

Fastening solutions
Easily bundle, secure and
manage your cables

Ty-Rap® Fastening solutions, how it all started



When you choose a Ty-Rap® cable tie, you can count on quality, performance and innovation to make your work easier.

First developed to solve the problem of bundling the hundreds of feet of wiring found inside commercial aircraft, Ty-Rap® cable ties can now be found virtually everywhere - from Nascar racing engines to backyard tool sheds. Self-fastening and basically indestructible, the ground-breaking design of the Ty-Rap® cable tie demonstrates how to solve a complex problem with a simple technology.

The corrosion-proof, non-magnetic stainless steel locking device inside the tie head guarantees the strongest and most durable locking you will ever find on the market. Ty-Rap® can be used in the most adverse conditions: humidity, heat, cold, UV radiation, aggressive chemicals, radiation and other harsh conditions.

Engineered for labour savings and high performance, Ty-Rap® cable ties are commonly used in a variety of applications.



"My dad didn't have a lot of formal education, but he was the most ingenious person I have ever met," said Robert Logan, Maurus' son. "He never thought the customary way of doing things was good enough and when he looked at anything he thought about ways to improve it. The invention of the cable tie is an excellent example of how he worked."

Maurus Logan Ty-Rap® Inventor

For the cable tie, the proverbial light bulb came on over Logan's head while touring a Boeing aircraft manufacturing facility in 1956. Aircraft wiring was a cumbersome and detailed undertaking, involving thousands of feet of wire organized on sheets of 50-foot long plywood and held in place with knotted, wax-coated, braided nylon cord. Each knot had to be pulled tight by wrapping the cord around one's finger which sometimes cut the operator's fingers until they developed thick calluses or

«hamburger hands.» Logan was convinced there had to be an easier, more forgiving, way to accomplish this critical task. For the next couple of years, Logan experimented with various tools and materials.

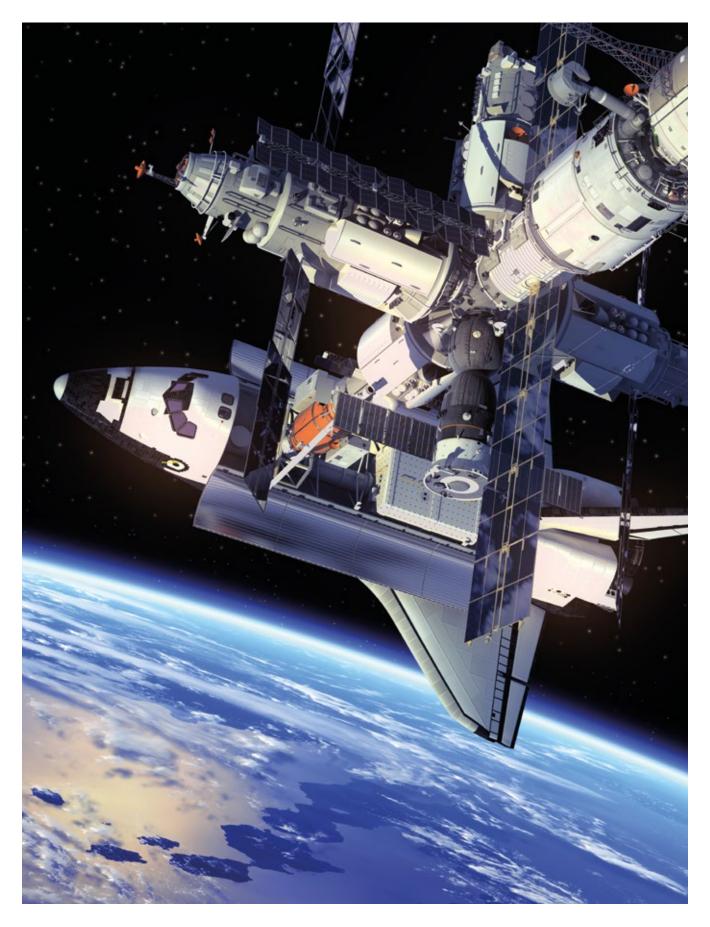
On June 24,1958, a patent for the longlasting, easy-to-use Ty-Rap® cable tie was submitted. The rest, as they say, is history.



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Introduction Ty-Rap® High Performance Cable Ties



Ty-Rap® High Performance Cable Ties

Thomas & Betts (today a Member of the ABB Group) invented the Ty-Rap® cable tie to solve the problem of harnessing the hundreds of wires used in manufacturing aircraft and revolutionised the world of fastening. Today, the Ty-Rap® brand remains the benchmark for excellence and innovation in wire management.

Ty-Rap®

ABB's broad offering of cable ties is designed to make the task of fastening, bundling, clamping and managing wires easier and quicker for industrial applications, construction, communications, utility and OEM professionals as well as home improvement specialists and do-it-yourself enthusiasts. When strength, aesthetics, reliability and performance are required, knowledgeable professionals turn to the original and the best source for cable ties and accessories.

The corrosion-proof, non-magnetic stainless steel locking device inside the tie head guarantees the strongest and most durable locking you will ever find on the market. Ty-Rap® can be used in the most adverse conditions: humidity, heat, cold,...

Engineered for labour savings and high performance, Ty-Rap® cable ties are commonly used in a variety of applications.

When you choose a Ty-Rap® cable tie, you can count on quality, performance and innovation to make your work easier.

Thomas & Betts - A Member of the ABB Group

Since June 2012, Thomas & Betts (T&B) is a Member of the ABB Group. ABB is a leading power and automation technology group, active in more than 100 countries with about 150.000 employees worldwide.

With Thomas & Betts, this portfolio will is now completed with the following product lines and flagship brands:

- Wire & Cable Management Ty-Rap® and Ty-Met® cable ties, Shrink-Kon® heat shrink, T&B Cabletray
- Cable Protection Systems nylon & metallic incl. brands: PMA, Adaptaflex, Kopex, Harnessflex
- Low Power Connection & Control Furse lightning & surge protection, Elastimold, Joslyn Hi-Voltage
- Emergency lighting emergency lighting, battery systems incl. VanLien, Kaufel, Emergi-Lite brands
- Hazardous location products DTS explosion proof light & boxes, Kopex-Ex conduits & fittings

Ty-Rap[®] High Performance Cable Ties Features and Benefits

When strength, aesthetics, reliability and performance are required, knowledgeable professionals turn to the original and the best source for cable ties and accessories. Ty-Rap® fastening systems include a full range or cable ties, identification ties, clamps, mounting bases, harnessing aids and installing tools. Using Ty-Rap® fastening systems for all wiring jobs, large and small, will speed and improve the reliability of harnessing and wire bundling while saving you money.

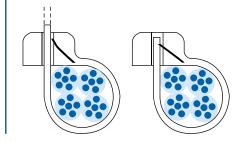


Rounded Edges, on the head and the strap, provide a comfortable handling of the ties and prevent sharp edges from damaging the cables. This gradual transition from the strap to the head protects the material against breaking at this most critical point. The edges of the head are also rounded off to offer maximum protection from injury.

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).



Non-Magnetic Stainless Steel Locking Barb – marine grade type 316 - that firmly anchors inside the tie head, ensures a strong, reliable and long lasting fastening under adverse conditions.



Ribbed and Stippled Surface, to prevent the tie from slipping around and along the bundle under vibration conditions and

external shock.

Non-Slip Tail, for an easy grip and pulling through the head during tensioning.

Extensive range of approvals and certifications:

Germanischer Lloyd, Lloyd's Register of Shipping, VG, Mil Specification, Amercian Bureau of Shipping (ABS); CE declaration, compliant to the low voltage directive and EN/IEC 62275 and UL 62275











Wide Range of Size Combinations:

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

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.

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, Fluoropolymer (ECTFE), Fluoropolymer (ETFE) and the recently introduced Detectable Polyamide 6.6 and Detectable Polypropylene. UL 94 V-0, UL 94 V-2 and UL 94 HB.











flexibility

Radiation

Chemically

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.

Wide Choice of Colours:

10 standard colours are available and pre-printed customized ties in any of the standard colours can be supplied on demand.



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.

Outstanding Range of Special Ties,

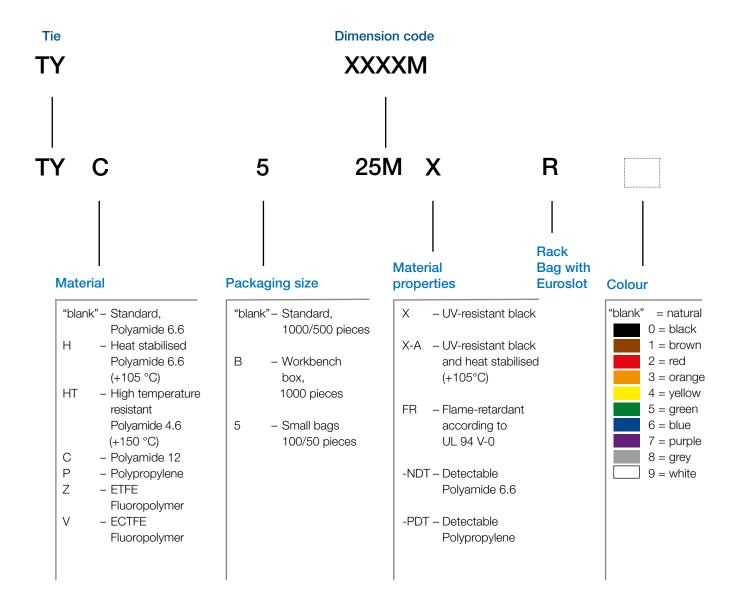
all with the famous stainless steel locking device:

ties with mounting hole or integrated peg/nail, panel mounting ties, identification ties with integrated label,...

Broad Range of Mounting Bases and Accessories.

Ty-Rap[®] High Performance Cable Ties Product reference structure

Ty-Rap® code



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.

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Natural

Characteristics

- Standard version (Polyamide 6.6), to cover most indoor applications
- Several lengths and 6 typical widths with a tensile strength up to 780N, to cover the most demanding applications
- Packaging: OEM bulk quantities in recyclable polythene bags
- Also available in small bags with Euroslot (see page 12) and in workbench boxes (see page 14)

Technical Information

Material - Moulding Polyamide 6.6

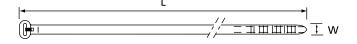
Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +85°C

Min. Installation Temp. -20°C
Colour
Rlammability rating
-20°C
Natural
UL 94 V-2

Other properties Halogen free, Silicone free

Product	MIL Spec.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W		from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY23M	MS-3367-4	92	2.3	1.0	1.5 - 22	80	1000	
TYB2315M	-	178	2.3	1.0	1.5 - 32	80	1000	
TY232M	-	203	2.3	1.0	1.5 - 51	80	1000	
TY234M	-	356	2.3	1.0	1.5 - 102	80	1000	ERG50
TY24M	MS-3367-5	140	3.6	1.1	2 - 35	178	1000	ENGOU
TY242M	-	208	3.6	1.1	2 - 51	180	1000	
TY26M	-	284	3.6	1.1	2 - 76	130	1000	
TY244M	_	368	3.6	1.1	2 - 102	134	1000	
TY25M	MS-3367-1	186	4.8	1.1	3 - 48	222	1000	
TY253M	MS-3367-7	290	4.8	1.3	3 - 78	222	1000	ERG50 ERG120
TY28M	MS-3367-2	361	4.8	1.3	3 - 102	222	1000	LINGTZU
TY271M	_	150	7.0	1.6	6 - 31	540	500	
TY272M	_	223	6.9	1.6	6 - 51	534	500	
TY27M	MS-3367-3	340	7.0	1.6	6 - 102	540	500	ERG120
TY275M	_	457	7.0	1.6	6 - 127	540	500	L-500-EU
TY277M	_	617	7.0	1.6	6 - 177	540	500	
TY29M	MS-3367-6	771	6.9	1.5	6 - 229	540	500	
TY53510M	-	889	8.2	1.7	to 254	780	50	WT3D
TY54513M	-	1143	8.2	1.7	to 330	780	50	L-500-EU











E49405

^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – UV-resistant black

Characteristics

- UV-resistant version, especially recommended for outdoor applications
- Black version (2% carbon for military specifications)
- Also available in heat stabilised + UV-resistant version (contains 2% carbon according to military application), 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
- Packaging: OEM bulk quantities in recyclable polythene bags
- Also available in small bags with Euroslot (see page 12) and in workbench boxes (see page 14)

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +105°C

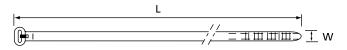
Min. Installation Temp. -30°C
Colour
Black
Flammability rating
UL 94 V-2

Other properties UV-resistant, Halogen free, Silicone free

Product	MIL Spec.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W		from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY23MX	MS-3367-4	92	2.3	1.0	1.5 - 22	80	1000	
TYB2315MX	-	178	2.3	1.0	1.5 - 32	80	1000	
TY232MX	-	203	2.3	1.0	1.5 - 51	80	1000	
TY234MX	-	356	2.3	1.0	1.5 - 102	80	1000	FDOEO
TY24MX	MS-3367-5	140	3.6	1.1	2 - 35	180	1000	ERG50
TY242MX	-	208	3.6	1.1	2 - 51	180	1000	
TY26MX	-	284	3.6	1.1	2 - 76	130	1000	
TY244MX	-	368	3.6	1.1	2 - 102	130	1000	
TY25MX	MS-3367-1	186	4.8	1.1	3 - 48	220	1000	
TY253MX	MS-3367-7	290	4.8	1.3	3 - 78	222	1000	ERG50 ERG120
TY28MX	MS-3367-2	361	4.8	1.3	3 - 102	222	1000	LIIGIZO
TY271MX	-	150	7.0	1.6	6 - 31	540	500	
TY272MX*	-	223	6.9	1.6	6 - 51	540	500	
TY27MX*	MS-3367-3	340	7.0	1.6	6 - 102	540	500	ERG120
TY275MX *	-	457	7.0	1.6	6 - 127	540	500	L-500-EU
TY277MX*	_	617	7.0	1.6	6 - 177	540	500	
TY29MX*	MS-3367-6	771	6.9	1.5	6 - 229	540	500	<u>.</u>
TY53510MX	-	889	8.2	1.7	to 254	780	50	WT3D
TY54513MX	-	1143	8.2	1.7	to 330	780	50	L-500-EU

^{*} Min. installation temp: -40°C

Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143











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

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Coloured

Characteristics

Ty-Rap® ties in Polyamide 6.6 are available in 10 different colours and pre-printed ties in any of the standard colours can be supplied on demand.

- Several lengths and 6 typical widths with a tensile strength up to 780 N, to cover the most demanding applications
- Standard packaging is 1.000 / 500 pieces but smaller packaging (100 pieces) can also be supplied on request
- Please contact your Sales Office for product availability and Minimium Order Quantity

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +85°C

Min. Installation Temp. -20°C Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	MIL Spec.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity **	Tooling
Ref.		L	W		from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY23M-*	MS-3367-4	92	2.3	1.0	1.5 - 22	80	1000	
TY232M-*	-	203	2.3	1.0	1.5 - 51	80	1000	
TY234M-*	-	356	2.3	1.0	1.5 - 102	80	1000	
TY24M -*	MS-3367-5	140	3.6	1.1	2 - 35	180	1000	ERG50
TY242M-*	_	208	3.6	1.1	2 - 51	180	1000	
TY26M-*	_	284	3.6	1.1	2 - 76	130	1000	
TY244M-*	-	368	3.6	1.1	2 - 102	134	1000	
TY25M-*	MS-3367-1	186	4.8	1.1	3 - 48	222	1000	
TY253M-*	MS-3367-7	290	4.8	1.3	3 - 78	222	1000	ERG50 ERG120
TY28M-*	MS-3367-2	361	4.8	1.3	3 - 102	222	1000	LITUIZU
TY271M-*	-	150	7.0	1.6	6 - 31	540	500	
TY272M-*	_	223	6.9	1.6	6 - 51	540	500	
TY27M-*	MS-3367-3	340	7.0	1.6	6 - 102	540	500	ERG120
TY275M-*	_	457	7.0	1.6	6 - 127	540	500	L-500-EU
TY277M-*	_	617	7.0	1.6	6 - 177	540	500	
TY29M-*	MS-3367-6	771	6.9	1.5	6 - 229	540	500	
TY53510M-*	_	889	8.2	1.7	to 254	780	50	WT3D
TY54513M-*	_	1143	8.2	1.7	to 330	780	50	L-500-EU

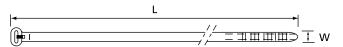
For cable ties in a specific colour, replace * in the Product Reference by the colour code:

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.

Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143









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

^{**} For smaller quantities, the figure "5" needs to be added to the part number immediately after "TY" - exemple: TY523M-2 is the same as TY23M-2 but in bags of 100

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Natural – Euroslot packaging

Characteristics

The main characteristics of the Ty-Rap® cable ties are shown on pages 6 and 7.

- Standard version (Polyamide 6.6), to cover most indoor applications
- Packaging in small polythene bags with Euroslot, ideal for display and point-of-sales promotion (rack)
- Several lengths and 5 typical widths with a tensile strength up to 540N, to cover the most demanding applications
- Very convenient for small series production: 100 pieces (for cable ties from 2.3 mm to 4.8 mm width) or 50 pieces (for cable ties 6.9 mm width and above)

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +85°C

Min. Installation Temp. -20°C
Colour
Rlammability rating
UL 94 V-2

Other properties Halogen free, Silicone free



Product	MIL Spec.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W		from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY523MR	MS-3367-4	92	2.3	1.0	1.5 - 22	80	100	
TY5232MR	_	203	2.3	1.0	1.5 - 51	80	100	
TY5234M	_	356	2.3	1.0	1.5 - 102	80	100	
TY524MR	MS-3367-5	140	3.6	1.1	2 - 35	178	100	ERG50
TY5242MR	-	208	3.6	1.1	2 - 51	180	100	
TY526MR	_	284	3.6	1.1	2 - 76	130	100	
TY5244MR	_	368	3.6	1.1	2 - 102	134	100	
TY525MR	MS-3367-1	186	4.8	1.1	3 - 48	222	100	
TY5253MR	MS-3367-7	290	4.8	1.3	3 - 78	222	100	ERG50 ERG120
TY528MR	MS-3367-2	361	4.8	1.3	3 - 102	222	100	Enaizo
TY5271MR	_	150	7.0	1.6	6 - 31	540	50	
TY5272MR	_	223	6.9	1.6	6 - 51	534	50	
TY527MR	MS-3367-3	340	7.0	1.6	6 - 102	540	50	ERG120
TY5275M	_	457	7.0	1.6	6 - 127	540	50	L-500-EU
TY5277M	_	617	7.0	1.6	6 - 177	540	50	
TY529M	MS-3367-6	771	6.9	1.5	6 - 229	540	50	

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











 $^{^{\}star}$ Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – UV-resistant black – Euroslot packaging

Characteristics

The main characteristics of the Ty-Rap® cable ties are shown on pages 6 and 7.

- UV-resistant version, especially recommended for outdoor applications
- Black version (2% carbon for military specifications)
- Packaging in small polythene bags with Euroslot, ideal for display and point-of-sales promotion (rack)
- Several lengths and 5 typical widths with a tensile strength up to 540N, to cover the most demanding applications
- Very convenient for small series production: 100 pieces (for cable ties from 2.3 mm to 4.8 mm width) or 50 pieces (for cable ties 6.9 mm width and above)

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel Temperature range -60°C to +105°C

Temperature range -60°C to Min. Installation Temp. -30°C

Colour Black (other colours see page 15)

Flammability rating UL 94 V-2

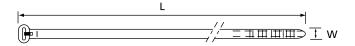
Other properties Halogen free, Silicone free



Product	MIL Spec.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W		from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY523MXR	MS-3367-4	92	2.3	1.0	1.5 - 22	80	100	
TY5232MXR	_	203	2.3	1.0	1.5 - 51	80	100	
TY5234MX*	-	356	2.3	1.0	1.5 - 102	80	100	
TY524MXR	MS-3367-5	140	3.6	1.1	2 - 35	180	100	ERG50
TY5242MXR	-	208	3.6	1.1	2 - 51	180	100	
TY526MXR	-	284	3.6	1.1	2 - 76	130	100	
TY5244MXR	-	368	3.6	1.1	2 - 102	130	100	
TY525MXR	MS-3367-1	186	4.8	1.1	3 - 48	220	100	
TY5253MXR	MS-3367-7	290	4.8	1.3	3 - 78	222	100	ERG50 ERG120
TY528MXR	MS-3367-2	361	4.8	1.3	3 - 102	222	100	LITOTZO
TY5271MXR	-	150	6.9	1.6	6 - 31	540	50	
TY5272MXR*	-	223	6.9	1.6	6 - 51	540	50	
TY527MXR*	MS-3367-3	340	7.0	1.6	6 - 102	540	50	ERG120
TY5275MX*	_	457	7.0	1.6	6 - 127	540	50	L-500-EU
TY5277MX*	-	617	6.9	1.6	6 - 177	540	50	
TY529MX*	MS-3367-6	771	6.9	1.6	6 - 229	540	50	

^{*} Min. installation temp: -40°C

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











^{**} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Workbench boxes

Characteristics

- 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

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel
Temperature range -60°C to +85°C (natural)
-60°C to +105°C (black)

Min. Installation Temp. -20°C (natural) -30°C (black)

Colour Natural or UV-resistant black (other colours see page 15)

Flammability rating UL 94 V-2

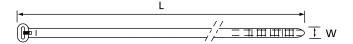
Other properties Halogen free, Silicone free, UV-resistant (black)



Product	MIL Spec.	Colour	Length	Width	Thick-	Bundle ø	Min. tensile	Quantity	Tooling
Ref.			L	W	ness	from to	strenght		
			[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYB23M	MS-3367-4	natural	92	2.3	1.0	1.5 - 22	80	1000	
TYB23MX	MS-3367-4	UV-resistant black	92	2.3	1.0	1.5 - 22	80	1000	
TYB232M	_	natural	203	2.3	1.0	1.5 - 51	80	1000	FRG50
TYB232MX	-	UV-resistant black	203	2.3	1.0	1.5 - 51	80	1000	ENGOU
TYB24M	MS-3367-5	natural	140	3.6	1.1	2 - 35	178	1000	
TYB24MX	MS-3367-5	UV-resistant black	140	3.6	1.1	2 - 35	180	1000	
TYB25M	MS-3367-1	natural	186	4.8	1.3	3 - 48	222	1000	ERG50
TYB25MX	MS-3367-1	UV-resistant black	186	4.8	1.3	3 - 48	220	1000	ERG120

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155
For trading progressings; see pages 120 to 142

For tooling specifications: see pages 130 to 143











^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Multi-coloured

Characteristics

- Multi-coloured TY25M cable ties in a single, convenient package
- Supplied in bags of 100 ties containing ten ties of each of the 10 standard colours (TY25M-0 to TY25M-9)
- Ideal for applications which require a colour coding or which have an aesthetic sensitivity (to match the colour of the cable or of the support), especially in cable bundling in telecom, datacom, cable and satellite TV

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +85°C

Min. Installation Temp. -20°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



Product Ref.	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY525M-CLRS	186	4.8	1.1	3 - 48	222	100	ERG50, ERG120

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155
For tooling specifications: see pages 130 to 143





Ty-Rap® High Performance Cable Ties Printed cable ties



ABB extends its highly respected existing capabilities in cable tie manufacture with its inhouse 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 5,000 ties approximately)

According to the requirements, following printing processes are proposed: Hot foil transfer

- 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

Laser printing

- The print is highly durable
- The standard printing colour is black
- The print is wear and weather resistant

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

Ty-Rap® High Performance Cable Ties Ty-Rap® professional kit



Product Ref.: TYRAP PROF KIT

Characteristics

A handy kit containing a professional selection of Ty-Rap $^{\! @}$ fastening products in one convenient box

- One ergonomic fastening tool ERG50 with exclusive features for quick set-up and fast installation
- 500 Ty-Rap® cable ties TY525MR
- 500 UV-resistant Ty-Rap® cable ties TY525MXR
- Includes a handy, light weight re-usable dispenser (Ty-Tote-25)

Ty-Rap[®] High Performance Cable Ties Polyamide 6.6 cable ties – Flame retardant

Characteristics

- Flame retardant version. Ideal for use when low flammability and low smoke are necessary such as public transport, tunnels, etc.

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -40°C to +65°C

Min. Installation Temp. -0°C
Colour White
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY23MFR	92	2.4	1.0	1.5 - 22	80	1000	
TY232MFR	203	2.4	1.0	1.5 - 51	80	1000	ERG 50
TY24MFR	140	3.6	1.1	2 - 35	134	1000	
TY25MFR	186	4.6	1.1	3 - 48	220	1000	ERG50
TY28MFR	360	4.6	1.1	3 - 102	177	500	ERG120
TY27MFR	335	7.6	1.6	6 - 95	540	500	ERG120
TY272MFR	223	7.0	1.6	4.8- 51	540	500	L-500-EU









Ty-Rap® High Performance Cable Ties Polyamide 6.6 cable ties – Heat stabilised

Characteristics

- Heat stabilised version, for applications up to 105°C.

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +105°C

Min. Installation Temp. -30°C

Colour Natural (may have a greenish tint)

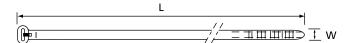
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYH23M / TYHB23M	92	2.4	1.0	1.5 - 22	80	1000	
TYH232M	203	2.4	1.0	1.5 - 51	80	1000	
TYH24M	140	3.6	1.1	2 - 35	180	1000	ERG50
TYH242M*	208	3.6	1.1	2 - 51	180	1000	
TYH26M	284	3.6	1.1	2 - 76	130	1000	
TYH25M	186	4.7	1.3	3 - 48	220	1000	50050
TYH253M*	290	4.8	1.2	3 - 76	220	1000	ERG50 ERG120
TYH28M	360	4.8	1.3	3 - 102	220	1000	Enaizo
TYH272M*	222	7.6	1.6	4.8 - 51	540	500	
TYH27M	340	7.0	1.6	4.8 - 102	540	500	L-500-EU ERG120
TYH29M*	771	6.9	1.5	4.8 - 229	540	500	110120

^{*} Not UL recognised







Ty-Rap® High Performance Cable Ties Polyamide 6.6 cable ties – Heat stabilised + UV-resistant

Characteristics

- 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 -60°C to +105°C

Min. Installation Temp. -40°C
Colour
Black
Flammability rating
UL 94 V-2

Other properties UV-resistant, heat stabilised, Halogen free, Silicone free

Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY23MX-A	92	2.3	0.9	4.8 - 22	80	1000	FDOSO
TY24MX-A	140	3.6	1.1	5.2 - 35	133	1000	ERG50 ERG120*
TY25MX-A	186	4.8	1.2	6.2 - 48	220	1000	ENGTED
TY27MX-A	340	6.9	1.6	8 - 95	540	500	ERG120, L-500-EU

^{*} ERG120 can not be used with TY23MX-A and TY24MX-A

Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143





E4940



Ty-Rap® High Performance Cable Ties Polyamide 4.6 cable ties – Extra high temperature

Characteristics

- 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

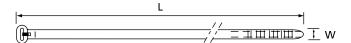
Temperature range -40°C to +150°C

Min. Installation Temp. -18°C
Colour
Elammability rating
UL 94 V-2

Other properties Extra high temperature resistant, Halogen free, Silicon free

Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYHT23M	95	2.3	0.91	2 - 20	80	1000	
TYHT24M	143	3.6	1.07	2 - 29	178	1000	ERG120* ERG50
TYHT25M	192	4.8	1.22	5 - 45	220	1000	WT199
TYHT28M	367	4.8	1.27	5 - 102	220	1000	
TYHT27M	349	6.9	1.60	5 - 89	534	500	ERG120
TYHT277M	617	7.0	1.60	6 - 177	540	500	L-500-EU

^{*} ERG120 can not be used with TYHT23M and TYHT24M







Ty-Rap® High Performance Cable Ties Polyamide 12 cable ties - UV-resistant

Characteristics

- Polyamide 12 UV-resistant version, remains flexible in cold & dry environments.
- Ages better and has a better chemical resistance than Polyamide 6.6

Technical Information

Material - Moulding Polyamide 12

Material - Locking barb 316 grade stainless steel

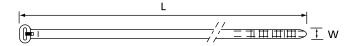
-40°C to +85°C Temperature range

Colour Black Flammability rating UL 94 V-2

Other properties UV-resistant, Halogen free, Silicone free



Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYC25MX	186	4.70	1.17	3.5 - 45	155	1000	
TYC525MX	186	4.70	1.17	3.5 - 45	155	100	ERG50
TYC28MX	360	4.70	1.20	3.5 - 102	155	1000	ERG120
TYC272MX	222	7.60	1.60	6 - 51	380	500	
TYC27MX	343	7.62	1.50	6 - 89	380	500	
TYC527MX	343	7.62	1.50	6 - 89	380	50	ERG120 L-500-FU
TYC29MX	771	7.60	1.60	6 - 229	380	500	2 300 20



Ty-Rap[®] High Performance Cable Ties Polypropylene cable ties – Weatherable

Characteristics

- Polypropylene weatherable version, for increased resistance to chemicals
- Resistant against inorganic acids, polyhydric alcohols, neutral and basic salts

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



Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYP23MX	92	2.4	1.0	2 - 16	50	1000	
TYP25MX	186	4.8	1.1	3.5 - 45	130	1000	ERG50
TYP28MX	360	4.8	1.1	3.5 - 102	130	1000	
TYP27MX	340	7.0	1.6	6 - 90	270	500	ERG120, L-500-EU

Ty-Rap[®] High Performance Cable Ties Detectable cable ties

Characteristics

The Ty-Rap® Detectable Cable Ties from ABB incor-porate a unique compound (patent pending) that can be detected by X-Ray equipment, metal detectors and visual inspection equipment.

Particularly recommended for applications in food, pharmaceutical and other contaminationsensitive industries using detection systems, where cable tie installation residuals (cut tails) are not allowed in the finished product.

- Detectable by metal detectors set at minimum 1.5 mm diameter ferrous sphere
- Detectable by X-Ray equipment
- Bright blue colour for an easy visual detection
- Help achieve the HACCP EU-Directive
- Available in standard Polyamide 6.6 or in Polypropylene version for liquid-processing applications
- Available in 5 different sizes in convenient small bags with Euroslot: 5 NDT, 4PDT

Technical Information

Material - Moulding Polyamide 6.6 or Polypropylene Material - Locking barb 316 grade stainless steel

Temperature range -40°C to +85°C
Colour Bright blue

Flammability rating UL 94 V-2 (Polyamide 6.6)

UL 94 HB (Polypropylene)
Other properties Halogen free, silicone free

PM

Product	Material	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	from to	strenght		
		[mm]	[mm]	[mm]	[N]	[pieces]	
DETECTABLE PO	OLYAMIDE 6.6	·					
TY523M-NDT	Polyamide 6.6	92	2.4	2 - 16	80	100	FRG50
TY524M-NDT	Polyamide 6.6	140	3.6	2 - 29	134	100	Endou
TY525M-NDT	Polyamide 6.6	186	4.8	3.5 - 45	180	100	ERG50
TY528M-NDT	Polyamide 6.6	360	4.8	3.5 - 102	220	100	ERG120
TY527M-NDT	Polyamide 6.6	340	7.0	6 - 90	540	50	ERG120, L-500-EU
DETECTABLE PO	DLYPROPYLENE				•		
TY523M-PDT	Polypropylene	92	2.4	2 - 16	50	100	ERG50
TY525M-PDT	Polypropylene	186	4.8	3.5 - 45	130	100	ERG50
TY528M-PDT	Polypropylene	360	4.8	3.5 - 102	130	100	ERG120
TY527M-PDT	Polypropylene	340	7.0	6 - 90	270	50	ERG120, L-500-EU









Ty-Rap® High Performance Cable Ties Fluoropolymer cable ties – ECTFE

Characteristics

- Outstanding characteristic: lower smoke density when burnt
- Recommended for applications where smoke generation is aconcern, such as plenum areas

Technical Information

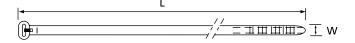
Material - Moulding Fluoropolymer ECTFE

Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +160°C

Min. Installation Temp. -60°C
Colour Maroon
Flammability rating UL 94 V-0
Other properties low smoke

Product	Length		Thickness		<u> </u>	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYV23M	92	2.3	1.15	1.5 - 22	80	1000	ERG50
TYV523M	92	2.3	1.15	1.5 - 22	80	100	ENUOU
TYV25M	186	4.7	1.30	3.0 - 48	220	1000	ERG50
TYV525M	186	4.7	1.30	3.0 - 48	220	100	ERG120



Ty-Rap® High Performance Cable Ties Fluoropolymer cable ties – ETFE

Characteristics

- ETFE Fluoropolymer version, resistant to chemicals and to radiation
- Non-outgassing properties for zero gravity applications
- The best all around plastic material for cable ties
- Typical applications include: nuclear, power plants, space industry, etc.

