



MOUNTING AND HAULING ROPES

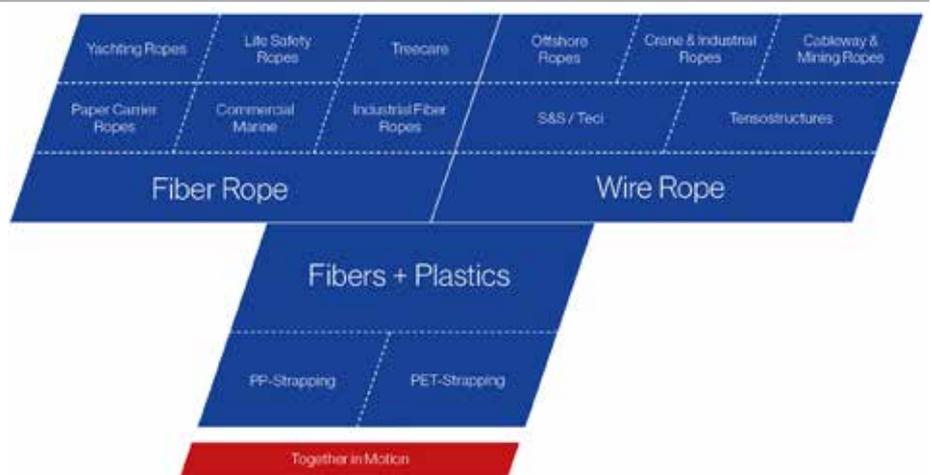
Overhead line construction, cable installation, ropeway construction

EXPERTISE FROM MORE THAN 230 YEARS OF EXPERIENCE

What started back in 1790 as a simple shop making hemp ropes has since evolved into a globally successful group of enterprises specializing in the development and production of fiber and steel wire ropes as well as strapping.

Great diversity

TEUFELBERGER's products and services are designed for a wide variety of uses ranging from cranes and marine applications to packaging and through to personal protection. The continuity and stability of a family enterprise makes us a reliable partner who, competently and effectively, supports you in mastering your day-to-day challenges.



Global presence and customer proximity

Manufacturing operations in various countries allow us to meet local quality and certification standards as well as customer requirements without difficulty. From our sites in Austria, the Czech Republic, the U.S., Italy, Sweden, and Thailand, and backed by a close-knit global network of distribution partners, we continue to satisfy the expectations of our customers.



Innovative solutions through synergies

TEUFELBERGER is a leading specialist for fiber and steel wire ropes as well as strapping. The spectrum of technologies in TEUFELBERGER's portfolio generates various synergies between the extrusion of thermoplastics, the braiding of high performance fibers, and the processing of wires into ropes and strapping.

Especially fiber and steel wire products have brought about valuable synergies with regard to both application and manufacturing technologies, which have benefited our customers tremendously. This makes TEUFELBERGER your ideal partner right from the project planning phase.

5% of TEUFELBERGER's employees are active in research and development and make sure that our customers have access to the latest in innovative rope technologies. 10% of the entire investment volume is committed to development and quality assurance.

CONTENTS

| | |
|--|----|
| Mounting and hauling ropes | 4 |
| Our service | 5 |
| Rope applications | 6 |
| Fiber ropes for overhead line construction | 6 |
| Fiber ropes for underground utility line construction | 7 |
| Ropes for rope pulling by means of helicopters and drones | 7 |
| Fiber ropes as installation and pulling lines for ropeways | 7 |
| Our fiber ropes | 8 |
| DuraTEN | 8 |
| HyperTEN | 10 |
| Rope end terminations | 13 |
| The right rope for your application | 14 |

WARNING

Using these products may involve hazards. Therefore, never use our products for any purposes other than those they are designed for. Customers must ensure that all users are familiar with their correct use and the necessary safety precautions. Please keep in mind that any of the products may cause damage or harm when misused or overloaded. The rope must NOT be used for lifting or transporting people. Moreover, the rope is not suited for working at live wires. The data specified in this catalog are reference values for assessing the quality of our products. We'll be glad to provide the valid detail specification. Subject to modifications based on technical research and development.

