

Introduction

In June 1898 Thomas and Betts was founded in New York. The Corporate Headquarters located in Memphis Tennessee with the Company being listed on the New York Stock Exchange. We now have over 100 years of experience of successfully supplying quality products to the market by using innovative design and manufacturing techniques. A truly Global player having a presence in North America, Central America, Australia, Far East, Middle East and Europe. With approximately 13,000 Employees dedicated to ensuring that Thomas and Betts is Fast, Flexible and Customer Focused whilst continually increasing Customer Satisfaction combined with over 100,000 part numbers its true, we are becoming the supplier of choice with some of the leading Brands in the Electrical World.

The basis of Thomas & Betts product superiority has always been innovative engineering. No other company can match our record of “firsts” in product development that increases performance whilst reducing installation time and human error. To Name three:

The first Solderless Lug, a boost to safety in complex electrical installations.

Color-Keyed® system of compression connectors designed to ensure that proper installation procedures were used, quickly became the industry standard.

Ty-Rap® the original cable tie was introduced to manage complex wire harnesses used in aircraft manufacturing. Today the cable tie is used by virtually everyone for a variety of applications.



The European Headquarters are located at Rhode-St-Genèse near Brussels. From a logistics point of view we have a Centralised European Distribution Centre in La Louvière, Belgium supplying to our Customers throughout Europe. Our manufacturing sites throughout Europe include Germany, France, Hungary, UK and The Netherlands.

Whilst one of our main business remains in the Electrical Products, Thomas & Betts also has leading Brands along with significant Market Share in Emergency Lighting, Safety Systems, Steel Structures, Communications, Electronic Systems Protection, Earthing and Lightning protection.

Maintaining the Technical excellence of existing products along with new product innovation is part of our core competence as we continue to provide competitive solutions to our customers across the World.



Your European connection

ELECTRICAL COMPONENTS

EUROPEAN HEADQUARTERS

Chaussée de Waterloo 200
B-1640 Rhode St. Genèse
BELGIUM
CUSTOMER SERVICE
Tel: +32 (0)64 88 63 88
Fax: +32 (0)64 88 65 50

EUROPEAN DISTRIBUTION CENTER

Gare Autoroutière
B-7110 Houdeng-Goegnies
BELGIUM
CUSTOMER SERVICE
Tel: +32 (0)64 88 63 88
Fax: +32 (0)64 88 65 50

UNITED KINGDOM IRELAND / MIDDLE EAST

Wilford Road
Nottingham NG2 1EB
UNITED KINGDOM
CUSTOMER SERVICE
Tel: +44 (0) 115 964 3820
Fax: +44 (0) 115 986 0538

FRANCE

29, Rue Dëlizy
F-93698 Pantin Cedex
FRANCE
SERVICE CLIENT
Tel: +33 (0)1 41 83 16 95/96
Fax: +33 (0)1 41 83 16 97

GERMANY

Lindberghstrasse 5
D-64625 Bensheim
DEUTSCHLAND
CUSTOMER SERVICE
Tel: +49 (0)6251 669 199/ 165/ 132
Fax: +49 (0)6251 669 176

ITALY

Via Paracelso 26
I-20041 Agrate Brianza (MI)
ITALY
CUSTOMER SERVICE
Tel: +39 039 657 90 32
Fax: +39 039 657 90 80



The Thomas & Betts catalogue is published "as is" without any warranty of any kind, express or implied, as to the accuracy of the information or the products or services referred to in it. Although, the content of this publication has been carefully checked for accuracy Thomas & Betts shall not be liable for any losses or damage that may result from any use or as a consequence of any inaccuracies in, or any omissions from, the information which it may contain.

© Copyright Thomas & Betts 2004. Copyright in these pages is owned by Thomas & Betts except where otherwise indicated. No part of this publication may be reproduced, copied or transmitted in any form or by any means, without our prior written permission. Images, trade marks, brands, designs and technology are also protected by other intellectual property laws and may not be reproduced or appropriated in any manner without written permission of their respective owners.

Thomas & Betts reserves the right to change and improve any product specifications or other mentions in the catalogue at its own discretion and at any time.

These conditions of use are governed by the laws of The Netherlands and you agree that the courts of Amsterdam shall have exclusive jurisdiction in any dispute.

Chapter overview

Fastening systems

4

**Electrical and mechanical
spring steel fasteners**

124

Heat shrink systems

188

Conduit & fittings

222

Termination systems

294

Index

406



+ ***Ty-Rap***[®]

+ ***Ty-Fast***[®]

+ ***Ty-Met***[™]

+ ***Col-Ty***[™]

+ ***Ty-Grip***[™]

+ ***Safe-Ty***[™]

+ ***Deltec***

+ ***Bind-It***[™]

one

1. Fastening systems

1.1	Cable ties	7
1.2	Accessories	65
1.3	Cable protection systems	95
1.4	Tooling	103
1.5	Material specifications	113





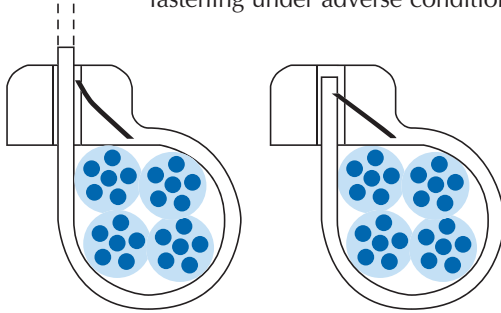
+ *Fastening systems*
To bundle, secure and
manage your cables

1. Fastening systems

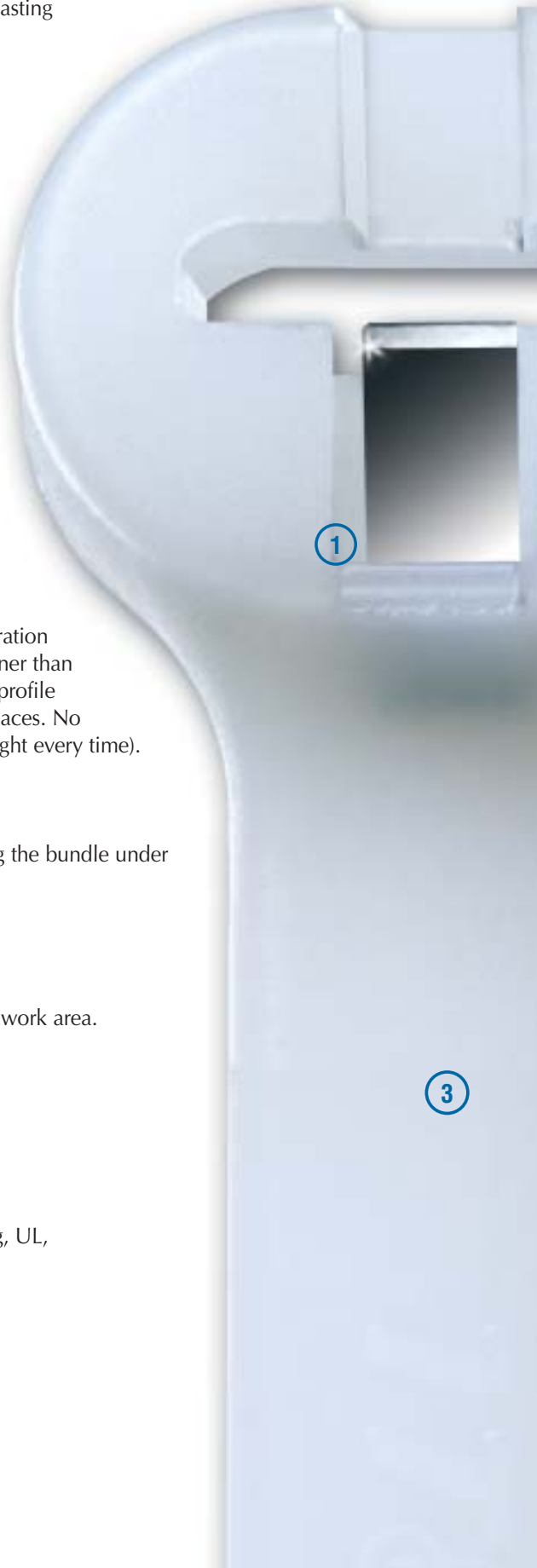
1.1	Cable ties	7
	Ty-Rap®	8
	Characteristics	8
	Product reference structure	10
	Standard ties	11
	Special ties	22
	Deltec	36
	Cable ties	36
	Accessories	39
	Ty-Fast®	41
	Overview	41
	Product reference structure	41
	Standard ties	42
	Special ties	46
	Safe-Ty™	51
	Col-Ty™	52
	Ty-Met™	55
	Introduction	55
	Ball-Lock type	57
	Ladder type	59
	Releasable type	60
	Multi purpose band	61
	Ty-Grip™	62
1.2	Accessories	65
1.3	Cable protection systems	95
1.4	Tooling	103
1.5	Material specifications	113



- 1 **“The Grip of Steel” Non-Magnetic Stainless Steel Locking Device – marine grade type 316** - that firmly anchors inside the tie head, ensures a strong, reliable and long lasting fastening under adverse conditions.



- 2 **Rounded Edges**, on the head and the strap, provide a comfortable handling of the ties and prevent sharp edges from damaging the cables. This gradual transition from the strap to the head protects the material against breaking at this most critical point. The edges of the head are also rounded off to offer maximum protection from injury.
- 3 **Smooth, Notchless Body**, reduces stress concentration points, making the Ty-Rap® ties stronger and thinner than conventional ties with notched bodies. The low-profile design of the head allows secure tying in tight spaces. No serration, means infinite adjustment (tensioned right every time).
- 4 **Ribbed and Stippled Surface**, to prevent the tie from slipping around and along the bundle under vibration conditions and external shock.
- 5 **Angled Tail (turned up)** for fast and easy insertion into the locking head and ideally suited to being picked up from a flat work area.
- 6 **Non-Slip Tail**, for an easy grip and pulling through the head during tensioning.
- 7 **Extensive Range of Approvals:** Germanischer Lloyd, Lloyd's Register of Shipping, UL, VG and MIL.





E49405



6

5

Most Extensive Choice of Special Materials:

in addition to Polyamide 6.6 (standard, UV-resistant, heat stabilised, flame retardant, heat stabilised/UV-resistant), Polyamide 4.6 (extra high temperature) and Polyamide 12, the Ty-Rap® ties are available in Polypropylene, Halar®* (ECTFE), Tefzel®** (ETFE). UL 94 V-0, UL 94 V-2 and UL 94 HB.

8

Wide Range of Size Combinations:

several lengths up to 1143mm, in 6 typical widths with a tensile strength up to 780N, to fasten cable bundles with a diameter up to 330mm.

9

Wide Choice of Colours:

10 standard colours are available, along with a range of special colours and the capability to supply customised pre-printed ties on demand, in any one of the 10 standard colours.

10

Dedicated Tooling,

to ensure that the excess end of the Ty-Rap® tie is automatically cut off and the slight over cut retracts into the head, eliminating the risk of injury from protruding sharp edges.

11

Different Types of Packaging,

including the unique "workbench boxes" for fast working without problems or losses. Recyclable packaging for a better contribution to the environment.

12

Outstanding Range of Special Ties,

all with the famous stainless steel locking device: ties with mounting hole or integrated peg/nail, panel mounting ties, identification ties with integrated label,...

13

Broad Range of Mounting Bases and Accessories.

14



UV-resistant



Flame retardant



Heat resistant



Weatherproof



Low temperature flexibility



Radiation resistant



Chemically resistant



Low smoke

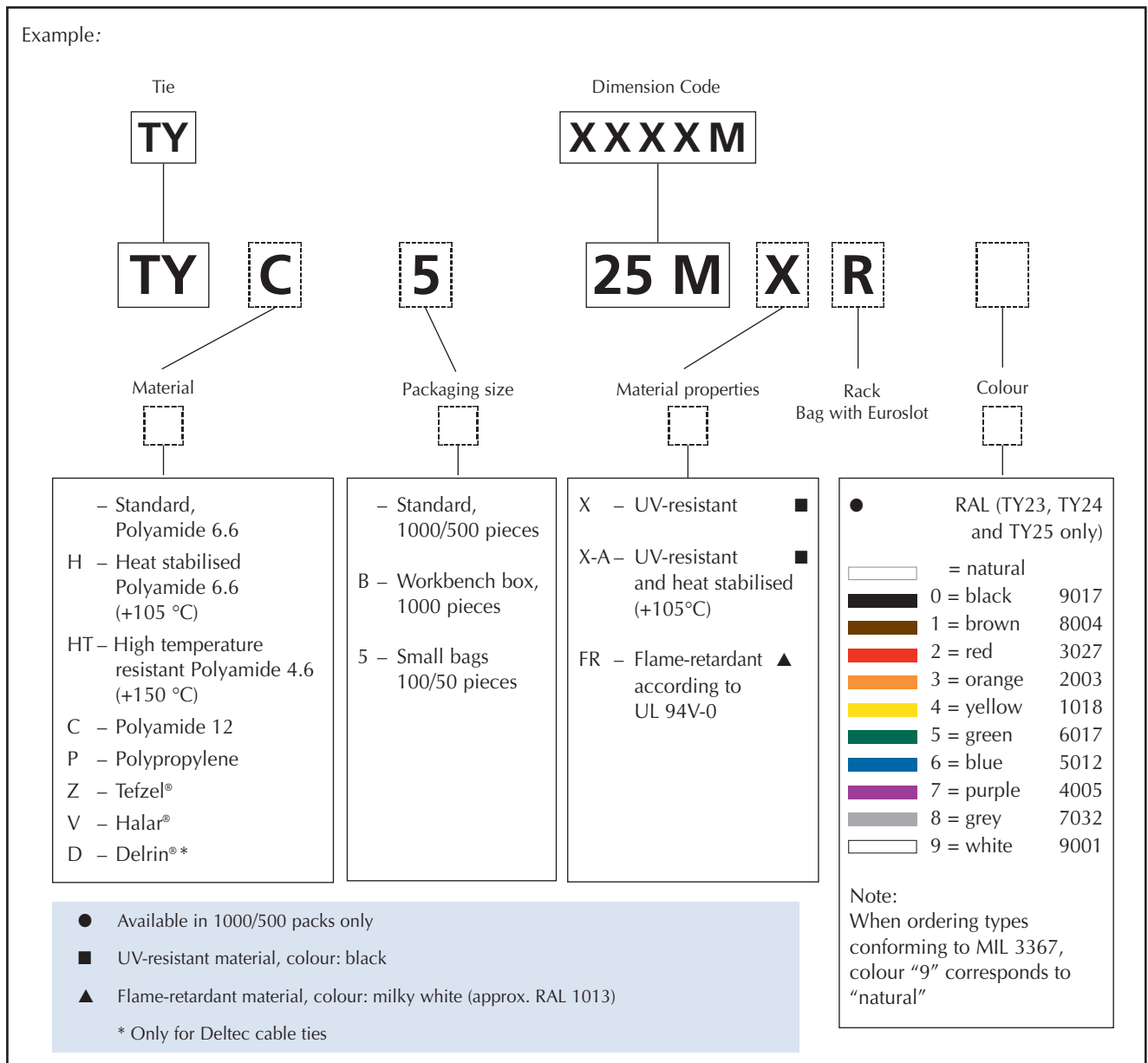
* Halar® is a registered trademark of Solvay Solexis

** Tefzel® is a registered trademark of DuPont de Nemours

Premium cable ties with steel locking barb
 Product reference structure for
 standard ties



To the standard Product Reference, you can add special order codes for: material, packaging size, material properties and colours.



Tefzel® and Delrin® are registered trademark of DuPont de Nemours

Halar® is a registered trademark of Solvay Solexis

Note: Nylon (Polyamide) is inherently susceptible to environmental conditions. Ty-Rap® cable ties are moisturised to optimum performance levels at machine-side and should be stored in cool dry areas out of direct sunlight. Cable ties are packaged in plastic bags to contain moisture and should remain sealed until ready for use.

Product overview

The main characteristics of the Ty-Rap® cable ties are shown on pages 8 and 9.

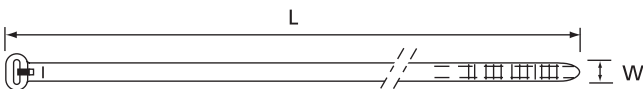
- Several lengths and 6 typical widths with a tensile strength up to 780N, to cover the most demanding applications
- Wide range of colours (see note below)
- Standard packaging: OEM bulk quantities in recyclable polythene bags
- Also available in small bags with Euroslot (see page 13) and in workbench boxes (see page 15)



Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information: Standard Polyamide 6.6 cable ties

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER FROM ... TO	MINIMUM TENSILE	QUANTITY	TOOLING
		L [mm]	W [mm]			STRENGTH [N]		
TY23M	MS-3367-4	92	2.4	1.0	2 - 16	80	1000	
TY232M	-	203	2.4	1.0	2 - 50	80	1000	ERG299
TY234M	-	356	2.4	1.0	2 - 102	80	1000	WT193A
TY24M	MS-3367-5	140	3.6	1.1	2 - 29	180	1000	TR227
TY242M	-	208	3.6	1.1	2 - 50	180	1000	
TY26M	-	284	3.6	1.1	2 - 76	130	1000	
TY244M	-	368	3.6	1.1	2 - 103	130	1000	
TY25M	MS-3367-1	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297
TY253M	MS-3367-7	290	4.8	1.1	3.5 - 78	220	1000	WT193A
TY28M	MS-3367-2	360	4.8	1.1	3.5 - 102	220	1000	TR227
TY271M	-	150	7.6	1.5	6 - 31	540	500	
TY272M	-	222	7.6	1.6	6 - 50	540	500	
TY27M	MS-3367-3	340	7.0	1.6	6 - 90	540	500	L-500-EU
TY275M	-	457	7.0	1.6	6 - 127	540	500	ERG297
TY277M	-	617	7.0	1.6	6 - 177	540	500	
TY29M	MS-3367-6	771	7.6	1.6	6 - 229	540	500	
TY53510M	-	889	8.1	1.7	to 254	780	50	WT3D
TY54513M	-	1143	8.1	1.7	to 330	780	50	L-500-EU

Description of product reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

Premium cable ties with steel locking barb Standard ties

The main characteristics of the Ty-Rap® cable ties are shown on pages 8 and 9.

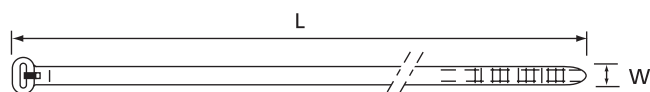
- UV-resistant version, especially recommended for outdoor applications
- Also available in heat stabilised/UV-resistant version, for outdoor applications that also require a resistance to high temperature (+105 °C)- See page 19 (TY...MX-A series)
- Several lengths and 6 typical widths with a tensile strength up to 780N, to cover the most demanding applications
- Standard packaging: OEM bulk quantities in recyclable polythene bags
- Also available in small bags with Euroslot (see page 14) and in workbench boxes (see page 15)



Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free

Ordering Information: Polyamide 6.6 UV-stabilised cable ties

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER	MINIMUM TENSILE STRENGTH	QUANTITY	TOOLING
		L [mm]	W [mm]					
TY23MX	MS-3367-4	92	2.4	1.0	2 - 16	80	1000	
TY232MX	-	203	2.4	1.0	2 - 50	80	1000	
TY234MX	-	356	2.4	1.0	2 - 102	80	1000	ERG299
TY24MX	MS-3367-5	140	3.6	1.1	2 - 29	130	1000	WT193A
TY242MX	-	208	3.6	1.1	2 - 50	130	1000	TR227
TY26MX	-	284	3.6	1.1	2 - 76	130	1000	
TY244MX	-	368	3.6	1.1	2 - 103	130	1000	
TY25MX	MS-3367-1	186	4.8	1.1	3.5 - 45	220	1000	ERG297
TY253MX	MS-3367-7	290	4.8	1.1	3.5 - 78	220	1000	ERG299
TY28MX	MS-3367-2	360	4.8	1.1	3.5 - 102	220	1000	WT193A, TR227
TY271MX	-	150	7.6	1.5	6 - 31	540	500	
TY272MX	-	222	7.6	1.6	6 - 50	540	500	
TY27MX	MS-3367-3	340	7.0	1.6	6 - 90	540	500	L-500-EU
TY275MX	-	457	7.0	1.6	6 - 127	540	500	ERG297
TY277MX	-	617	7.0	1.6	6 - 177	540	500	
TY29MX	MS-3367-6	771	7.6	1.6	6 - 229	540	500	
TY53510MX	-	889	8.1	1.7	to 254	780	50	WT3D
TY54513MX	-	1143	8.1	1.7	to 330	780	50	L-500-EU

Description of product reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

Ty-Rap®

Premium cable ties with steel locking barb Standard ties - Euroslot packaging

The main characteristics of the Ty-Rap® cable ties are shown on pages 8 and 9.

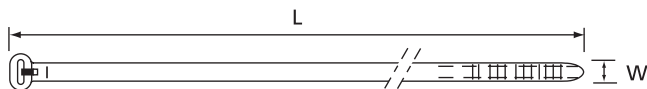
- Packaging in small polythene bags with Euroslot, ideal for display and point-of-sales promotion (rack)
- Several lengths and 6 typical widths with a tensile strength up to 780N, to cover the most demanding applications
- Very convenient for small series production: 100 pieces (for cable ties from 2.4 mm to 4.8 mm width) or 50 pieces (for cable ties 7.0 mm width and above)



Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural**
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information: Standard Polyamide 6.6 cable ties

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER	MINIMUM TENSILE STRENGTH	QUANTITY	TOOLING
		L [mm]	W [mm]					
TY523MR	MS-3367-4	92	2.4	1.0	2 - 16	80	100	
TY5232MR	-	203	2.4	1.0	2 - 50	80	100	ERG299
TY5234M*	-	356	2.4	1.0	2 - 102	80	100	WT193A
TY524MR	MS-3367-5	140	3.6	1.1	2 - 29	180	100	TR227
TY5242MR	-	208	3.6	1.1	2 - 50	180	100	
TY526MR	-	284	3.6	1.1	2 - 76	130	100	
TY5244MR	-	368	3.6	1.1	2 - 103	130	100	
TY525MR	MS-3367-1	186	4.8	1.1	3.5 - 45	220	100	ERG299, ERG297
TY5253MR	MS-3367-7	290	4.8	1.1	3.5 - 78	220	100	WT193A
TY528MR	MS-3367-2	360	4.8	1.1	3.5 - 102	220	100	TR227
TY5271MR	-	150	7.6	1.5	6 - 31	540	50	
TY5272MR	-	222	7.6	1.6	6 - 50	540	50	
TY527MR	MS-3367-3	340	7.0	1.6	6 - 90	540	50	L-500-EU
TY5275M*	-	457	7.0	1.6	6 - 127	540	50	ERG297
TY5277M*	-	617	7.0	1.6	6 - 177	540	50	
TY529M*	MS-3367-6	771	7.6	1.6	6 - 229	540	50	

* Product References TY5234M, TY5275M, TY5277M and TY529M have no Euroslot

** For other colours, please contact your Sales Office

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111



Ty-Rap®

Premium cable ties with steel locking barb Standard ties - Euroslot packaging

The main characteristics of the Ty-Rap® cable ties are shown on pages 8 and 9.

- UV-resistant version, especially recommended for outdoor applications
- Packaging in small polythene bags with Euroslot, ideal for display and point-of-sales promotion (rack)
- Several lengths and 6 typical widths with a tensile strength up to 780N, to cover the most demanding applications
- Very convenient for small series production: 100 pieces (for cable ties from 2.4 mm to 4.8 mm width) or 50 pieces (for cable ties 7.0 mm width and above)



Approvals

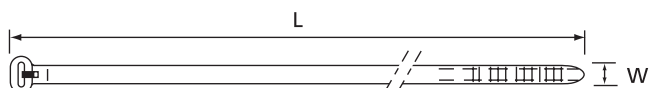


E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free



Ordering Information: Polyamide 6.6 UV-stabilised cable ties

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER	MINIMUM TENSILE STRENGTH	QUANTITY	TOOLING
		L [mm]	W [mm]					
TY523MXR	MS-3367-4	92	2.4	1.0	2 - 16	80	100	
TY5232MXR	-	203	2.4	1.0	2 - 50	80	100	
TY5234MX*	-	356	2.4	1.0	2 - 102	80	100	ERG299
TY524MXR	MS-3367-5	140	3.6	1.1	2 - 29	130	100	WT193A
TY5242MXR	-	208	3.6	1.1	2 - 50	130	100	TR227
TY526MXR	-	284	3.6	1.1	2 - 76	130	100	
TY5244MXR	-	368	3.6	1.1	2 - 103	130	100	
TY525MXR	MS-3367-1	186	4.8	1.1	3.5 - 45	220	100	ERG297
TY5253MXR	MS-3367-7	290	4.8	1.1	3.5 - 78	220	100	ERG299
TY528MXR	MS-3367-2	360	4.8	1.1	3.5 - 102	220	100	WT193A, TR227
TY5271MXR	-	150	7.6	1.5	6 - 31	540	50	
TY5272MXR	-	222	7.6	1.6	6 - 50	540	50	
TY527MXR	MS-3367-3	340	7.0	1.6	6 - 90	540	50	L-500-EU
TY5275MX*	-	457	7.0	1.6	6 - 127	540	50	ERG297
TY5277MX*	-	617	7.0	1.6	6 - 177	540	50	
TY529MX*	MS-3367-6	771	7.6	1.6	6 - 229	540	50	

* Product References TY5234MX, TY5275MX, TY5277MX and TY529MX have no Euroslot

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

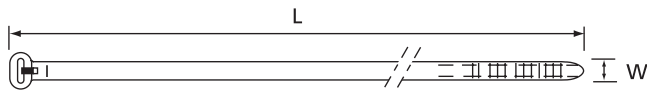
Premium cable ties with steel locking barb Standard ties - Workbench boxes

- An attractive packaging option for high volume manual assembly: 1000 pieces in a workbench box - easy to reach, hence timesaving.
- This user-friendly packaging allows fast working without problems or losses.

Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black*
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free, UV-resistant (black)

Ordering Information: Standard Polyamide 6.6 cable ties

PRODUCT REF.	MIL SPEC.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYB23M	MS-3367-4	92	2.4	1.0	2 - 16	80	1000	ERG299
TYB2315M	-	200	2.4	1.0	2 - 32	80	1000	WT193A
TYB24M	MS-3367-5	140	3.6	1.1	2 - 29	180	1000	TR227
TYB25M	MS-3367-1	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297 WT193A, TR227

Ordering Information: Polyamide 6.6 UV-stabilised cable ties

PRODUCT REF.	MIL SPEC.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYB23MX	MS-3367-4	92	2.4	1.0	2 - 16	80	1000	ERG299
TYB2315MX	-	200	2.4	1.0	2 - 32	80	1000	WT193A
TYB24MX	MS-3367-5	140	3.6	1.1	2 - 29	180	1000	TR227
TYB25MX	MS-3367-1	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297 WT193A, TR227

*For other colours, please contact your Sales Office.

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111



Ty-Rap®

Premium cable ties with steel locking barb
Standard coloured ties



Approvals

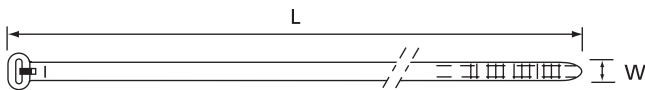


E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	See table
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



Ordering Information: Coloured Polyamide 6.6 cable ties

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER FROM ... TO	MINIMUM TENSILE	QUANTITY	TOOLING
		L [mm]	W [mm]	[mm]		STRENGTH [N]		
TY23M-*	MS-3367-4	92	2.4	1.0	2 - 16	80	1000	
TY232M-*	-	203	2.4	1.0	2 - 50	80	1000	ERG299
TY234M-*	-	356	2.4	1.0	2 - 102	80	1000	WT193A
TY24M -*	MS-3367-5	140	3.6	1.1	2 - 29	180	1000	TR227
TY242M-*	-	208	3.6	1.1	2 - 50	180	1000	
TY26M-*	-	284	3.6	1.1	2 - 76	130	1000	
TY244M-*	-	368	3.6	1.1	2 - 103	130	1000	
TY25M-*	MS-3367-1	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297
TY253M-*	MS-3367-7	290	4.8	1.1	3.5 - 78	220	1000	WT193A
TY28M-*	MS-3367-2	360	4.8	1.1	3.5 - 102	220	1000	TR227
TY271M-*	-	150	7.6	1.5	6 - 31	540	500	
TY272M-*	-	222	7.6	1.6	6 - 50	540	500	
TY27M-*	MS-3367-3	340	7.0	1.6	6 - 90	540	500	L-500-EU
TY275M-*	-	457	7.0	1.6	6 - 127	540	500	ERG297
TY277M-*	-	617	7.0	1.6	6 - 177	540	500	
TY29M-*	MS-3367-6	771	7.6	1.6	6 - 229	540	500	
TY53510M-*	-	889	8.1	1.7	to 254	780	50	WT3D
TY54513M-*	-	1143	8.1	1.7	to 330	780	50	L-500-EU

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

For cable ties in a specific colour, replace * in the Product Reference by the colour code:

0 = black, 1 = brown, 2 = red, 3 = orange, 4 = yellow, 5 = green, 6 = blue, 7 = purple, 8 = grey and 9 = white



For example: TY23M-1 defines a brown TY23M cable tie. Contact your Sales Office for product availability.

