



© JN Kites



TEUFELBERGER

HIGH PERFORMANCE KITE LINES 2015/16



© North Sails

- UP TO 15 % REDUCED STRETCH VALUE
- UP TO 10 % NARROWER TOLERANCE RANGES
- UP TO 3 TIMES HIGHER ABRASION RESISTANCE
- MARKEDLY LONGER LIFE SPANS
- CONSTANT BREAK AND STRETCH VALUES

NEXT.GENERATION KITE LINES



© Best Kiteboarding Galleries

TEUFELBERGER's extensive experience and close collaboration with the development departments of leading brands and manufacturers resulted in the launch of a comprehensive product range of premium quality lines for kiteboarding. The knockout criteria such as breaking load, low stretch, good abrasion resistance, and, most of all, minimal tolerances as well as an unique production process and ISO-certified quality control resulted in high-end products.

The advances achieved in kite design and bar functionality subject kite lines to ever increasing loads, comparable to the increasing performance Formula 1 race cars continue to require of their tires. Low stretch and high breaking loads are standard requirements, and only the narrowest tolerances in terms of stretch and, most of all, high abrasion resistance will in fact guarantee the perfect trim of a kite and thus maximum performance on the water. Or, to spin our comparison further, TEUFELBERGER developed and refined the slicks on which we pull ahead of the rest.

The technology of our **NEXT.GENERATION** kite lines benefits from a computer-controlled production plant developed specifically for our kite lines: it helps us achieve stretch values reduced by up to 15 % and tolerance ranges that are up

to 10 % narrower! Furthermore, we developed a special impregnation for our NEXT.GENERATION of kite lines that increases abrasion resistance by up to 3 times! In real life situations, crossed lines will be rubbing against one another. Consequently, this marked increase in abrasion resistance helps lengthen the lines' life spans enormously! These sensational innovations promise noticeably longer life spans, on the one hand. On the other hand, the NEXT.GENERATION technology of our kite lines always provides exactly the same constant break and stretch values, even after many abrasion cycles (or hours of use)! The diagram on page 2 clearly illustrates these improvements.

As of now, all our known kiteboarding lines are manufactured and delivered featuring our NEXT.GENERATION technology.



- **UP TO 15 % REDUCED STRETCH VALUE**
- **UP TO 10 % NARROWER TOLERANCE RANGES**
- **UP TO 3 TIMES HIGHER ABRASION RESISTANCE**
- **CONSTANT BREAK AND STRETCH VALUES**
- **MARKEDLY LONGER LIFE SPANS**

WARNING

Using these products may prove hazardous. Therefore, never use our products for purposes other than those they were designed for. Customers must ensure that all persons using these products are familiar with their correct use and the related necessary safety precautions. Please bear in mind that any of these products may inflict harm when used incorrectly or subjected to excessive loads. TEUFELBERGER® and 拖飞宝® are internationally registered trademarks of the TEUFELBERGER Group. Dyneema® is a registered trademark of DSM. Spectra® is a registered trademark of Honeywell. Subject to technical modifications, typesetting and printing errors.