Determining the safety factor: the safety factor is obtained through dividing the minimum rope breaking force by the scheduled working load. When used as a hauling rope in inclined elevators and for lifting processes a safety factor established by a risk analysis covering the overall system shall be chosen as stipulated in the Machinery Directive (Directive 2006/42/EC).

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MOUNTING AND HAULING ROPES

TEUFELBERGER mounting and hauling ropes are ideally suited for the installation and mounting of power supply lines and ropeway ropes.

Mounting and hauling ropes are high-strength fiber ropes, either with or without cover, to be used for cable pulling in utility line construction

and as mounting ropes for ropeways. Whether you work with a drum winch or a capstan winch, we have the right rope for each of your appli-

cations. By using our synthetic ropes for rope pulling you can omit up to two work steps, which saves you a significant amount of time.

TEUFELBERGER fiber ropes feature the following advantages:

- ✓ Our ropes weigh 7 times less than steel wire ropes. This is a particular advantage when transporting ropes through rough terrain where every pound counts.
- ✓ TEUFELBERGER synthetic ropes can be used with your existing equipment (winches, clamps, support rollers or deflection sheaves, etc.), without the need for adaptation.
- ✓ We offer highest breaking forces, which are sometimes higher than those of a steel wire rope of the same diameter.
- ✓ We offer increased safety and control due to torsion and stretch indicators in the rope cover.
- ✓ We manufacture optional lengths according to customer requirements - without any length limitation.
- ✓ TEUFELBERGER mounting and hauling ropes are characterized by perfect spooling behavior on all kinds of winches.
- ✓ No danger of injury from wires sticking out, uncoiling ends of the steel wire rope, or similar.
- ✓ The ropes are characterized by quick and easy handling, thus allowing the user to work ergonomically.
- ✓ We are flexible in terms of design: differences in color facilitate your work and permit an easier identification by diameter, year of manufacture, and much more.
- ✓ Our ropes offer an extremely high bending fatigue strength and service life.
- ✓ Our mounting ropes feature maximum abrasion resistance and minimal stretch. This is important when tensioning ropes over longer periods of time.



OUR SERVICE - OUR BONUS FOR YOU

When it comes to service, TEUFELBERGER relies only on the best - our in-house specialists.

The provision of fiber ropes custom-tailored to your specific needs is a fundamental prerequisite for a lasting and successful business relationship. However, we from TEUFELBERGER offer an added extra: at the customer's request we prepare the appropriate inspection and maintenance schedule for you and take charge of servicing your rope.

Being used on construction sites, mounting and hauling ropes are exposed to very harsh conditions of use such as stony and sandy grounds or sharp edges and thorns. Quite frequently, the ropes are soiled to an extent that even the rope core is affected. All these factors will accelerate wear, and the rope needs to be inspected by specialists at regular intervals.

This is the only way to ascertain whether a rope can still be used, whether it must be repaired or even has to be discarded altogether. The maintenance frequency depends mainly on the degree of utilization and the prevailing circumstances. Our experts will be happy to provide advice in these matters.