** Some approvals may not be applicable to all the Product References. Contact your Sales office for approvals limitations

Ty-Rap®

Premium cable ties with steel locking barb
Standard ties

- Multi-coloured TY25M cable ties in a single, convenient package
- Supplied in bags of 100 ties containing ten ties of each of the ten standard colours (TY25M-0 to TY25M-9)

Approvals



E49405

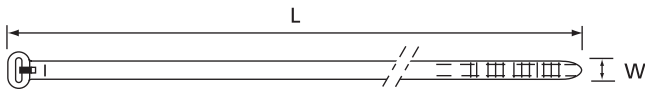
NEW



11

Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to + 85°C
Colour	Black, brown, red, orange, yellow, green, blue, purple, grey, white (10 ties of each colour)
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



Ordering Information: Multi-coloured cable ties

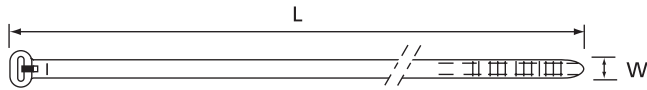
PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TY25M-CLRS	186	4.8	1.1	3.5 - 45	220	100	ERG299, ERG297 WT193A, TR227



Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	White
Flammability rating	UL 94 V-0
Other properties	Halogen free, Silicone free

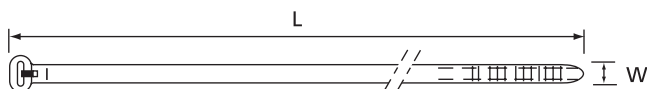
Ordering Information: Polyamide 6.6 flame retardant cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TY23MFR	92	2.4	1.0	2 - 16	80	1000	ERG299
TY232MFR	203	2.4	1.0	2 - 50	80	1000	WT193A
TY24MFR	140	3.6	1.1	2 - 29	180	1000	TR227
TY25MFR	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297
TY28MFR	360	4.8	1.1	3.5 - 102	220	1000	WT193A, TR227
TY27MFR	340	7.0	1.6	6 - 90	540	500	L-500-EU, ERG297

Approvals



E49405



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +105°C
Colour	Natural (may have a greenish tint)
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information: Polyamide 6.6 heat stabilised cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYH23M / TYHB23M	92	2.4	1.0	2 - 16	80	1000	
TYH232M	203	2.4	1.0	2 - 50	80	1000	ERG299
TYH24M	140	3.6	1.1	2 - 29	130	1000	WT193A
TYH242M*	208	3.6	1.1	2 - 50	130	1000	TR227
TYH26M	284	3.6	1.1	2 - 76	130	1000	
TYH25M	186	4.8	1.1	3.5 - 45	220	1000	ERG297
TYH253M*	290	4.8	1.1	3.5 - 78	220	1000	ERG299
TYH28M	360	4.8	1.1	3.5 - 102	220	1000	WT193A, TR227
TYH272M*	222	7.6	1.6	6 - 50	540	500	L-500-EU
TYH27M	340	7.0	1.6	6 - 90	540	500	ERG297
TYH29M*	771	7.6	1.6	6 - 229	540	500	

Description of Product Reference structure: see page 10

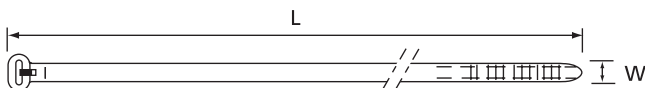
Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

* Not UL recognised

The main characteristics of the Ty-Rap® cable ties are shown on pages 8 and 9.

- Heat stabilised/UV-resistant version, for outdoor applications that also require a resistance to high temperature (+105°C)
- For OEM and MRO applications like: transportation, lawn / garden / farm / construction equipment, recreational vehicles



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +105°C
Colour	Black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, heat stabilised, Halogen free, Silicone free

Approvals



E49405

Ordering information: Polyamide 6.6 heat stabilised/UV-resistant cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TY23MX-A	92	2.3	0.9	2 - 16	80	1000	
TY24MX-A	140	3.6	1.1	2 - 29	180	1000	ERG297*, ERG299
TY25MX-A	186	4.8	1.2	3.5 - 45	220	1000	WT193A, TR227
TY27MX-A	340	6.9	1.6	6 - 89	540	500	ERG297, L-500-EU

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

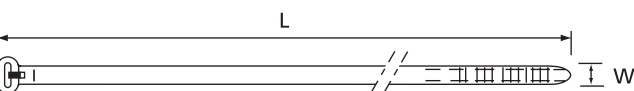
* ERG297 can not be used with TY23MX-A and TY24MX-A

- Extreme continuous temperature rating:
-40 °C to + 150 °C (in air)
- For high temperature environments in Industrial, OEM, MRO and Commercial Construction applications such as: metal processing, paper mills, lighting, automotive



Technical Information

Material - Moulding	Polyamide 4.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +150°C
Colour	Light green
Flammability rating	UL 94 V-2
Other properties	Extra high temperature resistant, Halogen free, Silicon free



Ordering information: Polyamide 4.6 extra high temperature cable ties

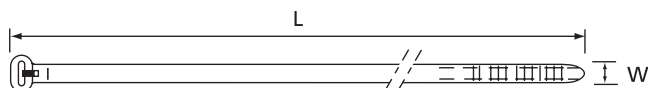
PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYHT23M	92	2.3	0.9	2 - 16	80	1000	
TYHT25M	186	4.8	1.2	3.5 - 45	220	1000	ERG297*, ERG299
TYHT28M	360	4.8	1.3	3.5 - 102	220	1000	WT193A, TR227
TYHT27M	340	6.9	1.6	6 - 89	540	500	ERG297, L-500-EU

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111

* ERG297 can not be used with TYHT23M



Technical Information

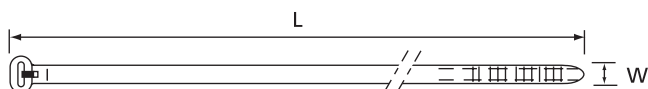
Material - Moulding	Polyamide 12
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +80°C
Colour	Black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free

Ordering Information: Polyamide 12 UV-resistant cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYC25MX	186	4.8	1.1	3.5 - 45	150	1000	ERG297
TYC28MX	360	4.8	1.1	3.5 - 102	150	1000	ERG299
TYC525MX	186	4.8	1.1	3.5 - 45	150	100	WT193A, TR227
TYC272MX	222	7.6	1.6	6 - 50	380	500	L-500-EU
TYC27MX	340	7.0	1.6	6 - 90	380	500	ERG297
TYC29MX	771	7.6	1.6	6 - 229	380	500	

Technical Information

Material - Moulding	Polypropylene
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Black
Flammability rating	UL 94 HB
Other properties	UV-resistant, Halogen free, Silicone free



Ordering Information: Polypropylene weatherable cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING *
TYP23MX	92	2.4	1.0	2 - 16	50	1000	
TYP25MX	186	4.8	1.1	3.5 - 45	130	1000	ERG297, ERG299
TYP28MX	360	4.8	1.1	3.5 - 102	130	1000	WT193A, TR227
TYP27MX	340	7.0	1.6	6 - 90	270	500	L-500-EU, ERG297

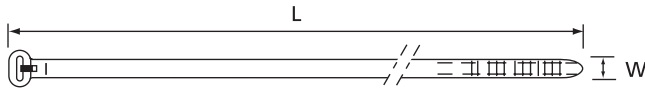
* TYP23MX can only be used with ERG299, WT193A, TR227

Description of Product Reference structure: see page 10
Description of materials and properties: see pages 113 to 122
For tooling specifications, see pages 104 to 111

Approvals



E49405



Technical Information

Material - Moulding	Halar®
Material - Locking barb	316 grade stainless steel
Temperature range	-46°C to +140°C
Colour	Maroon
Flammability rating	UL 94 V-0
Other properties	UV-resistant, low smoke

Ordering Information: Halar® cable ties

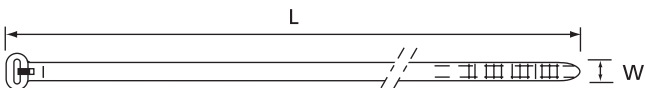
PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYV23M	92	2.4	1.0	2 - 16	80	1000	ERG299
TYV523M	92	2.4	1.0	2 - 16	80	100	WT193A, TR227
TYV25M	186	4.8	1.1	3.5 - 45	220	1000	ERG299, ERG297
TYV525M	186	4.8	1.1	3.5 - 45	220	100	WT193A, TR227

Halar® is a registered trademark of Solvay Solexis

Approvals



E49405



Technical Information

Material - Moulding	Tefzel®**
Material - Locking barb	316 grade stainless steel
Temperature range	-46°C to +150°C
Colour	Aquamarine
Flammability rating	UL 94 V-0
Other properties	UV-resistant, Silicone free, inert to most solvents and chemicals, hydrolytically stable, radiation resistant. Non-outgassing properties for zero gravity applications.

Ordering Information: Tefzel®** cable ties

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYZ23M*	92	2.4	1.0	2 - 16	80	1000	WT193A, TR227
TYZ25M	186	4.8	1.1	3.5 - 45	220	1000	ERG299
TYZ28M	360	4.8	1.1	3.5 - 102	220	1000	ERG297***
TYZ27M	340	7.0	1.6	6 - 90	540	500	L-500-EU, ERG297

* Product Ref. TYZ23M is UL listed (E49405)

** Tefzel is a registered trademark of DuPont de Nemours

*** ERG297 not to be used on TYZ23M

Description of Product Reference structure: see page 10

Description of materials and properties: see pages 113 to 122

For tooling specifications, see pages 104 to 111



Premium cable ties with steel locking barb Special ties

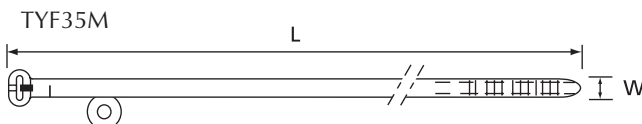
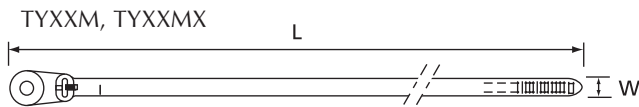
Thomas & Betts has developed a range of special Ty-Rap® cable ties, having the same main characteristics as the standard ties like the stainless steel locking barb (see pages 8 and 9), plus some additional features to provide an appropriate and elegant solution to some specific applications.

Cable ties with integrated mounting hole

- Can be directly mounted onto a support with screws, bolts or rivets
- Mounting and bundling in one maintenance-friendly assembly.
- Available in different versions with different positioning of mounting hole

Typical applications

Cable harness manufacture and pre- and end- mounting of bundles and parts. Maintenance friendly mounting of cables, tubes and parts in all types and sizes of machines and installations - indoor and outdoor.



Ordering Information

PRODUCT REF.	COLOUR	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TY33M	natural	3.0	102	2.3	0.9	2 - 16	80	1000	ERG299 TR227
TY33MX	UV-resistant black	3.0	102	2.3	0.9	2 - 16	80	1000	
TY34M	natural	4.4	151	3.5	1.0	2 - 29	180	1000	WT193A
TY34MX	UV-resistant black	4.4	151	3.5	1.0	2 - 29	180	1000	
TY635M	natural	4.0	198	4.7	1.1	3.5 - 45	220	1000	ERG297
TY635MX	UV-resistant black	4.0	198	4.7	1.1	3.5 - 45	220	1000	
TY35M	natural	5.1	199	4.7	1.1	3.5 - 45	220	1000	ERG299 TR227
TY35MX	UV-resistant black	5.1	199	4.7	1.1	3.5 - 45	220	1000	
TY1435M	natural	6.7	198	4.7	1.1	3.5 - 45	220	1000	WT193A
TY37M	natural	6.7	356	7.7	2.0	6 - 90	540	500	
TYF35M	natural	4.0	186	4.7	1.2	3.5 - 45	220	1000	ERG297, L-500-EU ERG299 TR227, WT193A

* UL recognition not applicable for UV-resistant black version
For tooling specifications, see pages 104 to 111



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free Silicone free

Approvals



E49405*

**VG
approved**

VG95387
part 4, type B

Ty-Rap[®]

Premium cable ties with steel locking barb Panel mounting cable ties, anchor type

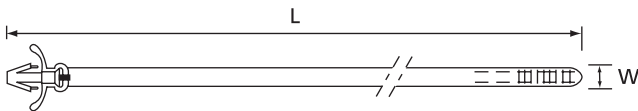
- Fastening and clip-mounting in one
- Fast pre- or on-site-assembly for a range of panel thickness up to 4.0 mm
- Fast and secure clip-mounting



Approvals



E49405*



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free Silicone free

Ordering Information

PRODUCT REF.	COLOUR	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	SUITABLE FOR BOARD/WALL THICKNESS FROM TO [mm]	QUANTITY [pieces]	TOOLING
TY54SMX	UV-resistant black	4.5 - 5.2	150	3.5	1.0	2 - 32	130	0.1 - 2.5	1000	WT193A
TY38M	natural	6.4 - 6.7	200	4.7	1.3	3.5 - 44	220	1.0 - 4.0	1000	TR227
TY38MX	UV-resistant black	6.4 - 6.7	200	4.7	1.3	3.5 - 44	220	1.0 - 4.0	1000	ERG297**

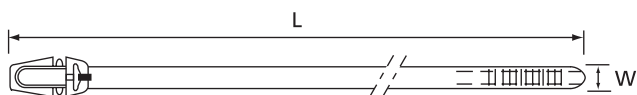
* UL recognised for TY38M only

** ERG297: only for reference TY38M and TY38MX

For tooling specifications see pages 104 to 111

Premium cable ties with steel locking barb Panel mounting cable ties

- Fastening and clip-mounting in one
- Fast pre- or on-site-assembly for different panel thickness up to 3.7 mm
- Fast and secure clip-mounting



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free Silicone free

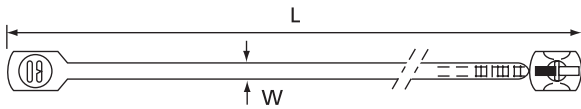
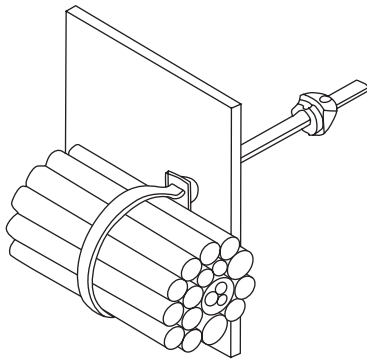
Ordering Information

PRODUCT REF.	COLOUR	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	SUITABLE FOR BOARD/WALL THICKNESS FROM TO [mm]	QUANTITY [pieces]	TOOLING
696-41836	natural	5.8 - 7.5	197	4.8	1.1	3.5 - 45	220	2.2 - 3.7	1000	ERG297 , ERG299
696-41836X	UV-resistant black	5.8 - 7.5	197	4.8	1.1	3.5 - 45	220	2.2 - 3.7	1000	WT193A, TR227

For tooling specifications see pages 104 to 111

Premium cable ties with steel locking barb Blind mounting cable ties

- Suitable for hard-to-reach areas
- Fast hidden mounting on walls and vehicle chassis
- Twist off the locking head
- Pull the tie end through the fastening hole
- Place locking head on tie end
- Pull tight and cut off excess
- In the locked state, the locking head neatly covers the mounting hole



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free Silicone free

Approvals



E49405

Ordering Information

PRODUCT REF.	COLOUR	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYG34M	natural	6.4 - 7.0	160	3.6	1.1	2 - 32	180	1000	ERG299
TYG534M	natural	6.4 - 7.0	160	3.6	1.1	2 - 32	180	100	WT193A
TYG34MX	UV-resistant black	6.4 - 7.0	160	3.6	1.1	2 - 32	180	1000	TR227
TYG534MX	UV-resistant black	6.4 - 7.0	160	3.6	1.1	2 - 32	180	100	

For tooling specifications see pages 104 to 111

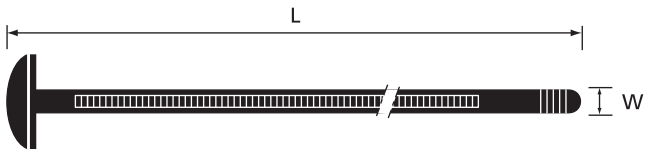
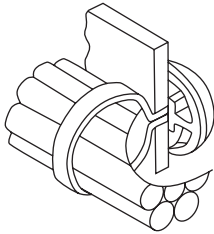
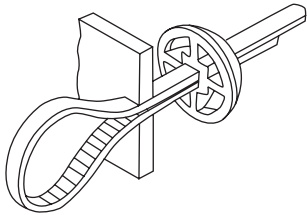


Ty-Rap®

Premium cable ties

Blind mounting cable ties

- Suitable for hard-to-reach areas
- Fast hidden mounting on walls and vehicle chassis
- Ideal for mounting on vehicle chassis. Can still be released before final tensioning
- In the locked state, the locking head neatly covers the mounting hole



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	UV-resistant black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free

Ordering Information

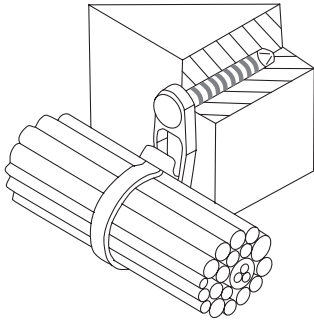
PRODUCT REF.	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TY41M	8.1 - 17.3	244	5.7	1.7	5 - 60	300	500	ERG297

For tooling specifications, see pages 104 to 111

Ty-Rap®

Premium cable ties with steel locking barb Integrated peg / nail cable ties

- TY545MX, with integrated nail for mounting onto wood or similar materials
- TY844MX, with integrated peg for mounting onto porous concrete or similar materials (masonry)
- Very simple application



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	UV-resistant black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free

TY844MX



TY545MX



Ordering Information

PRODUCT REF.	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	MOUNTING HOLE DEPTH [mm]	QUANTITY [pieces]	TOOLING
TY844MX	6.4	200	4.6	1.0	3.5 - 45	220	25 min.	50	ERG297, ERG299
TY545MX	-	200	4.7	1.0	4.7 - 38.1	220	-	50	WT193A, TR227

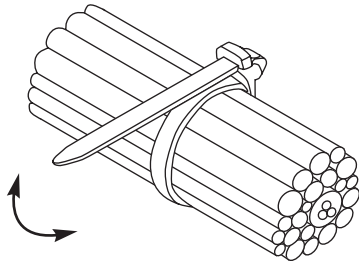
For tooling specifications, see page 104 to 111



Ty-Rap[®]

Premium cable ties Releasable cable ties

- For temporary but strong bundling, especially during control box wiring
- Very simple application
- Available in 2 lengths for different applications
- May be re-used many times
- No tooling necessary

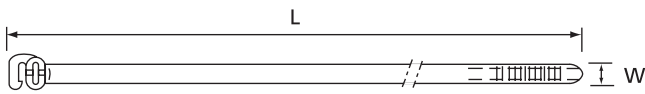


Pull end of tie through head. Turn tie end back on itself and insert into side of clip.
To open, release tie end from clip and open tie.



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



Ordering Information

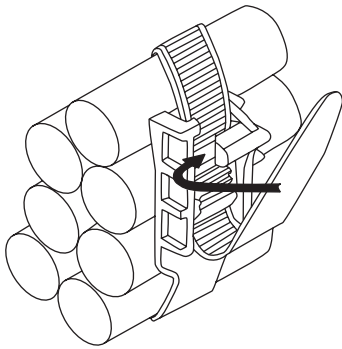
PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]
TYR505	190	4.7	1.19	10 - 44	220	100
TYR508	364	4.7	1.19	10 - 102	220	100

Ty-Rap[®]

Premium cable ties

Releasable lashing ties with incorporated fastener

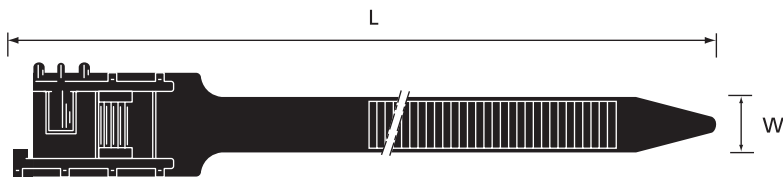
- Rugged one-piece construction, for heavy-duty applications
- Releasable and re-usable, ideal for temporary installations
- Fast and durable
- Easy handling
- No tooling necessary
- Specially developed accessories, like the wall plug TC5359 and the mounting bases TC5355 to TC5357 (see page 77 for details)



Introduce the cable tie tail into the lower slot in the head. Tighten the tie and pull it back. Slide in the tie under the catch from the side until it snaps into position.

Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	UV-resistant black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free



Ordering Information

PRODUCT REF.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER	MINIMUM TENSILE STRENGTH	QUANTITY
	L [mm]	W [mm]		FROM ... TO [mm]		
TY409	483	12.7	2.0	45 - 121	890	100
TY5409	483	12.7	2.0	45 - 121	890	25



Ty-Rap[®]

Premium cable ties

Releasable 2-piece lashing ties,
pre-assembled version

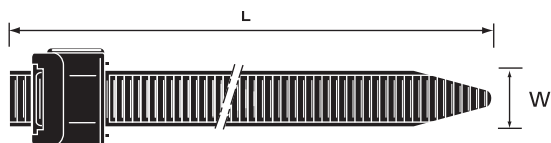
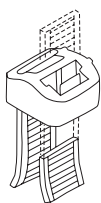
- Heavy-duty lashing ties, in cut lengths with pre-assembled heads
- Also available on reel with separate heads (see page 31)
- UV-resistant Polypropylene, ideal for applications where chemical resistance is important (heads in weatherable rigid Polyamide 6.6)
- Extremely robust (670N)
- Easily releasable & reusable
- 2 types of head: type A: no mounting hole
type B: with mounting hole



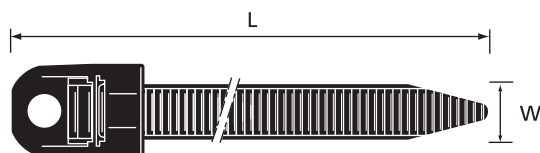
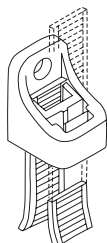
Typical applications

- Indoor and outdoor fastening of cables, pipes and other parts in industry, shipbuilding, chemical industry etc.

TY54XXPX



TY53418PX



Technical Information

Material - Tie	Weatherable Polypropylene
Material - Head	Polyamide 6.6
Temperature range	Head: -40°C to +85°C Tie: -55°C to +110°C
Colour	UV-resistant black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free

Ordering Information

PRODUCT REF.	DIAMETER OF MOUNTING HOLE [mm]	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]
TY53418PX	6.9	457	13.2	1.9	45 - 127	670	25
TY5418PX	-	457	13.2	1.8	45 - 127	670	25
TY5424PX	-	610	13.2	1.8	10 - 178	670	25
TY5442PX	-	1067	13.2	1.8	10 - 305	670	10
TY5460PX	-	1524	13.2	1.8	10 - 457	670	10

Ty-Rap[®]

Premium cable ties

Releasable 2-piece lashing ties on reel with separate heads

- Heavy-duty lashing ties on reel with separate heads
- Also available in cut lengths with pre-assembled heads (see page 30)
- UV-resistant Polypropylene, ideal for applications where chemical resistance is important (heads in weatherable rigid Polyamide 6.6)
- Extremely robust (670N)
- Easily releasable & reusable
- 2 types of head:
 - type A: no mounting hole
 - type B: with mounting hole

Typical applications

- Indoor and outdoor fastening of cables, pipes and other parts in industry, shipbuilding, chemical industry etc.
- **Product Ref. 696-41563:** lashing tie on reel (300 m), in weatherable Polypropylene
- **Product Ref. 696-41562:** separate head, type A (no mounting hole), weatherable Polyamide 6.6 (200 pieces)
- **Product Ref. 696-41614:** separate head, type B (with mounting hole), weatherable Polyamide 6.6 (200 pieces)
Mounting hole: Ø 6.9 mm
- **Product Ref. TY4100PX:** kit containing 30 m of lashing tie on reel + 50 separate heads, type A

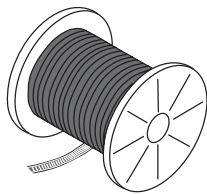


Technical Information

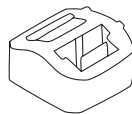
Material - Tie	Weatherable Polypropylene
Material - Head	Polyamide 6.6
Temperature range	Head: -40°C to +85°C Tie: -55°C to +110°C
Colour	UV-resistant black
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free



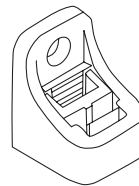
696-41563



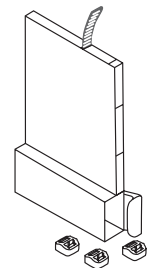
696-41563



696-41562



696-41614



TY4100PX

Ordering Information

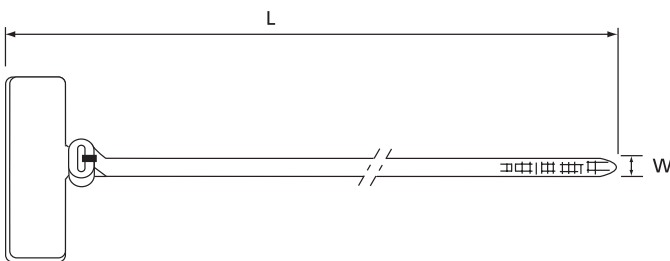
PRODUCT REF.	LASHING TIE, DIMENSIONS			SEPARATE LOCKING HEADS		MIN. TENSILE STRENGTH OF ASSEMBLY [N]
	LENGTH [m]	WIDTH [mm]	THICKNESS [mm]	QUANTITY [pieces]	TYPE	
696-41563	300	13.2	1.8	–	–	670
696-41562	–	–	–	200	Type A, no mounting hole	670
696-41614	–	–	–	200	Type B, with mounting hole	670
TY4100PX	30	13.2	1.8	50	Type A, no mounting hole	670

Premium cable ties with steel locking barb Cable ties with identification tag

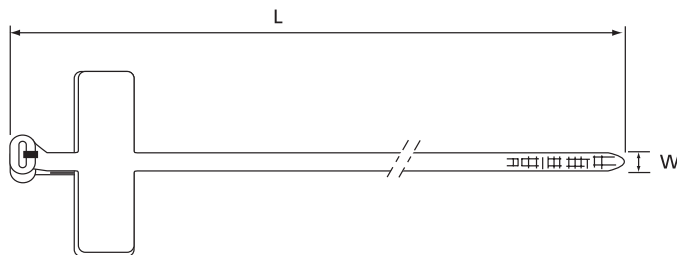
- Identification ties with incorporated label for durable marking and tying
- Label forms onto the bundle for types TY512M, TY51M and protrudes for ties TY532M and TY53M
- Type 51M is MIL (MS-3368-5) approved
- Trouble-free installation
- Simple marking on the roughened writing surface using the special marking pen WT163M-1 (black ink) or WT163M-3 (red ink) - See page 34
- All edges are rounded to make installation easier



TY532M & TY53M



TY512M & TY51M



Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Approvals



E49405

Ordering Information

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	THICKNESS	BUNDLE DIAMETER	MINIMUM TENSILE	LABEL	QUANTITY	TOOLING
		L [mm]	W [mm]						
TY51M	MS-3368-5	92	2.4	1.0	10 - 16	80	25.4 x 7.9	500	
TY512M	-	210	2.4	1.0	10 - 51	80	25.4 x 7.9	1000	WT193A
TY53M	-	102	2.4	1.0	2 - 16	80	20.6 x 9.3	500	ERC299
TY532M	-	212	2.4	1.0	2 - 51	80	20.6 x 9.3	1000	TR227

For other materials and colours contact your Sales Office
For tooling specifications see pages 104 to 111

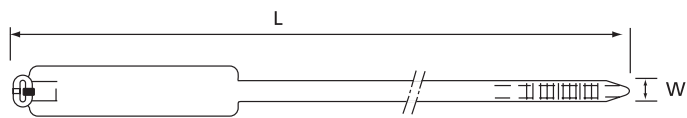
- Identification ties with incorporated label for durable marking and tying
- Label forms onto the bundle
- 5 different versions, up to 4 straps
- 4 versions (up to 3 straps) are Mil-specified
- Trouble free installation
- Labelling of bundles up to 102 mm diameter
- Simple marking on the roughened writing surface using the special marking pen WT163M-1 / WT163M-3 (black or red)
- All edges are rounded and surfaces smoothed to make installation easier



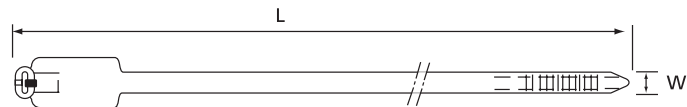
Technical Information

Material - Moulding	Polyamide 6.6
Material - Locking barb	316 grade stainless steel
Temperature range	-40°C to +85°C
Colour	Natural
Approvals	MIL: MS-3368 -1, -2, -3, -4
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

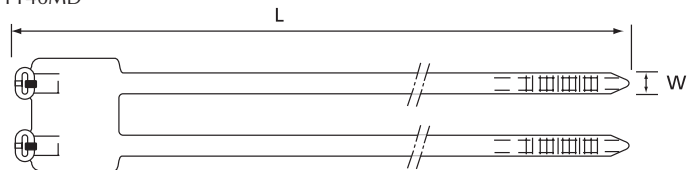
TY48M



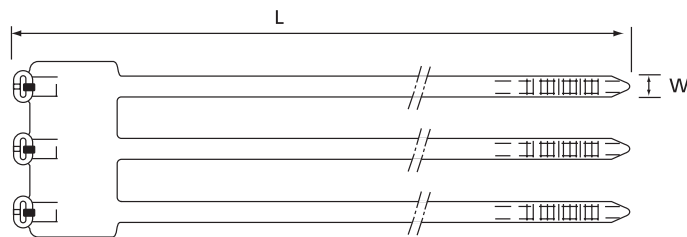
TY46M



TY46MD



TY46MT

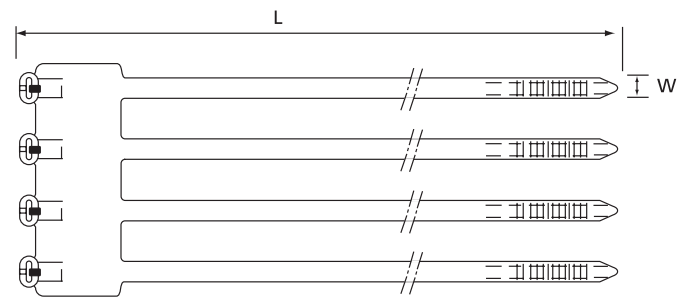


Approvals



E49405

TY46MF



Ordering Information

PRODUCT REF.	MIL SPEC.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	LABEL DIMENSIONS [mm]	QUANTITY [pieces]	TOOLING
TY48M	MS-3368-2	360	4.8	1.1	19 - 102	220	13.1 x 57.2	1000	
TY46M	MS-3368-1	184	4.8	1.1	9.5 - 45	220	13.1 x 27.0	1000	WT193A
TY46MD	MS-3368-3	184	4.8	1.1	9.5 - 45	220 x 2	29.7 x 27.0	500	ERG299
TY46MT	MS-3368-4	184	4.8	1.1	9.5 - 45	220 x 3	46.0 x 27.0	500	ERG297
TY46MF	-	184	4.8	1.1	9.5 - 45	220 x 4	63.1 x 27.0	250	TR227

For other materials and colours contact your Sales Office
For tooling specifications see pages 104 to 111



Ty-Rap[®]

Premium cable ties

Special marking pen

- Optimally suited for fast and long-lasting writing on Polyamide surfaces
- Fast-drying ink
- The ink is resistant to humidity, oil and light solvents
- Non toxic
- Available in 2 colours of ink



Ordering Information

PRODUCT REF.	COLOUR
WT163M-1	black ink
WT163M-3	red ink

Premium cable ties

Printed cable ties

Thomas & Betts extends its highly respected existing capabilities in cable tie manufacture with its in-house printing equipment in order to respond flexibly to customer requirements and to allow rapid delivery. This service is offered for ties having a width of minimum 4.6 mm (batches of minimum 10,000 ties approximately)

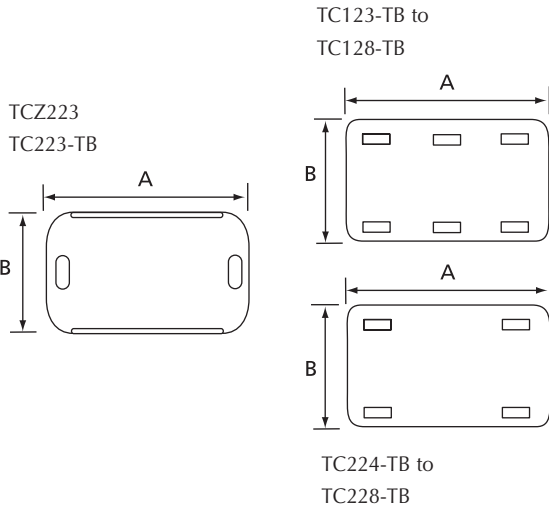
Technical Information

- The cable tie is printed using a Hot foil transfer process
- The print is highly durable
- The basic character set is in accordance with DIN1451- (3 mm character height)
- Text colours: Red, Orange, Yellow, Bright-Yellow, Green, Blue, Brown, Dark-Brown, Black, White

Please contact your Sales Office for other character sets and special stamping designs.



