

feel it

 **LONDON 2012**^{EN}





NEW

8.9

8.9 master

An exceptional rope with a diameter of **8.9 mm**, a single, half and twin rope in one. With a low weight, 52 g/m and the Complete Shield finish this is a rope to allow you to push your climbing even further. The double impregnation increases life span and its resistance to moisture, abrasion and penetration of impurities into the rope. The fantastic handling properties of the rope and the minimum friction through running belays make this rope your ally on long sport routes and technical mountain terrain.

Master

The absolute top of the line of our collection - extremely light ropes with a small diameter and low weight, for the toughest sport climbing and for extreme ascents in the mountains. The latest technologies and experience of our development team were used for their production. TEFLON®Eco is used for impregnating the sheath and/or the core of the rope using the revolutionary TENDON NANOTECHNOLOGY method. Selected ropes are then equipped with SBS construction of sheath. We have made MASTER ropes for all extreme climbers and demanding users.

EN 892
CE 1019

Tips Impregnation of ropes with the COMPLETE SHIELD treatment prevents water soaking into the entire structure of the rope (a wet rope is weaker and heavier). This advantage is manifested mainly at temperatures around zero degrees when in lower parts of the climb there may be slushy snow and a non-impregnated rope may absorb a considerable quantity of water into its structure. In the higher elevation of the climb or in the course of the day the temperature may drop below zero and the rope will get frozen and stiff. Its weight will increase, the number of falls will be reduced and handling the rope will become very difficult.

Rope diameter (mm)	8,9	8,9	8,9	9,2	9,4	9,7	7,8	7,8	8,5	8,5
	①	①	1/2	①	①	①	1/2	①	1/2	①
Weight (g/m)	52	52	52	53	58	61	38	38	48	48
Number of UIAA falls	5	29	16	5-6	5-7	9-10	6	16-17	10	14-17
Max. impact force (kN)	8,7	9,6	6,1	6,8	7	7,6	5,7	8,5	5,5	8
Sheath slippage (mm)	0	0	0	0	0	0	0	0	0	0
Static elongation (%)	6,9	6,9	6,9	9	8,9	7,6	8	7	8	8
Dynamic elongation (%)	33	27	30	35	35	35	32	30	34	34
Knotability	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8

Pictograms	Standard	Water	Fire	UV	CE	UIAA	SBS	TEFLON
8.9 single	-	-	•	•	•	•	-	•
8.9 twin	-	-	•	•	•	•	-	•
8.9 half	-	-	•	•	•	•	-	•
9.2 single	•	•	•	•	•	•	-	•
9.4 single	•	•	•	•	•	•	-	•
9.7 single	•	•	•	•	•	•	-	•
7.8 half	•	•	•	•	•	•	-	-
7.8 twin	•	•	•	•	•	•	-	-
8.5 half	•	•	•	•	•	•	-	-
8.5 twin	•	•	•	•	•	•	-	-

Master 9.2

The specialist of our range. Low weight and narrow diameter suit this rope to top-end sport climbing. Choose this rope for extreme on-sights and red-points where every gram saved and drag reduction are crucial to success.



D092TM21S000C • green

Master 9.4

An excellent single rope with low weight, great technical parameters and SBS construction of the sheath, which makes the rope not only more resistant to abrasion, but also soft and easy to manipulate. The best choice for both hard and sport climbing.



D094TM21S000C • red



D094TM22S000C • blue

Master 9.7

A top-class single rope with low weight and our SBS sheath construction that combines both increased resistance to abrasion, and great handling qualities. If you care about maximum performance, you have just found the right rope.

9.7



D097TV21S000C • yellow



D097TV22S000C • green

Master 7.8

An excellent rope with uncompromising quality certified both as a half and twin rope. Low weight and top-class specifications enable broad versatility but it's ideally suited to ice and mixed climbing.

7.8



D078TD21S000C • red/yellow



D078TD24S000C • green/black



D078TD22S000C • blue/red



D078TD23S000C • green/yellow

Master 8.5

High wear resistance and long lifespan target this rope towards both extreme rock climbs in summer as well as winter mountaineering. The possibility of its use as half rope and twin rope increases its versatility greatly.

8.5



D085TF22S000C • khaki/blue



D085TF21S000C • green/yellow

Ambition

The most popular ropes in our collection. Outstanding technical parameters, excellent handling and versatility predispose these ropes for frequent use for rock and mountain climbing. Applying TEFLON®Eco using the revolutionary TENDON NANOTECHNOLOGY method makes the absolute top-of-the-line impregnated ropes. Selected models of ropes are equipped with SBS or Bicolour sheath construction, which increases the utility of the product. AMBITION ropes are intended for all climbers who want to keep getting better and who enjoy climbing.

EN 892
CE 1019

Tip BICOLOUR – manufacturing technology of stranding offers various patterns on one rope – giving a clear indication of the centre and a guide to how much rope has been paid out. An optimist says that we still have a half to the end of our journey. On the other hand, a pessimist declares that it is a great pity that a half of our journey is over.
Marking of the rope centre with a dye used for the same purpose – the harmless dye does not have any impact on the quality of the rope.

Rope diameter (mm)	9.8	10.0	10.2	10.5	7.9	7.9	8.5	9.1
	①	①	①	①	1/2	∞	1/2	1/2
Weight (g/m)	64	65	66	68	40	40	46	52
Number of UIAA falls	9-10	9	12-13	9-11	6	16-17	10-11	13-14
Max. impact force (kN)	7.6	7.2	8	8.5	5.6	8	5.5	5.5
Sheath slippage (mm)	0	0	0	0	0	0	0	0
Static elongation (%)	7.6	7.1	7.4	7.2	7.8	7.8	6	7.2
Dynamic elongation (%)	35	33	34	34	35	30	35	36
Knotability	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Pictograms								
9.8 single	●	●	●	●	●	●	–	●
10.0 single	●	●	●	●	●	●	–	–
10.2 single	●	●	●	●	●	●	–	–
10.5 single	●	●	●	●	●	●	–	–
7.9 half	●	●	●	●	●	●	–	–
7.9 twin	●	●	●	●	●	●	–	–
8.5 half	●	●	●	●	●	●	–	●
9.1 half	●	●	●	●	●	●	–	–

Ambition 10.2

A dynamic rope with an excellent specification and great designs. Maximum user convenience is achieved by the combination of high suppleness, good knotability, strength and toughness. The right choice for all those who are regular climbing enthusiasts.



D102TM22S000C • blue



D102TM21S000C • yellow

Ambition 10.5

An excellent all-rounder and a good choice for those who want to possess one rope only. The best compromise diameter with extraordinary durability and great technical performance make the rope suitable for all kinds of climbing activities.



D105TA21S000C • red



D105TA22S000C • blue

Ambition 10

Dynamic sport climbing rope of SBS construction with a perfect design. Excellent handling, high resistance to abrasion and low weight are the special characteristics, which make this rope the top within its class. There is no better choice for those who have climbing as a passion. Check the best technology - now available in AMBITION line!

10



D100TA21S000C • red



D100TA22S000C • blue

Ambition 8.5

A lightweight half rope with great versatility and very high durability. All its technical specifications are designed to increase safety and broaden the range of suitable usage.

8.5



D085TB21S000C • yellow



D085TB22S000C • blue



D085TB25S000C • bicolor

Ambition 7.9

A lightweight rope certified as both a half and twin rope. Good durability and low weight make this rope the best companion when glacier walking or ski mountaineering.

7.9



D079TA22S000C • red



D079TA21S000C • yellow

Ambition 9.1

Our safest half rope with high strength, excellent knotability and fantastic abrasion resistance. Its features will be appreciated especially on conventional alpine ascents all the year round.

9.1



D091TE21S000C • yellow



D091TE22S000C • blue

Ambition 9.8

A more conventional sport rope designed for climbers aiming to get better. Although having a narrow diameter, this rope will give a long lifespan and high abrasion resistance. Its low weight, higher fall rating and excellent ease of handling are all benefits to help you push your own limits.

9.8



D098TR22S000C • yellow/red



D098TR21S000C • yellow/black



D098TR25S000C • bicolour



Marek Holeček

Trust

These are the most durable ropes in our collection. Their outstanding durability, long service life and high number of falls are properties making these the ideal ropes for use in rock climbing centres, mountain climbing schools, and schools for special climbing and rescue training.

TEFLON® Eco is used for impregnating the sheath and/or the core, and is applied using the revolutionary TENDON NANOTECHNOLOGY method.

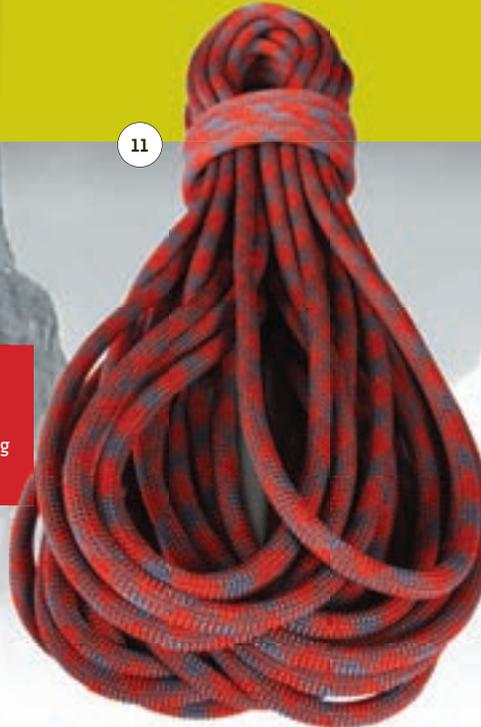
TRUST ropes are intended for total professionals who demand maximum safety and service life.

