OFFSHORE HEAVY LIFTING

HEAVY LIFT SLINGS

BEXCO has been instrumental in successfully implementing heavy lift projects for major offshore contractors with its custom-made solutions, which are built to match the toughest environments and conditions where our customers operate.

The company offers a range of purpose-built, heavy lift and installation sling ropes in HMPE, produced at the BEXCO manufacturing plant in Hamme, Belgium and at its load-out quayside facility in Antwerp.

With its modern R&D equipment, BEXCO is able to design, test and then produce customized slings for engineered lifts, meeting all complex loading and handling requirements for specific lifting projects. Attention to detail in approval procedures, documentation and administration are given equal importance, with the BEXCO project team committed to supporting the project follow-up from day one.

From tender through production and deployment right until final delivery and maintenance, BEXCO offers personal contact and advice from one of our expert BEXCO engineers for every step of the way.

BEXCO

OUR ROPE, YOUR SOLUTION

FLEXOR FOR SMULDERS

Smulders is an international steel construction company with offices in Belgium, the Netherlands, Poland and the United Kingdom. Smulders specializes in metal constructions for the oil and gas industry and wind energy sector.

Smulders uses BEXCO's FLEXOR slings for the lifting of windmill components in their factory in Hoboken, Belgium.

Bert De Vos, Smulders Purchasing Manager

"BEXCO's soft slings are, for the same break strengths, considerably thinner and lighter in comparison with the slings we used in the past, making them so much easier to handle. We choose our slings in function of the capacity of our cranes. The BEXCO slings are flexible in usage and can be used on different equipment, which means we can work with a minimum amount of slings for a maximum array of applications.

Before the use of the FLEXOR round slings we used PES-soft slings. By changing to FLEXOR, we were able to decrease the hook-up team from 4 to 1 person only. Also we noted a remarkable difference in lifespan thanks to the use of the DURA-1200 sleeve."

Delivered to Smulders

- FLEXOR round slings
- Lengths between 6 and 16 meter
- Breaking loads up to 1.000mT

SLINGS FOR ALE HEAVY LIFT

ALE is one of the biggest international heavy transportation and lifting contractors, with a global network of operating centres and a large fleet of heavy cranes, specialized transport and installation equipment.

For one of their projects off the Nigerian coast, ALE counted on BEXCO's Ultraline Dyneema@SK78 grommet slings to do the job.

Jelle Schepens, Senior Project Manager at ALE

"BEXCO's Ultraline slings had all the advantages we were looking for. The reduced weight offers a safer working environment for our people and equipment. The sub-rope system used in these slings is ingenious and reduces any operational risks. The Ultraline slings have a protective and breathing cover, which is a unique asset.

We were very satisfied about BEXCO's communication and project management. Although faced with a very tight time frame, BEXCO was able to deliver all slings inclusive all testing before the project deadline.

We had the feeling that BEXCO was one of our partners, not just a supplier."

The general manager of the end user added

"I would like to congratulate your company to have been from the beginning transparent with us and for achieving a timely delivery of the slings. I really appreciated your professionalism."

Delivered to ALE

- Ultraline Dyneema SK78 grommet slings
- Lengths 8 x 11 and 4 x 17 meters
- Breaking loads of 4300mT

PRODUCTS FOR HEAVY LIFTING & INSTALLATION

BEXCO offers various types of lifting and installation arrangements using ropes manufactured with High-Modulus Polyethylene (HMPE). With the same strength but weighing 8 to 10 times less than traditional wire ropes, HMPE ropes are more flexible and much easier to handle. HMPE also has a much better fatigue life compared to wire, whilst retaining similar elastic elongation properties.

