	7.9	0.25		50	250
MLT6WH-LP	304	316	152	521	2000	51	7.9	0.25		50	250
MLT8WH-LP	304	316	203	679	2000	51	7.9	0.25		50	250
MLT10WH-LP	304	316	254	838	2000	51	7.9	0.25		50	250

†Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, e.g. MLT2.7WS-LP316

*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

**Other lengths available, contact customer service.

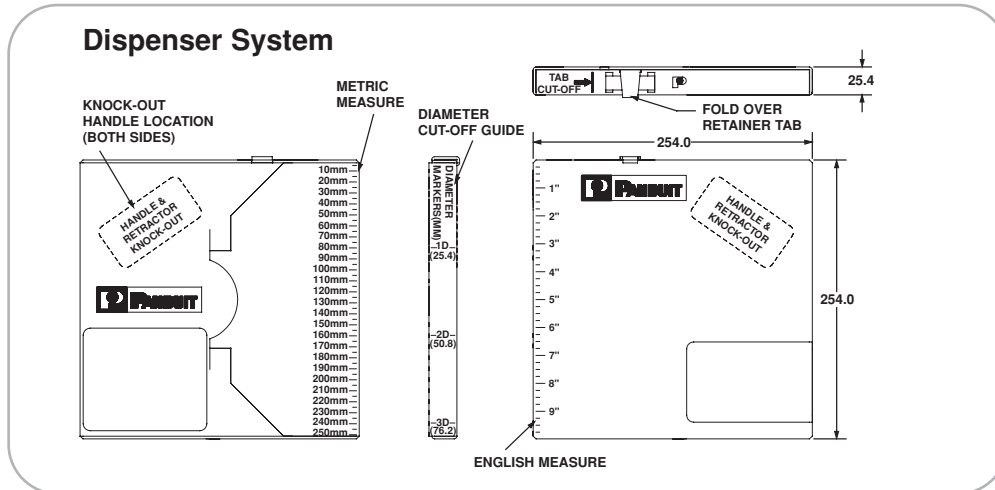
***For information on installation tools, refer to pages 11-13.



PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Custom Length Banding System

- For applications that require bundling various bundle diameters
- Supplied in reels of 61m, 76m or 305m
- Bundle any size bundle diameter
- To use, pull out as much banding as needed, cut off using GS4MT with CAMT accessory or with shears and install with appropriately sized banding heads



To determine the proper amount of banding required, use the following formula to determine length of banding needed

Calculate	Diameter (mm) x 3.14 + 76mm
------------------	--------------------------------

Example: 250mm Diameter Bundle
250mm x 3.14 = 785mm + 76mm = 861mm
of banding required.

Part Number†	Max. Bundle Diameter		Length**	Min. Loop Tensile Strength*	Min. Bundle Diameter	Width	Thickness	Recommended PANDUIT™ Installation Tool***	Recommended Banding Head	Std. Pkg. Qty.	
	mm	M									
Standard Cross Section											
MBS-TLR	304	316	Any	76	445	12.7	4.4	0.25	GS4MT, HTMT, PPTMT, ST2MT, ST3MT	MTHS-C	1
MBS-MR	304	316	Any	305	445	12.7	4.4	0.25		MTHS-C	1
Heavy Cross Section											
MBH-TLR	304	316	Any	76	1112	12.7	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT, ST3MT	MTHH-C	1
MBH-MR	304	316	Any	305	1112	12.7	7.9	0.25		MTHH-C	1
Extra-Heavy Cross Section											
MBEH-TLR	304	316	Any	76	1335	25.4	12.7	0.25	RT1HT, ST3MT	MTHEH-C	1
Super-Heavy Cross Section											
MBSH-TR	304	316	Any	61	2000	25.4	15.9	0.38	RT1HT	MTHSH-C	1

MTHS, MTHH, MTHEH and MTHSH Banding Heads

- To use, take one end of the cut banding and bend back 13mm
- Bend tail flat against bottom of banding head to complete assembly
- Take a self-locking head and slide it the entire length of the band until it reaches the bend



Part Number†			Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
MTHS-C	304	316	Loose piece banding head for Standard cross section banding	100	1000
MTHH-C	304	316	Loose piece banding head for Heavy cross section banding	100	1000
MTHEH-C	304	316	Loose piece banding head for Extra-Heavy cross section banding	100	1000
MTHSH-C	304	316	Loose piece banding head for Super-Heavy cross section banding	100	1000

†Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, e.g. MBS-TLR316 or MTHS-C316

*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

**The GS4MT with CAMT accessory is recommended for cutting the banding. This system provides a straight cut-off which assists in head assembly and eliminates the need for shears.

***For information on installation tools, refer to pages 11-13.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Coated Stainless Steel Ball-Locking Cable Ties

Enhanced Patented Nylon 11 Selectively Coated Ties



- For communication and electrical cables
- Strength of steel, the protection of nylon; the nylon coating provides protection for the cables
- Available in loop tensile strength of 1112N
- Base metal 316 grade stainless steel for excellent resistance to temperature extremes, corrosion, weather, chemicals, salt sprays and UV radiation

Nylon 11 Coating:

- Resistance to chemicals and salt sprays
- Halogen-free
- Temperature tolerance -40°C to 140°C
- Coating thickness 0.08mm
0.13mm per side

Part Number†	Max. Bundle		Min. Loop Tensile Strength*	Min. Bundle		Thickness**	Recommended PANDUIT™ Installation Tool***	Std. Pkg. Qty.	Std. Ctn. Qty.
	Diameter	Length		Diameter	Width				
	mm	mm	N	mm	mm	mm			

Heavy Cross Section

MLTC2H-LP316	–	–	51	201	1112	12.7	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLTC4H-LP316	–	–	102	362	1112	12.7	7.9	0.25		50	250
MLTC6H-LP316	–	–	152	521	1112	12.7	7.9	0.25		50	250
MLTC8H-LP316	–	–	203	679	1112	12.7	7.9	0.25		50	250
MLTC10H-LP316	–	–	254	838	1112	12.7	7.9	0.25		50	250

†Part number shown = 316 grade. *Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26. **Base material less coating.

***For information on installation tools, refer to pages 11-13.

Fully Coated Ties



- Base metal 316 grade stainless steel for excellent resistance to temperature extremes, corrosion, weather, chemicals, salt sprays and UV radiation
- Self-locking with low thread force

Polyester Coating

- Low smoke
- Halogen free
- Temperature tolerance -40°C to 150°C
- Coating thickness 0.08mm / 0.13mm per side

Part Number	Max. Bundle		Min. Loop Tensile Strength*	Min. Bundle		Thickness**	Recommended PANDUIT™ Installation Tool***	Std. Pkg. Qty.	Std. Ctn. Qty.
	Diameter	Length		Diameter	Width				
	mm	mm	N	mm	mm	mm			

Heavy Cross Section

MLTFC2H-LP316	–	–	51	201	1112	12.7	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT or ST3MT	50	250
MLTFC4H-LP316	–	–	102	362	1112	12.7	7.9	0.25		50	250
MLTFC6H-LP316	–	–	152	521	1112	12.7	7.9	0.25		50	250
MLTFC8H-LP316	–	–	203	679	1112	12.7	7.9	0.25		50	250

Super-Heavy Cross Section

MLTFC4SH-LP316	–	–	102	434	2002	25.4	15.9	0.25	RT1HT	50	250
MLTFC6SH-LP316	–	–	152	594	2002	25.4	15.9	0.25		50	250
MLTFC8SH-LP316	–	–	203	754	2002	25.4	15.9	0.25		50	250

* Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

**Base material less coating.

***For information on installation tools, refer to pages 11-13.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Double Wrapped Stainless Steel Ball-Locking Cable Ties



Cable tie body passes through head two times

- Available in 304 and 316 stainless steel for extra high strength in critical applications
- Allow for tighter tensioning on non-resilient bundles
- Available in 7.9mm, 12.7mm, 15.9mm widths for bundle diameters ranging from 25.4mm to 203mm
- Loop tensile strength up to 5340 N
- Self-locking ties – no tools required
- Optional tooling is available to speed installation and lower installed costs

Part Number†		Max. Bundle Diameter	Length**	Min. Loop Tensile Strength*	Min. Bundle Diameter	Width	Thickness	Recommended PANDUIT™ Installation Tool***	Std. Pkg. Qty.	Std. Ctn. Qty.	
											mm
Heavy Cross Section											
MLT2DH-L	304	316	50	470	2670	25.4	7.9	0.25	GS4MT, HTMT, PPTMT, ST2MT, or ST3MT	50	250
MLT4DH-L	304	316	101	711	2670	25.4	7.9	0.25		50	250
MLT5DH-L	304	–	127	863	2670	25.4	7.9	0.25		50	250
MLT6DH-Q	304	–	152	1016	2670	25.4	7.9	0.25		25	125
Extra-Heavy Cross Section											
MLT4DEH-Q	304	316	102	749	3560	25.4	12.7	0.25	RT1HT, ST3MT	25	125
MLT6DEH-Q	304	316	152	1054	3560	25.4	12.7	0.25		25	125
MLT8DEH-Q	304	316	203	1359	3560	25.4	12.7	0.25		25	125
MLT4DEH15-Q	304	316	102	749	4450	25.4	12.7	0.38		25	125
MLT6DEH15-Q	304	316	152	1054	4450	25.4	12.7	0.38		25	125
MLT8DEH15-Q	304	316	203	1359	4450	25.4	12.7	0.38		25	125
Super-Heavy Cross Section											
MLT4DSH-Q	304	316	102	749	5340	25.4	15.9	0.38	RT1HT	25	125
MLT6DSH-Q	304	316	152	1054	5340	25.4	15.9	0.38		25	125
MLT8DSH-Q	304	316	203	1359	5340	25.4	15.9	0.38		25	125

†Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, if available shown e.g. MLT2DH-L316

*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

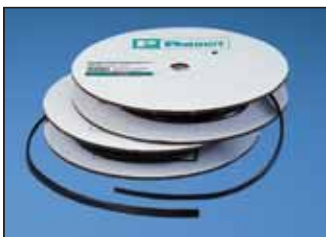
**Other lengths available, contact customer service.

***For information on installation tools, refer to pages 11-13.

PCS Cushion Sleeve



Black neoprene rubber sleeving slips on PAN STEEL™ steel ties and custom length banding and is used on applications requiring improved gripping on non-resilient objects, separation between dissimilar metals, and added bundle protection. Can be used indoors or outdoors (excellent ultraviolet resistance, good resistance to petroleum and many chemicals). Provides full separation between the ties and the material to which you are fastening. Instructions are included with the package or available upon request.



Part Number	Width	Length	Pkg. Qty.
	mm	M	
PCSS-B-CR Used with standard cross section ties or custom length banding system	8.4	30.5	1
PCSH-B-CR Used with heavy cross section ties or custom length banding system	12.0	30.5	1

Bulk Pkg. –CR = 30.5m reel.

Flammability Rating = UL94V-0
Operating Temperature Range = -5°C to 93°C

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Installation Tools for All Stainless Steel Cable Ties and Custom Length Banding System

A large selection of state-of-the-art installation tooling allows you to choose the proper tool to meet all your requirements, no matter what your application. These tools are lightweight and easy to operate. Because they are fast and efficient they speed cable tie installation and lower your total installed cost. The PANDUIT™ PPTMT and GS4MT tools automatically cut off excess tie when the pre-set tension level is reached.



ST2MT, ST3MT, PPTMT, HTMT, GS4MT, RT1HT

PPTMT Installation Tool



PPTMT (Pneumatic)
Side Entry (below)



Power assisted (pneumatic) tool will automatically tension and cut off excess tie when predetermined tension is reached with the squeeze of a trigger.

- Power assisted tool for fast and effortless installation
- Cable tie side entry for immediate positioning of tie and tool
- Controlled tension, fully adjustable
- Automatic cut-off
- One hand operation – lightweight
- Easy removal of excess tie
- Operates 586 KPA Bar non-lubricated air and requires no special maintenance

Part Number	Part Description	Std. Pkg. Qty.
PPTMT	Pneumatic hand tool used with MLT ties; MLTC and MLTFC coated ties, MLTDH double wrapped <i>WAVE-TY™</i> Stainless Steel Ties. Automatically tensions and cuts off tie when predetermined tension is reached, providing more reliable and consistent installations. Ideal for high production applications. Installs standard 4.3mm, light-heavy 6.4mm and heavy 7.9mm cross section ties.	1
PPH10	3m hose assembly; 3.175 mm NPT male connector	1
MK06	Filter regulator	1
KPPTMTG	Replacement gripper kit for PPTMT	1
KPPTMTB	Replacement blade kit for PPTMT	1

Adjustment Features for PPTMT and GS4MT Tools*

Fast and Easy Selection



The cross-section of the cable tie being installed is clearly indicated on the knob. To change, simply flip knob to proper cross-section indicator.

Tension Indicator



Each cross-section of cable ties can be installed with a variety of tensions to meet the application. The proper tensions (listed on PANDUIT™ cable tie packages) are clearly marked with this indicator.

To Change the Tension:



Turn clockwise to increase.

Turn counter-clockwise to decrease.

*For information on GS4MT installation tool, refer to page 12.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

GS4MT Installation Tool



Hand Operated Tool



CAMT

Side entry

- Single handle operation for fast installation
- Cable tie side entry for immediate positioning of tie and tool
- Controlled tension, fully adjustable
- Easy removal of excess tie
- Qualified product listed per SAE Standard MS90387-3
- When installing over resilient objects (or made resilient by using PCS cushions sleeve) automatically tensions and cuts off tie when predetermined tension is reached, providing more reliable and consistent installations
- Installs standard 4.3mm, light-heavy 6.4mm and heavy 7.9mm cross section ties

Part Number	Part Description	Std. Pkg. Qty.
GS4MT	Used with standard, light-heavy and heavy cross section MLT ties; MLTC and MLTFC coated ties, MLTDH double wrapped ties and <i>Wave-Ty</i> ™ Stainless Steel Ties.	1
K4M-BLD	Replacement cutter blade for GS4MT	1
K4MTG	Replacement tension gripper for GS4MT	1
CAMT	Cut-off accessory. Use this accessory with GS4MT tool to cut MBH or MBS continuous banding. Accessory drops in place for use.	1

Tool Tension Lock Kit



To lock fine adjustment



To lock selector knob and tension level

- For applications requiring a locking device on either the selector knob (one cross-section size and tension only) or tension level adjustment (but allow cross-section size changes)
- Replacement blade kits and gripper replacement kits can be part of a scheduled maintenance plan or used when cut-offs are not clean and crisp

Part Number	Part Description	Std. Pkg. Qty.
TTLK3	Tool Tension Locking Kit for GS4MT and PPTMT installation tools.	1

ST2MT Installation Tool



Hand Operated Tool. Installer controlled tension and cut-off

*When installing over resilient objects (or made resilient using PCS cushion sleeve).