EN 892
CE 1019

Tips What does the term Number of UIAA falls mean? And what is actually a fall? A standard fall is something that a climber should hope never to experience in his life even if he pushes hard... and the Number of UIAA falls is an exactly defined test that certifies how strong a rope is and what it is able to withstand as regards falls.

Trust 11

A dynamic single rope with high safety factor and utmost durability. Designed for heavy usage in rope training centres and climbing schools - where the properties of this product will be appreciated most.



D110TT22S000C • yellow



D110TT21S000C • red

Trust 11.4

A highly flexible single rope with high safety factor and long lifespan. The right choice for everyday professional use.



D114TA22S000C • blue



D114TA21S000C • yellow

Rope diameter (mm)	11	11.4
	①	①
Weight (g/m)	78	83
Number of UIAA falls	16-17	20-21
Max. impact force (kN)	8.4	8.6
Sheath slippage (mm)	0	0
Static elongation (%)	7	6.5
Dynamic elongation (%)	35	36
Knotability	0.9	0.9
Pictograms		
Trust 11	●	●
Trust 11.4	●	●

Tips

The fall factor and physiological limitation of the body with regard to the absorption of the fall energy are the main arguments why not to climb on a static rope. A dynamic rope receives certain elasticity in the production that absorbs a great part of the energy produced during capturing of the fall of a climber. Compared to a dynamic rope, a static rope does not have any elasticity or only has minimum elasticity. In case of a climber's fall on a static rope a part of energy is not absorbed in the entire rope, but all the energy is transferred to the harness, climber's body and belaying elements in the wall. There is a danger of serious damage of internal organs of the climber, of the belaying points being torn out and in an extreme case of rupture of the rope.

Ropes for indoor climbing are characterized with thicker and more resistant braiding as compared to standard ropes. They are ideal for use where the rope is subjected to heavy use, such as at an indoor wall, where top rope belaying will be normal. These ropes are suitable for all conditions where the braiding of standard ropes would have a shorter life expectancy.

Indoor 10.4

The top indoor ropes specially developed and tested for climbing on artificial walls and for top rope belaying. Robust sheath, practical and easy identifiable rope design, long life, excellent handling - are the specific parameters of ropes for indoor climbing.

EN 892
CE 1019

10.4



D104T121S000C • green

HardRope 10.4

A high-performance rope which, due to its construction, materials used and thicker and coarser sheath, has an extremely long lifespan and high abrasion resistance whilst maintaining all advantages of a dynamic rope - great number of drops, low impact force and very good handling. It is the right choice for frequent use under extreme conditions, for instance in climbing schools or outdoor centres.

EN 892
CE 1019

10.4



D104TH21S000C • red-yellow

Rope diameter (mm)	10.4 Indoor	10.4 HardRope
	①	①
Weight (g/m)	72	71.3
Number of UIAA falls	8-9	7-9
Max. impact force (kJ)	8	8.2
Sheath slippage (mm)	0	0
Static elongation (%)	7.5	6
Dynamic elongation (%)	39	39
Knotability	1.1	1

Pictograms	Standard	Water	UV	Rock	CE	UIAA	88	BC
10.4 HardRope	●	●	●	●	●	●	-	-
10.4 Indoor	●	-	-	●	●	●	-	-

Touch

Ropes and accessory cords, which are made of specially adjusted polyamide, which gives them absolutely unique user qualities.

Both ropes and cords feature an excellent "soft" handling, which evokes a return to classical natural materials (cotton etc.), increased resistance to heating during quick rappels, excellent resistance to abrasion and simple binding of knots.

Touch Static



L090TT21S000C • white/blue



L105TT21S000C • white/blue



EN 1891
CE 1019



EN 564
CE 1019

Touch 6.0



A060TT21S000R • white/red



A060TT22S000R • white/blue

	Touch Reep	Touch Static	Touch Static
Rope diameter (mm)	6	9	10.5
Weight (g/m)	23.2	51.4	73
Number of falls	-	25	40
Relative mass of sheath (%)	-	34.5	36
Sheath slippage (mm)	-	0	0
Elongation (50 - 150 kg) (%)	-	2.6	3.8
Shrinkage (%)	-	3	3
Tenacity (kN)	-	20	38
Min. tenacity with knots (kN)	-	13	15
Used material	PA	PA	PA
Min. strength (daN)	1000	-	-
Typ	-	B	A



Zdeněk Ustohal

Ambition 7.9 ALPINE

A superb rope intended to be used especially by mountain guides for "short roping". Excellent for many types of sport activities in the mountains - its low weight and top parameters make it ideally suited to ski alpine touring or highmountain hiking. This very light rope with long life span is available in short lengths of 20 m and 30 m as well as in coils of 200 m.

EN 892
CE 1019



Rope diameter (mm)	7.9 Alpine	7.9 Alpine
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1/2

30

Weight (g/m)	40	40
Number of UIAA falls	6	12-13
Max. impact force (kN)	5.2	8.3
Sheath slippage (mm)	0	0
Static elongation (%)	11.7	7.8
Dynamic elongation (%)	35	30
Knotability	0.8	0.8



D079TL21S000C • red



D079TL22S000C • yellow

Pictograms        

7.9 half	•	•	•	•	•	-	-
7.9 twin	•	•	•	•	•	-	-



GO PLANET GREEN

Some parents invest thousands of dollars in education for their children. Help invest in saving the mountains and glaciers.

Your children will want to follow your adventure spirit and walk your path.

We need to make sure there will be the path to follow.



Pictograms



SINGLE ROPES

For ascent where only one rope is used. This is the most basic and widely used method of using rope for ascents.



HALF ROPES

Separate ropes are anchored in alternating belaying points. This system reduces the risk of rope breakage by falling rocks and provides maximum protection in alpine conditions or on tough climbs.



TWIN ROPES

The same ropes are always used in pairs, secured at common belaying points. Twin ropes guarantee a high level of safety, especially for classic alpine climbing.



STANDARD

Improved basic finishing of dynamic ropes. The new technological process enables the application of impregnation agents early in the standard finishing of the ropes.



PROTECT SHIELD

In addition to the standard finishing against water and abrasion, the sheath of the entire product is treated with the TENDON NANOTECHNOLOGY surface finish. Using the new progressive method of surface finishing called NANOTECHNOLOGY, TEFLON® Eco in the form of very small particles is applied to the rope sheath and very effectively prevents penetration of water, dust and other particles into the rope sheath which means that the water resistance and the abrasion resistance of the ropes are increased.



COMPLETE SHIELD

The maximum level of protection of ropes with high water resistance and abrasion resistance. Using the new progressive method called NANOTECHNOLOGY, TEFLON® Eco in form of very small particles is applied to the rope sheath as well as the rope core and forms an almost impermeable protective layer against water and dust that could damage the sheath or the core. COMPLETE



SHIELD is a new impregnation which extends the general lifespan of TENDON ropes significantly.



TENDON ELECTRONIC ROPE MARKING (TeROM)

Rope marking system by means of a microchip.



SBS - SIMPLE BRAIDING SYSTEM

SBS gives the rope better properties. Every fibre of the sheath is guided individually, not in a pair as usual. The sheath is more resistant against breakage, but on the other hand it is smoother.



COMPACT

Our own special technology has been used for the ends of the rope. In a length of 15 mm, the core strand and sheath are connected into one unit.



MIDPOINT OF ROPE

At half of the length, the rope is visibly marked by coloured band, which does not affect the core structure and its mechanical properties. Lengths 30 - 80 m only.



BICOLOUR

A new, clearly identifiable change of rope pattern in the middle. Bicolour brings comfort in rope handling and is advantageous especially for descending. The change of pattern is practical also when climbing with half ropes and contributes to improvement of ropework as well as to safety in general.



CE - SYMBOL OF COMPLIANCE

The CE symbol on a product declares that the product is in compliance with all applicable regulations and has undergone all appropriate compliance evaluation procedures. The number after the CE symbol (e.g. 1019) indicates relevant accredited laboratory.

UIAA

Products marked with this symbol meet UIAA requirements. The UIAA is the International Mountaineering and Climbing Federation.

EN 1891

This European norm establishes safety requirements and testing procedures for static ropes at European Union accredited laboratories. Products labeled with the symbol of this European norm satisfy the given safety requirements.

EN 892

This European norm establishes safety requirements and testing procedures for dynamic climbing ropes at European Union accredited laboratories. Products labelled with the symbol of this European norm satisfy the given safety requirements.

NFPA

These ropes meet the life safety rope requirements of NFPA 1983, standard on fire service life safety rope and equipment for emergency services, 2006 edition.

NEW



A rope for any application where the sheath and the core may suffer damage. When using this rope you will significantly increase your safety margins, in cases where mechanical damage to the rope due to sharp edges or falling objects. Thanks to the unique sandwich-type construction of braided layers and the use of specially developed staple fibers, the rope is able to hold the suspended person or load even in the event of considerable sheath or core damage. Even if the rope is heavily damaged, the suspended person has enough time to abseil to the ground or to a safe anchor point.

Protected by utility model

EN 1891
CE 1019

Rope diameter (mm)	11
Weight (g/m)	75
Number of falls	17
Relative mass of sheath (%)	48,5
Sheath slippage (mm)	0
Elongation (50 - 150 kg) (%)	4,6
Shrinkage (%)	1,2
Min. tenacity with knots (kN)	18
Tenacity (kN)	28
Max. impact force (kN)	4,5

Tested according to EN 1891 type A except static elongation

L110TE21S000C • red



SECURE

Static

This excellent rope with low elongation and high static strength is intended primarily for work at height and for securing people above vertical drops. The thicker the diameter, the stronger the rope.



