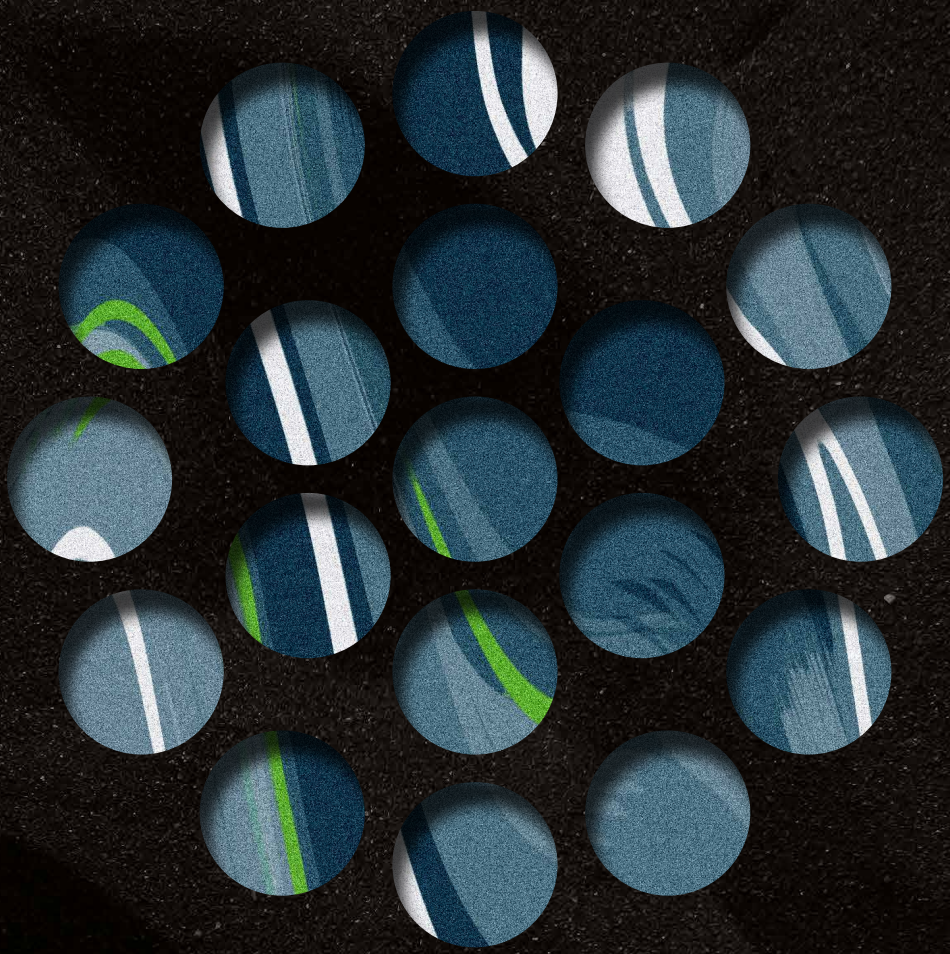


verope® MINING

VEROPE MINING
SPECIAL WIRE ROPES

Foreword

In today's world, where everything is speeding up and focus on long-term durability is diminishing, a reliable constant at one's side is all the more important. verope special wire ropes provide just that.

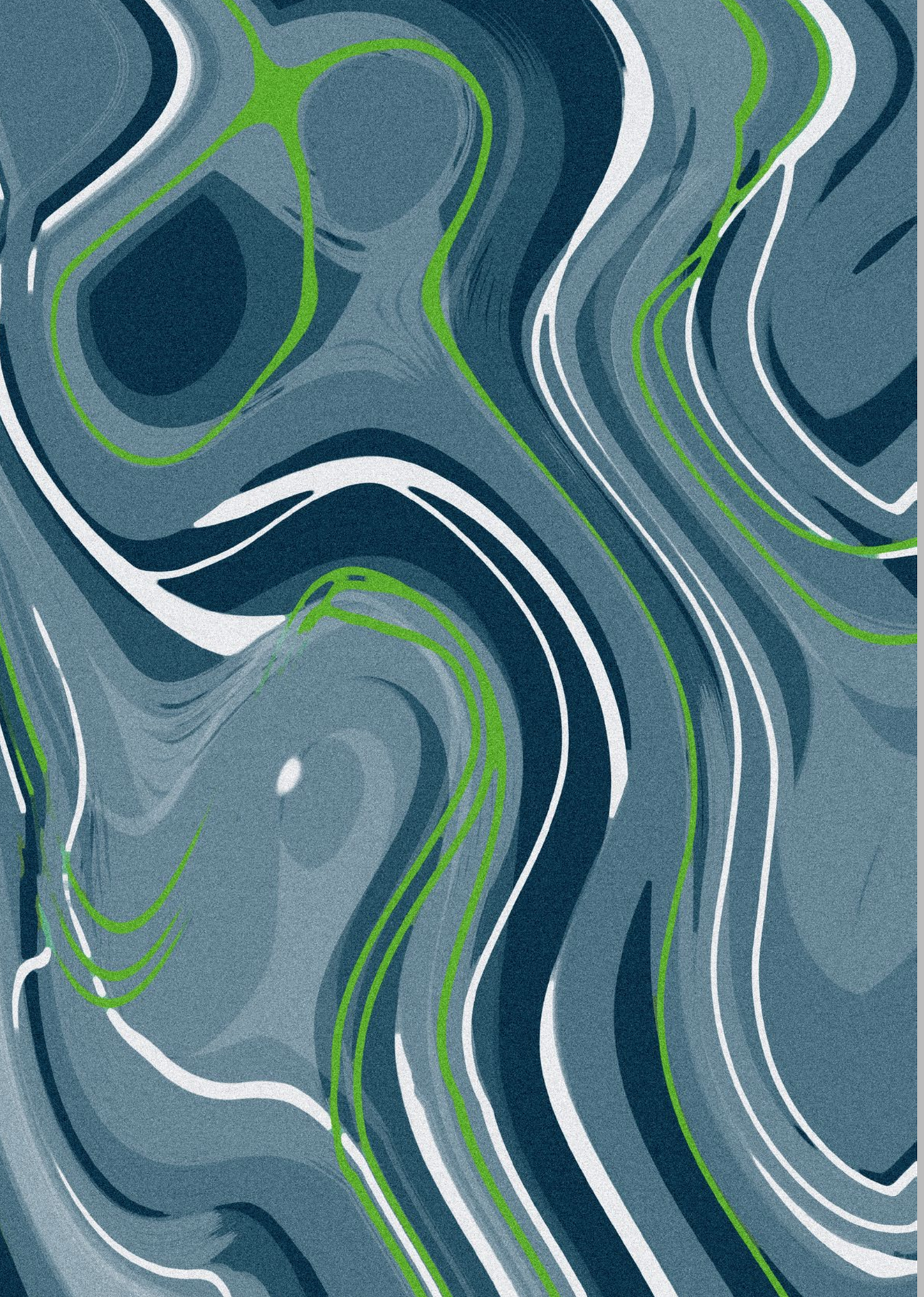
Our special wire ropes carry precious loads at highest safety and performance levels day after day. Partners and customers all over the world trust in verope special wire ropes and this family network is growing larger by the day. The mining sector is one of the most complex wire rope sectors in the world. With huge wire rope diameters and operation lengths, the demands on mining ropes are enormous.

In this catalog we proudly present our mining ropes that combine good old fashioned engineering with state-of-the-art improvements that offer both cost and quality benefits.

In addition to high quality standards, service and support are an important part of the verope philosophy. The network of the verope group extends all over the world. With state-of-the-art service centers in Singapore, Germany, China or the USA, you will receive a response to your support request within hours.

In addition, verope works with partners in more than 62 countries around the world in a long-term relationship. With this strong network, you will never ever feel like you are on your own when it comes to service and support.

The ever-growing verope team, our heroes of reliability, work hard to advise and support you in choosing the best and most competitive rope design for your application.



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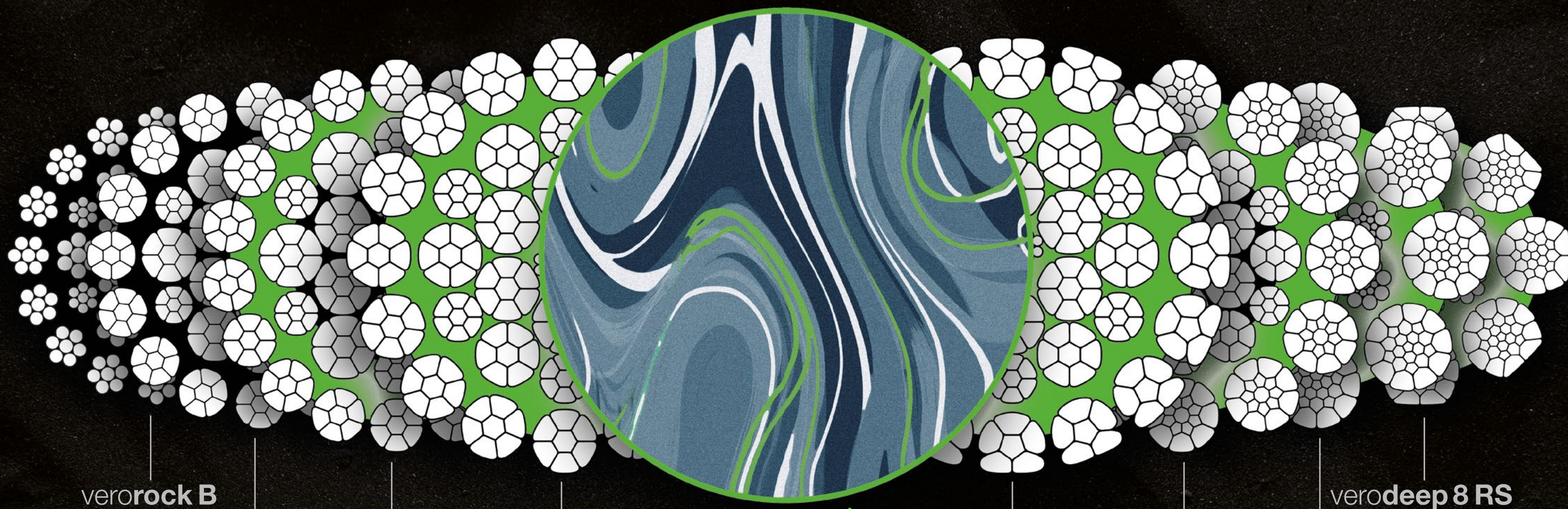
VEROPE MINING
SPECIAL WIRE ROPES