- Single handle trigger for fast installation
- Cable tie side entry for immediate positioning of tie and tool
- One hand operation - lightweight
- Installer controlled tension
- Cut-off capability with the twist of the wrist
- Easy removal of excess tie

Part Number	Part Description	Std. Pkg. Qty.
ST2MT	<ul style="list-style-type: none"> • Tool tension is controlled by installer. Flush* cut-off is made by twisting the tool • Rugged, lightweight, easy-to-operate pliers-type toll provides mechanical advantage. • Used with MLT ties; MLTC and MLTFC coated ties and Type MLTDH double wrapped ties. 	1
KT2MG	Replacement Gripper Kit <ul style="list-style-type: none"> • Replaces tension gripper on ST2MT tool. • Can be part of a maintenance programme. • Extends life of tool. 	1

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

ST3MT Installation Tool



Hand operated tool with installer controlled tension and cut-off.

- Cable tie side entry for immediate positioning of tie and tool
- One hand operation – lightweight
- Easy removal of excess tie
- Tool tension is controlled by installer. Lever actuated cut-off
- Rugged, lightweight, easy-to-operate pliers-type tool provides mechanical advantage

Part Number	Part Description	Std. Pkg. Qty.
ST3MT	Used with standard, light-heavy, heavy, and extra-heavy cross section MLT ties, MLTC and MLTFC coated ties, MLTDH double wrapped ties and WAVE-TY™ Stainless Steel Ties.	1
KT3MG	Replacement tension gripper for ST3MT tool.	1

RT1HT Installation Tool



Hand operated tool with adjustable tension control and lever cut-off.



- Cable tie side entry for immediate positioning of tie and tool
- One or two hand tensioning with multi-position rear handle
- Adjustable tension control
- Lever actuated cut-off
- Easy removal of excess tie
- Ratchet style tool for high tension
- Rugged, lightweight, easy-to-operate ratchet tool provides mechanical advantage

Part Number	Part Description	Std. Pkg. Qty.
RT1HT	Used with extra-heavy and super-heavy cross section MLT ties, MLTFC coated ties and MLTDH double wrapped ties.	1

HTMT Installation Tool



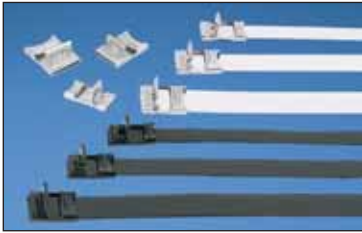
Installer controlled tension.

- Economical
- The coiled tie end remaining after tensioning assures a safe end
- No sharp edges
- Manual tension, no cut-off
- Installs ties parallel to the bundle

Part Number	Part Description	Std. Pkg. Qty.
HTMT	Used with standard, light-heavy and heavy cross section MLT ties, MLTC and MLTFC coated ties, MLTDH double wrapped ties and WAVE-TY™ Stainless Steel Ties.	1

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Stainless Steel Strapping System



The PANDUIT™ PAN-STEEL™ Stainless Steel Strapping System reduces installation time and leaves no sharp edges.

- 3 widths available: 9.5mm, 12.7mm, and 15.9mm
- Burr-free sides
- 304 and 316 stainless steel
- Designed for use in critical applications where strength, radiation, weathering, corrosion, and temperature extremes are a concern
- Temperature range: -80°C to 538°C

Unique Patented Locking Method

Hooked Clamping Tab*

Bends strap body within retention area of buckle for increased loop tensile strength and full coverage of cut end of strap

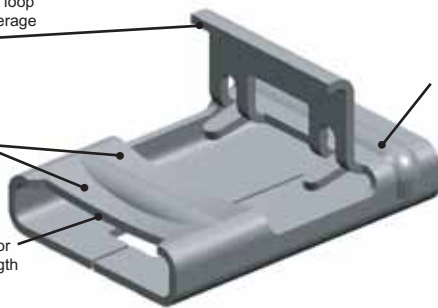
Concave Cross-section*

Enhanced support to improve tensile strength

Concave Buckle Recess*

Increases body resistance for increased loop tensile strength

*Patents Pending



Cross Rib Support*

Enhanced rigidity for higher loop tensile strength



- Buckle design provides a low finished profile
- After tensioning, cut end is locked inside buckle – no exposed sharp edge

The PANDUIT™ Method Reduces Installation Time



1. Place strap around the material, insert tail of strap through buckle. Pull strapping tight and bend up to hold in place. Insert tail of strapping into tool nose section. Squeeze handle to tension.



2. Once proper tension is reached, maintain tension and raise tool 90° – 120° over buckle and pull down on cutter lever, cutting strap.



3. Remove tool, press cut end down and toward retaining tab.



4. Using the closure lever on the handle of the tool, bend retaining tab down and over cut end. Provides finished, safe, low profile closure.

Part Number System Example

Discrete Length Part Numbering System

MS	4	W	38	T	15	L	4
Part Description	Bundle Diameter	Width	mm	Thickness	15 = 0.38	Package Qty.	Material
Metal Strap (C=Coated) (blank=Uncoated)	(Inches)		38 = 9.5 50 = 12.7 63 = 15.9			L = 50 Pcs.	4 = 304 6 = 316

Custom Length Strapping Part Number System

MS	W	50	T	15	CR	6
Part Description	Width	mm	Thickness	15 = 0.38	Package Qty.	Material
Metal Strap (C=Coated) (blank=Uncoated)		38 = 9.5 50 = 12.7 63 = 15.9			QR = 25m CR = 30.5m	4 = 304 6 = 316

Buckle Part Number System (use with Custom Length Strapping)

MS	B	W	63	C	4
Part Description	Buckle	Width	Inches	Package Qty.	Material
Metal Strap			38 = 9.5 50 = 12.7 63 = 15.9	C = 100 Pcs	4 = 304 6 = 316

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Stainless Steel Strapping



- Buckle design provides a low finished profile
- After tensioning, cut end is locked inside buckle – no sharp edges
- Buckle locked in place – will not slip down strap
- Available in both 304 and 316 material for the most corrosive environments

Part Number†	Suffix		Max. Bundle Diameter mm	Length** mm	Min. Loop Tensile Strength* N	Min. Bundle Diameter mm	Width mm	Thickness mm	Recommended PANDUIT™ Installation Tool***	Std. Pkg. Qty.	Std. Ctn. Qty.
	-4	-6									
AISI 304 Stainless Steel											
MS2W38T15-L4	304	316	51	300	2225	25.4	9.5	0.38	BT1HT, BT2MS75	50	250
MS4W38T15-L4	304	316	102	457	2225	25.4	9.5	0.38		50	250
MS6W38T15-L4	304	316	152	620	2225	25.4	9.5	0.38		50	250
MS8W38T15-L4	304	316	203	780	2225	25.4	9.5	0.38		50	250
MS10W38T15-L4	304	316	254	940	2225	25.4	9.5	0.38		50	250
MS4W50T15-L4	304	316	102	457	3115	25.4	12.7	0.38		50	250
MS6W50T15-L4	304	316	152	620	3115	25.4	12.7	0.38		50	250
MS8W50T15-L4	304	316	203	780	3115	25.4	12.7	0.38		50	250
MS10W50T15-L4	304	316	254	940	3115	25.4	12.7	0.38		50	250
MS4W63T15-L4	304	316	102	457	3560	25.4	15.9	0.38		50	250
MS6W63T15-L4	304	316	152	620	3560	25.4	15.9	0.38		50	250
MS8W63T15-L4	304	316	203	780	3560	25.4	15.9	0.38		50	250
MS10W63T15-L4	304	316	254	940	3560	25.4	15.9	0.38		50	250

†Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, if available shown e.g. MS2W38T15-L6

*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26.