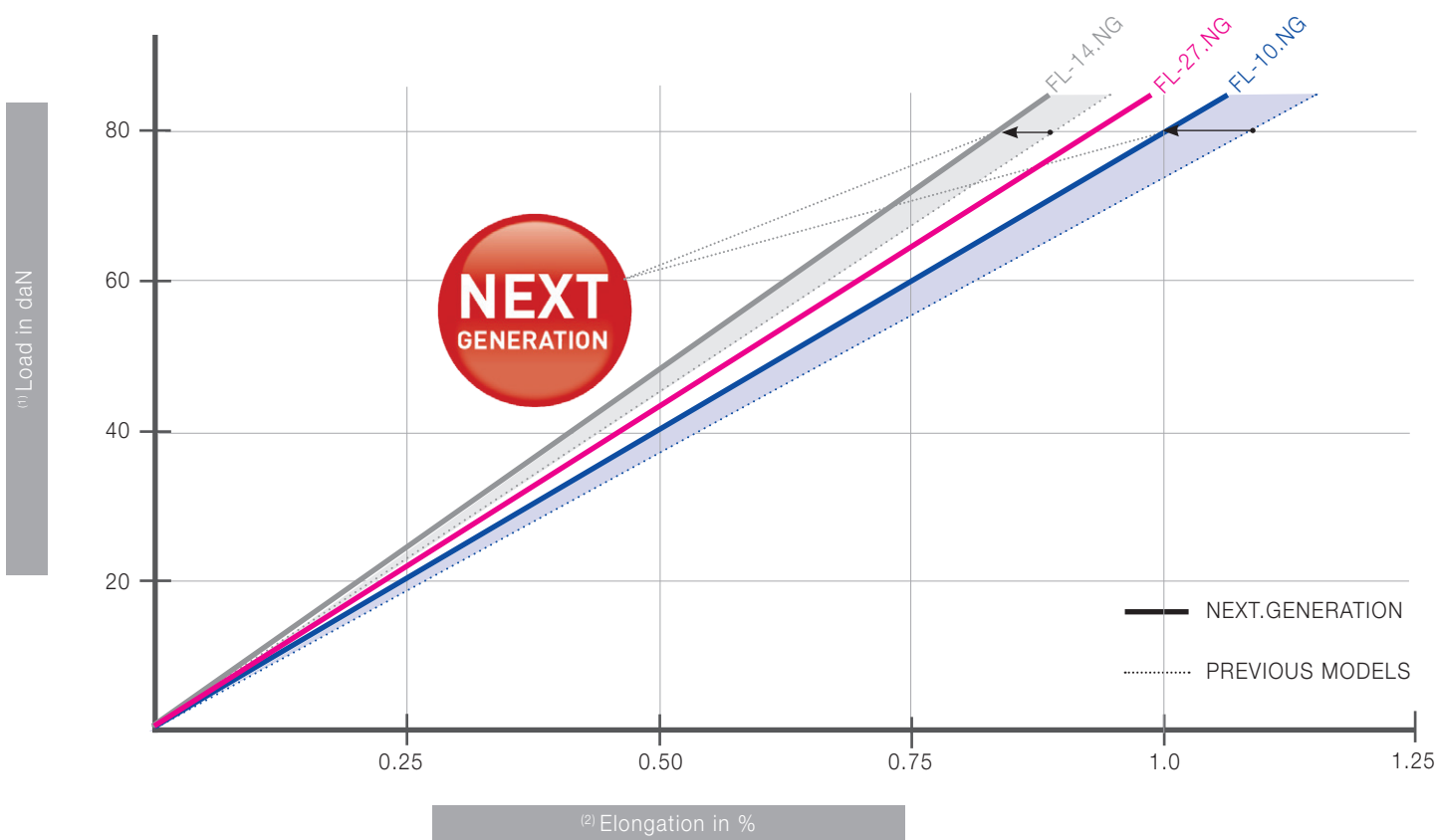
TECHNICAL BACKGROUND



Throughout the last few years, TEUFELBERGER has launched a comprehensive range of premium quality kitelines. These efforts have been based on the close cooperation with the product managers of leading manufacturers. Rather than simply taking existing lines from other segments and adapting them, TEUFELBERGER has developed entirely independent products on the basis of knockout criteria such as breaking load, elongation, abrasion resistance, and – above all – minimal tolerances.

OVERVIEW FLYING LINES

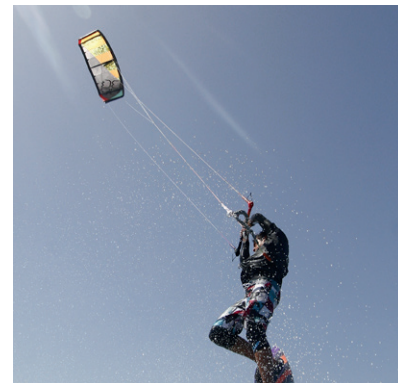
TARGET GROUP	PERFORMANCE		RACING		HEAVY DUTY	
PRODUCT NAME	FL-10.NG	FL-34.NG	FL-27.NG <small>NEW</small>	FL-28.NG	FL-14.NG	FL-35.NG <small>NEW</small>
Breaking load	330 daN	400 daN	400 daN	290 daN	400 daN	380 daN
Elongation (at 80 daN)	1.00 %	0.90 %	0.90 %	0.95 %	0.85 %	1.05 %
Weight	1.60 g/m	1.85 g/m	1.30 g/m	0.95 g/m	2.20 g/m	1.15 g/m



⁽¹⁾ The load in daN shows the load under which the rope would part. These loads are values which are approved as a result of laboratory testing.

⁽²⁾ All data and specifications based on used lines

TECHNICAL BACKGROUND



© M. Entero

TEUFELBERGER's development department is drawing on the experience and expertise gathered in the course of the company's more than 220 years of rope-making history. In addition, it benefits from synergies with its other divisions, for example, when it comes to certified quality assurance and testing. What is more, only premium quality fibers are used. Being a leading manufacturer of marine ropes gives us continued access to the latest developments in fibers. This way, we are able to always stay one step ahead of our competitors.