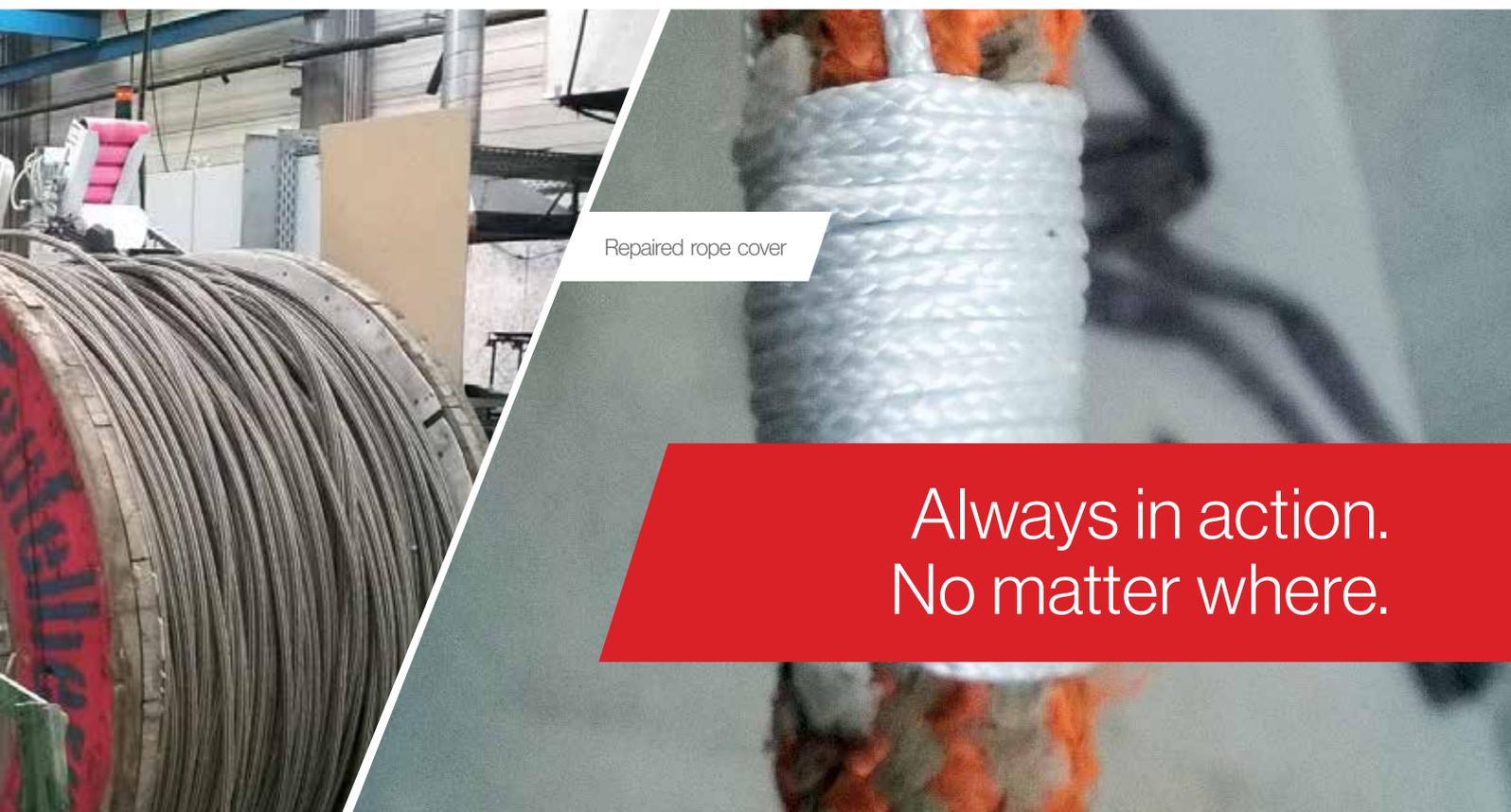
We offer the professional service that our premium products deserve:

- ✓ Checking the degree of wear
- ✓ Visual inspection for twist
- ✓ Measurement of cross section
- ✓ Checking rope end terminations
- ✓ Detection of damaged spots
- ✓ Checking for extraordinary soiling
- ✓ Performing repair
- ✓ Determining the residual breaking force
- ✓ Documentation of the condition of the rope

Our TEUFELBERGER team is there for you, even if help is needed quickly after improper handling, vandalism or similar circumstances. Our experts are available for

advice to decide on the further use of the rope and to perform repair at short notice, if required, thus helping you to save costs for unnecessary replacements or

avoid long downtimes.



Repaired rope cover

Always in action.
No matter where.

THE IDEAL ROPES FOR OVER-HEAD LINE CONSTRUCTION, CABLE INSTALLATION AND ROPEWAY CONSTRUCTION

Fiber ropes for overhead line construction

When it comes to fiber ropes for overhead line construction, TEUFELBERGER and its professionals go into action.

