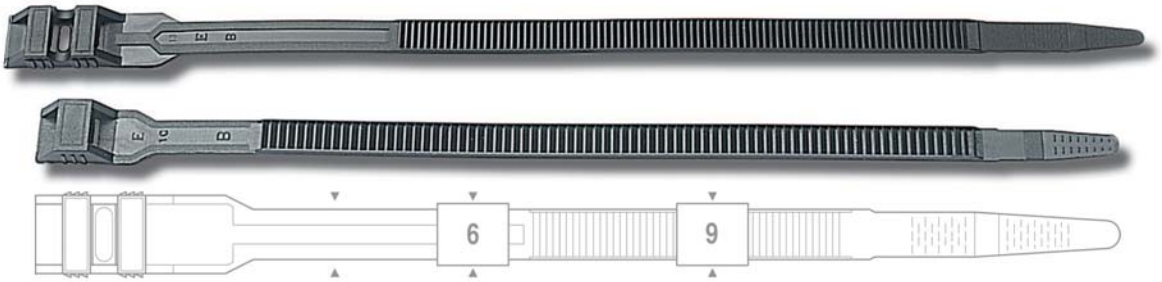
BELTURING PLUS CABLE TIES



CE

Characteristics of raw material:

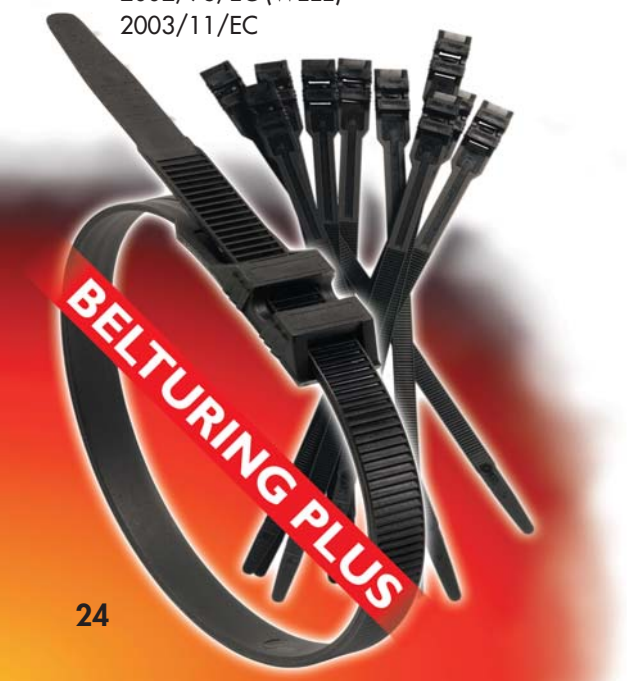
Humidity absorption: <1%

- Working temperature da -45°C a +85°C
- Tightening temperature da -30°C a +60°C
- Max admissible point +120°C for short time

Limit Oxygen Index (LOI): 22% (EN ISO 4589-1and ASTM D 2863-00)
Flammability rating: UL 94 class HB.
Halogen-free resins.
According to EN 50 146 and EDF HN 33 S 62

- High resistance to bases, oils, greases, oil derivatives, chloride solvents.
- Limited resistance to acids.
- Not resistant to phenols.
- Halogen-free resins.
- UV resistance.

EC Directives:
The raw material used to produce these cable ties is compliant with EC Directives:
2000/53/EC (ELV)
2002/95/EC (RoHS)
2002/96/EC (WEEE)
2003/11/EC



Applications

- Electrical installations.
- Industrial wiring.
- Automotive.
- Panel building.
- Special applications.
- Outdoor uses.

Characteristics

The flat head, the high surface and the closing system with external teeth of these Cable Ties make them particularly suitable for applications on suspended lines, avoiding problems of insulation damage.

Benefits

- Highly withstands climatic changes, also in sea-areas.
- High UV resistance.
- Halogen-free resins.

Tools for cable ties, see pages 106-107.