DYNEEMA® – AN ULTRA HIGH MOLECULAR WEIGHT POLYETHYLENE FIBER



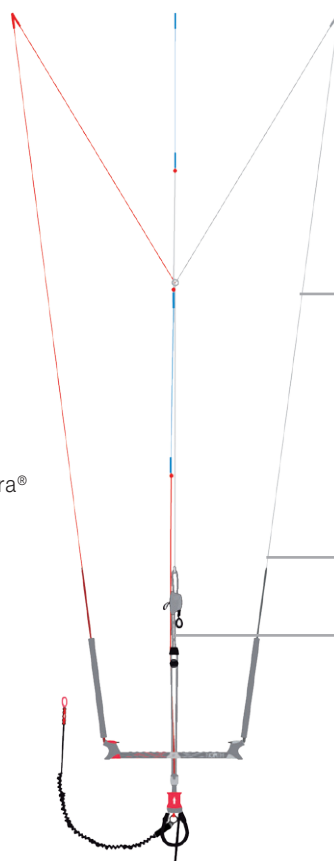
The raw material for Dyneema® is Polyethylene which is changed on a molecular basis and in addition is stretched in one direction. These stretched molecule chains increase the breaking load and decrease the elongation. Therefore Dyneema® has a low stretch at break. Dyneema® has a very low specific weight and is therefore buoyant. The only disadvantage is that it creeps.

This means the fiber will show a permanent elongation under load. Dyneema® also has a good abrasion resistance and resistance against sunlight.

Dyneema® is used for: FL-9.NG, FL-10.NG, FL-14.NG, FL-20.NG, FL-27.NG, FL-28.NG, FL-32.NG, FL-34.NG, FL-35.NG, OL-2, OL-3, Globe-5000, DPL-7.NG, DPL-6.NG, DPL-8.NG

Raw material	UHMWPE like Dyneema® or Spectra®
Strength	3450 N/mm ²
Specific weight	0.97 g/cm ³
Water intake	0 %
Sun resistance	very good
Elongation (at break)	3.5 %
Abrasion resistance	very good
Creep	at high loads
Melting temperature	144 – 152°C

Dyneema® is a registered trademark of DSM. Spectra® is a registered trademark of Honeywell.



Bridle Lines:
Globe-5000, OL-3

Flying Lines:
FL-9.NG, FL-10.NG, FL-14.NG, FL-20.NG, FL-27.NG, FL-28.NG, FL-32.NG, FL-34.NG, FL-35.NG

Leader Lines:
OL-2, OL-3

Depower Line:
DPL-7.NG, DPL-6.NG, DPL-8.NG

BRAND NEW FIBERS: DYNEEMA® SK99 & DYNEEMA® DM20



Always in Motion – Innovative Solutions with Dyneema® SK99 and Dyneema® DM20.

Having a reputation for always keeping pace with the latest trends and developments. It is with particular pride that we, as one of a select few companies, introduce to you now the latest development from DSM, the brand new Dyneema® fibers, as a part of our most recent product developments. Therefore, it is a pleasure to introduce to you for the coming season a number of new state-of-the-art products developed with the new Dyneema® SK99 and Dyneema® DM20

- 7,5% HIGHER BREAKING STRENGTH
- 10% BETTER ELASTICITY MODUL

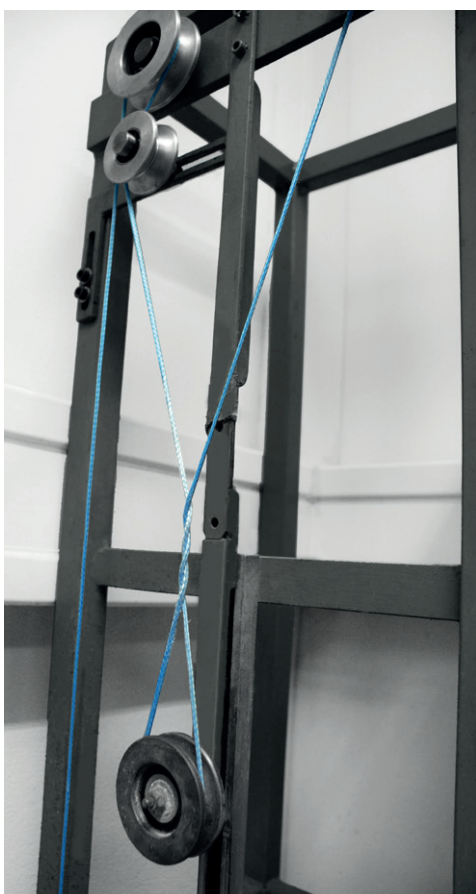
fiber. Our High Performance product line, the FL.27 and FL.28 already incorporate Dyneema® SK99. This allows us to further upgrade the technical specifications of our products and significantly improve your kite's performance.