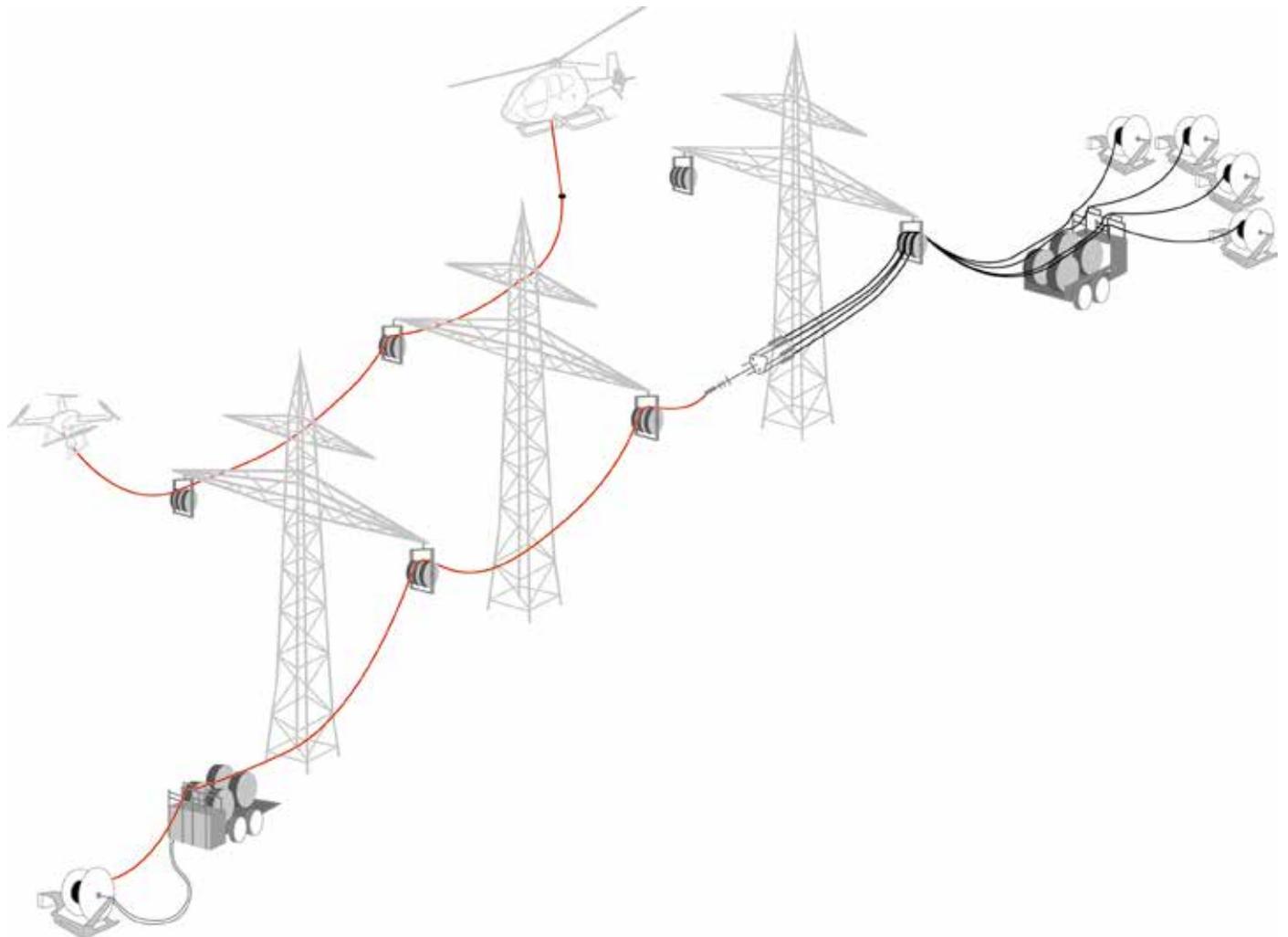
We have the perfect solution for the installation of cables and lines for every need:

- ✓ High voltage power lines
- ✓ Medium and low voltage lines
- ✓ Installation of fiber optic cables
- ✓ Installation of pilot ropes by means of helicopter or drone

The different lines are usually installed by means of capstan winches. Especially in rough terrain, helicopters and powerful drones are employed more and more for the installation of pilot ropes. Due to the reduced weight of fiber ropes compared to steel wire ropes, our products offer substantial advantages in

terms of weight and time. Our fiber ropes also set new standards by featuring enormous strength. We achieve this by carefully controlling our production processes and applying an elaborate pre-stretching technology. Each gram we can save on our ropes will increase your efficiency and help you to adhere to your budget.