verope MINING

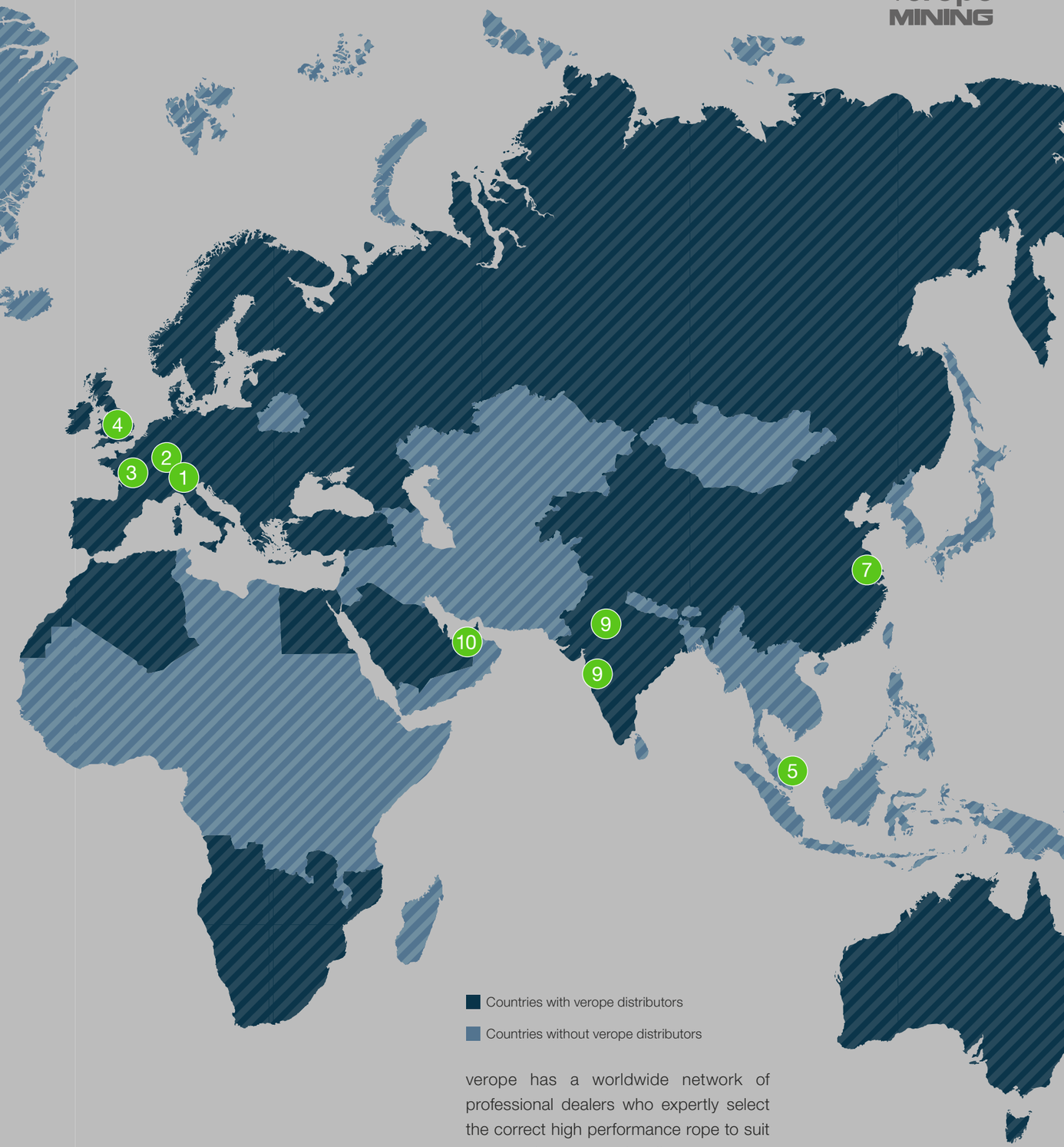
verope group worldwide

With our stock-keeping program at the different verope service centers, we are able to bridge the distance between our modern rope production facility and Joint Venture partner Kiswire in both South Korea and Malaysia and our customers day to day requirements locally.

Our service and logistics centers are able to turn on short notice any inquiries into action:

1 verope AG/Headquarters, Zug, Switzerland
2 verope Service Center GmbH, Contwig, Germany
3 verope France, Paris, France
4 verope UK, Birmingham, UK
5 verope Distribution Singapore Pte. Ltd., Singapore
6 verope USA, Houston, USA
7 LTI Steel Wire Rope Co., Ltd., Shanghai, China
8 verope do Brasil, Resende, RJ, Brazil
9 verope Steel Wire Ropes Private Limited, Mumbai & New Delhi, India
10 verope Middle East, Dubai, UAE

verope MINING



Countries with verope distributors

Countries without verope distributors

verope has a worldwide network of professional dealers who expertly select the correct high performance rope to suit your requirements regionally.

Why verope mining special wire ropes?

Benefits

verope AG is a Joint Venture company between Pierre Verreet, CEO and founder of verope and Kiswire Ltd. from South Korea.

verope AG is a Joint Venture company between Pierre Verreet, CEO and founder of verope, and Kiswire Ltd. from South Korea. With state-of-the-art production and an integrated production process, starting from the own wire drawing and finishing with the final rope under one roof, the quality can be controlled constantly. This setup also provides high flexibility when it comes to “tailor-made” rope constructions.

Our cost efficient production in South Korea enables us to directly transfer savings to our customers: premium quality at a moderate price level.

With the superb know-how of Kiswire Ltd. in wire drawing and the application and product know-how from Mr. Verreet and his team, verope creates reliable and cost-orientated mining wire ropes.

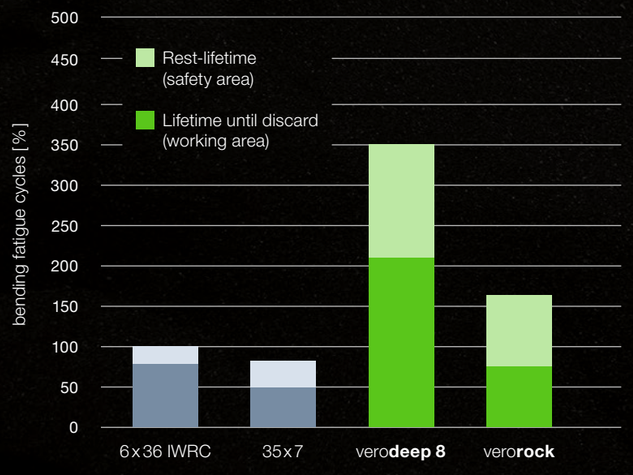
Safety

A part of verope's safety philosophy is the wide safety zone when it comes to discarding the rope.

In the mining industry where rough and robust work takes place on a daily basis with people being transported deep underground, a reliable and safe product is absolutely essential.

verope mining ropes are designed first and foremost for safety. Ropes with higher breaking load offer an increased service life under a lower specific level of stress.

A part of verope’s safety philosophy is the wide safety zone when it comes to discarding the rope. The zone between the point of reaching the rope’s discard criterion and the point where the rope fails is comparably higher than on other ropes, but still with excellent bending fatigue results.

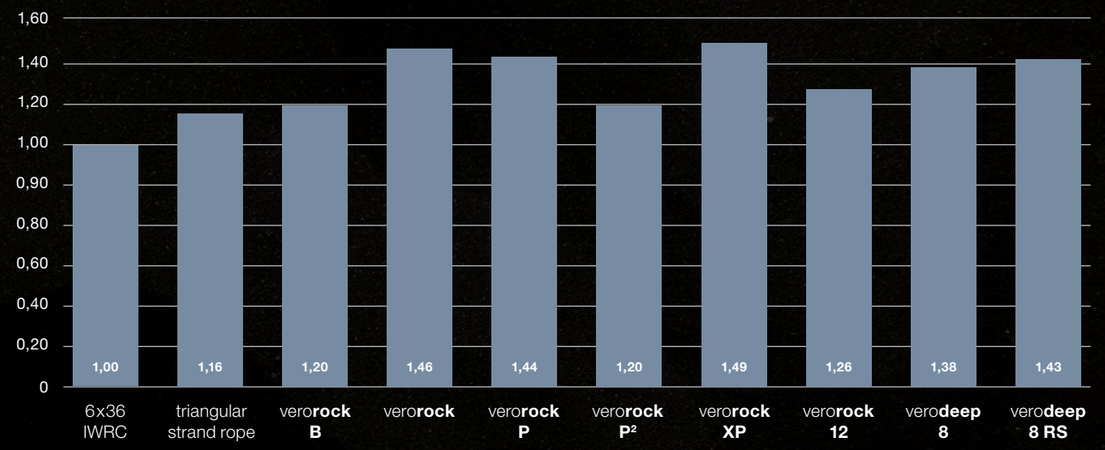


Breaking load

verope special wire ropes are designed to achieve high breaking loads and better strength-to-weight ratios.

verope special mining ropes are designed to achieve high breaking loads and better strength-to-weight ratios. High ductility wires drawn to controlled tolerances are stranded and closed into a rope, constructed with optimized gap spacing between the individual rope elements.

verope products achieve an increased fill factor by using compacted strands as well as rotary swaging in their method of rope construction. Parallel lay elements in the rope composition increase the metallic cross-sectional area.