**Other lengths available, contact customer service.

***For information on installation tools, refer to pages 17.

Nylon Coated Stainless Steel Strapping



- The strength of steel, the protection of nylon; the nylon coating provides protection for the bundles
 - Available in loop tensile strength up to 3560N
 - Base metal is 316 grade stainless steel for excellent resistance to temperature extremes, corrosion, weather, chemicals, salt sprays and UV radiation
- Nylon 11 Coating**
- 100% coated with Black Nylon 11, coating thickness 0.07 mm 0.13 mm per side
 - Halogen-free
 - Good in applications at temperatures down to – 40°C
 - Excellent resistance to chemicals and salt sprays
 - Upper temperature limit 140°C

Part Number	Suffix		Max. Bundle Diameter mm	Length mm	Min. Loop Tensile Strength* N	Min. Bundle Diameter mm	Width** mm	Thickness** mm	Recommended PANDUIT™ Installation Tool	Std. Pkg. Qty.	Std. Ctn. Qty.
	-4	-6									
MSC4W38T15-L6	–	316	102	457	2225	25.4	9.5	0.38	BT1HT, BT2MS75	50	250
MSC6W38T15-L6	–	316	152	620	2225	25.4	9.5	0.38		50	250
MSC8W38T15-L6	–	316	203	780	2225	25.4	9.5	0.38		50	250
MSC10W38T15-L6	–	316	254	940	2225	25.4	9.5	0.38		50	250
MSC4W50T15-L6	–	316	102	457	3115	25.4	12.7	0.38		50	250
MSC6W50T15-L6	–	316	152	620	3115	25.4	12.7	0.38		50	250
MSC8W50T15-L6	–	316	203	780	3115	25.4	12.7	0.38		50	250
MSC10W50T15-L6	–	316	254	940	3115	25.4	12.7	0.38		50	250
MSC6W63T15-L6	–	316	152	620	3560	25.4	15.9	0.38		50	250
MSC4W63T15-L6	–	316	102	457	3560	25.4	15.9	0.38		50	250
MSC8W63T15-L6	–	316	203	780	3560	25.4	15.9	0.38		50	250
MSC10W63T15-L6	–	316	254	940	3560	25.4	15.9	0.38		50	250

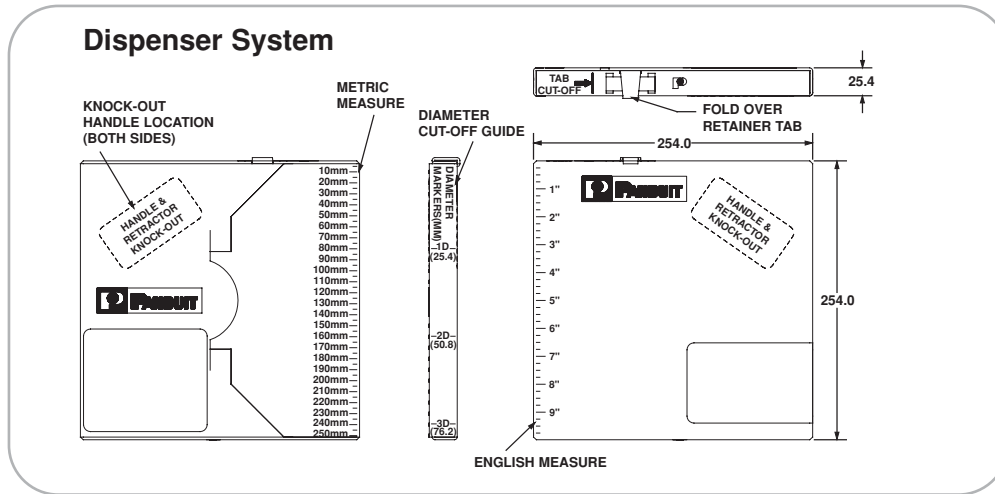
*Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26. ** Base material less coating

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Custom Length Strapping



- For applications that require various bundle diameters
- Supplied in reels of 30.5m and 25m
- 304 and 316 stainless steel
- Provides job-site versatility with minimum inventory
- Available with Nylon 11 coating or PPA 571 coating for additional edge protection



To determine the proper amount of banding required, use the following formula to determine length of banding needed

Calculate	Diameter (mm) x 3.14 + 76mm
------------------	--------------------------------

Example: 250mm Diameter Bundle
250mm x 3.14 = 785mm + 76mm = 861mm
of banding required

Part Number	Suffix		Min. Loop Tensile Str.**	Width	Thickness***	Used with Buckle	Tool	Std. Pkg. Qty.
	-4	-6						
304 Stainless Steel*								
MSW38T15-CR4	304	316	2225	9.5	0.38	MSBW38-C4	BT1HT, BT2MS75	1
MSW50T15-CR4	304	316	2225	12.7	0.38	MSBW50-C4		1
MSW63T15-CR4	304	316	2225	15.9	0.38	MSBW63-C4		1
316 Stainless Steel								
MSW38T15-CR6	—	316	3115	9.5	0.38	MSBW38-C6	BT1HT, BT2MS75	1
MSW50T15-CR6	—	316	3115	12.7	0.38	MSBW50-C6		1
MSW63T15-CR6	—	316	3115	15.9	0.38	MSBW63-C6		1
Nylon Coated Custom Length Strapping								
MSCNW38T15-QR6	—	316	3560	9.5	0.38	MSBW38-C6	BT1HT, BT2MS75	1
MSCNW50T15-QR6	—	316	3560	12.7	0.38	MSBW50-C6		1
MSCNW63T15-QR6	—	316	3560	15.9	0.38	MSBW63-C6		1
PPA Coated Custom Length Strapping								
MSCW38T15-QR6	—	316	3560	9.5	0.38	MSBW38-C6	BT1HT, BT2MS75	1
MSCW50T15-QR6	—	316	3560	12.7	0.38	MSBW50-C6		1
MSCW63T15-QR6	—	316	3560	15.9	0.38	MSBW63-C6		1

*Part number shown = 304 grade. Please add 316 suffix to part number for alternative grade, if available shown e.g. MSW38T15-CR6

Per SAE Standard AS23190/3 (formerly MIL). For additional details, refer to page 26. *Base metal less coating.

Buckles for Custom Length Strapping



- Buckle design provides a low finished profile
- No exposed sharp edge
- After tensioning cut end is locked inside buckle

Part Number*	Suffix		Strapping Width	Part Description	Std. Pkg. Qty.	Std. Ctn. Qty.
	4	6				
MSBW38-C4	304	316	9.5	Individual low profile buckles. To use, slip buckle onto strapping; turn back extended back approximately 51 mm to hold in place.	100	1000
MSBW50-C4	304	316	12.7		100	1000
MSBW63-C4	304	316	15.9		100	1000

*Replace suffix '4' with '6' for 316 grade material

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

BT1HT Installation Tool for Strapping (MS Series)



Hand operated tool. Adjustable tension control and lever actuated cut-off.