TEMPORARY INSTALLATION (RELEASABLE CABLE TIE)

DEFINITIVE INSTALLATION

Belturing Plus Cable Ties - SINGLE HEAD

Code	Dimension (mm)	Ø Bundle max (mm)	Tensile strength (Kg)	(N)	Bag pcs	Carton pcs
6449XE	115x6	25	28,56	280	100	9.000
6450XE	180x6	45	28,56	280	100	6.000
6452XE	290x6	78	28,56	280	100	4.800
6454XE	360x6	100	28,56	280	100	1.500
6447XE	132x9	27	39,78	390	100	4.800
6451XE	180x9	40	39,78	390	100	4.800

Belturing Plus Cable Ties - DOUBLE HEAD

Code	Dimension (mm)	Ø Bundle max (mm)	Tensile strength (Kg)	(N)	Bag pcs	Carton pcs
6453XE	260x9	62	55,08	540	100	2.800
6448XE	300x9	80	55,08	540	100	1.500
6455XE	360x9	93	55,08	540	100	1.500
6456XE	510x9	140	55,08	540	100	1.000
6457XE	760x9	220	55,08	540	100	800

A very practical box that can easily be hung to your belt. Its convenient upper opening, very easy to be reclosed, allows the quickest picking-up of the product and the best protection from dust.

How to choose the right cable tie

The most important characteristics of a cable tie are:
- the raw-material they are made of (weather, chemicals and heat resistance)
- the tensile strength they can stand (tear strength)
- the min and max diameter they can bundle
- the shape of the tie in case of particular applications
- the flammability rating

Hereby a few suggestions on how to choose the right cable tie for your application.

Resistance to chemical agents

Chemical agents as powders, liquids or gases can deteriorate the raw material cable tie are made of, or extract some components from the plastic compound. The mechanical properties of the cable tie can deteriorate as a consequence of the interaction with several compounds. In this case the performance of the product could not meet the required standards.

UV and weather resistant cable ties

All polymers including the polyamides used for the production of cable ties are sensitive to UV radiation.
The most common additive used for protecting polyamides from UV radiation is carbon powder commonly known as "carbon black".

Natural Cable Ties (**Elematic codes 52xx)** have low resistance to UV radiation and therefore are not suggested for outdoor applications.

Black Cable Ties (Elematic codes 53xx) are additivated with carbon black. They have improved weather and UV radiation resistance and are better suitable for outdoor applications, but this is not enough to protect the material from the damage due to the UV-radiation for a long time. For these needs the weather resistance cable ties could be used.

Tests performed in should labs give for black cable ties a resistance till 150 hours QUV-B radiation following ISO 4892 norm. This can be compared to ca. 3 years outdoor resistance on average exposure to South-European areas.

We underline that particular environmental situations as combination of exposure to chemical agents and UV radiation, exposure to very warm, humid and sunny weather, etc., can change dramatically the performance of the product. Our indications should therefore be used only as a reference. In case of specific needs, please contact our technical department.

Weather Resistant Cable Ties (Elematic codes 53xx UV) are made of a specially additivated compound to provide an extra weather resistance so that they are optional for outdoor applications.

Tests performed in recommended labs give for weather resistant cable ties a resistance till 600 hours of QUV-B radiation following ISO 4892 norm. This can be compared to ca. 10 years outdoor resistance on average exposure to South-European areas.

For minimum order quantities and quotations please contact our sales department.

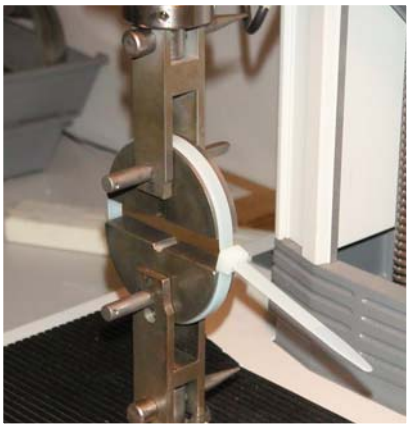
Heat resistance and self-extinguishing cable ties

All polymers including also polyamides used for the production of cable ties are sensitive to high temperatures.
Exposure to high temperatures can break the chemical bonds of the polymer causing degradation and loss of mechanical resistance. Polyamide products can therefore become fragile and sensitive to vibrations.
The max suggested installation temperature for standard cable ties is 60°C, while the max service temperature for continuous use is 85°C.