- Tie fastening labels
- For use in combination with the special marking pen WT163M-1 & WT163M-3 from Thomas & Betts (see page 34), or with a hot foil marking
- For secure labelling of bundles, parts etc
- Available in 3 shapes to suit all design requirements



Technical Information: Prod. Ref TCZ223

Material	Tefzel®*
Temperature range	-46°C to +150°C
Colour	Aquamarine
Flammability rating	UL 94 V-0
Other properties	UV-resistant, Silicone free Inert to most solvents and chemicals hydrolytically stable, radiation resistant

*Tefzel® is a registered trademark of DuPont de Nemours

Technical Information: Other Prod. Ref

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

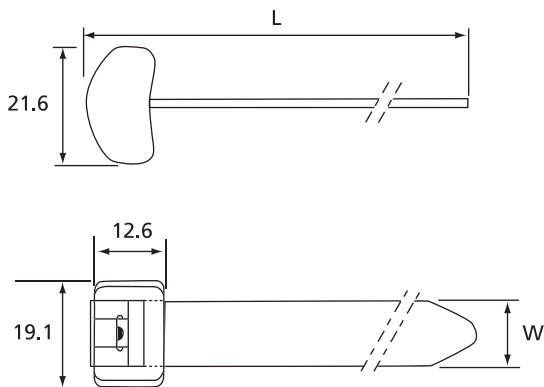
PRODUCT REF.	HEIGHT	WIDTH	LABEL THICKNESS	AREA FOR LABEL		FOR TIE WIDTH UP TO	WEIGHT [g/100]	QUANTITY [pieces]
	A [mm]	B [mm]		HEIGHT [mm]	WIDTH [mm]			
TC123-TB	19.6	32.0	0.3	9.5	32.0	4.8	17	1000
TC124-TB	19.6	38.0	0.3	9.5	38.0	4.8	18	1000
TC125-TB	19.6	44.7	0.3	9.5	44.7	4.8	19	1000
TC126-TB	19.6	51.0	0.3	9.5	51.0	4.8	31	1000
TC128-TB	19.6	63.5	0.3	9.5	63.5	4.8	35	1000
TC223-TB	19.6	32.3	1.0	18.0	24.0	4.8	37	1000
TCZ223	19.6	32.3	1.0	18.0	24.0	4.8	50	1000
TC224-TB	19.6	38.0	0.5	9.5	38.0	4.8	34	1000
TC225-TB	19.6	44.7	0.5	9.5	44.7	4.8	40	1000
TC226-TB	19.6	51.0	0.5	9.5	51.0	4.8	39	1000
TC228-TB	19.6	63.5	0.5	9.5	63.5	4.8	51	1000

Cable support system with metallic locking barb

The Deltec Cable Support System is a user-friendly product designed to provide ease and flexibility in fastening communications cables to messenger strand. It is equally well suited for copper conductor cable, coaxial cable, fibre optic cable and inner duct in aerial applications.

The Deltec system answers your aerial cable needs with innovative design and state of the art materials. This system includes weather-resistant Delrin® cable straps, marine grade locking devices, and base and hanger accessories for specific applications where mounting is required.

- Provides a strong, long-life and cost saving method of securing communication and overhead cables
- Double locking head with corrosion resistant locking barbs in copper alloy
- Proven years of service: designed to last a minimum of 20 years outdoor
- No sharp edges: operator friendly, cable friendly!
- Easy to install, low installation costs
- Extremely robust ties, with high tensile strength (1110N) after fastening
- Available either in pre-cut and pre-assembled lengths, or on reels with separate heads for total flexibility
- Choice of specific spacers and accessories
- Month and year of manufacture stamped into strap material



Technical Information

Material - Strap & head	Delrin®, toughened weatherable acetal
Material - Locking barb	Marine grade, corrosion-resistant copper alloy
Temperature range	-40°C to +85°C
Flammability rating	UL 94 HB
Colour	Black
Other properties	UV-resistant, Halogen free, superior resistance to moisture and salt environments

* Delrin® is a registered trade mark of DuPont de Nemours

Ordering Information: Pre-assembled Deltec cable ties with double-locking head

PRODUCT REF.	LENGTH	WIDTH	BUNDLE DIAMETER	MINIMUM TENSILE	QUANTITY	TOOLING
	L [mm]	W [mm]	MAX. [mm]	STRENGTH [N]		
TYD510M	1300.5	10.0	390	1110	100	
CSS-100	254.0	12.7	60	1110	50	
TYD5135M	342.9	12.7	90	1110	25	
CSS-160	406.4	12.7	110	1110	50	
TYD5270M	685.8	12.7	200	1110	10	

For tooling specifications, see pages 104 to 111

Note: the recommended maximum continuous static loading for the Deltec straps is 90 N per strap. For best results suggested spacing is 35 to 40 cm. It is the responsibility of the user to determine whether or not their application meets our recommendation.

Deltec

Cable support system with metallic locking barb on a reel

- Strap on reel, with separate head
- Total flexibility & no waste: cut at the desired length
- Easy to store: reduced inventory
- User friendly



Technical Information

Material	Delrin [®] *, toughened weatherable acetal
Temperature range	-40°C to +85°C
Flammability rating	UL 94 HB
Colour	Black
Other properties	UV-resistant, Halogen free superior resistance to moisture and salt environments

* Delrin[®] is a registered trademark of DuPont de Nemours

Ordering Information

PRODUCT REF.	LENGTH PER REEL L [m]	WIDTH W [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [reels]	TOOLING
TYD-50R	15.2	12.7	1110	1	WT3D
696-41794	304.8	12.7	1110	1	L-500-EU

For tooling specifications, see pages 104 to 111

To be assembled with Deltec separate double locking-heads (see page 38)

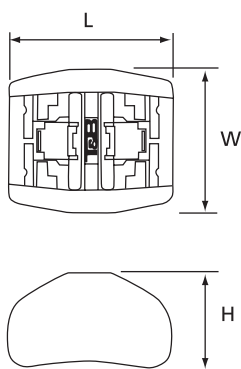
Tooling is for fastening the assembly



Deltec

Cable support system with metallic locking barb

Double locking heads



Technical Information

Material - moulding	Delrin®
Material - locking barb	Marine grade, corrosion-resistant copper alloy
Temperature range	-40°C to +85°C
Flammability rating	UL 94 HB
Colour	Black
Other properties	UV-resistant, Halogen free superior resistance to moisture and salt environments

* Delrin® is a registered trademark of DuPont de Nemours

Ordering Information

PRODUCT REF.	LENGTH	WIDTH	HEIGHT	QUANTITY
	L [mm]	W [mm]	H [mm]	
TYD-LH	21.6	19.1	12.6	25
696-41795	21.6	19.1	12.6	1000

To be assembled with Deltec strap on reel (see page 37)

Cable support system with metallic locking barb

Deltec Kits

- Convenient kits containing several reels of strap and separate locking heads, to provide all you need to be efficient on the field
- 2 configurations to match your need

Ordering Information

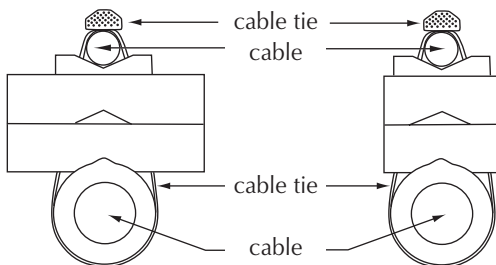
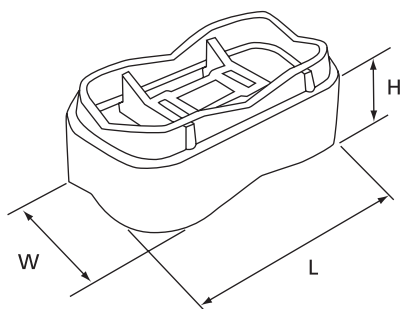
PRODUCT REF.	REELS		LOCKING HEADS
	LENGTH PER REEL [m]	QUANTITY [reels]	QUANTITY [pieces]
CSS-5K	15.2	5	150
CSS-10K	15.2	10	300

Deltec

Cable support system with metallic locking barb

Modular, stackable cable spacers

- Stackable height in 12.7 mm increments, for any desired spacing and all cable sizes - no need to stock multiple sizes of individual height spacers
- Designed to retain strap on each side and cradle the cable, providing restricted movement of spacer and preventing damage to cable
- Suitable for coaxial cables
- Can be used for parallel routing or for perpendicular cables



Technical Information

Material	Weather-resistant polypropylene
Temperature range	-40°C to +85°C
Flammability rating	UL 94 HB
Colour	Black
Other properties	UV-resistant, Halogen free

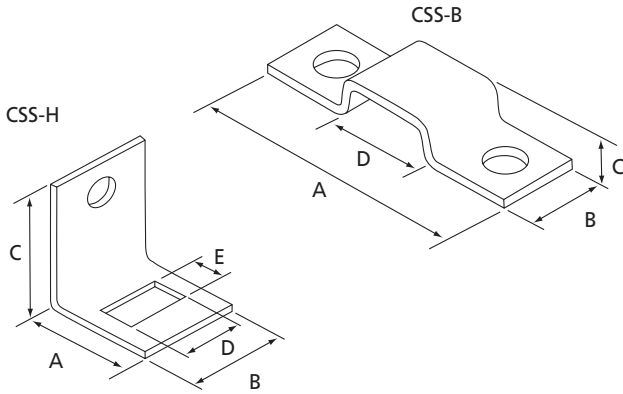
Ordering Information

PRODUCT REF.	LENGTH	WIDTH	HEIGHT	QUANTITY
	L [mm]	W [mm]	H [mm]	
TCP5255	53.3	30.5	12.7	25
TCP360	53.3	30.5	12.7	100

Cable support system with metallic locking barb

Base and hanger

- To secure the cables to all types of surfaces



Technical Information

Material	Zinc plated steel
Colour	Metallic

Ordering Information

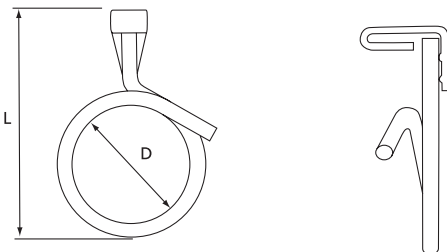
PRODUCT REF.	DIMENSIONS					MOUNTING HOLE DIAMETER [mm]	QUANTITY [pieces]
	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]		
CSS-B	48.4	14.3	7.1	15.1	5.6	6.7 (2x)	50
CSS-H	22.5	22.2	29.8	13.6	8.3	6.9	50

Note: see pages 67 to 82 for other mounting bases in Nylon

Cable support system with metallic locking barb

Drop wire support

- For easily routing drop wires along distribution cables, poles and cable support strand



Technical Information

Material	Nylon coated steel
Colour	Black

Ordering Information

PRODUCT REF.	L [mm]	D [mm]	QUANTITY [pieces]
CSS-DWS	61.9	31.8	25

Ty-Fast®

All-plastic ties

A complete range to fit the needs of OEM's

Introduction

- The Thomas & Betts Ty-Fast® cable ties are available in lengths from 91 mm to 1214 mm strap. Cable ties will satisfy bundling requirements up to 381 mm and loop tensile strengths from 80 to 1120N
- Cable ties are made from halogen free and silicone free Polyamide 6.6 and stocked in colours as listed. Contact your Customer Service Representative for availability in special materials and colours
- Where applicable, Thomas & Betts cable ties are UL listed and/or approved by Germanischer Lloyd, by Lloyd's Register of Shipping, by Mil-Specifications and/or QPL listed
- State-of-the-art robotic and raw material handling equipment assures product and material integrity throughout the manufacturing process.

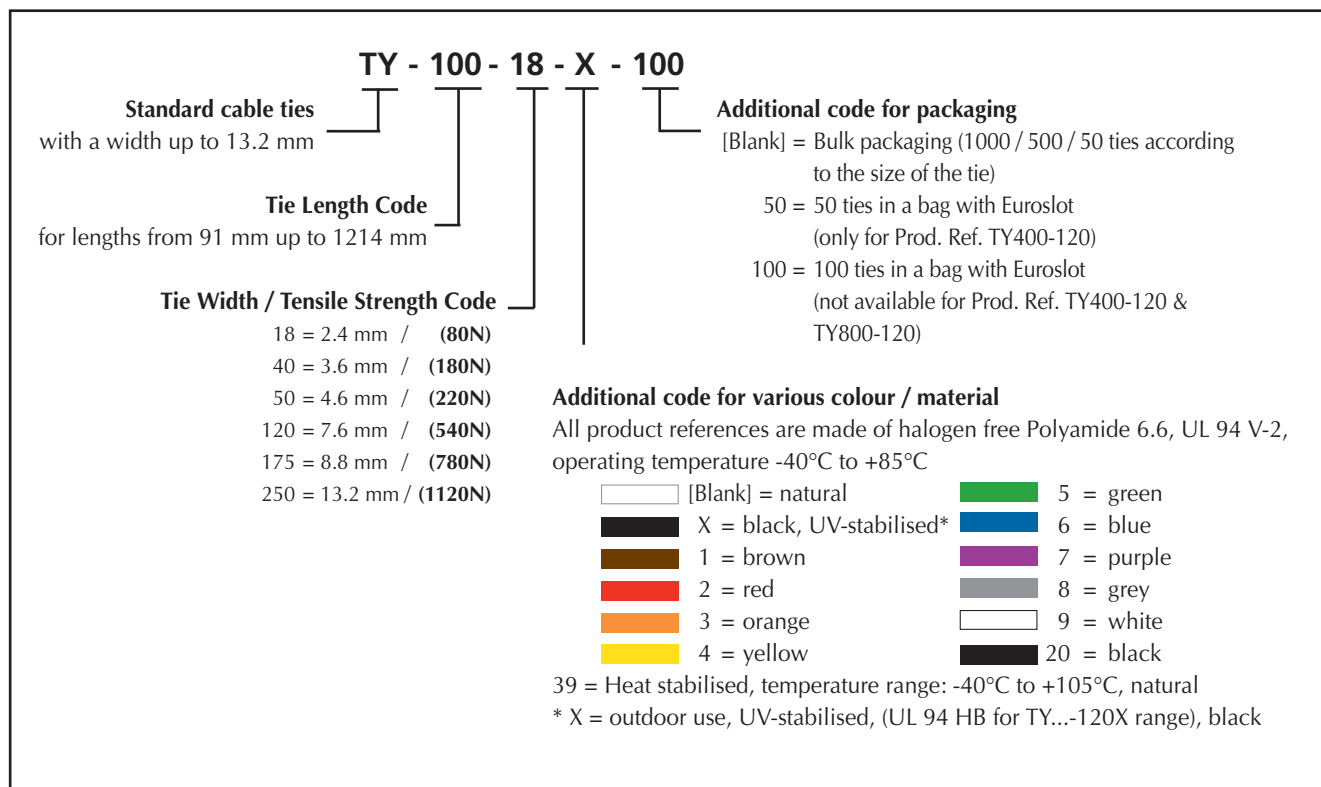


Product advantages

- The integrally formed Polyamide pawl combines low insertion and high locking strength
- A rounded, low-profile head makes for less snags
- Tails have improved two-sided finger grip design that helps the operator grasp and pull ties snug
- Sure Grip tab keeps the tail from popping out while being threaded, then holds it securely for final tightening by hand or tool
- Quick and easy pull through increases productivity, reduces operator fatigue

All-plastic ties

Product reference structure

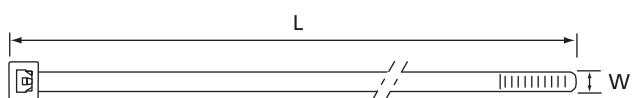


Note: Nylon (Polyamide) is inherently susceptible to environmental conditions. Ty-Fast® cable ties are moisturised to optimum performance levels at machine-side and should be stored in cool dry areas out of direct sunlight. Cable ties are packaged in plastic bags to contain moisture and should remain sealed until ready for use.

Technical Information

Material - Moulding	Polyamide 6.6 (*)
Temperature range	-40°C to +85°C
Colour	Natural as standard colour (*)
Approvals	MIL: MS 3367-x (see table)
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

(*) For other materials and colours see the product reference structure page 41



Approvals



E49405



Ordering Information

PRODUCT REF.	MIL SPEC.	LENGTH	WIDTH	BUNDLE DIAMETER FROM ... TO	MINIMUM TENSILE STRENGTH	QUANTITY [pieces]	TOOLING
		L [mm]	W [mm]				
TY075-18**	MS-3367-4	91	2.4	1.6 - 20	80	1000	
TY100-18	-	112	2.4	1.6 - 25	80	1000	
TY125-18	-	136	2.4	1.6 - 32	80	1000	
TY200-18	-	203	2.4	1.6 - 50	80	1000	ERG299
TY125-40	MS-3367-5	141	3.5	1.6 - 32	180	1000	WT193A
TY200-40	-	205	3.5	1.6 - 50	180	1000	TR227
TY300-40	-	290	3.5	1.6 - 76	180	1000	
TY400-40***	-	368	3.5	1.6 - 102	180	1000	
TY175-50	MS-3367-1	186	4.6	1.6 - 44	220	1000	ERG299
TY225-50	-	226	4.6	1.6 - 57	220	1000	ERG297
TY300-50	-	291	4.6	1.6 - 76	220	1000	WT193A
TY400-50	MS-3367-2	366	4.6	1.6 - 102	220	1000	TR227
TY200-120*	-	219	7.6	4.8 - 50	540	500	ERG297
TY400-120	MS-3367-3	375	7.6	4.8 - 102	540	500	L-500-EU
TY800-120**	-	706	7.6	4.8 - 203	540	50	WT3D

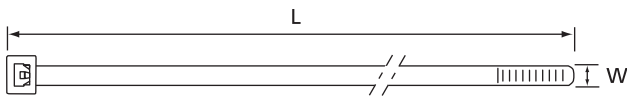
* not UL approved

** not Germanischer Lloyd approved

*** not UL or Germanischer Lloyd approved

For tooling specifications see pages 104 to 111

- Extremely long ties (up to 1214 mm)
- Robust construction (780N), for demanding applications where superior tensile strength is required
- The extra long Ty-Fast® ties are available in natural colour for indoor applications and in UV-resistant black for outdoor applications



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free

Approvals



Ordering Information

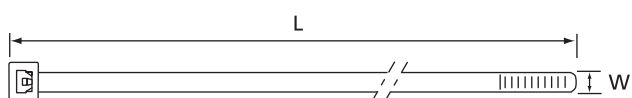
PRODUCT REF.	COLOUR	LENGTH	WIDTH	BUNDLE DIAMETER FROM ... TO	MINIMUM TENSILE	QUANTITY [pieces]	TOOLING
		L [mm]	W [mm]		STRENGTH [N]		
L-34-175-9-L	Natural	866	8.8	5 - 254	780	50	
L-36-175-0-L	UV-resistant black	930	8.8	5 - 273	780	50	
L-36-175-9-L	Natural	930	8.8	5 - 273	780	50	WT3D
L-41-175-0-L	UV-resistant black	1036	8.8	5 - 305	780	50	L300FR
L-41-175-9-L	Natural	1036	8.8	5 - 305	780	50	L-500-EU
L-48-175-0-L	UV-resistant black	1214	8.8	5 - 381	780	50	
L-48-175-9-L	Natural	1214	8.8	5 - 381	780	50	

For tooling specifications see pages 104 to 111

Ty-Fast®

All-plastic ties Heavy-duty cable ties

- Extremely robust ties (1120N), for demanding applications where extreme tensile strength is required
- Available in natural colour for indoor applications and in UV-resistant black for outdoor applications



Technical Information

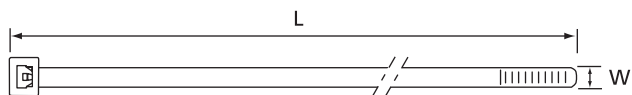
Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	LENGTH L [mm]	WIDTH W [mm]	BUNDLE DIAMETER MAX. [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TYL300M	natural	300	13.2	75	1120	50	L-500-EU
TYL300MX	UV-resistant black	300	13.2	75	1120	50	
TYL546M	natural	546	13.2	140	1120	50	
TYL546MX	UV-resistant black	546	13.2	140	1120	50	

For tooling specifications see pages 104 to 111

Similar to our Ty-Rap® range of flame retardant ties, these all-plastic ties are made from low smoke flame retardant Polyamide 6.6 and meet the requirements of UL 94 V-0. Ideal for use where low flammability and low smoke are necessary such as public transport / buildings, tunnels etc.



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Milky white
Flammability rating	UL 94 V-0
Other properties	Limited fire hazard (low smoke) Halogen free, Silicone free

Ordering Information

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TS1025HF	100	2.5	2 - 24	90	100	
TS1435HF	140	3.5	2.5 - 36	180	100	ERG299
TS2045HF	200	4.5	3 - 51	220	100	TR227
TS2845HF	280	4.5	5 - 76	220	100	WT193A
TS3645HF	360	4.5	5 - 101	220	100	
TS3675HF	360	7.5	5 - 101	540	100	ERG297, L-500-EU WT3D

For tooling specifications see pages 104 to 111

Ty-Fast®

All-plastic ties

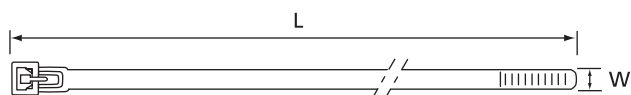
Special ties

Thomas & Betts has developed a range of special Ty-Fast® cable ties, having the same main characteristics as the standard ties (see page 41), plus a few additional features, to provide an appropriate and elegant solution to some very specific applications. These special ties are described hereafter.



All-plastic ties

Releasable cable ties



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	LENGTH L [mm]	WIDTH W [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
L-5-50R-0-C	UV-resistant black	150	7.5	3 - 32	220	100	
L-5-50R-9-C	natural	150	7.5	3 - 32	220	100	
L-8-50R-0-C	UV-resistant black	198	7.5	3 - 51	220	100	WT3D
L-8-50R-9-C	natural	198	7.5	3 - 51	220	100	ERG297
L-10-50R-0-C	UV-resistant black	298	7.5	3 - 76	220	100	L-500-EU
L-10-50R-9-C	natural	298	7.5	3 - 76	220	100	

For tooling specifications see pages 104 to 111

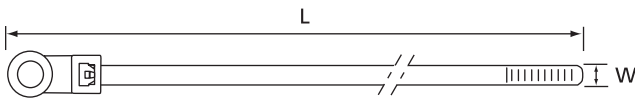
Ty-Fast®

All-plastic ties

Cable ties with integrated mounting hole

Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free



Approvals



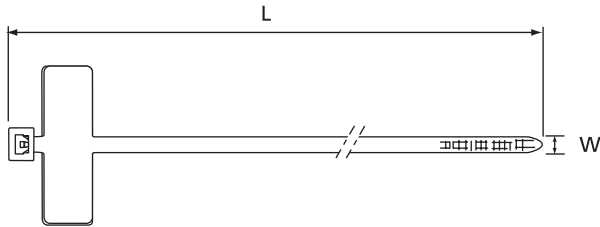
E49405

Ordering Information

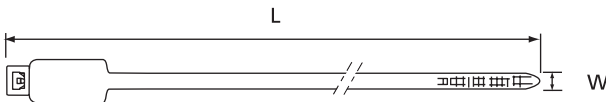
PRODUCT REF.	COLOUR	LENGTH	WIDTH	FIXING	BUNDLE DIAMETER	MINIMUM TENSILE	QUANTITY	TOOLING
		L	W	SCREW SIZE		STRENGTH		
		[mm]	[mm]		FROM ... TO	[N]	[pieces]	
L-5-30MH-0-C	UV-resistant black	152	3.3	M4	2 - 32	130	100	ERG299
L-5-30MH-9-C	natural	152	3.3	M4	2 - 32	130	100	WT193A, TR227
L-7-50MH-0-C	UV-resistant black	208	4.7	M5	2 - 44	220	100	ERG297
L-7-50MH-9-C	natural	208	4.7	M5	2 - 44	220	100	ERG299
L-11-50MH-0-C	UV-resistant black	314	4.7	M5	2 - 76	220	100	TR227
L-11-50MH-9-C	natural	314	4.7	M5	2 - 76	220	100	WT193A
L-14-50MH-0-C	UV-resistant black	382	4.7	M5	2 - 102	220	100	WT3D
L-14-50MH-9-C	natural	382	4.7	M5	2 - 102	220	100	
L-14-120MH-0-C	UV-resistant black	382	7.6	M6	5 - 102	540	100	ERG297
L-14-120MH-9-C	natural	382	7.6	M6	5 - 102	540	100	L-500-EU, WT3D

For tooling specifications see pages 104 to 111

L-4-18ID-9-C



L-7-50ID-9-C



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	LABEL DIMENSIONS [mm]	BUNDLE DIAMETER MAX. [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
L-4-18ID-9-C	102	2.5	7.9 x 24.7	19	80	100	ERG299
L-4-18ID-9-M	102	2.5	7.9 x 24.7	19	80	1000	TR227, WT193A
L-7-50ID-9-C	200	4.7	30 x 13.3	44	220	100	ERG297, ERG299
L-7-50ID-9-M	200	4.7	30 x 13.3	44	220	1000	TR227, WT193A L-500-EU

For tooling specifications see pages 104 to 111

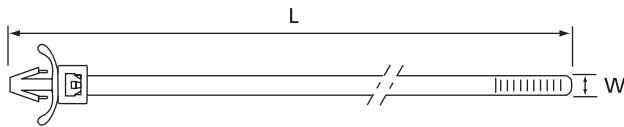
Ty-Fast®

All-plastic ties
Panel mounting cable ties

Approvals



E49405



Ordering Information

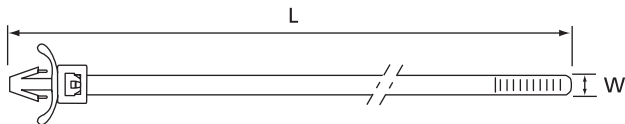
PRODUCT REF.	COLOUR	LENGTH L [mm]	WIDTH W [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
L-5-50PM-0-C	UV-resistant black	147	4.8	2 - 25	220	100	ERG297, ERG299
L-5-50PM-9-D	natural	147	4.8	2 - 25	220	1000	TR227
L-7-50PM-0-C	UV-resistant black	208	4.8	2 - 44	220	100	WT193A
L-7-50PM-9-C	natural	208	4.8	2 - 44	220	100	L-500-EU

For use in 6.35 mm mounting hole. Maximum panel thickness 2.7 mm
For tooling specifications see pages 104 to 111

All-plastic ties Panel mounting cable ties

Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free



Ordering Information

PRODUCT REF.	COLOUR	LENGTH L [mm]	WIDTH W [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
TB-4-50PMR-9-C-EU*	natural	110	4.8	2 - 22	220	100	WT1-TB, WT2-TB
L-5-50PMR-0-C	UV-resistant black	147	4.8	2 - 25	220	100	ERG297, ERG299
L-5-50PMR-9-C	natural	147	4.8	2 - 25	220	100	TR227
L-7-50PMR-0-C	UV-resistant black	208	4.8	2 - 44	220	100	WT193A
L-7-50PMR-9-C	natural	208	4.8	2 - 44	220	100	L-500-EU

* not UL approved

For use in 6.35 mm mounting hole. Maximum panel thickness 2.7 mm
For tooling specifications see pages 104 to 111



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant black (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black) Halogen free, Silicone free

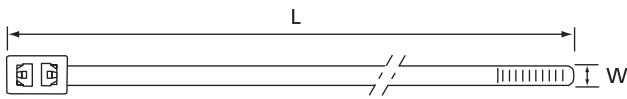
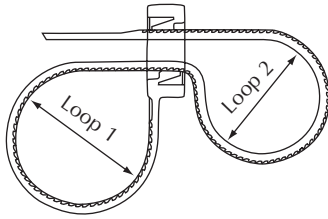


Approvals



E49405

The double-headed ties allow the parallel routing of two bundles of cable with one single tie.
Available in 3 different lengths.