Technical Information

Material - Moulding Fluoropolymer ETFE
Material - Locking barb 316 grade stainless steel

Temperature range -60°C to +170°C

Min. Installation Temp. -60°C
Colour Aquamarine
Flammability rating UL 94 V-0

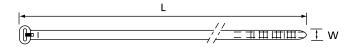
Other properties Silicone free, inert to most solvents and chemicals,

hydrolytically stable, radiation resistant.

Non-outgassing properties for zero gravity applications.

Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYZ23M*	92	2.3	1.10	1.5 - 22	80	1000	
TYZ523M*	92	2.3	1.10	1.5 - 22	80	100	
TYZ25M	186	4.3	1.66	3 - 48	220	1000	ERG50
TYZ525M	186	4.3	1.66	3 - 48	220	100	ERG120**
TYZ28M	360	4.4	1.66	3 - 102	220	500	
TYZ528M	360	4.3	1.66	3 - 102	220	100	
TYZ27M***	340	6.8	1.85	6 - 95	540	100	ERG120
TYZ527M***	340	6.8	1.85	6 - 95	540	50	L-500-EU

^{*} Product Ref. TYZ23M and TYZ523M are UL listed (E49405), all other items are UL recognized





^{**} ERG120 not to be used on TYZ23M

^{***} Not on EC Declaration

Special ties with steel locking barb Integrated mounting hole cable ties

Characteristics

- Can be directly mounted onto a support with screws, bolts or rivets
- Mounting and bundling in one maintenance-friendly assembly.
- Typical application: 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.

Technical Information

Polyamide 6.6 Material - Moulding

316 grade stainless steel Material - Locking barb

Temperature range -40°C to +85°C

Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

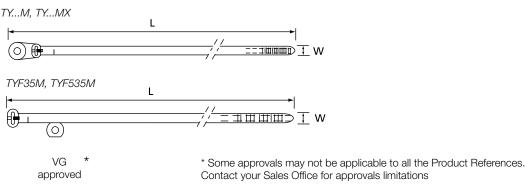
Other properties UV-resistant (black), Halogen free, Silicone free



Product	Colour	Diameter of	Length	Width	Thick-	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		mounting hole	L	W	ness	from to	strenght		
		[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY33M	natural	3.0	102	2.3	0.9	2 - 16	80	1000	
TY533M	natural	3.0	102	2.3	0.9	2 - 16	80	100	
TY33MX	UV-resistant black	3.0	102	2.3	0.9	2 - 16	80	1000	
TY533MX	UV-resistant black	3.0	102	2.3	0.9	2 - 16	80	100	FRG50
TY34M	natural	4.4	151	3.5	1.0	2 - 29	180	1000	LINGOU
TY534M	natural	4.4	151	3.5	1.0	2 - 29	180	100	
TY34MX	UV-resistant black	4.4	151	3.5	1.0	2 - 29	180	1000	
TY534MX	UV-resistant black	4.4	151	3.5	1.0	2 - 29	180	100	
TY635M	natural	4.0	198	4.7	1.1	3.5 - 45	220	1000	
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	FD0-50
TY535M	natural	5.1	199	4.7	1.1	3.5 - 45	220	100	ERG50 FRG120
TY35MX	UV-resistant black	5.1	199	4.7	1.1	3.5 - 45	220	1000	2110120
TY535MX	UV-resistant black	5.1	199	4.7	1.1	3.5 - 45	220	100	
TY1435M	natural	6.7	198	4.7	1.1	3.5 - 45	220	1000	
TY37M	natural	6.7	356	7.7	2.0	6 - 90	540	500	
TY537M	natural	6.7	356	7.7	2.0	6 - 90	540	50	ERG120
TY37MX	UV-resistant black	6.7	356	7.7	2.0	6 - 90	540	500	L-500-EU
TY537MX	UV-resistant black	6.7	356	7.7	2.0	6 - 90	540	50	
TYF35M	natural	4.0	186	4.7	1.2	3.5 - 45	220	1000	ERG50
TYF535M	natural	4.0	186	4.7	1.2	3.5 - 45	220	100	ERG120

Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143

VG95387 part 4, type B



Special ties with steel locking barb Panel mounting cable ties

Characteristics

- 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

Technical Information

Material - Moulding Polyamide 6.6

Material - Locking barb 316 grade stainless steel

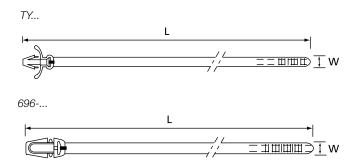
Temperature range -40°C to +85°C

Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

Other properties UV-resistant (black), Halogen free, Silicone free

Product Ref.	Colour	Diameter of moun- ting hole	_	Width W	Thick- ness	Bundle diameter from to	Minimum tensile strength	Suitable for board/wall thickness from to	Quantity	Tooling
		[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[mm]	[pieces]	
ANCHOR TYPE										
TY54SM	natural	4.5 - 5.2	150	3.5	1.0	2 - 32	130	0.1 - 2.5	1000	
TY54SMX	UV-resistant black	4.5 - 5.2	150	3.5	1.0	2 - 32	130	0.1 - 2.5	1000	ERG50
TY38M	natural	6.4 - 6.7	200	4.7	1.3	3.5 - 44	220	1.0 - 4.0	1000	EDOFO
TY38MX	UV-resistant black	6.4 - 6.7	200	4.7	1.3	3.5 - 44	220	1.0 - 4.0	1000	ERG50 ERG120
STANDARD TY	/PE									
696-41836	natural	5.8 - 7.5	197	4.8	1.1	3.5 - 45	220	2.2 - 3.7	1000	ERG50 ERG120





Special ties with steel locking barb Blind mounting cable ties

Characteristics

- 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

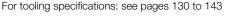
Colour Natural or UV-resistant black (see table)

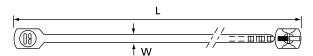
Flammability rating UL 94 V-2

Other properties UV-resistant (black), Halogen free, Silicone free

Product	Colour	Diameter of	Length	Width	Thick-	Bundle ø	Min.	Quantity	Tooling
Ref.	:	mounting hole	L	W	ness	from to	tensile strenght		
		[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TYG34M	natural	6.4 - 7.0	160	3.6	1.1	2 - 32	180	1000	
TYG534M	natural	6.4 - 7.0	160	3.6	1.1	2 - 32	180	100	ERG50
TYG34MX	UV-resistant black	6.4 - 7.0	160	3.6	1.1	2 - 32	180	1000	ENU3U
TYG534MX	UV-resistant black	6.4 - 7.0	160	3.6	1.1	2 - 32	180	100	

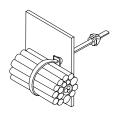
Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155











Special ties Blind mounting cable ties

Characteristics

- 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

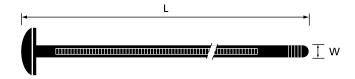
Flammability rating UL 94 V-2

Other properties UV-resistant, Halogen free, Silicone free

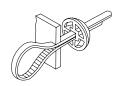
Product	Diameter of	Length	Width	Thick-	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	mounting hole	L	W	ness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TY41M	8.1 - 17.3	244	5.7	1.7	5 - 60	300	500	ERG120
TY541M	8.1 - 17.3	244	5.7	1.7	5 - 60	300	50	ENGIZU

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143









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

Characteristics

- TY545MX, with integrated nail for mounting onto wood or similar materials
- TY544MX, 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

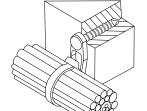
Flammability rating UL 94 V-2

Other properties UV-resistant, Halogen free, Silicone free

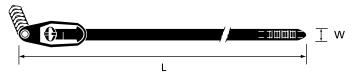
Product	Diameter of	Length	Width	Thick-	Bundle ø	Min. tensile	Mounting	Quantity	Tooling
Ref.	mounting hole	L	W	ness	from to	strenght	hole depth		
	[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[mm]	[pieces]	
TY544MX	6.4	200	4.6	1.0	3.5 - 45	220	25 min.	50	ERG50
TY545MX	-	200	4.7	1.0	4.7 - 38.1	220	_	50	ERG120

Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155

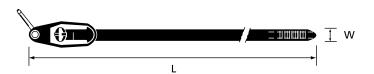
For tooling specifications: see pages 130 to 143







TY545MX





Special ties Releasable cable ties

Characteristics

- 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

Technical Information

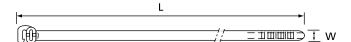
Material Polyamide 6.6 Temperature range -40°C to +85°C

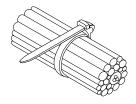
Colour Natural Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity
Ref.	L	W		from to	strenght	
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]
TYR505	190	4.7	1.19	10 - 44	220	100
TYR508	364	4.7	1.19	10 - 102	220	100

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155





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.

Special ties

Releasable lashing ties with incorporated fastener

Characteristics

- 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

Technical Information

Material Polyamide 6.6
Temperature range -40°C to +85°C
Colour UV-resistant black

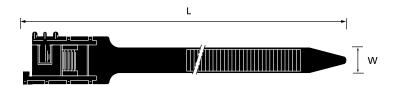
Flammability rating UL 94 V-2

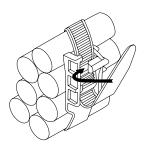
Other properties Halogen free, Silicone free



Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity
Ref.	L	W		from to	strenght	
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]
TY409	483	12.7	2.0	45 - 121	890	100
TY5409	483	12.7	2.0	45 - 121	890	25

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155





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.

Special ties

Releasable 2-piece lashing ties, pre-assembled version

Characteristics

- Heavy-duty lashing ties, in cut lengths with pre-assembled heads
- Also available on reel with separate heads (see page 34)
- 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

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

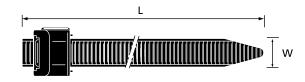


Product	Diameter of	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity
Ref.	mounting hole	L	W		from to	strenght	
	[mm]	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]
TY53418PX	6.9	457	13.2	1.9	45 - 127	670	25
TY5418PX	_	457	13.2	1.8	45 - 127	670	25
TY5424PX	_	610	13.2	1.8	10 - 178	670	25
TY5442PX	-	1067	13.2	1.8	10 - 305	670	10
TY5460PX	_	1524	13.2	1.8	10 - 457	670	10

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155

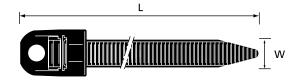
TY54XXPX





TY53418PX





Special ties

Releasable 2-piece lashing ties on reel with separate heads

Characteristics

- Heavy-duty lashing ties on reel with separate heads
- Also available in cut lengths with pre-assembled heads (see page 33)
- UV-resistant Polypropylene, ideal for applications where chemical resistance is important (heads in weatherable rigid Polyamide 6.6)
- Extremely robust (670N)
- Easily releasable and 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



Product	Lashing tie, dimensions		Seperate locking heads		Min. tensile strength	
Ref.	Length	Width	Thickness	Quantity	Туре	of assembly
	[mm]	[mm]	[mm]	[pieces]		[N]
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

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155

696-41563

696-41562

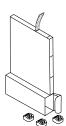
696-41614

TY4100PX

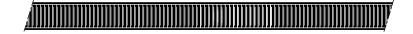








696-41563



Special ties with steel locking barb Cable ties with identification tag

Characteristics

- 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
- Series 51M is MIL (MS-3368-5) approved
- Trouble-free installation
- All edges are rounded to make installation easier
- Available in bulk packaging (500/1000 pieces) or in small packaging (100 pieces)

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



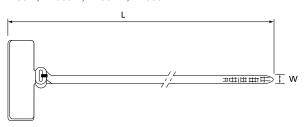
Product	MIL Spec.	Length	Width	Thick-	Bundle ø	Min. tensile	Label	Quantity	Tooling
Ref.		L	W	ness	from to	strenght	dimensions		
		[mm]	[mm]	[mm]	[mm]	[N]	[mm]	[pieces]	
TY51M	MS-3368-5	92	2.4	1.0	10 - 16	80	25.4 x 7.9	500	
TY551M	MS-3368-5	92	2.4	1.0	10 - 16	80	25.4 x 7.9	100	
TY512M	-	210	2.4	1.0	10 - 51	80	25.4 x 7.9	1000	
TY5512M	-	210	2.4	1.0	10 - 51	80	25.4 x 7.9	100	FRG50
TY53M	-	102	2.4	1.0	2 - 16	80	20.6 x 9.3	500	ERGOU
TY553M	-	102	2.4	1.0	2 - 16	80	20.6 x 9.3	100	•
TY532M	-	212	2.4	1.0	2 - 51	80	20.6 x 9.3	1000	•
TY5532M	-	212	2.4	1.0	2 - 51	80	20.6 x 9.3	100	'

For other materials and colours contact your Sales Office

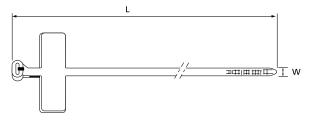
Description of product reference structure: see page 8 Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143

TY53M, TY553M, TY532M, TY5532M



TY51M, TY551M, TY512M, TY5512M



Special ties with steel locking barb Cable ties with identification tag

Characteristics

- Identification ties with incorporated label for durable marking and tying
- Label forms onto the bundle
- 5 different versions, up to 4 straps, in bulk and small packaging
- 4 versions (up to 3 straps) are Mil-specified
- Trouble free installation
- Labelling of bundles up to 102 mm diameter
- 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

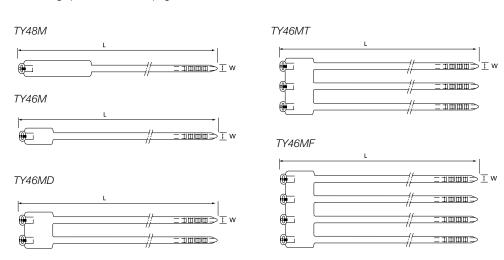


Product	MIL Spec.	Length	Width	Thick-	Bundle ø	Min. tensile	Label	Quantity	Tooling
Ref.		L	W	ness	from to	strenght	dimensions		
		[mm]	[mm]	[mm]	[mm]	[N]	[mm]	[pieces]	
TY48M	MS-3368-2	360	4.8	1.1	19 - 102	220	13.1 x 57.2	1000	
TY548M	MS-3368-2	360	4.8	1.1	19 - 102	220	13.1 x 57.2	100	
TY46M	MS-3368-1	184	4.8	1.1	9.5 - 45	220	13.1 x 27.0	1000	
TY546M	MS-3368-1	184	4.8	1.1	9.5 - 45	220	13.1 x 27.0	100	
TY46MD	MS-3368-3	184	4.8	1.1	9.5 - 45	220 x 2	29.7 x 27.0	500	ERG50
TY546MD	MS-3368-3	184	4.8	1.1	9.5 - 45	220 x 2	29.7 x 27.0	50	ERG120
TY46MT	MS-3368-4	184	4.8	1.1	9.5 - 45	220 x 3	46.0 x 27.0	500	
TY546MT	MS-3368-4	184	4.8	1.1	9.5 - 45	220 x 3	46.0 x 27.0	100	
TY46MF	_	184	4.8	1.1	9.5 - 45	220 x 4	63.1 x 27.0	250	
TY546MF	_	184	4.8	1.1	9.5 - 45	220 x 4	63.1 x 27.0	50	

For other materials and colours contact your Sales Office

Description of product reference structure: see page 8
Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143



Cable support system with metallic locking barb Pre-assembled Deltec® cable ties

Characteristics

- 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 Toughened weatherable acetal

Material - Locking barb Marine grade, corrosion-resistant copper alloy

Temperature range -65°C to +90°C Flammability rating UL 94 HB Colour Black

Other properties UV-resistant, Halogen free, superior resistance to moisture

and salt environments

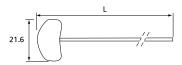


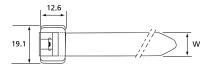
Product	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling	
Ref.	L	w	from to	strenght			
	[mm]	[mm]	[mm]	[N]	[pieces]		
CSS-100	254.0	12.7	60	1110	50		
TYD5135M	342.9	12.7	90	1110	25	WT3D L-500-EU	
CSS-160	406.4	12.7	110	1110	50		
TYD5270M	685.8	12.7	200	1110	10		

For tooling specifications: see pages 130 to 143

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.





Cable support system with metallic locking barb Strap on reel

Characteristics

- 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 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



Product	Length per reel	Width	Min. tensile	Quantity	Tooling
Ref.	L	W	strenght		
	[m]	[mm]	[N]	[reels]	
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 130 to 143

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.

Cable support system with metallic locking barb Double locking heads

Technical Information

Material - moulding 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

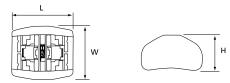
Other properties UV-resistant, Halogen free, superior resistance to moisture

and salt environments



Product	Length	Width	Height	Quantity
Ref.	L	W	Н	
	[mm]	[mm]	[mm]	[pieces]
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



Cable support system with metallic locking barb Deltec® Kits

Characteristics

- 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



Product	F	Reels	Locking heads
Ref.	Length per reel	Quantity	Quantity
	[mm]	[reels]	[pieces]
CSS-5K	15.2	5	150
CSS-10K	15.2	10	300

Ty-Rap® High Performance Cable Ties Cable spacers

Characteristics

- 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

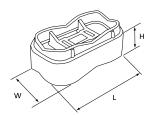
Material Weather-resistant polypropylene

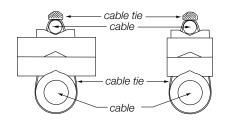
Temperature range -40°C to +85°C Flammability rating UL 94 HB Colour Black

Other properties UV-resistant, Halogen free



Product	Length	Width	Height	Quantity
Ref.	L	W	Н	
	[mm]	[mm]	[mm]	[pieces]
TCP5255	53.3	30.5		25
TCP360	53.3	30.5	12 7	100





Cable support system with metallic locking barb Base and hanger

Characteristics

To secure the cables to all types of surfaces

Technical Information

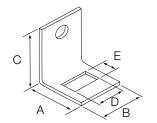
Material Zinc plated steel

Colour Metallic



Product			Dimensions		Mounting hole	Quantity	
Ref.	Α	В	С	D	E	diameter	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
CSS-B	48.4	14.3	7.1	:		6.7 (2x)	50
CSS-H	22.5	22.2	29.8	13.6	8.3	6.9	50





CSS-B

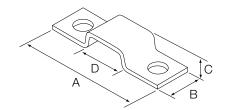
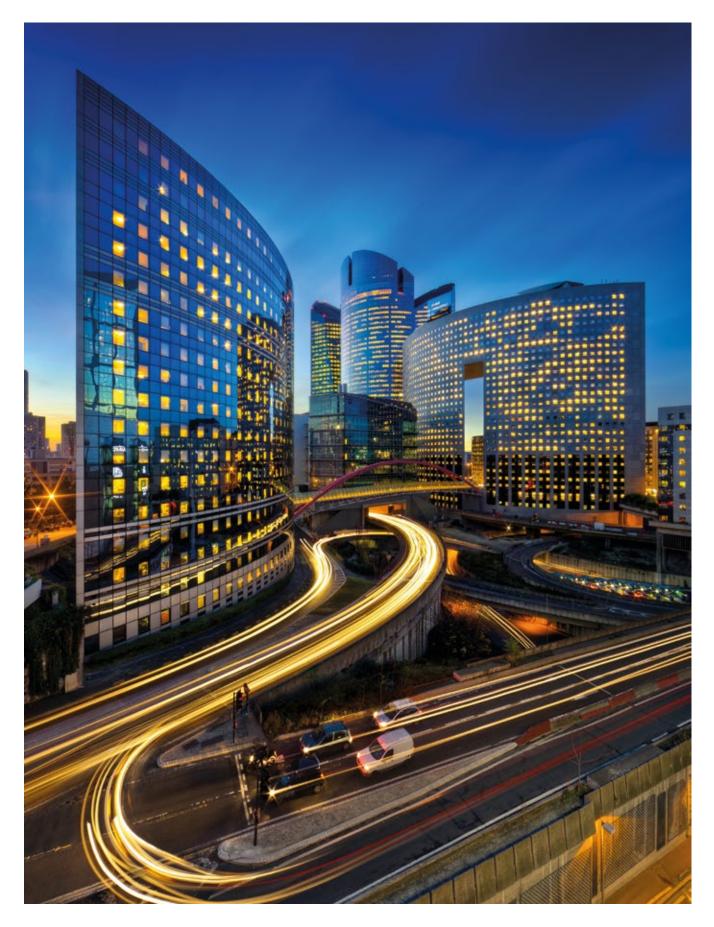




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All plastic cable ties Introduction



All plastic cable ties Ty-Fast®, Col-Ty™, Safe-Ty™ and Ty-Grip™

ABB offers a complete range of all plastic cable ties to cover the most demanding applications.

Ty-Fast® All plastic ties

The all-plastic cable ties are available in lengths from 112 mm to 1214 mm and widths from 2.4 mm to 13.2 mm, offering a loop tensile strength up to 1120 N. Those cable ties will satisfy bundling requirements up to 381 mm. Those cable ties are halogen and silicone free Polyamide 6.6 and are available in 12 different colours.

Ty-Fast® cable ties meet shipbuilding classification such as Germanischer Lloyd/DNV-GL, Lloyd's Register of Shipping, Bureau Veritas but also Mil Specification and QPL. Ty-Fast® cable ties have a CE declaration, supported by compliance to the low voltage directive and EN/IEC 62275 and UL 62275.

State-of-the-art robotic and raw material handling equipment assures product and material integrity throughout the manufacturing process. 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. The Sure Grip tab keeps the tail from popping out while being threaded, then holds it securely for final tightening by hand or tool.

Heavy duty installation ties

Col- Ty^{TM} -the heavy installation tie - is mainly used for securing and bundling of cables in the utility and construction industries.

Col-TyTM is ideal for hazardous environments, low temperatures and humidity. Col-TyTM has a low profile double locking head with serration on the outer side of the tie, which eliminates the risk of damage to the cable.

Low-profile inline fasteners

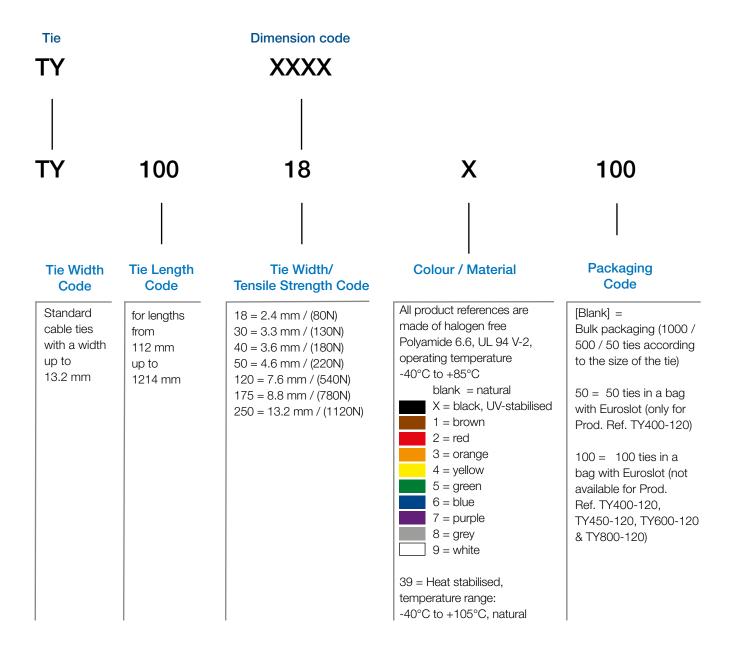
The Safe-Ty™ design from ABB is ideal for use where precision bundling is required and clearance is a necessity. A unique saddle back design curves to form a snug fit around the bundle, and allows for easy pull-trough in bulkheads and any other tight spaces.

Hook & loop fasteners

Ty-Grip™ cable ties are very easy to release and re-use, making them ideal for applications where changes are anticipated or continuous access is required. There is no risk of over-tightening the cables, which makes the Ty-Grip™ hook & loop fasteners ideal for specific applications in fiber optics, computer network wiring, telecom cables, etc.

All plastic cable ties Product reference structure

Ty-Fast® code



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

All plastic cable ties Standard cable ties

Characteristics

State-of-the-art robotic and raw material handling equipment assures product and material integrity throughout the manufacturing process.

- 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

Technical Information

Material Polyamide 6.6 (*)

Temperature range -40°C to +85°C (natural and colours, excl. UV-resistant black)

-40°C to +105°C (black)

Min. Installation Temp. -20°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 46

Prod	uct MIL Spe	ec. Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	w	from to	strenght		
l		[mm]	[mm]	[mm]	[N]	[pieces]	
TY100	-18 MS-3367	-4 115	2.4	1.5 - 25	80	1000	
TY125	-18 –	140	2.4	1.5 - 32	80	1000	
TY150	-18 –	157	2.4	1.5 - 38	80	1000	
TY125	-30 –	143	3.3	1.5 - 32	130	1000	ERG50
TY125	-40* MS-3367	-5 143	3.6	1.5 - 32	180	1000	
TY200	-40 –	205	3.6	1.5 - 50	180	1000	
TY300	-40 –	292	3.6	1.5 - 76	180	1000	
TY400	-40 –	370	3.6	6.35 - 102	180	1000	
TY125	-50 –	163	4.8	1.5 - 32	220	1000	
TY175	-50 MS-3367	-1 188	4.8	3.17 - 44	220	1000	
TY225	-50 –	228	4.8	3.17 - 57	220	1000	ERG50 ERG120
TY300	-50 MS-3367	-7 304	4.8	3.17 - 76	220	1000	LINGIZO
TY400	-50 MS-3367	-2 365	4.8	3.17 - 102	220	1000	•
TY200	-120 –	220	7.6	15 - 50	540	500	<u> </u>
TY300	-120 –	288	7.6	15 - 76	540	100	
TY400	-120 MS-3367	-3 374	7.6	15 - 102	540	50 /100	ERG120 L-500-EU WT3D
TY450	-120 –	456	7.6	15 - 124	540	50	
TY600	-120 –	634	7.6	15 - 184	540	50	
TY800	-120 MS-3367	-6 718	7.6	6.35 - 204	540	50	

^{*} Operation temperature: -30°C to +85°C

Description of Product Reference structure: see page 46 Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143





All plastic cable ties Standard cable ties – Jar

Characteristics

- Ty-Fast® cable ties packed in an attractive plastic jar
- Ideal product for the distribution market
- Different dimensions in the same packaging: 112 mm x 2.4 mm, 141 mm x 3.6 mm and 186 mm x 4.7 mm
- Tensile strength from 80N to 220N
- Available in 3 different packaging configurations: 1 in natural cable ties and 2 in black cable ties
- Ideal product when small volumes are needed for various applications

Technical Information

Material Polyamide 6.6

Temperature range -40°C to +85°C (natural) -40°C to +105°C (black)

Min. Installation Temp. -20°C

Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

Other properties UV-resistant (black) Halogen free, Silicone free



Product Ref.	Quantity	Colour	Mil Spec	Length	Width	Bundle diameter	Minimum tensile strength	Tooling	
				L	W	from to			
	[pieces]			[mm]	[N]	[mm]	[N]		
JTN-500	2 x 100	natural	-	112	2.4	1.6 - 25	80	FRG50	
	1 x 100	natural	MS-3367-5	141	3.6	1.6 - 32	180	LINGOU	
	2 x 100	natural	MS-3367-1	186	4.6	1.6 - 44	220	ERG50, ERG120	
JTB-500	2 x 100	UV-resistant black	-	112	2.4	1.6 - 25	80	ERG50	
	1 x 100	UV-resistant black	MS-3367-5	141	3.6	1.6 - 32	180		
	2 x 100	UV-resistant black	MS-3367-1	186	4.6	1.6 - 44	220	ERG50, ERG120	
JTB1-500	2 x 100	UV-resistant black	-	112	2.4	1.6 - 25	80	FRG50	
	2 x 100	UV-resistant black	MS-3367-5	141	3.6	1.6 - 32	180	ENUOU	
	1 x 100	UV-resistant black	MS-3367-1	186	4.6	1.6 - 44	220	ERG50, ERG120	

Description of Product Reference structure: see page 46 Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143







All plastic cable ties Extra-long cable ties

Characteristics

- Extremely long ties (up to 1214 mm)
- Robust construction (778N), 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

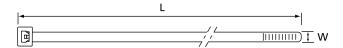
Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

Other properties UV-resistant (black), Halogen free, Silicone free

Product	Colour	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	from to	strenght		
		[mm]	[mm]	[mm]	[N]	[pieces]	
TY600-175X	UV-resistant black	631	9.0	7 - 187	778	50	
TY600-175	Natural	631	9.0	7 - 187	778	50	
TY900-175X	UV-resistant black	916	8.8	7 - 263	778	50	
TY900-175	Natural	916	8.8	7 - 263	778	50	WT3D
TY1000-175X	UV-resistant black	1041	8.8	7 - 305	778	50	L-500-EU
TY1000-175	Natural	1041	8.8	7 - 305	778	50	
TY1200-175	UV-resistant black	1233	8.6	38 - 368	778	50	
TY1200-175	Natural	1233	8.6	38 - 368	778	50	

Description of Product Reference structure: see page 46 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143







All plastic cable ties Heavy-duty cable ties

Characteristics

- 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

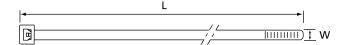
Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

Other properties UV-resistant (black), Halogen free, Silicone free

Product	Colour	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	from to	strenght		
		[mm]	[mm]	[mm]	[N]	[pieces]	
TYL300M	natural	300	13.2	75	1120	50	
TYL300MX	UV-resistant black	300	13.2	75	1120	50	L-500-EU
TYL546M	natural	546	13.2	140	1120	50	L-300-E0
TYL546MX	UV-resistant black	546	13.2	140	1120	50	

Description of Product Reference structure: see page 46 Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143





All plastic cable ties UL 94 V-0 flame retardant cable ties

Characteristics

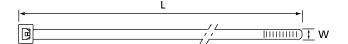
- Similar to our Ty-Rap® range of flame retardant ties, these all-plastic ties are made from low smoke flame retardant Polyamide 6.6 and meet the requirements of UL 94 V-0
- Ideal for use where low flammability and low smoke are necessary such as public transport / buildings, tunnels etc.