ULTIMATE QUALITY GUARANTEED



Good flying lines exhibit low elongation values, but production tolerances must be as small as possible. Certified quality assurance means regular testing and highest quality standards. This is why we not only test but also document all production lots by means of control numbers, making them traceable at all times!

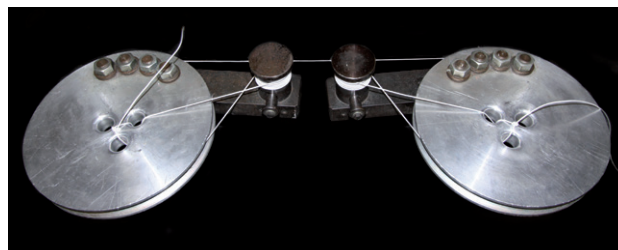
To achieve an appropriate life span for de-power lines, they need to be highly abrasion resistant. During a 2-year testing phase, we have developed a special impregnation that helps attain an up to 3 times greater abrasion resistance.



Specific abrasion test for **NEXT GENERATION** kite lines



Quality control based on control numbers, which allow a detailed follow-up of each individual production run and the relevant quality control.

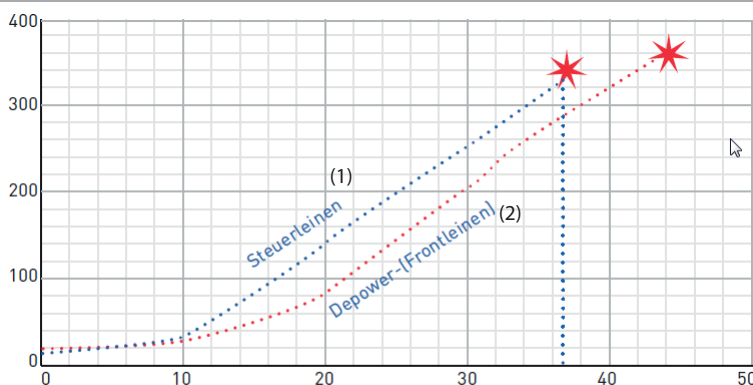


Breaking strength test for **NEXT GENERATION** kite lines



Line failure at approx. 350 daN

FL.10 - KITELINE TEST IN THE "KITE MAGAZIN" [ISSUE 11+12/2012]



Diameter: 1.48 mm Frontlines, 1.53 Backlines

Weight: 1.64 g/m (Frontlines), 1.6 g (Back)

Construction: 8-braided

Test results:

- Elongation Frontlines: **very low**
- Elongation Backlines: **very low**
- Breaking strength: **very good**

(1) "Steuerleinen" = Backlines

(2) "Frontleinen" = Frontlines

★ Line failure; standard testing period in sec.

FLYING LINES

RACING



© Blade Kiteboarding

We at TEUFELBERGER perceive ourselves as leaders in technology. From our TRACE.TECHNOLOGY to the computer-assisted pre-stretching process and, most recently, the brand-new Dyneema® SK99 (FL-27.NG and FL-28.NG) and Dyneema® DM20 (FL-32.NG) fibers, we keep the constant stream of innovations flowing. By doing so, we continue to take the performance we offer our customers to new unprecedented levels. It is the whole package, composed of kite, line and bar, that is instrumental for success in kiteboarding, just like in Formula 1 racing where even the strongest engine won't matter if your tires wear down fast.

FL-27.NG – DYNEEMA® SK99: THE RACING BENCHMARK

RACING **NEW**



Technical Specifications	Dyneema® SK99, pre-stretched, NG-impregnated, 8-braided	
Diameter	1.25 mm	
Elongation (at 80 daN)	0.90%	
Stretch Development	20 daN: 0.40%	80 daN: 0.90%
Breaking Load	400 daN	
Weight	1.30 g/m	

Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice
Capacity: 800-2000 m/spool

FL-28.NG – DYNEEMA® SK99: LIGHTER [-40%!] & THINNER [-20%!] – PUREBRED RACING!