- Strap side entry
- One or two hand tensioning with multi-position rear handle
- Adjustable tension control
- Lever actuated cut-off
- Easy removal of excess strap
- Installs all sizes: 9.5mm, 12.7mm and 15.9mm

Part Number	Part Description	Std. Pkg. Qty.
BT1HT	Installation tool. Used for all widths of PANDUIT™ PAN-STEEL™ strapping. Tensions, cuts strapping, and secures the buckle tab. Ratchet-type tool provides mechanical advantage for tensioning. Easy to operate.	1

BT2MS75 Installation Tool for Strapping (MS Series)



BT2MS75

- Strap side entry (see photo)
- One or two hand tensioning with multi-position rear handle
- Lever actuated cut-off
- Easy removal of excess strap
- Installs all sizes: 9.5mm, 12.7mm and 15.9mm

Part Number	Part Description	Std. Pkg. Qty.
BT2MS75	Installation tool. Used for all widths of PANDUIT™ PAN-STEEL™ strapping. Tensions, cuts strapping, and secures the buckle tab. Allows one hand operation in otherwise difficult areas to install. Pliers-type tool provides mechanical advantage for tensioning. Easy to operate.	1
BT2N75	Replacement nose section for BT2MS75 tool. Provides the economy of repair vs. total tool replacement. Easy to install on tool.	1
KT2MG	Replacement tension gripper for BT2MS75 and ST2MT tool. Easy to install on tool. Can be part of a maintenance program. Extends life of tool.	1

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Stainless Steel, Brass and Aluminium Marker Plates and Tags



Most tags are provided with one 6.35mm hole.

- Identify pipes, conduit, valves, cables and equipment in petrochemical plants, pulp and paper mills, refineries, offshore oil rigs and in any other harsh environments
- All marker plates/tags can be custom marked by *PANDUIT™* with one of two computer controlled systems (laser or embosser) to provide permanent identification to resist corrosion, abrasion and radiation
- Use with *PANDUIT* MLT Standard and Heavy width Stainless Steel ties.



Part Number	Used with <i>PAN-STEEL™</i> Ties	Plate/Tag Size		Material	Thickness mm	Std. Pkg. Qty.	Std. Ctn. Qty.
		Width mm	Length mm				
MMP350-C	MLT-S	19	89	304 Stainless Steel	0.25	100	1000
MMP350-C316	MLT-S	19	89	316 Stainless Steel	0.25	100	1000
MMP350H-C	MLT-S/H	19	89	304 Stainless Steel	0.25	100	1000
MMP350H-C316	MLT-S/H	19	89	316 Stainless Steel	0.25	100	1000
MMP350W38-C	MLT-S	10	89	304 Stainless Steel	0.25	100	1000
MMP350W38-C316	MLT-S	10	89	316 Stainless Steel	0.25	100	1000
MMP172-C	MLT-S	19	44	304 Stainless Steel	0.25	100	1000
MMP172-C316	MLT-S	19	44	316 Stainless Steel	0.25	100	1000
MMP172W38-C	MLT-S	10	44	304 Stainless Steel	0.25	100	1000
MMP172W38-C316	MLT-S	10	44	316 Stainless Steel	0.25	100	1000
MT350-C	MLT-S	19	89	304 Stainless Steel	0.25	100	1000
MT350-C316	MLT-S	19	89	316 Stainless Steel	0.25	100	1000
MT350W38-C316	MLT-S	10	89	316 Stainless Steel	0.25	100	1000
MT172-C	MLT-S	19	44	304 Stainless Steel	0.25	100	1000
MT172-C316	MLT-S	19	44	316 Stainless Steel	0.25	100	1000
MT172W38-C	MLT-S	10	44	304 Stainless Steel	0.25	100	1000
MT338W21-Q	MLT-S	54	86	304 Stainless Steel	0.38	25	250
MTB338W21-Q	MLT-S	54	86	Brass	0.38	25	250
MT350W17-Q	MLT-S	44	89	304 Stainless Steel	0.38	25	250
MTB350W17-Q	MLT-S	44	89	Brass	0.38	25	250
MMP338W21-Q	MLT-S	54	86	304 Stainless Steel	0.38	25	250
MMPB338W21-Q	MLT-S	54	86	Brass	0.38	25	250
MMP350W17-Q	MLT-S	44	89	304 Stainless Steel	0.38	25	250
MT1D-Q	MLT-S	25 Circular	-	304 Stainless Steel	0.89	25	250
MTB1D-Q	MLT-S	25 Circular	-	Brass	1.02	25	250
MT150D-Q	MLT-S	38 Circular	-	304 Stainless Steel	0.89	25	250
MTB150D-Q	MLT-S	38 Circular	-	Brass	1.02	25	250
MT213D-Q	MLT-S	54 Circular	-	304 Stainless Steel	0.38	25	250
MTB213D-Q	MLT-S	54 Circular	-	Brass	0.38	25	250
AP350HW86-C	MLT-S/H*	22	89	Aluminium	.0.38	100	1000

*Galvanic reaction may occur between stainless steel ties and aluminium marker plates in certain environments causing the aluminium to corrode.

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

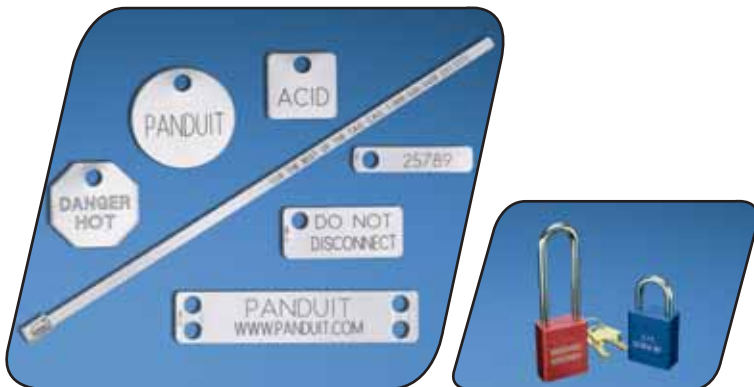
Custom Marking Capabilities

Custom Marking Capabilities on PANDUIT™ PAN-STEEL™ Stainless Steel Cable Ties, Strapping, Metal Marker Plates/Tags and Anodized Aluminium Locks*



PANDUIT™ stainless steel cable ties, strapping, stainless steel, brass and aluminium marker plates/tags and anodized aluminium locks can be custom marked for identification of equipment, cables, hoses, pipes, conduit, etc. in petrochemical plants, power plants, pulp and paper mills, breweries, and many other applications. PANDUIT™ in-house computer controlled custom marking systems provide sharp, crisp, high quality legends. Sequential numbering for serialization is available.

* Anodized aluminium locks can only be marked by the laser system.



LASER MARKING SYSTEM

- Used on all stainless steel cable ties, strapping, metal marker plates/tags and anodized aluminium locks
- BOLD block letters
- Upper and lower case character capability
- Alphanumeric and sequential numbering ability

Character Sizes** Available:

3.18mm	6.35mm	4.77mm
7.94mm	12.7mm	

**Contact customer service for other available character sizes.



EMBOSSING SYSTEM

- Used on metal marker plates and tags which are a maximum of 0.5 mm thick
- Excellent for applications that are exposed to occasional painting and excessive dirt
- Upper case "raised" character capability only
- Alphanumeric and sequential numbering ability

Character Sizes** Available:

3.18mm	4.77mm
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PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Metal Marking Devices

Metal Embossing Tape System



Used with *PAN-STEEL™* ties and accessories



Used with *PAN-STEEL™* ties and accessories



Tool punches a single 5mm diameter hole (For Std. Cross section tie) or a series of holes for wider cross-section sizes.