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

Product	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W	from to	strenght		
	[mm]	[mm]	[mm]	[N]	[pieces]	
TS1025HF	100	2.5	2 - 22	80	100	
TS1435HF	140	3.6	2.5 - 33	180	100	
TS2045HF	200	4.8	3 - 50	220	100	ERG50
TS2845HF	280	4.8	5 - 70	220	100	
TS3645HF	370	4.8	5 - 102	220	100	
TS3675HF	370	7.6	5 - 102	540	100	ERG120, L-500-EU, WT3D





Special all-plastic cable ties Integrated mounting hole cable ties

Characteristics

- Cable tie can be directly mounted onto a support with screws, bolts or rivets
- Mounting and bundling in one maintenance-friendly assembly
- Cable harness manufacture and pre- and end- mounting of bundles and parts
- UV-resistant version, especially recommended 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



Product	Colour	Length	Width	Fixing	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	scrw size	from to	strenght		
		[mm]	[mm]		[mm]	[N]	[pieces]	
L-5-30MH-0-C*	UV-resistant black	152	3.3	M4	2 - 32	130	100	FRG50
L-5-30MH-9-C*	natural	152	3.3	M4	2 - 32	130	100	Endou
L-7-50MH-0-C	UV-resistant black	208	4.7	M5	2 - 44	220	100	
L-7-50MH-9-C	natural	208	4.7	M5	2 - 44	220	100	
L-11-50MH-0-C*	UV-resistant black	314	4.7	M5	2 - 76	220	100	ERG50
L-11-50MH-9-C*	natural	314	4.7	M5	2 - 76	220	100	ERG120 WT3D
L-14-50MH-0-C	UV-resistant black	382	4.7	M5	2 - 102	220	100	
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	ERG120
L-14-120MH-9-C*	natural	382	7.6	M6	5 - 102	540	100	L-500-EU, WT3D

^{*} Not UL listed





Special all-plastic cable ties Releasable panel mounting cable ties

Characteristics

- Fastening and clip-mounting in one
- Fast pre- or on-site-assembly for a range of panel thickness up to 2.7 mm
- Fast and secure clip-mounting
- For use in 6.35 mm mounting hole
- Product References containing xxx-PMR-xxx are releasable

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

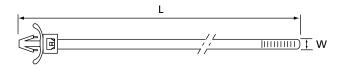


Product	Colour	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	from to	strenght		
		[mm]	[mm]	[mm]	[N]	[pieces]	
STANDARD PANEL MOU	INTING TIES						
L-5-50PM-0-C*	UV-resistant black	147	4.8	2 - 25	220	100	
L-5-50PM-9-D*	natural	147	4.8	2 - 25	220	500	ERG50 ERG120
L-7-50PM-0-C	UV-resistant black	208	4.8	2 - 44	220	100	L-500-EU
L-7-50PM-9-C	natural	208	4.8	2 - 44	220	100	
RELEASABLE PANEL MO	DUNTING TIES						
TB-4-50PMR-9-C-EU*	natural	110	4.8	2 - 22	220	100	ERG50
L-5-50PMR-0-C*	UV-resistant black	147	4.8	2 - 25	220	100	ERG120 L-500-FU
L-5-50PMR-9-C*	natural	147	4.8	2 - 25	220	100	WT1-TB
L-7-50PMR-9-C*	natural	208	4.8	2 - 44	220	100	WT2-TB

^{*} Not UL registered

Description of materials and properties: see pages 144 to 155

For tooling specifications: see pages 130 to 143





Special all-plastic cable ties Releasable cable ties

Characteristics

- Easy releasable and re-usable. UV-resistant version, especially recommended 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

Product	Colour	Length	Width	Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	w	from to	strenght		
		[mm]	[mm]	[mm]	[N]	[pieces]	
L-5-50R-0-C*	UV-resistant black	150	7.5	3 - 32	220	100	
L-8-50R-0-C*	UV-resistant black	198	7.5	3 - 51	220	100	L-500-FU
L-8-50R-9-C*	natural	198	7.5	3 - 51	220	100	WT3D
L-10-50R-0-C	UV-resistant black	298	7.5	3 - 76	220	100	ERG120
L-10-50R-9-C	natural	298	7.5	3 - 76	220	100	

^{*} Not UL Listed







Special all-plastic cable ties Cable ties with identification tag

Characteristics

- Identification ties with incorporated label for durable marking and tying
- Simple marking on the roughened writing surface

Technical Information

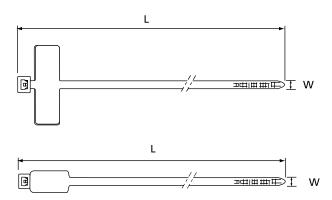
Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Length	Width	Label	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W	dimensions	max.	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
L-4-18ID-9-C	102	2.5	7.9 x 24.7	19	80	100	FRG50
L-4-18ID-9-M	102	2.5	7.9 x 24.7	19	80	1000	ENGOU
L-7-50ID-9-C	200	4.7	30 x 13.3	44	220	100	ERG50, ERG120
L-7-50ID-9-M	200	4.7	30 x 13.3	44	220	1000	L-500-EU





Special all-plastic cable ties Special double-headed ties

Characteristics

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

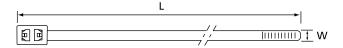
Technical Information

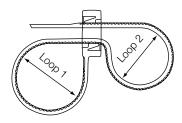
Material Polyamide 6.6
Temperature range -40°C to +85°C

Colour Natural Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

Product	Length	Width	Bundle diameter		Min. tensile	Quantity	Tooling
Ref.	L	:	loop 1 from to	Loop 2 from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
TB-50RLDH	200	4.8	2.5 - 47	2.0 - 45	220	1000	ERG50
TB-12-50RLDH	300	4.8	2.5 - 72	2.0 - 70	220	1000	ERG120
TB-15-50RLDH	370	4.8	2.5 - 100	2.0 - 97	220	1000	L-500-EU





Special all-plastic cable ties Safe-Ty™ Low profile in-line fasteners

Characteristics

The Safe-Ty™ design from ABB 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.

- 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



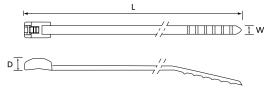
Product	Colour	Length	Width		Bundle ø	Min. tensile	Quantity	Tooling
Ref.		L	W	D	from to	strenght	**	
		[mm]	[mm]		[mm]	[N]	[pieces]	
SF100-18	natural*	118	2.4	3.2	3.2 - 25.4	80	100 / 1000	
SF100-18X	UV-resistant black	118	2.4	3.2	3.2 - 25.4	80	100 / 1000	FRG50
SF200-18	natural*	206	2.4	3.2	3.2 - 50.8	80	100 / 1000	ERGOU
SF200-18X	UV-resistant black	206	2.4	3.2	3.2 - 50.8	80	100 / 1000	
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	ERG50
SF300-50	natural*	288	4.7	4.5	4.7 - 76.2	220	100 / 1000	ERG120 L-500-EU
SF300-50X	UV-resistant black	288	4.7	4.5	4.7 - 76.2	220	100 / 1000	

^{*} 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: SF175-50-2 (red)



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

Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143



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

Special cable ties Ty-Grip™ Hook & Loop fasteners

Characteristics

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.

- 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.
- 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

Technical Information FO Series

Material hook side Polyamide

Material loop side
Temperature range
Colour

Low density Polyethylene
-20°C to +104°C
Standard colour: black

Maximum bundle

Flammability rating UL 94 HB*
Peel-off strength 0.8N/cm

Technical Information FOL Series

Material hook side Polyamide
Temperature range -20°C to +93°C

Colour Standard colour: black - see note after table

Flammability rating UL 94 HB Peel-off strength 0.8N/cm

Product



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

Ref.	diameter	L	W	strenght	
	[mm]	[mm]	[mm]	[N]	[pieces]
FO SERIES LOOP TIES	,		,		
F0200-40-0	50.8	228.6	12.7	180	10
F0200-50-0	50.8	228.6	19.1	220	10
F0350-40-0	88.9	330.2	12.7	180	10
F0350-50-0	88.9	330.2	19.1	220	10
F0350-50-0-FR*	88.9	330.2	19.1	220	10
FOL SERIES BUCKLE TIES		,			
F0L300-50-0	76.2	304.8	19.1	220	10
F0L500-50-0	127.0	457.2	19.1	220	10
Deplete "O" in the Dre	d at Dafa a sa la ut				

Length

Width

Tensile

Quantity



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

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



^{*} Suffix FR is Flame Retardant version

Special cable ties Ty-Grip™ Hook & Loop fasteners

Characteristics

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.

- 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.
- 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

Technical Information FOS and FOR Series

Material hook side Polyamide

Material loop side Low density Polyethylene
Temperature range -20°C to +104°C
Colour Standard colour: black*

Flammability rating UL 94 HB
Peel-off strength 0.8N/cm



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



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

Product	Maximum bundle	Length	Width	Tensile	Quantity
Ref.	diameter	L	W	strenght	
	[mm]	[mm]	[mm]	[N]	[pieces]
FOS SERIES STRIP TIES		,			
F0S150-50-0	38.1	152.4	19.1	220	10
F0S320-50-0	81.3	304.8	19.1	220	10
F0S500-50-0	127.0	457.2	19.1	220	10
FOR SERIES ROLLED STRI	P				
F0R180-50-0	Various	4572.0	19.1	220	1
F0R180-50-0-FR**	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: FOS150-50-2 defines a red FOS150-50 type fastener



^{**} FOR180-50-0-FR is made of flame retardant material

Contact your Sales Office for Product Availability in the other colours

Polyamide 6.6 Twist Tail® cable tie All plastic cable tie – no tool needed

Characteristics

- New all-plastic cable tie, with unique patent design
- Quick and easy to install, no tools required
- Strong, made of Polyamide 6.6, with 130N minimum tensile strength
- Safe, tail breaks off neat and clean, with no sharp edges
- General purpose applications, indoor and outdoor
- Available in 3 different lengths and 2 colours (white and UV-resistant black)

Technical Information

Material Polyamide 6.6

Min. Installation Temp. 0°C
Max. Installation Temp. +85°C

Colour White or UV-resistant black

Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product Ref.	Colour	Length	Width	Thickness	Bundle diameter	Quantity
		[mm]	[mm]	[mm]	[mm]	[pieces]
TT-7-30-9-L-EU	white	181	4.7	1.4	45	50
TT-7-30-0-L-EU	black	181	4.7	1.4	45	50
TT-11-30-9-L-EU	white	282	4.7	1.4	76	50
TT-11-30-0-L-EU	black	282	4.7	1.4	76	50
TT-14-30-9-L-EU	white	358	4.7	1.4	102	50
TT-14-30-0-L-EU	black	358	4.7	1.4	102	50

Col-Ty™ Heavy-duty double headed installation ties Heavy-duty installation ties

Characteristics

- 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

Technical Information

Material Polyester
Temperature range -40°C to +80°C

Colour Black
Flammability rating UL 94 HB
Other properties UV-resistant

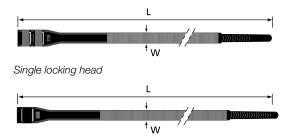


Product	Length	Width	Thickness	Bundle ø	Min. tensile	Quantity	Tooling
Ref.	L	W		from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
CTP-9-180-0-C*	180	9	1.8	10 - 42	320	100	
CTP-9-260-0-C	260	9	2.0	15 - 62	500	100	L300-FR
CTP-9-360-0-C	360	9	2.0	25 - 92	500	100	L-500-EU
CTP-9-500-0-C	510	9	2.4	74 - 140	600	100	WT3D
CTP-9-750-0-C	760	9	2.4	74 - 220	600	100	•

^{*} Product Ref. CTP-9-180-0-C has a single locking head

Description of materials and properties: see pages 144 to 155 For tooling specifications: see pages 130 to 143

Double locking head



Col-Ty[™] Accessories Heavy-duty installation ties

Characteristics

- Use 5 mm screw
- Cradle for ties up to 9 mm wide

Technical Information

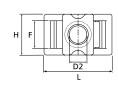
Material Polyamide 11/12 Temperature range -40°C to +80°C

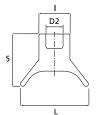
Colour Black
Flammability rating UL 94 HB
Other properties UV-resistant



Product Réf.	L	ı	S	Н	F	d2	Quantity
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
CT-3401	22.9	10.5	17.6	13.8	9.4	5.9	100







Col-Ty[™] Accessories Heavy-duty installation ties

Characteristics

- Wall plug suitable for ø 8 mm hole
- Simply drill hole and hammer the plug in

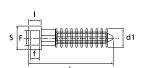
Technical Information

Material Polyamide 11/12 Temperature range -40°C to +80°C

Colour Black
Flammability rating UL 94 HB
Other properties UV-resistant

Product Réf.	L	Ød1	S	Н	I	F	f	Quantity
	[mm]	[pieces]						
CT-5359	43.1	9.6	13.2	16	6.3	9.5	2.4	100







Spec-Kon® cable ties The right cable tie for the right application

Characteristics

A complete range of cable ties for control panel applications.

- Available in different packaging quantities to respond to the user's need
- Available in different lengths and tensile strengths
- Sophisticated, ergonomic fastening installation tools and easy to use cable ties dispenser

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

Product Ref.	Length L	Width W	Min. tensile strength	Bundle diameter from to	Quantity	Bags/ Carton
	[mm]	[mm]	[N]	[mm]	[pieces]	
SKT100-80-100	100	2.5	80	1.5 - 22	100	550
SKT100-80	100	2.5	80	1.5 - 22	1000	70
SKT140-80-100	140	2.5	80	1.5 - 33	100	450
SKT140-80	140	2.5	80	1.5 - 33	1000	55
SKT160-80-100	160	2.5	80	1.5 - 40	100	400
SKT160-80	160	2.5	80	1.5 - 40	1000	45
SKT200-80-100	200	2.5	80	1.5 - 53	100	300
SKT200-80	200	2.5	80	1.5 - 53	1000	32
SKT140-180-100	140	3.6	180	2 - 33	100	300
SKT140-180	140	3.6	180	2 - 33	1000	30
SKT200-180-100	200	3.6	180	2 - 53	100	200
SKT200-180	200	3.6	180	2 - 53	1000	22
SKT300-180-100	300	3.6	180	2 - 76	100	120
SKT300-180	300	3.6	180	2 - 76	1000	12
SKT370-180-100	370	3.6	180	2 - 102	100	120
SKT370-180	370	3.6	180	2 - 102	1000	12
SKT188-220-100	188	4.8	220	3 - 46	100	160
SKT188-220	188	4.8	220	3 - 46	1000	16
SKT215-220-100	215	4.8	220	3 - 53	100	11
SKT215-220	215	4.8	220	3 - 53	1000	13
SKT250-220-100	250	4.8	220	3 - 60	100	120
SKT250-220	250	4.8	220	3 - 60	1000	12
SKT300-220-100	300	4.8	220	3 - 76	100	80
SKT300-220	300	4.8	220	3 - 76	1000	8
SKT370-220-100	370	4.8	220	3 - 102	100	70
SKT370-220	370	4.8	220	3 - 102	1000	7
SKT300-540-100	300	7.6	540	7 - 76	100	50
SKT300-540	300	7.6	540	7 - 76	500	10
SKT370-540-100	370	7.6	540	7 - 102	100	40
SKT370-540	370	7.6	540	7 - 102	500	8
SKT450-540-50	450	7.6	540	7 - 142	50	50
SKT750-540-50	750	7.6	540	7 - 218	50	30
SKT776-780-50	776	9.0	780	7 - 228	50	30
SKT912-780-50	912	9.0	780	7 - 263	50	10



Spec-Kon® cable ties The right cable tie for the right application

Characteristics

A complete range of cable ties for control panel applications.

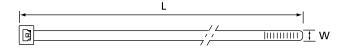
- Available in different packaging quantities to respond to the user's need
- Available in different lengths and tensile strengths
- Sophisticated, ergonomic fastening installation tools and easy to use cable ties dispenser

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

Product Ref.	Length L	Width W	Min. tensile strength	Bundle diameter from to	Quantity	Bags/ Carton
	[mm]	[mm]	[N]	[mm]	[pieces]	
SKT100-80X-100	100	2.5	80	1.5 - 22	100	550
SKT100-80X	100	2.5	80	1.5 - 22	1000	70
SKT140-80X-100	140	2.5	80	1.5 - 33	100	450
SKT140-80X	140	2.5	80	1.5 - 33	1000	55
SKT160-80X-100	160	2.5	80	1.5 - 40	100	400
SKT160-80X	160	2.5	80	1.5 - 40	1000	45
SKT200-80X-100	200	2.5	80	1.5 - 53	100	300
SKT200-80X	200	2.5	80	1.5 - 53	1000	32
SKT140-180X-100	140	3.6	180	2 - 33	100	300
SKT140-180X	140	3.6	180	2 - 33	1000	30
SKT200-180X-100	200	3.6	180	2 - 53	100	200
SKT200-180X	200	3.6	180	2 - 53	1000	22
SKT300-180X-100	300	3.6	180	2 - 76	100	120
SKT300-180X	300	3.6	180	2 - 76	1000	12
SKT370-180X-100	370	3.6	180	2 - 102	100	120
SKT370-180X	370	3.6	180	2 - 102	1000	12
SKT188-220X-100	188	4.8	220	3 - 46	100	160
SKT188-220X	188	4.8	220	3 - 46	1000	16
SKT215-220X-100	215	4.8	220	3 - 53	100	11
SKT215-220X	215	4.8	220	3 - 53	1000	13
SKT250-220X-100	250	4.8	220	3 - 60	100	120
SKT250-220X	250	4.8	220	3 - 60	1000	12
SKT300-220X-100	300	4.8	220	3 - 76	100	80
SKT300-220X	300	4.8	220	3 - 76	1000	8
SKT370-220X-100	370	4.8	220	3 - 102	100	70
SKT370-220X	370	4.8	220	3 - 102	1000	7
SKT300-540X-100	300	7.6	540	7 - 76	100	50
SKT300-540X	300	7.6	540	7 - 76	500	10
SKT370-540X-100	370	7.6	540	7 - 102	100	40
SKT370-540X	370	7.6	540	7 - 102	500	8
SKT450-540X-50	450	7.6	540	7 - 142	50	50
SKT750-540X-50	750	7.6	540	7 - 218	50	30
SKT776-780X-50	776	9.0	780	7 - 228	50	30
SKT912-780X-50	912	9.0	780	7 - 263	50	10



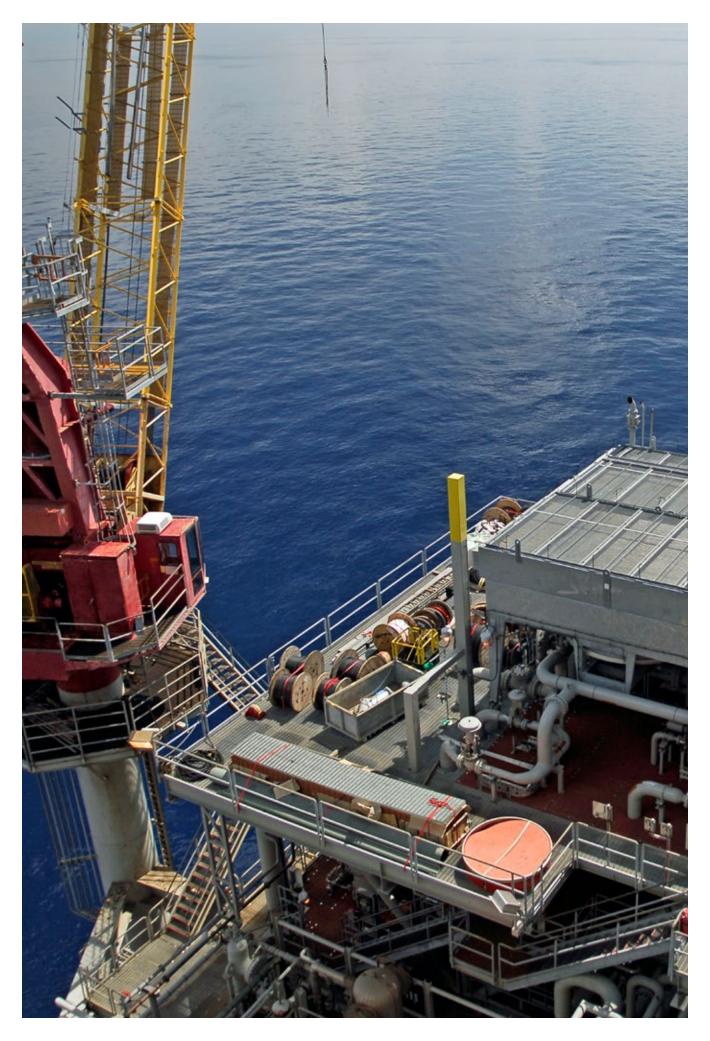
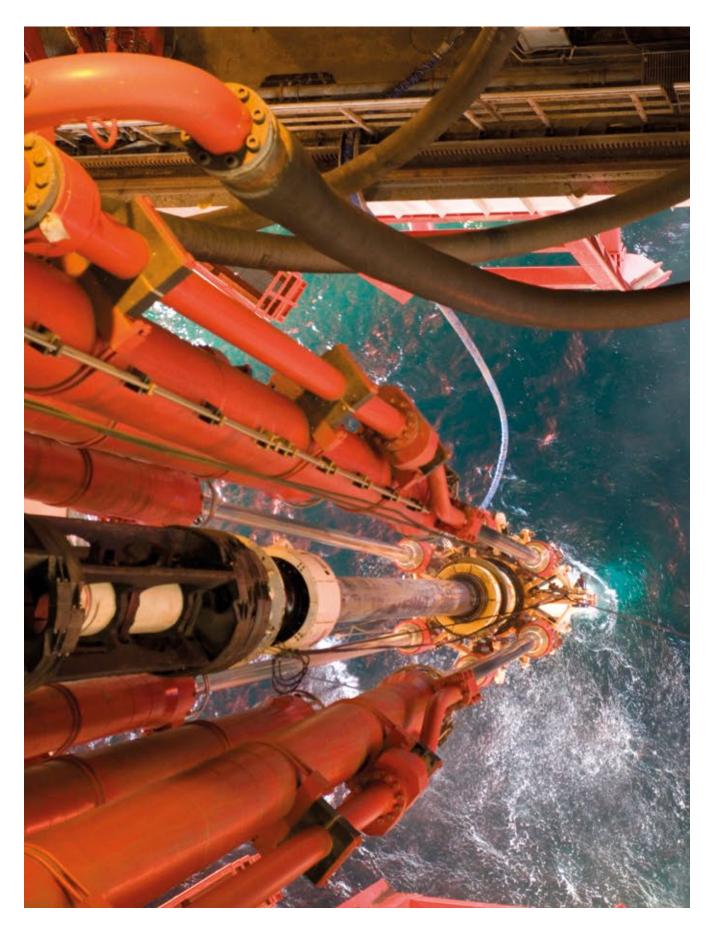


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Ty-Met™ Stainless steel cable ties Introduction



Ty-Met[™] Stainless Steel cable ties Stainless steel cable ties

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 several different types:

- Ball-Lock Type: quick and reliable self-locking mechanism
- Ladder Type: easy application and strong locking system
- Strap Type: either pre-assembled or on reel with separate heads
- Releasable Type: can be unfastened for re-use
- Identification System: durable in tough environments and extreme conditions
- Band on reel with separate heads, for a cost saving installation without waste

Ty-Met[™] cable ties have international approvals such as UL, Germanischer Lloyd, Lloyd's Register and Det Norske Veritas. All types are available in 316 grade (marine grade) stainless steel, for extra corrosionresistance

Available in uncoated version (for high temperature applications) or in fully coated version with non-toxic, halogen free coating, for a superior protection of cables and installer's hands and for an improved insulation between dissimilar materials.

A range of dedicated hand tools completes the product offering.

Ty-Met[™] Stainless steel cable ties Features and Benefits

Ball-Lock Type

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

Angled / rounded tail, for safer handling and easier insertion



Rounded Edges and smooth surfaces, for fast and safe hand installation Uncoated or fully coated with non-toxic, Halogen free Polyester

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



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

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



Additional ears can be bent back over the fastened tie to increase the tensile strength Fully coated with non-toxic, Halogen free Polyester





Heat resistant



temperature flexibility









ID System

Durable identification system for tough environments and extreme conditions, indoor and outdoor

Dedicated carrier strips for 6, 10 or 16 characters Carrier strips can be secured with Ty-Met ™ stainless steel ties



Characters and carrier strips are made of corrosion resistant 316 grade stainless steel, for high mechanical and chemical durability

Pre-embossed characters are easy to read, even when covered with dust, paint or dirt Characters can be mounted on carrier strips or directly onto Ty-Met™ stainless steel ties

Bands on Reel with Separate Heads

Bands and separate heads are made of corrosion resistant 316 grade stainless steel, for high mechanical and chemical durability

Dedicated heads are easy to install



Available in 5 widths up to 19.1 mm, to suit a wide range of applications

25-metre reels for a cost saving and customised installation, around all sizes and shapes of objects

Bands are fully covered with non-toxic, halogen free Polypropylene

Ty-Met[™] Stainless steel cable ties Ball-Lock Type – Standard widths, uncoated

Characteristics

The Ball-Lock Type stainless steel ties from ABB are self-locking, requiring no time consuming crimping or folding operations.

- Strong self-locking mechanism (stainless steel ball), with low insertion force
- Fast, easy and reliable installation
- Standard widths (4.6 mm & 7.9 mm), suitable for most applications, indoor and outdoor
- Uncoated version, suitable for high temperature environments
- 2 grades of non-magnetic stainless steel: 304 grade for standard applications and 316 grade (marine grade) for extra corrosion resistance
- Applications: installation of cables and pipes in extreme conditions and hazardous areas, such
 as: petrochemical and food processing industries, power stations, mining, shipbuilding, offshore
 and other aggressive environments

Technical Information

Material A. 304 grade non-magnetic stainless steel

B. 316 grade non-magnetic stainless steel

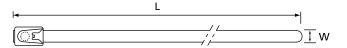
Temperature range -40°C to +300°C

Colour Metallic

Flammability rating Absolutely fireproof

Other properties UV-resistant

Product Ref.	Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
Stainless steel	Stainless steel	L	W	thickness	from to	strenght		
304	316	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLS-4.6-100A	YLS-4.6-100B	100	4.6	0.26	20-25	778	100	
YLS-4.6-125A	YLS-4.6-125B	125	4.6	0.26	20-25	778	100	
YLS-4.6-150A	YLS-4.6-150B	150	4.6	0.26	20-35	778	100	
YLS4.6-200A	YLS4.6-200B	200	4.6	0.26	20-50	778	100	
YLS-4.6-300A	YLS-4.6-300B	300	4.6	0.26	20-83	778	100	
YLS4.6-360A	YLS4.6-360B	360	4.6	0.26	20-100	778	100	
YLS4.6-520A	YLS-4.6-520B	520	4.6	0.26	20-150	778	100	
YLS-4.6-680A	YLS-4.6-680B	680	4.6	0.26	20-200	778	100	
YLS-4.6-840A	YLS-4.6-840B	840	4.6	0.26	20-250	778	100	
YLS-4.6-1000A	YLS-4.6-1000B	1000	4.6	0.26	20-300	778	100	
YLS-4.6-1200A	YLS-4.6-1200B	1200	4.6	0.26	20-365	778	100	
YLS-4.6-1400A	YLS-4.6-1400B	1400	4.6	0.26	20-425	778	100	CT3
YLS-7.9-100A	YLS-7.9-100B	100	7.9	0.26	20-20	1112	100	CT6
YLS-7.9-125A	YLS-7.9-125B	125	7.9	0.26	20-22	1112	100	
YLS-7.9-150A	YLS-7.9-150B	150	7.9	0.26	20-35	1112	100	
YLS7.9-200A	YLS-7.9-200B	200	7.9	0.26	20-50	1112	100	
YLS-7.9-300A	YLS-7.9-300B	300	7.9	0.26	20-83	1112	100	
YLS7.9-360A	YLS-7.9-360B	360	7.9	0.26	20-100	1112	100	
YLS7.9-520A	YLS-7.9-520B	520	7.9	0.26	20-150	1112	100	
YLS-7.9-680A	YLS-7.9-680B	680	7.9	0.26	20-200	1112	100	
YLS-7.9-840A	YLS-7.9-840B	840	7.9	0.26	20-250	1112	100	
YLS-7.9-1000A	YLS-7.9-1000B	1000	7.9	0.26	20-300	1112	100	Ī
YLS-7.9-1200A	YLS-7.9-1200B	1200	7.9	0.26	20-365	1112	100	
YLS-7.9-1400A	YLS-7.9-1400B	1400	7.9	0.26	20-425	1112	100	









^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Met[™] Stainless steel cable ties Ball-Lock Type – Standard widths, fully coated

Characteristics

The Ball-Lock Type stainless steel ties from ABB are self-locking, requiring no time consuming crimping or folding operations.

- Strong self-locking mechanism (stainless steel ball), with low insertion force
- Fast, easy and reliable installation
- Standard widths (4.6 mm & 7.9 mm), suitable for most applications, indoor and outdoor
- Corrosion resistant 316 grade stainless steel (marine grade) 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.
- Applications: installation of cables and pipes in extreme conditions and hazardous areas, such
 as: petrochemical and food processing industries, power stations, mining, shipbuilding, offshore
 and other aggressive environments

Technical Information

Material 316 grade non-magnetic stainless steel

Coating Polyester

Temperature range -40°C to +165°C

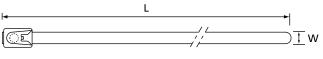
Colour Black

Flammability rating Absolutely fireproof

Other properties UV-resistant, Halogen free, non toxic

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Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
	L	W	thickness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLS-4.6-100BC	100	4.6	0.36	20-25	778	100	
YLS-4.6-125BC	125	4.6	0.36	20-25	778	100	
YLS4.6-150BC	150	4.6	0.36	20-35	778	100	
YLS-4.6-200BC	200	4.6	0.36	20-50	778	100	
YLS-4.6-300BC	300	4.6	0.36	20-83	778	100	
YLS-4.6-360BC	360	4.6	0.36	20-100	778	100	
YLS-4.6-520BC	520	4.6	0.36	20-150	778	100	
YLS-4.6-680BC	680	4.6	0.36	20-200	778	100	
YLS-4.6-840BC	840	4.6	0.36	20-250	778	100	
YLS-4.6-1000BC	1000	4.6	0.36	20-300	778	100	
YLS-4.6-1200BC	1200	4.6	0.36	20-365	778	100	
YLS-4.6-1400BC	1400	4.6	0.36	20-425	778	100	CT3
YLS-7.9-100BC	100	7.9	0.36	20-20	1112	100	CT6
YLS-7.9-125BC	125	7.9	0.36	20-22	1112	100	
YLS-7.9-150BC	150	7.9	0.36	20-35	1112	100	
YLS-7.9-200BC	200	7.9	0.36	20-50	1112	100	
YLS-7.9-300BC	300	7.9	0.36	20-83	1112	100	
YLS-7.9-360BC	360	7.9	0.36	20-100	1112	100	
YLS-7.9-520BC	520	7.9	0.36	20-150	1112	100	
YLS-7.9-680BC	680	7.9	0.36	20-200	1112	100	
YLS-7.9-840BC	840	7.9	0.36	20-250	1112	100	
YLS-7.9-1000BC	1000	7.9	0.36	20-300	1112	100	
YLS-7.9-1200BC	1200	7.9	0.36	20-365	1112	100	
YLS-7.9-1400BC	1400	7.9	0.36	20-425	1112	100	







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

Ty-Met[™] Stainless steel cable ties Ball-Lock Type – Heavy-duty ties, uncoated

Characteristics

The Ball-Lock Type stainless steel ties from ABB are self-locking, requiring no time consuming crimping or folding operations.