BEXCO's range of offshore heavy lifting rope has served several onshore and offshore applications, including

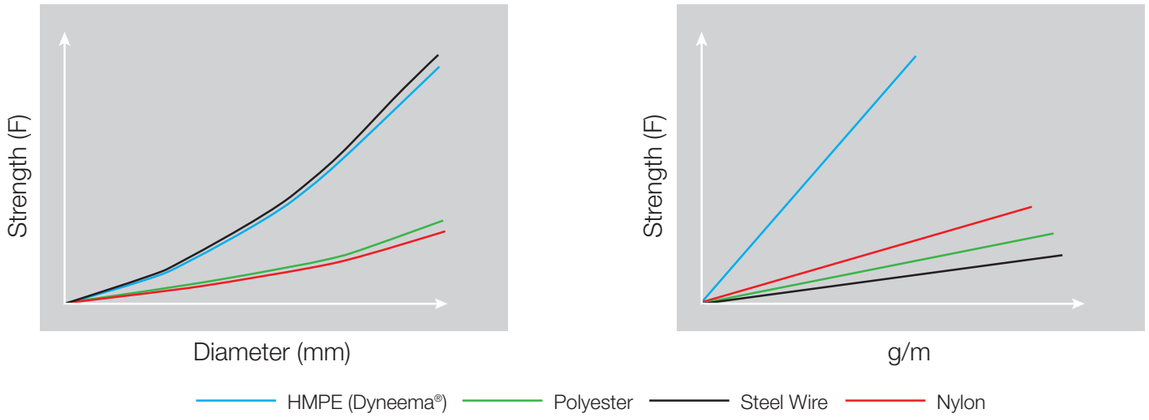
- Offshore Oil & Gas lifting and installation projects (topsides, modules, substations, flares, modules)
- Subsea installation (suction piles, pipelines, anchors, support structures, manifolds)
- Foundations for offshore Renewable Projects (jackets, monopoles, turbines, blades)
- Offshore decommissioning & Salvage

BEXCO supplies the world's leading engineering contractors with heavy lift slings to serve at offshore installations located in some of the most challenging marine environments on the planet.

BEXCO manufactures its HMPE rope using Dyneema®SK78, having been awarded diamond partnership status with its fibre supplier Royal DSM NV of Holland.

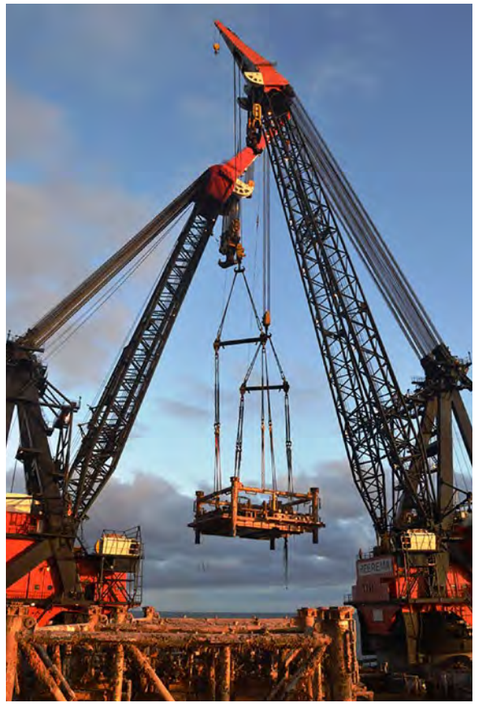
Dyneema®
With you when it matters

Dyneema® is a registered trademark of Royal DSM N.V.



ADVANTAGES AND BENEFITS

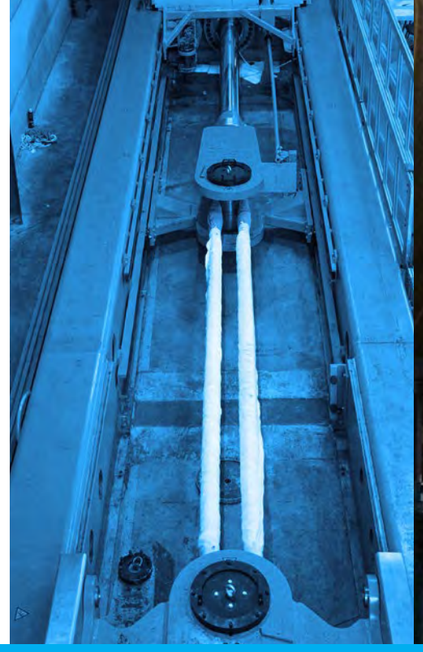
- Light and easy handling
- Fast rigging installation
- Increased lift capacity
- Soft contact surfaces
- Torque free
- Safe operations during use
- No abrasion
- Maintenance free
- Not affected by fresh or salt water
- Reduced risk of injuries
- No fish hooks