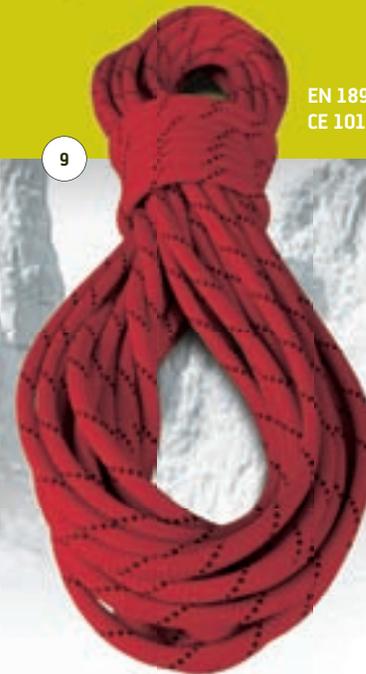
11

EN 1891
CE 1019



12

EN 1891
CE 1019



9

EN 1891
CE 1019

Rope diameter (mm)	9	9A	10	10.5	11	12	13
Weight (g/m)	50	61	67	73	79	90	109
Number of falls	25	5	30	40	50	70	80
Relative mass of sheath (%)	49.2	40.2	39	36	42	36.5	55.3
Sheath slippage (mm)	0	0	0	0	0	0	0
Elongation (50 - 150 kg) (%)	2.6	2.1	3.8	3.8	3.2	2.8	1.5
Shrinkage (%)	3	1.2	3	3	3	3	3
Tenacity (kN)	23	25	34	38	40	44	48
Min. tenacity with knots (kN)	13	17	17	18	20	25	27
Used material	PA	PA	PA	PA	PA	PA	PA
Typ	B	A	A	A	A	A	A
NFPA 1983 2006 edition	no	no	no	yes	no	yes	no



L100TS23S000C • blue



L100TS21S000C • white



L100TS22S000C • red

Tips

Static ropes of the A and B type are ropes with low elongation and karmantle construction core. Ropes of the A type have the required minimum strength of 22 kN, B type ropes are ropes of lower parameters and they are not subject to such high requirements. B type ropes usually have smaller diameters, their minimum strength requirement is 18 kN and they are mainly used in applications where the rope weight is the limiting factor. TENDON is bringing a new product in the market in the form of a rope with the diameter of 9 mm, complying with A type requirements.



Static 9 mm, type A rope according to EN 1891

Thanks to the unique construction and the state-of-the-art technological finishing, the static rope offers a strength higher than 22 kN with a falling mass of 100 kg (in comparison with the standard falling mass of 80 kg for type B ropes). The strength of the rope with knots exceeds 15 kN for a period of 3 minutes without any damage to the core and the sheath (type B ropes are tested for 12 kN for a period of 3 minutes). This is an advantage which workers working at heights and rescue teams are eager for, because having a stronger rope in critical situations with full outfit and gear brings them to a higher standard.

EN 1891
CE 1019

9

12

EN 1891
CE 1019

NFPA

Static 9A

Rope diameter (mm)	9
Weight (g/m)	61
Number of falls	5
Relative mass of sheath (%)	40.2
Sheath slippage (mm)	0
Elongation (50 - 150 kg) (%)	2.1
Shrinkage (%)	1.2
Tenacity (kN)	25
Min. tenacity with knots (kN)	17
Used material	PA
Typ	A

Static 12 NFPA

Diameter (mm)	12
Diameter (in)	0.472
MBS* (LB)	9442
MBS* (kN)	42
Weight (g/m)	87
Elongation at 10% MBS (%)	6.1
Elongation at 1.35 kN (300 lbf) (%)	1.9
Elongation at 2.70 kN (600 lbf) (%)	3.8
Elongation at 4.40 kN (1000 lbf) (%)	6.3
NFPA 1983-2006	yes
Classified	general use safety rope

*MBS - Minimum Breaking Strength



L090TS21A000C • white



L120NS21S000C • white





Military

This excellent rope with low elongation and high static strength is designed for army and police.

EN 1891
CE 1019

11



Rope diameter (mm)	9	10	10.5	11	12
Weight (g/m)	50	67	73	79	90
Number of falls	25	30	40	50	70
Relative mass of sheath (%)	49.2	39	36	42	36.5
Sheath slippage (mm)	0	0	0	0	0
Elongation (50 - 150 kg) (%)	2.6	3.8	3.8	3.2	2.8
Shrinkage (%)	3	3	3	3	3
Tenacity (kN)	23	34	38	40	44
Min. tenacity with knots (kN)	13	17	18	20	25
Used material	PA	PA	PA	PA	PA
Typ	B	A	A	A	A
NFPA 1983 2006 edition	no	no	yes	no	yes



L100TS245000C • black



L100TS255000C • green



L100TS265000C • camouflage



Aramid

A unique rope with aramid sheath and polyamide core, which features high firmness and increased resistance to cutting and abrasion. The rope is resistant to naked flame and radiant heat of up to 400 °C for short periods of time! This characteristic will be appreciated in particular by special police and army emergency squads for quick release from a helicopter, when ordinary ropes are not able to tackle the heat energy.

EN 1891
CE 1019

10



EN 1891
CE 1019

Force

A special rope which makes use of a patented technology of combination of materials and the rope construction itself. A rope for use in extremely severe conditions (for instance rescuers, firemen, policemen and other special forces) due to its increased resistance to cutting.

Reflective

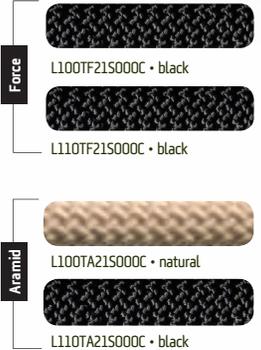
The newly developed rope with reflection control weaving reflects a beam of direct light, making it easier to identify the rope in the dark and in poor lighting conditions. The rope is particularly useful for rescue work, speleology, diving and as a tracing rope for mines.

EN 1891
CE 1019

11



Static rope	Aramid	Aramid	Force	Force	Reflective
Rope diameter (mm)	10*	11	10**	11***	11
Weight (g/m)	66.4	80	68	84.3	79
Number of falls	-	18	-	-	50
Relative mass of sheath (%)	50	47.3	40	42.2	42
Sheath slippage (mm)	0	1	0	5	0
Elongation (50 - 150 kg) (%)	2,1	3	2	3,8	3,2
Shrinkage (%)	1,9	1,3	2	4	3
Tenacity (kN)	29	40,3	24	24,9	40
Min. tenacity with knots (kN)	15	15	13	15	20
Used material	aramid/PA	aramid/PA	PA/steel	PA/steel	PA
NFPA 1983 2006 edition	yes	no	no	no	no
Typ	-	A	-	A	A



L110TS29S000C • black

Tip The rope has minimal elongation under loading and its resistance to rupture or cutting is much higher than in the case of a conventional static rope. It can be used in applications where maximum safety of the user and accuracy of fixation of the working position is required.



* tested according to EN 1891 except impact force
 ** tested according to EN 1891 type B excepted material, marking and falls
 *** tested according to EN 1891 type A excepted material, marking and falls

Canyon Grande

Excellent knotability, maintenance of softness even after repeated multiple wetting and brilliant colours contrasting with the colour of water, maximum abrasion resistance and increased water resistance – all these are properties that predestine the CANYON Grande rope for use not only in canyoning, but in other water sports as well. Thanks to the materials used, the rope has lower water absorption capacity and floats on water. WET – a CANYON rope variant which does not float on water due to materials used (PA).

EN 1891
CE 1019

Canyon Grande



Static rope	Canyon Grande	Wet
Rope diameter (mm)	10	10
Weight (g/m)	60.9	66
Number of falls	10*	11
Relative mass of sheath (%)	47	38.1
Sheath slippage (mm)	0	5
Elongation (50 - 150 kg) (%)	2.4	3.9
Shrinkage (%)	0.5	0
Tenacity (kN)	19	26
Min. tenacity with knots (kN)	13	17
Used material	PA/PPV	PA
Typ	-	A
Floating	yes	no

EN ** 1891



C100TC21S000C • yellow



C100TW28W000C Wet • orange

Speleo

This rope was developed especially for cave exploring. It is outstanding for its low elongation, high static strength and exceptional resistance to wear. Special – this version of the rope Speleo has a sheath made of PES and a core made of PA. Thanks to the use of this combination of materials, the rope is more wear resistant and is able to withstand the higher temperatures caused, for example, by fast descending.

EN 1891
CE 1019

Speleo



Rope diameter (mm)	9	10	10.5	10.5 Special	11
Weight (g/m)	48	64	72	75.4	77
Number of falls	8	20	28	7	30
Relative mass of sheath (%)	42	40	43	51.2	43
Sheath slippage (mm)	0	0	0	2	0
Elongation (50 - 150 kg) (%)	4	3.7	3.2	3	4.1
Shrinkage (%)	3	3	3	0.5	3
Tenacity (kN)	23	33	34	32.6	37
Min. tenacity with knots (kN)	12	16	17	15	19
Used material	PA	PA	PA	PES/PA	PA
Typ	B	A	A	A	A



S105TG21S000C Special • white



S105TS21S000C • white



* weight 55 kg, fall factor 1

** tested according to EN 1891 type B except min. tenacity and material

TIMBER SET - NEW LINE

TIMBER Set has been developed especially for maximum comfort of work of tree workers and arborists.

SET

The Set is completed with a throwline, an accessory cord and a throw bag, all in high quality and in colours that are markedly visible in treetops.

Prusiks 8 and 10 mm

Prusiks are new products in our offer. The use of the PES/TECHNORA material combination results in a better thermal and mechanical resistance of the sheath. Supplied in any length or as prusiks made to measure with sewn eyes.

Lowering rope 15 mm of a new construction with increased strength and reduced diameter. Very good handling during lowering and braking of loads.

Ascent rope 11.5 of a brand new construction enables comfortable work and troublefree splicing of eyes. Supplied in any length by the metre or as finished rope with spliced eye.