RACING **NEXT GENERATION**

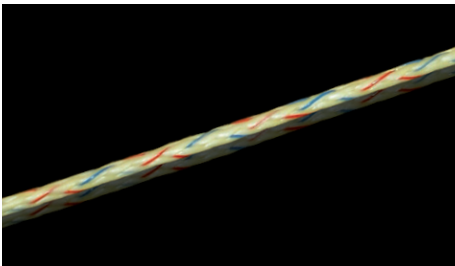


Technical Specifications	Dyneema® SK99, pre-stretched, NG-impregnated, 8-braided	
Diameter	1.10 mm	
Elongation (at 80 daN)	0.95%	
Stretch Development	20 daN: 0.30%	80 daN: 0.95%
Breaking Load	290 daN	
Weight	0.95 g/m	

Characteristics: lowest stretch with nearly no creep, small tolerances, high breaking load
Capacity: 1400-2000 m/spool

FL-32.NG – DYNEEMA® DM20: NO MORE PERMANENT ELONGATION!

RACING **NEXT GENERATION**



Technical Specifications	Dyneema® DM20 with PE-Monofil, pre-stretched, NG-impregnated, 8-braided	
Diameter	1.50 mm	
Elongation (at 80 daN)	1.10%	
Stretch Development	20 daN: 0.35%	80 daN: 1.10%
Breaking Load	350 daN	
Weight	1.80 g/m	

Characteristics: lowest stretch with nearly no creep, small tolerances, high breaking load
Capacity: 1400-2000 m/spool

FLYING LINES

PERFORMANCE



© Caro Thiersen

TEUFELBERGER flying lines feature TRACE.TECHNOLOGY, that is braided-in colored mono-filament threads. This unique (and therefore as utility model protected) development behaves in a manner similar to a toothbrush's bristle: the sustained restoring force always causes the kite line to straighten itself again, and it also helps avoid extreme kink radii. Such kinks may inflict structural damage on high tech fibers which reduces their breaking strength, and, if worse comes to worst, causes the line to rupture.

Choose the right line for each application on the kite.

FL-10.NG – THE BENCHMARK

PERFORMANCE



Technical Specifications

Diameter

1.45 mm

Elongation (at 80 daN)

1.00%

Stretch Development

20 daN: 0.30%

80 daN: 1.00%

Breaking Load

330 daN

Weight

1.60 g/m

Dyneema® with PE-Monofil, pre-stretched, NG-impregnated, 8-braided

Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice

Capacity: 800-2000 m/spool

FL-20.NG – BEST VALUE FOR MONEY

PERFORMANCE



Technical Specifications

Diameter

1.45 mm

Elongation (at 80 daN)

1.10%

Stretch Development

20 daN: 0.35%

80 daN: 1.10%

Breaking Load

275 daN

Weight

1.60 g/m

Dyneema® with PE-Monofil, pre-stretched, NG-impregnated, 8-braided

Characteristics: lowest stretch with nearly no creep, small tolerances, high breaking load

Capacity: 1400-2000 m/spool

FL-34.NG – TAKING PERFORMANCE TO YET ANOTHER LEVEL

PERFORMANCE



Technical Specifications

Diameter

1.65 mm

Elongation (at 80 daN)

0.90%

Stretch Development

20 daN: 0.40%

80 daN: 1.10%

Breaking Load

400 daN

Weight

1.85 g/m

Dyneema® with PE-Monofil, pre-stretched, NG-impregnated, 12-braided

Characteristics: lowest stretch with nearly no creep, small tolerances, high breaking load

Capacity: 1400-2000 m/spool

FLYING LINES

HEAVY DUTY



© North - Dirk Hanel

In recent years, kiteboarding has evolved at breathtaking speed, and so have all its tricks, moves, jumps, and maneuvers on the water. It is about time that freestylers be given the chance to get lines that are capable of withstanding all these extreme loads. In the past, the enormous shock loads encountered in freestyle kiting, in particular, stressed many a line beyond its breaking point. Therefore, we prefer to design our lines with a greater safety margin so as to make absolutely sure that there will be no breakage. Those were the fundamental targets in the development of our heavy-duty lines.

FL-9.NG – HOW ABOUT ULTIMATE BREAKING STRENGTH?

HEAVY DUTY



Technical Specifications	Dyneema®, pre-stretched, NG-impregnated, 12-braided	
Diameter	2.05 mm	
Elongation (at 80 daN)	0.55%	
Stretch Development	20 daN: 0.25%	80 daN: 0.55%
Breaking Load	650 daN	
Weight	3.30 g/m	

Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice
Capacity: 800-1200 m/spool

FL-14.NG – HAS SAILED THROUGH ALL TESTS!