PRODUCT OVERVIEW

Product	Round Slings	Rope Slings	
	Flexor (P 6-9)	Ultraline Dyneema® SK78 (P 10-11)	Superior Dyneema® SK78 (P 12-13)
Abrasion resistance	Very good	Excellent	Very good
UV resistance	Excellent	Excellent	Good
CUT resistance	Very good	Excellent	Good
Typical sling lengths	2-35m	>8m	>5m
Typical MBL	300-3500mT	300-4500mT	50-2000mT
Length tolerance	Excellent	Very good	Very good
Ease of handling/flexible	Excellent	Very good	Very good
Storage space	Very limited	Limited	Limited

When ordering, BEXCO collects detailed operational information so we can offer, design and deliver exactly the right solution for your needs.



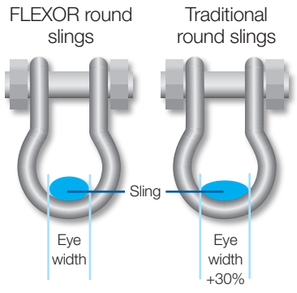
FLEXOR ROUND SLING WITH DYNEEMA® SK78 CORE

FLEXOR round slings are tested on various pin diameters to determine bending efficiency on different pin diameters.

BEXCO's precision manufacturing methods ensure production with tight length tolerances of identical batches of FLEXOR Slings.

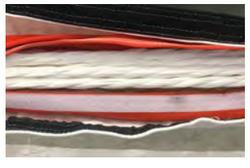
Strong and sturdy label fastened to sling.

Double protected eye which retains its shape and resists any flattening whilst operating in harsh conditions, allowing the use of smaller hardware; compared to traditional round slings, the width of the eyes when in use is 30 to 40% smaller.



Eyes can be lashed together forming a false eye.

Double protection sleeve with heavy duty velcro closing for easy inspection and repair.



The core is made of Dyneema® SK78 fibers which gives the sling an unrivaled lightweight in combination with its strength and flexibility.

BEXCO's DURA cover made with HMPE, especially designed in collaboration with local weaver. The DURA sleeve is tested intensively and shows a cut and abrasion resistance X10 compared with other round slings.

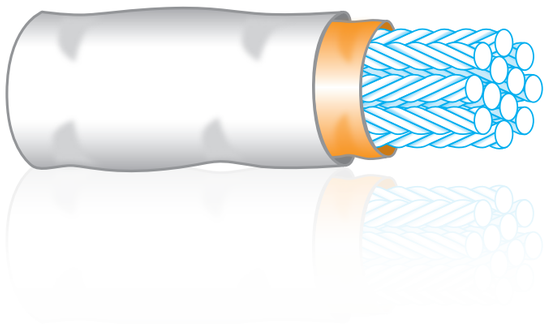
FLEXOR

CONSTRUCTION

FLEXOR is a round sling using a three-strand core. This construction allows a combination of short lengths with high strengths, ensuring ease in handling. FLEXOR is designed for a long lifecycle and flexible usage.

The core is made with Dyneema® SK78 fibres and is protected by a double cover.

The outer cover is standard made of a BEXCO DURA-1200 sleeve. This custom-made sleeve offers maximum protection against cuts, punctures, snags and abrasion as well as UV exposure. The strength will be only be affected after the covers have been worn through and the cores start to abrade. The eyes are designed to retain their shape during precision lifts and will resist any natural flattening whilst operating in harsh offshore conditions, allowing the use of smaller hardware.



FEATURES

- Construction: Load bearing cores in Dyneema® SK78 covered with a DURA sleeve made of HMPE
- Torque neutral
- Specific density: 0,975kg/m3 (floating)
- Melting point: 145°C
- Abrasion resistance: excellent
- Elastic elongation at WLL: +/- 1%
- UV Resistance: excellent
- Chemical resistance: excellent
- Water absorption: 0%
- Colour of rope: standard white with blue eyes; other colours on request