- Strong self-locking mechanism (stainless steel ball), with low insertion force
- Fast, easy and reliable installation
- Heavy-duty version (12 mm & 16 mm of width), for extreme applications, indoor and outdoor
- Uncoated version, suitable for high temperature environments
- Corrosion resistant 316 grade stainless steel (marine grade) for high mechanical and chemical durability
- Applications: installation of cables and pipes in extreme conditions and hazardous areas, such
 as: petrochemical and food processing industries, power stations, mining, shipbuilding, offshore
 and other aggressive environments

Technical Information

Material 316 grade non-magnetic stainless steel

Temperature range -40°C to +300°C

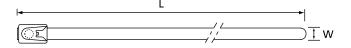
Colour Metallic

Flammability rating Absolutely fireproof

Other properties UV-resistant



Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
	L	W	thickness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLS-12-200B	200	12.0	0.32	25-50	1117	50	
YLS-12-300B	300	12.0	0.32	25-83	1117	50	
YLS-12-360B	360	12.0	0.32	25-100	1117	50	
YLS-12-440B	440	12.0	0.32	25-125	1117	50	
YLS-12-520B	520	12.0	0.32	25-150	1117	50	
YLS-12-600B	600	12.0	0.32	25-175	1117	50	CT3
YLS-12-680B	680	12.0	0.32	25-200	1117	50	CT7
YLS-12-760B	760	12.0	0.32	25-225	1117	50	
YLS-12-840B	840	12.0	0.32	25-250	1117	50	
YLS-12-1000B	1000	12.0	0.32	25-300	1117	25	
YLS-12-1200B	1200	12.0	0.32	25-365	1117	25	
YLS-12-1400B	1400	12.0	0.32	25-425	1117	25	
YLS-16-200B	200	16.0	0.32	40-50	4005	50	
YLS-16-300B	300	16.0	0.32	40-80	4005	50	
YLS-16-360B	360	16.0	0.32	40-100	4005	50	
YLS-16-440B	440	16.0	0.32	40-125	4005	50	
YLS-16-520B	520	16.0	0.32	40-150	4005	50	
YLS-16-600B	600	16.0	0.32	40-185	4005	50	0.77
YLS-16-680B	680	16.0	0.32	40-200	4005	50	···· CT7
YLS-16-760B	760	16.0	0.32	40-225	4005	50	
YLS-16-840B	840	16.0	0.32	40-250	4005	50	
YLS-16-1000B	1000	16.0	0.32	40-300	4005	25	
YLS-16-1200B	1200	16.0	0.32	40-365	4005	25	
YLS-16-1400B	1400	16.0	0.32	40-425	4005	25	





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

Ty-Met[™] Stainless steel cable ties Ball-Lock Type – Heavy-duty ties, fully coated

Characteristics

The Ball-Lock Type stainless steel ties from ABB are self-locking, requiring no time consuming crimping or folding operations.

- Strong self-locking mechanism (stainless steel ball), with low insertion force
- Fast, easy and reliable installation
- Heavy-duty version (12 mm & 16 mm of width), for extreme applications, indoor and outdoor
- Corrosion resistant 316 grade stainless steel (marine grade) 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
- Applications: installation of cables and pipes in extreme conditions and hazardous areas, such as: petrochemical and food processing industries, power stations, mining, shipbuilding, offshore and other aggressive environments

Technical Information

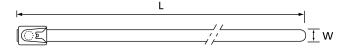
Material 316 grade non-magnetic stainless steel

Coating Black Polyester
Temperature range -40°C to +165°C
Flammability rating Absolutely fireproof

Other properties UV-resistant, Halogen free, non toxic

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Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
	L	W	thickness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLS-12-200BC	200	12.0	0.42	25-50	1335	50	
YLS-12-300BC	300	12.0	0.42	25-83	1335	50	
YLS-12-360BC	360	12.0	0.42	25-100	1335	50	
YLS-12-440BC	440	12.0	0.42	25-125	1335	50	
YLS-12-520BC	520	12.0	0.42	25-150	1335	50	
YLS-12-600BC	600	12.0	0.42	25-175	1335	50	CT3
YLS-12-680BC	680	12.0	0.42	25-200	1335	50	CT7
YLS-12-760BC	760	12.0	0.42	25-225	1335	50	
YLS-12-840BC	840	12.0	0.42	25-250	1335	50	
YLS-12-1000BC	1000	12.0	0.42	25-300	1335	25	
YLS-12-1200BC	1200	12.0	0.42	25-365	1335	25	
YLS-12-1400BC	1400	12.0	0.42	25-425	1335	25	
YLS-16-200BC	200	16.0	0.42	40-50	2002	50	
YLS-16-300BC	300	16.0	0.42	40-80	2002	50	
YLS-16-360BC	360	16.0	0.42	40-100	2002	50	
YLS-16-440BC	440	16.0	0.42	40-125	2002	50	
YLS-16-520BC	520	16.0	0.42	40-150	2002	50	
YLS-16-600BC	600	16.0	0.42	40-185	2002	50	CT7
YLS-16-680BC	680	16.0	0.42	40-200	2002	50	617
YLS-16-760BC	760	16.0	0.42	40-225	2002	50	
YLS-16-840BC	840	16.0	0.42	40-250	2002	50	
YLS-16-1000BC	1000	16.0	0.42	40-300	2002	25	
YLS-16-1200BC	1200	16.0	0.42	40-365	2002	25	
YLS-16-1400BC	1400	16.0	0.42	40-425	2002	25	



Ty-Met[™] Stainless steel cable ties Ladder Type – Uncoated

Characteristics

The Ladder Type stainless steel ties from ABB 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
- 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, shipbuil-ding, offshore and other aggressive environments

Technical Information

Material 316 grade stainless steel

Coating Uncoated

Temperature range -40°C to +300°C

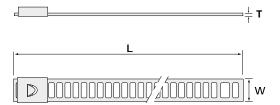
Colour Metallic

Flammability rating Absolutely fireproof

Other properties UV-resistant



Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
	L	W	thickness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLD-7-150-B	150	7.0	0.30	20-45	529	100	
YLD-7-225-B	225	7.0	0.30	20-70	529	100	Ī
YLD-7-300-B	300	7.0	0.30	20-95	529	100	
YLD-7-450-B	450	7.0	0.30	20-140	529	100	CT1-TB
YLD-7-610-B	610	7.0	0.30	20-190	529	100	CT3
YLD-12-150-B	150	12.0	0.35	20-43	529	100	CT4-TB
YLD-12-225-B	225	12.0	0.35	20-60	529	100	CT5 WT3S
YLD-12-300-B	300	12.0	0.35	20-80	529	100	* **100
YLD-12-450-B	450	12.0	0.35	20-135	529	100	Ī
YLD-12-610-B	610	12.0	0.35	20-185	529	100	Ī







^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Met[™] Stainless steel cable ties Ladder Type – Fully coated

Characteristics

The Ladder Type stainless steel ties from ABB 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
- Fully coated version with non-toxic, Halogen free Polyester coa-ting, 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, shipbuil-ding, offshore and other aggressive environments

Technical Information

Material 316 grade stainless steel

Coating Polyester

Temperature range -60°C to +165°C

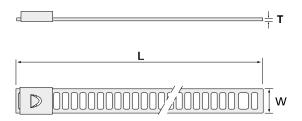
Colour Black

Flammability rating Absolutely fireproof

Other properties UV-resistant, Halogen free, non-toxic



Product Ref.	Length	Width	Material	Bundle ø	Min. tensile	Quantity	Tooling
	L	W	thickness	from to	strenght		
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YLD-7-150-BC	150	7.0	0.41	20-45	778	100	
YLD-7-225-BC	225	7.0	0.41	20-70	778	100	
YLD-7-300-BC	300	7.0	0.41	20-95	778	100	.
YLD-7-450-BC	450	7.0	0.41	20-140	778	100	CT1-TB
YLD-7-610-BC	610	7.0	0.41	20-190	778	100	CT3
YLD-12-150-BC	150	12.0	0.46	20-43	778	100	CT4-TB
YLD-12-225-BC	225	12.0	0.46	20-60	778	100	CT5
YLD-12-300-BC	300	12.0	0.46	20-80	778	100	WIJJ
YLD-12-450-BC	450	12.0	0.46	20-135	778	100	
YLD-12-610-BC	610	12.0	0.46	20-185	778	100	







^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Met[™] Stainless steel cable ties Strap Type ties

Characteristics

The Strap Type ties have an easy self-locking mechanism and exist in pre-assembled lengths or on reel with separate heads

- Strong self-locking mechanism (pawl and ratchet), requires no time-consuming crimping or folding operations
- Head and body in corrosion resistant 316 grade stainless steel for high mechanical and chemical durability
- Uncoated, for high temperature applications
- Available in pre-assembled lengths up to 728 mm or in 2 reels of 152.4 metres per reel with separate heads (to be ordered separately), for a cost saving installation (no waste) around all sizes and shapes of objects
- Applications: installation of cables and pipes in extreme conditions and hazardous areas, such as: petrochemical and food processing industries, power stations, mining, shipbuilding, offshore and other aggressive environments

Technical Information

Material 316 grade stainless steel

Coating Uncoated

Temperature range -80°C to +300°C

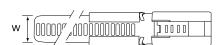
Colour Metallic

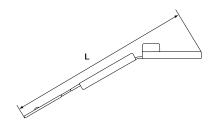
Flammability rating Absolutely fireproof Other properties UV-resistant



Product Ref.	Length	Width	Max.	Min. tensile	Quantity	Tooling
	L	W	Bundle ø	strenght		
	[mm]	[mm]	[mm]	[N]	[pieces]	
PRE-ASSEMBLED	STRAPS				,	
TYS8	271	7.9	50	890	50	CT1-TB
TYS14	372	7.9	101	890	50	CT2-TB CT3
TYS22	575	7.9	152	890	50	CT4-TB, CT5
TYS28	728	7.9	203	890	50	WT3S
STRAP ON REEL					,	
TYS1000	304.8 m (2 reels of 152.4m)	7.9	Variable	890		CT1-TB, CT2-TB CT3, CT4-TB CT5, WT3S
SEPARATE HEADS	-	•		•	•	•
TYS5200H					50	







Ty-Met[™] Stainless steel cable ties Releasable Type

Characteristics

The Releasable Type stainless steel ties from ABB 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, shipbuil-ding, offshore and other aggressive environments

Technical Information

Material 316 grade stainless steel

Coating Polyester

Temperature range -60°C to +165°C

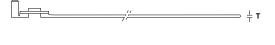
Colour Black

Flammability rating Absolutely fireproof

Other properties UV-resistant, Halogen free, non-toxic



Product Ref.	Length L	Width W	Material thickness	Bundle ø from to	Min. tensile strenght	Quantity	Tooling
	[mm]	[mm]	[mm]	[mm]	[N]	[pieces]	
YRL-5-150-BC	150	5.0	0.61	30-36	1300	100	
YRL-5-230-BC	230	5.0	0.61	30-60	1300	100	
YRL-5-330-BC	330	5.0	0.61	30-95	1300	100	
YRL-5-450-BC	450	5.0	0.61	30-130	1300	100	
YRL-5-650-BC	650	5.0	0.61	30-190	1300	100	
YRL-10-150-BC	150	10.0	0.61	40-40	2200	100	CT1-TB CT2-TB
YRL-10-230-BC	230	10.0	0.61	40-60	2200	100	CT4-TB
YRL-10-330-BC	330	10.0	0.61	40-95	2200	100	
YRL-10-450-BC	450	10.0	0.61	40-130	2200	100	
YRL-10-650-BC	650	10.0	0.61	40-190	2200	100	
YRL-10-750-BC	750	10.0	0.61	40-230	2200	100	
YRL-10-900-BC	900	10.0	0.61	40-275	2200	100	









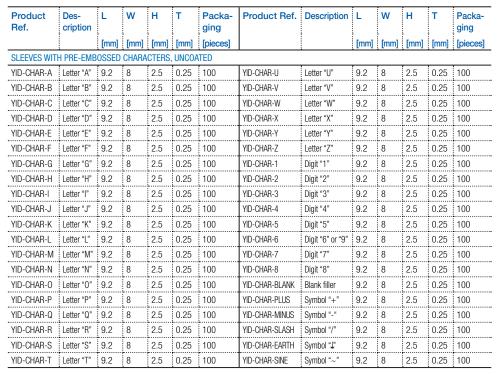
^{*} Some approvals may not be applicable to all the Product References. Contact your Sales Office for approvals limitations

Ty-Met™ Stainless steel cable ties Stainless steel ID system

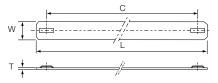
Characteristics

A new durable identification system, ideally suitable for tough environments and extreme conditions, indoor and outdoor.

- Sleeves with pre-embossed characters (letters, digits and symbols)
- Pre-embossed characters are raised above the surface of the sleeve, which makes them easy to read even when covered with dust, paint or dirt
- Dedicated strips can carry 6, 10 or 16 sleeves
- Sleeves and strips are made of corrosion resistant 316 grade stainless steel (marine grade), for high mechanical and chemical durability
- The sleeves can be mounted onto the carrier strips (which will besecured by Ty-Met™ stainless steel ties) or directly onto Ty-Met™ stainless steel ties having a width up to 7.9 mm



For digit 9 (nine) use digit 6 (six) upside down, for digit 0 (zero) use letter "O"



Product Ref.	Description	L	W	Т	С	Packaging	
		[mm]	[mm]	[mm]	[mm]	[pieces]	
CARRIER STRIPS, UNCOATED							
YID-STRIP-6	Carrier strip for 6 sleeves	93	7.9	0.25	75	100	
YID-STRIP-10	Carrier strip for 10 sleeves	133	7.9	0.25	115	100	
YID-STRIP-16	Carrier strip for 16 sleeves	188	7.9	0.25	170	100	

Strips can be secured with Ty-Met™ stainless steel ties having a width up to 7.9 mm





I N CONTRACTOR

Ty-Met[™] Stainless steel cable ties Bands on reel with separate heads

Characteristics

A new range of stainless steel band on reel with separate heads, for a cost saving installation without waste

- Bands and heads are made of corrosion resistant 316 grade stainless steel, for high mechanical and chemical durability
- Bands are fully covered with a non-toxic, halogen free black Polypropylene sheath, for a superior protection of cables and installer's hands, and for an improved insulation between dissimilar materials
- Cost saving and flexible: the 25-metre reels allow a customised installation (no waste) around all sizes and shapes of objects
- Dedicated separate heads are easy to install
- Available in 5 widths up to 19.1 mm, to suit a wide range of applications

Technical Information

Material 316 grade non-magnetic stainless steel

Coating Polypropylene Temperature range -25°C to +90°C

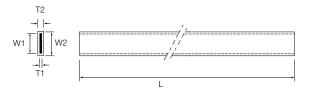
Colour Bands & Heads: metallic

Coating: black

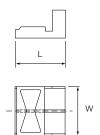
Other properties UV-resistant, Halogen free, non-toxic



Product Ref.	W1	W2	T1	T2	Length	Tooling	
	[mm]	[mm]	[mm]	[mm]	[m]		
BANDS ON REELS, FULLY COVERED WITH POLYPROPYLENE SHEATH							
YBR-6.4-25BC	6.4	7.2	0.48	1.25	25		
YBR-9.5-25BC	9.5	10.3	0.48	1.25	25		
YBR-12.7-25BC	12.7	13.5	0.48	1.25	25	CT8	
YBR-15.9-25BC	15.9	16.7	0.48	1.25	25		
YBR-19.1-25BC	19.1	18.9	0.48	1.25	25		



Product Ref.	Length	Width	Quantity
	L	W	
	[mm]	[mm]	[pieces]
SEPARATE HEADS, I	JNCOATED		
YBRH-6.4	9.3	15.9	100
YBRH-9.5	12.0	15.9	100
YBRH-12.7	16.5	22.3	100
YBRH-15.9	19.4	22.3	100
YBRH-19.1	21.7	22.3	100

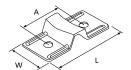


Ty-Met™ Stainless steel cable ties Mounting bases

Characteristics

- Mounting bases in corrosion resistant 316 grade stainless steel
- Uncoated, for high temperature applications (-80°C to +300°C)

Product Ref.	Length L	Width W	:	•	For stainless steel ties width up to	Quantity
	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
TCS25	57.1	25.4	31.8	6.7 (x2)	8.7	50



Ty-Met™ Stainless steel cable ties Selection chart & Specifications

Туре	Material	Coating	Series	Shape	Ra	inge	Packa-	Quantity
	• • • •				Width	Length	ging	
	•				[mm]	[mm]		
	304 Grade		YLS-4.6A		4.6	125 - 1400	Bag	100 ties per bag
	Stainless Steel	Uncoated	YLS-7.9A		7.9	125 - 1400	Bag	100 ties per bag
Dell Leel Tone	<u> </u>		YLS-4.6B		4.6	125 - 1400	Bag	100 ties per bag
Ball-Lock Type	316 Grade	Uncoated	YLS-7.9B		7.9	125 - 1400	Bag	100 ties per bag
	Stainless Steel	Dalosadas	YLS-4.6BC		4.6	125 - 1400	Bag	100 ties per bag
	* ! ! !	Polyester	YLS-7.9BC		7.9	125 - 1400	Bag	100 ties per bag
	: : :	Unacatad	YLS-12B		12.0	200 - 1400	Bag	50 / 25 ties per bag
Ball-Lock Type,	316 Grade	Uncoated	YLS-16B		16.0	200 - 1400	Bag	50 / 25 ties per bag
Heavy-Duty	Stainless Steel	Dolyootor	YLS-12BC		12.0	200 - 1400	Bag	50 / 25 ties per bag
	• • • • •	Polyester	YLS-16BC		16.0	200 - 1400	Bag	50 / 25 ties per bag
	: :	Uncoated	YLD-7B		7.0	150 - 610	Bag	100 ties per bag
Ladder lyne :	316 Grade	Uncoaleu	YLD-12B		12.0	150 - 610	Bag	100 ties per bag
	Stainless Steel		YLD-7BC		7.0	150 - 610	Bag	100 ties per bag
	• • • • •	Polyester	YLD-12BC		12.0	150 - 610	Bag	100 ties per bag
	316 Grade		TYS8 to TYS28	Preassembled strap	7.9	271 - 728	Bag	50 ties per bag
Strap Type	Stainless steel	Uncoated	TYS1000	Strap	7.9	152.4 m	Reel (1)	304.8 m (2x152.4 m)
	• • • • •	<u>.</u>	TYS5200H	Heads	7.9		Bag	50 pieces per bag
D	316 Grade		YRL-5BC		5.0	150 - 650	Bag	100 ties per bag
Releasable Type	Stainless Steel	Polyester	YRL-10BC		10.0	150 - 900	Bag	100 ties per bag
Identification System	316 Grade Stainless Steel	Uncoated	YID-CHAR	Characters All letters & digits + 6 symbols			Bag	100 pieces per bag
			YID-STRIP	Strips		93 - 188	Bag	100 pieces per bag
Bands on Reel & Separate Heads	316 Grade	Polypropy- lene	YBRBC	Bands	6.4 - 9.5 - 12.7 - 15.9 - 19.1		Reel (1)	25 metres per reel
	Stainless Steel	Uncoated	YBRH	Heads	6.4 - 9.5 - 12.7 -		Bag	100 pieces per bag

Reel (1): Reel in cardboard box

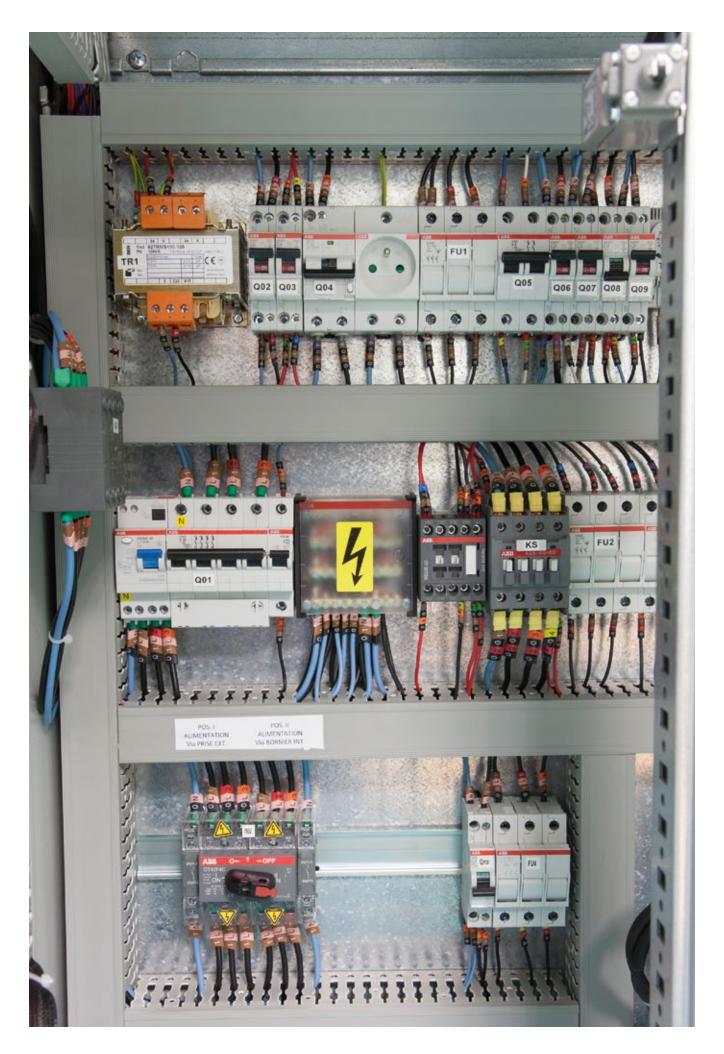
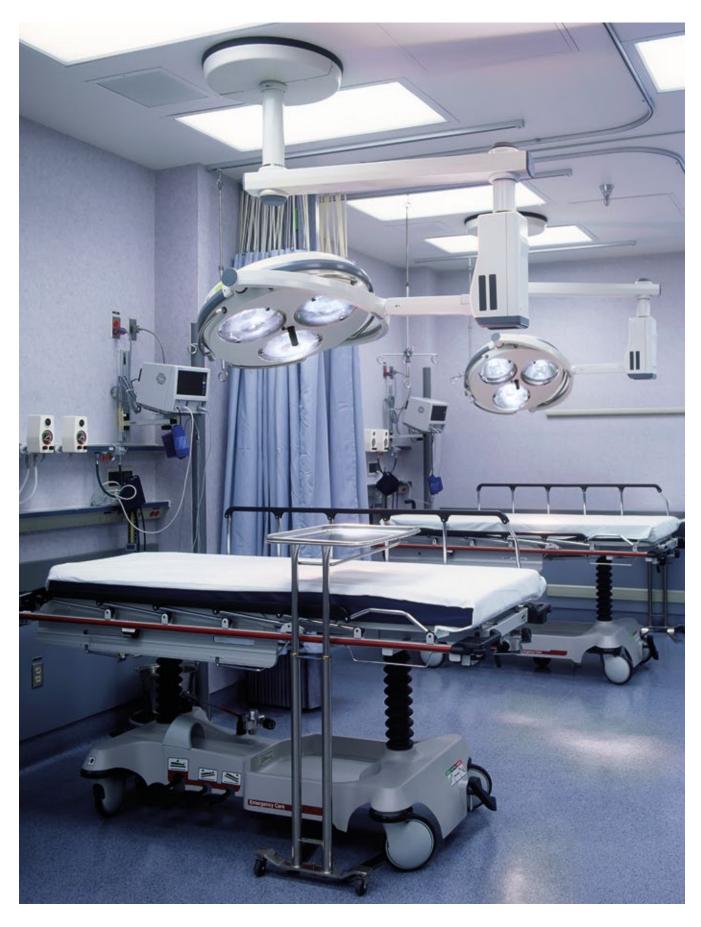


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Accessories Introduction



Ty-Rap[®] and Ty-Fast[®] Accessories Accessories

To complement the range of premium cable ties, ABB has also developed an extensive range of mounting bases, cable clamps and other fastening accessories, to provide a professional solution to the most demanding applications in cable management.

A wide range of material is offered, from the classic Polyamide 6.6 to the high performance Fluoropolymer ETFE for applications in tough conditions.

To better suit each kind of applications, these products exist in a wide choice of shape & design, and with different mounting methods, from self-adhesive to glue and / or screw mounting.

In particular, with the new high performance mounting bases (TC345 series), ABB is now offering a mounting base that leads the industry with more features and better performance:

- new design & materials, for increased performance
- special adhesive formulation, specifically for Nylon Mounting bases

Typical applications include wiring in:

- control boxes & machine control devices
- office equipment & home appliances
- military & medical equipment
- lighting & electronic equipment

Mounting Bases & Accessories Overview

Characteristics

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

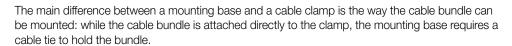


ABB offers a wide range of mounting bases and cable clamps, which can be self-adhesive or for screw and rivet mounting.



- 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
- When applicable ABB accessories are UL recognised
- Self-adhesive mounting bases allow wire and cable mounting where mounting holes can not be drilled
- Used for the adhesion on a variety of materials and for durablefixing of stamped signs and panels for the electrical industry

Typical surfaces

- Plastic
- Glass
- Wood
- Metal
- Paper
- Painted surfaces
- Ceramics



Mounting bases 2-way entry

Characteristics

- 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 3 materials: standard Polyamide 6.6 (natural), UV-resistant Polyamide 6.6 (black), Polyamide 6.6 flame retardant and ETFE Fluoropolymer (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, TC5347AR, TC347X and TC5347AX

Material Polyamide 6.6

Temperature range -40°C to +85°C (Self-adhesive version: 0°C to +65°C)

Flammability rating UL 94 V-2 Colour (see table)

Other properties UV-resistant (black), Halogen free, Silicone free

Technical Information TC347FR (Flame retardant)

Material Polyamide 6.6
Temperature range -40°C to +85°C
Flammability rating UL 94 V-0
Colour Natural

Other properties Halogen free, Silicone free

Technical Information TCZ347 (Fluoropolymer)

Material ETFE Fluoropolymer
Temperature range -46°C to +150°C
Flammability rating UL 94 V-0
Colour Aquamarine

Other properties Silicone free, inert to most solvents and chemicals,

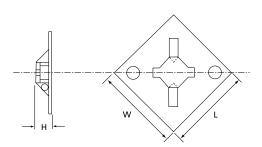
hydrolytically stable, radiation resistant





Product	Colour	Mounting	Di	Dimensions		For tie	Mounting	Quantity
Ref.		method	L	W	Н	width up to	hole diameter	
			[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
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
TC347FR	natural / flame retardant	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
TC347A	natural	self-adhesive / screw	8.5	29.0	29.0	7.6	4.4 (2x)	1000
TC5347AR	natural	self-adhesive / screw	8.5	29.0	29.0	7.6	4.4 (2x)	100
TC5347AX	UV-resistant black	self-adhesive / screw	8.5	29.0	29.0	7.6	4.4 (2x)	100

^{*} Glue = Product Ref. TC2PA (see page 147 for specifications)



Mounting bases 4-way entry - high performance

Characteristics

- Design & materials, for increased performance
- Low profile shape (height: 5.1 mm), to save space and reduce the torque forces on the mounting base
- Ramped cable tie entries, for easier insertion of the cable tie
- Longer struts (up to the edges of the base), for better adhesion
- Special adhesive formulation (specifically for Nylon mounting bases) for high pull-off strength
- 2 kinds of self-adhesive material:
 - rubber-based, for immediate adhesion (15 minutes set-up time)
 - acrylic based, to have the possibility of repositioning the mounting base initially (set-up time: 24 to 72 hours)
- Two holes to have the possibility to use additional screws, for even stronger installations when required
- Supplied on two-up lining, for easy removal of the lining

Technical Information

Material - Moulding Polyamide or UV-resistant Polyamide

Material - Self-adhesive Rubber based
Temperature range -60°C to +85°C

(Self-adhesive version: 0°C to +70°C)

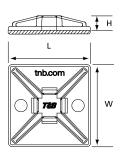
Flammability rating UL 94 V-2

Colours Natural or UV-resistant black (see table)
Other properties UV-resistant black, Halogen free, Silicone free



Product	Colour	Mounting	Di	imensio	ns	For tie	Moun-	Quantity
Ref.		method	L	W	Н	width up to	ting hole diameter	
			[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
TC345	natural	glue* / screws	28.6	28.6	5.1	5.2	4.0	1000
TC345A	natural	self-adhesive (rubber based) / screws	28.6	28.6	5.1	5.2	4.0	1000
TC5345A	natural	self-adhesive (rubber based) / screws	28.6	28.6	5.1	5.2	4.0	100
TC345AX	UV-resistant black	self-adhesive (rubber based) / screws	28.6	28.6	5.1	5.2	4.0	1000
TC5345AX	UV-resistant black	self-adhesive (rubber based) / screws	28.6	28.6	5.1	5.2	4.0	100

^{*} Glue = Product Ref. TC2PA (see page 147 for specifications)





Mounting bases 4-way entry

Characteristics

- 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) or UV-resistant Polyamide 6.6 (black)

Technical Information

Material Polyamide 6.6

Temperature range Glue version: -40°C to +85°C

Self-adhesive version: 0°C to +70°C

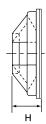
Flammability rating UL 94 V-2

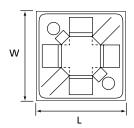
Colours Natural or UV-resistant black (see table)
Other properties UV-resistant black, Halogen free, Silicone free



Product	Colour	Mounting	Di	mensior	ns	For tie	Mounting	Quantity
Ref.		method	L	W	Н	width up to	hole diameter	
			[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
FOR TIE WIDTH UP TO	3.0 MM							
TC050x050A	natural	self-adhesive	12.7	12.7	4.5	3.0	-	1000
TC050x050A-C	natural	self-adhesive	12.7	12.7	4.5	3.0	_	100
TC050x050AX	UV-resistant black	self-adhesive	12.7	12.7	4.5	3.0	_	1000
TC050x050AX-C	UV-resistant black	self-adhesive	12.7	12.7	4.5	3.0	-	100
FOR TIE WIDTH UP TO	3.6 MM							
TC344	natural	screw / glue*	19.1	19.1	4.9	3.6	3.0	1000
TC5344	natural	screw / glue*	19.1	19.1	4.9	3.6	3.0	100
TC344A	natural	self-adhesive / screw	19.1	19.1	4.9	3.6	3.0	1000
TC5344AR	natural	self-adhesive / screw	19.1	19.1	4.9	3.6	3.0	100
TC344AX	UV-resistant black	self-adhesive / screw	19.1	19.1	4.9	3.6	3.0	1000
TC5344AX	UV-resistant black	self-adhesive / screw	19.1	19.1	4.9	3.6	3.0	100

^{*} Glue = Product Ref. TC2PA (see page 147 for specifications)







Mounting bases 4-way entry - for wide cable ties

Characteristics

- 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) or UV-resistant Polyamide 6.6 (black)

Technical Information

Material Polyamide 6.6

Temperature range Glue version: -60°C to +85°C

Self-adhesive version: 0°C to +70°C

Flammability rating UL 94 V-2

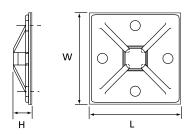
Colours Natural or UV-resistant black (see table)
Other properties UV-resistant black, Halogen free, Silicone free