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	LENGTH	WIDTH	BUNDLE Ø RANGE		MINIMUM TENSILE STRENGTH	QUANTITY	TOOLING
	L	W	LOOP 1	LOOP 2			
	[mm]	[mm]	FROM ... TO [mm]	FROM ... TO [mm]			
TB-50RLDH	200	4.8	2.5 - 47	2.0 - 45	220	1000	ERG297, ERG299
TB-12-50RLDH	300	4.8	2.5 - 72	2.0 - 70	220	1000	TR227, WT193A
TB-15-50RLDH	370	4.8	2.5 - 100	2.0 - 97	220	1000	L-500-EU

For tooling specifications see pages 104 to 111

Safe-Ty™

Low profile in-line fasteners

This Safe-Ty™ design from Thomas & Betts is ideal for use where precision bundling is required and clearance is a necessity. A unique saddle back design curves to form a snug fit around the bundle, and allows for easy pull-through in bulkheads and any other tight spaces.

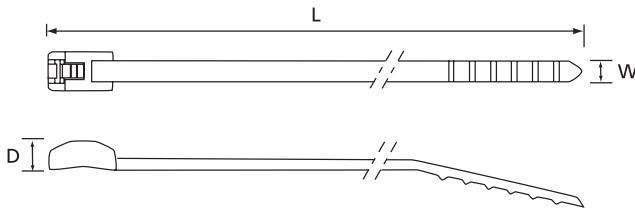
Features

- Low-profile, contoured head reduces clearance required for the bundle and enhances the appearance of your harness
- The safe-guard wall eliminates exposure to sharp edges
- The saddle back fits snug against the contour of the wiring harness
- Sizes and colours available to accommodate various requirements
- Recommended in all applications where the aesthetics and the user's safety can be a concern (thanks to the rounded edges): playgrounds, supermarket displays,...



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV-resistant (see table)
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free Silicone free



Ordering Information

PRODUCT REF.	COLOUR	LENGTH	WIDTH	D	BUNDLE DIAMETER FROM ... TO	MINIMUM TENSILE STRENGTH	QUANTITY **	TOOLING
		L [mm]	W [mm]					
SF100-18	natural*	118	2.4	3.2	3.2 - 25.4	80	100 / 1000	
SF100-18X	UV-resistant black	118	2.4	3.2	3.2 - 25.4	80	100 / 1000	ERG299
SF200-18	natural*	206	2.4	3.2	3.2 - 50.8	80	100 / 1000	WT193A
SF200-18X	UV-resistant black	206	2.4	3.2	3.2 - 50.8	80	100 / 1000	TR227
SF175-50	natural*	201	4.7	4.5	4.7 - 44.5	220	100 / 1000	
SF175-50X	UV-resistant black	201	4.7	4.5	4.7 - 44.5	220	100 / 1000	ERG297
SF300-50	natural*	288	4.7	4.5	4.7 - 76.2	220	100 / 1000	ERG299
SF300-50X	UV-resistant black	288	4.7	4.5	4.7 - 76.2	220	100 / 1000	WT193A
SF400-50	natural*	369	4.7	4.5	9.5 - 101.6	220	100 / 1000	TR227
SF400-50X	UV-resistant black	369	4.7	4.5	9.5 - 101.6	220	100 / 1000	L-500-EU
SF400-120	natural*	370	7.6	6.9	9.5 - 101.6	540	100 / 1000	
SF400-120X	UV-resistant black	370	7.6	6.9	9.5 - 101.6	540	100 / 1000	ERG297
SF600-120	natural*	533	7.6	6.9	9.5 - 152.4	540	100 / 1000	L-500-EU
SF600-120X	UV-resistant black	533	7.6	6.9	9.5 - 152.4	540	100 / 1000	WT3D

* For other colours add colour suffix to Product Reference: 0 = black, 1 = brown, 2 = red, 3 = orange, 4 = yellow, 5 = green, 6 = blue, 8 = grey and 9 = white. For example: SF-175-50-2 (red)



** Standard quantity = 1000. For bags of 100 add -100 to the product reference, for example. SF100-18-100.

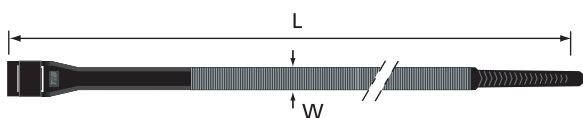
For tooling specifications see pages 104 to 111

Note: Nylon (Polyamide) is inherently susceptible to environmental conditions. Safe-Ty™ cable ties are moisturised to optimum performance levels at machine-side and should be stored in cool dry areas out of direct sunlight. Cable ties are packaged in plastic bags to contain moisture and should remain sealed until ready for use.

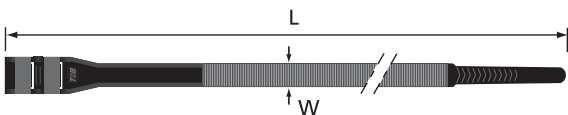


- For securing and bundling of cables in the utility and construction industries
- Low profile double locking head*
- Serrations on the outer side of the tie eliminates the risk of damage to the cable
- Ideal for hazardous environments, low temperatures and humidity
- Conform to EDF HN33/S/62

Single locking head



Double locking head



Technical Information

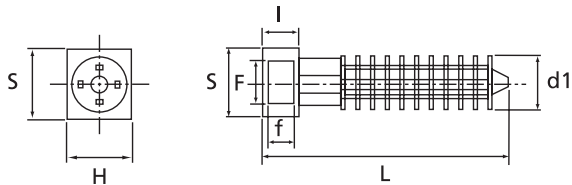
Material	Polyamide 12
Temperature range	-40°C to +80°C
Colour	Black
Flammability rating	UL 94 HB
Other properties	UV-resistant

Ordering Information

PRODUCT REF.	LENGTH L [mm]	WIDTH W [mm]	THICKNESS [mm]	BUNDLE DIAMETER FROM ... TO [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
CT-9-180-0-C*	180	9	1.8	10 - 42	440	100	
CT-9-260-0-C	260	9	2.0	15 - 62	560	100	L300-FR
CT-9-360-0-C	360	9	2.0	25 - 92	560	100	L-500-EU
CT-9-500-0-C	510	9	2.4	74 - 140	540	100	WT3D
CT-9-750-0-C	760	9	2.4	74 - 220	540	100	

* Product Ref. CT-9-180-0-C has a single locking head
For tooling specifications see pages 104 to 111

- Suitable for \varnothing 8 mm hole
- Simply drill hole and hammer the plug in



Technical Information

Material	Polyamide 11/12
Temperature range	-40°C to +80°C
Colour	Black
Flammability rating	UL 94 HB
Other properties	UV-resistant

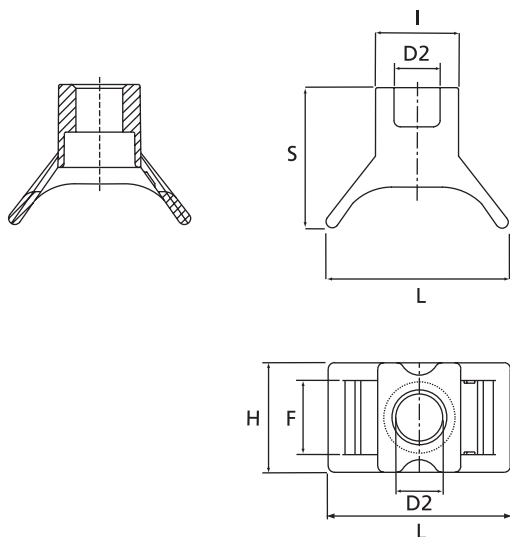
Ordering Information

PRODUCT REF.	L [mm]	$\varnothing d1$ [mm]	S [mm]	H [mm]	I [mm]	F [mm]	f [mm]	QUANTITY [pieces]
CT-5359	43.1	9.6	13.2	16	6.3	9.5	2.4	100

Heavy-duty installation ties

Accessories: cradle

- Use 5 mm screw
- For ties up to 9 mm wide



Technical Information

Material	Polyamide 11/12
Temperature range	-40°C to +80°C
Colour	Black
Flammability rating	UL 94 HB
Other properties	UV-resistant

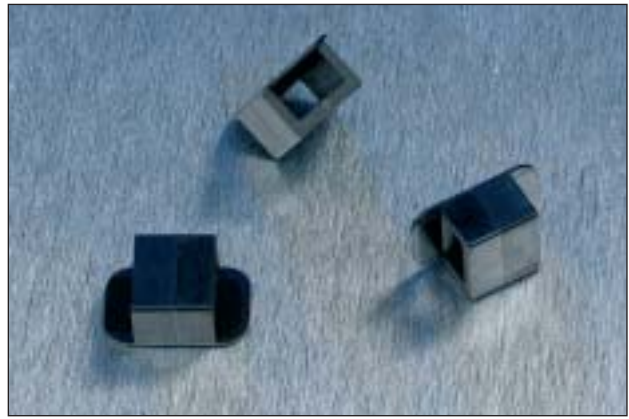
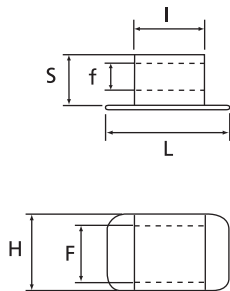
Ordering Information

PRODUCT REF.	L [mm]	I [mm]	S [mm]	H [mm]	F [mm]	D2 [mm]	QUANTITY [pieces]
CT-3401	22.9	10.5	17.6	13.8	9.4	5.9	100

Heavy-duty installation ties

Accessories: joining ring

- Accommodates two cable ties for joining the cables together or for joining the cable to a support



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Black
Flammability rating	UL 94 V-2
Other properties	UV-resistant

Ordering Information

PRODUCT REF.	L [mm]	I [mm]	S [mm]	F [mm]	f [mm]	H [mm]	QUANTITY [pieces]
LPT3402	21.3	11.9	9.4	10.2	4.4	13.8	100

Introduction

The Ty-Met™ stainless steel ties are the ultimate solution to install your cables in extreme conditions and hazardous areas, indoor and outdoor, such as the petrochemical and food processing industries, power stations, mining, shipbuilding, offshore and other aggressive environments.



The Ty-Met™ stainless steel ties provide a high mechanical strength combined with chemical durability and temperature resistance.

They are available in three different types:

- **Ball-Lock Type:** quick and reliable self-locking mechanism
- **Ladder Type:** easy application and strong locking system
- **Releasable Type:** can be unfastened for re-use

All types are available in a broad range of lengths and **two different widths**, providing extreme levels of tensile strength.

- Non-magnetic, **316 grade stainless steel** (marine grade), for extra corrosion resistance.
- **Uncoated version** for high temperature applications.
- **Fully coated version** with non-toxic, Halogen free Polyester coating, for a superior protection of cables and installer's hands and for an improved insulation between dissimilar materials.
- **Temperature range:** -80°C to +538°C (to +150°C for the coated version).
- Supplied in **bags of 100 ties**.
- **Approvals:** UL, Germanischer Lloyd, Lloyd's Register and Det Norske Veritas.
- **Halogen free, corrosion-proof and resistant to salt water.**



E49405



TYPE APPROVED



TYPE APPROVED PRODUCTS

Introduction

The Ty-Met™ stainless steel ties are available in three different types:

- **Ball-Lock Type:** quick and reliable self-locking mechanism
- **Ladder Type:** easy application and strong locking system
- **Releasable Type:** can be unfastened for re-use

Ball-Lock Type

Easy application and strong self-locking mechanism (steel ball), with low insertion force



Rounded edges and smooth surfaces, for fast and safe hand installation

Uncoated or fully coated with non-toxic, Halogen free Polyester

Angled / rounded tail, for safer handling and easier insertion

Ladder Type

Self-locking mechanism (pawl and ratchet)



Low profile, flat head (no sharp edges), for easy and safe installation

Uncoated or fully coated with non-toxic, Halogen free Polyester

Larger slot at the end, allows the use of a hook-type tool

Releasable Type

The unique buckle design allows the tie to be unfastened for re-use



Additional ears can be bent back over the fastened tie to increase the tensile strength

Fully coated with non-toxic, Halogen free Polyester

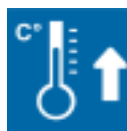
Can be installed by hand, and if necessary, the slots at the end allow the use of a hook-type tool



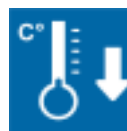
UV-resistant



Fire-proof



Heat resistant



Low temperature flexibility



Weatherproof



Radiation resistant



Chemically resistant

Ty-Met™

Stainless steel ties

Ball-Lock Type

The Ball-Lock Type stainless steel ties from Thomas & Betts are self-locking, requiring no time consuming crimping or folding operations. The strong locking mechanism, incorporating a stainless steel ball, has a low insertion force while the strap section has rounded edges and smooth surfaces making the ties ideal for fast, safe hand installation.

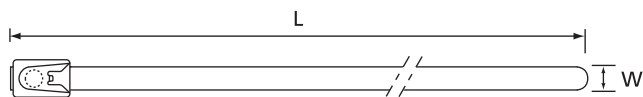
Main features

- “Ball-Lock” self-locking mechanism
- Fast end easy installation
- Suitable for indoor or outdoor applications
- 2 grades of non-magnetic materials: stainless steel 304 for standard applications and stainless steel 316 for extra corrosion resistance
- 2 types of finish: uncoated version (in 304 and 306 grades stainless steel) for high temperature applications and a 316 grade stainless steel version fully coated with a non-toxic, halogen free Polyester coating for a superior protection of cables and installer’s hands, as well as an improved insulation between dissimilar materials
- 2 widths: 4.6 mm and 7.9 mm for severe applications where extreme tensile strength (up to 1110N) is required
- 12 standard lengths (up to 1400 mm long) to cover most applications, while custom lengths can always be provided (please contact your Sales Office)
- Dedicated tooling: either Prod. Ref. CT3 for manual cutting, or Prod. Ref. CT6 for tension setting tool with automatic cutting

Applications

Installation of cables and pipes in extreme conditions and hazardous areas, indoor and outdoor, such as:

- Petrochemical and food processing industries
- Power stations
- Mining
- Shipbuilding
- Offshore
- Other aggressive environments



Technical Information: stainless steel Ball-Lock ties, uncoated

Material	A. 304 grade non-magnetic stainless steel B. 316 grade non-magnetic stainless steel
Temperature range	-80°C to +538°C
Colour	Metallic
Flammability rating	Absolutely fireproof and UV-resistant



Approvals



* Some approvals may not be applicable to all the Product References. Contact your Sales office for approvals limitations

Technical Information: stainless steel Ball-Lock ties, coated

Material	316 grade non-magnetic stainless steel Coating: Polyester
Temperature range	-80°C to +150°C
Colour	Black
Flammability rating	Absolutely fireproof
Other properties	UV-resistant Coating: Halogen free, non toxic



Ordering Information: uncoated

PRODUCT REF. STAINLESS STEEL 304	PRODUCT REF. STAINLESS STEEL 316	LENGTH X WIDTH [mm]	MATERIAL THICKNESS [mm]	MAX BUNDLE Ø [mm]	TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
YLS-4.6-100A	YLS-4.6-100B	100 x 4.6	0.26	20	440	100	
YLS-4.6-125A	YLS-4.6-125B	125 x 4.6	0.26	22	440	100	
YLS-4.6-150A	YLS-4.6-150B	150 x 4.6	0.26	24	440	100	
YLS-4.6-200A	YLS-4.6-200B	200 x 4.6	0.26	50	440	100	
YLS-4.6-300A	YLS-4.6-300B	300 x 4.6	0.26	80	440	100	
YLS-4.6-360A	YLS-4.6-360B	360 x 4.6	0.26	100	440	100	
YLS-4.6-520A	YLS-4.6-520B	520 x 4.6	0.26	150	440	100	
YLS-4.6-680A	YLS-4.6-680B	680 x 4.6	0.26	200	440	100	
YLS-4.6-840A	YLS-4.6-840B	840 x 4.6	0.26	250	440	100	
YLS-4.6-1000A	YLS-4.6-1000B	1000 x 4.6	0.26	300	440	100	
YLS-4.6-1200A	YLS-4.6-1200B	1200 x 4.6	0.26	365	440	100	
YLS-4.6-1400A	YLS-4.6-1400B	1400 x 4.6	0.26	425	440	100	
YLS-7.9-100A	YLS-7.9-100B	100 x 7.9	0.26	20	1110	100	CT3
YLS-7.9-125A	YLS-7.9-125B	125 x 7.9	0.26	22	1110	100	CT6
YLS-7.9-150A	YLS-7.9-150B	150 x 7.9	0.26	24	1110	100	
YLS-7.9-200A	YLS-7.9-200B	200 x 7.9	0.26	50	1110	100	
YLS-7.9-300A	YLS-7.9-300B	300 x 7.9	0.26	80	1110	100	
YLS-7.9-360A	YLS-7.9-360B	360 x 7.9	0.26	100	1110	100	
YLS-7.9-520A	YLS-7.9-520B	520 x 7.9	0.26	150	1110	100	
YLS-7.9-680A	YLS-7.9-680B	680 x 7.9	0.26	200	1110	100	
YLS-7.9-840A	YLS-7.9-840B	840 x 7.9	0.26	250	1110	100	
YLS-7.9-1000A	YLS-7.9-1000B	1000 x 7.9	0.26	300	1110	100	
YLS-7.9-1200A	YLS-7.9-1200B	1200 x 7.9	0.26	365	1110	100	
YLS-7.9-1400A	YLS-7.9-1400B	1400 x 7.9	0.26	425	1110	100	

Ordering Information: coated

PRODUCT REF. STAINLESS STEEL 316 POLYESTER COATED	LENGTH X WIDTH [mm]	MATERIAL THICKNESS [mm]	MAX BUNDLE Ø [mm]	TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
YLS-4.6-100BC	100 x 4.6	0.36	20	440	100	
YLS-4.6-125BC	125 x 4.6	0.36	22	440	100	
YLS-4.6-150BC	150 x 4.6	0.36	24	440	100	
YLS-4.6-200BC	200 x 4.6	0.36	50	440	100	
YLS-4.6-300BC	300 x 4.6	0.36	80	440	100	
YLS-4.6-360BC	360 x 4.6	0.36	100	440	100	
YLS-4.6-520BC	520 x 4.6	0.36	150	440	100	
YLS-4.6-680BC	680 x 4.6	0.36	200	440	100	
YLS-4.6-840BC	840 x 4.6	0.36	250	440	100	
YLS-4.6-1000BC	1000 x 4.6	0.36	300	440	100	
YLS-4.6-1200BC	1200 x 4.6	0.36	365	440	100	
YLS-4.6-1400BC	1400 x 4.6	0.36	425	440	100	
YLS-7.9-100BC	100 x 7.9	0.36	20	530	100	CT3
YLS-7.9-125BC	125 x 7.9	0.36	22	530	100	CT6
YLS-7.9-150BC	150 x 7.9	0.36	24	530	100	
YLS-7.9-200BC	200 x 7.9	0.36	50	530	100	
YLS-7.9-300BC	300 x 7.9	0.36	80	530	100	
YLS-7.9-360BC	360 x 7.9	0.36	100	530	100	
YLS-7.9-520BC	520 x 7.9	0.36	150	530	100	
YLS-7.9-680BC	680 x 7.9	0.36	200	530	100	
YLS-7.9-840BC	840 x 7.9	0.36	250	530	100	
YLS-7.9-1000BC	1000 x 7.9	0.36	300	530	100	
YLS-7.9-1200BC	1200 x 7.9	0.36	365	530	100	
YLS-7.9-1400BC	1400 x 7.9	0.36	425	530	100	



The new Ladder Type stainless steel ties from Thomas & Betts have a flat, low profile head for easy application.

- Strong self-locking mechanism (pawl and ratchet), requires no time consuming crimping or folding operations
- Flat and low profile head (no sharp edge), for easy installation
- Corrosion resistant 316 grade stainless steel for high mechanical and chemical durability
- Uncoated version for high temperature applications
- Fully coated version with non-toxic, Halogen free Polyester coating, for a superior protection of cables and installer's hands and for an improved insulation between dissimilar materials
- Increased usable length (slots up to the end of the tail), allows larger bundle diameters with the same tie length
- Larger slot at the end, allows the use of a hook-type tool

Applications

Installation of cables and pipes in extreme conditions and hazardous areas, indoor and outdoor, such as:

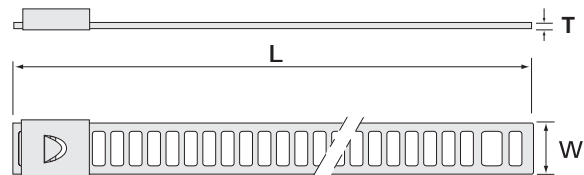
- Petrochemical and food processing industries
- Power stations
- Mining
- Shipbuilding
- Offshore
- Other aggressive environments

Ordering Information

Technical Information

Material	316 grade stainless steel
Coating	Uncoated or fully coated with non-toxic, halogen free Polyester
Temperature range	Uncoated: -80°C to +538°C Coated: -80°C to +150°C
Colour	Black coating or metallic
Flammability rating	Absolutely fireproof
Other properties	UV-resistant Coating: Halogen free, non-toxic

Approvals



PRODUCT REF.	COATING	LENGTH L [mm]	WIDTH W [mm]	THICKNESS T [mm]	MAX. BUNDLE DIAMETER [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
YLD-7-150-B	uncoated	150	7.0	0.30	43	445	100	
YLD-7-225-B	uncoated	225	7.0	0.30	67	445	100	
YLD-7-300-B	uncoated	300	7.0	0.30	91	445	100	
YLD-7-450-B	uncoated	450	7.0	0.30	139	445	100	
YLD-7-610-B	uncoated	610	7.0	0.30	190	445	100	
YLD-12-150-B	uncoated	150	12.0	0.35	43	890	100	
YLD-12-225-B	uncoated	225	12.0	0.35	67	890	100	CT1-TB
YLD-12-300-B	uncoated	300	12.0	0.35	91	890	100	CT2-TB
YLD-12-450-B	uncoated	450	12.0	0.35	139	890	100	CT3
YLD-12-610-B	uncoated	610	12.0	0.35	190	890	100	CT4-TB
YLD-7-150-BC	coated	150	7.0	0.41	43	445	100	CT5
YLD-7-225-BC	coated	225	7.0	0.41	67	445	100	WT3S
YLD-7-300-BC	coated	300	7.0	0.41	91	445	100	
YLD-7-450-BC	coated	450	7.0	0.41	139	445	100	
YLD-7-610-BC	coated	610	7.0	0.41	190	445	100	
YLD-12-150-BC	coated	150	12.0	0.46	43	890	100	
YLD-12-225-BC	coated	225	12.0	0.46	67	890	100	
YLD-12-300-BC	coated	300	12.0	0.46	91	890	100	
YLD-12-450-BC	coated	450	12.0	0.46	139	890	100	
YLD-12-610-BC	coated	610	12.0	0.46	190	890	100	



Ty-Met™

Stainless steel ties

Releasable Type (Polyester coated)

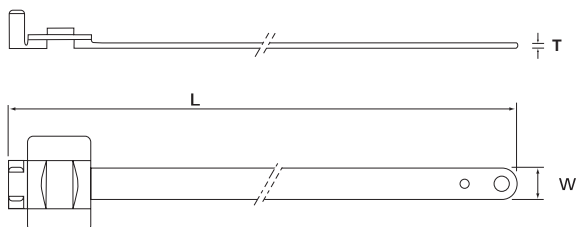
The new Releasable Type stainless steel ties from Thomas & Betts have a unique buckle design that allows the ties to be unfastened for re-use.

- Releasable and re-usable
- Corrosion resistant 316 grade stainless steel for high mechanical and chemical durability
- Fully coated version with non-toxic, Halogen free Polyester coating, for a superior protection of cables and installer's hands and for an improved insulation between dissimilar materials
- Fast, easy and reliable installation - can be installed by hand and if necessary, the slots at the end of the tie allow the use of a hook-type tool
- The additional ears can be bent back over the fastened tie to increase the tensile strength

Applications

Installation of cables and pipes in extreme conditions and hazardous areas, indoor and outdoor, such as:

- Petrochemical and food processing industries
- Power stations
- Mining
- Shipbuilding
- Offshore
- Other aggressive environments



Technical Information

Material	316 grade stainless Steel
Coating	Fully coated with non-toxic, halogen free Polyester
Temperature range	Coated: -80°C to +150°C
Colour	Black coating
Flammability rating	Absolutely fireproof
Other properties	UV-resistant Coating: Halogen free, non-toxic,

Approvals



TYPE APPROVED PRODUCTS

Ordering Information

PRODUCT REF.	DIMENSIONS			MAX. BUNDLE DIAMETER [mm]	MINIMUM TENSILE STRENGTH [N]	QUANTITY [pieces]	TOOLING
	L [mm]	W [mm]	T [mm]				
YRL-5-150-BC	150	5.0	0.61	35	334 (1334 for DNV)	100	
YRL-5-230-BC	230	5.0	0.61	60	334 (1334 for DNV)	100	
YRL-5-330-BC	330	5.0	0.61	95	334 (1334 for DNV)	100	
YRL-5-450-BC	450	5.0	0.61	130	334 (1334 for DNV)	100	
YRL-5-650-BC	650	5.0	0.61	195	334 (1334 for DNV)	100	
YRL-10-150-BC	150	10.0	0.61	35	1112 (2000 for DNV)	100	CT1-TB
YRL-10-230-BC	230	10.0	0.61	60	1112 (2000 for DNV)	100	CT2-TB
YRL-10-330-BC	330	10.0	0.61	95	1112 (2000 for DNV)	100	CT4-TB
YRL-10-450-BC	450	10.0	0.61	130	1112 (2000 for DNV)	100	
YRL-10-650-BC	650	10.0	0.61	195	1112 (2000 for DNV)	100	
YRL-10-750-BC	750	10.0	0.61	225	1112 (2000 for DNV)	100	
YRL-10-900-BC	900	10.0	0.61	270	1112 (2000 for DNV)	100	

For tooling specifications see pages 104 to 111

- Applications: installation, maintenance, street lights
- 3 different materials: non-magnetic 316 type stainless steel, galvanised steel and copper
- The multi purpose bands made of stainless steel and galvanised steel are also available coated with P.P.A., a non-toxic, halogen free and low-smoke material



Technical Information

Material (see table)	1. Stainless Steel 316 2. Galvanised Steel 3. Copper
Coating	Uncoated or coated with P.P.A.
Temperature range	-45°C to +150°C
Colour	Metallic Black coating
Flammability rating	Uncoated: fireproof Coating: UL 94 V-0
Other properties	Coating: halogen free, low smoke, non-toxic, UV-resistant

Ordering Information

PRODUCT REF.	MATERIAL	COATING	LENGTH [m]	WIDTH [mm]	THICKNESS [mm]	HOLE Ø [mm]
BND-5-10-B	316 grade stainless steel	uncoated	10	12	0.76	5
BND-7-10-B	316 grade stainless steel	uncoated	10	17	0.76	7
BND-8-10-B	316 grade stainless steel	uncoated	10	26	0.76	8
BND-5-10-BC	316 grade stainless steel	P.P.A. coated	10	12	0.76	5
BND-7-10-BC	316 grade stainless steel	P.P.A. coated	10	17	0.76	7
BND-8-10-BC	316 grade stainless steel	P.P.A. coated	10	26	0.76	8
BND-5-10-G	galvanised steel	uncoated	10	12	0.76	5
BND-7-10-G	galvanised steel	uncoated	10	17	0.76	7
BND-8-10-G	galvanised steel	uncoated	10	26	0.76	8
BND-5-10-GC	galvanised steel	P.P.A. coated	10	12	0.76	5
BND-7-10-GC	galvanised steel	P.P.A. coated	10	17	0.76	7
BND-8-10-GC	galvanised steel	P.P.A. coated	10	26	0.76	8
BND-5-10-K	copper	uncoated	10	12	0.76	5
BND-7-10-K	copper	uncoated	10	17	0.76	7

Other colours available on request: orange, red, grey and white.

These handy ties are very easy to release and re-use, making them ideal for applications where changes are anticipated or continuous access is required.

Main features

- High quality Hook & Loop Fasteners designed by Thomas & Betts
- Quick bundling and re-adjustable tension
- No risk of over-tightening the cables, which makes the Ty-Grip™ Hook & Loop fasteners ideal for specific applications in fibre optics, computer network wiring, telecom cables, etc
- Easily releasable and reusable
- Multiple colours available for identifying specific bundles
- Different sizes available to accommodate varying bundle diameters
- Screw-mount and self-adhesive mounting bases provide multiple mounting options



FO series: loop ties



FO series loop ties are ideal for wrapping pre-determined bundle diameters thanks to the convenient slotted head.

FOL Series: Buckle ties



FOL series buckle ties provide added strength and stability thanks to the high performance polyamide buckle.

FOS series: strip ties



FOS series strip ties are pre-cut which makes bundling easy.

FOR series: rolled Hook & Loop ties



FOR series rolled hook and loop allows customers to conveniently cut pieces to desired lengths, eliminating waste.