APPLICATIONS

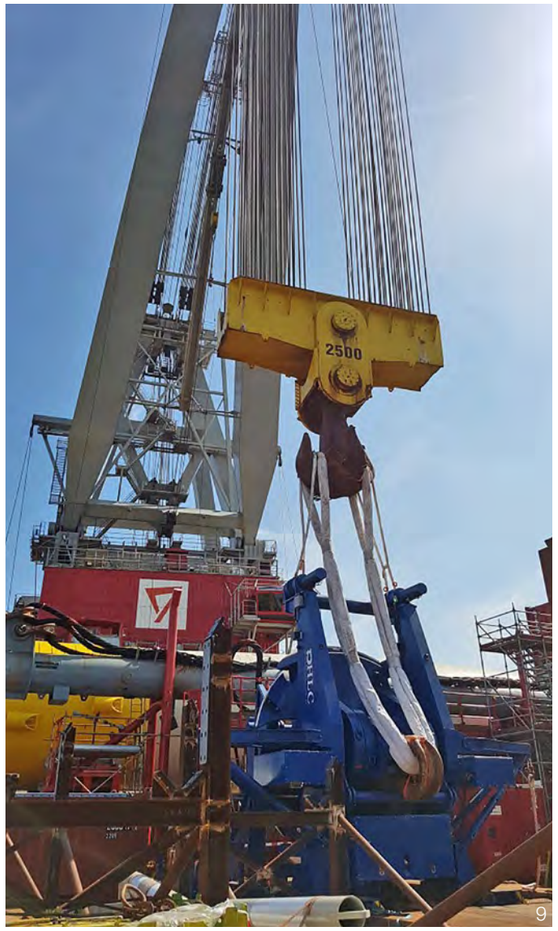
- Heavy lift sling, pennant, A&R recovery, forerunner, pull-in rope,...

SECTORS

- Onshore and offshore oil and gas installation
- Subsea installation
- Offshore renewable
- Decommisioning and salvage

Diameter	Weight in air	MBL		Minimum Bending Dia	Minimum Width eye
mm	kg/m	kN	mT	mm	mm
68	4,0	3.434	350	130	110
74	4,9	4.415	450	140	120
82	5,8	5.494	560	160	130
90	7,2	6.867	700	170	145
94	8,0	7.848	800	180	150
104	9,4	9.614	980	200	165
112	11,2	11.674	1.190	240	180
120	12,8	13.342	1.360	250	190
124	14,0	14.715	1.500	270	200
132	15,9	17.168	1.750	290	215
160	23,4	20.209	2.060	350	255
172	27,3	23.544	2.400	370	275
182	30,8	26.978	2.750	400	295
190	33,8	29.528	3.010	410	305
206	39,0	34.531	3.520	450	330

Other sizes are available on request. For lower bending diameters, please contact BEXCO.



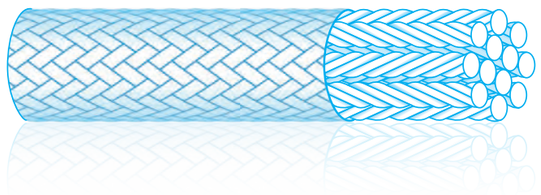
ULTRALINE DYNEEMA SK78®

CONSTRUCTION

BEXCO's precision-engineered Ultraline sling with Dyneema® SK78 is a so-called parallel core construction. This construction consists of two parts, namely the core elements and the cover (see illustration). It is stronger than conventional steel wire rope, yet the corresponding weight is 8 to 10 times lower.

The core elements are three-strand subropes that are oriented parallel to the longitudinal axis of the rope. The cover is a braid (standard consisting of polyester), which provides dimensional stability to the rope structure and protects the cores from external damage. The three-strand core design is used because of the good stretch characteristics and excellent splice strength efficiency exhibited by this type of core design.

The braided cover is treated with a marine finish to further enhance the life of the cover under abrasion loads. The cover braid itself does not contribute to the strength of the rope.



FEATURES

- Construction: load bearing cores made with Dyneema® SK78, overbraided with a polyester jacket
- Torque neutral
- Specific density: depending on rope size, 0,975kg/m3 for the Dyneema® SK78 core and 1,380kg/m3 for the PES jacket
- Melting point: 145°C
- Abrasion resistance: excellent
- Elastic elongation at WLL: +/-1%
- UV Resistance: excellent
- Chemical resistance: excellent
- Water absorption: 0%
- Colour: standard white; other colours on request

APPLICATIONS

- heavy lift sling, pennant, A&R recovery, forerunner, pull-in rope,...