Heat Resistance Cable Ties (Elematic codes 53xx T) are made of a specially additivated compound to provide an extra heat resistance (max service temperature for continuous use up to 125°C).
Polymers are also sensitive to low temperatures. Application of polyamide 6.6 cable ties is possible till around -10°C. Standard polyamide becomes very brittle at temperatures below -40°C (min. suggested service temperature for continuous use).

Heavy-duty Cable Ties (Elematic "Belturing Plus" range) provide an extra resistance to cold temperature (installation possible till -30°C) and an excellent resistance to UV radiation, therefore they are suggested also for external applications and long term exposure under the sunlight and UV action.

Self-extinguishing cable ties (Elematic codes 52xx V0) are made of polyamide 6.6 with additives that gives the auto extinguishing performance; the halogen and phosphorus free material avoids toxic emission in event of fire and conforms to UL-94 V0 and GW 960 °C standards.



Tear resistance

The tear resistance is the most important parameter for choosing the right cable tie for a specific application.

The technical data sheets of Elematic cable ties give the minimum guaranteed tear resistance for all sizes.

Elematic cable ties are tested following the main international standards as SAE AS 23190 (former MIL) or EN 50146 using dedicated equipment and with a constant rate of 25 mm/min.

The strength causing the collapse of the cable tie is given in Newton (N).

The standard testing conditions are 23°C and 50% of relative humidity.

It is important to underline that the values arising from those laboratory tests may not be representative of the resistance to the loads of real installations, due to the presence of external factors (high humidity, vibrations, high temperatures, etc.).

We therefore suggest to apply a safety factor of at least 2. This safety factor should be chosen depending on the application conditions.

In case of severe working conditions, at high temperatures, high humidity, vibrations… this safety factor should be increased up to 5.

General indications for cable ties installation (2,2-4,8 mm)

Cable Ties width (mm)	2,2	2,5÷2,6	3,6	4,5÷4,8
Tool setting (daN)*	0<daN<3	3<daN<6	6<daN<10	10<daN<13

*1 daN ≃1kg

For more details concerning specific requirements, please ask our technical department.

Flammability rating of Cable Ties

The UL 94 test (flammability of plastic materials for parts in devices and appliances) enables to compare plastic materials in terms of their burning behaviour. It gives indication either on the relative speed of burning, or on the ability to extinguish or not to propagate fire.

The classification starts with the lowest level HB till the highest V0 (best self-extinguishing value).

HB (Horizontal Burning) - Test description

Sample size	125 ± 5 x 13 ± 0.5 mm
Thickness	0.8; 1.6; 3.2; 6 mm
	Bar having marked lines at 25 and 100 mm from its end
Pre-treatment	48 hours / 23 ± 2 °C / 50 ± 5% RH
Burner	Bunsen Ø 9.5 mm 100 mm length
Flame height	20 ± 1 mm
Contact time	30 s

The material is classified HB if the burn rate measured between the 2 marks, does not exceed:
38.1 mm/min for 3.2 mm testbar thickness;
63.5 mm/min for <3.2 mm testbar thickness;
In both cases the testbar should stop burning before reaching the 100 mm mark.