EN 1891
CE 1019

Tips
Caution, the strength of loops sewn on the rope is generally lower than the rope strength. Loops sewn on the Timber ropes are subject to testing in accordance with the EN 1891 standard and meet the requirements of this standard.



8

10



EN 566, 795B

P080TA000



EN 566, 795B

P100TA000



Certificated sewing loops

15



L150TT21S000C

11.5



L115TT21S000C

Static rope	Timber Throw Line	Timber Accessory Cord	Timber Accessory Cord	Timber Lowering Rope	Timber Rope
Rope diameter (mm)	3	8	10	15	11.5
Weight (g/m)	2.5	54,3	73,3	164	83
Number of falls	-	-	-	-	13
Relative mass of sheat (%)	-	-	-	-	54
Sheat slippage (mm)	-	-	-	-	30
Elongation (50 - 150 kg) (%)	-	-	-	-	2,4
Shrinkage (%)	-	-	-	-	3
Tenacity (kN)	-	-	-	-	36
Min tenacity (kN)	0,8	20	24	61	21
Used material	PE	PES/Technora	PES/Technora	PES	PES/PA
Typ	-	-	-	-	A
EN	-	564	-	-	1891

CE 1019

8



EN 564

A080TP21S000C

10



A100TP21S000C

3



A030TP21S000C

Spider

Extremely lightweight and perfectly anatomically shaped harness with split ventilated back and comfortable leg loops, designed for sport climbing. Low weight, high degree of comfort and especially the progressive system of waistline adjustment are features you will appreciate when contesting and climbing extreme sport routes.

Spider



Size	Waist (cm)		Leg loops (cm)	
	min.	max.	min.	max.
XS	65	75	46	50
S	70	80	50	54
M	75	85	54	58
L	80	90	58	62
XL	85	95	62	66
XXL	90	100	62	66
Weight (g)	395			

EN 12277
CE 1019



Mercury

Harness designed with emphasis on maximum comfort of the climber. With reinforced attachment points and a colour-differentiated belay loop for safe fastening. Thanks to adjustable leg loops (that can be unbuckled at the back) and the revolutionary system of waistline adjustment, this harness is the right choice for every climbing.

Mercury



Size	Waist (cm)		Leg loops (cm)	
	min.	max.	min.	max.
XS	65	75	45	50
S	70	80	50	55
M	75	85	55	60
L	80	90	60	65
XL	85	95	65	70
XXL	90	100	65	70
Weight (g)	460			

EN 12277
CE 1019



Endurance

Multi-purpose harness designed for climbing in mountains and on big walls. Its main advantage is full adjustability thanks to 4 rock&lock shackles, split ventilated back and progressive system of waistline adjustment. It has a colour-differentiated belay loop and two eyes for plastic carabiners for safe fastening. The harness offers maximum comfort during long and strenuous ascents.

Endurance



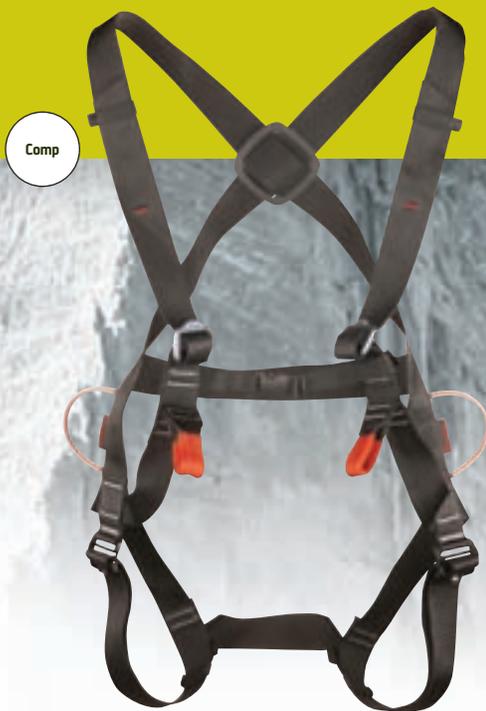
Size	Waist (cm)		Leg loops (cm)	
	min.	max.	min.	max.
S	65	80	50	55
M - L	75	90	60	65
XL	85	100	60	70
Weight (g)	540			

EN 12277
CE 1019



Comp

Harness for via ferratas and for beginners. With reinforced leg loops and attachment points, with one loop for material attachment. It optimizes the position of the body when hanging on the rope or after a fall. It prevents the body from taking the topsyturvy position.



Jammy				
Size	Waist (cm)		Leg loops (cm)	
	min.	max.	min.	max.
One size	60	120	42	66
Weight (g)	370			

EN 12277
CE 1019



Jammy

Very lightweight uncushioned harness designed especially for via ferratas, mountains and glaciers. Available in one universal size for all figures, with reinforced attachment point, colour-differentiated belay loop for safe fastening, and one loop for material attachment. The right choice also for artificial climbing walls, climbing schools and skialpinism.



Scout	
Size	Girth of chest (cm)
One size	75 -110
Weight (g)	240

EN 12277
CE 1019



Scout

Chest harness SCOUT must be used in combination with a sit harness. It has two buckles for adjustment purposes and the height of attachment may be selected according to its position.

Caution: Do not use the chest harness separately!



Comp				
Size	Waist (cm)		Leg loops (cm)	
	min.	max.	min.	max.
One size	65	120	42	66
Weight (g)	505			

EN 12277
CE 1019





Hardware

Carabiners



Carabiners	TENDON 02	TENDON 01	TENDON 06	TENDON 05	TENDON 07	TENDON 08	TENDON 16	TENDON 03	TENDON 04
Major axis strength (kN)	30	22	26	26	25	25	29	29	29
Minor axis strength (kN)	10	8	9	9	10	10	10	10	10
Open gate strength (kN)	10	6	10	10	10	10	12	12	12
Weight (g)	70	86	51	51	42	42	60	55	55
EN	12275, 362	12275, 362	12275	12275	12275	12275	12275, 362	12275	12275



Ascenders and descender

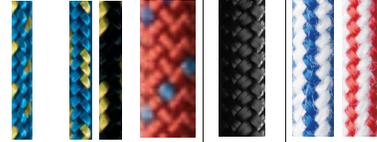
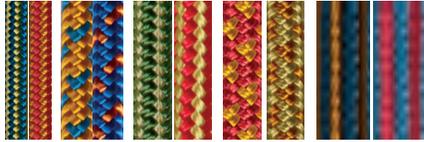


	Ascenders TENDON 13	Ascenders TENDON 14	Ascenders TENDON 15	Figure 8 DESCENDER
Weight (g)	160	225	225	135
EN	567	567	567	-



Accessory and power cords

Accessory and power cords	4	5	6	7	8	2	3	9	Aramid reep	Touch reep
Rope diameter (mm)	4	5	6	7	8	2	3	9	6	6
Weight (g/m)	12.7	18.9	23.2	34	39.8	2.8	6.5	54.4	22.9	23.2
Min. strength (daN)	340	510	1000	1300	1640	120	190	1900	1700	1000



EN 564
CE 1019



EN 564
CE 1019



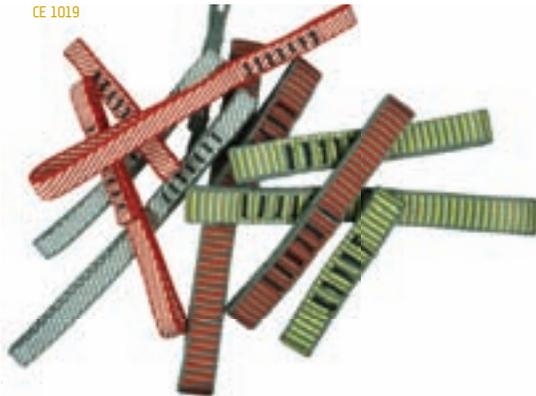
EN 564
CE 1019

Quickdraw and sewn slings

	PA			PA			DYNEEMA			DYNEEMA		
Lenght (mm)	10	15	20	60	120	180	10	15	20	60	120	180
Width (g/m)	19	19	19	19	19	19	13	13	13	13	13	13
Min. tenacity (kN)	22	22	22	22	22	22	22	22	22	22	22	22



EN 566
CE 1019



New accessory and power cords packaging



Accessories



ROPE CLEANERS

Highly effective TENDON detergents for safe and thorough washing of ropes in washing machines as well as by hand. They do not damage the ropes in any way and in addition - the ropes are clean, are ageing more slowly and are easier to use after washing and proper drying.



ROPE BAG SPEEDY

A new product for quick and comfortable wrapping of the rope. ROPE BAG SPEEDY is made of lightweight and water resistant fabrics, is space-saving and can be placed even into a small rucksack. The rope can be wrapped and unwrapped very easily in a flash without tangling it. A practical thing offering more comfort to climbers.



ROPE MARKER

A simple and useful means for rope marking - both centres and several metres from the rope ends. Marking with the Rope Marker makes rope handling easier and increases safety. The chemical composition does not affect the structure and properties of the rope and guarantees a long durability of marking.



CHALKBAG

An excellent cotton chalkbag of universal size.