HEAVY DUTY

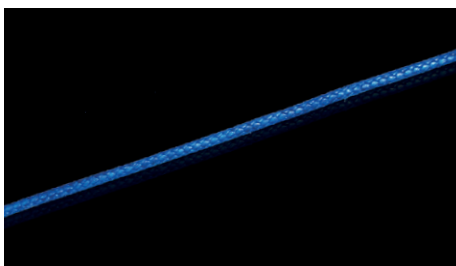


Technical Specifications	Dyneema® with PE-Monofil, pre-stretched, NG-impregnated, 12-braided	
Diameter	1.70 mm	
Elongation (at 80 daN)	0.85%	
Stretch Development	20 daN: 0.25%	80 daN: 0.85%
Breaking Load	400 daN	
Weight	2.20 g/m	

Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice
Capacity: 800-2000 m/spool

FL-35.NG – DYNEEMA® SK99: THIN, LOW WEIGHT AND STRONG!

HEAVY DUTY



Technical Specifications	Dyneema® SK99, pre-stretched, NG-impregnated, 12-braided	
Diameter	1.35 mm	
Elongation (at 80 daN)	1.05%	
Stretch Development	20 daN: 0.45%	80 daN: 1.05%
Breaking Load	380 daN	
Weight	1.15 g/m	

Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice
Capacity: 800-2000 m/spool

Standard colours of the PE Monofil for FL-10, FL-14 and FL-20: black, blue, red, grey, orange
 Standard colour of impregnation: transparent. Other colours on demand. For example:

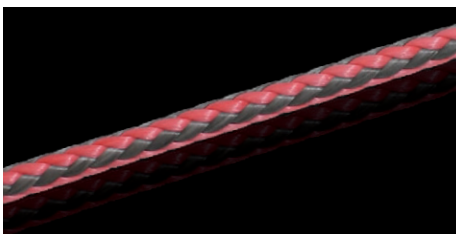


DEPOWER LINES



The most important property of depower lines for kiteboarding is high abrasion resistance. Together with our development partner, we have worked hard to come up with a high-performance line that offers great durability combined with minimal wear. To this end, this product was coated with a special impregnation which markedly increases its life span and offers great abrasion resistance.

DPL-6.NG - COOL LOOK AND LONGEST LIFE!



Technical Specifications

Dyneema®, pre-stretched, bi-colored, single yarn, NG-impregnated, 12-braided

Diameter

4.80 mm

Elongation (at 80 daN)

0.10%

Breaking Load

2200 daN

Standard colour combination: white/blue, red/grey

Characteristics: Extremely high abrasion resistance, highest breaking strength, nearly no stretch

Capacity: 500-1200 m/spool

DPL-7.NG - THIS LINE NEVER QUILTS ON YOU



Technical Specifications

Dyneema®, pre-stretched, NG-impregnated, 12-braided

Diameter

4.70 mm

Elongation (at 80 daN)

0.10%

Breaking Load

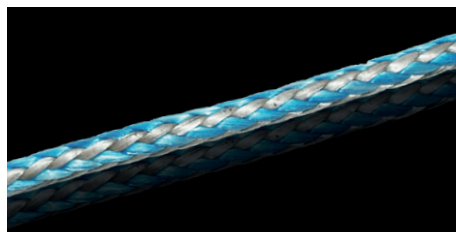
2200 daN

Standard colour of impregnation: grey

Characteristics: Extremely high abrasion resistance, highest breaking load, nearly no stretch

Capacity: 500-1200 m/spool

DPL-9.NG - TOP PERFORMANCE AT AN AFFORDABLE PRICE!



Technical Specifications

Dyneema®, pre-stretched, NG-impregnated, 12-braided

Diameter

4.70 mm

Elongation (at 80 daN)

0.10%

Breaking Load

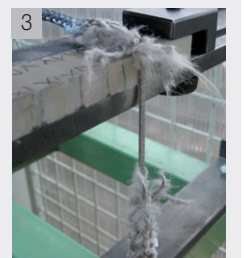
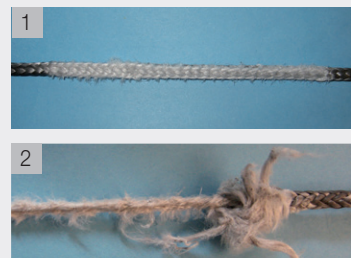
1400 daN

Standard colour combination: grey

Characteristics: Extremely high abrasion resistance, high breaking load, nearly no stretch

Capacity: 500-1200 m/spool

The tests conducted by our development department have shown that TEUFELBERGER's DPL-7, compared to other products, is considerably more abrasion resistant. While DPL-7 tore after 3,120 test cycles, the comparison product tested by us ruptured after only 640 cycles. Pic. 1 shows DPL-7 after 1,500 cycles, while pic. 2 shows a comparable product after 500 cycles. Pic. 3 shows the damage on a third-party sample after only 231 cycles. Testing was carried out in our in-house testing facility, where the line was rubbed over corundum.