- Embosses 5mm characters onto rolls of stainless steel or aluminium tape
- Excellent for on-site applications requiring quick, easy and permanent identification
- Can be used with *PAN-STEEL™* Stainless Steel Ties as a flag or a marker

Part Number	Part Description	Std. Pkg. Qty.
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Tool Kit

MEHT	Includes tool, carrying case, 1 roll each META aluminium and METS4 (stainless) tape. Characters Include: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 2 3 4 5 6 7 8 9 . /	1
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Tape

META-X	12.7mm X 4.9m aluminium tape*.	10
METS3-X	12.7mm X 6.4m 316 grade stainless steel tape.	10
METS4-X	12.7mm X 6.4m 304 grade stainless steel tape.	10

* Galvanic reaction may occur between stainless steel ties and aluminium tape in certain environments causing the aluminium to corrode.

Indenter Press



Easy-to-operate manual indenter press. Interchangeable indenter wheels in three character sizes are available.

- For identification in various environments
- Provides quick easy and permanent identification of *PANDUIT™ PAN-STEEL™* Stainless Steel Cable Ties, Straps, Marker Plates, and Tags
- Interchangeable wheels
- Press includes fixture to hold MMP350 series marker plates, MLT series cable ties, and MS strapping in place to provide high quality marking
- Tool is designed for long life and durability
- Automatic table indexing
- Depth adjustment screw

Part Number	Part Description	Std. Pkg. Qty.
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Press

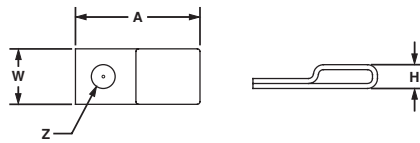
IMP094	Indenter press with 2.38mm character wheel.	1
IMP125	Indenter press with 3.18mm character wheel.	1
IMP187	Indenter press with 4.77mm character wheel.	1

Interchangeable Wheel Kits

MWK094	2.38mm character wheel kit (wheel and indexing gear).	1
MWK125	3.18mm character wheel kit (wheel and indexing gear).	1
MWK187	4.77mm character wheel kit (wheel and indexing gear).	1
IMP-FIX	Interchangeable fixture for MMP172, MMP338, MT Series, and the aluminium marker plates.	1

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Tie Mount

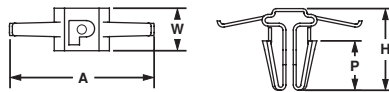


- Low profile
- One hole mounting
- For use with standard, light-heavy and heavy cross section MLT ties as well as 9.5mm wide strapping
- 304 Stainless Steel only

Part Number	Used with PAN-STEEL™ Ties/Strapping	Mounting Method*	Length A	Width W	Height H	Hole Diameter Z	Std. Pkg. Qty.	Std. Ctn. Qty.
			mm	mm	mm	mm		
MTM1H-C	MLTS/LH/H,	M4 screw	22.9	10.2	4.4	4.4	100	1000
MTM1H10-C	MLTS/LH/H,	M5 screw	22.9	10.2	4.4	5.4	100	1000
MTM1H25-C	MLTS/LH/H,	M6 screw	22.9	10.2	4.4	7.1	100	1000

*Stainless steel screws are recommended for fastening to avoid corrosion problems associated with dissimilar metals.

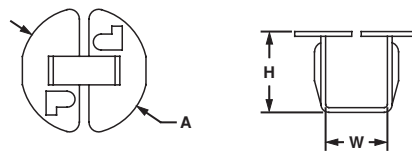
Push Mount



- No tapping required
- Used where only one side of the panel is accessible
- Nothing to assemble
- For use with standard, light-heavy and heavy cross section MLT ties
- 304 Stainless Steel only

Part Number	Used with PAN-STEEL™ Ties/Strapping	Mounting Method	Length A	Width W	Height H	Panel Thickness P	Std. Pkg. Qty.	Std. Ctn. Qty.
			mm	mm	mm	mm		
MPWM-H56-Q	MLTS/LH/H	Inserted into pre-drilled hole 8 mm.	24.7	7.3	14.2	0.8 – 2.4	25	250

Push Button Mount

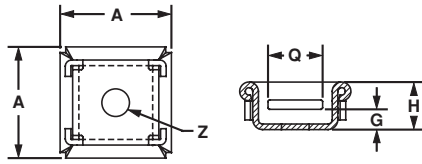
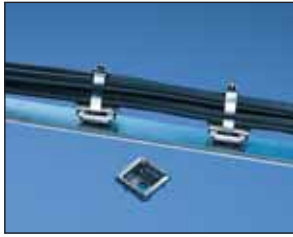


- Low profile
- No tapping required
- Designed for use only where both sides of the panel are accessible
- For use with standard cross section MLT ties
- 304 Stainless Steel only

Part Number	Used with PAN-STEEL™ Ties/Strapping	Mounting Method	Length A	Width W	Height H	Panel Thickness	Std. Pkg. Qty.	Std. Ctn. Qty.
			mm	mm	mm	mm		
MBM-H25-Q	MLT-S	Inserted into pre-drilled hole 6.4 mm.	10.0	5.0	6.5	0.8 – 3.0	25	250

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

2-Way Mount

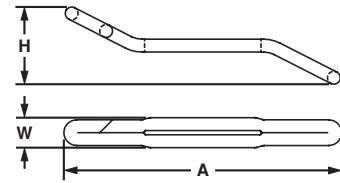
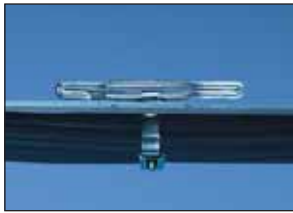


- Two-way mount allows stainless steel cable ties to be inserted from either of two sides
- Low profile
- Single hole center mounting for maximum holding and stability
- Maximum screw head height 2.3mm
- For use with standard, light-heavy and heavy cross section MLT ties
- 304 Stainless Steel only

Part Number	Used with PAN-STEEL™ Ties/Strapping	Mounting Method*	Length A	Height H	Screw Head Height G	Slot Width Q	Hole Diameter Z	Std. Pkg. Qty.	Std. Ctn. Qty.
			mm	mm	mm	mm	mm		
MTM2H-Q	MLTS/LH/H	M4 screw	18.0	8.0	2.3	9.0	4.5	25	250

*Stainless steel screws are recommended for fastening to avoid corrosion problems associated with dissimilar metals.