SECTORS

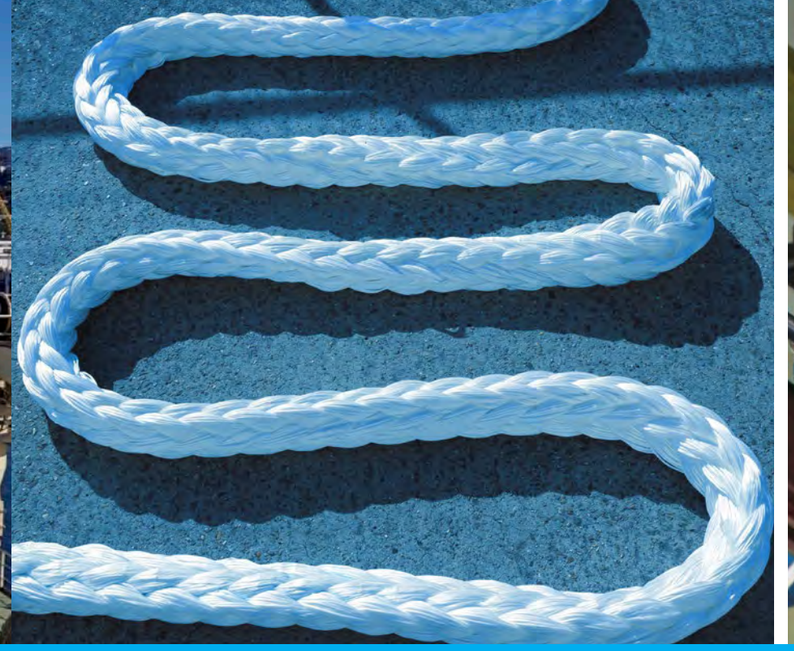
- Onshore and offshore oil and gas installation
- Subsea installation
- Offshore renewable
- Decommisioning and salvage

Diameter	Weight	MBL single		MBL Grommet	
mm	Kg/m	mT	kN	mT	kn
72	2,76	348	3.414	557	5464
80	3,70	426	4.179	682	6690
88	4,18	526	5.189	842	8260
96	5,37	547	5.366	875	8584
104	6,03	615	6.033	984	9653
112	6,90	752	7.377	1.203	11.801
120	7,32	880	8.633	1.408	13.812
128	8,98	1.026	10.065	1.642	16.108
136	9,99	1.160	11.378	1.856	18.207
144	11,00	1.300	12.753	2.080	20.405
150	12,00	1.435	14.077	2.296	22.524
160	13,40	1.640	16.088	2.624	25.741
180	16,70	2.100	20.601	3.360	32.962
200	19,60	2.530	24.819	4.048	39.711
216	23,20	3.030	29.724	4.848	47.559

Other sizes are available on request. For lower bending diameters, please contact BEXCO.

Remarks:

- *Sling strengths are for spliced ropes*
- *Single leg sling strengths are for D/d ratio in the eyes >2. See p14 for strength for lower D/d ratios*
- *Grommet sling strengths are for D/d ratio >3. See p14 for strengths for lower D/d ratios*



SUPERIOR WITH DYNEEMA SK78®

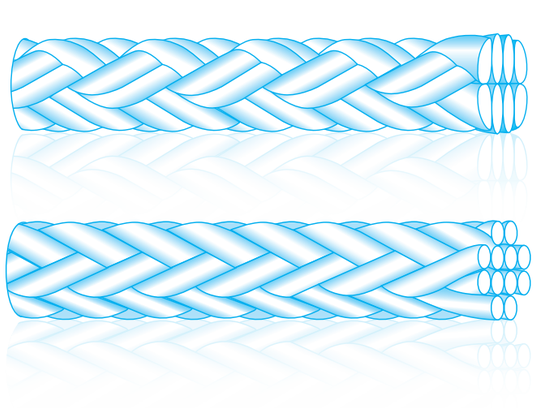
CONSTRUCTION

Superior is an 8- or 12-strand braided rope made of Dyneema® SK78. Superior has a very high strength and low weight-to-diameter ratio. It is stronger than conventional steel wire, yet the weight is 8 to 10 times lower. The rope has very good abrasion resistance and is used in applications where ease in handling and operation is important.

The rope consists of an equal number of interwoven clockwise and anti-clockwise strands making the rope torque free.