Rotation resistance

To guarantee rotation-free behavior, the ropes are constantly tested at the KV R&D testfield in Germany.

Especially in the mining industry, with deep shaft levels, the rotation resistance of multi-strand ropes is a crucial factor in the application.

Beyond the specification of the international standards, which demand “low” or “semi” rotation resistance, verope claims their rope as non-rotation ropes, which means almost zero rotation behavior. This is achieved by a balanced ratio between rope core and outer strands.

The opposite closing direction is the key for non-rotating verope mining ropes.

To guarantee rotation-free behavior, all the ropes are constantly tested at the KV R&D Centre in Germany. With a brand-new developed torque-twist testing device, the R&D department is able to precisely determine the rotation behavior of every single rope length.

verope MINING

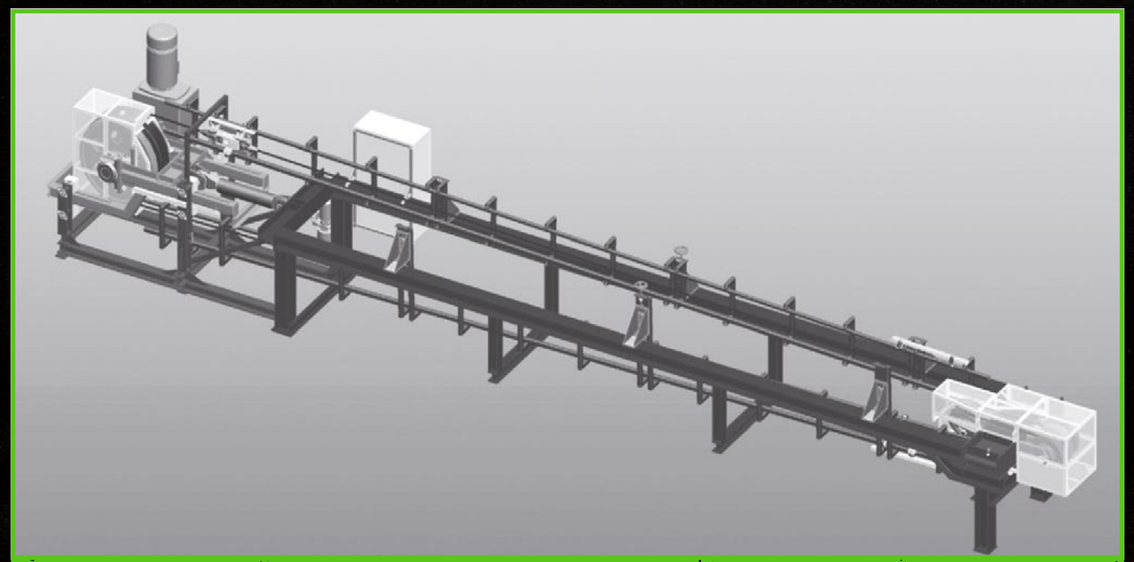
Bending fatigue

Good bending fatigue results are constantly proofed in our KV R&D testfield.

Besides the rotation behavior, the bending fatigue performance is the benchmark of high-performance special mining ropes. verope products achieve outstanding performance results in bending fatigue without losing focus on the safety aspect. High-class additives like plastic infill between the layers of the rope or special lubrication are raising verope mining ropes to a higher level of quality.

These good bending fatigue results are constantly proofed in our KV R&D testfield.

Every mining rope construction is tested on our two state-of-the-art bending fatigue machines using a brand-new testing concept.



bending fatigue machine

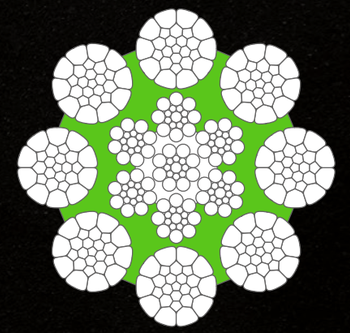
Plastic layer & radial stability

The main advantages are:

- Prevents internal wire breaks
- Seals in rope lubricant
- Keeps out infiltration of water, dust, etc. ...
- Reduces the internal stress
- Improves the form stability of the rope
- Absorbs dynamical energy
- Reduces the noise level

Many verope products have a plastic layer between the steel core and the outer strands. This intermediate layer supports form stability of the rope like a flexible corset and increases the lifetime of a rope – especially under difficult working conditions.

The intermediate plastic layer prevents the infiltration of water and dirt, and therefore protects the steel core from corrosion. The plastic layer acts like a cushion, avoiding internal steel-to-steel cross over contacts and limiting the damage caused by this phenomenon.

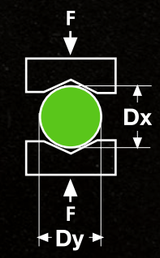


The plastic layer (shown in green)

Testing device (source: TU Dresden)

Additionally to tensile and bending loads, wire ropes are exposed to enormous traverse loads in multi-layer spooling. In order to be able to withstand these loads and to avoid spooling problems, a high degree of radial stability is needed. The radial stability of the rope also influences the deforming behavior of the drum.

Therefore, it is important that the designer of the drum knows the radial stability in terms of the transverse modulus of elasticity of the ropes. Radial stability is defined as the resistance of a wire rope to transverse (radial) deformation (ovalization). verope measures the radial stability of its products with and without load.



verope MINING

Research & development KV R&D

Close cooperation is the key to our application-oriented research and development approach.

To support the development of new, even more advantageous rope designs, verope and Kiswire have established another independent Joint Venture company.

The verope know-how in application technology and rope design with the expertise of Kiswire, the largest high carbon steel wire producer in the world in production technology, metallurgy, and material engineering, were merged in Contwig, Germany.

Our goal is the development of highly innovative products for lifting applications as well as continuous improvement of our existing products and their components with the aid of state-of-the-art production and testing equipment.

Close cooperation with the leading OEMs, wire rope component producers, and universities is key in our application-oriented research and development approach.

verope service center Contwig, Germany

Testing facilities

Destructive testing equipment

Tensile test machines:
- Quasistatic tensile test up to 50 kN / 300 kN / 2500 kN
- Tension tension fatigue test up to 210 kN
- Creep test

Bending fatigue test machines:
- Multizone bending fatigue test machine up to 50 kN / 198 kN
- Torque test machine up to 1500 Nm
- Twist test Machine up to 300 kN

Wire testing equipment:
- Wire reverse bending test
- Wire torsion test
- Wire tensile test

Non-destructive testing equipment

FE-SEM:
- Microstructure observation
- Qualitative analysis by EDX

SEM:
- Fractographic analysis
- Microstructure observation
- Qualitative analysis by EDX

Torsion tester:
- Determination torsion values of wires

Profile projector:
- Analysis of die geometry
- Analysis of wire breaks

Micro vickers hardness test:
- Determination of material hardness

Rockwell hardness tester:
- Determination of material hardness

testfield Contwig, Germany

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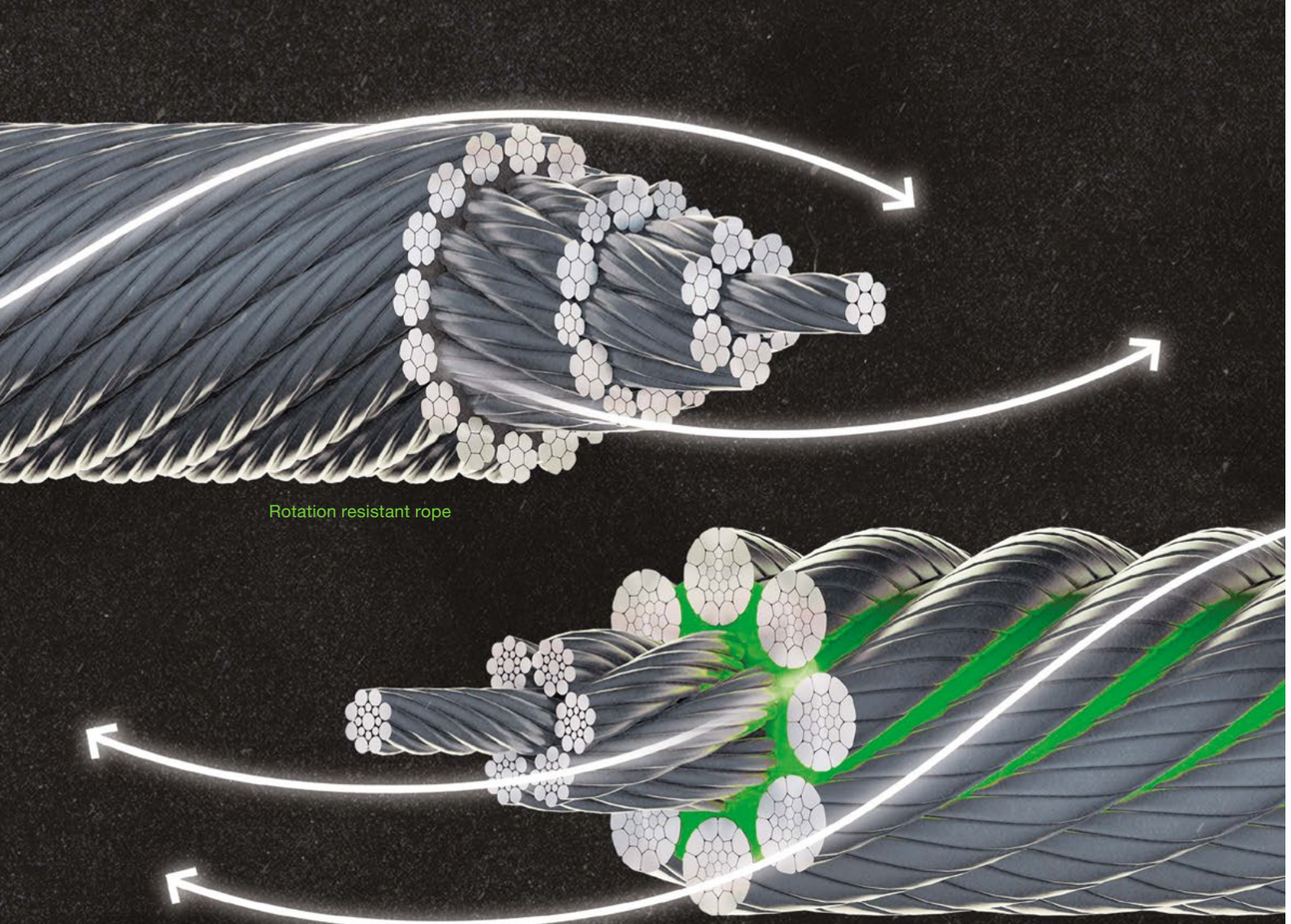