BRIDLE-, SAFETY- AND LEADER LINES



© Blade Kiteboarding

In cooperation with the development teams of the leading kite brands, our kite lines undergo continuous improvement. Our lines are required to pass strict stress tests and quality inspections. The result are tailor-made solutions for the respective field of use.

OL-2 / OL-3



	OL-2	OL-3
Technical Specifications	Dyneema®, NG-impregnated, 12-braided	Dyneema®, NG-impregnated, 12-braided
Diameter	2.90 mm	2.50 mm
Breaking Load	880 daN	500 daN

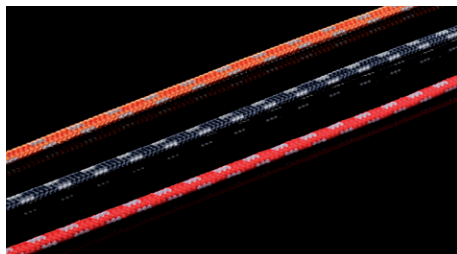
OL-2: Characteristics: Low stretch, high breaking load, easy to splice

Capacity: 500-1200 m/spool

OL-3: Characteristics: Low stretch with small tolerances, high breaking load, kink free, easy to splice

Capacity: 800-2000 m/spool

GLOBE-5000



	Cover: PES, 12-braided; Core: Dyneema®	Cover: PES, 16-braided Core: Dyneema®	Cover: PES, 16-braided Core: Dyneema®, 16-braided
Technical Specifications			
Diameter	1.70 mm	2.50 mm	3.00 mm
Elongation at 80 daN	1.20%	1.20%	1.20%
Breaking Load	130 daN	300 daN	500 daN

Characteristics: cover/core-construction; very high abrasion resistance, low stretch

Capacity: 800-2000 m/spool

HANDLING ADVICE FOR YOUR TEUFELBERGER KITE LINES



CLEANING KITE LINES

If the kite lines are used in salt-water, they should be thoroughly washed with fresh water after the season to remove salt-crystals, and other damaging dirt. If the lines are used in fresh water they will still benefit from a good rinsing to remove any dirt particles.



CLEANING IN THE WASHING MACHINE

Kite lines that are extremely dirty they can be cleaned in a washing machine, using cold or warm water. Don't use any kind of fabric softener!



STORAGE

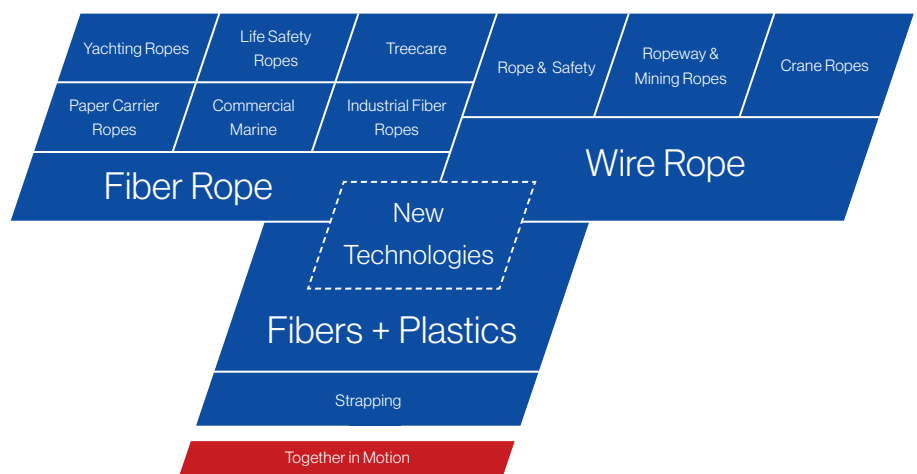
Before being put away for the season, or stored for extended periods kite lines should be thoroughly dry to avoid mildew. Kite lines are best stored hanging up and out of the sun. Generally, Dyneema® ropes should be protected from heat (above 60°C). **(Caution!** Be careful when keeping the ropes in a car!)