At the customer's request, we also deliver fiber ropes for auxiliary winches, by means of which you can easily hoist the material and equipment you need up there on the mast.



Fiber ropes for underground utility line construction

For underground utility line construction we offer the appropriate fiber ropes and thus the ideal solution for the installation of cables and lines, e.g. for:

- ✓ Data lines
- ✓ Underground cables

For underground utility line construction we offer special fiber ropes with a protective cover to prevent dirt, sand and soil from penetrating the core of the rope, which would result in internal abrasion and impairment not visible at the outside of the rope.

Our team of experts has developed ropes with high abrasion resistance, low stretch, ease of splicing and a long service life. Another plus of TEUFELBERGER synthetic ropes is the fact that we manufacture the ropes in different color variations indicating various

performance categories.

Ropes for rope pulling by means of helicopter or drone

Rope pulling by means of helicopter and/or drone makes sense especially in rough terrain. For this kind of rope pulling it is extremely important that the fiber ropes feature low weights and small diameters. This is especially true when drones are used, whose flight time is limited and depends on the load. This means: the lower the weight the higher the efficiency.

The fiber rope experts of TEUFELBERGER have many years of experience in the field of thin flying lines for sports and wind power kites, which have the same properties as the ropes used for rope pulling through drones and helicopters. By means of our STS` Stronger than Steel® technology we produce ropes featuring extremely low weights and small

diameters, but also very high breaking forces. They are easy to splice and available at very great lengths.

Fiber ropes as installation and pulling lines for ropeways

Pulling the ropes of a ropeway is a complicated task, because it usually takes place in rough terrain. To facilitate this job for you, TEUFELBERGER has developed clampable high strength fiber ropes for the easy installation and mounting of ropeway ropes.

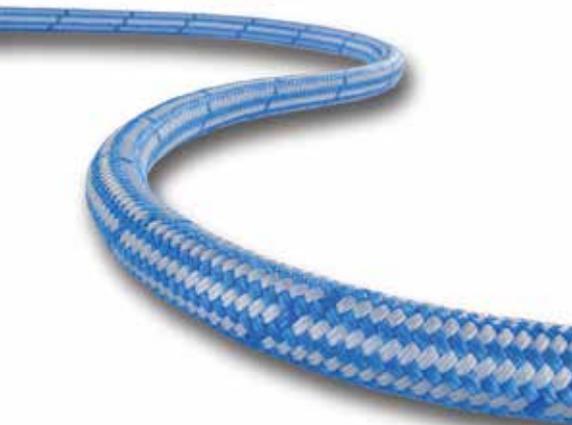
The fiber ropes are extremely lightweight and can be produced in any length depending on your requirements. The reduced weight and high breaking forces of our fiber ropes make it possible to omit two process steps in each pulling operation of your rope installation. The extremely high radial stability permits clamping the rope by means of commercially available clamping

jaws for steel wire ropes, thus allowing perfect and easy handling on site. Torsion and stretch indicators braided in by TEUFELBERGER facilitate the visual control of the pulling operation. Due to the extremely high bending fatigue strength and the long service life, you can use your synthetic ropes many times over many years without difficulty and without any safety

risk. Low stretch provides for a controlled tensioning process.

DuraTEN

Our high-strength fiber rope made of high-tech fibers provides high strength in relation to its weight. Its high flexural fatigue strength and long lifetime make this rope perfect for the high-end segment.