During production the rope is standard polyurethane coated using a specialized coating procedure that limits the abrasion and thus significantly extends the lifecycle of the ropes. Other coatings can be applied to suit specific applications.

The rope can also be overbraided with a protective jacket or covered with protection sleeves.



FEATURES

- Construction: 8- or 12-strand braided rope made with Dyneema® SK78
- Torque neutral
- Specific density: 0,975kg/m3 (floating)
- Melting point: 145°C
- Abrasion resistance: excellent
- Elastic elongation at WLL: +/- 1%
- UV Resistance: excellent
- Chemical resistance: excellent
- Water absorption: 0%
- Colour: standard white

APPLICATIONS

- Heavy lift sling, pennant, A&R recovery, forerunner, deepwater lowering line, pull-in rope,...

SECTORS

- Onshore and offshore oil and gas installation
- Subsea installation
- Offshore renewable
- Decommisioning and salvage

Diameter	Welght	MBL Single		MBL Grommet	
mm	Kg/m	mT	kN	mT	kN
32	0,60	94	926	151	1482
40	0,90	133	1.302	212	2.084
48	1,26	179	1.758	287	2.812
56	1,67	233	2.284	373	3.655
64	2,15	288	2.825	461	4.520
72	2,68	349	3.425	559	5.481
80	3,60	449	4.406	719	7.050
88	4,28	518	5.085	829	8.136
96	5,02	580	5.693	928	9.108
104	5,82	666	6.536	1.066	10.458
112	6,68	754	7.398	1.207	11.837
120	7,60	847	8.308	1.355	13.293
128	8,58	945	9.268	1.512	14.828
140	10,17	1.101	10.803	1.762	17.285
150	11,59	1.239	12.159	1.983	19.454
160	13,10	1.385	13.586	2.216	21.738

8-strand

12-strand

Other sizes are available on request. For lower bending diameters, please contact BEXCO.

Remarks:

- *Sling strengths are for spliced ropes*
- *Single leg sling strengths are for D/d ratio in the eyes >2. See p14 for strength for lower D/d ratios*
- *Grommet sling strengths are for D/d ratio >2,5. See p14 for strengths for lower D/d ratios*

ROPE SLING CONFIGURATIONS

BEXCO rope slings are available in single and endless configurations.

Single leg slings

Single leg slings are made from a single rope with an eye splice at both ends.

Advantages

- Maximum fiber efficiency
- High bending efficiency in eyes (D/d)

Disadvantages

- Heavier and bigger eyes
- Minimum length limited

Endless rope slings or grommets

The endless rope slings, also known as grommets, are configured splicing both ends of the rope into each other. The splice can be positioned in the center or out of the center. Both grommet legs can be lashed together forming ‘false eyes’.

Advantages

- Shorter lengths possible
- Narrower bearing point

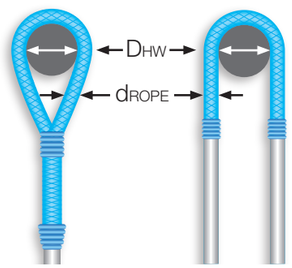
Disadvantages

- Lower bending efficiency in the eyes (D/d)
- Lower fiber efficiency

The choice of sling configuration is depended on the rigging arrangement. Each lift calls for a sling designed for that unique operation. BEXCO can assist in selecting the best solution for a specific project.

Bending efficiency at bearing points

Minimum D/d ratio for frequent use of single leg slings is recommended to be 2. For occasional use the D/d ratio may be less but not lower than 1.



For basket lifts and grommets, the greater the D/d ratio, the higher the strength efficiency. Below table gives an overview of bending effciency of rope slings in different configurations.