ROTATION RESISTANCE OF A SPECIAL WIRE ROPE

The main advantage is:
Good rotational stability over a wide load spectrum for torque balanced rotation resistant ropes.

verope MINING

Rotation resistance of a special wire rope

←

Non-rotation resistant ropes:
The outer strands are winding in the same direction as the rope core (IWRC). Torque built up along the rope length. Ropes with this characteristic must not work with free-twisting ends (e.g., swivel).

Rotation resistant ropes:
Outer strands winding in the opposite direction than the rope core (WSC). A torque balance is given. The ropes with this characteristic are needed in a certain depth or when the rope end can freely twist (e.g., swivel).

Lay direction and kind of lay

LHOL
left hand
ordinary lay

RHOL
right hand
ordinary lay

LHLL
left hand
Lang's lay

RHLL
right hand
Lang's lay

Tensile grade and rope surface

Wire surface:
Galvanized wires are zinc coated by going through a bath of liquid zinc. The wire is called "finally galvanized" if it does not get drawn further reduced after this process, the wire is called "drawn galvanized".

Bright wires, uncoated, are indicated with the capital letter "U", whereas zinc coated wires are divided into class "A" and "B", depending on the zinc weight of the coating.

Wire tensile strength:
The tensile strength of a wire is defined as the maximum tensile force a wire can stand in longitudinal direction without breaking, divided by the cross section of the wire. The nominal tensile strength of a wire is a theoretical value, the acutal tensile strength of the wire should not fall below the nominal tensile strength and exceed it only within certain limits. Rope wires with the nominal tensile strengths of 1770 N/mm², 1960 N/mm² and 2160 N/mm² are commonly used in modern wire ropes.

ALUMAR© special wire rope coating

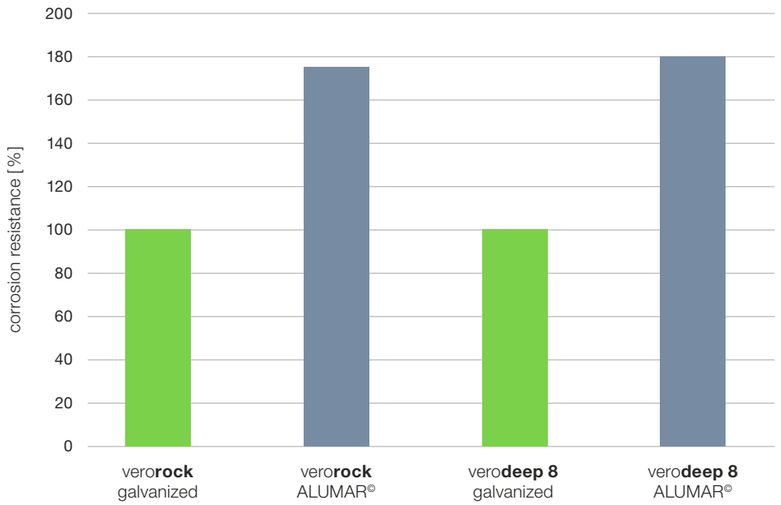
ALUMAR© can be applied on every wire rope from new production, ordered at verope.

What is ALUMAR©?
ALUMAR© is the brand name of corrosion-resistant wire rope, developed by KISWIRE and verope through accumulated technology and know-how.

By zinc and 5% aluminum coating, ALUMAR© improves more than 50% corrosion resistance compared to standard galvanized wire ropes. ALUMAR© can be applied to any new production wire rope ordered from verope.

Where can ALUMAR© be used?
ALUMAR© provides superb corrosion resistance and is used everywhere over there where certain requirements on a corrosion-resistant wire rope are made. Key areas where ALUMAR© coated ropes have been successfully used are acid or alkaline environment, saline air, offshore, and many other corrosive environments.

ALUMAR© in numbers



Lubrication in underground mining

verope AG as a manufacturer of special mining ropes, using high-quality lubricants of the market leading companies.

The lubrication on underground mining ropes is a crucial part of enhancing the durability of the rope performance. Especially in underground mining, the usage of a certain type of lubricant is mandatory. The type of lubricant depends on the mining application and its intended purpose. Furthermore, the lubricant must protect the rope against corrosion in an aggressive, dirty or dusty environment. verope AG as a manufacturer of special mining ropes, uses absolute high quality lubricants from market-leading companies only.

Lubricant for drum winders & BMR winders

verope can provide lubricants which have a positive influence on the rope lifetime.

All kinds of mining drum winders (single, double, or BMRs) have certain requirements for the wire rope lubricant. Ropes on drum winders are mostly spooling in a multi-layer system. That means that the rope is spooled in several layers on the winder drum. The number of layers is depending on the spooling depth and the geometry of the drum-winder. Shaft sinking winders can have up to 15 rope layers per drum. There are two critical parts for the rope on a multi-layer system: The climbing and cross-over area in each layer and the radial pressure between the rope layers, which is increasing with the total number of rope layers.

verope can provide lubricants that have a positive influence on both named parts. These high-quality lubricants have excellent values on the so-called “four-ball test welding load” which indicates the performance under high radial pressure.

Lubricant for all types of friction winders

The usage of conventional lubricants will lead to a slip-effect and a reduction in efficiency or – even worse – total outage.

For mining friction winders, a certain type of lubricant is mandatory. The lubricant must support the power transmission by friction. The usage of conventional lubricants will lead to a slip-effect and a reduction in efficiency or – even worse – to a total outage. Considering the special requirements for friction winders, this lubricant must also offer sufficient protection against corrosion in tough surroundings. verope cooperates with German manufacturers which provide state-of-the-art lubricants with superb results.

Flexibility in lubrication is one of verope AG's strengths: We work with established lubricant manufacturers and are happy to recommend lubricants for any application and condition – or apply any lubricant requested by our customers.

Methods to extend rope lifetime on drum winders

Mining applications running – not infrequently – 24/7. Such high performance demands everything from the components of the winder and the rope. There are methods to extend the lifetime of drum winder ropes significantly. Even though these methods are elaborated and the implementation takes some maintenance time, the result is worth it and can be easily done during the general maintenance period of the winder. verope highly recommends both methods, “doubling down” and making “back ends or front ends” to increase the general rope lifetime.

Doubling down or capstan

The multi-layer system of a winder loses tension from time to time. Tension on the lower/lowest rope layers keeps the structural stability of the whole system. When losing tension on the lower layers, the risk of rope deterioration, critical notches, or flattening is high. Using a so-called “doubling down sheave” the rope can be spooled off the drum to the dead ends and can be re-spooled under tension to renew the structural stabiliy of the rope layers.

It needs an experienced operator to properly execute the procedure, otherwise the procedure is not carried out properly. In general, using a capstan to re-tension the lower layer is easier, more efficient, and faster. Both methods – either the “doubling down” or “capstan” – effectively increase the service life of the rope.

Back- or front-end cuts

For ropes on drum-winders, the cross-over and climbing part in the multi-layer system is crucial. At these points, the contact pressure between the ropes is at maximum, and rope damages and rope wear inevitably occur. During operation, these points never change their position which makes them critical sections. The idea of the procedure “back- or front-end cuts” is to shift these critical sections onto another rope section in the length. By cutting a certain length off the drum end part, the rope gets re-wrapped and there are other rope parts in the critical areas (climbing and cross-over). These spare rope lengths for the cuts must be considered in the new rope order. To reinstall the mining rope end termination, a front-end cut is required. With a front-end cut the weakest part which is facing high stress, shock-load, or kinks (due to the design of the end termination) will be renewed. This has to be done from time to time.