VO-V1-V2 (Vertical Burning) - Test description

Sample size	125 ± 5 x 13 ± 0.5 mm
Thickness	0.8; 1.6; 3.2; 6 mm
Pre-treatment	One set of 5 testbar conditioned for 48 hours / 23 ± 2 °C / 50 ± 5% RH;
	One set of 5 testbar conditioned for 168 hours at 70 ± 1 °C
Burner	Bunsen Ø 9.5 mm 100 mm length
Flame height	20 ± 1 mm
Number of flame applications	2 x 10 s

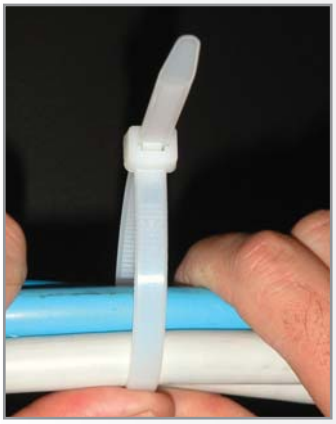
A flame is applied 2 times on 5 testbars obtaining 10 values per set of testbars. Two sets of sample, differently conditioned are tested for a total of 20 values.

Classification	**V0**	**V1**	**V2**
Maximum burning time single specimen (s)	≤ 10	≤ 30	≤ 30
Maximum burning time total of 5 specimens (s)	≤ 50	≤ 250	≤ 250
Afterflame plus afterglow time for each individual specimen after the second flame application (s)	≤ 30	≤ 60	≤ 60
Afterflame or afterglow of any specimen up to the holding clamp	No	No	Yes
Cotton indicator ignited by flaming particles or drops	No	No	Yes

All standard Elematic polyamide 6.6 cable ties are made of UL94-V2 classified raw material.

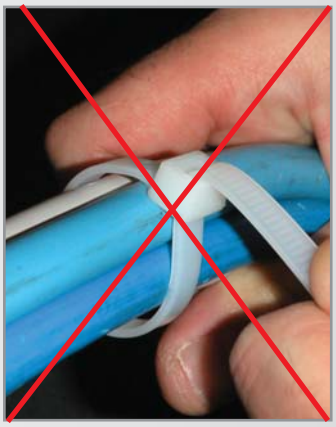
Special Cable Ties (Elematic codes 52xx V0 are made of a specially additivated compound to provide an extra self-extinguishing power (UL94-V0).

MANUAL INSTALLATION OF STANDARD CABLE TIES

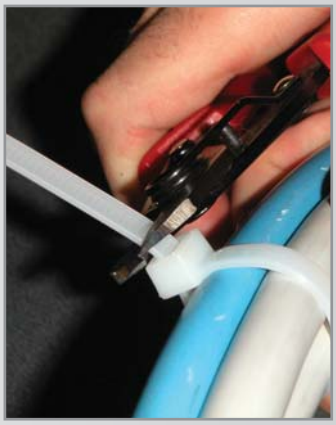


Insert the tip of the tie.

Tighten manually the tie till complete fixing of the cables.



Avoid sharp bending of the tie: it will not improve the fixing strength.



Cut the exceeding part of the tie, with a few mm of safety length.

TOOL INSTALLATION OF STANDARD CABLE TIES

Set the max tension of the tool depending on the size of the tie.

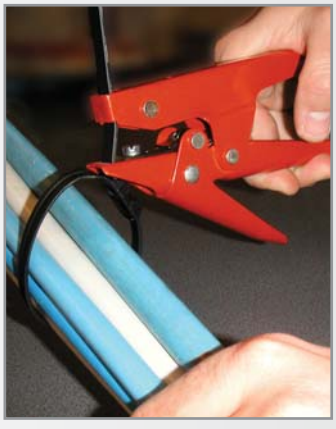
Grip the tie with the tool.

Tighten the tie till complete fixing of the cables.

Cut the exceeding part of the tie.