D/d	3	2,5	2	1,5	1
Eye-eye rope slings	100%	100%	100%	95%	75%
Eye-eye rope sling in basket hitch	75%	70%	65%	60%	50%
Grommet rope slings	100%	95%	80%	75%	65%

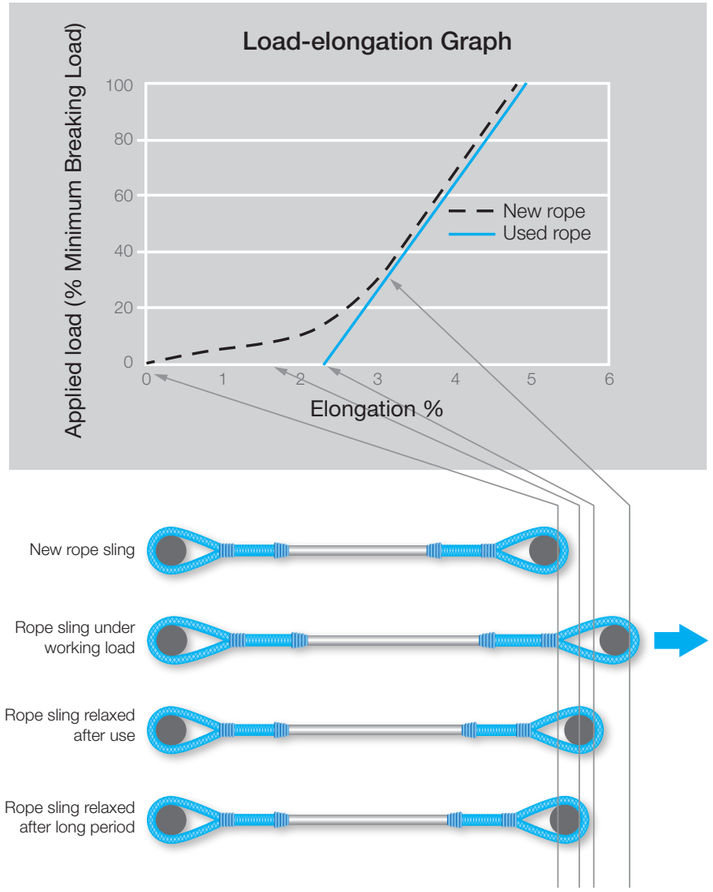
% mentioned is % of the spliced breaking strength

Lengths and elongation

BEXCO rope slings are standard supplied with a length tolerance of +/- 0.5%. It is possible to achieve tighter tolerances for e.g. a matched set of slings. These tolerances depend on sling length and configuration. Please contact BEXCO for length tolerances on specific slings.

It is import to note that new rope slings will experience an initial elongation when the slings are put under load. This is called bedding-in elongation or constructional elongation. Part of this elongation is recoverable. However after a long period of usage, the elongation will no longer be recoverable and the slings will not return to their original length.

The below graph highlights the differences between initial bedding-in (constructional) elongation and elastic elongation.



ACCESSORIES

Rope and Eye Protection

Polyester or HMPE jacket

The Ultraline sling is standard overbraided with a polyester jacket. Also the Superior line can be overbraided with a jacket. The polyester jacket is very durable with excellent abrasion and cut resistance and is non-floating. Rope slings can also be overbraided with an HMPE jacket for superior abrasion and cut resistance making them 100% floating.

Deltaweb clothing

As a standard offering, the eyes of BEXCO's rope slings are protected with a Deltaweb heavy-duty clothing. The clothing is highly abrasion resistant and remains flexible under working conditions.

DURA cover

The eyes can be equipped with a cloth made of HMPE yarns for superior abrasion resistance. These cloths can be applied by sewing or with a removable sleeve applied around the rope with a heavy-duty Velcro tape.

Coating

A polyurethane elastomer coating can be applied to a rope.

Heavy-duty steel thimbles

Eyes may also be protected with heavy-duty galvanized steel thimbles. The high-strength thimble protects the rope and maintains the proper bending radius when it is connected to mating hardware.

Filter Cloth

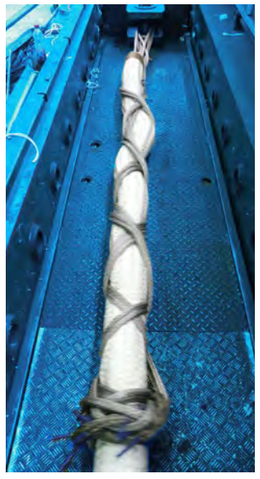
Depending on the installation procedure there may be a potential risk that the rope is dropped on the seabed. Although this in itself has no impact on the rope, it is possible that seabed particles may diffuse into the rope. These particles will have a deteriorating effect on the strength of the rope during its usage life due to their abrasive nature. To avoid this, filter material can be inserted between the cover and the core. The filter stops particles of 5 µm or larger.