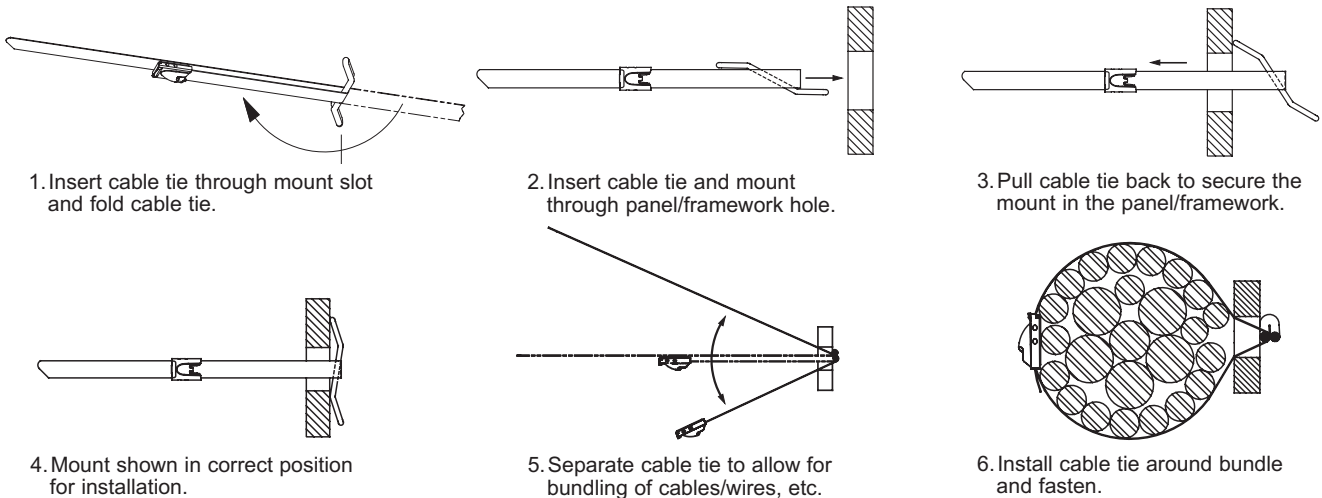
Bulkhead Mount



- Zero profile
- Mounts directly to surface
- Used where only one side of the panel is accessible
- Permanent, secure application
- Used with standard, light-heavy and heavy cross section MLT ties
- 304 Stainless Steel only

Part Number	Used with PAN-STEEL™ Ties/Strapping	Mounting Method	Length A	Width W	Height H	Max. Panel Thickness	Std. Pkg. Qty.	Std. Ctn. Qty.
			mm	mm	mm	mm		
MTMBH-Q	MLTS/LH/H	Pre-drill hole size Standard and Light Heavy cross section MLT-S/LH 9.5 – 12.7 Heavy cross section MLT-H 12.7 – 15.9	48.5	5.3	13.7	12.7	25	250

To Install Bulkhead Mount:



PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Stackable Aerial Cable Spacer



Stackable Spacers (SACS50-T100) and Stainless Steel Ties (MLT4H-LP).

- Just one part to inventory
- Spacer snaps by hand into another to increase spacer height by 12.7mm increments

- Only one part, on-site sorting is eliminated
- Used with cable ties up to 19mm wide in parallel or perpendicular applications

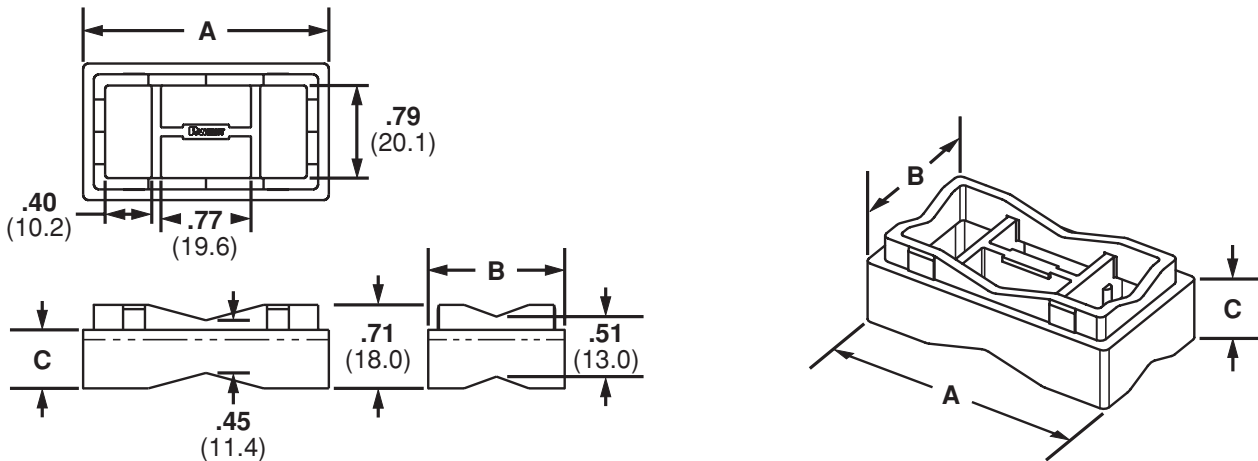


PANDUIT™ cable ties and spacers are used to separate the support strand from the cable or to separate two cables in aerial lashing applications.



Part Number	Used with Cable Ties	Dimensions			Material	Colour	Environment	Mounting Method	Std. Pkg. Qty.	Std. Ctn. Qty.
		A mm	B mm	C mm						
SACS50-T100	See Footnote	52.8	29.5	12.7	Weather Resistant Polypropylene	Black	Outdoors	Cable Ties	200	2000

Stackable spacers may be installed using stainless steel cable ties or weather resistant cable ties (see Cable Ties & Wiring Accessories Catalogue)



PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Stainless Steel Tie Technical Information

Physical Characteristics of Stainless Steel Cable Ties (MLT Series)

PAN-STEEL™	Stainless Steel
Tensile Strength 23° C	90,000* PSI
Colour	Stainless
Flammability	Non-flammable
Radiation Resistance	2 X 10 ⁸ Rads
Water Absorption	None

PAN-STEEL™	Stainless Steel
Max. Continuous Use Temperature	538° C for 304 & 316 material
Min. Continuous Use Temperature	-80° C for 304 & 316
Ultraviolet Light Resistance	Excellent

* ASTM E8 Test Method

PANDUIT™ Stainless Steel Cable Tie and Strapping Approvals

AGENCY	SPEC / APPROVAL	REQUIREMENT	APPLICABLE PRODUCTS	AGENCY	SPEC / APPROVAL	REQUIREMENT	APPLICABLE PRODUCTS
SAE Int'l formerly US MIL	AS23190 formerly M\$23190E	Dimensional, visual, vibration, temp. cycling, immersion, melting point	MLT-S & MLT-H Series and heavy cable ties in both 304 & 316 material	Underwriters Laboratories	E56854	Dimensional, tensile, temp., cycling, humidity	MLT-S, MLT-H, MLT-WS, & MLTWH in 304, 316, and 321 material
Det Norske Veritas	Cert. E-7305 E-7306	Salt mist test, tensile test, accelerated aging, vibration tests	MLT ties in 316 material MS/MSC strapping in 316 material	Germanischer Lloyd	Cert. 32-666-83HH 51-796-89HH	Mechanical	All MLT Ties and MS Straps
Amer. Bureau of Shipping	Cert. 99-CH18282-X 04-HS476898-PDA	Mechanical	All MLT ties and MS strapping in 304 and 316 material MLTC ties in 316 material	US Coast Guard	File No. 16703/46	Mechanical	MLT-H Series Cable Ties
Lloyd's Register of Shipping	Cert. 89/60123(E2)	Material specification, tensile test, vibration tests	All MLT & MS ties and straps in both 304 and 316 material	US Military	MIL-T-81306A MS90387-3	Mechanical	GS4MT Installation tools
Bureau Veritas	Cert. 04048/D2	Material specification, dimensional, visual	MLT ties in 304 and 316 material	RINA	Cert. #ELE71502CS	Mechanical	All MLT ties