Product	Colour	Mounting	D	imensio	ns	For tie	Mounting	Quantity
Ref.		method	L	W	Н	width up to	hole diameter	
			[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
FOR TIE WIDTH UP T	7.9 MM (38.1 MM)	(38.1 MM BASE)						
TC150x150	natural	screw / glue*	38.1	38.1	7.4	7.9	4.3	500
TC150x150L	natural	screw / glue*	38.1	38.1	7.4	7.9	4.3	50
TC150x150A	natural	self-adhesive / screw	38.1	38.1	7.4	7.9	4.3	500
TC150x150A-L	natural	self-adhesive / screw	38.1	38.1	7.4	7.9	4.3	50
TC150x150AX	UV-resistant black	self-adhesive / screw	38.1	38.1	7.4	7.9	4.3	500
TC150x150AX-L	UV-resistant black	self-adhesive / screw	38.1	38.1	7.4	7.9	4.3	50
FOR TIE WIDTH UP T	7.9 MM (50.8 MM)	(50.8 MM BASE)	•					
TC200x200	natural	screw / glue*	50.8	50.8	7.4	7.9	4.3	500
TC200x200L	natural	screw / glue*	50.8	50.8	7.4	7.9	4.3	50
TC200x200A	natural	self-adhesive / screw	50.8	50.8	7.4	7.9	4.3	500
TC200x200A-L	natural	self-adhesive / screw	50.8	50.8	7.4	7.9	4.3	50
TC200x200AX	UV-resistant black	self-adhesive / screw	50.8	50.8	7.4	7.9	4.3	500
FOR TIE WIDTH UP T	0 19.1 MM (50.8 MM	x 50.8 MM BASE)	•	•	•		•	•
TC368**	natural	screw / glue*	50.8	50.8	6.6	19.1	4.3	500
TC368A**	natural	self-adhesive / screw	50.8	50.8	6.6	19.1	4.3	500

^{*} Glue = Product Ref. TC2PA (see page 147 for specifications)

^{**} Not UL Listed



Mounting bases Low profile plates

Characteristics

- Low profile
- Easy to use
- Self-adhesive or to be glued with 2-component glue*

Technical Information

Material Polyamide 6.6

Temperature range -40°C to +85°C (Self-adhesive version: 0°C to +65°C)

Colour Natural or UV-resistant black (see table)

Flammability rating UL 94 V-2

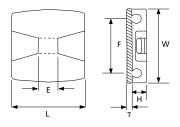
Other properties Halogen free, Silicone free, UV-resistant black





Product	Colour	Mounting		Dimensions I						Weight	Quantity
Ref.		method	Н	Т	W	L	E	F	width up to		
			[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC817-TB	natural	glue*	4.8	_	11.0	11.0	_	-	4.8	51	1000
TC342	natural	glue*	5.7	_	29.0	29.0	7.5	21.0	4.8	340	1000
TC342X	UV-resistant black	glue*	5.7	_	29.0	29.0	7.5	21.0	4.8	340	1000
TC342A	natural	self-adhesive	5.7	0.8	29.0	29.0	7.5	21.0	4.8	360	1000
TC5342A	natural	self-adhesive	5.7	0.8	29.0	29.0	7.5	21.0	4.8	360	100
TC342A-X	UV-resistant black	self-adhesive	5.7	0.8	29.0	29.0	7.5	21.0	4.8	360	1000

^{*} Glue = Product Ref. TC2PA (see page 147 for specifications)



Mounting bases Self-adhesive mounting cradle

Characteristics

- 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 0°C to +65°C

Colour Natural or UV-resistant black (see table)

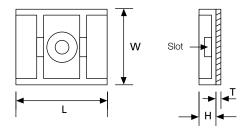
Mounting method Self adhesive and/or screw

Flammability rating UL 94 V-2

Other properties UV-resistant black, Halogen free, Silicone free



Product	Colour		Dir	mensions	For tie with	Quantity	
Ref.		н	Т	L	W	up to	
		[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
MCNY-1250-9-L	natural	7.2	0.8	31.7	25.4	7.6	50
MCNY-1250-9-C	natural	7.2	0.8	31.7	25.4	7.6	100
MCNY-1250-9-D	natural	7.2	0.8	31.7	25.4	7.6	500
MCNY-1250-0-C	UV-resistant black	7.2	0.8	31.7	25.4	7.6	100



Mounting bases Saddle support

Characteristics

- Tie mounting bases with supporting saddle
- For screw- or rivet-mounting
- 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
- Available in natural nylon, UV-resistant nylon or heat stabilised black version

Technical Information

Material Polyamide 6.6 or heat stabilised Polyamide 6.6

Temperature range -40°C to +85°C

Colour Natural or UV-resistant black (see table)

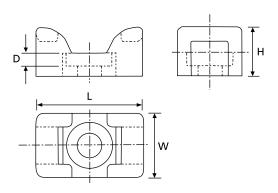
Mounting method Screw
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free, UV-resistant black



Product	Colour		Dime	nsions		For tie	Mounting	Quantity
Ref.		Н	W	L	D	width up to	hole diameter	
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
TC140	natural	6.7	8.7	14.2	1.8	2.4	3.0	500
TC5140	natural	6.7	8.7	14.2	1.8	2.4	3.0	100
TC141	natural	7.5	11.1	17.0	2.3	4.8	3.8	500
TC5141	natural	7.5	11.1	17.0	2.3	4.8	3.8	100
TC142	natural	10.7	14.2	23.4	2.9	7.6	5.2	500
TC5142	natural	10.7	14.2	23.4	2.9	7.6	5.2	100
TC142X*	UV-resistant black / heat stabilised	10.7	14.2	23.4	2.9	7.6	5.2	500
TC5142X*	UV-resistant black / heat stabilised	10.7	14.2	23.4	2.9	7.6	5.2	100

^{*} Are not UL recognised





Mounting bases Saddle support

Characteristics

- Tie mounting bases with supporting saddle
- For screw- or rivet-mounting
- 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
- Available in UV-resistant, heat stabilised black version

Technical Information

Material Polyamide 6.6 or heat stabilised Polyamide 6.6

Temperature range -40°C to +85°C (Natural)

-40°C to +105°C (UV-resistant black)

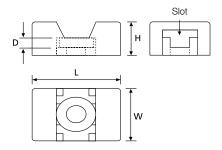
Colour Natural or UV-resistant black

Mounting method Screw or rivet Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free, UV-resistant black



Product	Colour	Dimensions				For tie	Mounting	Quantity
Ref.		Н	W	L	D	width up to	hole diameter	
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
SMNY-001-9-D	natural	7.1	9.8	15.2	4.7	4.8	4.2	500
SMNY-001-0-D	UV-resistant black / heat stabilised	7.1	9.8	15.2	4.7	4.8	4.2	500



Mounting bases Saddle-type mounting base

Characteristics

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 $31.8 \ \text{mm}$

Technical Information

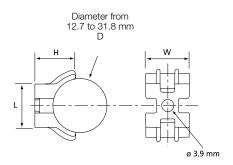
Material Polyamide 6.6 Temperature range -40°C to +85°C

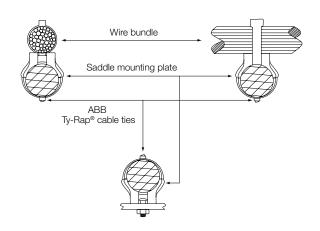
Colour Natural
Mounting method Screw
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Dimensions				For tie width	Mounting	Weight	Quantity
Ref.	Н	W L D u		up to	hole diameter			
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC92	14.3	15.1	15.1	12.7 - 31.8	4.8	3.9	143	100





Mounting bases Screw-mounted miniature bases

Characteristics

- 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

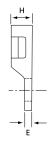
Colour Natural

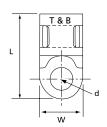
Mounting method Fillister-head screw Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Dimensions F			For tie	Mounting	Weight	Quantity	
Ref.	Н	W	L D wid		width up to	n up to hole diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]	[g/100]	[pieces]
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







Mounting bases Screw-mounted miniature bases

Characteristics

- 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

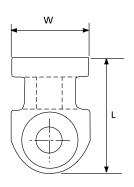
Colour Natural
Mounting method Screw or rivet
Flammability rating UL 94 V-2

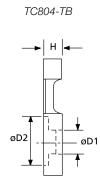
Other properties Halogen free, Silicone free

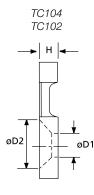


Product	Dimensions I		For tie	Mounting hole		Weight	Quantity	
Ref.	Н	w	L	width up to	diameter D1	diameter D2		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC804-TB*	2.4	7.9	10.2	2.4	2.3	4.7	11	1000
TC104	2.4	7.9	10.3	2.4	3.4	6.5	11	1000
TC102	3.2	12.7	19.1	4.8	4.4	8.7	50	1000
TC502	3.2	12.7	19.1	4.8	4.4	8.7	50	100

^{*} UL Recognized









Mounting bases Screw-mounted - for wide cable ties

Characteristics

- 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

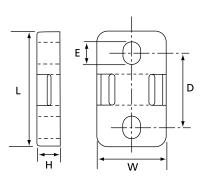
Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural
Mounting method 2 screws
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Dimensions				_	For tie	Mounting	Weight	Quantity
Ref.	Н	W	L	D	E	width up to	hole diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC815-TB	6.4	19.1	31.2	19.9	6.4	7.6	5.3	278	500





Mounting bases Screw-mounted - for crosswise fastening

Characteristics

- 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

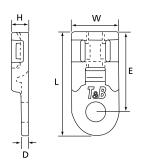
Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural
Mounting method Screw or rivet
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Dimensions			For tie width	Mounting	Weight	Quantity		
Ref.	Н	W	L	D	E	up to	hole diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC828-TB	3.8	10.1	22.5	1.5	13.4	4.8	4.3	46	1000
TC5828	3.8	10.1	22.5	1.5	13.4	4.8	4.3	46	100





Mounting bases Screw-mounted - for crosswise fastening

2-way and 4-way entry mounting bases



Product ref.	Mounting method	Width H	Length D	For tie width up to	Mounting hole (2x) diameter	Quantity
		[mm]	[mm]	[mm]	[mm]	[pieces]
TC5344A-NDT	self-adhesive*/screw	19.1	19.1	3.6	3	100
TC5344A-PDT	self-adhesive*/screw	19.1	19.1	3.6	3	100
TC344A-NDT	self-adhesive*/screw	19.1	19.1	3.6	3	1000
TC5347A-NDT	self-adhesive*/screw	29	29	7.6	4.4	100
TC5347A-PDT	self-adhesive*/screw	29	29	7.6	4.4	100
TC347A-NDT	self-adhesive*/screw	29	29	7.6	4.4	1000



Saddle support



Product ref.	Mounting method	Width H	Length D	For tie width up to	Mounting hole diameter	Quantity
		[mm]	[mm]	[mm]	[mm]	[pieces]
TC5141-NDT	screw	11.1	17	4.8	3.8	100
TC5141-PDT	screw	11.1	17	4.8	3.8	100
TC141-NDT	screw	11.1	17	4.8	3.8	500
TC5142-NDT	screw	14.2	23.4	7.6	5.2	100
TC5142-PDT	screw	14.2	23.4	7.6	5.2	100
TC142-NDT	screw	14.2	23.4	7.6	5.2	500



Screw-mounted miniature bases



Product ref.	Mounting method	Width	Length	For tie width	Mounti	ng hole	Quantity
		Н	D	up to	diameter D1	diameter D2	
		[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
TC5102-NDT	screw	12,7	19,1	4,8	4,4	8,7	100
TC102-NDT	screw	12,7	19,1	4,8	4,4	8,7	1000
TC102-PDT	screw	12,7	19,1	4,8	4,4	8,7	1000



Low profile plates



Product ref.	Mounting method	Width	Length	For tie width	Quantity
		Н	D	up to	
		[mm]	[mm]	[mm]	[pieces]
TC5342A-NDT	self-adhesive*	29	29	4,8	100
	self-adhesive*	29	29	4,8	100
TC342A-NDT	self-adhesive*	29	29	4,8	1000



^{*} Surface preparation: surface should be cleaned with alcohol-based cleaner before application. Installation: Surface must be clean and dry prior to application of accessory. Allow 15-minute setting time for maximum adhesion performance of synthetic rubber adhesive (SRA).

Mounting bases

Screw-mounted - for crosswise fastening

Characteristics

- 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

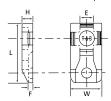
Colour Natural
Mounting method Screw or rivet
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product	Dimensions					For tie	Mounting	Weight	Quantity
Ref.	Н	W	L	D	E	width up to	hole diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
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 Screw-mounted supporting bases

Characteristics

- 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

Н

[mm]

25.4

11.1

Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural

Mounting method 2 screws or 2 rivets

Flammability rating UL 94 V-2

w

[mm]

19.1

9.9

Other properties Halogen free, Silicone free

L

[mm]

25.4

14.3

Dimensions

G

[mm]

12.7

7.1

Ε

[mm]

4.6

1.7

[mm]

16.5

7.0

For tie

[mm]

7.6

4.8

width up to

Mounting

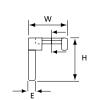
[mm]

3.3 (x 2)

2.4 (x 2)

hole diameter





Product

Ref.

TC106

TC109



Weight

[g/100]

435

45

Quantity

[pieces]

200

1000

Mounting bases Screw-mounted strips for multiple bundling

Characteristics

- 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 (MS-3339-...-...)
- 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

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)

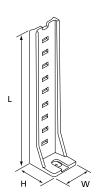
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

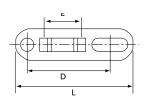


Product	Mil. Spec.		Dir	nensio	ns		Max.	For tie	Mounting	Weight	Quantity
Ref.		Н	W	L	D	E	number of bundles	width up to	hole diameter		
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC101	_	3.2	12.7	50.0	35.6	9.5	1	4.8	5.2	151	1000
TC103	-	5.1	15.8	79.0	59.6	18.6	1	7.6	6.9	505	500
TC1101	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

TC375 & TC376



For other colours and quantities please contact your Sales Office



TC101 & TC103





TC1101 ... TC1117

Mounting bases Weather resistant - Heavy-duty

Characteristics

- 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

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

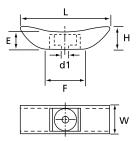
Other properties UV-resistant, Halogen free, Silicone free



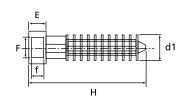
Product	Dimensions						For tie	Mounting	Weight	Quantity
Ref.	Н	W	L	E	F	f	width up to	hole diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
MOUNTING CRADLE										
TC5355	15.9	19.1	44.5	11.1	28.6	-	12.7	4.6	500	25
TC5356	15.9	19.1	44.5	11.1	28.6	_	12.7	5.2	500	25
TC5357	15.9	19.1	44.5	11.1	28.6	-	12.7	6.7	500	25
WALL PLUG				•			•		•	
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

TC5355-TC5356-TC5357

TC5358-TC5359







Mounting bases Clip-in mounting bases for blind mounting

Characteristics

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

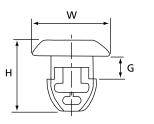
Technical Information

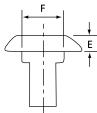
Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural
Mounting method Clip in
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

Product Ref.	Dimensions					Panel thickness	:	Mounting hole diameter	Weight	Quantity
	Н	W	G	E	F	from to	up to			
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC121-TB	10.4	11.2	3.4	2.0	6.1	0.1 - 3.2	2.4 or 4.8	6.3	31	1000







Mounting bases Clip-in mounting bases for surface mounting

Characteristics

- 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 & TC5823)

UV-resistant black (TC823X)

Mounting method Clip in Flammability rating UL 94 V-2

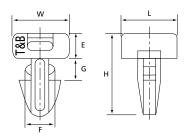
Other properties UV-resistant (black), Halogen free, Silicone free



Product						Panel thickness	:	Mounting hole	Weight	Quantity	
Ref.	Н	W	L	G	E	F	from to	up to	diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
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
TC5823	16.8	11.1	11.1	3.6	5.1	5.8	0.1 - 3.2	4.8	6.2 - 6.5	68	100
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

^{*} Are not UL recognised

For other colours and quantities please contact your Sales Office



Mounting bases Rivet-mounted bases

Characteristics

- 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

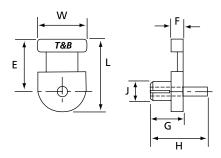
Technical Information

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



Product Ref.	Colou	ır								:	Mounting hole	Weight	Quantity
			W	L	F	E	G	Н	J	up to	diameter		
			[mm]	[mm]	[g/100]	[pieces]							
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





Mounting bases Aluminium plates

Characteristics

- 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 under extreme temperatures

Technical Information

Material Aluminium (3003, ASTMB-209)

Temperature range -100°C to +450°C (Self-adhesive version: 0°C to +65°C)

Colour Metallic

Mounting method Glue (*) and / or screw or self-adhesive

Flammability rating Fire proof Other properties **UV-resistant**

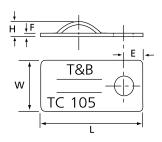




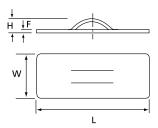
Product	Mounting	Dimensions					For tie	Mounting	Weight	Quantity
Ref.	method	Н	W	L	E	F	width up to	hole diameter		
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC105AP	self-adhesive / screw	3.8	13.2	25.4	4.8	0.8	4.8	4.9	67	1000
TC105	screw	3.8	13.2	25.4	4.8	0.8	4.8	4.9	67	1000
TC5105	screw	3.8	13.2	25.4	4.8	0.8	4.8	4.9	67	100
TC824-TB	2-component glue*	3.8	9.5	34.9	-	0.8	4.8	_	69	1000

^{*} Glue = Product Ref TC2PA (see page 147 for specifications)

TC824-TB



TC105 and TC105AP



Cable clamps Plain Edge Cable clamps

Characteristics

- 18 diameters and 2 widths with mounting holes for M4 and M5 screws
- Indoor application

Technical Information

Material Polyamide 6.6
Temperature range -40°C to +85°C

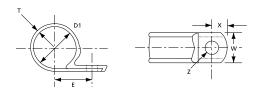
Colour Black
Mounting method Screw
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product			Dimens	sions			Quantity
Ref.	D1 closed diameter	Е	Т	W	z	X	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
N4NY-002-0-M	3.20	8.71	1.27	9.53	5.54	4.30	1000
N4NY-003-0-M	4.70	9.60	1.27	9.53	5.54	4.30	1000
N4NY-004-0-M	6.30	10.70	1.27	9.53	5.54	4.30	1000
N4NY-005-0-M	7.90	11.20	1.27	9.53	5.54	4.30	1000
N4NY-006-0-M	9.50	11.79	1.27	9.53	5.54	4.30	1000
N4NY-008-0-M	12.70	13.46	1.27	9.53	5.54	4.30	1000
N6NY-004C-0-M	6.35	11.10	1.52	12.71	5.54	5.16	1000
N6NY-005C-0-M	7.92	12.24	1.52	12.71	5.54	5.16	1000
N6NY-006C-0-M	9.53	12.70	1.52	12.71	5.54	5.16	1000
N6NY-008C-0-M	12.70	14.05	1.52	12.71	5.54	5.16	1000
N6NY-009-0-M	14.27	15.32	1.52	12.71	5.54	5.16	1000
N6NY-010-0-M	15.88	15.88	1.52	12.71	5.54	5.16	1000
N6NY-011-0-M	17.48	16.89	1.52	12.71	5.54	5.16	1000
N6NY-012-0-M	19.05	17.75	1.52	12.71	5.54	5.16	1000
N6NY-013-0-M	20.62	19.43	1.52	12.71	5.54	5.16	1000
N6NY-014-0-M	22.23	20.19	1.52	12.71	5.54	5.16	1000
N6NY-016-0-M	25.40	21.00	1.52	12.71	5.54	5.16	1000

Also available in quantities of 100 pieces. For other colours please contact your Sales Office



Cable clamps Adjustable, ladder style clamps

Characteristics

- 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 0°C to +65°C

Colour Grey

Mounting method Self adhesive and / or screw-mounting

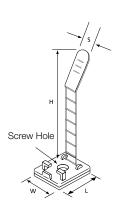
Flammability rating UL 94 V-2 (clamp)

Other properties Halogen free, Silicone free



Product		Dime	nsions		Bundle	Screw	Quantity
Ref.	Н	W	L	S	diameter range	hole diameter	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
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



Cable clamps Latching clamps

Characteristics

- 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 guarantee a high adhesive strength
- The self-adhesive film is foam backed (0.8 mm) which allows durable fixing on a variety of materials

Technical Information

Material Polyamide 6.6

Temperature range -40°C to +85°C (Self-adhesive version: 0°C to +65°C)

Colour Natural

Mounting method Self adhesive or screw-mounting

Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

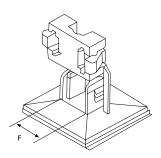


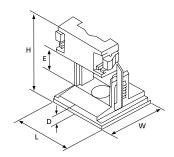




Product	Mounting				Dime	ension	S		Mounting	Weight	Quantity
Ref.	method	H max.	H min.	W	L	D	E Height of clam- ping area from to		hole diameter		
		[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
TC349A-TB	self-adhesive (rubber based) / screw	14.5	11.5	25.0	25.0	2.7	6 - 8.5	6	-	120	1000
TC349AN	self-adhesive (acrylic based) / screw	14.5	11.5	25.0	25.0	2.7	6 - 8.5	6	-	120	1000
TC5349A-TB	self-adhesive (rubber based) / screw	14.5	11.5	25.0	25.0	2.7	6 - 8.5	6	_	120	100
TC350A-TB	self-adhesive rubber based) / screw	22.0	18.0	25.0	25.0	4.7	6 - 12.5	15	4.3	400	1000
TC350AN	self-adhesive (acrylic based) / screw	22.0	18.0	25.0	25.0	4.7	6 - 12.5	15	4.3	400	1000
TC5350A-TB	self-adhesive rubber based) / 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

TC349A-TB TC349AN TC5349A-TB TC350 TC350AN TC5350 TC350A-TB TC5350A-TB





Cable clamps Re-openable clamps

Characteristics

- Simple installation
- Can be mounted by clipping-in or gluing
- For series production or as a temporary support during wiringinstallation
- Clip ends are rounded for comfortable re-opening
- Product Ref. TC95 features 2-stage lock

Technical Information

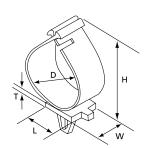
Material Polyamide 6.6 Temperature range -40°C to +85°C

Colour Natural
Mounting method Clip in
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product		Dimensions				For wall thickness	Mounting hole	Weight	Quantity
Ref.	Н	W	L	D	Т	from to	diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
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



Cable clamps Re-openable clamps with springs

Characteristics

- 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

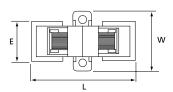
Temperature range -40°C to +85°C

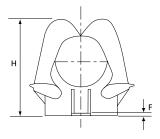
Colour Natural Mounting method 2 screws

Flammability rating UL 94 V-2 (body)
Other properties Halogen free



Product	Dimensions					Max. bundle	Mounting hole	Weight	Quantity
Ref.	Н	L	W	E	F	diameter	diameter		
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[g/100]	[pieces]
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





Cable clamps Self-adhesive press clips

Characteristics

- Available in "full clip" version (PCNY series) or "half clip" version (HCNY series)
- 4 sizes to accommodate bundles up to 12 mm
- Clips are provided "two-up" on a rubber based closed cell foam adhesive

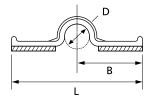
Technical Information

Material Polyamide 6.6 (clip)
Temperature range 0°C to +65°C
Colour Natural
Mounting method Self-adhesive
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free

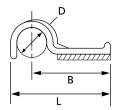
Product			Dimens	sions		Quantity
Ref.	D	L	В	Н	W	
	[mm]	[mm]	[mm]	[mm]	[mm]	[pieces]
FULL CLIP	•		•		•	•
PCNY-125-9-D	3.17	19.30	9.65	5.36	9.52	500
PCNY-250-9-C	6.35	35.05	17.52	8.23	12.69	100
PCNY-250-9-D	6.35	35.05	17.52	8.23	12.69	500
PCNY-375-9-C	9.52	37.32	18.61	11.29	15.87	100
PCNY-375-9-D	9.52	37.32	18.61	11.29	15.87	500
PCNY-500-9-C	12.69	40.57	20.19	14.85	19.05	100
PCNY-500-9-D	12.69	40.57	20.19	14.85	19.05	500
HALF CLIP	•		•	•	•	•
HCNY-125-9-C	3.17	12.52	9.65	4.57	9.52	100
HCNY-125-9-M	3.17	12.52	9.65	4.57	9.52	1000
HCNY-250-9-C	6.35	21.97	17.52	8.25	12.69	100
HCNY-250-9-M	6.35	21.97	17.52	8.25	12.69	1000
HCNY-375-9-C	9.52	24.88	19.05	10.54	15.87	100
HCNY-375-9-M	9.52	24.88	19.05	10.54	15.87	1000
HCNY-500-9-C	12.69	28.19	20.83	14.22	19.05	100
HCNY-500-9-M	12.69	28.19	20.83	14.22	19.05	1000

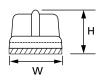
PCNY





HCNY





Cable clamps Self-adhesive clips for round cable

Characteristics

- Diverse cable clamps for bundle diameters from 4 mm to 13.5 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

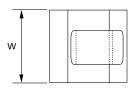
Material Polyamide 6.6 (clip)
Temperature range 0°C to +65°C
Colour Natural or black
Mounting method Self-adhesive
Flammability rating UL 94 V-2

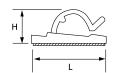
Other properties Halogen free, Silicone free



Product	Colour	Dimensions			Max. bundle	Quantity
Ref.		Н	W	L	diameter	
		[mm]	[mm]	[mm]	[mm]	[pieces]
RANY-160-9-D	natural	6.4	16.0	14.8	4.0	500
RANY-280-9-D	natural	10.4	25.4	25.4	7.1	500
RANY-280-0-D	black	10.4	25.4	25.4	7.1	500
RANY-530-9-D	natural	15.8	25.4	25.4	13.5	500
RANY-620-9-D	natural	14.2	31.8	28.5	13.5	500

For other colours and quantities please contact your Sales Office





Cable clamps Accessories for flat cables

Characteristics

- 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

(Self-adhesive version: 0°C to +65°C)

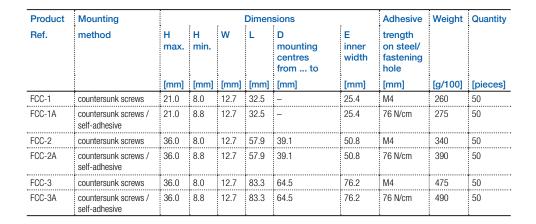
Colour Natural

Mounting method Self-adhesive and / or for screw- or rivet-mounting

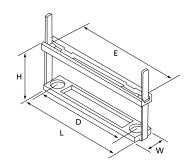
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free









Accessories for flat cables PVC cable-clips

Characteristics

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

Technical Information

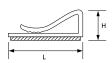
Material PVC (clip)
Temperature range 0°C to +65°C

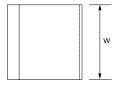
Colour Grey

Mounting method Self-adhesive
Flammability rating UL 94 V-0 (clip)
Other properties UV-resistant



Product		Dimensio	Quantity	
Ref.	Н	Т	W	
	[mm]	[mm]	[mm]	[pieces]
FRPV-1000-8-C	5.8	27	25.4	100
FRPV-1000-8-D	5.8	27	25.4	500





Accessories for flat cables Clips with flexible leg

Characteristics

- 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

(Self-adhesive version: 0°C to +65°C)

Colour Natural

Mounting method Self-adhesive or screw Flammability rating UL 94 V-2 (clip)

Other properties Halogen free, Silicone free

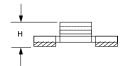


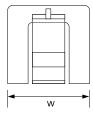
Product	Mounting		Quantity		
Ref.	method	Н	Т	W	
		[mm]	[mm]	[mm]	[pieces]
FSNY-812-9-C	M4 screw	3.17	30.15	25.40	100
FANY-812-9-C	self-adhesive	7.14	25.40	25.40	100
FANY-812-9-D	self-adhesive	7.14	25.40	25.40	500

For other colours and quantities please contact your Sales Office

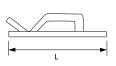
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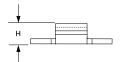


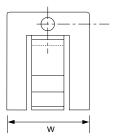




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Cable sleeves and spiral wraps Table of Content

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Cable sleeves and spiral wraps Introduction



Cable sleeves and spiral wraps Bind-It®

The Cable Protection Systems (CPS) from ABB captures different products:

- Wrap-around woven sleeving
- Braided sleeving
- Spiral wrap
- Extruded grommeting .

The wrap-around sleeving – better known under the name Bind-It® - is a tough but lightweight sleeve used to bundle and protect wires and cables from abrasion, sharp edges and chafing. Bind-It® is a self-wrapping sleeve that is very quick and easy to install and remove. Bind-It® is also available in a flame retardant version. No heat is necessary to seal the ends of this product. The ends can be secured by using Ty-Rap® cable ties.

The braided sleeving of ABB is used for bundling and protecting cables. The braided sleeving is a closed sleeve available in a flame and a non-flame retardant version. This product is mainly used inside cabinets and enclosures. To stop the end of the sleeving fraying it is necessary to heat seal the ends using a "hotwire" device.

Spiral wrap is mainly used for protection of bundles. This product is available in a natural and UV-resistant version and supplied in a Euroslot bag, ideal for the distribution market.

Finally the extruded grommeting of ABB is used to line panel edges and knock-outs where the chafing of passing wires is a concern. In most applications, grommeting will grip tightly by itself.

Cable sleeves and spiral wraps Wrap-around woven sleeving

Characteristics

- 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

Technical Information

Material Mono and multifilaments of polyester

Temperature range -70°C to +125°C

Melt temperature +255°C Automotive temperature T3

class

Colour Black

Flammability rating Self-extinguishing, type B (FMVSS-302

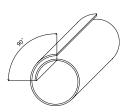
Test method D45 1333)

Abrasion resistance PSA D44 1722 : R8

Dielectric strength from 1kVAC



Product Ref.	Nominal Size*	Length per mini-reel
	[mm]	[m]
CPS05W-150-EU	5	150
CPS08W-100-EU	8	100
CPS13W-50-EU	13	50
CPS19W-25-EU	19	25
CPS25W-25-EU	25	25
CPS29W-15-EU	29	15
CPS32W-15-EU	32	15
CPS38W-15-EU	38	15



 $^{^{\}star}$ Nominal size is determined by wrapping the product around a mandrel of a given size to obtain 90 degrees of overlap (average value).

Cable sleeves and spiral wraps Wrap-around woven sleeving — Flame retardant

Characteristics

- 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
- 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 50 mm

Technical Information

Material Mono and multifilaments of polyester

Temperature range -50°C to +125°C

Melt temperature +240°C Automotive temperature T3

class

Colour Black

Fire behaviour According to EN 45545-2: HL3

According to NF F 16 101 : I2-F1

Ignitability test According to NF-EN-ISO 11925-2

Abrasion resistance PSA D44 1722: R8 Smoke opacity PSA D45 1722: R8 NFX 10-702-1; 10-702-2:

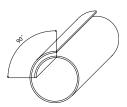
Pass; Smoke index: 12

Index oxygen According to EN 45545-2: 37.5%

Dielectric strength from 1kVAC
Other properties Halogen free



Product Ref.	Nominal Size*	Length per mini-reel
	[mm]	[m]
CPS05W-150-FR-EU	5	150
CPS08W-100-FR-EU	8	100
CPS13W-50-FR-EU	13	50
CPS19W-25-FR-EU	19	25
CPS25W-25-FR-EU	25	25
CPS29W-15-FR-EU	29	15
CPS32W-15-FR-EU	32	15
CPS38W-15-FR-EU	38	15
CPS50W-15-FR-EU	50	15



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

Cable sleeves and spiral wraps Braided sleeving

Characteristics

- 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



The state of the s

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

Technical Information

Material Polyester

Temperature range -50°C to +150°C Colour Black or grey
Flammability rating UL 94 V-2

CPS50G-25

1:2

CPS50B-25

Product Ref.	Product Ref.	Nominal	Expandable	Length per
Black	Grey	as supplied	diameter range	mini-reel
		[mm]	[mm]	[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

40 - 66

50

Cable sleeves and spiral wraps Braided sleeving — Flame retardant

Characteristics

- Braided sleeving manufactured from flame-retardant polyester monofilaments
- Flame retardant polyester, conform to UL 94 V-0, mainly used in the railway industry
- Available in diameters from 3 to 50 mm to cover bundle diameters of 2 to 60 mm
- Recommended in applications such as public transportation, aircraft industry, telecommunications, underground cables, etc.