Formulary and maintenance

Formulary

Rope stretch

$$\Delta L = \frac{F \cdot L}{E \cdot A}$$

ΔL	Rope stretch [m]
F	Rope tension [N]
L	Rope length [m]
E	Modulus of elasticity [N/m²]
A	Metallic cross-section [m²]

Tread pressure

$$p = \frac{2 \cdot F}{d \cdot D}$$

p	Tread pressure [N/m²]
F	Rope tension [N]
d	Rope diameter [m]
D	Sheave diameter [m]

Rope torque

$$T = C \cdot d \cdot P$$

T	Rope torque [Nm]
C	Torque factor [-]
d	Rope diameter [m]
P	Rope tension [N]

Safety factor

$$SF = \frac{M + L_S \cdot uw}{BF}$$

SF	Saftey factor [-]
M	Mass of loaded conveyance [kg]
L_S	Length of suspendend rope [m]
uw	Rope unit weight [kg/m]
BF	Rope breaking force [kg]

Diameter reduction

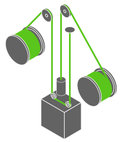
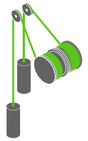
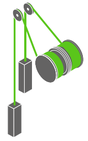
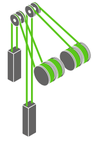
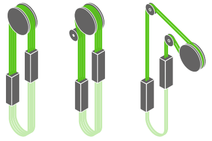
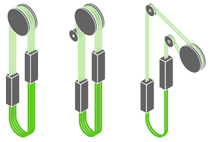
$$\Delta Ø = \left[\frac{Ø_{ref} - Ø_A}{Ø_N}\right] \cdot 100$$

ΔØ	Diameter reduction [%]
$Ø_{ref}$	Reference diameter [mm]
ØA	Actual diameter [mm]
ØN	Nominal rope diameter [mm]

Maintenance

Drum and sheave radius profile	+6 % – +10 % of the nominal rope diameter
Back-end cutting	every 10,000 winding cycles
Front-end cutting	every six month
Remaking of the termination	every six month
Dead ends tension force of winder ropes	rope doubling-down force with fully loaded skip

verope mining
special wire ropes →

Application	Characteristic
Shaft Sinking Stage Ropes 	• No guide system • Slow driving speed • Low bending fatigue
Shaft Sinking Kibble Ropes 	• No guide system (crosshead) • Hoist-cyclic application • Single fall hoisting
Drum Winder 	• Multilayer spooling • Hoist-cyclic application • Fix or rope guides
Blair Multi Rope Winder (BMR) 	• Multilayer spooling • Hoist-cyclic application • Working with rope pairs
Friction Winder Head Ropes 	• Friction driven • Hoist-cyclic application • One layer spooling
Friction Winder Balance ropes 	• Zero rope tension • Free hanging rope length • Working with swivels

ROPE'S ROTATIONAL BEHAVIOUR		KIND OF LAY		LUBRICATION	ADDITIONAL PLASTIC	ROPE'S SURFACE		TENSILE GRADE		
Rotation resistant	Non-rotation resistant	Lang's lay	Ordinary lay	Fully lubricated	Recommended	Galvanized	Bright	1770 N/mm²	1960 N/mm²	On request
×	×	×		×	×	×	×	×	×	×
×		×		×	×	×	×	×	×	×
×	×	×		×	×	×	×	×	×	×
×	×	×		×	×	×	×	×	×	×
×	×	×	×	× Special lubrication for friction winder	×	×	×	×	×	×
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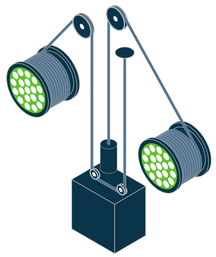
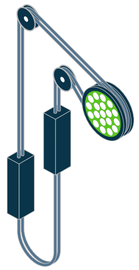
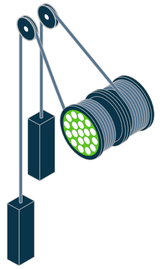
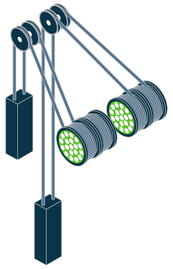
Mining applications

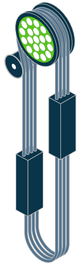
verope MINING

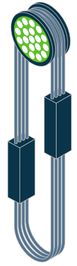








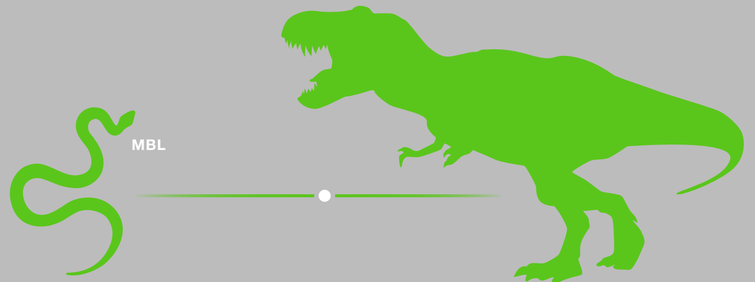




verope products: sandbox system

Every mine and every shaft has its own character. Therefore each mine rope is unique and has to be matched to the installation. Especially the properties such as breaking load, tensile strength or weight are parameters that must be precisely adjusted to the upcoming use.

With the know-how and the state-of-the-art production verope can design every rope according to the demands of the customer or of the application. Like in a sandbox-system, all parameters can be defined infinitely variable.



TENSILE GRADE (N / MM²)

1570 1770 1960 2160

verope underground mining ropes are the right choice for challenging mining applications and meet the demands of a satisfying rope life and a rewarding cost-benefit ratio.

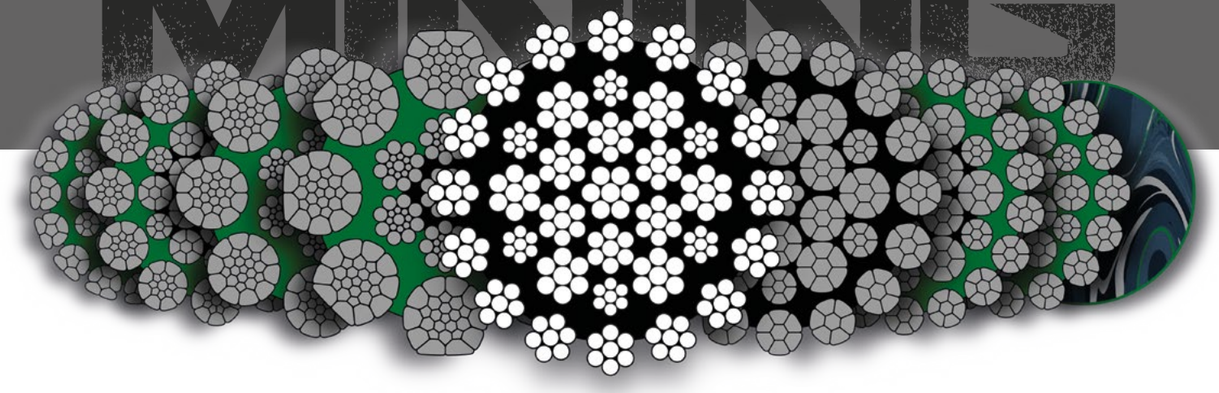
ENGINEERED FOR YOUR APPLICATION:

veromine

our most special wire rope construction tailored to your exact mining application.

verope MINING

verope® MINING

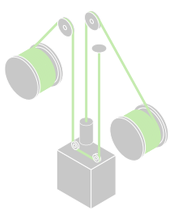


verorock B

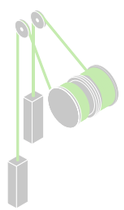
combines good rotation resistance and a remarkable flexibility for friction winder tail ropes with a small loop diameter.

- ➔ Balance rope for friction drum winder
- ➔ Rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
- ➔ Available in right hand and left hand
- ➔ Available in Lang's lay and ordinary lay
- ➔ Available with special lubrication on request
- ➔ Available in 1770 N/mm², 1960 N/mm², 2160 N/mm², or upon customers request

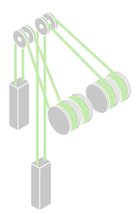
Applications



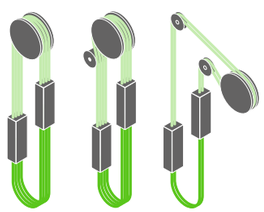
shaft sinking



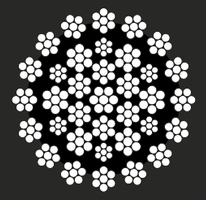
double drum winder



blair multi rope winder



koepe friction winder



VERO**ROCK B**

combines good rotation resistance and a remarkable flexibility for friction winder tail ropes with a small loop diameter.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	199,5	1,764	353,10	391,00	284,24	314,76
21	219,9	1,944	389,29	431,08	313,38	347,02
22	241,4	2,134	427,25	473,11	343,94	380,86
23	263,8	2,332	466,97	517,10	375,91	416,27
24	287,3	2,539	508,46	563,04	409,31	453,25
25	311,7	2,755	551,72	610,94	444,13	491,81
26	337,1	2,980	596,74	660,79	480,37	531,94
27	363,6	3,214	643,52	712,60	518,04	573,64
28	391,0	3,456	692,07	766,37	557,12	616,92
29	419,4	3,708	742,39	822,08	597,62	661,78
30	448,9	3,968	794,47	879,76	639,55	708,20
31	479,3	4,237	848,32	939,38	682,90	756,20
32	510,7	4,515	903,93	1000,97	727,67	805,78
33	543,1	4,801	961,31	1064,50	773,86	856,93
34	576,5	5,097	1020,46	1130,00	821,47	909,65
35	610,9	5,401	1081,37	1197,45	870,50	963,94
36	646,4	5,714	1144,04	1266,85	920,95	1019,81
37	682,8	6,036	1208,48	1338,21	972,83	1077,26
38	720,2	6,366	1274,69	1411,52	1026,12	1136,27
39	758,6	6,706	1342,66	1486,79	1080,84	1196,86
40	798,0	7,054	1412,40	1564,01	1136,98	1259,03
41	838,4	7,411	1483,90	1643,19	1194,54	1322,77
42	879,8	7,777	1557,17	1724,32	1253,52	1388,08
43	922,1	8,152	1632,20	1807,41	1313,92	1454,96
44	965,5	8,535	1709,00	1892,45	1375,75	1523,42
45	1009,9	8,928	1787,57	1979,45	1438,99	1593,46
46	1055,3	9,329	1867,90	2068,40	1503,66	1665,07
47	1101,7	9,739	1949,99	2159,31	1569,74	1738,25
48	1149,1	10,158	2033,85	2252,18	1637,25	1813,00
49	1197,4	10,585	2119,48	2346,99	1706,18	1889,33
50	1246,8	11,022	2206,87	2443,77	1776,53	1967,23
51	1297,2	11,467	2296,03	2542,49	1848,30	2046,71
52	1348,6	11,921	2386,95	2643,18	1921,50	2127,76
53	1400,9	12,384	2479,64	2745,82	1996,11	2210,38
54	1454,3	12,856	2574,09	2850,41	2072,15	2294,58
55	1508,7	13,336	2670,31	2956,96	2149,60	2380,35
56	1564,0	13,826	2768,30	3065,46	2228,48	2467,70