DuraTEN Pro-P



DuraTEN

Specifications

- Diameter: 5 - 72 mm
- Core:
DuraTEN: UHMWPE
- Variants:
DuraTEN: without cover
DuraTEN Pro-P: with PES cover
- Colors:
 - Core: dark-gray
 - Cover: in various possible colors or color combinations
- For the lifting of loads, certification to Machinery Directive 2006/42/EC as amended from time to time is possible

Characteristics

- ✓ 1/7th of the weight of comparable steel wire ropes
- ✓ Extremely high breaking force - comparable with the breaking force of a steel wire rope of the same diameter
- ✓ No corrosion and/or soiling caused by rope grease
- ✓ No risk of injury, easy and quick handling
- ✓ Flexible design
- ✓ Very high abrasion resistance, especially when provided with a cover
- ✓ High flexural fatigue strength and extremely long service life
- ✓ The kinetic energy unleashed when damage to the rope occurs is significantly lower than with steel wire ropes

Application and fields of use

Industrial applications which require high breaking forces, flexural fatigue strength, and low elongation in combination with minimal weight such as:

- vehicle winches for off-road, maintenance, recovery and military vehicles
- overhead line construction
- motor winches
- mounting ropes
- and many others

THE JACK OF ALL TRADES MADE OF UHMWPE

Technical data

| Core Ø / Rope Ø without cover | Rope Ø with cover | Weight | | MBF** |
|----------------------------------|----------------------|---------|---------------|-------|
| | | DuraTEN | DuraTEN Pro-P | |
| mm | mm | g/m | g/m | kN |
| 5 | 7 | 15 | 35 | 21 |
| 6 | 8 | 20 | 42 | 35 |
| 7 | 9 | 27 | 52 | 43 |
| 8 | 10 | 34 | 61 | 55 |
| 9 | 11 | 44 | 75 | 72 |
| 10 | 12 | 54 | 88 | 85 |
| 11 | 13 | 65 | 101 | 107 |
| 12 | 15 | 76 | 137 | 125 |
| 14 | 17 | 107 | 179 | 160 |
| 16 | 20 | 144 | 259 | 220 |
| 18 | 23 | 183 | 332 | 275 |
| 22 | 28 | 248 | 442 | 378 |
| 24 | 30 | 291 | 508 | 436 |
| 26 | 32 | 332 | 569 | 500 |
| 28 | 34 | 392 | 653 | 591 |
| 30 | 36 | 445 | 749 | 663 |
| 33 | 40 | 502 | 902 | 738 |
| 35 | 42 | 564 | 985 | 823 |
| 36 | 44 | 620 | 1,050 | 912 |
| 40 | 48 | 850 | 1,447 | 1,134 |
| 42 | 50 | 1,042 | 1,657 | 1,343 |
| 48 | 60 | 1,223 | 2,197 | 1,525 |
| 52 | 64 | 1,510 | 2,610 | 1,810 |
| 56 | 68 | 1,704 | 2,848 | 2,148 |
| 60 | 72 | 1,914 | 3,106 | 2,353 |
| 64 | 77 | 2,283 | 3,729 | 2,651 |
| 66 | 82 | 2,405 | 4,255 | 2,800 |
| 72 | 88 | 2,817 | 4,786 | 3,332 |

*with protective polyester cover, **minimum breaking force, spliced



HyperTEN

With STS - Stronger Than Steel® technology

This superlative fiber rope offers users minimal weight combined with highest breaking force and reduced UHMWPE-typical creep. Produced with STS - Stronger Than Steel® technology. Optionally available with PES (HyperTEN Pro-P), UHMWPE (HyperTEN Pro-U) cover, or as XBO variant (HyperTEN XBO) offering compellingly high flexural fatigue strength.



HyperTEN Pro-U



HyperTEN

Specifications

- Diameter: 3 - 34 mm
- Core:
HyperTEN: thermally pre-stretched UHMWPE
Each with STS - Stronger Than Steel® technology.
- Variants:
HyperTEN: without cover
HyperTEN Pro-P: with PES cover
HyperTEN Pro-U: with UHMWPE cover
- Colors:
 - Core: silver-gray
 - Cover: in various possible colors or color combinations
- For the lifting of loads, certification to Machinery Directive 2006/42/EC as amended from time to time is possible