TOOL INSTALLATION OF BELTURING CABLE TIES

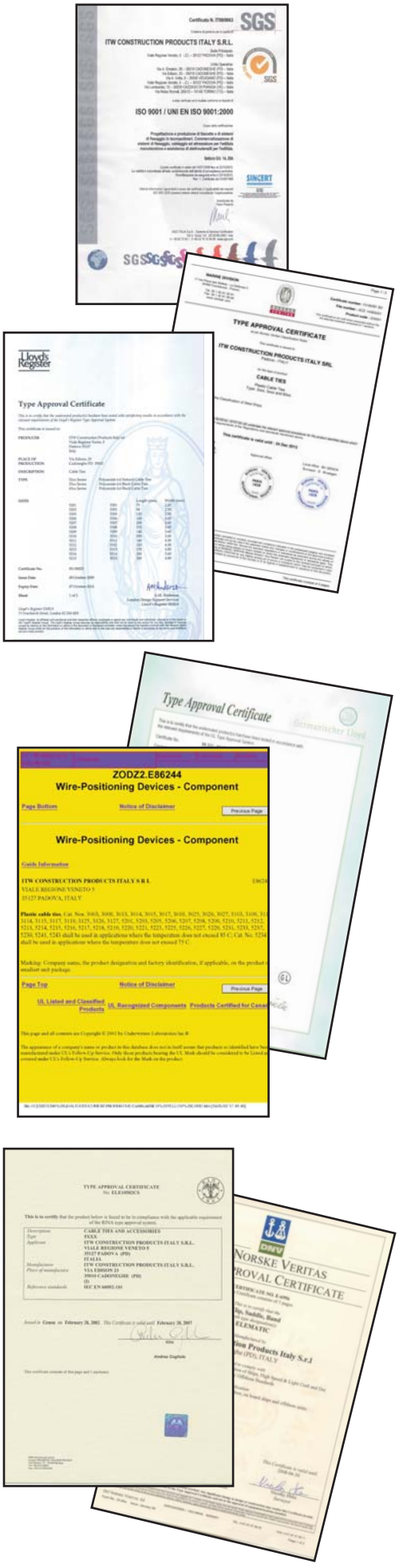
Insert the tip of the tie and tighten a short segment.



Use the tool for tightening the tie around the cables.

Tighten the tie till complete fixing of the cables.

Cut the exceeding part of the tie with the tool, leaving at least one centimeter of safety length.



Quality System

ISO 9001:2000

The company is certified ISO 9001:2000 for the design and manufacturing of cable ties and fixing systems with engineering polymers. Trading of fixing, cabling systems and electrical power tools. This certification guarantees that all the steps of our company processes, from development to delivery, are controlled following detailed procedures.

Voluntary product certifications through international approval societies

UL – File E86244

Elematic Cable Ties are recognized by the Underwriters Laboratories Inc. following the norm UL 1565 "Wire positioning devices" for the continuous use at a max temperature of 85°C.

R.I.Na. Certificate ELE158207CS

Italian Naval Register omologation following the norm IEC EN 60092-101 "Electrical installation in ship".

GL Germanisches Lloyd certificate Nr. 99 332 – 97 HH

Certifies the mechanical properties and the flame resistance of the Elematic cable ties.

DNV - File E6996

Guarantees that the Elematic cable ties comply the "Det Norske Veritas" standards for the securing of cables in the naval constructions and offshore, for indoor and outdoor installations.

LLOYD'S REGISTER – Type Approval Certificate N° 09/00025

Certifies the mechanical properties and the flame resistance of Elematic cable ties in the shipbuilding and offshore applications.

BUREAU VERITAS - Certificate n° 13190/B1 BV

This homologation, according to IEC 60092 – EN 50146 normative, assures that Elematic Cable Ties are made in accordance to "Bureau Veritas" standards for the fixing cables in shipbuilding.

Internal certifications

CE marking

Elematic certifies the conformity of its cable ties to the European instruction 73/23/CEE and following modification 93/68/CEE.

CEI EN 50146 - CEI - IEC 62275

Elematic cable ties are internally tested following the European Norm "Cable Ties for Electrical Installation". The results are in accordance with the requirements of the regulation.

RoHS - WEEE - ELV

Material used for Elematic cable ties & Accessories are compliant to European directives regarding:

- RoHS - restriction on hazardous substances (2002/95/CE),
- WEEE - waste of Electrical and Electronic Equipment (2002/96/CE),
- ELV - life vehicles (2000/53/CE).