Approvals



Military Specification
MIL-S-23190E



E56854



Cert. 99CH18282-X



United States
Coast Guard



Bureau
Veritas



Det Norske
Veritas



Lloyd's Register
of Shipping



Germanischer
Lloyd



RINA



PANDUIT™ PAN-STEEL™ System

FOR HARSH ENVIRONMENTS

Chemical Resistance at 21°C Temperature

Chemical	%	304 & 316 Stainless Steel*	Chemical	%	304 & 316 Stainless Steel*	Chemical	%	304 & 316 Stainless Steel*	Chemical	%	304 & 316 Stainless Steel*
Arsenic Acid	40	E	Cider		E	Methyl Alcohol	100	E	Sodium Bisulfate	10	E
Acetone	100	E	Diochloroethane	100	E	Methyl Chloride	100	E	Sodium Borate	All	E
Aluminum Hydroxide	AQ C.S.	E	Diethyl Ether	100	E	Methyl Ethyl Ketone	100	E	Sodium Carbonate	5	E
Ammonium Carbonate	5	E	Ethyl Alcohol	100	E	Naphtha	100	E	Sodium Chlorate	25	E
Ammonium Hydroxide	10	E	Ethyl Chloride	100	E	Nitric Acid	30-70	E	Sodium Chloride	2	E
Ammonium Nitrate		E	Ethyl Glycol	100	E	Nitrous Acid	5	E	Sodium Fluoride	5	F
Ammonium Sulfate	10	S	Ferric Hydroxide	All	E	Oleic Acid	100	E	Sodium Hydroxide	10	E
Barium Carbonate	All	E	Ferric Nitrate	10	E	Oxalic Acid	10	E	Sodium Hyposulfite	AQ C.S.	E
Barium Chloride	5	E	Ferrous Sulfate	10	E	Paraffin	100	E	Sodium Nitrate	5	E
Barium Sulfate	10	E	Fuel Oil	100	E	Petroleum Ether	100	E	Sodium Nitrite	AQ C.S.	E
Barium Sulfide	10	E	Furfural	100	E	Phenol	90	E	Sodium Perchlorate	10	E
Benzene	100	E	Gallic Acid	AQ C.S.	E	Phosphoric Acid	10	E	Sodium Phosphate	5	E
Benzoic Acid	100	E	Gasoline	100	E	Picric Acid	1	S	Sodium Sulfate	5	E
Butyric Acid	50	E	Glycerine	100	E	Potassium Bromide	AQ C.S.	S	Sodium Thiosulfate	5	S
Calcium Carbonate	AQ C.S.	E	Hydrocyanic Acid	All	E	Potassium Carbonate 1%		E	Stearic Acid	100	E
Calcium Chlorate	10	E	Hydrogen Peroxide	30	E	Potassium Chlorate	AQ C.S.	E	Sulfur	100	E
Calcium Hydroxide	20	E	Hydrogen Sulfide	Dry	E	Potassium Dichromate	40	E	Sulfur Dioxide	All	E
Calcium Hydrochlorite	2	F	Idoform	100	E	Potassium Ferrocyanide	25	E	Sulfuric Acid	100	E
Calcium Sulfate	2	E	Isopropyl Alcohol	100	E	Potassium hydroxide	5	E	Sulfuric Acid	5	F
Carbon Tetrachloride			Jet Fuel	100	E	Potassium Iodide	All	E	Tannic Acid	10	E
Chlorine (Wet)		F	Lactic Acid	100	E	Potassium Nitrate	50	E	Tartaric Acid	50	E
Chlorine (Dry)		F	Lanolin	10	E	Potassium Permanganate	5	E	Tetrahydrofuran	100	E
Chloroacetic Acid	30	F	Lead Acetate	5	E	Potassium Sulfate	5	E	Toluene	100	F
Chloroform	100	E	Magnesium Carbonate	All	E	Potassium Sulfide	AQ C.S.	E	Xylene	100	E
Chromic Acid	5	E	Magnesium Chloride	10	F	Propyl Alcohol	100	E	Zinc Chloride	70	E
Citric Acid	50	E	Magnesium Nitrate	All	E	Silver Nitrate	10	E	Zinc Nitrate	AQ C.S.	E
Copper Cyanide	10	E	Malic Acid	AQ C.S.	E	Sodium Acetate	60	E	Zinc Sulfate	AQ C.S.	E
Copper Nitrate	50	E	Mercury	100	E	Sodium Bicarbonate	All	E			

*E = Excellent S = Satisfactory F = Fair AQ C.S. = Aqueous Cold Saturated All = All % Concentrations

PANDUIT™ PAN-STEEL™ System FOR HARSH ENVIRONMENTS

Rigorous Tests and Physical Properties of Stainless Steel Ties

STRENGTH: PANDUIT™ PAN-STEEL™ Stainless Steel Ties are tested per the U.S. Military Specification MIL-S-23190, minimum loop tensile test. This test consists of applying a tie to a split mandrel and then measuring the force required to separate the 2 halves until the tie fails.

TEMPERATURE EXTREMES: PANDUIT™ PAN-STEEL™ Stainless Steel Ties are 100% stainless steel in the alloy provided (locking head, locking ball and body all provided from the same grade of material ordered).

Various temperature tests have been successfully completed. One such test is the U.S. Military Temperature Cycling Test per Thermal Shock Method 107, Test Condition B of MIL-STD-202F. This test exposes the parts from low temperature -65°C to high temperature 135°C to low temperature -65°C. After exposure, the parts must be free of cracks, distortions, breaks, release of locking device, and meet the minimum loop tensile requirements.

VIBRATION: PANDUIT™ PAN-STEEL™ standard cross section ties have passed the U.S. Military random vibration Test Method 214. Test Condition II, Letter J of MIL-STD-202. This test consists of applying parts to a bundle and then vibrating them with random vibration for 8 hours in each of two mutually perpendicular directions. The parts are then subjected to further temperature testing and finally have to pass the minimum loop tensile strength test.

SALT SPRAY: PANDUIT™ PAN-STEEL™ Stainless Steel Ties have been subjected to salt spray tests without signs of corrosion or reduction in performance.

OUTDOOR EXPOSURE: PANDUIT™ PAN-STEEL™ Stainless Steel Ties have been exposed outdoors at New Lenox, Illinois USA since 1985. At the printing of this catalogue, there has been no sign of corrosion or loss of performance.

FLUID IMMERSION: PANDUIT™ PAN-STEEL™ Stainless Steel Ties were immersed in: 1-Hydraulic Fluid, 2-Turbine Fuel, 3-Lubricating Oil, and 4-Isopropyl Alcohol for 4 hours at temperatures of 50°C. Per SAE Standard AS23190/3, the parts were then subjected to and passed the minimum loop tensile test.

RADIATION: Installed cable ties of various materials have been exposed to different amounts of radiation to determine the maximum acceptable limit. These tests were conducted by PANDUIT™ to determine the acceptability for use in various areas of nuclear power plants (accumulated over 40 year life). Radiation resistance is 2×10^8 rads.



Military Cross Reference (AS23190)	
PANDUIT™ Part Number	Current Military Standard Part Number
MLT2S-CP	AS23190/3-1
MLT2S-CP316	AS23190/3-1
MLT4S-CP	AS23190/3-2
MLT4S-CP316	AS23190/3-2
MLT6S-CP	AS23190/3-3
MLT6S-CP316	AS23190/3-3
MLT8S-CP	AS23190/3-4
MLT8S-CP316	AS23190/3-4
MLT2H-LP	AS23190/3-5
MLT2H-LP316	AS23190/3-5
MLT4H-LP	AS23190/3-6
MLT4H-LP316	AS23190/3-6
MLT6H-LP	AS23190/3-7
MLT6H-LP316	AS23190/3-7
MLT8H-LP	AS23190/3-8
MLT8H-LP316	AS23190/3-8
MLT10H-LP	AS23190/3-9
MLT10H-LP316	AS23190/3-9

***PANDUIT™ PAN-STEEL™ System
FOR HARSH ENVIRONMENTS***

NOTES

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NOTES