Characteristics

- ✓ 1/7th of the weight of comparable steel wire ropes
- ✓ Extremely high breaking force – higher than that of most commercially available steel wire ropes of the same diameter
- ✓ No corrosion and/or soiling caused by rope grease
- ✓ Reduced risk of injury, easy and quick handling
- ✓ Flexible design
- ✓ Extremely high abrasion resistance due to smooth surface, especially when provided with a cover
- ✓ Very high flexural fatigue strength and extremely long lifetime
- ✓ The kinetic energy unleashed when damage to the rope occurs is significantly lower than with steel wire ropes
- ✓ Very low initial and working stretch (already eliminated during production)
- ✓ Very smooth running behavior thanks to the extremely compact cross-section that offers high transverse pressure stability

Application and fields of use:

Wherever highest breaking forces in combination with lowest weight and minimal stretch are needed (especially to replace identically dimensioned steel wire ropes without having to modify the equipment), for example:

- vehicle winches for off-road, maintenance, recovery and military vehicles
- overhead line construction
- motor winches
- mounting ropes
- pulling lines for ropeways
- and many others

Technical data:

| Core Ø / Rope Ø without cover | Rope Ø with cover | Weight HyperTEN | HyperTEN Pro-P | HyperTEN Pro-U | MBF*** |
|----------------------------------|----------------------|--------------------|----------------|----------------|--------|
| mm | mm | g/m | g/m | g/m | kN |
| 3 | 5 | 7 | 15 | 12 | 13 |
| 4 | 6 | 12 | 22 | 19 | 23 |
| 5 | 7 | 20 | 47 | 39 | 40 |
| 6 | 8 | 25 | 53 | 44 | 48 |
| 7 | 9 | 36 | 69 | 60 | 70 |
| 8 | 10 | 47 | 84 | 73 | 90 |
| 9 | 11 | 59 | 100 | 88 | 105 |
| 10 | 12 | 65 | 105 | 94 | 120 |
| 11 | 13 | 73 | 114 | 102 | 145 |
| 12 | 15 | 101 | 171 | 150 | 180 |
| 14 | 17 | 130 | 217 | 192 | 235 |
| 15 | 18 | 146 | 237 | 210 | 270 |
| 16 | 20 | 176 | 293 | 259 | 300 |
| 18 | 23 | 215 | 381 | 332 | 355 |
| 20 | 25 | 253 | 454 | 395 | 440 |
| 22 | 28 | 270 | 507 | 437 | 500 |
| 24 | 30 | 350 | 629 | 547 | 600 |
| 26 | 32 | 366 | 650 | 568 | 650 |
| 28 | 34 | 425 | 710 | 627 | 700 |
| 30 | 36 | 488 | 792 | 703 | 800 |
| 32 | 39 | 555 | 936 | 824 | 900 |
| 34 | 41 | 626 | 1,028 | 910 | 1,010 |

*with polyester protective cover (Pro-P), ** with UHMWPE protective cover (Pro-U), ***minimum breaking force, spliced

STS – Stronger Than Steel® technology

When looking for particularly high-performing ropes, one automatically thinks of steel wire ropes. But now we have STS – Stronger Than Steel®. Conceived and constructed by TEUFELBERGER's development team, this fiber rope is not only much lighter than a steel wire rope, but also much more effective. This is made possible by a combination of high-tech fibers, an optimized

rope design, and an innovative pre-stretching process. This process lends highest breaking forces to the rope that, combined with minimal weight and diameter, make it ideally suited for a variety of industrial applications.

ULTIMATE BREAKING FORCE MADE FROM UHMWPE



ROPE END TERMINATIONS



Splice / eye

A splice and/or eye can be fabricated for all ropes with and without cover. In case of ropes with covers, the whole spliced area is machine-covered and thus ideally protected. When the splice is made properly, there is no reduction on all our given DuraTEN und HyperTEN minimum breaking force values.



Thimble

Steel or stainless-steel thimbles protect the rope's eye perfectly when connected to bolts or similar devices.



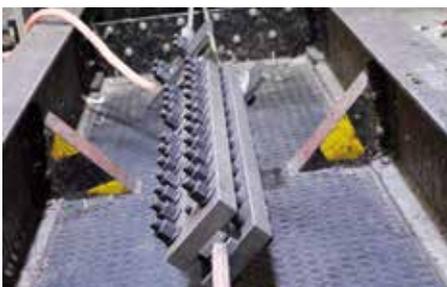
End bond

A fiber rope with a cast cone is a high-tech solution ensuring both maximum tensile strength and flexibility for dimensioning the metal end bond. The cast cone proper is provided with a thread by means of which any optional rope end termination can be screwed in place. Depending on the care and accuracy applied of the person making the end bond as well as his or her experience, breaking force reductions between 0 and 25 % on the given MBF values are possible.