SELECTING A SUITABLE CLIMBING ROPE

TENDON		Sport climbing	Multipitch routes	Big walls	Mixed and ice	Alpinism	Ski mountaineering and alpine tourism	Top rope and indoor	Rescue
MASTER									
Master	8.9	***	*	-	*	*	*	-	-
Master	9.2	***	-	-	-	-	*	-	-
Master	9.4	***	-	-	-	-	*	-	-
Master	9.7	***	*	-	-	-	*	-	-
Master	7.8	-	***	-	***	***	***	-	*
Master	8.5	-	***	-	***	***	***	-	*
AMBITION									
Ambition	9.8	***	*	-	-	-	*	-	-
Ambition	10.0	***	*	-	-	-	-	-	-
Ambition	10.2	***	***	*	-	-	-	*	*
Ambition	10.5	*	***	***	-	-	-	*	*
Ambition	8.5	-	*	-	***	***	***	-	*
Ambition	9.1	-	*	-	*	***	***	-	***
Ambition	10.4 HR	*	***	***	-	-	-	***	*
Ambition	7.9	-	*	-	***	***	***	-	*
Ambition	7.9 Alpine	-	-	-	*	***	***	-	-
TRUST									
Trust	11.0	*	*	***	-	-	-	*	***
Trust	11.4	*	*	***	-	-	-	*	***
INDOOR									
Indoor	10.4	*	-	-	-	-	-	***	-

*** ideal * good - use another rope

SINGLE ROPES

Single ropes are more suitable for use in places where there is no danger of the rope being cut by falling stone. They are suitable for all climbing adventures outdoor and indoor. Our lowest diameter single rope is the TENDON Master 8.9 mm, and at the upper limit, is the TENDON Trust with a diameter of 11.4 mm. With the increasing diameter, the

CAUTION! You cannot combine belaying elements of twin and half ropes! There is a danger, that should the lead climber fall, that the differing diameters of the individual ropes, while passing through a common belay point at different speeds will suffer heat damage.

rope strength and the number of falls increase as well; unfortunately this also holds true for the weight. Therefore, you should select an optimum ratio between the thickness of the rope and its weight. The selection is also related to the climber's experience and character of the "work" on the rock. An experienced climber prefers thin ropes with a low weight while a beginning or inexperienced climber selects a thicker rope with higher safety parameters. In establishing new routes, there is a higher probability of falls and in this case a thicker rope is more suitable. For long climbs taking several days, you should select a compromise between the diameter and weight of the ropes. However, all this depends

on the climber's experience. For top belaying (top rope) climbing we recommend you to use ropes designed for this purpose - indoor ropes, e.g. TENDON 10.4 indoor or TENDON 10.4 hard rope with higher abrasion resistance. The correct rope selection at the outset will help extend its life.

TWIN ROPES

Twin ropes should be of equal length and diameter to ensure that they have common belaying progression points. They are excellent for classic climbing activities in the mountains and less stable terrain, where you need to minimise potential risk from falling stone or sharp rock edges.

HALF ROPES

Half ropes must be used as a pair (double), only when used this way will they provide the correct safety standard. The climber's safety can be considerably increased by the half rope technique, in which the "left" and "right" rope is guided separately through different belaying points. If the belaying points are widely spread, this technique helps to reduce abrasion and the impact load in the event of a fall. Belay devices should enable independent control of either rope. Half ropes are ideal for a mixture of climbing conditions and environments, such as, high mountains, rock climbing and ice climbing.



A surface finishing method by means of which TEFLON® Eco in the form of tiny particles having a size of 10^{-9} m (standard sizes used up to now were 10^{-3} to 10^{-6} m) is applied to the rope sheath. It covers the whole surface of the rope perfectly and forms an almost impermeable protective layer along the entire rope, protecting it against water, dust and other particles that might damage the sheath or the core of the rope.

Both laboratory tests and the experiences of our test climbers have shown that the NANOTECHNOLOGY means that TENDON ropes are able to boast better water-proofing and abrasion-proofing parameters when compared to other products - these ropes show minimum absorption and maximum resistance to sharp rock edges. Logically, their service life and the safety of climbers are improved.

TEFLON® Eco represents an additional development innovation in the field of impregnation of ropes.

TEFLON® Eco is a special water-repellent polymer on the basis of fluorinated polyacrylate with C6 carbon structure which is able to seal the rope structure hermetically and to prevent water molecules from getting into the inner structure of the rope. It shows a high stability under extreme conditions, resistance to direct sunshine and to direct action of water. The major advantage of this innovated finish is the fact that it is more easily degradable in the nature in comparison with the previous generation. The result of use of this polymer with TENDON ropes is stabilization and fixation of the structure of twisted yarns and increase of abrasion resistance.

Application of the TEFLON® Eco polymer to TENDON ropes is in comparison with the formerly used TEFLON® EVO more friendly to the environment as well as to the organism of the climber in contact with the rope.

The revolutionary system of rope marking uses a microchip integrated in the end of the rope to carry rope identification information. TeROM allows for easier identification and registration of rope inspections and checks. All data saved in the microchip can be easily read and some of them complemented using a mobile reader.

Yarn enters the knitting machine from bobbins. For knitting of a larger diameter of ropes machines with a higher number of bobbins are generally used. These ropes then have better dynamic characteristics. By adjusting the arrangement of bobbins with spun coloured yarns you can achieve various colour patterns.

Tips

The microchip contains both data programmed by the manufacturer (e.g. name, diameter, length and production date of the rope) and freely programmable data (numerical code, inspection date or identification of the inspecting technician).

Washing

You know it well - at the belay stance there is a bit of confusion, ropes are lying on the ground (and sometimes a little in the mud), climbers step on each other's feet and on the ropes. Then, the ropes contact and rub against the rock, accumulating more dust and dirt until micro-particles get to the rope core.

And destruction starts

Every time you use a rope, you expose it to the effect of dust and tiny microscopic dirt particles that may penetrate into the structure of rope braiding especially by the action of pressure, moisture, static electricity and during any mechanical stress. These actions can damage the rope by fretting individual fibres of the braiding or even the rope core.

There is a simple solution!

You can wash dirty ropes in water up to 40°C manually in a bath tub, or in a washing machine set to the "WOOL" programme. You can wash ropes either in clean water or with the use of specialized detergents. We recommend you to do the washing in a highly efficient TENDON ROPE CLEANER washing detergent, which ensures thorough and safe washing both manually and in a washing machine.

Drying is as important as washing

Dry the rope in a ventilated space at the room temperature, freely spread, protected from direct sunshine and sources of radiant heat. CAUTION: perfect drying may take more than a week.

Washing does not harm the rope in any way and moreover, after washing and proper drying the rope is clean, its ageing is slower and it is easier to use.

Notice

If you buy a new static rope and a situation occurs that you have to use it in a wet environment, we recommend you to wash the new rope before the first use. This way you will remove greasy additives (used during production of PA fibre) that would get released from the rope on the first contact with moisture.

Storage life and life span of dynamic ropes

Storage life

The maximum storage life in unused condition without limitation to life span makes up to 5 years.

This is conditional on optimum storage conditions: clean place protected against light, without chemical, physical and mechanical effects, in a normal climate of 15-25°C and a relative humidity of about 65%. An examination of the rope by a competent person (person authorized by the manufacturer) once every six months is mandatory.

In the process of rope production, the fibres are mechanically doubled, twisted and braided in several stages. In this way the fibres finally attain a condition of mechanically induced stress. A long-term storage leads to retardation and relaxation. This means that stress in macromolecules is "relieving". This phenomenon is not harmful, on the contrary it is connected with an improvement of dynamic properties. Research works showed that the results of tests of dynamic performance of ropes that had been (optimally) stored for several years were often better than values measured immediately after production. Polyamide also does not contain additives and softeners like, for example, PVC that could diffuse out. This is the reason why no embrittlement occurs.

In addition, the in-the-meantime standardized finishing of fibres by nanotechnological treatment offers an additional protection.

In case of present-time advanced materials, a considerable negative change of properties of the product in a time interval of 5 years can be excluded provided that optimum storage conditions are maintained.

Safety investigations performed by mountaineering associations in the past showed that some used and duly stored ropes made early in the sixties (!) still had a residual capacity of two standard falls!

Life span

Ageing of DYNAMIC ropes in use

Due to different influences on use and specialities of use it is impossible to give an exact numerical value, only a roughly estimated time value can be specified. Depending on frequency and intensity of use, external effects as abrasion, contamination, mechanical loading (static), rope work (lowering and/or abseiling) loading by falls (dynamic), intensive action of UV radiation, aggressive climatic conditions etc. lead to reduction of safety reserve of the dynamic rope.

- The consequences of abseiling and lowering are reduction of dynamic performance and reduction of safety reserve of the rope.
- Abrasion leads to gradual weakening of consistency of the sheath. Heavier abrasion makes the sheath "hairier" and reduces the loadability of the sheath and its protective effect on the rope core.
- Particles of impurities and rocks inside the rope, especially in combination with heavy performance of the rope, result in abrasion of fine fibres of the core and the sheath. The particles

act as abrasive sand and lead to reduction of the load-bearing cross section of the fibres, especially during frequent abseiling/lowering.

- Dynamic load results in loss of rope performance - the ability of arresting dynamic (impact) energy decreases. This depends on the hardness of the fall considerably (hardness of the fall is given by the belay method and the fall factor; falls with a fall factor of >1 are classified as hard falls according to the general state of the art).

Safety investigations performed by mountaineering associations reveal that if the rope sheath is not excessively damaged and shows no signs of heavy abrasion, a loading by falls with a fall factor of <0.5 and correct dynamic belaying does not represent a safety risk provided that the rope is not resting on sharp edges.

Investigations by the Safety Commission of the German Alpine Club

Investigations performed by the Safety Commission of the German Alpine Club in the nineties revealed that there was a hyperbolic relation between the loss in safety reserve and the rope performance. There is also a linear relation between the rope quality and the loss in safety reserve.

The higher the safety reserve (number of falls) of the rope, the longer the life span of the rope, because the loss starts from the higher initial level.