Technical Information

Material Flame retardant polyester monofilaments (PET FR)

Temperature range -50°C to +150°C

Melt temperature +250°C Colour Black or grey

Tested according to

Other properties Halogen free

1:2

Product Ref.	Product Ref.	Nominal	Expandable	Length per
Black	Grey	as supplied	diameter range	reel
		[mm]	[mm]	[m]
CPS3B-100-CV0	CPS3G-100-CV0	3	2 - 5	100
CPS4B-100-CV0	CPS4G-100-CV0	4	3 - 7	100
CPS5B-100-CV0	CPS5G-100-CV0	5	4 - 9	100
CPS6B-100-CV0	CPS6G-100-CV0	6	5 - 11	100
CPS8B-100-CV0	CPS8G-100-CV0	8	7 - 13	100
CPS10B-50-CV0	CPS10G-50-CV0	10	9 - 15	50
CPS12B-50-CV0	CPS12G-50-CV0	12	11 - 17	50
CPS15B-50-CV0	CPS15G-50-CV0	15	13 - 20	50
CPS20B-50-CV0	CPS20G-50-CV0	20	18 - 25	50
CPS25B-50-CV0	CPS25G-50-CV0	25	22 - 30	50
CPS30B-50-CV0	CPS30G-50-CV0	30	27 - 40	50
CPS40B-50-CV0	CPS40G-50-CV0	40	35 - 50	50
CPS50B-50-CV0	CPS50G-50-CV0	50	45 - 60	50



Cable sleeves and spiral wraps Spiral wrap

Characteristics

- For protection of bundles from 4 mm to 130 mm
- Install gapped for greater flexibility or butted for maximum abrasion resistance, insulation and rigidity
- Counter-clockwise cut
- Delivered in bags with Euroslot
- Available in natural and UV-resistant black Polyethylene

Technical Information

Material Polyethylene
Temperature range -30°C to +80°C

Colour Natural and UV-resistant black

Flammability rating UL 94 HB

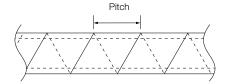
Other properties UV-resistant black, Halogen free, Silicone free



Product Ref. Colour		Outer diameter	Pitch	Nominal thickness	Min max. bundle diameter	Length
		[mm]	[mm]	[mm]	[mm]	[m]
SRPE-6-9	natural	6.0	7.0	0.5	4 - 50	10
SRPE-8-9	natural	8.0	10.8	0.5	6 - 60	10
SRPE-10-9	natural	10.0	11.4	0.8	7.5 - 60	10
SRPE-12-9	natural	12.0	13.9	0.9	9 - 65	10
SRPE-15-9	natural	15.0	15.0	1.0	12 - 70	10
SRPE-19-9	natural	19.0	18.2	1.3	15 - 100	10
SRPE-24-9	natural	24.0	19.6	1.5	20 - 130	10
SRPE-6-0	UV-resistant black	6.0	7.0	0.5	4 - 50	10
SRPE-8-0	UV-resistant black	8.0	10.8	0.5	6 - 60	10
SRPE-10-0	UV-resistant black	10.0	11.4	0.8	7.5 - 60	10
SRPE-12-0	UV-resistant black	12.0	13.9	0.9	9 - 65	10
SRPE-15-0	UV-resistant black	15.0	15.0	1.0	12 - 70	10
SRPE-19-0	UV-resistant black	19.0	18.2	1.3	15 - 100	10
SRPE-24-0	UV-resistant black	24.0	19.6	1.5	20 - 130	10







Cable sleeves and spiral wraps Extruded grommeting

Characteristics

- 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

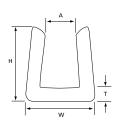
Technical Information

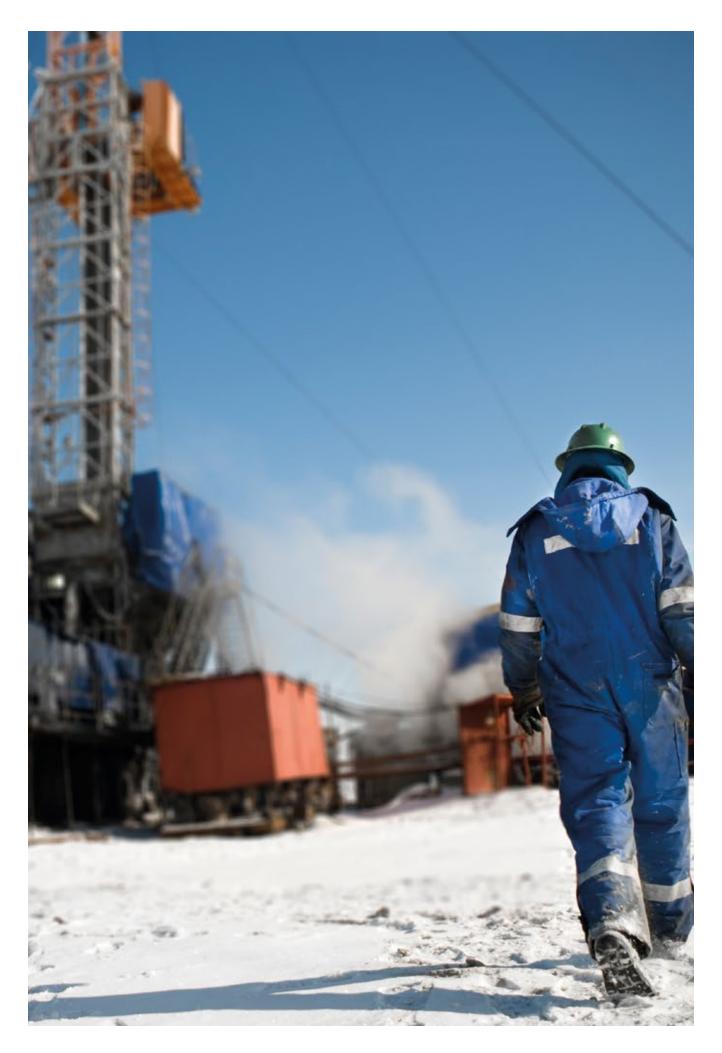
Material Polyamide 6.6
Temperature range -40°C to +85°C
Colour Natural or black
Flammability rating UL 94 V-2

Other properties Halogen free, Silicone free



Product Ref.	Colour	Internal width A	Thickness T	Н	W	Length per reel
		[mm]	[mm]	[mm]	[mm]	[m]
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





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Cable Tie Tooling Introduction



Cable Tie Tooling Ty-Rap® and Ty-Met™ tooling

ABB 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, as well as robust and ergonomic tools with tension setting and automatic cutting, now also in pneumatic version

In particular, the ERG50 and ERG120 hand tools, as well as the new ERG50P pneumatic tool, provide a superior level of reliability and performance, combined with enhanced ergonomics and comfort of use.

These ergonomic tools, with adjustable tension and automatic cutting, are ideally suited for efficiently installing all kinds of plastic cable ties in industrial (Original Equipment Manufacturers, Maintenance and Repair Organisations, etc) and construction applications.

ERG50, ERG50P & ERG120

Superior reliability and performance

- Developed to meet the market needs for a more rugged and longer lasting tool
- Designed to integrate the greatest number of features in the market

Enhanced ergonomics and comfort of use

- First class design and materials, for maximum convenience
- As a result, the operator is subject to less stress, less fatigue and less risk of trauma due to long term use (such as Carpal Tunnel Syndrome)
- The pneumatic version (ERG50P) provides an even increased comfort of use

Increased efficiency

- Exclusive features for quick set-up and fast installation
- Confidence to achieve a highly professional result, installation after installation

Cable Tie Tooling Selection guide



Product Ref.	Features	Tensioning	Cutting	For cable ties
TOOLING FOR PLAS	TIC TIES			
ERG50	Ergonomic hand tool with superior level of reliability and performance	adjustable	automatic	2.4 mm - 4.8 mm
ERG120	Ergonomic hand tool with superior level of reliability and performance	adjustable	automatic	4.8 mm - 7.6 mm
	or orabity and portornation			
ERG50P	Ergonomic pneumatic tool with superior level of reliability and performance	adjustable	automatic	2.4 mm - 4.8 mm
WT199	Semi- automatic MIL specified hand tool (MIL. Nr. MS-90387-1)	adjustable	automatic	2.4 mm - 4.8 mm
WT1-TB	Basic tensioning tool, intended for maintenance and small batch use	basic	twist cut	2.4 mm - 4.8 mm
NT197	Semi-automatic MIL specified hand tool (MIL. Nr. MS-90387-2)	adjustable	automatic	4.8 mm - 7.6 mm
WT2-TB	Basic tensioning tool, intended for maintenance and small batch use	basic	twist cut	4.8 mm - 7.6 mm
_300-FR	Rugged construction tool for Col-Ty [™] installation ties	basic	manual	Col-Ty™ - 9 mm
WT3D	Robust metal body with plastic hand-grips, designed for tensioning and cutting heavy-duty cable ties	basic	twist cut	7.6 mm - 12.7 mm
L-500-EU	Rugged metallic construction	adjustable	automatic	4.7 mm - 13.3 mm

Cable Tie Tooling Selection guide



Product Ref.	Features	Tensioning	Cutting	For cable ties
TOOLING FOR TY-ME	ET™ STAINLESS STEEL TIES		<u> </u>	<u> </u>
CT1-TB	Tensioning hook provides extra-leverage for tensioning the ties by hand	basic	no cutting	Releasable, Ladder Type & Strap Type
CT2-TB	Basic hand tool	basic	no cutting	Releasable, Ladder Type & Strap Type
WT3S	A robust metallic hand tool with rubber grips	basic	no cutting	Ladder Type & Strap Type
CT3	Economic tensioning tool	basic	manual	Ladder Type, Strap Type & Ball-Lock Type (width up to 12 mm)
L-600	Tensioning tool	basic	manual (twist cut)	Ball-Lock Type (width: 4.6 mm & 7.9 mm)
CT4-TB	Bantam tool, unique 3-way handle can be used in various positions. Especially useful in tight areas with minimal access	basic	manual	Releasable, Ladder Type & Strap Type
CT5	Adjustable tension setting tool with automatic cutting	adjustable	automatic	Ladder Type & Strap Type
CT6	Adjustable tension setting tool with automatic cutting	adjustable	automatic	Ball-Lock Type (width: 4.6 mm & 7.9 mm)
CT7	Tensioning and cutting tool, ratchet type	basic	manual	Ball-Lock Type (width: 12mm & 16mm)
CT8	Tensioning and cutting tool, ratchet type	basic	manual	Bands on reel (all widths)
CT8	Tensioning and cutting tool, ratchet type	basic	manual	Bands on reel (all widt

Cable Tie Tooling

Tools for plastic cable ties: ERG50, ERG120 and ERG50P

Characteristics

The ergenomic tools from ABB provide a superior level of reliability and performance, combined with enhanced ergonomics and comfort of use. With their adjustable tension and automatic cutting, they are ideally suited for efficiently installing all kinds of plastic cable ties in industrial (Original Equipment Manufacturers, Maintenance and Repair Organisations, etc) and construction applications. They are available in hand tool version (ERG50 and ERG120) and in pneumatic version (ERG50P) for higher volumes of installation without muscle strain.

Developed to meet the market needs for a more rugged and longer lasting tool, and to integrate the greatest number of features in the market:

- 360° rotating nose (patented), allows the tool to be used in any position
- Tension adjustment lock, for constant tension setting
- Quick tension-adjustment wheel located towards the front for easy access and fast changes
- Adjustable handle span (for hand tools only) fits large and small hands.
- Anti-recoil mechanism (patented) reduces vibration shock
- First class design and materials: ergonomic shape with rounded edges, soft rubber handles, well balanced center of gravity
- Longest stroke length on the market (25.4 mm), meaning less tensioning cycles, for time and cost saving
- High / low force setting (patent pending), for a selection between "high force & long stroke" or "low force & short stroke" (for hand tools only)
- The cable tie is cut flush to the head, with no remaining protrusion, and the cut tail remains captive in the tool for a cleaner installation
- Easy access to spare blade nest, always a spare blade at hand (each tool is supplied with a spare blade)

As a result, the operator is subject to less stress, less fatigue and less risk of trauma due to long term use (such as Carpal Tunnel Syndrome)

Technical Information ERG50

Tool type Ergonomic hand tool

Nose colour

For type of cable tie

For tie width

Black

Plastic ties

2.4 mm - 4.8 mm

Features Adjustable tension setting, automatic cutting, retraction of the

strap end after application of Ty-Rap® cable ties

Weight 260 g

Dimensions [L x W x H] 178 x 127 x 38 mm Replacement blades Product Ref. ERG50B

Technical Information ERG120

Tool type Ergonomic hand tool

Nose colour Orange
For type of cable tie Plastic ties
For tie width 4.8 mm - 7.6 mm

Features Adjustable tension setting, automatic cutting, retraction of the

strap end after application of Ty-Rap® cable ties

Weight 278 g

Dimensions [L x W x H] 178 x 127 x 38 mm Replacement blades Product Ref. ERG120B

Technical Information ERG50P

Tool type Ergonomic pneumatic tool

Nose colour
For type of cable tie
For tie width

Eigenomie pricein
Black
Plastic ties
2.4 mm - 4.8 mm

Features Adjustable tension setting, automatic cutting, retraction of the

strap end after application of Ty-Rap® cable ties, double hangers,

supplied with pneumatic hose (2.7 metre)

Operating air pressure 6 to 7 bar non-lubricated air Weight 415 g (without pneumatic hose)

Dimensions [L x W x H] 245 x 155 x 40 mm Replacement blades Product Ref. ERG50B







Cable Tie Tooling Tools for plastic cable ties



Product Ref.: WT199

Characteristics

- 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 Plastic ties
2.4 mm - 4.8 mm

Features Adjustable tension setting, automatic cutting,

MIL specified (MS-90387-1)

Weight 410 g

Dimensions [L x W x H] 163 x 134 x 24 mm



Product Ref.: WT197

Characteristics

- 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 - 7.6 mm

Features Adjustable tension setting, automatic cutting,

MIL specified (MS-90387-2)

Weight 420 g

Dimensions [L x W x H] 165 x 135 x 29 mm

Cable Tie Tooling Tools for plastic cable ties

Product Ref.: WT3D

Characteristics

- 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 - 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

Product Ref.: L-500-EU

Characteristics

- 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
Colour Red
For type of cable tie Plastic ties
For tie width 4.7 mm - 13 mm

Features Tensioning, automatic cutting

Weight 320 g

Dimensions [L x W x H] 220 x 90 x 25 mm

Product Ref.: L300-FR

Characteristics

- Rugged construction makes this tool ideal for Col-Ty™ installation 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

Colour White For type of cable tie Plastic ties

Features Tensioning, manual cutting

Weight 330 g

Dimensions [L x W x H] 195 x 100 x 25 mm







Cable Tie Tooling Tools for plastic cable ties

Product Ref.: WT1-TB

Characteristics

- 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 - 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 Ref.: WT2-TB

Characteristics

- 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 - 7.6 mm
Features Basic tensioning, twist cut

Weight 28.4 g

Dimensions [L x W x H] 134 x 55 x 27 mm

Cable Tie Tooling Tools for stainless steel ties

Product Ref.: CT1-TB

Characteristics

- Tensioning hook suitable for Releasable Type, Ladder Type and Strap 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, Ladder Type & Strap Type stainless steel ties

Features Tensioning, no cutting

Weight 50 g

Dimensions [L x W x H] 85 x 106 x 15 mm



Product Ref.: CT2-TB

Characteristics

- Cable tie tensioner suitable for Releasable Type, Ladder Type & Strap type 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, Ladder Type & Strap Type stainless steel ties

For tie width Up to 12 mm

Features Tensioning, no cutting

Weight 300 g

Dimensions [L x W x H] 195 x 90 x 30 mm



Product Ref.: WT3S

Characteristics

- A robust metallic hand tool with rubber grips designed for tensioning Ladder Type & Strap 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 & Strap Type stainless steel ties

For tie width Up to 12 mm

Features Tensioning, no cutting

Weight 225 g

Dimensions [L x W x H] 178 x 112 x 20 mm

Cable Tie Tooling Tools for stainless steel ties

Product Ref.: CT3

Characteristics

- Cost-effective tensioning tool
- Cut-off by hand-activated lever



Tool type Hand tool

For type of cable tie Ladder Type, Strap Type & Ball Lock Type stainless steel ties,

coated and uncoated

For tie width Up to 12 mm

Features Tensioning, manual cutting

Weight 550 g

Dimensions [L x W x H] 210 x155 x 35 mm

Product Ref.: L-600

Characteristics

- Tensioning tool with twist cut

Technical Information

Tool type Hand tool

For type of cable tie Ball Lock Type stainless steel ties, coated and uncoated

For tie width 4.6 - 7.9 mm

Features Tensioning, manual cutting (by twisting the tool)

Weight 600 g

Dimensions [L x W x H] 200 x 140 x 40 mm

Product Ref.: CT4-TB

Characteristics

- Bantam tool, suitable for Releasable Type, Ladder Type & Strap 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, Ladder Type & Strap Type stainless steel ties

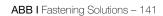
Features Tensioning, manual cutting

Weight 1200 g

Dimensions [L x W x H] 156 x 180 x 80 mm







Cable Tie Tooling Tools for stainless steel ties

Product Ref.: CT5

Characteristics

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



Technical Information

For type of cable tie

Tool type Tension setting hand tool

Ladder Type & Strap Type stainless steel ties,

coated and uncoated

For tie width Up to 12 mm

Features Adjustable tension setting, automatic cutting

Weight 430 g

Dimensions [L x W x H] 173 x 158 x 22 mm

Product Ref.: CT6

Characteristics

- 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

For tie width 4.6 - 7.9 mm

Features Adjustable tension setting, automatic cutting

Weight 430 g

Dimensions [L x W x H] 173 x 158 x 22 mm

Cable Tie Tooling Tools for stainless steel ties

Product Ref.: CT7

Characteristics

- Tensioning and cutting tool, ratchet type
- Suitable for coated and uncoated Ball-Lock Type stainless steel ties, having a width of 12 mm and 16 mm



Technical Information

Tool type Hand tool, ratchet type

Weight 1300 g

Dimensions [L x W x H] 270 x 170 x 60 mm

Product Ref.: CT8

Characteristics

- Tensionng and cutting tool, ratchet type
- Suitable for the bands on reel, in all widths
- The long nose leaves an excess of 45 mm after the tie is cut, for an easy installation of the band on reel



Technical Information

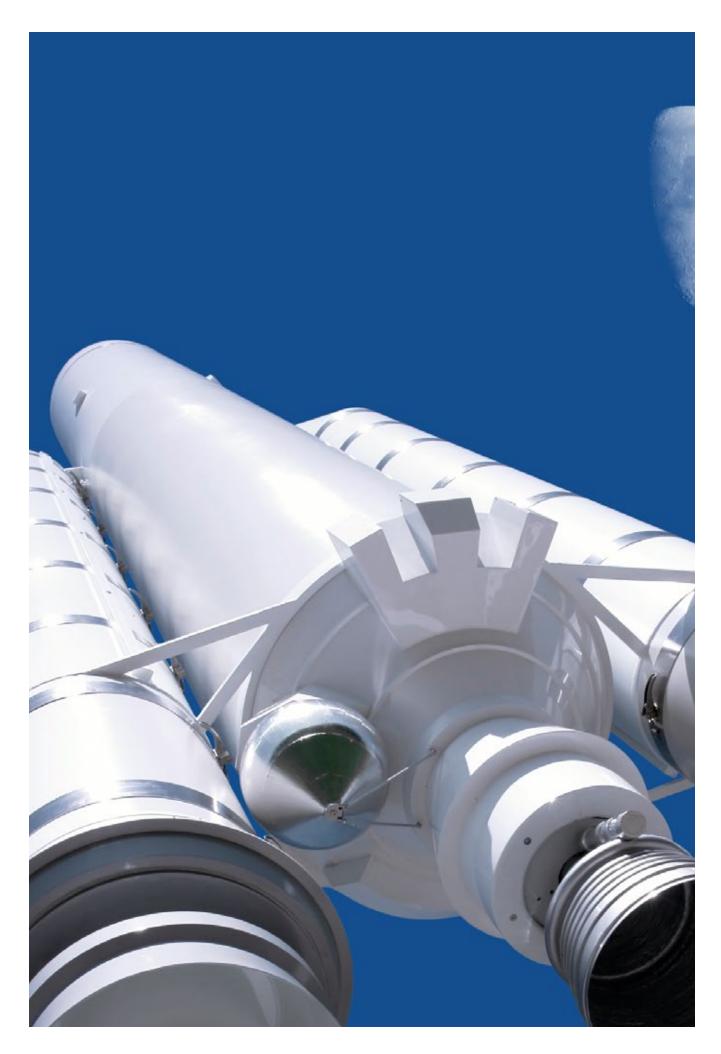
Tool type Hand tool, ratchet type

For type of cable tie Bands on reel

For tie width All widths (up to 19.1 mm)

Weight 1570 g

Dimensions [L x W x H] 310 x 200 x 60 mm



Material specifications Table of Content

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Material specifications UL flammability ratings

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 $127 \times 12.7 \text{ mm}$ (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.

Material specifications Adhesive material specifications

Property	Method	Unit of measure	Rubber based (self-adhesive)	Acrylic based (2 component glue)
Coated Sides	-	each	2	2
Foam Density	-	Kg/m3	96.9	96.9
Peel Adhesion	PSTC 1	N/cm width	10.9	10
	ASTM D 1000	Average		8.8
Shear Adhesion	natural	15.0	15.0	10
22°C 50% RH	PSTC 7	Hours	100 +	8+
22°C Occasional Wetting		N/m2	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

Characteristics

- 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

Technical Information

Description 2 component glue

Weight 0.21 kg

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

Selecting the right material for your applications

ABB 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 ABB.

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
- Indoor applications
- Ty-Fast® ties in standard Polyamide 6.6 are available in natural colour and in a wide range of colours
- Ty-Rap[®] ties in standard Polyamide 6.6 are available in natural colour only

Polyamide 6.6, weather resistant

- Similar to Polyamide 6.6, but recommended for outdoor applications
- UV-resistant
- Halogen free and Silicone free
- Ty-Fast® ties in weather resistant Polyamide 6.6 are available in black colour only (with 2 % carbon for military specifications)
- Ty-Rap® ties in weather resistant Polyamide 6.6 are available in black colour (with 2 % carbon for military specifications) and in a wide range of colours (except natural)
- 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 6.6, detectable

- Similar to Polyamide 6.6, but contains a compound detectable by metal detectors (tested and rated at 1.5 mm diameter ferrous sphere setting) and X-ray equipment
- Colour: bright blue, also contributes to visual detection
- Especially recommend for the food industry, and for any other contamination sensitive industry using detection equipment
- Halogen free and silicone free
- Flammability rating: UL 94 V-2



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







Polypropylene, detectable

- Similar to standard Polypropylene, but contains a compound detectable by metal detectors (tested and rated at 1.5 mm dia-meter ferrous sphere setting) and X-ray equipment
- Colour: bright blue, also contributes to visual detection
- Especially recommend for the food industry, and for any other contamination sensitive industry using detection equipment
- Halogen free and silicone free
- Flammability rating: UL 94 HB



ETFE Fluoropolymer

- Tensile strength slightly lower than Polyamide 6.6
- ETFE Fluoropolymer 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















ECTFE Fluoropolymer

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















Toughened weatherable acetal

- 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 indus-

















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 the table

If your application is in an extremely cold environment, three materials will answer your need: ETFE Fluoropolymer, 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

Table 1 - Information on cable tie materials

Material Code	Polyamide 6.6	Polyamide 6.6 weather resistant*	Polyamide 6.6 heat stabilised		Polyamide 6.6 flame retardant
	PA6.6	UV PA6.6	HS PA6.6	HSUV PA6.6	FR PA6.6
Ty-Rap® Product Ref.	TYM	TYMX	TYHM	TYMXA	TYMFR
Ty-Fast® Product Ref.	TY	TYX	TY39		TSHF
Max. operating	+85°C	+105°C	+105°C	+105°C	+65°C
temperature					
Min. operating temp.	-60°C	-60°C	-60°C	-60°C	-20°C
UL flammability rating	V-2	V-2	V-2	V-2	V-0
Specific density	1.14	1.14	1.14	1.14	1.16
Water absorption (24h/ASTM)	2.5 - 3.1%	2.5 - 3.1%	2.5 - 3.1%	2.5 - 3.1%	3.0 - 3.5%
Colours	Natural**	Black***	Natural****	Black	White
E-module (N/mm²)	2000	2000	2000	2000	1400
Notch impact	2-20	2-20	2-20	2-20	3-25
strength conform DIN 53453 (KJ/m²)					
UV resistant		v		v	
Flame retardant					✓
Heat resistant			~	~	
Enhanced weatherability				~	
Flexible at low temperatures					
Radiation resistant					
Chemically resistant					See table 2 (pages 152 - 154)
Halogen free	~	v	~	~	✓
Silicon free	~	~	~	~	~

^{* 2%} carbon for military specifications

^{**} Ty-Fast® ties in standard Polyamide 6.6 are available in natural colour and in a wide range of colours Ty-Rap® ties in standard Polyamide 6.6 are available in natural colour only

^{***} Ty-Fast® ties in weather resistant Polyamide 6.6 are available in black colour only (with 2 % carbon for military specifications)

Ty-Rap® ties in weather resistant Polyamide 6.6 are available in black colour (with 2 % carbon for military specifications) and in a wide range of colours (except natural)

^{****} Heat stabilised Polyamide 6.6 may have a greenish tint

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
DETECTABLE POLYAMIDE 6.6	DET PA6.6
WEATHER RESISTANT POLYAMIDE 12	UV PA12
POLYPROPYLENE	PP
WEATHER RESISTANT POLYPROPYLENE	UV PP
DETECTABLE POLYPROPYLENE	DET PP
ETFE FLUOROPOLYMER	TZ
ECTFE FLUOROPOLYMER	HAL
TOUGHENED WEATHERABLE ACETAL	DEL
STAINLESS STEEL	SS

hig	olyamide 4.6 gh mperature	Detectable Polyamide 6.6	Polyamide 12 weather resistant	Polypropylene weather resistant	Detectable Polypropylene	ETFE	ECTFE	Toughened weatherable acetal	Stainless Steel
НТ	Γ PA4.6	DET PA6.6	UV PA12	UV PP	DET PP	TZ	TV	DEL	SS
TYI	HTM	TYM-NDT	TYCMX	TYPMX	TYM-PDT	TYZM	TYVM	TYD	YRL or YLD
							į	CSS	or YLS or YID
							Ī		or YBR or TYS
+1	70°C	+85°C	+85°C	+85°C	+85°C	+150°C	+160°C	+90°C	+300°C
									+150°C for Polyester
-40)°C	-40°C	-40°C	-40°C	-40°C	-60°C	-60°C	-65°C	-80°C
V-2	2	V-2	V-2	HB	HB	V-0	V-0	НВ	Excellent
1.1	8	1.31	1.02	0.90 - 0.91	1.03 - 1.07	1.67 - 1.75			7.95
1.3	3%		0.7 - 1.1%	0.01 - 0.03%		0.02%			0%
Lig	ht green	Bright blue	Black	Black	Bright blue	Aquamarine	Maroon	Black	Metallic / Black
320	00		1600	1100-1300		1000			193000
			3.5-13	3-17		o.B.			122J(IZOD)
			~	~	v	v	•	•	✓
						~	~		•
v					~	~	~		•
			•	•	~	~	~	•	•
			•	~	~				✓
						~			•
•									~
~		~	v	V	v			V	~
~		V	✓	~	~	~	~	~	✓

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

Reagents	Concen- tration	HS PA6.6	TV	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Arsenic Acid	40%	-	-	-	-	_	-	-	Е	Е	-	Е
Acetaldehyde	50%	S	-	-	S	S	S	 -	 –	<u> </u>	<u>-</u>	<u>+</u> -
Acetone	100%	E	E	F	E	E	E	E	Е	E	Е	E
Aluminum Hydroxide	AQ	-	Е	-	<u> </u>	<u>†</u> –	<u> </u>	 -	E	E	Е	E
Ammonia	All	_	Е	-	-	<u>†</u>	<u>+</u>	E	Ε	E	Е	15.0
Ammonium Carbonate	5%	S	E		S	S	S	E	E	E	Е	E
Ammonium Hydroxide	10%	E	E	F	E	E	E	 -	E	E	Е	E
Ammonium Nitrate	<u> </u>	-	E	-	<u> </u> –	<u>†</u> –	<u>†</u> -	E	Е	E	Е	E
Ammonium Sulfate	10%	-	E	-	-	-	 -	S	S	S	S	S
Barium Carbonate	All	_	E		-	<u>+</u> –	<u> </u>	E	Е	E	Е	E
Barium Chloride	5%	NR	<u> </u>	-	NR	NR	NR	E	Е	E	Е	Е
Barium Sulfate	10%	E	<u> </u>	<u> </u>	E	E	E	E	E	E	Е	E
Barium Sulfide	10%	S			S	S	S	E	E	E	Е	E
Benzene	100%	E	E	F	E	E	E	E	S	S	Е	E
Benzoic Acid	100%	NR	E	-	NR	NR	NR	E	Е	E	Е	E
Butyric Acid	50%	NR	E	-	NR	NR	NR	-	Е	E	Е	Е
Calcium Carbonate	AQ	-	E	-	-	<u>+</u> –	 -	<u>-</u>	Е	E	Е	E
Calcium Hydroxide	20%	-	F	E	-	<u>+</u> –	<u> </u>	 -	Е	E	Е	E
Calcium Hydrochlorite	2	NR	-	-	NR	NR	NR	-	F	F	F	F
Calcium Sulfate	2%	-	E	-	<u> </u> –	<u>†</u> –	<u>†</u> -	-	Е	E	Е	E
Carbon Tetrachloride	100%	E	Е	E	E	E	E	E	F	F	Е	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	<u>-</u>	<u> </u>	NR	NR	NR	-	 -	<u> </u>	F	F
Chloroform	100%	-	E	-	<u> </u>	<u>†</u> –	<u> </u>	F	F	F	Е	E
Chromic Acid	50%	NR	S	-	NR	NR	NR	-	F	F	F	F
Citric Acid	50%	S	E	E	S	S	S	E	Е	E	Е	E
Copper Cyanide	10%	-	E	-	<u> </u> –	<u>†</u> –	<u>†</u> –	-	Е	E	Е	E
Copper Nitrate	50%	_	E	-	-	<u>+</u> —	<u> </u>	<u> </u>	Е	E	Е	E
Cider	<u> </u>	-	E	-	-	<u> </u>	<u> </u>	 	Е	E	E	E
Dichloroethane	100%	-	E		<u> </u> –	<u> </u>	 -	 	 	-	Е	E
Diethyl Ether	100%	<u>-</u>	Е	S	<u> </u> –	<u>†</u> –	<u> </u>	Е	Е	Е	Е	Е
Ethyl Alcohol	100%	S	Е	-	S	S	S	E	Е	E	Е	E
Ethyl Chloride	100%	_	S	E	-	<u> </u>	<u>+</u>	F	F	F	Е	Е
Ethylene Glycol	100%	E	E	S	E	E	E	 	E	E	E	E
Ferric Hydroxide	All	_	E	<u> </u>	<u> </u> –	<u>†</u> –	<u>†</u> –	 	E	E	Е	E
Ferric Nitrate	10%	_	E	-	-	 -	<u>-</u>	-	E	E	Е	E
Ferrous Sulfate	10%	<u> </u>	E	-	-	-	<u>+</u>	 -	E	E	E	E
Fuel Oil	100%		E	-	†	<u>+</u>	†-	E	-	_	Е	E