Stitched terminations

Teufelberger cuts the rope to the required length and manufactures the end stitching according to the customer's specifications. Decades of stitching experience and comprehensive know-how in this field help us to achieve maximum breaking forces.

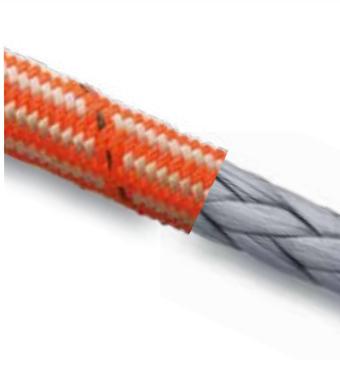
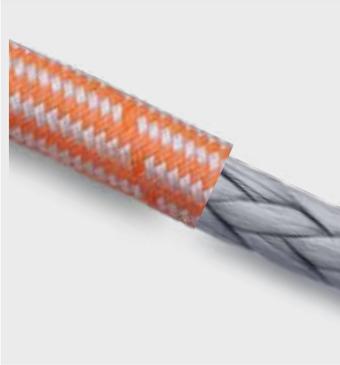


Clamp

The extremely high dimensional stability under lateral pressure of our mounting and hauling ropes allows tensioning the ropes by means of commercial clamping jaws for steel wire ropes.

THE RIGHT ROPE FOR YOUR APPLICATION

Each application has its very specific challenges, which makes the selection of the right rope key to your success. TEUFELBERGER has the know-how and thus the right rope for each kind of mounting and hauling application in overhead line construction, cable installation and ropeway construction.

| Ropes | HyperTEN (3 – 34 mm) | HyperTEN Pro-P (5 – 41 mm) | HyperTEN Pro-U (5 – 41 mm) |
|---|---|---|---|
| |  |  |  |
| Brief description of core & cover | UHMWPE hollow braid manufactured by means of STS - Stronger than Steel® technology, without cover | UHMWPE core manufactured by means of STS - Stronger than Steel® technology, provided with abrasion-resistant and highly UV-resistant protective polyester cover | UHMWPE core manufactured by means of STS - Stronger than Steel® technology, provided with highly abrasion-resistant and UV-resistant protective cover |
| |  |   |   |
| Capstan winch pilot rope | + | ++ | +++ |
| Drum winch pilot rope | + | ++ | +++ |
| Helicopter pilot rope | +++ | - | - |
| Drone pilot rope | +++ | - | - |
| Pilot rope for buried cable installation | + | ++ | +++ |
| Auxiliary winch | + | ++ | +++ |

Caption:

- +++ideally suited
- ++very well suited
- +well suited
- 0suited
-not suited

Caption symbol:

-  unstretched core
-  stretched core
-  PES cover
-  UHMWPE cover

Customized solutions

We have the right product for each of your applications and fabricate your fiber rope to your specific needs.

DuraTEN

(5 – 72 mm)



UHMWPE hollow braid, without cover



+

+

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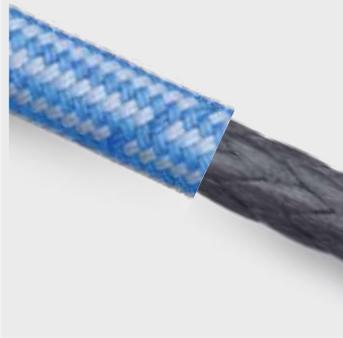
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0

+

DuraTEN Pro-P

(7 – 87 mm)



UHMWPE core, provided with an abrasion-resistant and highly UV-resistant protective polyester cover



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TEUFELBERGER Fiber Rope GmbH

Vogelweiderstraße 50

4600 Wels, Austria

Phone: +43 (0) 7242 413-0

Fax: +43 (0) 7242 413-169

fiberrope@teufelberger.com

www.teufelberger.com