In practical use of mountaineering ropes, two factors of rope work with different

effects on the rope may be defined essentially:

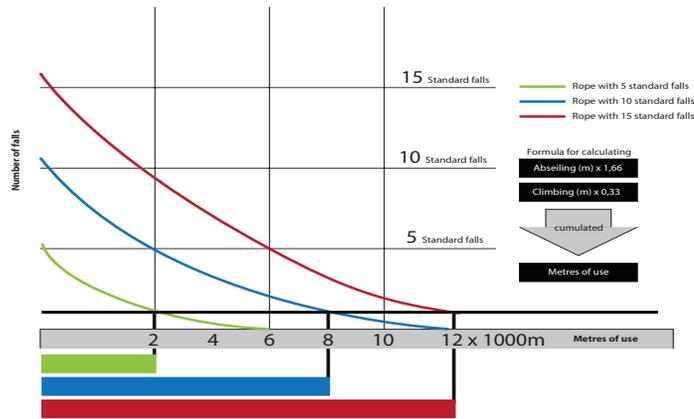
- The rope is drawn by dead weight and friction only (metres of climbing) The leader climbs up and draws the rope behind to the next belay station, the rope is drawn from above or by change of rope direction without being loaded by the weight of the climber. The influencing factors are only the surface of the ground and friction when drawing the rope, as well as ambient conditions (UV radiation, moisture, impurities etc.). **The general load is very low.**
- The rope is used for lowering and abseiling (metres of abseiling) When using the rope for lowering with bending, a high performance induced by friction and movement is generated both in the belay/braking system (HMS, descender or belay device) and in the place of bending in the sheath and the core, and is often connected with twisting which is brought about by the frequently-occurring false twist effect. **The general load is much higher than in the aforementioned case!**

The user may use the following simple equation for making an approximate calculation:

metres of climbing x 0.33 + metres of abseiling x 1.66 = metres of use

When documenting the metres of use cumulatively, the user may estimate the safety condition of the rope (safety reserve of the number of falls) from the number of metres of use of the rope since the first day of use.

General values of safety condition (safety reserve)



According to curves depicted in the graph for individual rope types:

TENDON 11.4 mm Trust	20 standard falls on the day of production
TENDON 11.0 mm Trust	16 standard falls on the day of production
TENDON 10.5 mm Ambition	11 standard falls on the day of production

The number of cumulated metres may be used to estimate the remaining safety condition/safety reserve (number of standard falls) of the rope.

Estimated safety condition of ropes used with different intensity (TENDON 11 mm Trust):

- Safety condition ≥ 5 standard falls (up to approx. 6,000-8,000 metres of use)
If the rope is in perfect condition, it may be used to secure any climbing situation up to a fall factor of 2.
- Safety condition > 2 standard falls (up to approx. 12,000-14,000 metres of use)
If the rope is in perfect condition, it may be used to secure any climbing situation up to a fall factor of 1.

- Safety condition ≤ 2 standard falls
If the rope is in perfect condition, it may be used to secure any climbing situation up to a fall factor of 0.3, if the rope sheath shows no signs of damage or extreme hairiness.

It is not easy to specify an exactly defined life span.

The following information can be used as a guide:

- occasional use (e.g., five times a year, training use) with no heavy performance of the rope (no abseiling), without loading by hard falls, with the rope being correctly used and loaded by not more than 600-800 metres of use = the rope may be used safely for 10 years maximum.

Extreme loading by falls or other strong mechanical, physical, climatic or chemical effects can damage the rope so heavily that it must be discarded immediately.

The rope must be discarded immediately also in case the user has the slightest doubt about the safety and the perfect condition of the rope.

Storage life and life span of static ropes

Storage life

The maximum storage life in unused condition without limitation to life span makes up to 5 years.

This is conditional on optimum storage conditions: clean place protected against light, without chemical, physical and mechanical effects, in a normal climate of 15-25°C and a relative humidity of about 65%. An examination of the rope by a competent person once every six months is mandatory.

Notes:

In the process of rope production, the fibres are mechanically doubled, twisted and braided in several stages. In this way the fibres finally attain a condition of mechanically induced stress. A long-term storage leads to retardation and relaxation. This means that stress in macromolecules is "relieving". This phenomenon is not harmful, on the contrary it is connected with an improvement of dynamic properties.

Research works showed that the results of tests of dynamic performance of ropes that had been (optimally) stored for several years were often better than values measured immediately after production. Polyamide also does not contain additives and softeners like, for example, PVC that could diffuse out. This is the reason why no embrittlement occurs.

In case of present-time advanced materials, a considerable negative change of properties of the product in a time interval of 5 years can be excluded provided that optimum storage conditions are maintained.

Life span

As to ageing of static ropes, it is impossible to give an exact numerical value, only a roughly estimated time value can be specified. This information does not relieve the user of the mandatory examination of the rope by a competent person (person authorized by the manufacturer) after use.

Depending on frequency and intensity of use, external effects as abrasion, contamination, mechanical loading (static), rope work (lowering and/or abseiling) loading by falls (dynamic), intensive action of UV radiation, aggressive climatic conditions etc. lead to reduction of static and dynamic performance (safety reserve) of the static rope.

The crucial influencing factors for safety of static ropes are external effects, as for instance:

- Sharp edges that may have fatal consequences even at a slight tension of the rope!
- Abseiling and lowering (rope work) lead to loss of dynamic and static performance. For instance, frequent abseiling with high load forms

clusters of fused (melted) fibres in the rope sheath as a result of the heat inevitably developed by friction.

- Abrasion leads to gradual weakening of consistency of the sheath. Heavier abrasion makes the sheath "hairier".
- Internal wear - particles of impurities and rocks inside the rope, especially in combination with heavy performance of the rope, result in abrasion of fine fibres of the core and the sheath. The particles act as abrasive sand and lead to reduction of the load-bearing cross section of the fibres, especially during frequent abseiling.
- Loading by falls
Due to the low dynamic elongation, loading by falls with a fall factor of 0.3 or greater must be essentially excluded.

Because, unlike dynamic ropes, the main task of static ropes does not consist in safe arrest of falls but in a quasi-static loading with a minimum dynamic stress only, a macromolecular stretching occurs when the rope is used correctly which, however, has no adverse effects on the maximum tensile force and the elongation of the rope. In case of an alternating to repeated (cyclic) loading of up to 20% of the maximum tensile strength of the rope with approximately 10,000 loading cycles, a residual force at break of the rope of >75% may be expected.

Example:

TENDON 11 mm Static

- maximum tensile force: 40.0 kN
- residual force at break - knot: 16.5 kN
- residual force at break after 10,000 cycles of repeated (cyclic) loading of up to 20% (= 6 kN): 30.0 kN

The above parameters exceed the minimum requirements of EN 1891 for Type A static rope significantly.

Occasional use (several times a year) with an intensity of use unworthy of notice, without considerable mechanical loading or fall arrest, without recognizable wear or contamination.	8 - 10 years
Frequent use (several times a month) with low intensity of use, without considerable mechanical loading (suspension, occasional lowering or abseiling) or fall arrest. Signs of use: no signs of heavy wear, slight contamination, hardly recognizable hairiness.	5 - 8 years
Occasional use (several times a year) with high intensity of use, mechanical loading (suspension, occasional lowering or abseiling), without fall arrest. Signs of use: slight wear, contamination, negligible hairiness.	3 - 5 years
Very frequent use (several times a week) with low intensity of use, without considerable mechanical loading or fall arrest. Signs of use: signs of heavy wear, slight contamination, recognizable hairiness.	3 - 5 years
Very frequent use (several times a week) with high intensity of use, mechanical loading (suspension), but without fall arrest. Signs of use: signs of wear, obvious hairiness, slight vitrification.	3 - 5 years
Intensive use (every day) with normal intensity of use, without considerable mechanical loading or fall arrest. Signs of use: obvious wear, obvious hairiness, heavy contamination.	1 - 3 years
Intensive use (every day) with high intensity of use, mechanical loading (suspension), but without fall arrest. Signs of use: heavy wear, vitrification, contamination and hairiness.	</=1 year
<p>Extreme loading by falls or other strong mechanical, physical, climatic or chemical effects can damage the rope so heavily that it must be discarded immediately.</p> <p>The rope must be discarded immediately also in case the user has the slightest doubt about the safety and the perfect condition of the rope.</p>	





Stefan Brunner

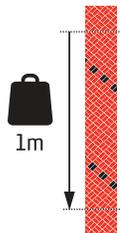
TESTING OF CLIMBING ROPES IN ACCORDANCE WITH EN 892

DIAMETER



This parameter is measured with a 10 kg load for single ropes, 6 kg for half ropes and 5 kg for twin ropes. This would imply that testing the exact diameter of ropes under domestic conditions is quite difficult.

WEIGHT



The mass of a rope is measured for a length of one meter. A single rope without any added finish weights 52 to 88 grams per meter, a half rope about 50 grams and twin rope approximately 42 grams per meter. The rope's core must account for at least 50 % of its total mass.

NUMBER OF STANDARD FALLS

This gives the number of falls the rope being tested under conditions given by the EN 892. This standard requires a minimum of 5 falls with a load of 80 kilograms for single ropes. Half ropes are tested with a 55 kg load. For twin ropes, the two ropes are under a constant load of 80 kilograms and the minimum number of falls is 12. The number of falls withstood during testing is a direct measurement of a rope's margin of safety (strength). In practice, no new rope will break under a sudden load if the rope is in good condition and has been properly handled. A rope will gradually become less safe as its material ages and as it becomes worn from use, as these factors reduce its strength. Moisture can also reduce a rope's strength by degrading the polyamide fibers used for making the rope.

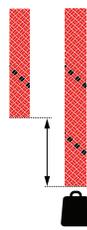
MAXIMUM IMPACT FORCE

Impact force is the force that occurs during a first fall under defined conditions (mass of the load, fall factor, etc.) and that is absorbed by the rope. Under testing, the impact force increases for each additional test fall the rope is subjected to. How fast

the impact force increases determines the number of standard falls withstood. The higher the number of standard falls, the longer the service life of the rope for the user. The practical use of ropes in real climbing or on training walls is different from laboratory conditions. During standard rope tests, the end of the rope is firmly secured, but in real climbing, belaying equipment and systems allow for some slippage of the rope, breaking the fall dynamically. Dynamic belaying dissipates some of the fall's energy, thereby lowering the impact force. For that reason, it is important to know how to use appropriate dynamic belaying.