Technical Information

	FO series, FOS series, FOR series	FOL series
Material loop side	Low density Polyethylene	Low density Polyethylene
Material hook side	Polyamide	Polyamide
Temperature range	-20°C to +60°C	-20°C to +93°C
Colour	Standard colour: black - see note after table	Standard colour: black - see note after table
Flammability rating	UL 94 HB	UL 94 HB
Peel-off strength	0.8N/cm	0.8N/cm

Ordering Information

PRODUCT REF.	MAXIMUM BUNDLE Ø [mm]	LENGTH [mm]	WIDTH [mm]	TENSILE STRENGTH [N]	QUANTITY [pieces]
FO SERIES LOOP TIES					
FO200-40-0	50.8	228.6	12.7	180	10
FO200-50-0	50.8	228.6	19.1	220	10
FO350-40-0	88.9	330.2	12.7	180	10
FO350-50-0	88.9	330.2	19.1	220	10
FOL SERIES BUCKLE TIES					
FOL300-50-0	76.2	304.8	19.1	220	10
FOL500-50-0	127.0	457.2	19.1	220	10
FOS SERIES STRIP TIES					
FOS150-50-0	38.1	152.4	19.1	220	10
FOS320-50-0	81.3	304.8	19.1	220	10
FOS500-50-0	127.0	457.2	19.1	220	10
FOR SERIES ROLLED STRIP					
FOR180-50-0	Various	4572.0	19.1	220	1

Standard colour: black

Replace "-0" in the Product Reference by the corresponding colour code: 1 = brown, 2 = red, 3 = orange, 4 = yellow, 5 = green, 6 = blue, 8 = grey and 9 = white

For example: FO 200-40-2 defines a red FO200-40 type fastener

Contact your Sales Office for Product Availability in the other colours

Accessories: mounting bases

Two mounting bases with 4-way entry specifically designed for use with Ty-Grip™ Hook & Loop fasteners. Screw-mount version and self-adhesive version (with pressure sensitive foam).



Technical Information

Material	Polyamide 6.6 moulding + pressure sensitive foam (for self-adhesive version)
Temperature range	-40°C to +85°C
Colour	Natural
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	MOUNTING METHOD	HEIGHT [mm]	WIDTH [mm]	LENGTH [mm]	FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	QUANTITY [pieces]
TC368	M4 screws / glue*	6.6	50.8	50.8	19.1	4.3 (4x)	500
TC368A	self-adhesive	6.6	50.8	50.8	19.1	-	500

* See page 115 for TC2PA 2-component glue



+ Accessories

***Mounting bases
and clamps to support
cable bundles***

1. Fastening systems

1.1	Cable ties	7
1.2	Accessories	65
	Overview	66
	Mounting bases	67
	Cable clamps	83
	Cable clips	89
	Accessories for flat cables	91
1.3	Cable protection systems	95
1.4	Tooling	103
1.5	Material specifications	113

Overview

Self-adhesive mounting bases and clamps for screw and rivet mounting

The main difference between a mounting base and a cable clamp is the way the cable bundle can be mounted: while the cable bundle is attached directly to the clamp, the mounting base requires a cable tie to hold the bundle.

Thomas & Betts offers a wide range of mounting bases and cable clamps, which can be self-adhesive or for screw and rivet mounting.

- Standard material: Polyamide 6.6
- Available in different types / material to suit any application
- Available in a wide range of sizes
- Temperature range: -40°C to +85°C (+105°C for short periods)
- Low profile design
- Easy to install
- Extremely strong and durable adhesive
- The self-adhesive film is foam backed (0.8 mm) to compensate for any irregularities on the mounting surface
- When applicable Thomas & Betts accessories are UL recognised

Typical applications

Wiring of:

- Control boxes
- Vehicles
- Office equipment
- Machine control devices
- Machine construction
- Military equipment
- Aeronautics
- Railway industry
- Electronic equipment
- Home appliances
- Lighting
- Medical equipment



Mounting bases



Cable clamps

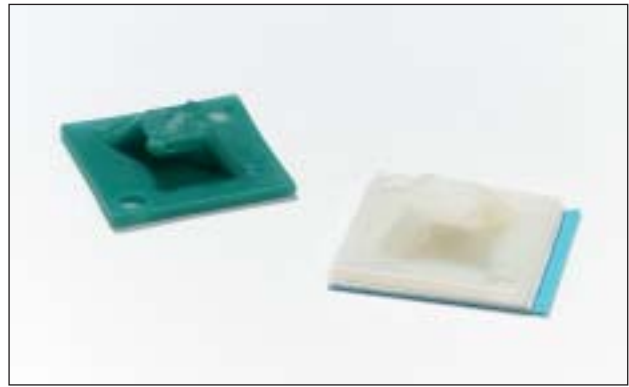
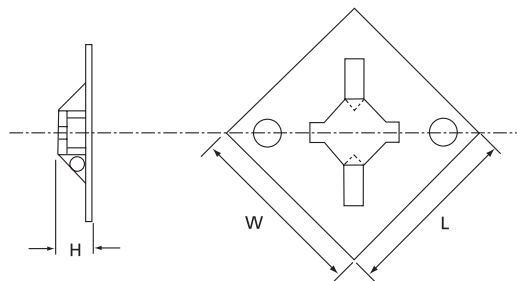
Accessories

Mounting bases

2 way entry bases

Self-adhesive / screw mounted / glue mounted

- Can be used in 2-way entry style for cable ties having a width up to 7.6 mm
- For cable ties having a width up to 4.8 mm, the mounting bases can be used in 4-way entry style
- Choice of 4 materials: standard Polyamide 6.6 (natural), UV-resistant Polyamide 6.6 (black), Polyamide 6.6 flame retardant and Tefzel[®] (aquamarine)
- Supplied either on a rubber based (synthetic polymer) closed cell foam adhesive (installation: self-adhesive and/or screw) or without self-adhesive (installation: screw and/or 2-component glue*)



Technical Information:

TC347, TC347A, TC347X, TC347FR

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Flammability rating	UL 94 V-2*
Other properties	UV-resistant (black), Halogen free, Silicone free

* UL 94 V-0 for TC347FR

Technical Information: TCZ347

Material	Tefzel [®]
Temperature range	-46°C to +150°C
Flammability rating	UL 94 V-0
Other properties	UV-resistant, Silicone free, inert to most solvents and chemicals, hydrolytically stable, radiation resistant

**trademark registered by DuPont de Nemours

Ordering Information

PRODUCT REF.	COLOUR	MOUNTING METHOD	DIMENSIONS			FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	QUANTITY [pieces]
			H [mm]	W [mm]	L [mm]			
TC347FR	natural / flame retardant	screw / glue*	7.8	28.6	28.6	7.6	4.4 (2x)	1000
TC347A	natural	self-adhesive / screw	8.5	29.0	29.0	7.6	4.4 (2x)	1000
TC347	natural	screw / glue*	7.8	28.6	28.6	7.6	4.4 (2x)	1000
TC347X	UV-resistant black	screw / glue*	7.8	28.6	28.6	7.6	4.4 (2x)	1000
TCZ347	aquamarine	screw / glue*	7.8	28.6	28.6	7.6	4.4 (2x)	500

* Glue = Product Ref. TC2PA (see page 115 for specifications)

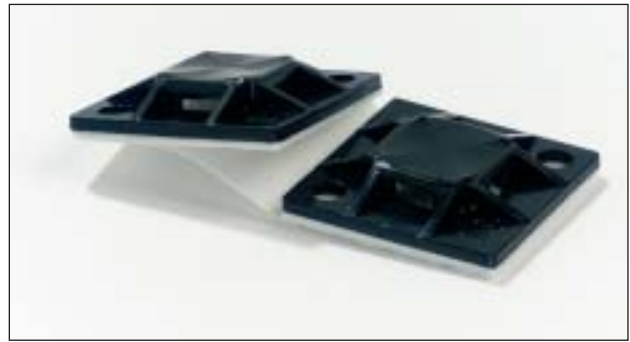
Accessories

Mounting bases

4 way entry bases

Self-adhesive / screw mounted / glue mounted

- 3 types to cover most applications
- Supplied either on a rubber based (synthetic polymer) closed cell foam adhesive or without self adhesive (installation: screw and/or 2 component glue*)
- Available in standard Polyamide 6.6 (natural), UV-resistant Polyamide 6.6 (black) or flame retardant Polyamide 6.6 (natural)



Technical Information

Material - moulding	Polyamide 6.6
Temperature range	-40 °C to +85 °C
Flammability rating	UL 94 V-2 / UL 94 V-0 (TC345AFR)
Colour	Natural, black or UV-resistant black
Other properties	UV-resistant (black), Halogen free, Silicone free

Fig. 1

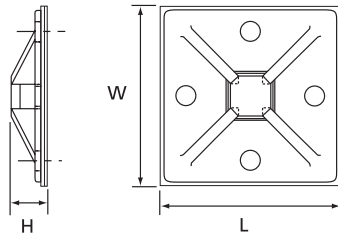


Fig. 3

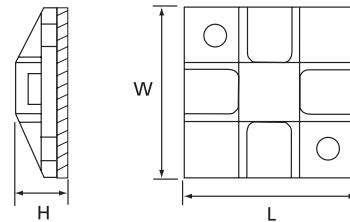


Fig. 2

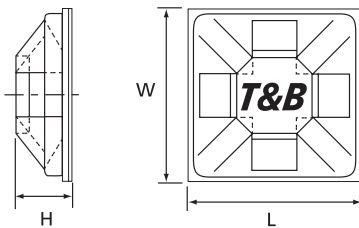
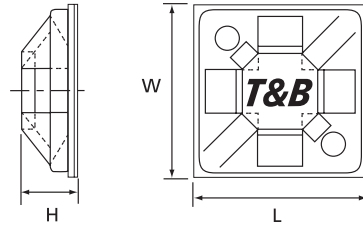


Fig. 4



Ordering Information

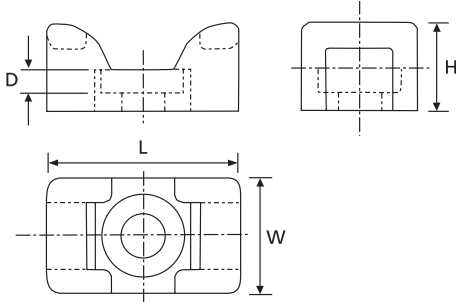
PRODUCT REF.	TYPE	COLOUR	MOUNTING METHOD	DIMENSIONS			FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	QUANTITY [pieces]
				L [mm]	W [mm]	H [mm]			
TC050x050A	Fig. 2	natural	self-adhesive	12.7	12.7	4.5	3.0	–	1000
TC050x050AX	Fig. 2	UV-resistant black	self-adhesive	12.7	12.7	4.5	3.0	–	1000
MPNY-750-0-D	Fig. 3	black	screw / self-adhesive	19.4	19.4	5.2	3.2	–	500
MPNY-750-9-D	Fig. 3	natural	screw / self-adhesive	19.4	19.4	5.2	3.2	–	500
TC344A	Fig. 4	natural	screw / self-adhesive	19.1	19.1	4.9	3.6	3.0	1000
TC344AX	Fig. 4	UV-resistant black	screw / self-adhesive	19.1	19.1	4.9	3.6	3.0	1000
TC345A	Fig. 1	natural	screw / self-adhesive	28.6	28.6	7.4	4.8	4.3	1000
TC345AFR	Fig. 1	natural flame retardant	screw / self-adhesive	28.6	28.6	7.4	4.8	4.3	1000
TC345AX	Fig. 1	UV-resistant black	screw / self-adhesive	28.6	28.6	7.4	4.8	4.3	1000
MPNY-1000-0-C	Fig. 3	black	screw / self-adhesive	25.4	25.4	5.5	5.2	–	100
MPNY-1000-9-C	Fig. 3	natural	screw / self-adhesive	25.4	25.4	5.5	5.2	–	100
TC150x150A	Fig. 1	natural	screw / self-adhesive	38.1	38.1	7.4	7.9	4.3	500
TC150x150	Fig. 1	natural	screw / glue*	38.1	38.1	7.4	7.9	4.3	500
TC200x200A	Fig. 1	natural	screw / self-adhesive	50.8	50.8	7.4	7.9	4.3	500
TC200x200	Fig. 1	natural	screw / glue*	50.8	50.8	7.4	7.9	4.3	500
TC368	Fig. 1	natural	screw / glue*	50.8	50.8	6.6	19.1	4.3	500
TC368A	Fig. 1	natural	screw / self-adhesive	50.8	50.8	6.6	19.1	4.3	500

* Glue = Product Ref. TC2PA (see page 115 for specifications)

Accessories

Mounting bases, Saddle support

- Tie mounting bases with supporting saddle
- For screw- or rivet-mounting
- Available in 2 different shapes and 5 sizes
- The prism-shape of the saddle prevents twisting around the fixture
- High strength through compact design
- Non-conductive, non-corrosive, resistant to fuels, lubricants and most chemicals



1.2

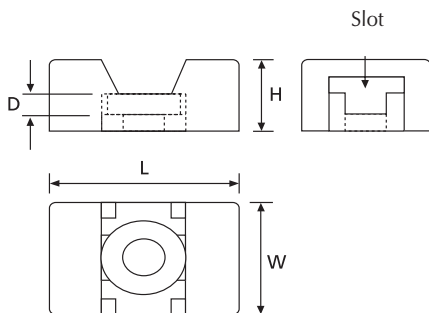
Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	DIMENSIONS				FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	QUANTITY [pieces]
		H [mm]	W [mm]	L [mm]	D [mm]			
TC140	natural	6.7	8.7	14.2	1.8	2.4	3.0	500
TC141	natural	7.5	11.1	17.0	2.3	4.8	3.8	500
TC142	natural	10.7	14.2	23.4	2.9	7.6	5.2	500

For other colours and quantities please contact your Sales Office



Technical Information

Material	Polyamide 6.6, Heat stabilised
Temperature range	-40°C to +105°C
Colour	Black or natural (see table)
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free, Heat stabilised

Ordering Information

PRODUCT REF.	COLOUR	DIMENSIONS				FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	QUANTITY [pieces]
		H [mm]	W [mm]	L [mm]	D [mm]			
SMNY-001-9-D	natural	7.1	9.8	15.2	4.7	4.8	4.2	500
SMNY-001-0-D	black	7.1	9.8	15.2	4.7	4.8	4.2	500
SMNY-002-9-D	natural	9.9	15.9	22.2	7.6	7.6	4.7	500
SMNY-002-0-D	black	9.9	15.9	22.2	7.6	7.6	4.7	500

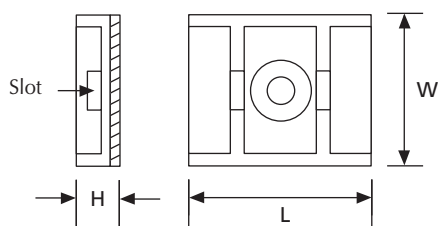
For other colours and quantities please contact your Sales Office

Accessories

Mounting bases

Self-adhesive mounting cradle

- Accepts cable ties to 7.6 mm width
- Supplied “two-up” on closed cell foam with synthetic polymer “rubber” based adhesive
- Use M3.5 self-tapping screw for added strength if desired



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or UV resistant black (see table)
Mounting method	Self adhesive and/or screw
Flammability rating	UL 94 V-2
Other properties	UV-resistant (black), Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	DIMENSIONS			FOR TIE WIDTH UP TO	QUANTITY
		H [mm]	L [mm]	W [mm]		
MCNY-1250-9-C	natural	7.2	31.7	25.4	7.6	100
MCNY-1250-0-C	UV-resistant black	7.2	31.7	25.4	7.6	100

* Glue = Product Ref. TC2PA (see page 115 for specifications)

For other colours and quantities please contact your Sales Office

Accessories

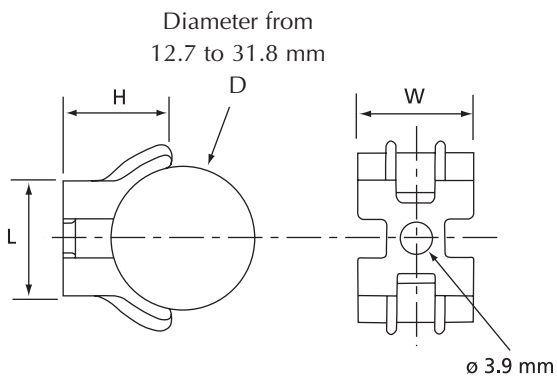
Mounting bases

Saddle-type mounting base

The saddle-type mounting bases allow 3 possible cable mounting:

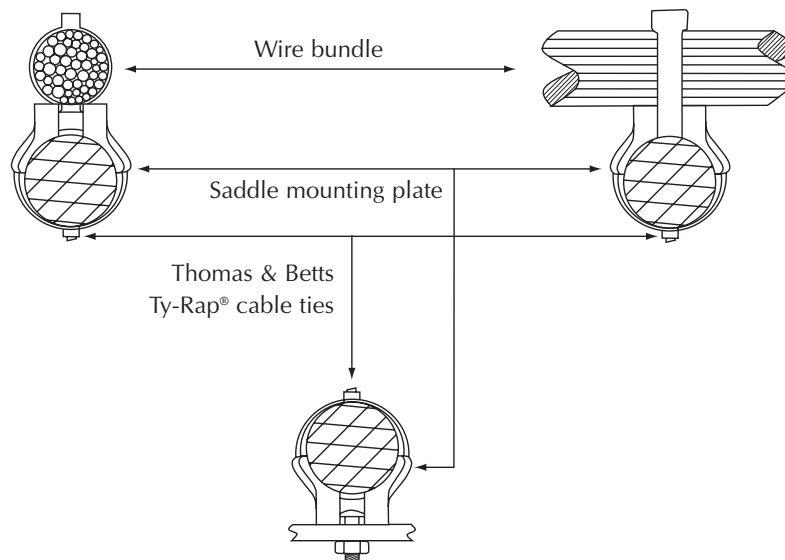
- the cables can be attached to a flat surface on which the base is screwed
- the cable bundles can be mounted in parallel
- the cable bundles can be mounted crosswise

Can also be used for the mounting of cylindrical objects having a diameter between 12.7 and 31.8 mm



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



Ordering Information

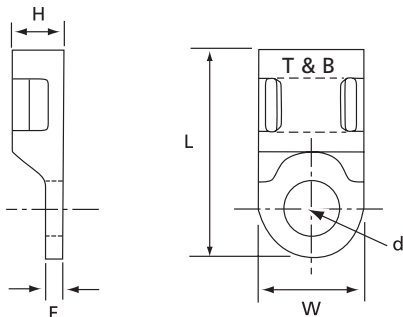
PRODUCT REF.	DIMENSIONS				FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	D [mm]				
TC92	14.3	15.1	15.1	12.7 - 31.8	4.8	3.9	143	100

Accessories

Mounting bases

Screw-mounted bases

- Low profile mounting base
- For screw- or rivet-mounting
- Easy to use thanks to the cable tie insertion guide



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Fillister-head screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

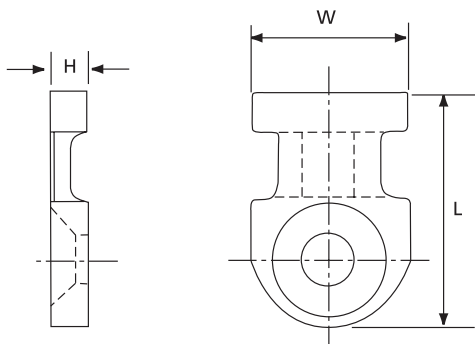
PRODUCT REF.	DIMENSIONS				FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø d [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	E [mm]				
TC814-TB	4.8	9.5	19.1	2.0	4.8	3.3	44	1000
TC112-TB	4.8	9.5	19.1	2.0	4.8	4.4	44	1000
TC812-TB	4.8	9.5	19.1	2.0	4.8	5.1	44	1000

For other colours and quantities please contact your Sales Office

Mounting bases

Screw-mounted bases

- Extremely low profile
- For screw- or rivet-mounting
- Easy to use thanks to the cable tie insertion guide



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Countersunk-head screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS			FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]				
TC804-TB	2.4	7.9	10.2	2.4	2.3	11	1000
TC104	2.4	7.9	10.3	2.4	3.4	11	1000
TC102	3.2	12.7	19.1	4.8	4.4	50	1000

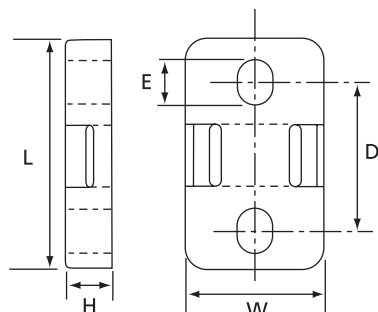
For other colours and quantities please contact your Sales Office

Accessories

Mounting bases

Screw-mounted bases for wide cable ties

- Extremely low profile
- For screw- or rivet-mounting
- Easy to use thanks to the cable tie insertion guide
- Secure fixing with 2 fastening holes



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	2 screws
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

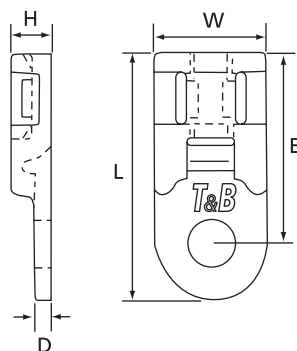
PRODUCT REF.	DIMENSIONS					FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	D [mm]	E [mm]				
TC815-TB	6.4	19.1	31.2	19.9	6.4	7.6	5.3	278	500

For other colours and quantities please contact your Sales Office

Mounting bases

Screw-mounted bases for crosswise fastening

- Extremely low profile
- For screw- or rivet-mounting
- Easy to use thanks to the cable tie insertion guide
- Two ties can be fastened crosswise to securely fix cable intersections



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS					FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	D [mm]	E [mm]				
TC828-TB	3.8	10.1	22.5	1.5	13.4	4.8	4.3	46	1000

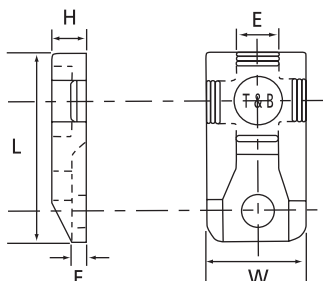
For other colours and quantities please contact your Sales Office

Accessories

Mounting bases

Screw-mounted bases for crosswise fastening

- Extremely low profile
- For screw- or rivet-mounting
- Easy to use thanks to the cable tie insertion guide
- Two ties can be fastened crosswise to securely fix cable intersections



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

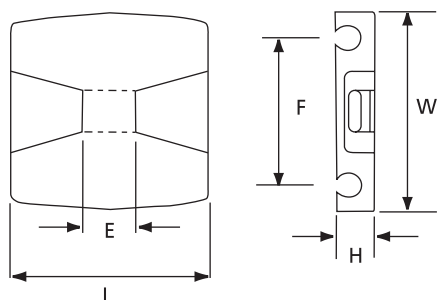
PRODUCT REF.	DIMENSIONS					FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	E [mm]	F [mm]				
TC826-TB	5.7	12.7	23.8	5.3	2.0	4.8	4.4	102	1000

For other colours and quantities please contact your Sales Office

Mounting bases

Glue mounted bases

- Tie mounting base for gluing with 2-component glue*
- Low profile
- Easy to use



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	2 component glue (Product Ref. TC2PA *)
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

* Product Ref. TC2PA: see page 115 for specifications

Ordering Information

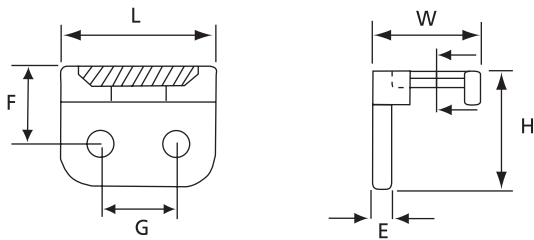
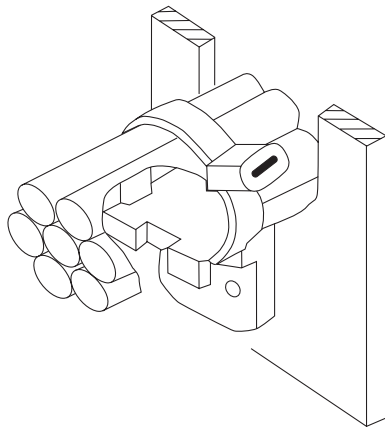
PRODUCT REF.	DIMENSIONS					FOR TIE WIDTH UP TO [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	E [mm]	F [mm]			
TC342	5.7	29.0	29.0	7.5	21.0	4.8	340	1000
TC817-TB	4.8	11.0	11.0	-	-	4.8	51	1000

Accessories

Mounting bases

Screw-mounted supporting bases

- Supporting mounting base with strong hold thanks to 2 mounting holes
- Can be screwed or riveted
- Allows double and/or crosswise (two ties) fixing
- For parallel and through mounting with support
- Suitable for large bundle diameters



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	2 screws
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS						FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	G [mm]	E [mm]	F [mm]				
TC106	25.4	19.1	25.4	12.7	4.6	16.5	7.6	3.3 (x 2)	435	200
TC109	11.1	9.9	14.3	7.1	1.7	7.0	4.8	2.4 (x 2)	45	1000

Accessories

Mounting bases

Screw-mounted strips for multiple bundling

- Tie mounting strips for up to 6 bundles simultaneously
- When mounted, the tie is guided through the clamp for fast assembly

Product Ref. TC1101 to TC1117

- Simple and strong flat mounting beams for fixing multiple cables, bundles or components
- Mil. Specified
- VG approved (VG 95387, item 2)

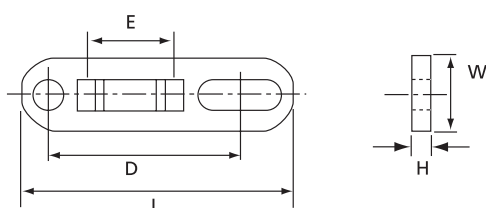
Product Ref. TC375 and TC376

- For vertical and double-side mounting

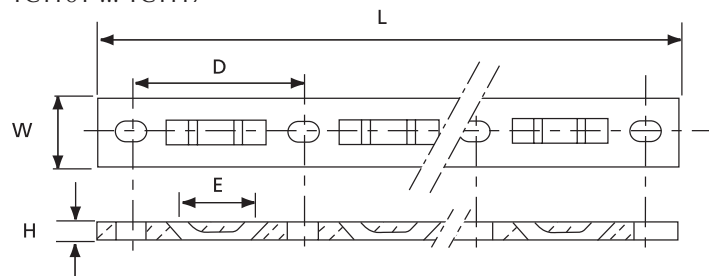
Product Ref. TC101 and TC103

- Elongated fastening hole on one end allows greater flexibility during mounting

TC101 & TC103



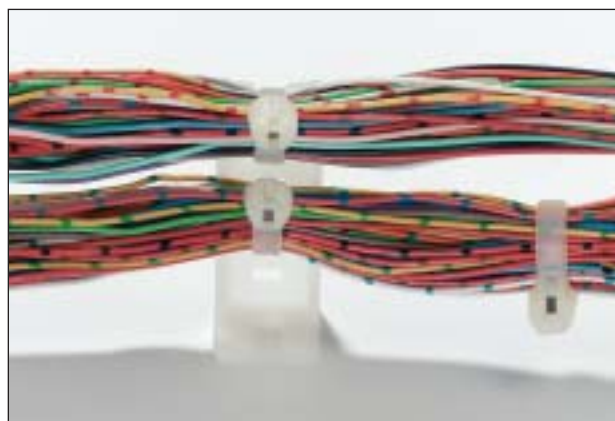
TC1101 ... TC1117



Ordering Information

PRODUCT REF.	MIL SPEC.	DIMENSIONS					MAX. NUMBER OF BUNDLES	FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
		H [mm]	W [mm]	L [mm]	D [mm]	E [mm]					
TC101	-	3.2	12.7	50.0	35.6	9.5	1	4.8	5.2	151	1000
TC103	-	5.1	15.8	79.0	59.6	18.6	1	7.6	6.9	505	500
TC1101	MS-3339-1-9	3.2	12.7	44.0	31.8	9.5	1	4.8	3.7	160	100
TC1102	MS-3339-2-9	3.2	12.7	76.0	31.8	9.5	2	4.8	3.7	280	100
TC1103	MS-3339-3-9	3.2	12.7	108.0	31.8	9.5	3	4.8	3.7	400	100
TC1104	MS-3339-4-9	3.2	12.7	140.0	31.8	9.5	4	4.8	3.7	520	100
TC1105	MS-3339-5-9	3.2	12.7	171.0	31.8	9.5	5	4.8	3.7	650	100
TC1112	MS-3339-11-9	5.2	15.9	244.0	38.1	14.3	6	7.6	3.7	1679	100
TC1113	MS-3339-6-9	5.2	15.9	53.3	38.1	14.3	1	7.6	3.7	385	100
TC1114	MS-3339-7-9	5.2	15.9	91.4	38.1	14.3	2	7.6	3.7	658	100
TC1115	MS-3339-8-9	5.2	15.9	130.0	38.1	14.3	3	7.6	3.7	914	100
TC1116	MS-3339-9-9	5.2	15.9	168.0	38.1	14.3	4	7.6	3.7	1190	100
TC1117	MS-3339-10-9	5.2	15.9	206.0	38.1	14.3	5	7.6	3.7	1141	100
TC375	-	19.1	17.5	93.0	-	6.4	5	4.8	4.8	486	100
TC376	-	17.0	17.5	44.0	-	6.4	2	4.8	4.8	253	100

For other colours and quantities please contact your Sales Office

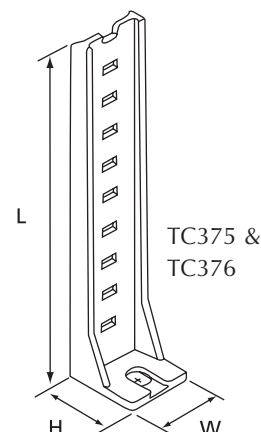


Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	2 screws (1 screw for Prod. Ref. TC376 & TC375)
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Approvals

Mil. Specified (MS-3339-...-...)



Accessories

Mounting bases

Heavy-duty bases

- Tie mounting base for outdoor installation
- A strong, weatherproof and durable outdoor fastening solution for pipes, hoses, cables, etc.