EXPERTISE FROM 225 YEARS OF EXPERIENCE

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

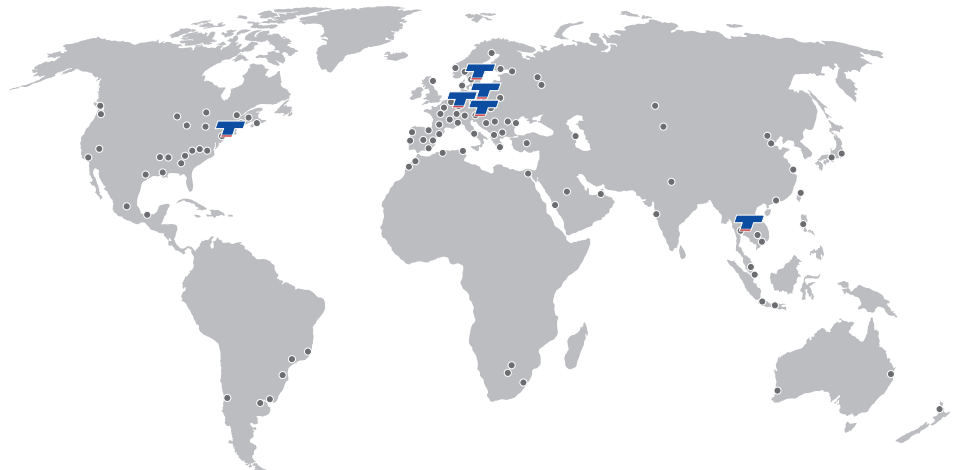
Vast diversity

Its products are designed for a wide variety of applications ranging from cranes and marine applications to packaging and through to the automotive sector. It is the continuity and stability of a family business that makes us the reliable partner who supports you, competently and effectively, in coping with your daily challenges.



Global presence ensures 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., 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, strapping, and fiber composite components. The spectrum of technologies in TEUFELBERGER's portfolio generates various synergies between the extrusion of thermoplastics, braiding of high performance fibers, and processing of wires into ropes, strapping, and lightweight composite components.

Especially fiber and steel wire products 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, innovative rope technologies. 10 % of the entire investment volume are committed to development and quality assurance.



© Switch Kites



© JN-Kites



© JN-Kites

REFERENCES

TEUFELBERGER has worked together with leading manufacturers and kite pros for years. And the success has proven us right. At both world championships and other international competitions, kites who are using our ropes have been achieving top results on a regular basis.

"Since we started working with kite lines made by TEUFELBERGER, we have seen no more elongation or line breakage problems".

Dirk Hanel, Head Product Manager North Kiteboarding and IKA World Champion Masters Production

"Our company philosophy demands offering the highest quality products available, so we relentlessly strive to find and source from the best suppliers worldwide. Before purchasing any products, we thoroughly test them both in the field and our laboratories to ensure that our customers will be 100% satisfied with their purchase. After years of searching, we are confident we have found in Teufelberger a partner that will create unprecedented customer satisfaction and will lead the way in cutting edge technology."

Ralph von Brause, Head of R&D Switch Kites

"It is often underestimated the power of the flying lines. Thankfully Teufelberger has helped deliver trustworthy and consistent lines year after year."

Yaron Barlev, CEO Blade Kiteboarding Barlev, CEO Blade Kiteboarding

"In the development of our kites, direct turning behavior always figures at the top of our task list. Yet, when fitted with poor quality kite lines, even the best kite very quickly becomes a lame duck. This is why JN has relied on Teufelberger lines for years. The ongoing personal exchange of thoughts and ideas with the development team ensures that we get the best possible connection between bar and kite. Always!"

Alois Egger, Product Manager JN Kites, JN Sporting Goods GmbH

"Whether in snow or water, these lines work always!"

Jacob Buzianis, Overall Champ Snowkite Masters 2009

"It is extremely important to us that we don't only have a supplier but also a competent development partner: in opting for TEUFELBERGER, we have made the right choice!"

Till Eberle, CEO Boards & More GmbH.

"For a long time, it didn't really matter to me, but now I am always looking forward with anticipation to the newest lines!"

Steph Bridge, IKA World Champion Masters Women

"We are working on new ideas, TEUFELBERGER on new materials and designs. This incredible synergy creates a living development process that results in the constant creation of innovative products which is the way that it should be!"

Aurelien "Lou" Mierswa, Product Manager North Kiteboarding

"It's always fascinating to observe what impact a perfect kite line has on the whole kite system".

Peter Stiewe, Managing Director R&D Pure Action Sports

"In developing and refining our kites, we can always rely on TEUFELBERGER's expertise. This speeds things up and helps us achieve better results!"

Jordi Modolell, Head of R&D Best Kiteboarding

"Continued development with a creative partner is fun. And it gets even more fun if this partner also offers expertise in other fields of use, as is the case at TEUFELBERGER!"

Sebastian Heitmann, CEO Best Kiteboarding



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Together in Motion