WARNING!

The fall factor is also of key importance for the amount of impact force. How far you fall is virtually insignificant for the impact force. The amount of the fall factor is much more important. A five meter fall with a fall factor of $f = 1$ will result in a much lower impact force than a fall of the same length with a factor of $f = 2$. The energy of the climber's fall is absorbed by the active length of the rope (shown in the illustrations in red).

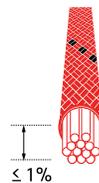


STATIC ELONGATION

Usable static elongation is tested by applying an 80 kg load to the rope. Elongation may not exceed 10 % for single ropes (one strand) and twin ropes (two strands tested in tandem) and 12 % for half ropes (one strand).

SHEATH SLIPPAGE

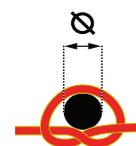
Using a special machine, this test determines how much the surface of a rope will slip



relative to the core when subjected to a load. The EN 892 establishes that slippage may not exceed 20 mm when stretching a length of rope measuring 1930 (+ - 10 mm).

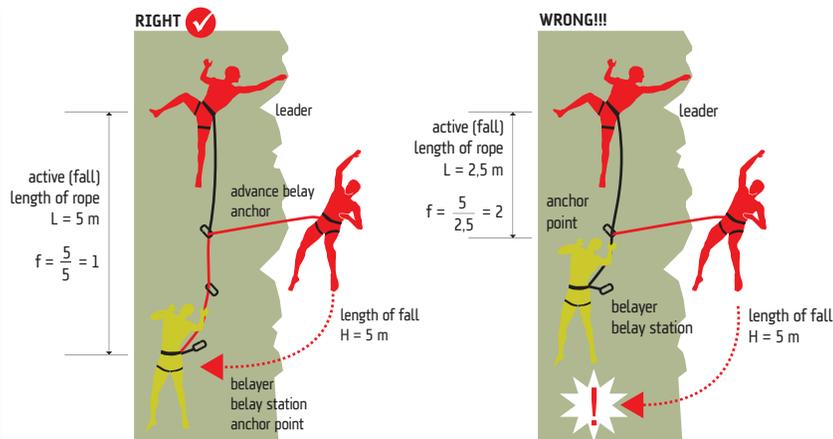
If the sheath slides over the core during actual climbing, it can lead to bulges and so-called stockings. If the ends of ropes have not been sealed properly, the core at the end of the rope can come loose from the sheath or the sheath may extend longer than the core. The ends of our ropes are sealed with

measurement is a better indicator of the rope's properties than the static elongation value.

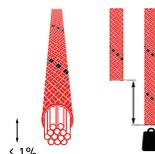


KNOTABILITY

One of the most important requirements for mountain climbing rope is outstanding flexibility. How is this measured? A section of the tested rope is tied into a simple knot. Weight is then applied to the rope (10 kg for a single rope). Then the interior diameter of the knot is measured. The ratio between that



ultrasound into one indivisible whole, and if the limits for slippage are complied with, the situation described above will not occur.



DYNAMIC ELONGATION DURING A FIRST DROP

This parameter measures the elongation of the rope during

the first standard drop. The maximum allowable dynamic elongation is 40 %. This

diameter and the diameter of the rope gives the coefficient of Knotability. The maximum value of the coefficient is 1.1 times the diameter of the rope.

WARNING!

A rope with poor flexibility is harder to tie in knots and slides less efficiently through the carabiners of a belaying system. The effects of the elements or of improper care can reduce a rope's flexibility.

LANEX has built its own laboratory for testing its TENDON ropes, including its own drop tower. Newly developed ropes to European labs for certification already

fully prepared and with known technical parameters. Most TENDON ropes are tested at the accredited TÜV lab in Vienna.

Requirements of the norm EN 892 - dynamic climbing ropes

MONITORED PARAMETER	REQUIRED VALUES		
	SINGLE ROPE	HALF ROPE	TWIN ROPE
Rope diameter	Undefined	Undefined	Undefined
Rope weight	Undefined	Undefined	Undefined
Sheath slippage	± 20 mm	± 20 mm	± 20 mm
Static elongation	max. 10 % *	max. 12 % *	max. 10 % **
Dynamic elongation	max. 40 % +	max. 40 % ***	max. 40 % ++
Impact force of the first fall	max. 12 kN +	max. 8 kN ***	max. 12 kN ++
Number of falls	min. 5 +	min. 5 ***	min. 12 ++

* test of one strand of rope / ** test of two strands of rope / *** test of one strand of rope, load: 55 kg
+ test of one strand of rope, load: 80 kg / ++ test of two strands of rope, load: 80 kg

TESTING ROPES WITH LOW ELONGATION (STATIC ROPES) IN ACCORDANCE WITH EN 1891

DIAMETER

This quantity is measured with a 10 kg load on the rope. The ropes may have a minimum diameter of 8.5 mm and a maximum of 16 mm.

ELONGATION

Usable static elongation is measured by applying a test load of 150 kg (after 50 kg pretensioning). Elongation may not exceed 5 %.

STATIC STRENGTH

This is always stated on tags on the ropes. It varies according to the diameter of the rope and the kind of material used. EN 1891 requires that group A ropes have a minimum static strength of 22 kN, and that typ lana B ropes have a minimum static strength of 18 kN.

WARNING!

The maximum recommended load is 1/10 of the nominal strength stated on the product label.

REQUIREMENTS WITH RESPECT TO MATERIAL PROPERTIES

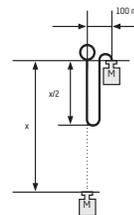
According to EN 1891, static ropes must be manufactured from a material that has a melting point higher than 195 °C, so they may not be made using polyethylene and polypropylene. Ropes made for those materials for canyoning are not subject to that norm, although they fulfill the norm with respect to static strength and other parameters.

SHEATH SLIPPAGE

This parameter is important mainly during rappelling on static ropes - if this parameter of a rope is insufficient, a safe descent could be endangered by the bunching of the rope's sheath in front of the rappelling brake.



For typ lana A ropes, slippage may not exceed ca. 20 mm for a 2 m length of rope (this applies to ropes with a diameter of up to 12 mm). For typ B ropes, slippage may not exceed 15 mm.



DYNAMIC PERFORMANCE

The testing equipment is similar to that used for testing climbing ropes, except that the rope is ca. 2 m long. At the ends it is tied in figure eight knots

and it is tested with five falls with a fall factor of 1. During the test, the rope must

withstand all five falls. Type A ropes are tested with a load of 100 kg. Type B ropes are tested with a load of 80 kg.

KNOTABILITY

This is tested in the same way as mountain climbing ropes: it must not be possible to insert a bar with a diameter greater than a multiple of 1.2 times the diameter of the rope into the opening in the knot tightened by the testing force.

Requirements of the norm EN 1891 - static ropes

MONITORED PARAMETER	REQUIRED VALUES	
	ROPE TYPE A	ROPE TYPE B
Rope diameter	8,5 - 16 mm	8,5 - 16 mm
Knotability coefficient	max. 1,2	max. 1,2
Sheath slippage	max. 20 mm*	max. 15 mm*
Elongation	max. 5 %	max. 5 %
Shrinkage	Undefined	Undefined
Impact force	max. 6kN	max. 6kN
No. of falls with a fall factor of 1	min. 5	min. 5
Strength without knots	min. 22 kN	min. 18 kN
Strength with knots	min. 15 kN (3 minutes)	min. 12 kN (3 minutes)

* 20 mm + 10 for ropes to diameter 12 mm, 20 mm + 5 for ropes with diameter between 12,1 - 16 mm

TESTING OF ACCESSORY CORD

DIAMETER

Accessory cords are tested in a manner similar to testing of ropes, except that the pretensioning is less. According to EN 564, cords should have diameters of 4, 5, 6, 7 and 8 mm. Smaller diameters (2 mm -

avalanche cords, 3 mm - hammer cord and 9 mm - force cord) do not comply with the norm.

STRENGTH

The minimum strength under to EN 564 is shown on the table below:

diameter (mm)	minimum strength (kN)
4	3,2
5	5,0
6	7,2
7	9,8
8	12,8

ANDORRA	Viladomat SA	C/Esteve Dola N. 30	Andorra La Vella		+376 800 600	esterferrer@viladomat.com
ARGENTINA	Camping Center	Blas Parera 3145	Olivos	1636	+011 479 005 81	
AUSTRALIA	Climbing Anchors	48 Eteleta Street	Belmore, New South Wales 2192		+614 221 055 10	steve@climbinganchors.com
AUSTRIA	Sail & Surf Produktions- und Handels GmbH	Bundesstrasse 55	Bad Goisern	4822	+43 (0) 6135 20633-0	office@sailsurf.at
BELGIE	Condor Safety bvba	Kleine Weg 229A	Roeselare	B-8800	+32 (0)51 25 24 94	info@condorsafety.be
BELARUS	Outdoor Trade	13-26 B Seraphimovicha str.	Minsk	220033	+375 172 147 346	info@fortint.by
BRAZIL	Sisteroutdoors	Rua Júlio Conceição 449	Sao Paulo	SP 01126-001	+551 132 228 756	info@sisteroutdoors.com.br
BULGARIA	C.T.C. - 3 Ltd.	Akademik Ivan Buresh Str 23	Sofia	1407	+359 888 618 522	sava164@abvbg
CANADA	La Cordée	2159 Est. rue Ste-Catherine. CL 4 Sur-43A-195	Montréal (Québec)	H2K 2H9	+151 452 411 06	info@lacordee.com
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FINLAND	Heaven Distribution OY, O/O Suomen Kiipeilytekniikka Oy	Viertolantie 2-4b	Helsinki	00730	+358 445 768 976	sampsajyrkynen@kiipeilytekniikka.com
FRANCE	Sarl Amwear	122 Avenue du Vercors	38600 Fontaine		+334 754 539 41	vamwear@aol.com
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HUNGARY	MOUNTEX	Rózsa u. 16	Szentendre	H-2000	+362 650 12 20	moutext@moutext.hu
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CHINA	G-View Equipment	Huayun Hotel D-002 Room, Jia No. 26, Zhanlangguan St.	Beijing	100037	+861 068 365 520	gview@emg.com.cn
ICELAND	Utilif	Alfheimur 74	Reykjavik	IS-1004	+354 545 15 22	utwist@utilif.is
INDIA	AVI Industries	13, Shriji Sadan 352, Chandavarkar	Matunga (E) Mumbai, Maharashtra	400019	+912 224 143 810	avinashkamath@gmail.com
INDIA	SHRADHA OUTDOOR EQUIPMENTS PVT LTD	5/61 GOPINATH MARKET DELHI CANTT	DELHI	110 010	+911 125 684 868	soumen@soepl.com
IRAN	Avia Imen Gostar	Apt.13.No.29.1 Aram St., North Mofateh Ave. Haft Tir sqy.	Tehran	33411	+98 218 882 44 88	info@aviamen.com
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MOLDAVIA	Linia Montana	Miron Kostin 25 OF 205	Kishinev	2068	+373 224 414 09	magic-lamp@mail.ru
MEXICO	Suquinsa, S.A. de C.V.	Michoacan 321 Fracc.Jacarandas, Tlalnepantla, edode Mexico	MEXICO, R.F.C. SUQ980817A23	C.P 54050	+52 555 365 7997	singingmex@prodigy.net.mx
MEXICO	Gimbel Mexiana S.A. De C.V	Prolongacion Molere No.46, Exq./Andomaco Col. Ampliacion	Granada, Mexico D.F.	C.P.11529	+525 511 012 300	gimbel@gimbel.com.mx
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NEW ZEALAND	Outsider Mountain Sports Ltd	BOX 117/24a Albert Street	Rangiora		+643 310 64 01	office@oms.co.nz
NORWAY	Vertical Playground AS	Auneveien 4	Oppdal	N-7340	+47 72 42 31 00	marius@blaner.no
POLAND	Fatra Hurtownia	Ul. Podgórze 1	Sandomierz	27-600	+481 583 246 26	info@hurtowniafatra.pl
POLAND	LANEX Polska Sp. z o.o.	Ul. Rapackiego 22	Dabrowa Górnicza	42-520	+483 226 478 81-3	lanex@lanexpolska.pl
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SINGAPORE	Exponent Challenge Technology, Asia Pte Ltd.	48 Toh Guan Road East, # 05-153	Enterprise Hub	608586	+656 515 93 63	jeochua@singnet.com.sg
SINGAPORE	FORCE 21 EQUIPMENT PTE LTD	38 Tanjong Penjuru	CWT Logistics Hub 1	609039	+656 626 268 88	chjames@force21.cwlimited.com
SLOVAKIA	LANEX a.s.	Hlucinská 1/96	Bolatice	747 23	+420 602 505 865	michal.smuk@lanex.cz
SLOVENIA	Treking Sport	Tbilisijaska 59	Ljubljana	LI-1000	+386 125 625 01	trek@siol.net
SOUTH AFRICA	Eiger Equipment (Pty) Ltd.	P.O.Box 16201	Vlaeberg	2018	+270 215 550 781	info@eigerequipment.co.za
SPAIN	Fixe Climbing SL	C. Jeroni Guixa', 1	Sant Quirze de Besora, Spain	08580	+349 385 500 42	tecnica@fixeclimbing.com
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UNITED KINGDOM	Allcord Limited	Ilford Road	Newcastle upon Tyne	NE2 3NX	+441 91 28 484 44	enquiries@allcord.co.uk
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USA	Cascade Alpinist	28104 3rd Ave. NE	Arlington, WA	98223	+1 425 698 5045	craigdxon@casccadealpinist.com

Dynamic ropes

MASTER		ART. NO.	COLOUR	
Master	single, half twin	8,9	D089TM21S000C	green
Master	single, half twin	8,9	D089TM22S000C	red
Master	single	9,2	D092TM21S000C	green
Master	single	9,4	D094TM21S000C	red
Master	single	9,4	D094TM22S000C	blue
Master	single	9,7	D097TM21S000C	yellow
Master	single	9,7	D097TV22S000C	green
MASTER		ART. NO.	COLOUR	
Master	half & twin	7,8	D078TD21S000C	red/yellow
Master	half & twin	7,8	D078TD22S000C	red/blue
Master	half & twin	7,8	D078TD23S000C	green/yellow
Master	half & twin	7,8	D078TD24S000C	green/black
Master	half & twin	8,5	D085TF22S000C	green/yellow
Master	half & twin	8,5	D085TF21S000C	khaki/blue
Master	half & twin	8,9	D089TM21S000C	green
Master	half & twin	8,9	D089TM22S000C	red
Master Alpine	half & twin	7,9	D079TL21S000C	red
Master Alpine	half & twin	7,9	D079TL22S000C	yellow
AMBITION		ART. NO.	COLOUR	
Ambition	single	9,8	D098TR21S000C	yellow/black
Ambition	single	9,8	D098TR22S000C	yellow/red
Ambition	single	9,8	D098TR25S000C	bicolour
Ambition	single	10	D100TA21S000C	red
Ambition	single	10	D100TA22S000C	blue
Ambition	single	10,2	D102TM21S000C	yellow
Ambition	single	10,2	D102TM22S000C	blue
HardRope	single	10,4	D104TH21S000C	red-yellow
Ambition	single	10,5	D105TA21S000C	red
Ambition	single	10,5	D105TA21S000C	blue
AMBITION		ART. NO.	COLOUR	
Ambition	half & twin	7,9	D079TA21S000C	yellow
Ambition	half & twin	7,9	D079TA22S000C	red
AMBITION		ART. NO.	COLOUR	
Ambition	half	8,5	D085TB21S000C	yellow
Ambition	half	8,5	D085TB22S000C	blue
Ambition	half	8,5	D085TB25S000C	bicolour
Ambition	half	9,1	D091TE21S000C	yellow
Ambition	half	9,1	D091TE22S000C	blue
TRUST		ART. NO.	COLOUR	
Trust	single	11	D110TT21S000C	red
Trust	single	11	D110TT22S000C	yellow
Trust	single	11,4	D114TA21S000C	yellow
Trust	single	11,4	D114TA22S000C	blue
INDOOR		ART. NO.	COLOUR	
Indoor	single	10,4	D104TI21S000C	green
TOUCH		ART. NO.	COLOUR	
Touch	static	10,5	L105TF21S000C	white/blue
Touch	static	9	L090TF21S000C	white/blue
Touch	reep	6	A060TT21S000R	white/red
Touch	reep	6	A060TT22S000R	white/blue

Static ropes

STATIC		ART. NO.	COLOUR
Static	9	L090TS21S000C	white
Static	9	L090TS22S000C	red
Static	9	L090TS23S000C	blue
Static	9 A	L090TS21A000C	white
Static	10	L100TS21S000C	white
Static	10	L100TS22S000C	red
Static	10	L100TS23S000C	blue
Static	10,5	L105TS21S000C	white
Static	10,5	L105TS22S000C	red
Static	10,5	L105TS23S000C	blue
Static	11	L110TS21S000C	white
Static	11	L110TS22S000C	red
Static	11	L110TS23S000C	blue
Static	12	L120TS21S000C	white
Static	12	L120TS22S000C	red
Static	12	L120TS23S000C	blue
Static	13	L130TS21S000C	white
SECURE	11	L110TE21S000C	red
REFLECTIVE		ART. NO.	COLOUR
Reflective	11	L110TS29S000C	black
MILITARY		ART. NO.	COLOUR
Military	9	L090TS24S000C	black
Military	9	L090TS25S000C	green
Military	9	L090TS26S000C	camouflage
Military	10	L100TS24S000C	black
Military	10	L100TS25S000C	green
Military	10	L100TS26S000C	camouflage
Military	10,5	L105TS24S000C	black
Military	10,5	L105TS25S000C	green
Military	10,5	L105TS26S000C	camouflage
Military	11	L110TS24S000C	black
Military	11	L110TS25S000C	green
Military	11	L110TS26S000C	camouflage
Military	12	L120TS24S000C	black
Military	12	L120TS25S000C	green
Military	12	L120TS26S000C	camouflage
CANYON		ART. NO.	COLOUR
Canyon Grande	10	C100TC21S000C	yellow
Canyon Wet	10	C100TW28W000C	orange
SPELEO		ART. NO.	COLOUR
Speleo	9	S090TS21S000C	white
Speleo	10	S100TS21S000C	white
Speleo	10,5	S105TS21S000C	white
Speleo Special	10,5	S105TG21S000C	white
Speleo	11	S110TS21S000C	white
ARAMID		ART. NO.	COLOUR
Aramid	10	L100TA21S000C	natural
Aramid	11	L110TA21S000C	black
FORCE		ART. NO.	COLOUR
Force	10	L100TF21S000C	black
Force	11	L110TF21S000C	black
TIMBER		ART. NO.	COLOUR
Timber	11,5	L115TT21S000C	yellow-white
Timber	15	L150TT21S000C	green/black
Timber cord	8	A080TP21S000C	red
Timber cord	10	A100TP21S000C	black
Timber bag	300 g	TIMBERBAG300	yellow
Timber bag	350 g	TIMBERBAG350	red
Timber bag	400 g	TIMBERBAG400	orange

LANEX a.s.

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