verope MINING

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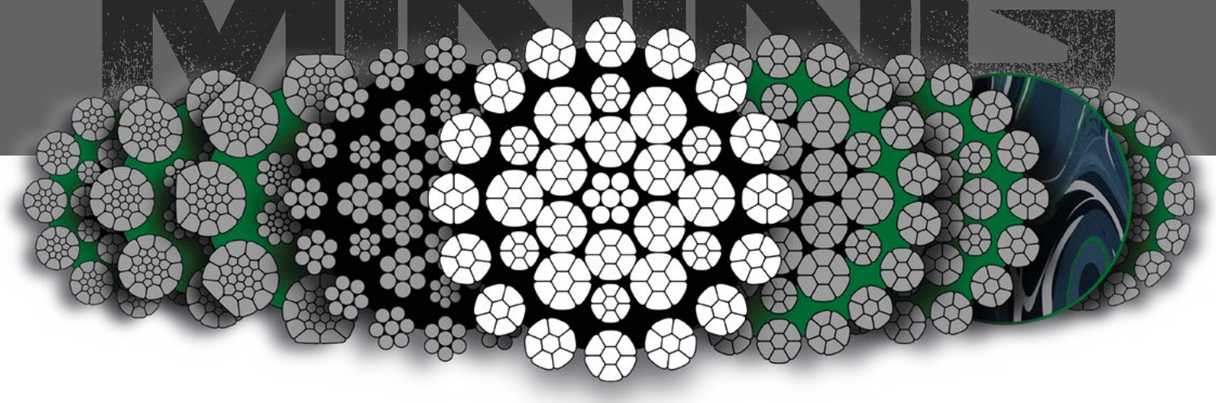
verope®
MINING



verorock

is a rope with superb non-rotational properties, ideal for shaft sinking or deep mine drum winders, when bending fatigue performance is needed.

- ➔ Rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
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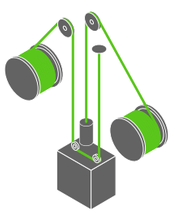
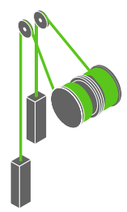
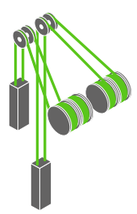
Applications



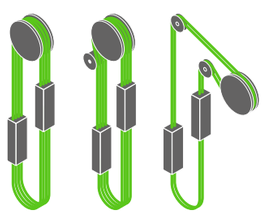
shaft sinking



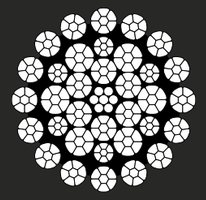
double drum winder



blair multi rope winder



koepe friction winder



VERO**ROCK**

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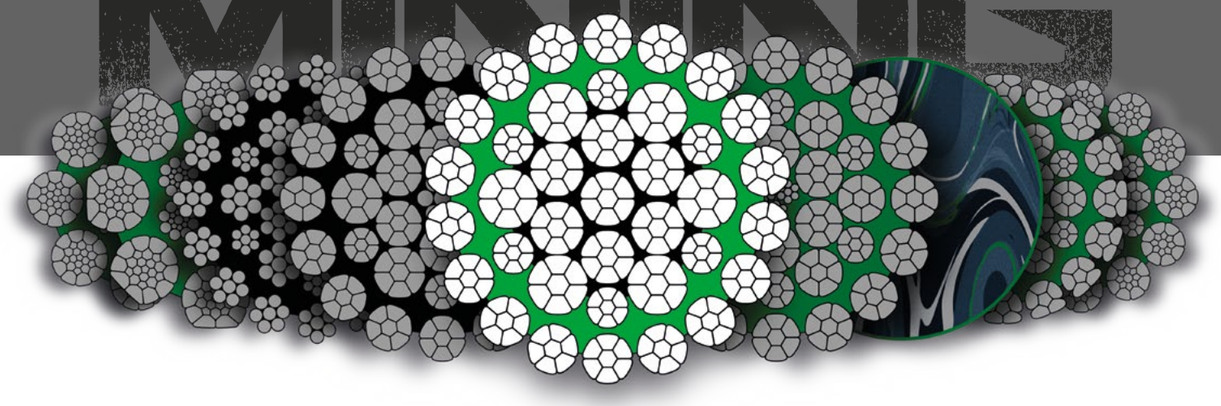
when bending fatigue performance is needed.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	231,8	1,959	410,37	454,43	344,71	381,72
21	255,6	2,160	452,44	501,00	380,05	420,84
22	280,5	2,371	496,55	549,85	417,10	461,88
23	306,6	2,591	542,72	600,98	455,88	504,82
24	333,9	2,821	590,94	654,37	496,39	549,67
25	362,3	3,061	641,21	710,04	538,62	596,43
26	391,8	3,311	693,53	767,98	582,57	645,10
27	422,5	3,571	747,91	828,19	628,24	695,68
28	454,4	3,840	804,33	890,67	675,64	748,17
29	487,5	4,119	862,81	955,43	724,76	802,56
30	521,7	4,408	923,34	1022,46	775,61	858,86
31	557,0	4,707	985,92	1091,76	828,18	917,08
32	593,5	5,015	1050,56	1163,33	882,47	977,20
33	631,2	5,334	1117,24	1237,17	938,48	1039,22
34	670,0	5,662	1185,98	1313,29	996,22	1103,16
35	710,0	6,000	1256,77	1391,68	1055,69	1169,01
36	751,2	6,348	1329,61	1472,34	1116,87	1236,76
37	793,5	6,705	1404,50	1555,27	1179,78	1306,43
38	837,0	7,072	1481,45	1640,47	1244,42	1378,00
39	881,6	7,450	1560,45	1727,95	1310,77	1451,48
40	927,4	7,837	1641,49	1817,70	1378,86	1526,87
41	974,3	8,233	1724,60	1909,72	1448,66	1604,17
42	1022,5	8,640	1809,75	2004,01	1520,19	1683,37
43	1071,7	9,056	1896,95	2100,58	1593,44	1764,49
44	1122,2	9,482	1986,21	2199,42	1668,42	1847,51
45	1173,7	9,918	2077,52	2300,53	1745,11	1932,44
46	1226,5	10,364	2170,88	2403,91	1823,54	2019,28
47	1280,4	10,819	2266,29	2509,56	1903,68	2108,03
48	1335,5	11,285	2363,75	2617,49	1985,55	2198,69
49	1391,7	11,760	2463,27	2727,69	2069,15	2291,26
50	1449,1	12,245	2564,84	2840,16	2154,46	2385,73
51	1507,6	12,739	2668,45	2954,90	2241,50	2482,12
52	1567,3	13,244	2774,13	3071,91	2330,27	2580,41
53	1628,2	13,758	2881,85	3191,20	2420,75	2680,61
54	1690,2	14,282	2991,62	3312,76	2512,96	2782,72
55	1753,4	14,816	3103,45	3436,59	2606,90	2886,74
56	1817,7	15,360	3217,33	3562,69	2702,56	2992,66

verope MINING

The rope data provided in the above table is for reference only and may be adjusted by applying slight changes to the rope design.

verope® MINING



verorock P

is ideal whenever moisture or highly corrosive shafts require a rope with plastic-infill and good rotational behavior.