Handling point

ROV Handling points (or clump weight connection points etc.) can be attached to the eyes and the body.

Pulling eyes

Chinese fingers can be installed on the rope for a higher pulling force.



TESTING AND SERVICES

BEXCO's R&D facility performs comprehensive testing of all of its synthetic rope constructions in different configurations. These include break load testing, stiffness and fatigue testing, influence of twist and small D/d ratios. The test facility can be used for proof loading and length verification of slings up to 25m in accordance with various industry standards.

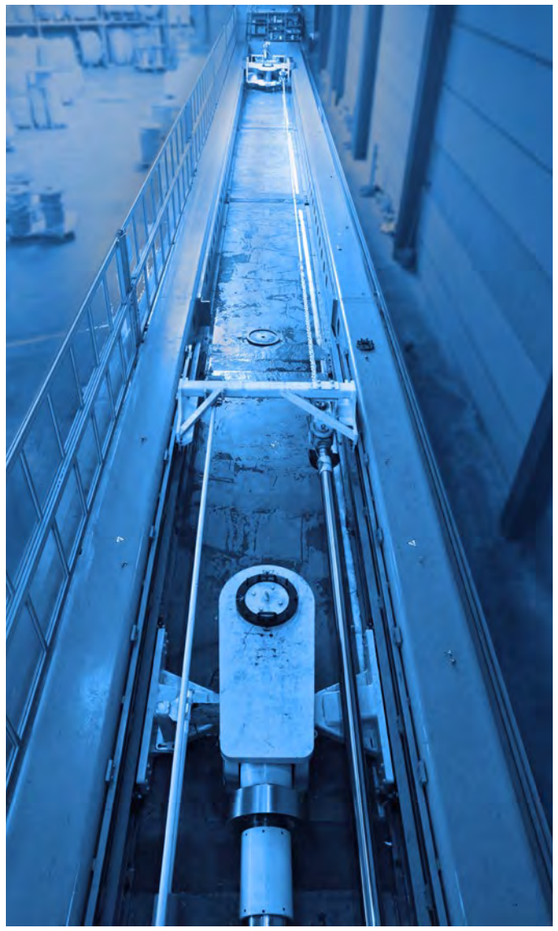
FEATURES

- 25m testbed
- 5m stroke
- 500Tf + 80Tf cylinder
- Break testing
- Stiffness testing
- Creep testing
- Fatigue testing
- Water spraying
- Extensometer system

SERVICES

BEXCO has in-house, highly-trained technicians to serve our clients' needs.

- Installation support on site
- Inspection on site
- Repairs
- Our inspectors are trained and hold the required certifications and permits to go offshore.



CERTIFICATION AND IDENTIFICATION

BEXCO Heavy-Lift slings with Dyneema® SK78 are manufactured to the highest standards of quality. BEXCO's manufacturing facilities are ISO 9001: 2015 certified for the research, development and production of Marine, Offshore and Industrial Ropes in synthetic high performance fibers. All of BEXCO's production, operational and administrative processes are regularly audited by the world's leading classification societies including Lloyds Register, DNV GL, Bureau Veritas as the majority of its main offshore synthetic rope solutions serve the world's leading oil and gas majors. Comprehensive certification packages are put together for each sling including description, drawings, certificates, handling and installation manual.

A strong and sturdy identification label is fastened securely to the rope. It typically contains the following data:

- Purchase order number
- Rope reference number
- Rope minimum break strength
- Rope diameter
- Rope length
- Class certification number

Lloyd's Register

BUREAU VERITAS

DNV·GL

ABS

CONTACT

Dries Hoefkens
Key Account Manager
Offshore Lifting and Installation
dhoefkens@bexco.be

Joe McCoy
Director of Sales US
jmccoy@bexco.be

BEXCO nv
Industriepark Zwaarveld 25
9220 Hamme
Belgium
Tel: +32 52 499 370
E-mail : offshore@bexco.be
For more information on our products:
www.bexco.be

BEXCO

OUR ROPE, YOUR SOLUTION

REFERENCES

Saipem, Heerema Marine Contracting, Allseas, Geosea, Ale Heavy Lift, Seaway Heavy lifting, Smulders, Bluewater, Jan de Nul, Technip, Subsea 7