Product Ref. TC5358 and TC5359

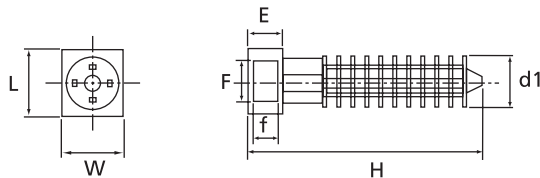
- Built-in plug for mounting into walls
- Easy to install: the plug is simply hammered into a hole
- The lamellar plug ensures high tensile strength and durability

Product Ref. TC5355 to TC5357

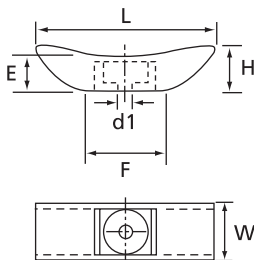
- For screw-fastening
- Ergonomically shaped for trouble-free installation



TC5358-TC5359



TC5355-TC5356-TC5357



Technical Information

Material	UV-stabilised Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Black
Mounting method	Screw (for Product ref. TC5355 to TC5357 only)
Flammability rating	UL 94 V-2
Other properties	UV-resistant, Halogen free, Silicone free

Ordering Information

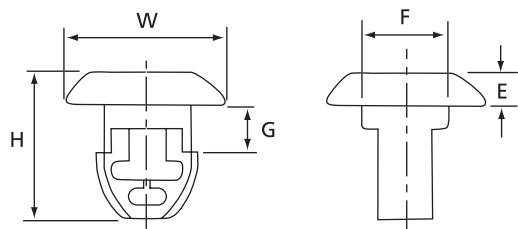
PRODUCT REF.	DIMENSIONS						FOR TIE WIDTH UP TO	MOUNTING HOLE Ø d1	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	E [mm]	F [mm]	f [mm]				
TC5355	15.9	19.1	44.5	11.1	28.6	-	12.7	4.6	500	25
TC5356	15.9	19.1	44.5	11.1	28.6	-	12.7	5.2	500	25
TC5357	15.9	19.1	44.5	11.1	28.6	-	12.7	6.7	500	25
TC5358	31.8	9.9	9.9	7.1	5.6	2.3	4.8	6.4 (in wall)	120	100
TC5359	38.4	19.1	19.1	8.1	14.0	3.1	12.7	9.5 (in wall)	320	50

Accessories

Mounting bases

Clip-in mounting bases for blind mounting

- Clip-in tie mounting bases for housings, faceplates etc
- With fastening clip for blind-mounting and two openings for two 2.8 mm or 4.8 mm ties
- Low profile



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Clip in
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

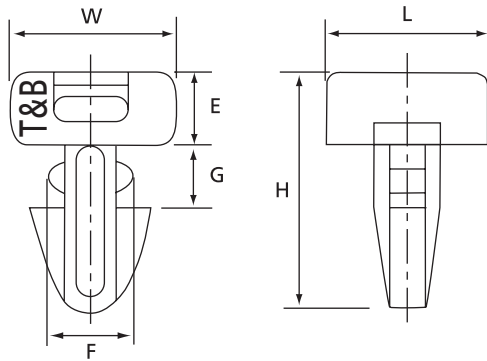
PRODUCT REF.	DIMENSIONS					PANEL THICKNESS FROM ... TO	FOR TIE WIDTH UP TO	MOUNTING HOLE Ø	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	G [mm]	E [mm]	F [mm]					
TC121-TB	10.4	11.2	3.4	2.0	6.1	0.1 - 3.2	2.4 and 4.8	6.3	31	1000

Accessories

Mounting bases

Clip-in mounting bases for surface mounting

- Clip-in tie mounting bases for housings, faceplates etc
- With fastening clip for surface mounting
- Low profile



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural (TC823-TB & TC823FR) UV-resistant black (TC823X)
Mounting method	Clip in
Flammability rating	UL 94 V-0 (TC823FR) UL 94 V-2 (TC823-TB & TC823X)
Other properties	UV-resistant (black), Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS						PANEL THICKNESS FROM ... TO	FOR TIE WIDTH UP TO	MOUNTING HOLE Ø	WEIGHT [g/100]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	G [mm]	E [mm]	F [mm]					
TC823-TB	16.8	11.1	11.1	3.6	5.1	5.8	0.1 - 3.2	4.8	6.2 - 6.5	68	1000
TC823X	16.8	11.1	11.1	3.6	5.1	5.8	0.1 - 3.2	4.8	6.2 - 6.5	68	1000
TC823FR	16.8	11.1	11.1	3.6	5.1	5.8	0.1 - 3.2	4.8	6.2 - 6.5	68	1000

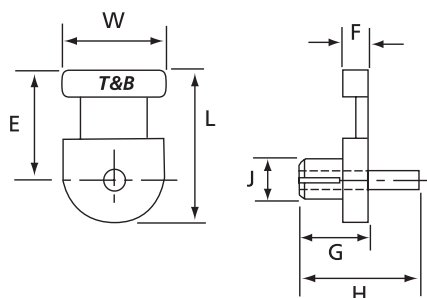
For other colours and quantities please contact your Sales Office

Accessories

Mounting bases

Rivet-mounted bases

- Low profile mounting base with integrated rivet
- Easy to install into normal or blind holes: just hammer in the expanding harbour
- Parts are colour-coded according to hole diameter to avoid confusion



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	See table
Mounting method	Rivet mounted
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	DIMENSIONS							FOR TIE WIDTH UP TO	MOUNTING HOLE Ø	WEIGHT [g/100]	QUANTITY [pieces]
		W [mm]	L [mm]	F [mm]	E [mm]	G [mm]	H [mm]	J [mm]				
TC116-TB	red	12.7	19.1	3.2	13.9	8.6	15	3.9	4.8	3.7	70.5	1000
TC118-TB	blue	12.7	19.1	3.2	13.9	8.6	15	4.5	4.8	4.4	71.0	1000
TC120	yellow	12.7	19.1	3.2	13.9	8.6	15	5.2	4.8	4.9	71.5	1000

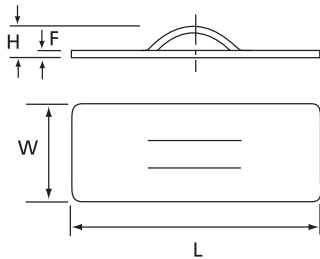
Accessories

Mounting bases Aluminium plates

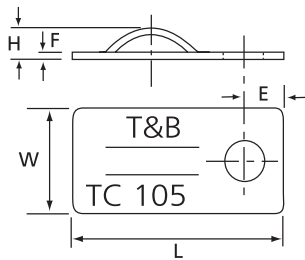
- Very strong mounting base for gluing or screw mounting or self-adhesive mounting
- Low profile
- Soft material can be perfectly shaped onto any support
- Lightweight
- Does not age even under extreme temperatures



TC824-TB



TC105 and TC105AP



Technical Information

Material	Aluminium (3003, ASTM-B-209)
Temperature range	-100°C to +450°C
Colour	Metallic
Mounting method	Glue (*) and / or screw or self-adhesive
Flammability rating	Fire proof
Other properties	UV-resistant

Ordering Information

PRODUCT REF.	MOUNTING METHOD	DIMENSIONS					FOR TIE WIDTH UP TO [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
		H [mm]	W [mm]	L [mm]	E [mm]	F [mm]				
TC105AP	self-adhesive / screw	3.8	13.2	25.4	4.8	0.8	4.8	4.9	67	1000
TC105	screw	3.8	13.2	25.4	4.8	0.8	4.8	4.9	67	1000
TC824-TB	2-component glue*	3.8	9.5	34.9	-	0.8	4.8	-	69	1000

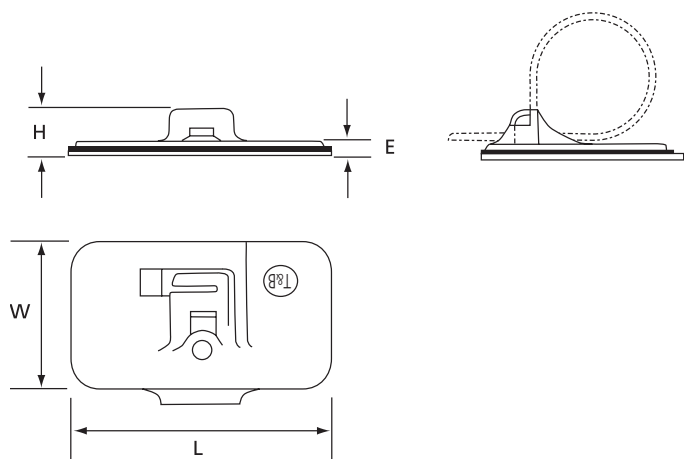
(*) Product. Ref. TC2PA (see page 115) for specifications

Accessories

Mounting bases

Special mounting bases for Ty-Rap® cable ties

- Easy to install: The Ty-Rap® is slid into the mounting base before its installation
- Recommended for use with Ty-Rap® cable ties TY25M, TY253M and TY28M (see page 11)



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive and / or screw-mounting
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	MOUNTING METHOD	DIMENSIONS				FOR TIE WIDTH UP TO [mm]	ADHESIVE STRENGTH ON STEEL [N/cm]	HOLE DIAMETER [mm]	WEIGHT [g/100]	QUANTITY [pieces]
		H [mm]	W [mm]	L [mm]	E [mm]					
TC353A	self-adhesive / screw	9.1	25.4	50.9	2.5	4.8	72	3.8	320	100
TC5353A	self-adhesive / screw	9.1	25.4	50.9	2.5	4.8	72	3.8	320	25
TC353	screw	8.4	26.5	52.0	1.4	4.8	-	3.8	320	100

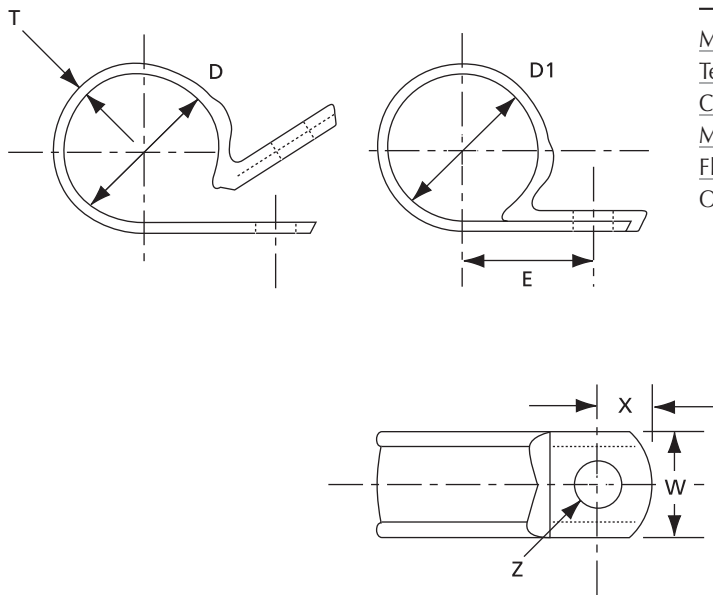
See page 115 for self-adhesive material specifications.

Accessories

Cable clamps

Self-aligning cable clamps

- Moulded-in saddle washer enhances performance and appearance
- Self-alignment feature makes this clamp ideal for assembly applications
- 14 diameters and 2 widths with mounting holes for M4 and M5 screws
- Item numbers moulded-in for easy identification
- Indoor application



Technical Information

Material	Heat-stabilised Polyamide 6.6
Temperature range	-40°C to +105°C
Colour	Black
Mounting method	Screw
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS							QUANTITY
	D NOMINAL DIAMETER [mm]	D1 CLOSED DIAMETER [mm]	E [mm]	T [mm]	W [mm]	Z [mm]	X [mm]	
W4NY-125-0-C	3.17	2.89	8.46	1.02	9.52	4.24	6.53	100
W4NY-187-0-C	4.76	4.36	9.02	1.02	9.52	4.24	5.53	100
W4NY-250-0-C	6.34	5.94	9.70	1.02	9.52	4.24	4.83	100
W4NY-312-0-C	7.93	7.54	10.71	1.02	9.52	4.24	5.21	100
W4NY-375-0-C	9.52	9.11	11.53	1.02	9.52	4.24	5.33	100
W4NY-500-0-C	12.69	12.29	12.45	1.02	9.52	4.24	6.76	100
W6NY-562-0-C	14.28	13.90	16.68	1.52	12.69	5.15	5.99	100
W6NY-625-0-C	15.87	15.46	16.17	1.52	12.69	5.15	7.37	100
W6NY-687-0-C	17.46	17.06	17.63	1.52	12.69	5.15	8.31	100
W6NY-750-0-C	19.04	18.64	18.44	1.52	12.69	5.15	8.28	100
W6NY-812-0-C	20.63	20.24	19.71	1.52	12.69	5.15	8.20	100
W6NY-875-0-C	22.22	21.81	18.62	1.52	12.69	5.15	7.87	100
W6NY-1000-0-C	25.39	24.99	22.38	1.52	12.69	5.15	7.42	100
W6NY-1250-0-C	31.73	31.16	25.65	1.52	12.69	5.15	8.61	100

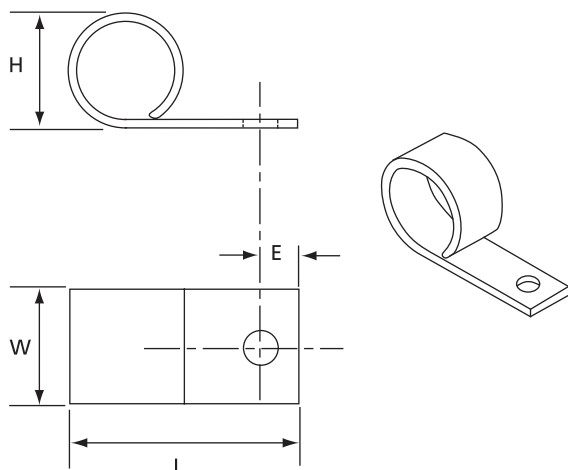
Also available in quantities of 1,000 pieces. For other colours please contact your Sales Office

Accessories

Cable clamps

Rigid PVC cable clamps

- Open mounting clips
- Easy to use: cables, for example, are simply pushed sideways into the clip one by one



Technical Information

Material	Rigid PVC
Temperature range	-40°C to +85°C
Colour	White
Mounting method	Screw
Flammability rating	UL 94 V-2

Ordering Information

PRODUCT REF.	DIMENSIONS				MOUNTING HOLE Ø	WEIGHT	QUANTITY
	H	W	L	E			
	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC70	6.4	9.9	22.2	6.4	5.2	49	100
TC71	12.7	9.9	29.0	6.4	5.2	123	100
TC72	20.6	13.1	36.9	6.4	5.2	259	100
TC73	25.4	13.1	46.8	6.4	5.2	399	100
TC74	38.1	13.1	58.3	6.4	5.2	608	100

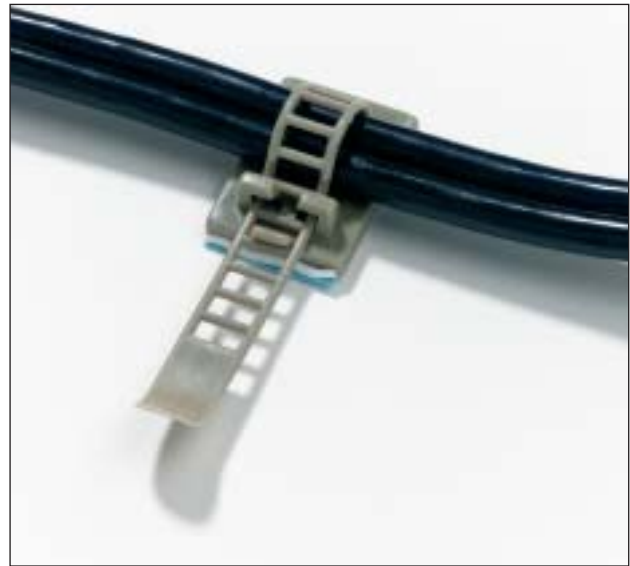
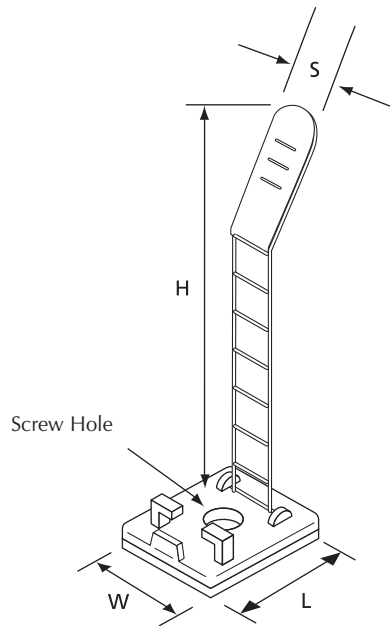
For other quantities please contact your Sales Office

Accessories

Cable clamps

Adjustable, ladder style clamps

- Ladder style fastener is easily released and refastened
- Supplied "single-cut" on a rubber based closed cell foam adhesive
- In addition, can also be mounted with a screw, for improved pull-off strength



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Grey
Mounting method	Self adhesive and / or screw-mounting
Flammability rating	UL 94 V-2 (clamp)
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS				BUNDLE DIAMETER RANGE [mm]	SCREW HOLE DIAMETER [mm]	QUANTITY [pieces]
	H [mm]	W [mm]	L [mm]	S [mm]			
ULNY-013-8-C	59.5	18	25	8	3 - 12.7	2.79	100
ULNY-018-8-C	79.4	21	30	12	5 - 21.0	2.79	100
ULNY-023-8-C	85.5	25	35	14	7 - 25.0	3.43	100

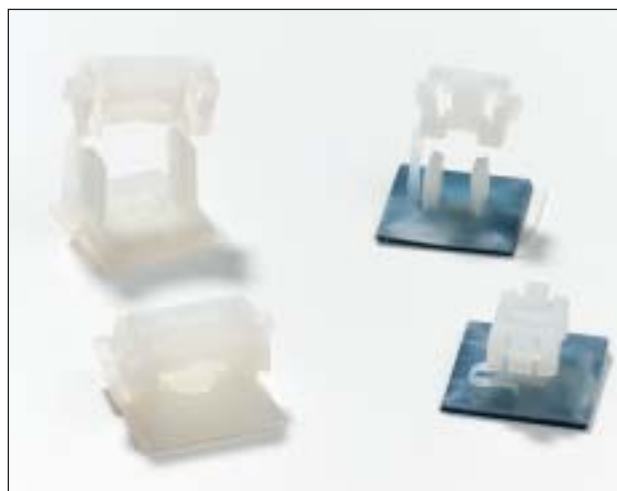
For other quantities please contact your Sales Office

Accessories

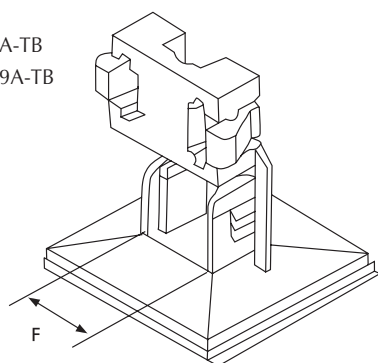
Cable clamps

Latching clamps

- Re-usable tie mounting clamps
- For self-adhesive and / or screw- or rivet mounting
- One-piece design with integrated releasable lock
- The inner profile protects sensitive cables, fibre optics etc
- Desired height can be set in 3 or 6 ratchet steps
- The large base surface area and the strong adhesive film guarantees a high adhesive strength
- The self-adhesive film is foam backed (0.8 mm) to compensate for any irregularities on the mounting surface

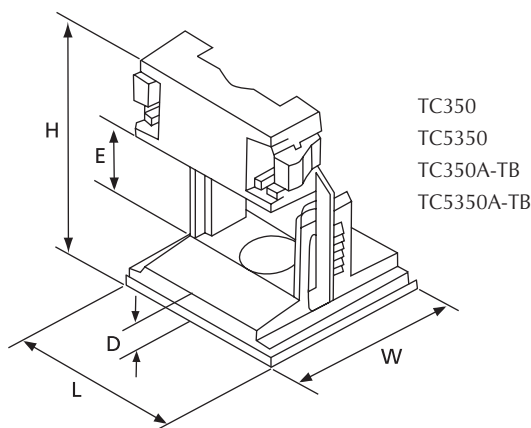


TC349A-TB
TC5349A-TB



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self adhesive or screw-mounting
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



TC350
TC5350
TC350A-TB
TC5350A-TB

Ordering Information

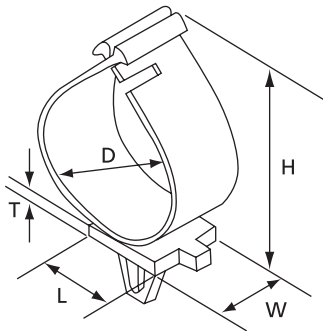
PRODUCT REF.	MOUNTING METHOD	DIMENSIONS					E HEIGHT OF CLAMPING AREA FROM ... TO [mm]	F WIDTH OF CLAMPING AREA [mm]	MOUNTING HOLE Ø [mm]	WEIGHT [g/100]	QUANTITY [pieces]
		H MAX. [mm]	H MIN. [mm]	W [mm]	L [mm]	D [mm]					
TC349A-TB	self-adhesive	14.5	11.5	25.0	25.0	2.7	6 - 8.5	6	-	120	1000
TC5349A-TB	self-adhesive	14.5	11.5	25.0	25.0	2.7	6 - 8.5	6	-	120	100
TC350A-TB	self-adhesive /screw	22.0	18.0	25.0	25.0	4.7	6 - 12.5	15	4.3	400	1000
TC5350A-TB	self-adhesive / screw	22.0	18.0	25.0	25.0	4.7	6 - 12.5	15	4.3	400	100
TC350	screw	21.3	17.2	25.0	25.0	4.0	6 - 12.5	15	4.3	380	1000
TC5350	screw	21.3	17.2	25.0	25.0	4.0	6 - 12.5	15	4.3	380	100

Accessories

Cable clamps

Re-openable clamps

- Simple installation
- Can be mounted by clipping-in or gluing
- For series production or as a temporary support during wiring installation
- Clip ends are rounded for comfortable re-opening
- Product Ref. TC 95 features 2-stage lock



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Clip in
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

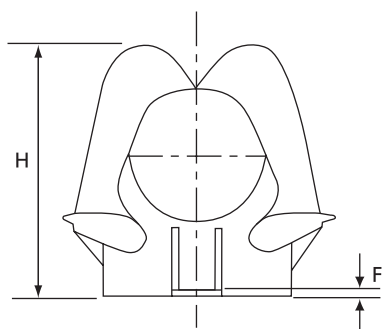
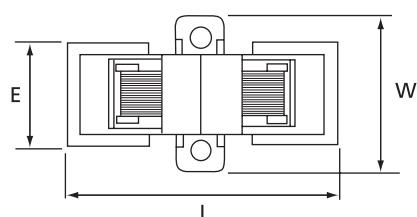
PRODUCT REF.	DIMENSIONS					FOR WALL THICKNESS FROM ... TO	MOUNTING HOLE Ø	WEIGHT	QUANTITY
	H [mm]	W [mm]	L [mm]	D [mm]	T [mm]				
TC88	22.6	12.7	19.1	12.7	2.5	2.5 - 3.6	5.7 - 7	115	100
TC95	40.5	12.7	19.1	25.4	2.5	2.5 - 3.6	5.7 - 7	278	100

Accessories

Mounting clamp

Re-openable clamps with springs

- Holding clips with rubberised fabric tape
- The built-in springs hold the cable bundle safely in the desired position
- The upper clip end is rounded for easy addition of cables
- Strong fixing due to two mounting holes, aligned along the axis of the cable bundle



Technical Information

Material - Body	Polyamide 6.6
Material - Elastic	Rayon & natural rubber
Material - Spring	Steel
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	2 screws
Flammability rating	UL 94 V-2 (body)
Other properties	Halogen free

Ordering Information

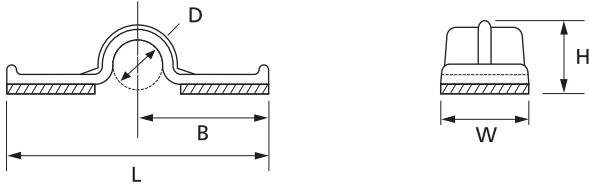
PRODUCT REF.	DIMENSIONS					MAX. BUNDLE Ø	MOUNTING HOLE Ø	WEIGHT	QUANTITY
	H [mm]	L [mm]	W [mm]	E [mm]	F [mm]				
TC86	46	44.5	31.8	22.2	2.5	19	3.9	860	25
TC87	58	62.7	38.1	25.4	2.5	32	3.9	1950	25

Accessories

Cable clips

Self-adhesive press clips

- 4 sizes to accommodate bundles from 3 mm to 12 mm
- Clips are provided "two-up" on a rubber based closed cell foam adhesive



Technical Information

Material	Polyamide 6.6 (clip)
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

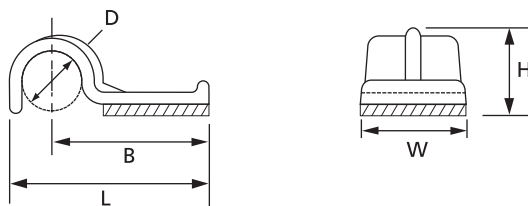
Ordering Information

PRODUCT REF.	DIMENSIONS						QUANTITY [pieces]
	D [mm]	L [mm]	B [mm]	H [mm]	W [mm]		
PCNY-125-9-C	3.17	19.30	9.65	5.36	9.52	100	
PCNY-250-9-C	6.35	35.05	17.52	8.23	12.69	100	
PCNY-375-9-C	9.52	37.32	18.61	11.29	15.87	100	
PCNY-500-9-C	12.69	40.57	20.19	14.85	19.05	100	

Cable clips

Self-adhesive half press clips

- 4 sizes to accommodate bundles from 3 mm to 12 mm
- Clips are provided "two-up" on a rubber based closed cell foam adhesive



Technical Information

Material - Body	Polyamide 6.6 (clip)
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS						QUANTITY [pieces]
	D [mm]	L [mm]	B [mm]	H [mm]	W [mm]		
HCNY-125-9-C	3.17	12.52	9.65	4.57	9.52	100	
HCNY-250-9-C	6.35	21.97	17.52	8.25	12.69	100	
HCNY-375-9-C	9.52	24.88	19.05	10.54	15.87	100	
HCNY-500-9-C	12.69	28.19	20.83	14.22	19.05	100	

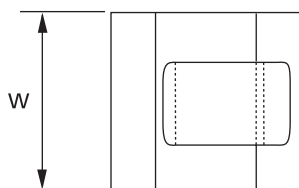
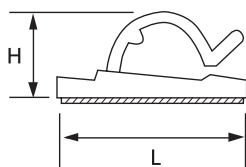
For other quantities please contact your Sales Office

Accessories

Cable clips

Self-adhesive clips for round cable

- Diverse cable clamps for bundle diameters from 4 mm to 15.8 mm
- Clips are provided two-up on a rubber based closed cell foam adhesive
- Flexible centre tongue for removal or addition of cables



Technical Information

Material	Polyamide 6.6 (clip)
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	DIMENSIONS			MAX. BUNDLE Ø	QUANTITY
	H [mm]	L [mm]	W [mm]		
RANY-160-9-D	6.4	16.0	14.8	4.0	500
RANY-280-9-D	10.4	25.4	25.4	7.1	500
RANY-530-9-D	15.8	25.4	25.4	13.5	500
RANY-620-9-D	14.2	31.8	28.5	15.8	500

For other quantities please contact your Sales Office

Accessories

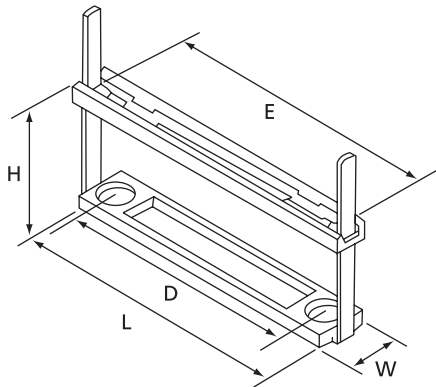
Accessories for flat cables

Cable clamps

- This system allows the secure and neat fixing of between 1 and 25 ribbon cables
- Clamp height adapts accurately to the desired number of ribbon cables
- Suitable for ribbon cables up to 60 conductors with a pitch of 1.27 mm (76.2 mm wide)
- Can be re-opened for later addition or removal of a cable
- Very strong hold
- All versions can be mounted with countersunk-head screws or rivets
- Some versions have an additional self-adhesive foam, for fast mounting

Technical Information

Material	Polyamide 6.6 (clip)
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive and / or for screw- or rivet-mounting
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free



Ordering Information

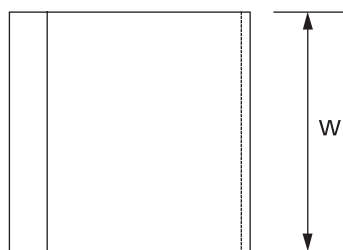
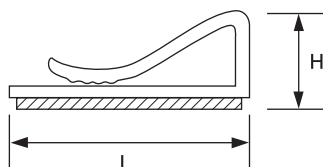
PRODUCT REF.	MOUNTING METHOD	DIMENSIONS					ADHESIVE STRENGTH ON STEEL/ FASTENING HOLE	WEIGHT [g/100]	QUANTITY [pieces]	
		H	H	W	L	D				E
		MAX. [mm]	MIN. [mm]	[mm]	[mm]	MOUNTING CENTRES [mm]				INNER WIDTH [mm]
FCC-1	countersunk screws	21.0	8.0	12.7	32.5	–	25.4	M4	260	50
FCC-1A	countersunk screws / self-adhesive	21.0	8.8	12.7	32.5	–	25.4	76 N/cm	275	50
FCC-2	countersunk screws	36.0	8.0	12.7	57.9	39.1	50.8	M4	340	50
FCC-2A	countersunk screws / self-adhesive	36.0	8.8	12.7	57.9	39.1	50.8	76 N/cm	390	50
FCC-3	countersunk screws	36.0	8.0	12.7	83.3	64.5	76.2	M4	475	50
FCC-3A	countersunk screws / self-adhesive	36.0	8.8	12.7	83.3	64.5	76.2	76 N/cm	490	50

Accessories

Accessories for flat cables

PVC cable-clips

- Low profile clip for single or multiple layers of flat ribbon cable
- "Single cut" on a rubber based closed cell foam adhesive



Technical Information

Material	PVC (clip)
Temperature range	-40°C to +85°C
Colour	Grey
Mounting method	Self-adhesive
Flammability rating	UL 94 V-0 (clip)
Other properties	UV-resistant