- ➔ Rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
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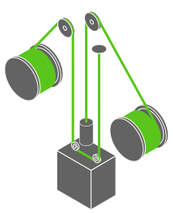
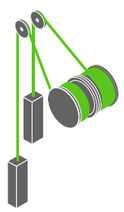
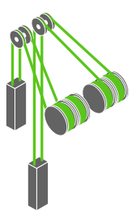
Applications



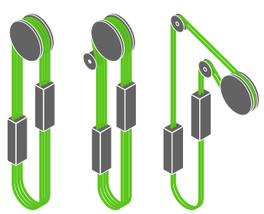
shaft sinking



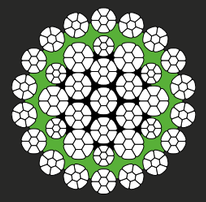
double drum winder



blair multi rope winder



koepe friction winder



VERO**ROCK P**

is ideal whenever moisture or highly corrosive shafts require a rope with plastic-infill and good rotational behavior.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	229,3	1,949	405,93	449,50	340,98	377,58
21	252,8	2,149	447,53	495,57	375,93	416,28
22	277,5	2,359	491,17	543,89	412,58	456,87
23	303,3	2,578	536,84	594,46	450,94	499,35
24	330,2	2,807	584,53	647,28	491,01	543,71
25	358,3	3,046	634,26	702,34	532,78	589,97
26	387,6	3,294	686,01	759,65	576,25	638,11
27	418,0	3,553	739,80	819,21	621,43	688,14
28	449,5	3,821	795,61	881,02	668,32	740,06
29	482,2	4,099	853,46	945,07	716,90	793,86
30	516,0	4,386	913,33	1011,37	767,20	849,55
31	551,0	4,683	975,24	1079,92	819,20	907,13
32	587,1	4,990	1039,17	1150,72	872,90	966,60
33	624,4	5,307	1105,13	1223,76	928,31	1027,96
34	662,8	5,634	1173,12	1299,05	985,42	1091,20
35	702,3	5,970	1243,15	1376,59	1044,24	1156,34
36	743,0	6,316	1315,20	1456,38	1104,77	1223,36
37	784,9	6,672	1389,28	1538,41	1166,99	1292,26
38	827,9	7,037	1465,39	1622,69	1230,93	1363,06
39	872,1	7,412	1543,53	1709,22	1296,57	1435,75
40	917,3	7,797	1623,70	1798,00	1363,91	1510,32
41	963,8	8,192	1705,90	1889,02	1432,96	1586,78
42	1011,4	8,597	1790,13	1982,29	1503,71	1665,12
43	1060,1	9,011	1876,39	2077,81	1576,17	1745,36
44	1110,0	9,435	1964,68	2175,58	1650,33	1827,48
45	1161,0	9,869	2055,00	2275,59	1726,20	1911,49
46	1213,2	10,312	2147,34	2377,85	1803,77	1997,39
47	1266,5	10,765	2241,72	2482,36	1883,05	2085,18
48	1321,0	11,228	2338,13	2589,11	1964,03	2174,86
49	1376,6	11,701	2436,57	2698,12	2046,72	2266,42
50	1433,4	12,183	2537,03	2809,37	2131,11	2359,87
51	1491,3	12,676	2639,53	2922,87	2217,20	2455,21
52	1550,3	13,178	2744,05	3038,61	2305,01	2552,44
53	1610,5	13,689	2850,61	3156,61	2394,51	2651,55
54	1671,9	14,211	2959,19	3276,85	2485,72	2752,55
55	1734,4	14,742	3069,81	3399,34	2578,64	2855,44
56	1798,0	15,283	3182,45	3524,07	2673,26	2960,22

verope MINING

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verope® MINING

verorock P²

is fully plastic covered and its 16 outer strands provide resistance against abrasion on friction winders. Outstanding bending fatigue results.

- ➔ Rotation-resistant rope construction
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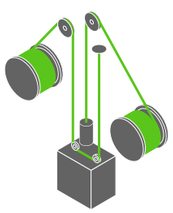
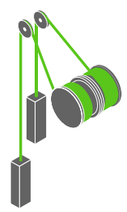
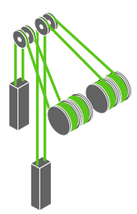
Applications



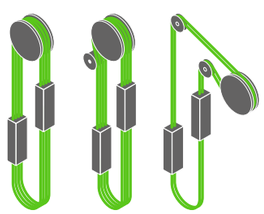
shaft sinking



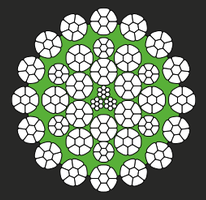
double drum winder



blair multi rope winder



koepe friction winder



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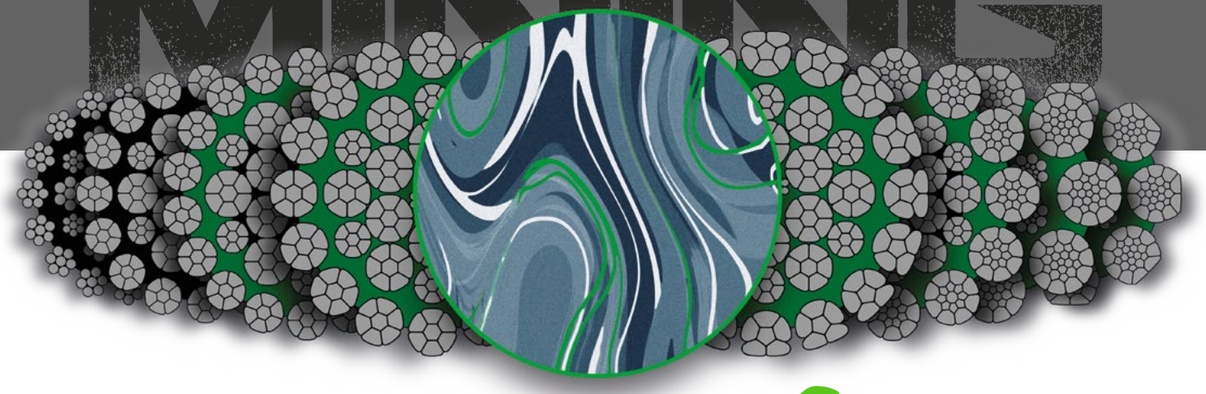
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	195,4	1,735	345,87	383,00	282,58	312,91
21	215,4	1,913	381,32	422,26	311,54	344,98
22	236,4	2,100	418,50	463,43	341,92	378,62
23	258,4	2,295	457,41	506,51	373,71	413,82
24	281,4	2,499	498,05	551,52	406,91	450,59
25	305,3	2,711	540,42	598,43	441,53	488,92
26	330,2	2,933	584,52	647,27	477,55	528,82
27	356,1	3,162	630,35	698,01	515,00	570,28
28	383,0	3,401	677,91	750,68	553,85	613,30
29	410,8	3,648	727,19	805,25	594,12	657,89
30	439,7	3,904	778,21	861,75	635,80	704,05
31	469,5	4,169	830,95	920,15	678,89	751,76
32	500,2	4,442	885,43	980,47	723,40	801,05
33	532,0	4,724	941,63	1042,71	769,31	851,90
34	564,7	5,015	999,57	1106,86	816,65	904,31
35	598,4	5,314	1059,23	1172,93	865,39	958,28
36	633,1	5,622	1120,62	1240,91	915,55	1013,83
37	668,8	5,939	1183,74	1310,81	967,12	1070,93
38	705,4	6,264	1248,59	1382,62	1020,10	1129,60
39	743,0	6,598	1315,17	1456,35	1074,50	1189,84
40	781,6	6,941	1383,48	1531,99	1130,30	1251,64
41	821,2	7,292	1453,52	1609,55	1187,53	1315,00
42	861,7	7,652	1525,29	1689,02	1246,16	1379,93
43	903,3	8,021	1598,79	1770,41	1306,21	1446,42
44	945,8	8,398	1674,01	1853,71	1367,67	1514,48
45	989,2	8,785	1750,97	1938,93	1430,54	1584,10
46	1033,7	9,179	1829,65	2026,06	1494,83	1655,29
47	1079,1	9,583	1910,07	2115,11	1560,53	1728,04
48	1125,5	9,995	1992,21	2206,07	1627,64	1802,36
49	1172,9	10,416	2076,09	2298,94	1696,16	1878,24
50	1221,3	10,845	2161,69	2393,74	1766,10	1955,68
51	1270,6	11,283	2249,02	2490,44	1837,45	2034,69
52	1321,0	11,730	2338,08	2589,07	1910,22	2115,27
53	1372,2	12,186	2428,88	2689,60	1984,39	2197,41
54	1424,5	12,650	2521,40	2792,05	2059,98	2281,11
55	1477,8	13,123	2615,65	2896,42	2136,98	2366,38
56	1532,0	13,604	2711,62	3002,70	2215,40	2453,21

verope MINING

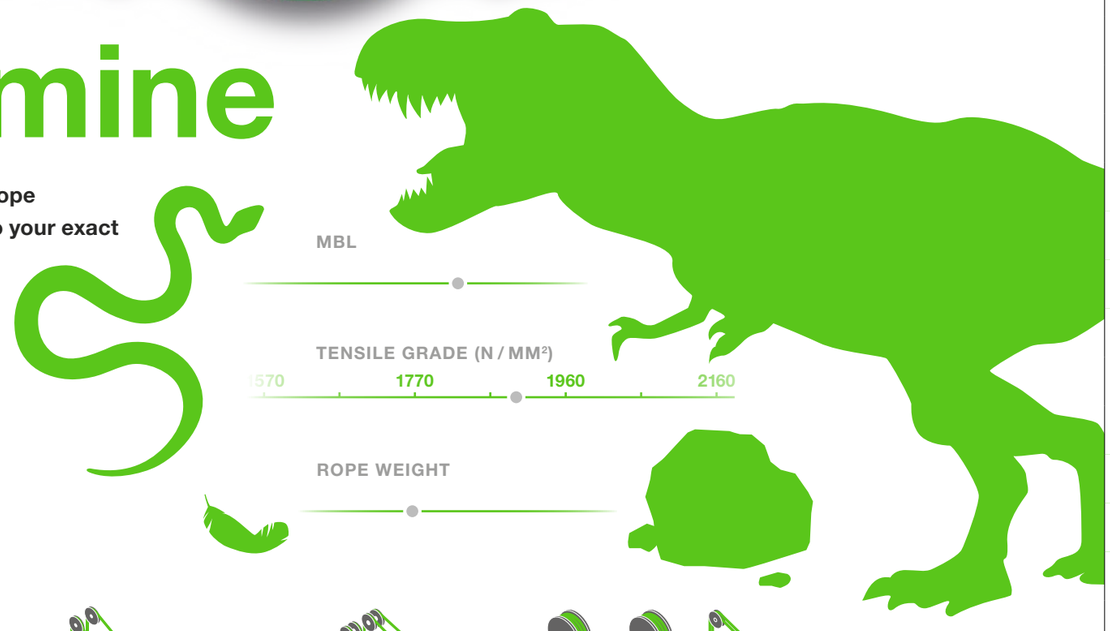
The rope data provided in the above table is for reference only and may be adjusted by applying slight changes to the rope design.

verope®
MINING

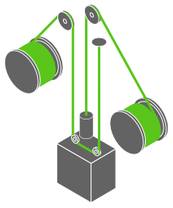


veromine

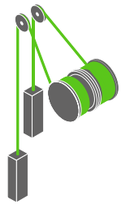
our most special wire rope construction tailored to your exact mining application.