Ratings

E = Excellent

S = Satisfactory

F = Fai

NR = Not Recommended

(AQ = Aqueous)

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

Reagents	Concen- tration	HS PA6.6	TV	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Furfural	100%	-	Е	-	-	-	-	-	F	F	Е	Е
Gallic Acid	AQ	-	Е	-	-	<u> </u>	<u> </u>	 	-	<u> </u>	Е	E
Gasoline	100%	E	E	-	E	E	E	 	S	S	Е	E
Glycerine	100%	<u> </u>	Е	-	<u> </u> –	<u> </u>	<u> </u>	E	Е	Е	-	Е
Hydrocyanic Acid	All	<u> </u>	Е	-	<u> </u>	-	-	-	Е	E	Е	E
Hydrogen Peroxide	30%	NR	Е	F	NR	NR	NR	S	Ε	E	Е	E
Hydrogen Sulfide	Dry	NR	Е	-	NR	NR	NR	E	Е	Е	Е	E
lodoform	100%	-	Е	-	<u> </u>	 	<u> </u>	 -	<u>-</u>	-	Е	E
Isopropyl Alohol	100%	S	E	-	S	S	S	E	Е	E	Е	E
Jet Fuel	100%	E	Е	-	E	E	E	<u> </u>	S	S	Е	E
Lactic Acid	10%	E	Е	-	Е	Е	Е	S	Е	Е	Е	Е
Lanolin	10%	E	Е	-	E	E	Е	E	Ε	E	Е	E
Lead Acetate	5%	_	E	-	<u> </u>	<u> </u>	<u> </u>	<u>-</u>	Ε	E	Е	E
Linseed Oil	10%	E	Е	E	E	E	E	E	Е	E	E	E
Magnesium Carbonate	All	<u> </u>	E	-	<u> </u>	<u> </u>	<u> </u>	E	Е	Е	Е	Е
Magnesium Chloride	10%	F	-	-	F	F	F	F	F	F	F	F
Magnesium Nitrate	All	_	Е	-	<u> </u>	<u> </u>	<u> </u>	E	Е	E	Е	Е
Malic Acid	AQ	-	Е	-	-	_	-	<u> </u>	Е	E	Е	Е
Mercury	100%	-	Е	-	-	-	-	E	Е	Е	Е	E
Methyl Alcohol	100%	S	Е	-	S	S	S	E	Е	E	Е	Е
Methyl Chloride	100%	_	S	-	-	_	-		S	S	Е	Е
MethylEthyl Ketone	100%	-	E	F	-	_	-	E	Е	Е	Е	E
Naptha	100%	-	E	-	-	-	<u>-</u>	-	Е	Е	Е	E
Nitric Acid	30%	NR	Е	NR	NR	NR	NR	-	Е	E	Е	Е
Nitric Acid	30-70%	NR	S	NR	NR	NR	NR	-	F	F	S	Е
Nitrous Acid	5%	-	E		-	-	<u>-</u>	-	F	F	Е	E
Oieic Acid	100%	-	E	S	-	_	<u> </u>	-	Е	E	Е	Е
Oxalic Acid	10%	-	Е	-	<u> </u>	_	-	S	Е	Е	Е	Е
Paraffin	100%	E	E	-	E	E	E	E	Е	E	Е	Е
PetroleumEther	100%	-	E	-	_	-	-	Е	F	F	Е	E
Phenol	90%	NR	Е	NR	NR	NR	NR	-	Е	Е	Е	Е
Phosphoric Acid	10%	NR	Е	-	NR	NR	NR	-	Е	Е	Е	Е
Picric Acid	1%	-	Е	-	-	_	<u> </u>	-	Е	E	Е	Е
Potassium Bromide	AQ	-	-	-	-	-	-	<u> </u> –	S	S	S	S
Potassium Carbonate	1%	-	Е	-	-	-	-	Е	Е	Е	Е	E
Potassium Chlorate	AQ	-	Е	-	-	-	-	S	Е	Е	Е	E
Potassium Dichromate	40%	NR	Е	-	NR	NR	NR	F	Е	Е	Е	E
Potassium Ferrocyanide	25%	-	Е	-	-	<u> </u>	-	-	E	E	Е	E
Potassium Hydroxide	5%	S	Е	-	S	S	S	-	Е	E	Е	Е

Ratings

E = Excellent

S = Satisfactory

F = Fai

NR = Not Recommended

(AQ = Aqueous)

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

Reagents	Concen- tration	HS PA6.6	TV	DEL	PA6.6	UV PA6.6	FR PA6.6	UV PA12	PP	UVPP	TZ	SS
Potassium lodide	All	_	Е	-	-	-	-	Е	Е	Е	Е	Е
Potassium Nitrate	50%	F	Е	-	F	F	F	Е	Е	E	Е	Е
Potassium Permanganate	5%	NR	Е	S	NR	NR	NR	NR	Е	E	Е	Е
PotassiumSulfate	5%	-	Е	-	_	<u> </u>	<u></u>	Е	Е	E	Е	Е
PotassiumSulfide	AQ	_	Е	-	-	<u> </u>	-	<u> </u>	Е	E	Е	Е
Propyl Alcohol	100%	E	E	-	E	E	E	<u></u>	Е	E	Е	Ε
Silver Nitrate	10%	-	Е	-	-	 	<u></u>	Е	Е	E	Е	Е
Sodium Acetate	60%	E	E	-	E	E	E	<u>-</u>	E	E	Е	Е
Sodium Bicarbonate	All	E	E	-	E	E	E	E	Е	E	Е	Е
Sodium Bisulfate	10%	_	E	E	-	-	-	E	E	E	Е	E
Sodium Borate	All	-	E	-	-	 	<u> </u>	-	E	E	E	E
Sodium Carbonate	5%	E	E	S	E	E	E	E	E	E	Е	Е
Sodium Chlorate	25%	_	E	E	-	-	 -	S	E	E	Е	Е
Sodium Chloride	2%	E	E	S	E	E	E	E	E	E	Е	Ε
Sodium Fluoride	5%	_	-	-	<u>-</u>	 	 -	-	F	F	F	F
Sodium Hydroxide	10%	E	E	S	E	E	E	Е	E	E	Е	Е
Sodium Hyposulfite	AQ	_	E	-	-	-	 -	<u>+</u>	 	<u> </u>	Е	Е
Sodium Nitrate	5%	E	E	-	E	E	E	E	E	E	Е	Ε
Sodium Nitrite	AQ	_	E	-	<u> </u>	 	 -	S	E	E	E	Е
Sodium Perchlorate	10%	-	E	-	-	 	† –	-	-	<u> </u> –	E	E
Sodium Phosphate	5%	_	E	-	-	-	-	E	E	E	Е	Е
Sodium Sulfate	5%	S	E	-	S	E	E	E	E	E	Е	E
Sodium Thiosulfate	5%	_	<u> </u> –	S	<u>-</u>	 	-	S	S	S	S	S
Stearic Acid	100%	-	E	<u>-</u>	<u> </u>	 	<u>†</u> –	F	E	E	Е	Е
Sulfur	100%	_	E	-	-	-	-	E	E	E	Е	Е
Sulfur Dioxide	All	NR	E	<u> </u>	NR	NR	NR	E	E	E	Е	E
Sulfuric Acid	Conc.	NR	E	NR	NR	NR	NR	-	S	S	Е	Е
Sulfuric Acid	5%	NR	F	F	NR	NR	NR	F	F	F	F	F
Tannic Acid	10%	_	E	-	-	<u>-</u>	-	-	E	E	Е	E
Tartaric Acid	50%	_	E	Е	-	-	-	E	E	E	Е	Ε
Tetrahydrofuran	100%	_	F	E	-	-	-	S	F	F	Е	Е
Toluene	100%	E	E	F	E	E	E	Е	F	F	Е	F
Xylene	100%	E	-	E	E	E	E	F	F	E	Е	E
Zinc Chloride	70%	F	E	NR	F	F	F	E	E	E	E	E
Zinc Nitrate	AQ	-	E	-	-	 	<u> </u> -	E	E	E	E	E
Zinc Sulfate	AQ	_	E	-	<u> </u>	† –	<u>†</u> –	E	E	E	Е	Е

Ratings

E = Excellent

S = Satisfactory

F = Fair

NR = Not Recommended

(AQ = Aqueous)

Material specifications Unit conversion factors

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	inches² (in²)
circular mils	0.000506671	square millimetres (mm²)
circular mils	0.7854	mils ²
cubic centimetre (cm³)	0.000035314	cubic foot (ft³)
cubic centimetre (cm ³)	0.061023	cubic inch (in³)
cubic centimetre (cm³)	0.000001	cubic metre (m³)
cubic centimetre (cm ³)	0.0026417	gallons
cubic foot (ft³)	17280.	cubic inch (in³)
cubic foot (ft³)	28317.016	cubic centimetre (cm³)
cubic inch (in³)	0.00057870	cubic feet (ft³)
cubic inch (in³)	0.000016387	cubic metre (m³)
cubic inch (in³)	16.387162	cubic centimetre (cm³)
cubic metre (m³)	1000000.0	centimetre (cm)
cubic metre (m³)	35.314456	cubic foot (ft³)
cubic metre (m³)	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 (I)

Unit x	Constant =	unit
gallons	0.13368	cubic foot (ft³)
gallons	231.0	cubic inch (in³)
gallons	3785.332	cubic centimetres (cm³)
grams (g)	15.432	grains
gram/centimetre3 (gm/cm3)	0.0361275	pounds/in³ (lb/in³)
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 (I)	61.0250	cubic inch (in³)
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

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696-41562	7TAG009550R0012	34	CPS6B-100	7TCG054800R0097	126	GRNY-187-0-C	7TAG009750R0032	129
696-41563	7TAG009550R0013	34	CPS6B-100-CV0	7TCG054800R0098	127	GRNY-187-9-C	7TAG009750R0033	129
696-41614	7TAG009910R0018	34	CPS6G-100	7TCG054800R0101	126	GRNY-250-0-C	7TAG009750R0034	129
696-41794	7TAA159090R0000	38	CPS6G-100-CV0	7TCG054800R0102	127	GRNY-250-9-C	7TAG009750R0035	129
696-41795	7TAA159090R0001	39	CPS8B-100	7TCG054800R0103	126	HCNY-125-9-M	7TAG009970R0044	115
696-41836	7TAG009530R0003	27	CPS8B-100-CV0	7TCG054800R0104	127	HCNY-250-9-C	7TAG009970R0045	115
CPS05W-150-EU	7TCG054800R0001	124	CPS8G-100	7TCG054800R0107	126	HCNY-250-9-M	7TAG009970R0046	115
CPS05W-150-FR-EU	7TCG054800R0003	125	CPS8G-100-CV0	7TCG054800R0111	127	HCNY-375-9-C	7TAG054980R0536	115
CPS08W-100-EU	7TCG054800R0005	124	CSS-100	7TAA159110R0000	37	HCNY-375-9-M	7TAG009970R0047	115
CPS08W-100-FR-EU	7TCG054800R0007	125	CSS-10K	7TAA159130R0001	39	HCNY-500-9-C	7TAG054980R0538	115
CPS10B-100 CPS10B-50-CV0	7TCG054800R0008 7TCG054800R0010	126 127	CSS-160 CSS-5K	7TAA159170R0000 7TAA159120R0000	37 39	HCNY-500-9-M JTB-500	7TAG009970R0048 7TCG054830R0018	115 48
CPS10B-50-CV0 CPS10G-100	7TCG054800R0010 7TCG054800R0012	127	CSS-B	7TAA159120R0000 7TAA159220R0000	39 41	JTB1-500	7TCG054830R0018 7TCG054830R0019	48 48
CPS10G-50-CV0	7TCG054800R0013	127	CSS-H	7TAA159180R0000	41	JTN-500	7TCG054830R0020	48
CPS12B-50	7TCG054800R0015	126	CT-3401	7TCG009750R0009	62	L-10-50R-0-C	7TAG054750R0009	54
CPS12B-50-CV0	7TCG054800R0016	127	CT-5359	7TCG009750R0010	63	L-10-50R-9-C	7TAG054750R0011	54
CPS12G-50	7TCG054800R0018	126	CT1-TB	7TCA131140R0004	135, 140	L-11-50MH-0-C	7TAG054670R0001	52
CPS12G-50-CV0	7TCG054800R0112	127	CT2-TB	7TCA131140R0005	135, 140	L-11-50MH-9-C	7TAG054670R0003	52
CPS13W-50-EU	7TCG054800R0020	124	CT3	7TCA131990R0206	135, 141	L-14-120MH-0-C	7TAG054670R0004	52
CPS13W-50-FR-EU	7TCG054800R0022	125	CT4-TB	7TCA131140R0007	135, 141	L-14-120MH-9-C	7TAG054670R0005	52
CPS15B-50	7TCG054800R0025	126	CT5	7TCA131140R0008	135, 142	L-14-50MH-0-C	7TAG054680R0012	52
CPS15B-50-CV0	7TCG054800R0026	127	CT6	7TCA131990R0211	135, 142	L-14-50MH-9-C	7TAG054670R0006	52
CPS15G-50	7TCG054800R0028	126	CT7	7TCA131140R0009	135, 143	L-4-18ID-9-C	7TAG054640R0001	55
CPS15G-50-CV0	7TCG054800R0029	127	CT8	7TCA131140R0010	135, 143	L-4-18ID-9-M	7TAG054640R0002	55
CPS19W-25-EU	7TCG054800R0031	124	CTP-9-180-0-C	7TCG009910R0048	61	L-5-30MH-0-C	7TAG054680R0014	52
CPS19W-25-FR-EU	7TCG054800R0033	125	CTP-9-260-0-C	7TCG009910R0049	61	L-5-30MH-9-C	7TAG054670R0008	52
CPS20B-25	7TCG054800R0035	126	CTP-9-360-0-C	7TCG009910R0050	61	L-5-50PM-0-C	7TAG054980R0640	53
CPS20B-50-CV0	7TCG054800R0036	127	CTP-9-500-0-C	7TCG009910R0051	61	L-5-50PM-9-D	7TAG054710R0001	53
CPS20G-25	7TCG054800R0038 7TCG054800R0039	126 127	CTP-9-750-0-C ERG120	7TCG009910R0052	61 134, 136	L-5-50PMR-0-C L-5-50PMR-9-C	7TAG054710R0002	53 53
CPS20G-50-CV0 CPS25B-25	7TCG054800R0039 7TCG054800R0042	127	ERG120 ERG50	7TAA131790R0000 7TAA131790R0001	134, 136	L-5-50PMR-9-C L-5-50R-0-C	7TAG054980R0642 7TAG054750R0012	53 54
CPS25B-50-CV0	7TCG054800R0042	127	ERG50P	7TAA131790R0001	134, 136	L-7-50ID-9-C	7TAG054730R0012 7TAG054640R0003	55
CPS25G-25	7TCG054800R0045	126	FANY-812-9-C	7TAG009970R0025	119	L-7-50ID-9-M	7TAG054640R0004	55
CPS25G-50-CV0	7TCG054800R0046	127	FANY-812-9-D	7TAG009970R0026	119	L-7-50MH-0-C	7TAG054670R0009	52
CPS25W-25-EU	7TCG054800R0048	124	FCC-1	7TCG009630R0012	117	L-7-50MH-9-C	7TAG054660R0000	52
CPS25W-25-FR-EU	7TCG054800R0050	125	FCC-1A	7TCG009630R0013	117	L-7-50PM-0-C	7TAG054710R0004	53
CPS29W-15-EU	7TCG054800R0051	124	FCC-2	7TCG009630R0014	117	L-7-50PM-9-C	7TAG054710R0005	53
CPS29W-15-FR-EU	7TCG054800R0065	125	FCC-2A	7TCG009630R0015	117	L-7-50PMR-9-C	7TAG054980R0648	53
CPS30B-25	7TCG054800R0058	126	FCC-3	7TCG009630R0016	117	L-8-50R-0-C	7TAG054750R0016	54
CPS30B-50-CV0	7TCG054800R0059	127	FCC-3A	7TCG009630R0017	117	L-8-50R-9-C	7TAG054750R0018	54
CPS30G-25	7TCG054800R0061	126	FO200-40-0	7TAG009630R0018	58	L300-FR	7TCA131810R0001	134, 138
CPS30G-50-CV0	7TCG054800R0062	127	FO200-50-0	7TAG009630R0026	58	L-600	7TCA131990R0273	134, 141
CPS32W-15-EU	7TCG054800R0064	124	FO350-40-0	7TAG009630R0031	58	MCNY-1250-0-C	7TAG009990R0006	94
CPS32W-15-FR-EU	7TCG054800R0069	125	FO350-50-0	7TAG009630R0033	58	MCNY-1250-9-C	7TAG009990R0007	94
CPS38W-15-EU CPS38W-15-FR-EU	7TCG054800R0068	124	FO350-50-0-FR FOL300-50-0	7TAG009000R0104	58 58	MCNY-1250-9-D	7TAG009990R0008	94
CPS38W-15-FR-EU CPS3B-100	7TCG054800R0090 7TCG054800R0071	125 126	FOL500-50-0	7TAG009630R0036 7TAG009630R0040	58 58	MCNY-1250-9-L N4NY-002-0-M	7TAG009990R0009 7TAG009970R0050	94 110
CPS3B-100-CV0	7TCG054800R0071	127	FOR180-50-0	7TAG009630R0040	59	N4NY-003-0-M	7TAG009970R0056	110
CPS3G-100	7TCG054800R0075	126	FOR180-50-0-FR	7TAG009370R0000	59	N4NY-004-0-M	7TAG009970R0063	110
CPS3G-100-CV0	7TCG054800R0108	127	FOS150-50-0	7TAG009630R0046	59	N4NY-005-0-M	7TAG009970R0070	110
CPS40B-25	7TCG054800R0076	126	FOS320-50-0	7TAG009630R0048	59	N4NY-006-0-M	7TAG009970R0075	110
CPS40B-50-CV0	7TCG054800R0077	127	FOS500-50-0	7TAG009630R0050	59	N4NY-008-0-M	7TAG009970R0089	110
CPS40G-25	7TCG054800R0079	126	FRPV-1000-8-C	7TAG009970R0028	118	N6NY-009-0-M	7TAG009970R0110	110
CPS40G-50-CV0	7TCG054800R0080	127	FRPV-1000-8-D	7TAG009970R0029	118	N6NY-010-0-M	7TAG009970R0113	110
CPS4B-100	7TCG054800R0081	126	FSNY-812-9-C	7TAG009970R0030	119	N6NY-011-0-M	7TAG009970R0116	110
CPS4B-100-CV0	7TCG054800R0082	127	GRNY-040-0-C	7TAG009750R0017	129	N6NY-012-0-M	7TAG009970R0119	110
CPS4G-100	7TCG054800R0084	126	GRNY-040-9-C	7TAG009750R0018	129	N6NY-013-0-M	7TAG009970R0122	110
CPS4G-100-CV0	7TCG054800R0085	127	GRNY-052-0-C	7TAG009750R0019	129	N6NY-014-0-M	7TAG009970R0125	110
CPS50B-25	7TCG054800R0086	126	GRNY-052-9-C	7TAG009750R0021	129	N6NY-016-0-M	7TAG009970R0129	110
CPS50B-50-CV0	7TCG054800R0087	127	GRNY-062-0-C	7TAG009750R0022	129	N6NY-004C-0-M	7TAG009970R0096	110
CPS50G-25	7TCG054800R0089	126	GRNY-062-9-C	7TAG009750R0023	129	N6NY-005C-0-M	7TAG009970R0099	110
CPS50G-50-CV0	7TCG054800R0110	127	GRNY-085-0-C	7TAG009750R0024	129	N6NY-006C-0-M	7TAG009970R0102	110
CPS50W-15-FR-EU	7TOO05 4000 D0000	125	GRNY-085-9-C	7TAG009750R0026	129	N6NY-008C-0-M	7TAG009970R0107	110
CPS5B-100 CPS5B-100-CV0	7TCG054800R0092	126	GRNY-100-0-C GRNY-100-9-C	7TAG009750R0027	129	PCNY-125-9-D	7TAG009970R0143 7TAG009970R0144	115
CPS5B-100-CV0	7TCG054800R0093 7TCG054800R0096	127 126	GRNY-100-9-C GRNY-125-0-C	7TAG009750R0028 7TAG009750R0029	129 129	PCNY-250-9-C PCNY-250-9-D	7TAG009970R0144 7TAG009970R0145	115 115
CPS5G-100-CV0	7TCG054800R0109	120	GRNY-125-9-C	7TAG009750R0029	129	PCNY-375-9-C	7TAG009970R0145	115
31 333 100 340	. 100007000110103	161	31 11 1 1 LU 3-U		140	1 3111 010 3-0	1 17 1000001 01 10 140	110

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PCNY-375-9-D	7TAG009970R0147	115	SKT370-220	7TCA300200R0004	64	TC141	7TAG009880R0006	95
PCNY-500-9-D	7TAG009970R0148	115	SKT370-220-100	7TCA300180R0004	64	TC141-NDT	7TAG009660R0010	102
RANY-160-9-D	7TAG009970R0149	116	SKT370-220X	7TCA300240R0004	65	TC142	7TAG009880R0007	95
RANY-280-0-D	7TAG054980R1267	116	SKT370-220X-100	7TCA300220R0004	65	TC142-NDT	7TAG009660R0011	102
RANY-280-9-D	7TAG009970R0150	116	SKT370-540	7TCA300280R0001	64	TC142X	7TAG009840R0007	95
RANY-530-9-D	7TAG009970R0151	116	SKT370-540-100	7TCA300260R0001	64	TC150x150	7TAG009840R0008	92
RANY-620-9-D	7TAG009970R0152	116	SKT370-540X	7TCA300320R0001	65	TC150x150A	7TAG009840R0009	92
SF100-18	7TAG009700R0000	57	SKT370-540X-100	7TCA300300R0001	65	TC150x150A-L	7TAG009830R0002	92
SF100-18X	7TAG009700R0006	57	SKT450-540-50	7TCA300260R0003	64	TC150x150AX	7TAG009840R0010	92
SF175-50	7TAG009700R0012	57	SKT450-540X-50	7TCA300300R0003	65	TC150x150AX-L	7TAG009830R0003	92
SF175-50X	7TAG009700R0018	57	SKT750-540-50	7TCA300260R0002	64	TC150x150L	7TAG009830R0004	92
SF200-18		57	SKT750-540X-50	7TCA300300R0002	65	TC200x200	7TAG009840R0011	92
SF200-18X	7T4 C000700D0006	57 57	SKT776-780-50	7TCA300340R0000	64	TC200x200A	7TAG009840R0012	92
SF300-50	7TAG009700R0026	57 57	SKT776-780X-50	7TCA300360R0000	65 64	TC200x200A-L	7TAG009830R0005	92
SF300-50X SKT100-80	7TAG009700R0032 7TCA300040R0000	57 64	SKT912-780-50 SKT912-780X-50	7TCA300340R0001 7TCA300360R0001	64 65	TC200x200AX TC200x200L	7TAG009840R0013 7TAG009830R0006	92 92
SKT100-80-100	7TCA300040R0000 7TCA300020R0000	64	SMNY-001-0-D	7TAG009990R0018	96	TC2PA	7TAG009930N0000	147
SKT100-80X	7TCA300020R0000	65	SMNY-001-9-D	7TAG009990R0019	96	TC342	7TAG0099T0R0065	93
SKT100-80X-100	7TCA300060R0000	65	SRPE-10-0	7TCG054090R0216	128	TC342A	7TAG009820R0037	93
SKT140-180	7TCA300120R0000	64	SRPE-10-9	7TCG054090R0217	128	TC342A-NDT	7TAG009660R0012	102
SKT140-180-100	7TCA300120N0000	64	SRPE-12-0	7TCG054090R0220	128	TC342A-X	7TAG009820R0038	93
SKT140-180X	7TCA300160R0000	65	SRPE-12-9	7TCG054090R0221	128	TC342X	7TAG009820R0040	93
SKT140-180X-100	7TCA300140R0000	65	SRPE-15-0	7TCG054090R0222	128	TC344	7TAG009810R0008	91
SKT140-80	7TCA300040R0001	64	SRPE-15-9	7TCG054090R0223	128	TC344A	7TAG009810R0010	91
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SKT140-80X	7TCA300080R0001	65	SRPE-19-9	7TCG054090R0225	128	TC344AX	7TAG009810R0012	91
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SKT160-80X-100	7TCA300060R0002	65	SRPE-8-0	7TCG054090R0238	128	TC347A	7TAG009820R0051	89
SKT188-220	7TCA300200R0000	64	SRPE-8-9	7TCG054090R0239	128	TC347A-NDT	7TAG009660R0014	102
SKT188-220-100	7TCA300180R0000	64	TB-12-50RLDH	7TCG054360R0057	56	TC347FR	7TAG009820R0053	89
SKT188-220X	7TCA300240R0000	65	TB-15-50RLDH	7TCG054360R0059	56	TC347X	7TAG009820R0054	89
SKT188-220X-100	7TCA300220R0000	65	TB-4-50PMR-9-C-EU	7TCG054360R0060	53	TC349A-TB	7TCG009900R0001	112
SKT200-180	7TCA300120R0001	64	TB-50RLDH	7TCG054360R0061	56	TC349AN	7TCG009500R0035	112
SKT200-180-100	7TCA300100R0001	64	TC050x050A	7TAG009840R0003	92	TC350	7TCG009900R0002	112
SKT200-180X	7TCA300160R0001	65	TC050x050A-C	7TAG009830R0000	92	TC350A-TB	7TCG009900R0003	112
SKT200-180X-100	7TCA300140R0001	65	TC050x050AX	7TAG009840R0004	92	TC350AN	7TCG009500R0036	112
SKT200-80	7TCA300040R0003	64	TC050x050AX-C	7TAG009830R0001	92	TC368	7TAG009840R0015	92
SKT200-80-100	7TCA300020R0003	64	TC101	7TAG009880R0000	104	TC368A	7TAG009840R0016	92
SKT200-80X	7TCA300080R0003	65 65	TC102	7TAG009880R0001	99 102	TC375	7TAG009910R0084	104
SKT200-80X-100	7TCA300060R0003 7TCA300200R0001		TC102-NDT	7TAG009660R0008		TC376	7TAG009910R0086	104
SKT215-220 SKT215-220-100	7TCA300200R0001 7TCA300180R0001	64 64	TC102-PDT TC103	7TAG009660R0009 7TAG009880R0002	102 104	TC502 TC5102-NDT	7TAG009870R0000 7TAG009660R0015	99 102
SKT215-220-100	7TCA300180R0001	65	TC103	7TAG009880R0002	99	TC5102-ND1	7TAG009680R0006	102
SKT215-220X-100	7TCA30024010001	65	TC105	7TAG009840R0005	109	TC5140	7TAG009840R0017	95
SKT250-220	7TCA300200R0002	64	TC105AP	7TCG009500R0034	109	TC5141	7TAG009870R0002	95
SKT250-220-100	7TCA300180R0002	64	TC106	7TAG009910R0071	103	TC5141-NDT	7TAG009660R0017	102
SKT250-220X	7TCA300240R0002	65	TC109	7TAG009920R0001	103	TC5141-PDT	7TAG009660R0018	102
SKT250-220X-100	7TCA300220R0002	65	TC1101	7TAG009910R0072	104	TC5142	7TAG009870R0003	95
SKT300-180	7TCA300120R0002	64	TC1102	7TAG009910R0073	104	TC5142-NDT	7TAG009660R0019	102
SKT300-180-100	7TCA300100R0002	64	TC1103	7TAG009910R0074	104	TC5142-PDT	7TAG009660R0020	102
SKT300-180X	7TCA300160R0002	65	TC1104	7TAG009910R0075	104	TC5142X	7TAG009840R0018	95
SKT300-180X-100	7TCA300140R0002	65	TC1105	7TAG009910R0076	104	TC5342A	7TAG009800R0000	93
SKT300-220	7TCA300200R0003	64	TC1112	7TAG009910R0077	104	TC5342A-NDT	7TAG009660R0021	102
SKT300-220-100	7TCA300180R0003	64	TC1113	7TAG009910R0078	104	TC5342A-PDT	7TAG009660R0022	102
SKT300-220X	7TCA300240R0003	65	TC1114	7TAG009910R0079	104	TC5344	7TAG009790R0010	91
SKT300-220X-100	7TCA300220R0003	65	TC1115	7TAG009910R0080	104	TC5344A-NDT	7TAG009660R0023	102
SKT300-540	7TCA300280R0000	64	TC1116	7TAG009910R0081	104	TC5344A-PDT	7TAG009660R0024	102
SKT300-540-100	7TCA300260R0000	64	TC1117	7TAG009910R0082	104	TC5344AR	7TCG009500R0039	91
SKT300-540X	7TCA300320R0000	65	TC112-TB	7TAG009880R0004	98	TC5344AX	7TCG009790R0012	91
SKT300-540X-100	7TCA300300R0000	65	TC116-TB	7TAG009860R0003	108	TC5345A	7TAG009800R0002	90
SKT370-180	7TCA300120R0003	64	TC118-TB	7TAG009860R0004	108	TC5345AX	7TAG009800R0005	90
SKT370-180-100	7TCA300100R0003	64	TC120	7TAG009860R0005	108	TC5347A-NDT	7TAG009660R0025	102
SKT370-180X	7TCA300160R0003	65	TC121-TB	7TAG009860R0006	106	TC5347A-PDT	7TAG009660R0026	102
SKT370-180X-100	7TCA300140R0003	65	TC140	7TAG009880R0005	95	TC5347AR	7TCG009500R0040	89