Ordering Information

PRODUCT REF.	DIMENSIONS			QUANTITY
	H [mm]	L [mm]	W [mm]	
FRPV-1000-8-D	5.8	27	25.4	500

For other quantities please contact your Sales Office

Accessories

Accessories for flat cables

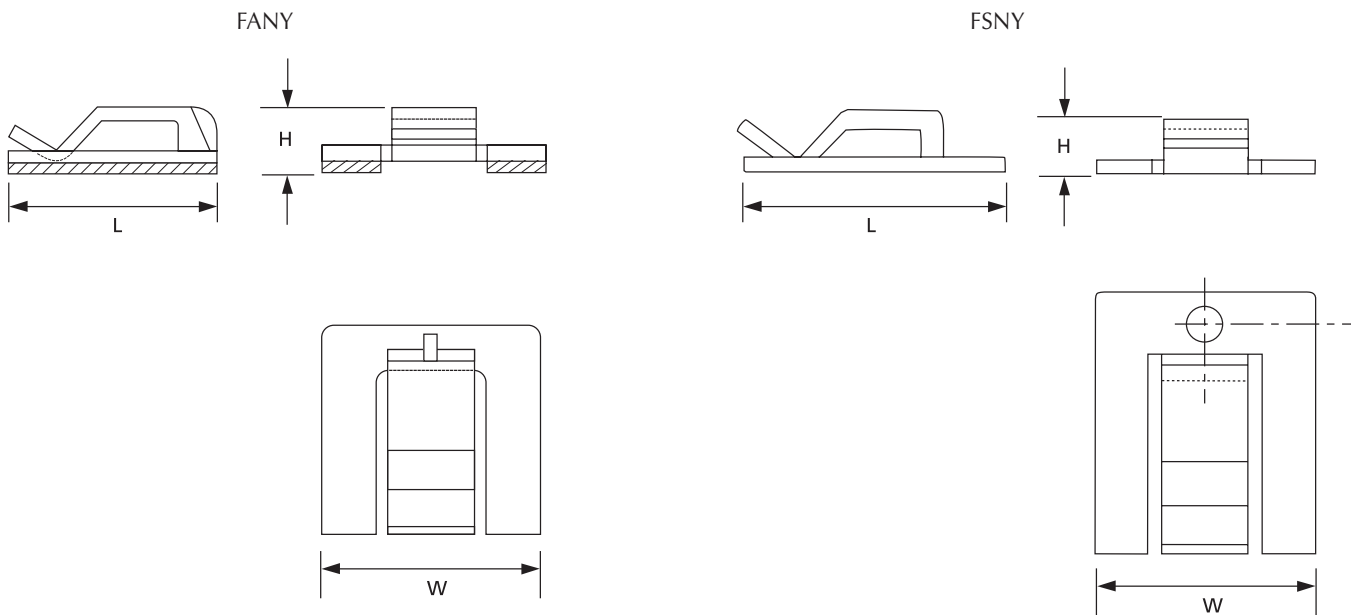
Clips with flexible leg

- Low profile clip for single or multiple layers of flat ribbon cable
- Flexible centre leg allows for easy removal and replacement of desired cable
- Non-conductive, non-corrosive, resistant to fuels, lubricants and most chemicals
- FANY supplied "two-up" on a rubber based closed cell foam adhesive
- FSNY type has an additional mounting hole for screw mounting (M4 screw)



Technical Information

Material	Polyamide 6.6 (clip)
Temperature range	-40°C to +85°C
Colour	Natural
Mounting method	Self-adhesive or screw
Flammability rating	UL 94 V-2 (clip)
Other properties	Halogen free, Silicone free



Ordering Information

PRODUCT REF.	MOUNTING METHOD	DIMENSIONS			QUANTITY
		H [mm]	L [mm]	W [mm]	
FSNY-812-9-C	M4 screw	3.17	30.15	25.40	100
FANY-812-9-C	self-adhesive	7.14	25.40	25.40	100

For other quantities please contact your Thomas & Betts Sales Office



**+ Cable protection
systems**

***To protect and bundle
wires and cables***

1. Fastening systems

1.1	Cable ties	7
1.2	Accessories	65
1.3	Cable protection systems	95
	Bind-It™	96
	Bind-It™ - Flame retardant	97
	Braided sleeving - Flame retardant	98
	Braided sleeving - Non flame retardant	99
	Spiral wrap	100
	Extruded grommeting	101
1.4	Tooling	103
1.5	Material specifications	113

- Offers excellent protection for cable assemblies against abrasion
- No heat is required to seal the ends of this product as with traditional braided sleeving
- With its wrap-around design, it can be installed on assemblies where the wires are already terminated or wires need to be broken-out
- Bind-It™ is available in nominal sizes from 5 mm to 38 mm
- A professional assembly tool is supplied on request for the 5 mm, 8 mm and 13 mm nominal sizes
- Product is supplied black as standard with a white version available on request
- Material: mono and multifilaments of polyester



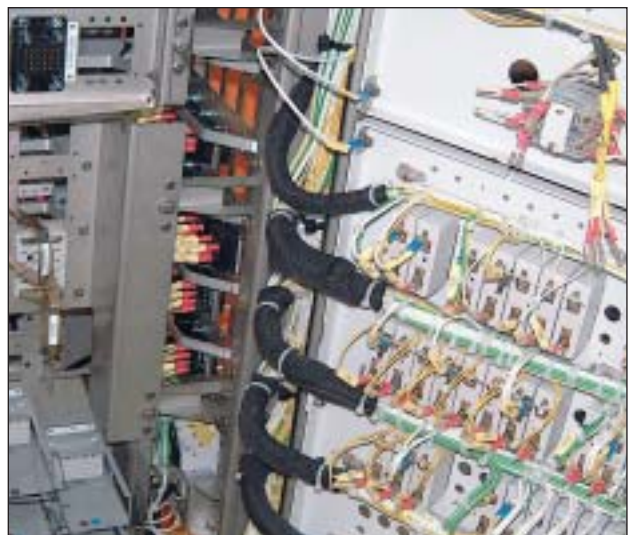
Technical Information

Property	Test method	Typical performance
Operating temperature range		-70°C to +125°C
Melt temperature	ASTM D-2117	+256°C
Low temperature flexibility	MIL-DTL-23053E	-70°C
Smoke density	ASTM E-1354	Pending
Fire resistance	FMVSS-302 Test method D45 1333	Self-extinguishing, type B
Hard Vacuum	ASTM E-595	
• TML (Mass)		0.63 %
• CVCN (Condensation)		0.16 %
• WVR (Steam)		0.06 %
Corrosivity	MIL-I-23053	No corrosive smoke
Fluid resistance	MIL-I-23053	Tensile retention
• Jet fuel: JP-41		100 %
• Hydraulic fluid: (MIL-H-5606)		100 %
• Lube oil: (MIL-I-7808)		100 %
• De-icing fluid: (MIL-A-8243)		100 %
• Salt Water: (O-S-1926)		100 %

Ordering Information

PRODUCT REF.	NOMINAL SIZE* [mm]	LENGTH PER MINI-REEL [m]
CPS05W-150	5	150
CPS08W-100	8	100
CPS13W-50	13	50
CPS19W-25	19	25
CPS25W-25	25	25
CPS29W-25	29	25
CPS32W-15	32	15
CPS38W-15	38	15

* Nominal size is determined by wrapping the product around a mandrel of a given size to obtain 90 degrees of overlap (average value). See drawing on page 97.



Bind-It™

Cable protection systems

Bind-It™

Flame Retardant

- Wrap-around sleeving manufactured from flame-retardant polyester monofilaments and multifilaments
- Designed for mechanical protection and maintenance of wire and cable bundles
- Its construction with 100% covering ratio provides excellent cut-through and abrasion resistance
- Bind-It™ has many applications in the marine, railway and electronic industries
- No heat is required to seal the ends of this product as with traditional braided sleeving
- With its wrap-around design, it can be installed on assemblies where the wires are already terminated or wires need to be broken-out
- Bind-It™ is available in nominal sizes from 5 mm to 38 mm
- A professional assembly tool is supplied on request for the 5 mm, 8 mm and 13 mm nominal sizes
- For a UL version please contact your Sales Office

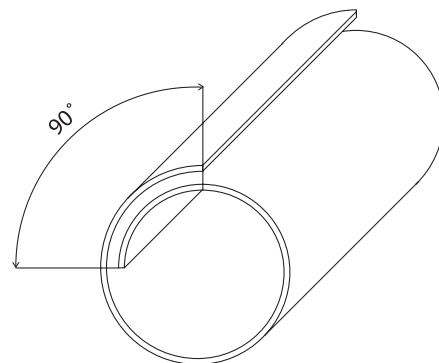


Technical Information

Property	Test method	Typical performance
Operating temperature range		-50°C to +125°C
Melt temperature	ASTM D-2117	+250°C
Low temperature flexibility	MIL-DTL-23053E	-50°C
Fire resistance	NF 16 101-16 102	I3-F2
	DB DIN 5510§2 &§4 837	Halogen free S4,SR2, ST2
Fluid resistance	MIL-I-23053	Tensile retention
• Jet fuel: JP-41		100 %
• Hydraulic fluid: (MIL-H-5606)		100 %
• Lube oil: (MIL-I-7808)		100 %
• De-icing fluid: (MIL-A-8243)		100 %
• Salt Water: (O-S-1926)		100 %

Ordering Information

PRODUCT REF.	NOMINAL SIZE* [mm]	LENGTH PER MINI-REEL [m]
CPS05W-150-FR	5	150
CPS08W-100-FR	8	100
CPS13W-50-FR	13	50
CPS19W-25-FR	19	25
CPS25W-25-FR	25	25
CPS29W-25-FR	29	25
CPS32W-25-FR	32	25
CPS38W-25-FR	38	25
CPS50W-25-FR	50	25



* Nominal size is determined by wrapping the product around a mandrel of a given size to obtain 90 degrees of overlap (average value). See drawing.

Accessories

Cable protection systems

CPS Series - Braided Sleeving

Flame retardant

- Standard colour – black with grey identification yarn
- Flame-retardant polyester, rated at UL 94V-0
- Available in nominal diameters from 3 to 50 mm to cover bundle diameters of 2 mm to 60 mm, giving flexibility when adding to or removing cables from wire looms
- For use in temperature ranges from -50°C to +150°C
- Good chemical resistance
- Excellent abrasion resistance
- For protecting and bundling cables and wires inside cabinets and enclosures

To stop the ends of the sleeving fraying it is necessary to heat seal the ends using a "hotwire" device. (see Product Ref. WTHSG)

1:2

Ordering Information

PRODUCT REF.	NOMINAL DIAMETER AS SUPPLIED [mm]	EXPANDABLE DIAMETER RANGE [mm]	LENGTH PER MINI-REEL [m]
CPS3B-100-V0	3	2 - 5	100
CPS4B-100-V0	4	3 - 7	100
CPS5B-100-V0	5	4 - 9	100
CPS6B-100-V0	6	5 - 11	100
CPS8B-100-V0	8	7 - 13	100
CPS10B-50-V0	10	9 - 15	50
CPS12B-50-V0	12	11 - 17	50
CPS15B-50-V0	15	13 - 20	50
CPS20B-50-V0	20	18 - 25	50
CPS25B-50-V0	25	22 - 30	50
CPS30B-50-V0	30	27 - 40	50
CPS40B-50-V0	40	35 - 50	50
CPS50B-50-V0	50	45 - 60	50

Grey sleeving and other lengths available to special order, please contact your Sales Office



Product Ref. WTHSG



Accessories

Cable protection systems

CPS Series - Braided Sleeving

Non-flame retardant

- Standard colour – black or grey
- Non-flame retardant Polyester rated at UL 94 V-2
- Available in nominal diameters from 3 to 50 mm to cover bundle diameters of 1 to 66 mm, giving flexibility when adding to or removing cables from wire looms
- For use in temperature ranges from -50°C to +150°C
- Good chemical resistance
- Halogen free
- For protecting and bundling cables and wires inside cabinets and enclosures



To stop the ends of the sleeving fraying it is necessary to heat seal the ends using a "hotwire" device. (see Product Ref. WTHSG)



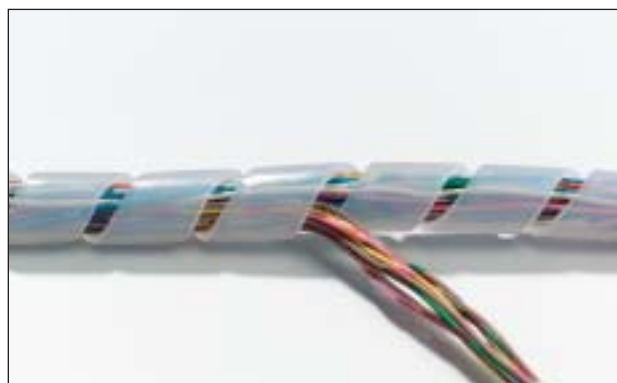
Ordering Information

PRODUCT REF. BLACK	PRODUCT REF. GREY	NOMINAL DIAMETER AS SUPPLIED [mm]	EXPANDABLE DIAMETER RANGE [mm]	LENGTH PER MINI-REEL [m]
CPS3B-100	CPS3G-100	3	1 - 5	100
CPS4B-100	CPS4G-100	4	2 - 7	100
CPS5B-100	CPS5G-100	5	3 - 9	100
CPS6B-100	CPS6G-100	6	4 - 11	100
CPS8B-100	CPS8G-100	8	5 - 12	100
CPS10B-100	CPS10G-100	10	7 - 15	100
CPS12B-50	CPS12G-50	12	8 - 17	50
CPS15B-50	CPS15G-50	15	10 - 20	50
CPS20B-25	CPS20G-25	20	14 - 26	25
CPS25B-25	CPS25G-25	25	18 - 34	25
CPS30B-25	CPS30G-25	30	20 - 40	25
CPS40B-25	CPS40G-25	40	30 - 50	25
CPS50B-25	CPS50G-25	50	40 - 66	25

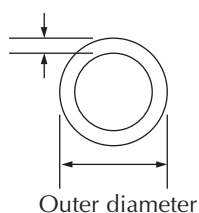
Accessories

Spiral wrap

- For protection of bundles from 1.6 mm to 177.8 mm
- Install gapped for greater flexibility or butted for maximum abrasion resistance, insulation and rigidity
- Counter-clockwise cut
- Available in natural and UV-resistant black Polyethylene

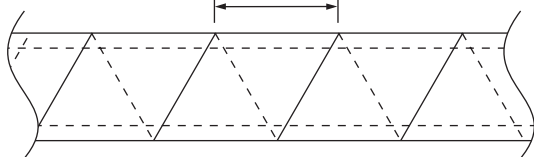


Nominal thickness



Outer diameter

Pitch



Technical Information

Material	Polyethylene
Temperature range	+10°C to +80°C
Colour	Natural and UV-resistant black
Flammability rating	UL 94 HB
Other properties	UV-resistant (black), Halogen free

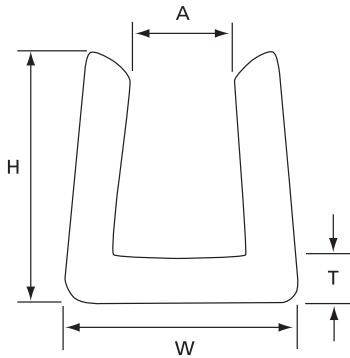
Ordering Information

PRODUCT REF.	COLOUR	OUTER DIAMETER [mm]	PITCH [mm]	NOMINAL THICKNESS [mm]	MIN. - MAX. BUNDLE Ø [mm]	LENGTH PER REEL [m]
SRPE-125-9-C	natural	3.2	5.3	0.9	1.6 - 12.7	30.5
SRPE-187-9-C	natural	4.8	6.1	1.0	3.2 - 25.9	30.5
SRPE-250-9-C	natural	6.4	9.5	1.1	4.8 - 50.8	30.5
SRPE-375-9-C	natural	9.5	11.1	1.3	7.9 - 76.2	30.5
SRPE-500-9-C	natural	12.7	14.3	1.6	9.5 - 102.0	30.5
SRPE-625-9-C	natural	15.9	15.9	1.6	15.9 - 114.3	30.5
SRPE-750-9-C	natural	19.1	19.1	1.7	19.1 - 127.0	30.5
SRPE-1000-9-C	natural	25.4	28.2	1.8	25.4 - 177.8	30.5
SRPE-125-0-C	UV-resistant black	3.2	5.3	0.9	1.6 - 12.7	30.5
SRPE-187-0-C	UV-resistant black	4.8	6.1	1.0	3.2 - 25.9	30.5
SRPE-250-0-C	UV-resistant black	6.4	9.5	1.1	4.8 - 50.8	30.5
SRPE-375-0-C	UV-resistant black	9.5	11.1	1.3	7.9 - 76.2	30.5
SRPE-500-0-C	UV-resistant black	12.7	14.3	1.6	9.5 - 102.0	30.5
SRPE-625-0-C	UV-resistant black	15.9	15.9	1.6	15.9 - 114.3	30.5
SRPE-750-0-C	UV-resistant black	19.1	19.1	1.7	19.1 - 127.0	30.5
SRPE-1000-0-C	UV-resistant black	25.4	28.2	1.8	25.4 - 177.8	30.5

Accessories

Extruded grommeting

- Used to line panel edges and knock-outs where the chafing of passing wires is a concern
- Available in 8 stock sizes in 30.5 m lengths for panels from 1 mm to 6.35 mm
- In most applications, grommeting will grip tightly by itself, if not, a touch of Epoxy will keep it in place



Technical Information

Material	Polyamide 6.6
Temperature range	-40°C to +85°C
Colour	Natural or black
Flammability rating	UL 94 V-2
Other properties	Halogen free, Silicone free

Ordering Information

PRODUCT REF.	COLOUR	INTERNAL WIDTH	THICKNESS	H	W	LENGTH PER REEL
		A [mm]	T [mm]			
GRNY-040-9-C	natural	1.01	1.01	4.82	3.17	30.5
GRNY-052-9-C	natural	1.32	1.01	4.82	3.17	30.5
GRNY-062-9-C	natural	1.57	1.14	5.08	4.32	30.5
GRNY-085-9-C	natural	2.15	1.14	5.08	4.32	30.5
GRNY-100-9-C	natural	2.54	1.14	5.58	5.33	30.5
GRNY-125-9-C	natural	3.17	1.27	5.58	5.23	30.5
GRNY-187-9-C	natural	4.74	1.27	6.85	6.98	30.5
GRNY-250-9-C	natural	6.35	1.27	7.11	9.39	30.5
GRNY-040-0-C	black	1.01	1.01	4.82	3.17	30.5
GRNY-052-0-C	black	1.32	1.01	4.82	3.17	30.5
GRNY-062-0-C	black	1.57	1.14	5.08	4.32	30.5
GRNY-085-0-C	black	2.15	1.14	5.08	4.32	30.5
GRNY-100-0-C	black	2.54	1.14	5.58	5.33	30.5
GRNY-125-0-C	black	3.17	1.27	5.58	5.23	30.5
GRNY-187-0-C	black	4.74	1.27	6.85	6.85	30.5
GRNY-250-0-C	black	6.35	1.27	7.11	9.39	30.5



+ Tooling

***To install, tension
and cut plastic and
metal ties***

1. Fastening systems

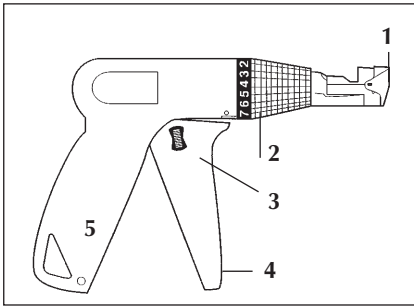
1.1	Cable ties	7
1.2	Accessories	65
1.3	Cable protection systems	95
1.4	Tooling	103
	Tools for plastic cable ties	104
	Tools for Ty-Met™ stainless steel ties	108
	Tooling selection charts	111
1.5	Material specifications	113

Tooling

Tools for plastic ties

Thomas & Betts offers a comprehensive range of tooling to complement the full range of cable ties. The range includes low-cost tools for maintenance and small batch requirements, pneumatic hand tools for small to medium batch use and a semi-automatic tooling for high volume use.

The Thomas & Betts Ty-Gun:
Product Reference ERG299 & ERG297



Advanced cutting mechanism, allows the strap end to retract in the head when used on Ty-Rap® cable ties.

1. 360° rotating nose allows the Ty-Gun tool to be used in any position.
2. Quick tension-adjustment wheel is located towards the front for easy access and fast changes.
3. Adjustable handle span fits large and small hands.
4. Weighs only 240 grams, with a well-balanced centre of gravity.
5. Anti-recoil mechanism reduces vibration shock.



Technical Information: ERG297

Tool type	Ergonomic hand tool
Handle colour	Red
For type of cable tie	Plastic ties
For tie width	4.8 mm to 7.6 mm
Features	Adjustable tension setting, automatic cutting, retraction of the strap end after application of Ty-Rap® cable ties
Weight	240 g
Dimensions [L x W x H]	200 x 125 x 25 mm
Spare parts	Replacement blades: Product Ref. ED03074

Technical Information: ERG299

Tool type	Ergonomic hand tool
Handle colour	Black
For type of cable tie	Plastic ties
For tie width	2.4 mm to 4.8 mm
Features	Adjustable tension setting, automatic cutting, retraction of the strap end after application of Ty-Rap® cable ties
Weight	240 g
Dimensions [L x W x H]	200 x 125 x 25 mm
Spare parts	Replacement blades: Product Ref. ED02041

Tooling

Tools for plastic ties

Product Reference: WT193A

- High quality hand tool, to bind, tension and cut in one operation.
- Solid lightweight metal body
- Tension setting to ensure product consistency
- Robust construction, ideal for industrial mass finishing applications like cable-tree assemblies

Technical Information

Tool type	Heavy-duty hand tool
For type of cable tie	Plastic ties
For tie width	2.4 mm to 4.8 mm
Features	Adjustable tension setting, automatic cutting
Weight	300 g
Dimensions [L x W x H]	182 x 135 x 19.5 mm
Spare parts	Replacement blades: Product Ref. R464201



Product Reference: WT199

- Semi-automatic hand tool
- MIL. Nr. MS-90387-1
- Tension setting to ensure product consistency
- Robust metal construction
- Ideal for industrial mass finishing applications like cable tree assemblies, for example in the military industry

Technical Information

Tool type	Semi-automatic hand tool
For type of cable tie	Plastic ties
For tie width	2.4 mm to 4.8 mm
Features	Adjustable tension setting, automatic cutting, MIL specified (MS-90378-1)
Weight	410 g
Dimensions [L x W x H]	163 x 134 x 24 mm



Product Reference: WT197

- Semi-automatic hand tool
- MIL. Nr. MS-90387-2
- Tension setting to ensure product consistency
- Robust metal construction
- Ideal for industrial mass finishing applications like cable tree assemblies, for example in the military industry

Technical Information

Tool type	Semi-automatic hand tool
For type of cable tie	Plastic ties
For tie width	4.8 mm to 7.6 mm
Features	Adjustable tension setting, automatic cutting, MIL specified (MS-90378-2)
Weight	420 g
Dimensions [L x W x H]	165 x 135 x 29 mm



Product Reference: WT1-TB

- Twist-and-cut tensioning tool in plastic, intended for maintenance and small batch use

Technical Information

Tool type	Low-cost hand tool
Colour	Orange
For type of cable tie	Plastic ties
For tie width	2.4 mm to 4.8 mm
Features	Basic tensioning, twist cut
Weight	28.4 g
Dimensions [L x W x H]	134 x 55 x 27 mm



Product Reference: WT2-TB

- Twist-and-cut tensioning tool in plastic, intended for maintenance and small batch use

Technical Information

Tool type	Low-cost hand tool
Colour	Black
For type of cable tie	Plastic ties
For tie width	4.8 mm to 7.6 mm
Features	Basic tensioning, twist cut
Weight	28.4 g
Dimensions [L x W x H]	134 x 55 x 27 mm



Tooling

Tools for plastic ties

Product Reference: TR227

- A pneumatic powered hand tool intended for medium & high volume use, which offers fast action tensioning and cutting
- The tool is easy to use and requires low operator effort
- The tool operates from standard factory air supplies of 75 to 85 P.S.I. (5.2 - 5.9 bar)



Technical Information

Tool type	Pneumatic powered hand tool
For type of cable tie	Plastic ties
For tie width	2.4 mm to 4.8 mm
Features	Tensioning, automatic cutting

Product Reference: L300-FR

- Rugged construction makes this tool ideal for use with our 7.6 mm to 9 mm wide ties
- Pull tie to desired tension and pull trigger to cut excess flush at cable tie head
- Field proven durability



Technical Information

Tool type	Hand tool for Col-Ty™ installation ties and other wide cable ties
Colour	White
For type of cable tie	Plastic ties
For tie width	7.6 mm to 9 mm
Features	Tensioning, manual cutting
Weight	330 g
Dimensions [L x W x H]	195 x 100 x 25 mm

Product Reference: WT3D

- Designed for tensioning and cutting heavy-duty cable ties
- Robust metal body with plastic hand-grips

Technical Information

Tool type	Hand tool for Deltec ties, Col-Ty™ installation ties and other wide cable ties
For type of cable tie	Plastic ties
For tie width	7.6 mm to 12.7 mm
Features	Tensioning, manual cutting (by twisting the tool)
Weight	225 g
Dimensions [L x W x H]	178 x 112 x 20 mm



Tooling

Tools for plastic ties

Product Reference: L-500-EU

- Rugged metallic construction makes this tool ideal for use with our 4.7 mm to 13.3 mm wide ties
- Set tension adjuster to give desired tie tightness
- Pull trigger and tie is automatically tensioned and cut

Technical Information

Tool type	Hand tool
For type of cable tie	Plastic ties
For tie width	4.7 mm to 13.3 mm
Features	Tensioning, automatic cutting



Tools for Ty-Met™ stainless steel ties

Product Reference: CT3

- Economic tensioning tool
- Cut-off by hand-activated lever

Technical Information

Tool type	Hand tool
For type of cable tie	Ladder Type & Ball-Lock Type stainless steel ties, coated and uncoated
Features	Tensioning, manual cutting
Weight	550 g
Dimensions [L x W x H]	210 x 155 x 35 mm



Product Reference: CT5

- Suitable for coated and uncoated Ladder Type stainless steel ties
- Adjustable tension settings
- Automatic cutting once desired tension has been reached

Technical Information

Tool type	Tension setting hand tool
For type of cable tie	Ladder Type stainless steel ties
Features	Adjustable tension setting, automatic cutting
Weight	430 g
Dimensions [L x W x H]	173 x 158 x 22 mm



Tooling

Tools for Ty-Met™ stainless steel ties

Product Reference: CT6

- Suitable for coated and uncoated Ball-Lock Type stainless steel ties
- Adjustable tension settings
- Automatic cutting once desired tension has been reached



Technical Information

Tool type	Tension setting hand tool
For type of cable tie	Ball-Lock Type stainless steel ties, coated and uncoated
Features	Adjustable tension setting, automatic cutting
Weight	430 g
Dimensions [L x W x H]	173 x 158 x 22 mm

Product Reference: WT3S

- A robust metallic hand tool with rubber grips designed for tensioning Ladder Type stainless steel ties
- After tensioning, the stainless steel ties can easily be cut with side-cutters



Technical Information

Tool type	Hand tool
For type of cable tie	Ladder Type stainless steel ties
Features	Tensioning, no cutting
Weight	225 g
Dimensions [L x W x H]	178 x 112 x 20 mm

Product Reference: CT2-TB

- Cable tie tensioner suitable for Releasable Type and Ladder Type stainless steel ties
- Tensions the ties to their optimum holding power with a simple squeeze: a flick of the wrist and they're locked tight



Technical Information

Tool type	Hand tool
For type of cable tie	Releasable Type and Ladder Type stainless steel ties
Features	Tensioning, no cutting
Weight	300 g
Dimensions [L x W x H]	195 x 90 x 30 mm

Tooling

Tools for Ty-Met™ stainless steel ties

Product Reference: CT1-TB

- Tensioning hook suitable for Releasable Type and Ladder Type stainless steel ties
- Provides extra-leverage for tensioning the ties by hand



Technical Information

Tool type	Hand tool
For type of cable tie	Releasable Type and Ladder Type stainless steel ties
Features	Tensioning, no cutting
Weight	50 g
Dimensions [L x W x H]	85 x 106 x 15 mm

Product Reference: CT4-TB

- Bantam tool, suitable for Releasable Type and Ladder Type stainless steel ties
- Unique 3-way handle can be used in various positions. Especially useful in tight areas with minimal access



Technical Information

Tool type	Hand tool
For type of cable tie	Releasable Type and Ladder Type stainless steel ties
Features	Tensioning, manual cutting
Weight	1200 g
Dimensions [L x W x H]	156 x 180 x 80 mm

Technical Information: Tooling for plastic ties

TOOL	DESCRIPTION	FOR TIE WIDTH RANGE		
		2.4 mm - 4.8 mm	4.8 mm - 7.6 mm	7.6 mm - 12.7 mm
HAND TOOL				
WT1-TB	Basic tensioning tool, twist cut	■		
WT2-TB	Basic tensioning tool, twist cut		■	
WT193A	Adjustable tension, automatic cutting	■		
WT199	Mill specified adjustable tension, automatic cutting	■		
WT197	Mill specified adjustable tension, automatic cutting		■	
ERG299	Ergonomic adjustable tension, automatic cutting	■		
ERG297	Ergonomic adjustable tension, automatic cutting		■	
WT3D	Tensioning tool, manual cutting			■
L300-FR*	Tensioning tool, manual cutting			■*
L-500-EU	Adjustable tension, automatic cutting		■	■**
PNEUMATIC POWERED HAND TOOL				
TR227	Adjustable tension, automatic cutting	■		

* Tie width range for L300-FR: 7.6 - 9 mm

** Tie width range for L-500-EU: 4.7 - 13.3 mm

Technical Information: Tooling for Ty-Met™ stainless steel ties

TOOL	DESCRIPTION	CABLE TIE FAMILY	CABLE TIE FAMILY	CABLE TIE FAMILY
		RELEASABLE TYPE	LADDER TYPE	BALL-LOCK TYPE
HAND TOOL				
CT1-TB	Basic tool (tensioning hook)	■	■	
CT2-TB	Tensioning tool	■	■	
CT4-TB	Tensioning tool	■	■	
WT3S	Tensioning tool, no cutting		■	
CT3	Tensioning tool, manual cutting		■	■
CT5	Adjustable tension, automatic cutting		■	
CT6	Adjustable tension, automatic cutting			■



**+ Material
specifications**

1. Fastening systems

1.1	Cable ties	7
1.2	Accessories	65
1.3	Cable protection systems	95
1.4	Tooling	103
1.5	Material specifications	113
	UL flammability ratings	114
	Adhesive material specifications	115
	Material selection and specifications	116
	Unit conversion factors	123



Flammability ratings for selecting cable ties

Note: Flammability ratings of cable tie materials per UL as follows. These tests for flammability of plastic material are intended to serve as a preliminary indication of acceptability with respect to flammability for particular applications.