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TC5347AX	7TCG009800R0008	89	TY125-18-9		47	TY200-120-9		47
TC5349A-TB	7TCG009890R0001	112	TY125-30	7TAG054360R0119	47	TY200-40	7TAG054360R0213	47
TC5350	7TCG009500R0042	112	TY125-30X	7TAG054360R0121	47	TY200-40X	7TAG054360R0228	47
TC5350A-TB	7TCG009890R0002	112	TY125-30-1		47	TY200-40-1		47
TC5355	7TAG009870R0004	105	TY125-30-2		47	TY200-40-2	7TAG054360R0216	47
TC5356	7TAG009870R0005	105	TY125-30-3		47	TY200-40-3	7TAG054360R0218	47
TC5357	7TAG009870R0006	105	TY125-30-4		47	TY200-40-4	1 11 1000 1000110210	47
TC5358	7TAG009850R0001	105	TY125-30-5		47	TY200-40-5		47
TC5359	7TAG009850R0001	105	TY125-30-6		47	TY200-40-6	7TAG054360R0222	47
TC5823	7TAG009850R0002 7TAG009850R0003	103	TY125-30-7		47	TY200-40-7	7TAG054360R0224	47
TC5828	7TAG009830H0003 7TAG009870R0007	107	TY125-30-7		47	TY200-40-7 TY200-40-8	7 TAG004000H0224	47
TC804-TB	7TAG009870A0007 7TAG009880R0008	99	TY125-30-9		47	TY200-40-9		47
				7TA 005 4000D0400			7T0005 4000D0000	
TC812-TB	7TAG009880R0009	98	TY125-40	7TAG054360R0123	47	TY225-50	7TCG054360R0230	47
TC814-TB	7TAG009880R0011	98	TY125-40X	7TAG054360R0141	47	TY225-50X	7TCG054360R0236	47
TC815-TB	7TAG009880R0012	100	TY125-40-1	7TAG054360R0124	47	TY225-50-1		47
TC817-TB	7TAG009840R0020	93	TY125-40-2	7TAG054360R0127	47	TY225-50-2		47
TC823-TB	7TAG009860R0007	107	TY125-40-3		47	TY225-50-3		47
TC823X	7TAG009860R0008	107	TY125-40-4	7TAG054360R0132	47	TY225-50-4		47
TC824-TB	7TAG009840R0021	109	TY125-40-5	7TAG054360R0134	47	TY225-50-5		47
TC826-TB	7TAG009880R0014	103	TY125-40-6	7TAG054360R0136	47	TY225-50-6		47
TC828-TB	7TAG009880R0015	101	TY125-40-7		47	TY225-50-7		47
TC86	7TAG009710R0006	114	TY125-40-8		47	TY225-50-8		47
TC87	7TAG009710R0007	114	TY125-40-9		47	TY225-50-9		47
TC88	7TAG009710R0008	113	TY125-50	7TAG054360R0144	47	TY232M	7TAG009040R0005	9
TC92	7TAG009910R0088	97	TY125-50X	7TAG054360R0146	47	TY232M-1	7TAG009070R0083	11
TC95	7TAG009710R0009	113	TY125-50-1		47	TY232M-2	7TAG009070R0084	11
TCP360	7TAA159160R0000	40	TY125-50-2		47	TY232M-3	7TAG009070R0085	11
TCP5255	7TAA159090R0004	40	TY125-50-3		47	TY232M-4	7TAG009070R0086	11
TCS25	7TAG009470R0057	82	TY125-50-4		47	TY232M-5	7TAG009070R0087	11
TCZ347	7TAG009820R0055	89	TY125-50-5		47	TY232M-6	7TAG009070R0088	11
TS1025HF	7TCG054360R0062	51	TY125-50-6		47	TY232M-7	7TAG009070R0089	11
TS1435HF	7TCG054360R0063	51	TY125-50-7		47	TY232M-8	7TAG009070R0090	11
TS2045HF	7TCG054360R0064	51	TY125-50-8		47	TY232M-9	7TAG009070R0091	11
TS2845HF	7TCG054360R0065	51	TY125-50-9		47	TY232MFR	7TAG009570R0000	17
TS3645HF	7TCG054360R0066	51	TY1435M	7TAG009520R0045	26	TY232MX	7TAG009040R0007	10
TS3675HF	7TCG054360R0067	51	TY150-18	7TAG054360R0149	47	TY234M	7TAG009050R0000	9
TT-11-30-0-L-EU	7TAG054780R0009	60	TY150-18X	7TAG054360R0151	47	TY234M-1	7 1AG009030H0000	11
TT-11-30-9-L-EU	7TAG054780R0012	60	TY150-18-1	7 1AG034300N0131	47	TY234M-2	7TAG009070R0092	11
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TT-14-30-9-L-EU	7TAG054780R0015						7T4 0000070D0000	
	7TAG054780R0017	60	TY150-18-3		47	TY234M-4	7TAG009070R0093	11
TT-7-30-0-L-EU	7TAG054780R0020	60	TY150-18-4		47	TY234M-5	7T4 000000000000000000000000000000000000	11
TT-7-30-9-L-EU	7TAG054780R0023	60	TY150-18-5		47	TY234M-6	7TAG009000R0210	11
TY100-18	7TCG054360R0073	47	TY150-18-6		47	TY234M-7	7TAG009070R0094	11
TY100-18X	7TCG054360R0096	47	TY150-18-7		47	TY234M-8	7TAG009000R0212	11
TY100-18-1	7TCG054360R0074	47	TY150-18-8		47	TY234M-9	7TAG009000R0211	11
TY100-18-2	7TCG054360R0078	47	TY150-18-9		47	TY234MX	7TAG009050R0001	10
TY100-18-3	7TCG054360R0081	47	TY175-50	7TAG054360R0153	47	TY23M	7TAG009040R0009	9
TY100-18-4	7TCG054360R0085	47	TY175-50X	7TAG054360R0178	47	TY23M-6	7TAG009070R0100	11
TY100-18-5	7TCG054360R0087	47	TY175-50-1	7TAG054360R0155	47	TY23M-7	7TAG009070R0101	11
TY100-18-6	7TCG054360R0089	47	TY175-50-2	7TAG054360R0159	47	TY23M-8	7TAG009070R0102	11
TY100-18-7	7TCG054360R0091	47	TY175-50-3	7TAG054360R0163	47	TY23M-9	7TAG009070R0103	11
TY100-18-8	7TCG054360R0093	47	TY175-50-4	7TAG054360R0167	47	TY23MFR	7TAG009570R0002	17
TY100-18-9		47	TY175-50-5	7TAG054360R0169	47	TY23MX	7TAG009040R0011	10
TY1000-175	7TAG054360R0100	49	TY175-50-6	7TAG054360R0171	47	TY23MX-A	7TAG009640R0000	19
TY1000-175X	7TAG054360R0101	49	TY175-50-7	7TAG054360R0173	47	TY242M	7TAG009120R0000	9
TY1200-175	7TAG054360R0102	49	TY175-50-8	7TAG054360R0175	47	TY242M-1	7TAG009000R0216	11
TY1200-175X	7TAG054360R0103	49	TY175-50-9		47	TY242M-2	7TAG009160R0005	11
TY125-18	7TCG054360R0104	47	TY200-120	7TCG054360R0182	47	TY242M-3	7TAG009160R0006	11
TY125-18X	7TCG054360R0148	47	TY200-120X	7TCG054360R0188	47	TY242M-4	7TAG009160R0007	11
TY125-18-1	7 7 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	47	TY200-120X TY200-120-1	, , 0 000 1000 10 100	47	TY242M-5	7TAG009160R0007	11
TY125-18-1	7TCG054360R0107	47 47	TY200-120-1	7TCG054360R0184	47 47	TY242M-6	7TAG009160R0008 7TAG009160R0009	11
	1 1 0 GUU 4 3 BUHU 1 U /		TY200-120-2 TY200-120-3	/ 100004300H0184				
TY125-18-3	7TOO05 4000 D0000	47 47			47 47	TY242M-7	7TAG009160R0010	11
TY125-18-4	7TCG054360R0068	47	TY200-120-4	770005 (0007	47	TY242M-8	7TAG009160R0011	11
TY125-18-5	7TCG054360R0111	47	TY200-120-5	7TCG054360R0185	47	TY242M-9	7TAG009160R0012	11
TY125-18-6	7TCG054360R0113	47	TY200-120-6	7TCG054360R0187	47	TY242MX	7TAG009130R0004	10
TY125-18-7		47	TY200-120-7		47	TY244M	7TCG009130R0005	9
TY125-18-8		47	TY200-120-8		47	TY244M-1		11

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TY244M-2	7TCG009160R0013	11	TY271MX	7TCG009450R0163	10	TY29M-7	7TCG009370R0037	11
TY244M-3	7TCG009000R0219	11	TY272M	7TAG009340R0002	9	TY29M-8	7TCG009370R0038	11
TY244M-4	7TCG009000R0220	11	TY272M-1	7TAG009000R0239	11	TY29M-9	7TCG009370R0039	11
TY244M-5	7 1 0 0 0 0 0 0 0 1 0 2 2 0	11	TY272M-2	7TAG009370R0001	11	TY29MX	7TAG009330R0014	10
TY244M-6	7TCG009160R0014	11	TY272M-3	7TAG009370R0003	11	TY300-120	7TAG054360R0238	47
TY244M-7	7100003100110014	11	TY272M-4	7TAG009370R0004	11	TY300-40	7TCG054360R0240	47
TY244M-8	7TCG009160R0015	11	TY272M-5	7TAG009370R0004 7TAG009370R0005	11	TY300-40X	7TCG054360R0256	47
TY244M-9	/ 100009100n0013		TY272M-6	7TAG009370R0007	11	TY300-40A	/ TOGUS4300NU230	47
TY244MX	7TCG009130R0006	11 10	TY272M-7	7TAG009370R0007 7TAG009370R0009	11	TY300-40-1	7TCG054360R0243	47 47
TY244IVIX		9	TY272M-8	/ IAG0093/0H0009			/ TOGUS4300HUZ43	47 47
	7TAG009130R0007		TY272M-9	7TA C000070D0011	11	TY300-40-3	7T000E4000D00E0	
TY24M -1	7TAG009160R0016	11		7TAG009370R0011	11	TY300-40-4	7TCG054360R0250	47
TY24M -2	7TAG009160R0017	11	TY272MFR	7TAG009570R0005	17	TY300-40-5	7TCG054360R0252	47
TY24M -3	7TAG009160R0018	11	TY272MX	7TAG009330R0007	10	TY300-40-6	7TCG054360R0254	47
TY24M -4	7TAG009160R0019	11	TY275M	7TAG009330R0009	9	TY300-40-7		47
TY24M -5	7TAG009160R0020	11	TY275M-1	7TAG009000R0241	11	TY300-40-8		47
TY24M -6	7TAG009160R0021	11	TY275M-2	7TAG009370R0014	11	TY300-40-9		47
TY24M -7	7TAG009160R0022	11	TY275M-3	7TAG009370R0015	11	TY300-50	7TAG054360R0259	47
TY24M -8	7TAG009160R0023	11	TY275M-4	7TAG009370R0012	11	TY300-50X	7TAG054360R0278	47
TY24M -9	7TAG009160R0024	11	TY275M-5	7TAG009370R0013	11	TY300-50-1		47
TY24MFR	7TAG009570R0003	17	TY275M-6	7TAG009370R0016	11	TY300-50-2	7TAG054360R0262	47
TY24MX	7TAG009130R0009	10	TY275M-7		11	TY300-50-3		47
TY24MX-A	7TAG009640R0001	19	TY275M-8		11	TY300-50-4	7TAG054360R0269	47
TY253M	7TAG009220R0001	9	TY275M-9	7TAG009000R0242	11	TY300-50-5	7TAG054360R0271	47
TY253M-1	7TAG009270R0002	11	TY275MX	7TAG009320R0001	10	TY300-50-6	7TAG054360R0273	47
TY253M-2	7TAG009270R0003	11	TY277M	7TAG009340R0003	9	TY300-50-7		47
TY253M-3	7TAG009270R0004	11	TY277M-1	7TAG009000R0243	11	TY300-50-8		47
TY253M-4	7TAG009270R0009	11	TY277M-2	7TAG009370R0017	11	TY300-50-9		47
TY253M-5	7TAG009270R0005	11	TY277M-3	7TAG009370R0018	11	TY33M	7TAG009520R0046	26
TY253M-6	7TAG009270R0006	11	TY277M-4	7TAG009370R0019	11	TY33MX	7TAG009520R0048	26
TY253M-7	7TAG009270R0007	11	TY277M-5	7TAG009370R0020	11	TY34M	7TAG009520R0049	26
TY253M-8	7TAG009270R0008	11	TY277M-6	7TAG009370R0021	11	TY34MX	7TAG009520R0050	26
TY253M-9	7TAG009000R0223	11	TY277M-7		11	TY35M	7TAG009520R0053	26
TY253MX	7TAG009220R0003	10	TY277M-8		11	TY35MX	7TAG009520R0056	26
TY25M	7TAG009210R0042	9	TY277M-9	7TAG009180R0005	11	TY37M	7TAG009520R0057	26
TY25M-1	7TAG009270R0010	11	TY277MX	7TAG009330R0010	10	TY37MX	7TAG009520R0060	26
TY25M-2	7TAG009270R0011	11	TY27M	7TAG009320R0003	9	TY38M	7TAG009530R0005	27
TY25M-3	7TAG009270R0013	11	TY27M-1	7TAG009370R0022	11	TY38MX	7TAG009530R0006	27
TY25M-4	7TAG009270R0014	11	TY27M-2	7TAG009370R0023	11	TY400-120	7TAG05333010000 7TAG054360R0282	47
TY25M-5	7TAG009270R0014	11	TY27M-3	7TAG009370R0024	11	TY400-120X	7TAG054360R0307	47
TY25M-6	7TAG009270R0016	11	TY27M-4	7TAG009370R0024	11	TY400-120-1	7TAG054360R0283	47
TY25M-7	7TAG009270R0017	11	TY27M-5	7TAG009370R0025	11	TY400-120-1	7TCG054360R0286	47
TY25M-8	7TAG009270R0017	11	TY27M-6	7TAG009370R0027	11	TY400-120-3		47
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TY25M-9	7TAG009270R0019	11	TY27M-7	7TAG009370R0028	11	TY400-120-4	7TAG054360R0293	47
TY25MFR	7TAG009570R0004	17	TY27M-8	7TAG009370R0029	11	TY400-120-5	7TAG054360R0295	47
TY25MX	7TAG009210R0045	10	TY27M-9	7TAG009370R0030	11	TY400-120-6	7TAG054360R0299	47
TY25MX-A	7TAG009640R0002	19	TY27MFR	7TAG009570R0006	17	TY400-120-7	7TAG054360R0301	47
TY26M	7TAG009120R0002	9	TY27MX	7TAG009320R0004	10	TY400-120-8	7TAG054360R0303	47
TY26M-1	7TAG009000R0234	11	TY27MX-A	7TAG009640R0003	19	TY400-120-9		47
TY26M-2	7TAG009160R0025	11	TY28M	7TAG009210R0048	9	TY400-40	7TAG054360R0311	47
TY26M-3	7TAG009160R0026	11	TY28M-1	7TAG009270R0020	11	TY400-40	7TAG054360R0313	47
TY26M-4	7TAG009160R0027	11	TY28M-2	7TAG009270R0021	11	TY400-40		47
TY26M-5	7TAG009160R0028	11	TY28M-3	7TAG009270R0022	11	TY400-40		47
TY26M-6	7TAG009160R0029	11	TY28M-4	7TAG009270R0023	11	TY400-40		47
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TY26M-8	7TAG009160R0030	11	TY28M-6	7TAG009270R0025	11	TY400-40		47
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TY26MX	7TAG009120R0004	10	TY28M-8	7TAG009270R0027	11	TY400-40		47
TY271M	7TCG009450R0162	9	TY28M-9	7TAG009270R0028	11	TY400-40		47
TY271M-1		11	TY28MFR	7TAG009570R0007	17	TY400-40		47
TY271M-2		11	TY28MX	7TAG009210R0050	10	TY400-50	7TAG054360R0315	47
TY271M-3		11	TY29M	7TAG009330R0012	9	TY400-50X		47
TY271M-4		11	TY29M-1	7TCG009370R0031	11	TY400-50-1		47
TY271M-5		11	TY29M-2	7TCG009370R0031	11	TY400-50-2	7TAG054360R0319	47
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TY271M-7		11	TY29M-4	7TCG009370R0034	11	TY400-50-4	7TA OOF 4000D0000	47
TY271M-8 TY271M-9		11	TY29M-5	7TCG009370R0035	11	TY400-50-5	7TAG054360R0326	47
		11	TY29M-6	7TCG009370R0036	11	TY400-50-6	7TAG054360R0328	47

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TY400-50-7		47	TY53510M-5	7TCG009000R0350	11	TY900-175	7TAG054360R0350	49
TY400-50-8	7TAG054360R0331	47	TY53510M-6	7TCG009400R0009	11	TY900-175X	7TAG054360R0351	49
TY400-50-9		47	TY53510M-7		11	TYB2315M	7TAG009050R0002	9
TY409	7TAG009550R0018	32	TY53510M-8		11	TYB2315M-1	7TAG009070R0106	9
TY4100PX	7TCG009460R0099	34	TY53510M-9	7TCG009000R0302	11	TYB2315M-2	7TAG009070R0107	9
TY41M	7TAG009520R0061	29	TY53510MX	7TCG009380R0002	10	TYB2315M-3	7TAG009070R0111	9
TY450-120	7TAG054360R0341	47	TY535M	7TAG009520R0068	26	TYB2315M-4	7TAG009070R0108	9
TY46M	7TAG009510R0018	36	TY535MX	7TAG009520R0069	26	TYB2315M-5	7TAG009070R0109	9
TY46MD	7TAG009510R0025	36	TY537M	7TAG009520R0070	26	TYB2315M-6	7TAG009000R0323	9
TY46MF	7TAG009510R0031	36	TY537MX	7TAG009520R0071	26	TYB2315M-8	7TAG009070R0110	9
TY46MT	7TAG009510R0033	36	TY53M	7TAG009510R0052	35	TYB2315M-9	7TAG009000R0324	9
TY48M	7TAG009510R0039	36	TY5409	7TAG009550R0020	32	TYB2315MX	7TAG009050R0003	10
TY512M	7TAG009510R0044	35	TY5418PX	7TAG009550R0021	33	TYB232M	7TCG009020R0054	14
TY51M	7TAG009510R0046	35	TY541M	7TAG009520R0072	29	TYB232M-1		14
TY5232MR	7TCG009030R0080	12	TY5424PX	7TAG009550R0022	33	TYB232M-2		14
TY5232MXR	7TCG009030R0082	13	TY5442PX	7TAG009550R0025	33	TYB232M-3		14
TY5234M	7TAG009020R0052	12	TY544MX	7TAG009530R0008	30	TYB232M-4		14
TY5234MX	7TAG009010R0011	13	TY54513M	7TCG009380R0003	9	TYB232M-5		14
TY523M-NDT	7TAG009660R0029	23	TY54513M-1	-T-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	11	TYB232M-6		14
TY523M-PDT	7TAG009660R0030	23	TY54513M-2	7TCG009380R0004	11	TYB232M-7		14
TY523MR	7TCG009030R0085	12	TY54513M-3		11	TYB232M-8		14
TY523MXR	7TCG009450R0168	13	TY54513M-4		11	TYB232M-9		14
TY5242MR	7TCG009110R0021	12	TY54513M-5		11	TYB232MX	7TCG009020R0055	14
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TY5244MR	7TCG009110R0023	12	TY54513M-7		11	TYB23M-1	770000045000400	14
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TY525M-CLRS	7TAG009270R0037	15	TY546MD	7TAG009510R0059	36	TYB23M-8	7TCG009450R0189	14
TY525M-NDT	7TAG009660R0032	23	TY546MF	7TAG009510R0060	36	TYB23M-9	-T-00000000000000000000000000000000000	14
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TY525MXR	7TCG009200R0023	13	TY54SM	7TCG009460R0104	27	TYB24M-1		14
TY526MR	7TCG009450R0177	12	TY54SMX	7TCG009460R0105	27	TYB24M-2		14
TY526MXR TY5271MR	7TCG009450R0178	13	TY5512M	7TAG009510R0064	35	TYB24M-3		14
TY527 IMR TY5271MXR	7TCG009450R0180	12	TY551M TY5532M	7TAG009510R0065	35 35	TYB24M-4 TYB24M-5		14 14
	7TCG009450R0181 7TCG009460R0102	13		7TAG009510R0067			7TCG009060R0013	14
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TY5272MXR TY5275M*	7TCG009460R0103	13 12	TY600-120	7TAG054360R0343	47 47	TYB24M-7 TYB24M-8		14 14
	7TAG009290R0004		TY600-120X	7TAG054360R0344				
TY5275MX* TY5277M*	7TAG009280R0000 7TAG009290R0005	13 12	TY600-120-1 TY600-120-2		47 47	TYB24M-9 TYB24MX	7TCG009960R0069	14 14
TY5277MX*	7TAG009290R0006	13	TY600-120-2		47	TYB25M	7TCG009960R0009 7TCG009450R0193	14
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TY527M-PDT	7TAG009660R0035	23	TY600-120-4		47	TYB25M-1	7TCG009450R0195	14
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TY533M	7TAG00951010000 7TAG009520R0062	26	TY800-120X	7TAG054360R0348	47	TYC272MX	7TCG009580R0002	21
TY533MX	7TAG009520R0063	26	TY800-120-1	300 10001 10040	47	TYC27MX	7TCG009580R0003	21
TY53418PX	7TAG009550R0019	33	TY800-120-1		47	TYC28MX	7TCG009580R0004	21
	7TAG009520R0064	26	TY800-120-3		47	TYC29MX	7TCG009580R0005	21
TY534M		20			47	TYC525MX	7TCG009580R0006	21
TY534M TY534MX		26	Y8()()-17(1-4					
TY534MX	7TAG009520R0065	26 9	TY800-120-4 TY800-120-5					
TY534MX TY53510M		9	TY800-120-5		47	TYC527MX	7TCG009580R0007	21
TY534MX TY53510M TY53510M-1	7TAG009520R0065 7TCG009380R0001	9 11	TY800-120-5 TY800-120-6		47 47	TYC527MX TYD-50R	7TCG009580R0007 7TAA159090R0005	21 38
TY534MX TY53510M	7TAG009520R0065	9	TY800-120-5		47	TYC527MX	7TCG009580R0007	21

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TYF35M	7TCG009520R0076	26	YBRH-12.7	7TCG009470R0059	81	YLS-12-1200B	7TCG009420R0034	74
TYF535M	7TCG009520R0077	26	YBRH-15.9	7TCG009470R0060	81	YLS-12-1200BC	7TCG009420R0035	75
TYG34M	7TCG009520R0078	28	YBRH-19.1	7TCG009470R0061	81	YLS-12-1400B	7TCG009420R0036	74
TYG34MX	7TCG009520R0079	28	YBRH-6.4	7TCG009470R0062	81	YLS-12-1400BC	7TCG009420R0037	75
TYG534M	7TCG009520R0080	28	YBRH-9.5	7TCG009470R0063	81	YLS-12-200B	7TCG009420R0038	74
TYG534MX		28	YID-CHAR-1					74 75
	7TCG009520R0081			7TCG009470R0065	80	YLS-12-200BC	7TCG009420R0039	
TYH232M	7TCG009590R0001	18	YID-CHAR-2	7TCG009470R0066	80	YLS-12-300B	7TCG009420R0040	74
TYH23M	7TCG009590R0002	18	YID-CHAR-3	7TCG009470R0067	80	YLS-12-300BC	7TCG009420R0041	75
TYH242M*	7TCG009590R0003	18	YID-CHAR-4	7TCG009470R0068	80	YLS-12-360B	7TCG009420R0042	74
TYH24M	7TAG009590R0004	18	YID-CHAR-5	7TCG009470R0069	80	YLS-12-360BC	7TCG009420R0043	75
TYH253M*	7TAG009590R0005	18	YID-CHAR-6	7TCG009470R0070	80	YLS-12-440B	7TCG009420R0044	74
TYH25M	7TAG009590R0006	18	YID-CHAR-7	7TCG009470R0071	80	YLS-12-440BC	7TCG009420R0045	75
TYH26M	7TCG009590R0007	18	YID-CHAR-8	7TCG009470R0072	80	YLS-12-520B	7TCG009420R0046	74
TYH272M*	7TCG009590R0008	18	YID-CHAR-A	7TCG009470R0074	80	YLS-12-520BC	7TCG009420R0047	75
TYH27M	7TAG009590R0009	18	YID-CHAR-B	7TCG009470R0075	80	YLS-12-600B	7TCG009420R0048	74
TYH28M	7TAG009590R0010	18	YID-CHAR-BLANK	7TCG009470R0076	80	YLS-12-600BC	7TCG009420R0049	75
TYH29M*	7TCG009590R0011	18	YID-CHAR-C	7TCG009470R0076	80	YLS-12-680B	7TCG009420R0049 7TCG009420R0050	73
TYHB23M	7TCG009460R0111	18	YID-CHAR-D	7TCG009470R0079	80	YLS-12-680BC	7TCG009420R0051	75
TYHT23M	7TAG009590R0012	20	YID-CHAR-E	7TCG009470R0080	80	YLS-12-760B	7TCG009420R0052	74
TYHT25M	7TAG009590R0014	20	YID-CHAR-EARTH	7TCG009470R0081	80	YLS-12-760BC	7TCG009420R0053	75
TYHT277M	7TAG009000R0326	20	YID-CHAR-F	7TCG009470R0082	80	YLS-12-840B	7TCG009420R0054	74
TYHT27M	7TAG009590R0015	20	YID-CHAR-G	7TCG009470R0083	80	YLS-12-840BC	7TCG009420R0055	75
TYHT28M	7TAG009590R0016	20	YID-CHAR-H	7TCG009470R0084	80	YLS-16-1000B	7TCG009420R0058	74
TYL300M	7TCG054360R0353	50	YID-CHAR-I	7TCG009470R0085	80	YLS-16-1000BC	7TCG009420R0059	75
TYL300MX	7TCG054360R0354	50	YID-CHAR-J	7TCG009470R0086	80	YLS-16-1200B	7TCG009420R0060	74
TYL546M	7TCG054360R0355	50	YID-CHAR-K	7TCG009470R0087	80	YLS-16-1200BC	7TCG009420R0061	75
TYL546MX	7TCG054360R0356	50	YID-CHAR-L	7TCG009470R0088	80	YLS-16-1400B	7TCG009420R0062	74
TYP23MX	7TAG009600R0000	22	YID-CHAR-M	7TCG009470R0089	80	YLS-16-1400BC	7TCG009420R0063	75
TYP25MX	7TAG009600R0001	22	YID-CHAR-MINUS	7TCG009470R0090	80	YLS-16-200B	7TCG009420R0064	74
TYP27MX	7TAG009600R0002	22	YID-CHAR-N	7TCG009470R0091	80	YLS-16-200BC	7TCG009420R0065	75
TYP28MX	7TAG009600R0003	22	YID-CHAR-O	7TCG009470R0092	80	YLS-16-300B	7TCG009420R0066	74
TYR505	7TAG009540R0001	31	YID-CHAR-P	7TCG009470R0093	80	YLS-16-300BC	7TCG009420R0067	75
TYR508	7TAG009540R0002	31	YID-CHAR-PLUS	7TCG009470R0094	80	YLS-16-360B	7TCG009420R0068	74
TYRAP PROF KIT	7TCA131140R0023	16	YID-CHAR-Q	7TCG009470R0095	80	YLS-16-360BC	7TCG009420R0069	75
TYS1000	7TAG009460R0112	78	YID-CHAR-R	7TCG009470R0096	80	YLS-16-440B	7TCG009420R0070	74
TYS14	7TAG009450R0203	78	YID-CHAR-S	7TCG009470R0097	80	YLS-16-440BC	7TCG009420R0071	75
TYS22	7TAG009460R0116	78	YID-CHAR-SINE	7TCG009470R0098	80	YLS-16-520B	7TCG009420R0072	74
TYS28	7TAG009460R0121	78	YID-CHAR-SLASH	7TCG009470R0099	80	YLS-16-520BC	7TCG009420R0072	75
TYS5200H	7TAG009470R0058	78	YID-CHAR-T	7TCG009470R0100	80	YLS-16-600B	7TCG009420R0074	74
TYS8	7TAG009460R0124	78	YID-CHAR-U	7TCG009470R0101	80	YLS-16-600BC	7TCG009420R0075	75
TYV23M	7TAG009000R0330	24	YID-CHAR-V	7TCG009470R0102	80	YLS-16-680B	7TCG009420R0076	74
TYV25M	7TAG009610R0000	24	YID-CHAR-W	7TCG009470R0103	80	YLS-16-680BC	7TCG009420R0077	75
TYV523M	7TAG009610R0001	24	YID-CHAR-X	7TCG009470R0104	80	YLS-16-760B	7TCG009420R0078	74
TYV525M	7TAG009610R0002	24	YID-CHAR-Y	7TCG009470R0105	80	YLS-16-760BC	7TCG009420R0079	75
TYZ23M*	7TAG009620R0000	25	YID-CHAR-Z	7TCG009470R0106	80	YLS-16-840B	7TCG009420R0080	74
TYZ25M	7TAG009620R0002	25	YLD-12-150-B	7TCG009460R0133	76	YLS-16-840BC	7TCG009420R0081	75
TYZ27M	7TAG009620R0004	25	YLD-12-150-BC	7TCG009450R0210	77	YLS-4.6-1000A	7TCG009410R0009	72
TYZ28M	7TAG009620R0005	25	YLD-12-225-B	7TCG009460R0136	76	YLS-4.6-1000B	7TCG009420R0084	72
TYZ523M*	7TAG009620R0006	25	YLD-12-225-BC	7TCG009450R0211	77	YLS-4.6-1000BC	7TCG009420R0085	73
TYZ525M	7TAG009620R0007	25	YLD-12-300-B	7TCG009450R0212	76	YLS-4.6-100A	7TCG009410R0010	72
TYZ527M								
	7TAG009620R0008	25	YLD-12-300-BC	7TCG009450R0213	77	YLS-4.6-100B	7TCG009410R0011	72
TYZ528M	7TAG009620R0009	25	YLD-12-450-B	7TCG009450R0214	76	YLS-4.6-100BC	7TCG009410R0012	73
ULNY-013-8-C	7TAG009970R0153	111	YLD-12-450-BC	7TCG009450R0215	77	YLS-4.6-1200A	7TCG009420R0086	72
ULNY-018-8-C	7TAG009970R0155	111	YLD-12-610-B	7TCG009460R0143	76	YLS-4.6-1200B	7TCG009420R0087	72
ULNY-023-8-C	7TAG009970R0156	111	YLD-12-610-BC	7TCG009460R0144	77	YLS-4.6-1200BC	7TCG009420R0088	73
WT-HSG	7TCA131140R0028	126	YLD-7-150-B	7TCG009450R0217	76	YLS-4.6-125A	7TCG009410R0013	72
WT1-TB	7TAA131800R0004	134, 139	YLD-7-150-BC	7TCG009450R0218	77	YLS-4.6-125B	7TCG009410R0014	72
WT197	7TAA131800R0005	134, 137	YLD-7-225-B	7TCG009450R0219	76	YLS-4.6-125BC	7TCG009420R0089	73
WT199	7TAA131800R0006	134, 137	YLD-7-225-BC	7TCG009450R0220	77	YLS-4.6-1400A	7TCG009420R0090	72
WT2-TB	7TAA131800R0007	134, 139	YLD-7-300-B	7TCG009450R0221	76	YLS-4.6-1400B	7TCG009420R0091	72
WT3D	7TAA131800R0008	134, 138	YLD-7-300-BC	7TCG009450R0222	77	YLS-4.6-1400BC	7TCG009420R0092	73
WT3S	7TAA131810R0002	134, 140	YLD-7-450-B	7TCG009460R0157	76	YLS-4.6-150A	7TCG009410R0015	72
YBR-12.7-25BC	7TCG009460R0126	81	YLD-7-450-BC	7TCG009450R0223	77	YLS-4.6-150B	7TCG009420R0093	72
YBR-15.9-25BC	7TCG009460R0127	81	YLD-7-610-B	7TCG009450R0224	76	YLS4.6-150BC	7TCG009410R0034	73
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	7TCG009460R0128 7TCG009460R0129	81 81	YLD-7-610-BC YLS-12-1000B	7TCG009450R0225 7TCG009420R0032	77 74	YLS4.6-200A YLS4.6-200B	7TCG009410R0035 7TCG009410R0036	72 72

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YLS-7.9-100A	7TCG009420R0107	72
YLS-7.9-100B	7TCG009420R0108	72
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YLS-7.9-1200B	7TCG009420R0111	72
YLS-7.9-1200BC	7TCG009420R0112	73
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Notes

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