UL 94 vertical burn test procedures

Test specimens of the material, with dimensions 127 x 12.7 mm (5" x 1/2"), with the thickness intended for use in the end product, are tested in both the manufactured condition and in the aged state. The test requires that the specimen be supported in a vertical fixture and a precisely controlled flame applied for a 10 second period. The flame is removed and the duration of flaming is noted. If the flame extinguishes, a second exposure to flame for 10 seconds is applied and duration of flaming is again noted. It is observed and recorded whether or not test specimens drip flaming particles that ignite a cotton swab.

Materials classed 94 V-0:

A material classed 94 V-0 shall:

- A Not have any specimens that burn with flaming combustion for more than 10 seconds after either application of the test flame
- B Not have a total flaming combustion time exceeding 50 seconds for the 10 flame applications for each set of five specimens
- C Not have any specimens that burn with flaming or glowing combustion up to the holding fixture
- D Not have any specimens that drip flaming particles that ignite the dry absorbent surgical cotton located 304.8 mm (12") below the test specimen
- E Not have any specimens with glowing combustion that persists for more than 30 seconds after the second removal of the test flame

Materials classed 94 V-1:

A material classed 94 V-1 shall:

- A Not have any specimens that burn with flaming combustion for more than 30 seconds after either application of the test flame
- B Not have a total flaming combustion time exceeding 250 seconds for the 10 flame applications for each set of five specimens
- C Not have any specimens that burn with flaming or glowing combustion up to the holding fixture

D Not have any specimens that drip flaming particles that ignite the dry absorbent surgical cotton located 304.8 mm (12") below the test specimen

E Not have any specimens with glowing combustion that persists for more than 60 seconds after the second removal of the test flame.

Materials classed 94 V-2:

A material classed 94 V-2 shall:

- A Not have any specimens that burn with flaming combustion for more than 30 seconds after either application of the test flame
- B Not have a total flaming combustion time exceeding 250 seconds for the 10 flame applications for each set of five specimens
- C Not have any specimens that burn with flaming or glowing combustion up to the holding fixture
- D Be permitted to have specimens that drip flaming particles that burn only briefly, some of which ignite the dry absorbent surgical cotton placed 304.8 mm (12") below the test specimen
- E Not have any specimens with glowing combustion that persists for more than 60 seconds after the second removal of the test flame

UL 94 horizontal burn (HB) test procedures

The test uses a 1/2 inch x 5 inches (12.7 mm x 127 mm) specimen held at one end in a horizontal position with marks at 1 inch (25.4 mm) and 5 inches (127 mm) from the free end. A flame is applied to the free end for 30 seconds or until the flame front reaches the 1 inch (25.4 mm) mark. If combustion continues the duration is timed between the 1 inch (25.4 mm) mark and the 5 inch (127 mm) mark. If combustion stops before the 5 inch (127 mm) mark, the time of combustion and the damaged length between the two marks are recorded. A set of three specimens are tested.

Materials classed 94 HB

A material that is less than 0.118 inch (3 mm) in thickness will be classified 94HB if it has a burning rate of less than 3 inches (76.2 mm) per minute or stops burning before the 5 inches (127 mm) mark. If one specimen from the set of three fails to comply, then a second set of three are tested. All three of this second set must comply.

HB rated materials are considered "self-extinguishing". This is the lowest (least flame retardant) UL94 rating.

***Nylon 6.6 = Polyamide 6.6 is Halogen-free and Silicone-free.**

Technical Information

PROPERTY	METHOD	UNIT OF MEASURE	RUBBER BASED (SELF-ADHESIVE)	ACRYLIC BASED (2 COMPONENT GLUE)
COATED SIDES	-	each	2	2
FOAM DENSITY	-	Kg/m ³	96.9	96.9
PEEL ADHESION	PSTC 1	N/cm width	10.9	
	ASTM D 1000	Average		8.8
SHEAR ADHESION				
22°C 50% R4	PSTC 7	Hours	100 +	8 +
22°C OCCASIONAL WETTING		N/m ²	68971	15174
TENSILE STRENGTH	ASTM D 412	PSI	100	100 +
TEAR RESISTANCE	ASTM D 624	N/cm	52.6	52.6 +
ELONGATION AT BREAK	-	%	400	200
SERVICE TEMPERATURE	-	°C Min	-18	-29
	-	°C Max	+66	+79
FLAMMABILITY	ASTM D 624		Slow Burn	Slow Burn

Installation instructions for self-adhesive mounting bases

- Mounting surfaces should be cleaned with alcohol based (IPA) cleaner before application
- The self-adhesive mounting bases have a double-sided adhesive tape made of synthetic foam, covered by a protecting foil.
- To install the self-adhesive mounting base, remove the protecting foil and press the mounting base onto the cleaned surface
- The thickness of the self-adhesive foam (0.8 mm) compensates the irregularities of the application surfaces and allows installations on structured surfaces of cabinet doors, on sheet metal, on machines, etc
- The adhesion is achieved immediately during the installation, which means that later repositioning is not possible

Product Ref.: TC2PA

- 2 component glue
- Consists of one tube each of adhesive and activator
- Easy application
- Stable and durable adhesion
- Applicable on all Polyamide and Aluminium mounting bases and cable clamps
- Also applicable on concrete and other porous surfaces
- UV resistant

Ordering Information

PRODUCT REF.	DESCRIPTION	WEIGHT
TC2PA	2 component glue	0.21 kg

Important note: The quality of installation of the glue mounted and self-adhesive mounting bases depend a lot on the state of the mounting surfaces (smooth or rough, clean or dirty, presence of oil, grease, dust, etc) and on the dexterity of the installer.

Thomas & Betts can not control these external parameters and therefore can not accept any responsibility about the performances of the glue mounted mounting bases and self-adhesive mounted bases.

Installation instructions for Product Ref. :

TC2PA (2 component glue)

- Mounting surfaces should be cleaned before application
- The liquid adhesive in the tube is to be spread onto the mounting surface. It can be used on most rough surfaces (like concrete)
- The activator liquid is then spread onto the surface of the mounting base
- Place the surface of the mounting base in contact with the surface where it has to be mounted, position the mounting base correctly and then press firmly
- Repositioning the mounting base remains possible only for a few seconds
- Do not use the mounting base immediately after installation. The Acrylic-based adhesive requires a set-up time that can be influenced by factors such as temperature (allow 24 - 72 hours for maximum performance)
- Temperature of installation needs to be above +20°C



UV-resistant



Flame retardant



Heat resistant



Weatherproof



Low temperature flexibility



Radiation resistant



Low smoke



Chemically resistant

Selecting the right material for your applications

Thomas & Betts offers cable ties and accessories in a wide variety of materials, each suited for specific environments. The purpose of this document, therefore, is to assist in choosing the best material for a particular application. The effects of weathering, flame, chemicals, extreme temperatures and radiation on the different materials is clearly

presented in tabular form. This will facilitate the choice of the best material for the application.

Having determined the most suitable material, one can choose from the wide variety of cable ties, identification ties, mounting bases, lashing ties, etc., offered by Thomas & Betts.

Material specifications

Note: Nylon (Polyamide) is inherently susceptible to environmental conditions. Polyamide 6.6 cable ties are moisturised to optimum performance levels at machine-side and should be stored in cool dry areas out of direct sunlight. Cable ties are packaged in plastic bags to contain moisture and should remain sealed until ready for use.

Polyamide 6.6

- Thermoplastic material used in cable ties for universal applications in the industry
- Excellent resistance to shocks, chemicals, oils and temperature fluctuations
- High surface hardness and a small coefficient of friction
- Flammability rating: UL 94 V-2
- Halogen free and Silicone free
- Available in natural version or in a wide range of colours
- Indoor applications

Polyamide 6.6, weather resistant



- Similar to Polyamide 6.6, but recommended for outdoor applications
- UV-resistant
- Halogen free and Silicone free
- Colour: black
- Flammability rating: UL 94 V-2

Polyamide 6.6, heat stabilised



- Similar to Polyamide 6.6, but increased operating temperatures, up to 105°C
- Excellent tensile strength
- High temperature resistance
- Colour: natural (may have a greenish tint)
- Flammability rating: UL 94 V-2

Polyamide 6.6, heat stabilised and UV-resistant



- Similar to Polyamide 6.6, but recommended for outdoor applications and/or high temperature applications, up to 105°C
- Combines the features & benefits of Polyamide 6.6, weather resistant and Polyamide 6.6, heat stabilised
- Colour: black
- Flammability rating: UL 94 V-2

Polyamide 6.6, flame retardant



- Excellent flammability rating: UL 94 V-0
- Ideal in areas where human life is at risk
- Colour: white

Polyamide 4.6, extra high temperature (150°C)



- Similar to Polyamide 6.6, but outstanding resistance to high temperatures up to 150°C
- Halogen free and silicone free
- Colour: light green
- Flammability rating: UL 94 V-2

Polyamide 12, weather resistant



- Extremely flexible, also at low temperatures
- Ages better than Polyamide 6.6
- UV-resistant and weatherproof
- Better chemical resistance than Polyamide 6.6
- Colour: black
- Flammability rating: UL 94 V-2

Polypropylene, weather resistant



- Resistant against inorganic acids, polyhydric alcohols, neutral and basic salts
- Resists a number of other chemicals
- UV resistant
- Lower tensile strength than Polyamide 6.6
- Colour: black
- Flammability rating: UL 94 HB

Tefzel® 280 (trademark of DuPont de Nemours)



- Tensile strength slightly lower than Polyamide 6.6
- Tefzel® 280 is inert to most solvents and chemicals, hydrolytically stable, UV and weather resistant
- Radiation resistant (meets IEEE383) and approved for nuclear plant use
- Non-outgassing properties for zero gravity applications
- Very high temperature resistance
- Flammability rating: UL 94 V-0
- The best all around plastic material for cable ties
- Colour: aquamarine

Halar® (trademark of Solvay Solexis)



- Similar to Tefzel® in performance
- Outstanding characteristic: lower smoke density when burnt
- Recommended for applications where smoke generation is a concern, such as plenum areas
- Colour: maroon
- Flammability rating: UL 94 V-0

Delrin® (trademark of DuPont de Nemours)



- Excellent resistance to a wide variety of solvents, esters, oils, greases, gasoline and other petroleum hydrocarbons
- Resistant to weak acids and bases
- Excellent resistance to UV (weatherable acetal)
- Limited self-extinguishing properties
- Colour: black
- Flammability rating: UL 94 HB

302/304 Stainless Steel

316 Stainless Steel



- Superior corrosion resistance
- Excellent tensile strengths at extreme temperatures
- High resistance to chemicals, acids and radiation
- 316 grade has a better resistance to saltwater corrosion and can be supplied with a halogen free coating
- Extensively used in offshore, rail and petrochemical industries

General

There is a number of factors to be considered when choosing the proper materials for a specific environment. It is extremely difficult to provide data on all the possible combinations or conditions that can occur and therefore, it is recommended that this information be used as a guideline and that cable tie samples be tested in the intended application, by the user, to determine suitability.

How to use Table 1:

If your application is in an extremely cold environment, three materials will answer your need: Tefzel^{®*}, Polyamide 12 and stainless steel. If you also require high tensile strength, then stainless steel is your best choice. Where high strength is not required, Polyamide 12 might be your choice as it is the less costly.

This information is based on data provided by the manufacturers of the specific materials listed and is provided only as a general guide. No specific recommendation is intended. As each application may vary, testing should be conducted by the user in the intended environment.

Table 1 gives relative performance ratings of the different materials we offer. Chemical resistance is shown in Table 2

* Trademark of E.I. Du Pont

Material codes used in tables

MATERIAL	CODE
STANDARD POLYAMIDE 6.6	PA6.6
WEATHER RESISTANT POLYAMIDE 6.6	UV PA6.6
HEAT-STABILISED POLYAMIDE 6.6	HS PA6.6
HEAT-STABILISED UV RESISTANT POLYAMIDE 6.6	HSUV PA6.6
FLAME RETARDANT POLYAMIDE 6.6	FR PA6.6
HIGH TEMPERATURE POLYAMIDE 4.6	HT PA4.6
WEATHER RESISTANT POLYAMIDE 12	UV PA12
POLYPROPYLENE	PP
WEATHER RESISTANT POLYPROPYLENE	UV PP
TEFZEL ^{®*}	TZ
HALAR ^{®**}	HAL
DELTRIN ^{®*}	DEL
STAINLESS STEEL	SS

* Trademark of E.I. DuPont de Nemours and Company

** Trademark of Solvay Solexis

Table 1 - Information on cable tie materials

	POLYAMIDE 6.6	POLYAMIDE WEATHER RESISTANT*	POLYAMIDE HEAT STABILISED	POLYAMIDE HEAT STABILISED UV RESISTANT	POLYAMIDE FLAME RETARDANT	POLYAMIDE HIGH TEMPERATURE	POLYAMIDE WEATHER RESISTANT	POLYPROPYLENE WEATHER RESISTANT	HALAR® TYV...M	DELIRIN® TYD... CSS	STAINLESS STEEL	ETFE (TEFZEL)
	PA6.6	UV PA6.6	HS PA6.6	HSUV PA6.6	FR PA6.6	HT PA4.6	UV PA12	UV PP	HAL	DEL	SS	TZ
MATERIAL CODE	TY...M	TY...MX	TYH...M	TY...MXA	TY...MFR	TYHT...M	TYC...MX	TYP...MX	TYV...M	TYD... CSS	YRL.. or YLD... or YLS...	TYZ...M
MAX. OPERATING TEMPERATURE	+85°C	+85°C	+105°C	+105°C	+85°C	+150°C	+85°C	+85°C	+140°C	+85°C	+538°C +150°C for coated	+150°C
MIN. OPERATING TEMP.	-40°C	-40°C	-40°C	-40°C	-40°C	-40°C	-55°C	-40°C	-46°C	-40°C	-80°C	-46°C
UL FLAMMABILITY RATING	V-2	V-2	V-2	V-2	V-0	V-2	V-2	HB	V-0	HB	Excellent	V-0
SPECIFIC DENSITY	1.14	1.14	1.14	1.14	1.16	1.18	1.02	0.90 - 0.91	-	-	7.95	1.67 - 1.75
WATER ABSORPTION (24h/ASTM)	2.5 - 3.1%	2.5 - 3.1%	2.5 - 3.1%	2.5 - 3.1%	3.0 - 3.5%	1.3%	0.7 - 1.1%	0.01 - 0.03%	-	-	0%	0.02%
COLOURS	Natural**	Black	Natural***	Black	White	Light green	Black	Black	Maroon	Black	Metallic/ Black	Aquamarine
E-MODULE (N/mm²)	2000	2000	2000	2000	1400	3200	1600	1100-1300	-	-	193000	1000
NOTCH IMPACT	2-20	2-20	2-20	2-20	3-25		3.5-13	3-17	-	-	122J(IZOD)	o.B.
STRENGTH CONFORM DIN 53453 (KJ/m²)												
UV RESISTANT	■	■	■	■	■	■	■	■	■	■	■	■
FLAME RETARDANT			■		■				■		■	■
HEAT RESISTANT			■			■			■		■	■
ENHANCED WEATHERABILITY			■				■		■		■	■
FLEXIBLE AT LOW TEMPERATURES							■					■
RADIATION RESISTANT							■					■
CHEMICALLY RESISTANT												■
HALOGEN FREE	■	■	■	■	■	■	■	■	■	■	■	■

See table 2 (pages 120 - 122)

* 2% Carbon for military specifications
 ** Can be supplied in a wide range of colours
 *** May have a greenish tint

Table 2 - Resistance of available materials to various chemicals at 21°C

REAGENTS	CONCENTRATION	HS PA6.6	HAL	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Arsenic Acid	40%	–	–	–	–	–	–	–	E	E	–	E
Acetaldehyde	50%	S	–	–	S	S	S	–	–	–	–	–
Acetone	100%	E	E	F	E	E	E	E	E	E	E	E
Aluminum Hydroxide	AQ	–	E	–	–	–	–	–	E	E	E	E
Ammonia	All	–	E	–	–	–	–	E	E	E	E	E
Ammonium Carbonate	5%	S	E	–	S	S	S	E	E	E	E	E
Ammonium Hydroxide	10%	E	E	F	E	E	E	–	E	E	E	E
Ammonium Nitrate	–	–	E	–	–	–	–	E	E	E	E	E
Ammonium Sulfate	10%	–	E	–	–	–	–	S	S	S	S	S
Barium Carbonate	All	–	E	–	–	–	–	E	E	E	E	E
Barium Chloride	5%	NR	–	–	NR	NR	NR	E	E	E	E	E
Barium Sulfate	10%	E	–	–	E	E	E	E	E	E	E	E
Barium Sulfide	10%	S	–	–	S	S	S	E	E	E	E	E
Benzene	100%	E	E	F	E	E	E	E	S	S	E	E
Benzoic Acid	100%	NR	E	–	NR	NR	NR	E	E	E	E	E
Butyric Acid	50%	NR	E	–	NR	NR	NR	–	E	E	E	E
Calcium Carbonate	AQ	–	E	–	–	–	–	–	E	E	E	E
Calcium Hydroxide	20%	–	F	E	–	–	–	–	E	E	E	E
Calcium Hydrochlorite	2	NR	–	–	NR	NR	NR	–	F	F	F	F
Calcium Sulfate	2%	–	E	–	–	–	–	–	E	E	E	E
Carbon Tetrachloride	100%	E	E	E	E	E	E	E	F	F	E	E
Chlorine (WET)	–	NR	–	–	NR	NR	NR	–	F	F	F	F
Chlorine (DRY)	–	NR	–	–	NR	NR	NR	–	NR	NR	F	F
Chloroacetic Acid	30%	NR	–	–	NR	NR	NR	–	–	–	F	F
Chloroform	100%	–	E	–	–	–	–	F	F	F	E	E
Chromic Acid	50%	NR	S	–	NR	NR	NR	–	F	F	F	F
Citric Acid	50%	S	E	E	S	S	S	E	E	E	E	E
Copper Cyanide	10%	–	E	–	–	–	–	–	E	E	E	E
Copper Nitrate	50%	–	E	–	–	–	–	–	E	E	E	E
Cider	–	–	E	–	–	–	–	–	E	E	E	E
Dichloroethane	100%	–	E	–	–	–	–	–	–	–	E	E
Diethyl Ether	100%	–	E	S	–	–	–	E	E	E	E	E
Ethyl Alcohol	100%	S	E	–	S	S	S	E	E	E	E	E
Ethyl Chloride	100%	–	S	E	–	–	–	F	F	F	E	E
Ethylene Glycol	100%	E	E	S	E	E	E	–	E	E	E	E
Ferric Hydroxide	All	–	E	–	–	–	–	–	E	E	E	E
Ferric Nitrate	10%	–	E	–	–	–	–	–	E	E	E	E
Ferrous Sulfate	10%	–	E	–	–	–	–	–	E	E	E	E
Fuel Oil	100%	–	E	–	–	–	–	E	–	–	E	E
Furfural	100%	–	E	–	–	–	–	–	F	F	E	E
Gallic Acid	AQ	–	E	–	–	–	–	–	–	–	E	E
Gasoline	100%	E	E	–	E	E	E	–	S	S	E	E
Glycerine	100%	–	E	–	–	–	–	E	E	E	–	E
Hydrocyanic Acid	All	–	E	–	–	–	–	–	E	E	E	E
Hydrogen Peroxide	30%	NR	E	F	NR	NR	NR	S	E	E	E	E
Hydrogen Sulfide	Dry	NR	E	–	NR	NR	NR	E	E	E	E	E

Ratings

E = Excellent

S = Satisfactory

F = Fair

NR = Not Recommended

(AQ = Aqueous)

Table 2 - Resistance of available materials to various chemicals at 21°C

REAGENTS	CONCENTRATION	HS PA6.6	HAL	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Iodoform	100%	-	E	-	-	-	-	-	-	-	E	E
Isopropyl Alcohol	100%	S	E	-	S	S	S	E	E	E	E	E
Jet Fuel	100%	E	E	-	E	E	E	-	S	S	E	E
Lactic Acid	10%	E	E	-	E	E	E	S	E	E	E	E
Lanolin	10%	E	E	-	E	E	E	E	E	E	E	E
Lead Acetate	5%	-	E	-	-	-	-	-	E	E	E	E
Linseed Oil	10%	E	E	E	E	E	E	E	E	E	E	E
Magnesium Carbonate	All	-	E	-	-	-	-	E	E	E	E	E
Magnesium Chloride	10%	F	-	-	F	F	F	F	F	F	F	F
Magnesium Nitrate	All	-	E	-	-	-	-	E	E	E	E	E
Malic Acid	AQ	-	E	-	-	-	-	-	E	E	E	E
Mercury	100%	-	E	-	-	-	-	E	E	E	E	E
Methyl Alcohol	100%	S	E	-	S	S	S	E	E	E	E	E
Methyl Chloride	100%	-	S	-	-	-	-	-	S	S	E	E
MethylEthyl Ketone	100%	-	E	F	-	-	-	E	E	E	E	E
Naptha	100%	-	E	-	-	-	-	-	E	E	E	E
Nitric Acid	30%	NR	E	NR	NR	NR	NR	-	E	E	E	E
Nitric Acid	30-70%	NR	S	NR	NR	NR	NR	-	F	F	S	E
Nitrous Acid	5%	-	E	-	-	-	-	-	F	F	E	E
Oieic Acid	100%	-	E	S	-	-	-	-	E	E	E	E
Oxalic Acid	10%	-	E	-	-	-	-	S	E	E	E	E
Paraffin	100%	E	E	-	E	E	E	E	E	E	E	E
PetroleumEther	100%	-	E	-	-	-	-	E	F	F	E	E
Phenol	90%	NR	E	NR	NR	NR	NR	-	E	E	E	E
Phosphoric Acid	10%	NR	E	-	NR	NR	NR	-	E	E	E	E
Picric Acid	1%	-	E	-	-	-	-	-	E	E	E	E
Potassium Bromide	AQ	-	-	-	-	-	-	-	S	S	S	S
Potassium Carbonate	1%	-	E	-	-	-	-	E	E	E	E	E
Potassium Chlorate	AQ	-	E	-	-	-	-	S	E	E	E	E
Potassium Dichromate	40%	NR	E	-	NR	NR	NR	F	E	E	E	E
Potassium Ferrocyanide	25%	-	E	-	-	-	-	-	E	E	E	E
Potassium Hydroxide	5%	S	E	-	S	S	S	-	E	E	E	E
Potassium Iodide	All	-	E	-	-	-	-	E	E	E	E	E
Potassium Nitrate	50%	F	E	-	F	F	F	E	E	E	E	E
Potassium Permanganate	5%	NR	E	S	NR	NR	NR	NR	E	E	E	E
PotassiumSulfate	5%	-	E	-	-	-	-	E	E	E	E	E
PotassiumSulfide	AQ	-	E	-	-	-	-	-	E	E	E	E
Propyl Alcohol	100%	E	E	-	E	E	E	-	E	E	E	E
Silver Nitrate	10%	-	E	-	-	-	-	E	E	E	E	E
Sodium Acetate	60%	E	E	-	E	E	E	-	E	E	E	E
Sodium Bicarbonate	All	E	E	-	E	E	E	E	E	E	E	E
Sodium Bisulfate	10%	-	E	E	-	-	-	E	E	E	E	E
Sodium Borate	All	-	E	-	-	-	-	-	E	E	E	E
Sodium Carbonate	5%	E	E	S	E	E	E	E	E	E	E	E
Sodium Chlorate	25%	-	E	E	-	-	-	S	E	E	E	E
Sodium Chloride	2%	E	E	S	E	E	E	E	E	E	E	E
Sodium Fluoride	5%	-	-	-	-	-	-	-	F	F	F	F

Ratings

E = Excellent

S = Satisfactory

F = Fair

NR = Not Recommended

(AQ = Aqueous)

Table 2 - Resistance of available materials to various chemicals at 21°C

REAGENTS	CONCENTRATION	HS PA6.6	HAL	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Sodium Hydroxide	10%	E	E	S	E	E	E	E	E	E	E	E
Sodium Hyposulfite	AQ	-	E	-	-	-	-	-	-	-	E	E
Sodium Nitrate	5%	E	E	-	E	E	E	E	E	E	E	E
Sodium Nitrite	AQ	-	E	-	-	-	-	S	E	E	E	E
Sodium Perchlorate	10%	-	E	-	-	-	-	-	-	-	E	E
Sodium Phosphate	5%	-	E	-	-	-	-	E	E	E	E	E
Sodium Sulfate	5%	S	E	-	S	E	E	E	E	E	E	E
Sodium Thiosulfate	5%	-	-	S	-	-	-	S	S	S	S	S
Stearic Acid	100%	-	E	-	-	-	-	F	E	E	E	E
Sulfur	100%	-	E	-	-	-	-	E	E	E	E	E
Sulfur Dioxide	All	NR	E	-	NR	NR	NR	E	E	E	E	E
Sulfuric Acid	Conc.	NR	E	NR	NR	NR	NR	-	S	S	E	E
Sulfuric Acid	5%	NR	F	F	NR	NR	NR	F	F	F	F	F
Tannic Acid	10%	-	E	-	-	-	-	-	E	E	E	E
Tartaric Acid	50%	-	E	E	-	-	-	E	E	E	E	E
Tetrahydrofuran	100%	-	F	E	-	-	-	S	F	F	E	E
Toluene	100%	E	E	F	E	E	E	E	F	F	E	F
Xylene	100%	E	-	E	E	E	E	F	F	E	E	
Zinc Chloride	70%	F	E	NR	F	F	F	E	E	E	E	E
Zinc Nitrate	AQ	-	E	-	-	-	-	E	E	E	E	E
Zinc Sulfate	AQ	-	E	-	-	-	-	E	E	E	E	E

Ratings

E = Excellent

S = Satisfactory

F = Fair

NR = Not Recommended

(AQ = Aqueous)

Technical information

UNIT	x	CONSTANT	=	UNIT
BTU		778.0		foot-pound (ft x lb)
BTU		1054.8		Joules
BTU		0.293		Watt-hours (W x h)
centimetres (cm)		0.032808		feet (ft)
centimetres (cm)		0.3937		inches (in)
centimetres (cm)		0.00001		kilometres (km)
centimetres (cm)		0.010		metres (m)
centimetres (cm)		10.0		millimetres (mm)
circular mils		0.00064516		circular millimetres
circular mils		0.0000007854		inches ² (in ²)
circular mils		0.000506671		square millimetres (mm ²)
circular mils		0.7854		mils ²
cubic centimetre (cm ³)		0.000035314		cubic foot (ft ³)
cubic centimetre (cm ³)		0.061023		cubic inch (in ³)
cubic centimetre (cm ³)		0.000001		cubic metre (m ³)
cubic centimetre (cm ³)		0.0026417		gallons
cubic foot (ft ³)		17280.		cubic inch (in ³)
cubic foot (ft ³)		28317.016		cubic centimetre (cm ³)
cubic inch (in ³)		0.00057870		cubic feet (ft ³)
cubic inch (in ³)		0.000016387		cubic metre (m ³)
cubic inch (in ³)		16.387162		cubic centimetre (cm ³)
cubic metre (m ³)		1000000.0		centimetre (cm)
cubic metre (m ³)		35.314456		cubic foot (ft ³)
cubic metre (m ³)		264.17		gallons
foot (ft)		0.00018939		miles
foot (ft)		0.33333		yards (yd)
foot (ft)		12		inches (in)
foot (ft)		0.00030480		kilometres (km)
foot (ft)		0.30480		metres (m)
foot (ft)		30.480		centimetres (cm)
foot (ft)		304.80		millimetres (mm)
foot/pound (ft/lb)		0.00067197		metres/grams (m/g)
foot-pound (ft x lb)		0.001285		BTU
foot-pound (ft x lb)		1.356		Joules (J)
foot/pound (ft/lb)		0.1383		kilogram/metre (kg/m)
gallons (US)		3.785332		litres (l)

UNIT	x	CONSTANT	=	UNIT
gallons		0.13368		cubic foot (ft ³)
gallons		231.0		cubic inch (in ³)
gallons		3785.332		cubic centimetres (cm ³)
grams (g)		15.432		grains
gram/centimetre ³ (gm/cm ³)		0.0361275		pounds/in ³ (lb/in ³)
horsepower (hp)		33000.0		ft x lb/min
horsepower (hp)		550.0		ft x lb/sec
horsepower (hp)		745.7		Watts (W)
inch (in)		0.027178		yards (yd)
inch (in)		0.083333		feet (ft)
inch (in)		0.00002540		kilometre (km)
inch (in)		0.025400		metre (m)
inch (in)		2.54000514		centimetre (cm)
inch (in)		25.4000514		millimetre (mm)
inch (in)		1000.0		mils
Joules		0.000948		BTU
Joules		107		ergs
liters (l)		61.0250		cubic inch (in ³)
metres (m)		1.093611		yard (yd)
metres (m)		3.2808333		feet (ft)
metres (m)		39.37		inch (in)
metres (m)		100.0		centimetre (cm)
miles		1760.0		yards (yd)
miles		5280.0		feet (ft)
miles		1.6093		kilometre (km)
millimetres (mm)		0.0032808		feet (ft)
millimetres (mm)		0.03937		inch (in)
millimetres (mm)		0.001		metres (m)
millimetres (mm)		0.01		centimetres (cm)
millimetres (mm)		39.3701		mils
millimetres (mm)		1000.0		microns (µm)
Watts (W)		44.25		ft x lb/minute
Watts (W)		0.737562		ft x lb/sec
Watts (W)		0.001341		horsepower (hp)
Watt-hours (W x h)		3.41266		BTU