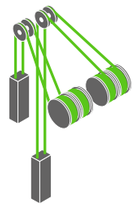
Applications



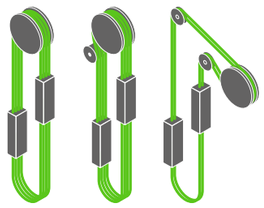
shaft sinking



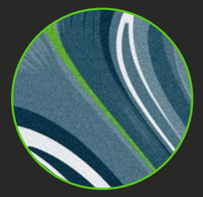
double drum winder



blair multi rope winder



koepe friction winder



VERO**MINE**

our most special wire rope construction tailored to your exact mining application.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN

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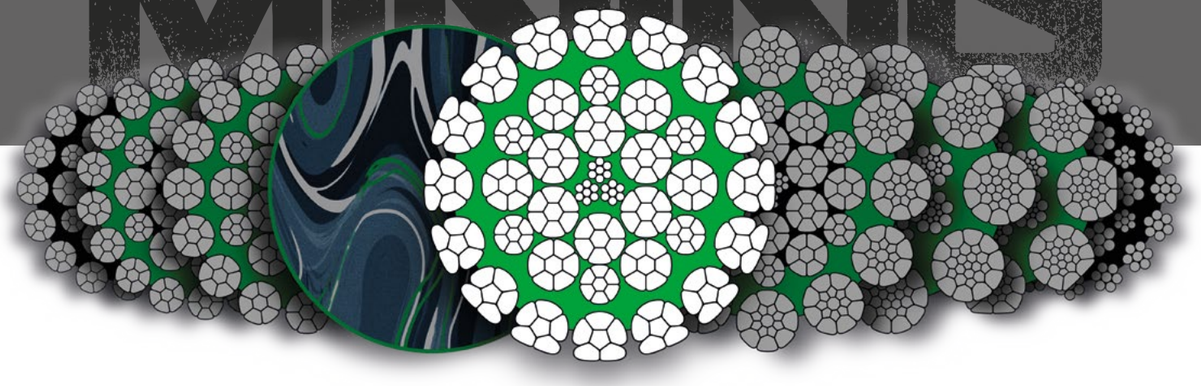
The rope data provided in the above table is for reference only and may be adjusted by applying slight changes to the rope design.

verope® MINING

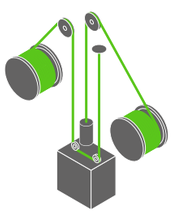


verorock XP

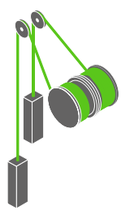
has the highest breaking load for demanding mining applications with a low rope weight and excellent rope lifetime.

- ➔ Rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
- ➔ Available in right hand and left hand
- ➔ Available in Lang's lay and ordinary lay
- ➔ Available with special lubrication on request
- ➔ The plastic layer offers certain construction advantages
- ➔ The swaged surface offers higher breaking forces and a better contact behavior
- ➔ Available in 1770 N/mm², 1960 N/mm², 2160 N/mm², or upon customers request

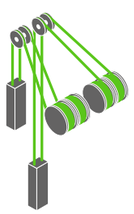
Applications



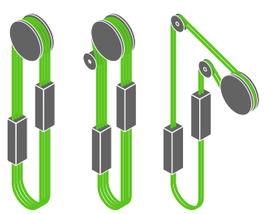
shaft sinking



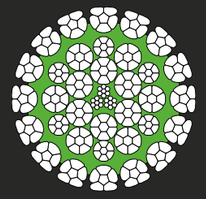
double drum winder



blair multi rope winder



koepe friction winder



VERO**ROCK XP**

has the highest breaking load for demanding mining applications with a low rope weight and excellent rope lifetime.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	234,0	2,001	414,27	458,74	352,13	389,93
21	258,0	2,206	456,73	505,76	388,22	429,89
22	283,2	2,421	501,26	555,07	426,07	471,81
23	309,5	2,646	547,87	606,68	465,69	515,68
24	337,0	2,882	596,54	660,58	507,06	561,49
25	365,7	3,127	647,29	716,77	550,20	609,26
26	395,5	3,382	700,11	775,26	595,09	658,97
27	426,6	3,647	755,00	836,05	641,75	710,64
28	458,7	3,922	811,96	899,12	690,17	764,25
29	492,1	4,207	870,99	964,49	740,35	819,82
30	526,6	4,503	932,10	1032,15	792,28	877,33
31	562,3	4,808	995,27	1102,11	845,98	936,79
32	599,2	5,123	1060,52	1174,36	901,44	998,21
33	637,2	5,448	1127,84	1248,91	958,66	1061,57
34	676,4	5,783	1197,23	1325,75	1017,64	1126,88
35	716,8	6,128	1268,69	1404,88	1078,39	1194,15
36	758,3	6,484	1342,22	1486,30	1140,89	1263,36
37	801,0	6,849	1417,83	1570,02	1205,15	1334,52
38	844,9	7,224	1495,50	1656,03	1271,18	1407,63
39	890,0	7,609	1575,25	1744,34	1338,96	1482,69
40	936,2	8,004	1657,06	1834,94	1408,50	1559,70
41	983,6	8,410	1740,95	1927,84	1479,81	1638,66
42	1032,2	8,825	1826,91	2023,02	1552,88	1719,57
43	1081,9	9,250	1914,95	2120,50	1627,70	1802,43
44	1132,8	9,685	2005,05	2220,28	1704,29	1887,24
45	1184,9	10,131	2097,22	2322,35	1782,64	1974,00
46	1238,1	10,586	2191,47	2426,71	1862,75	2062,70
47	1292,5	11,051	2287,78	2533,37	1944,62	2153,36
48	1348,1	11,526	2386,17	2642,32	2028,25	2245,97
49	1404,9	12,012	2486,63	2753,56	2113,64	2340,53
50	1462,8	12,507	2589,16	2867,10	2200,79	2437,03
51	1521,9	13,012	2693,77	2982,93	2289,70	2535,49
52	1582,2	13,528	2800,44	3101,05	2380,37	2635,89
53	1643,6	14,053	2909,18	3221,47	2472,81	2738,25
54	1706,2	14,588	3020,00	3344,18	2567,00	2842,55
55	1770,0	15,133	3132,89	3469,19	2662,95	2948,81
56	1834,9	15,689	3247,85	3596,49	2760,67	3057,01

verope MINING

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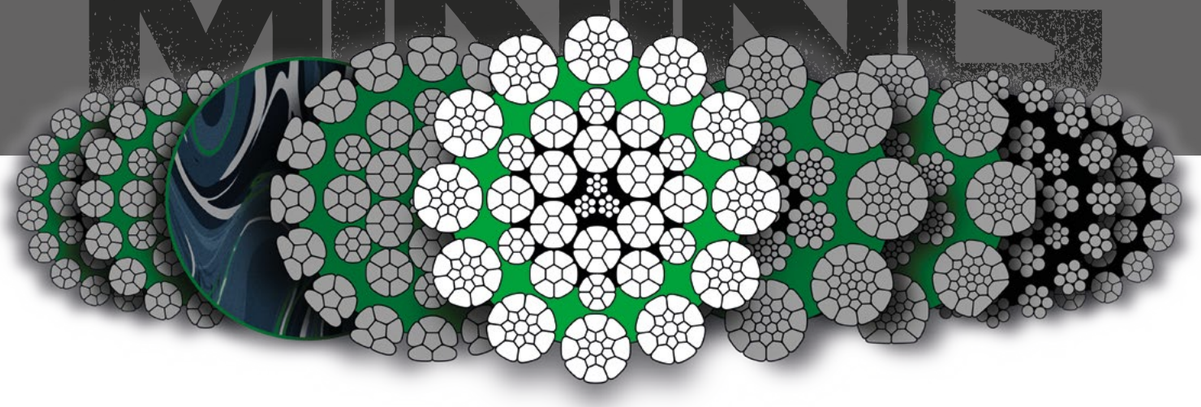
verope® MINING



verorock 12

provides good rotation resistance for mid-deep shafts with a strong abrasion resistance and high bending fatigue results.

- ➔ Rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
- ➔ Available in right hand and left hand
- ➔ Available in Lang's lay and ordinary lay
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- ➔ The plastic layer offers certain construction advantages
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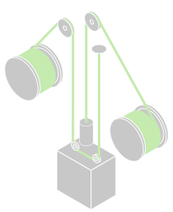
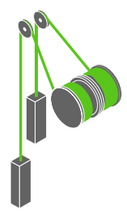
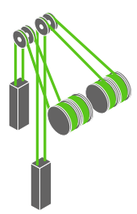
Applications



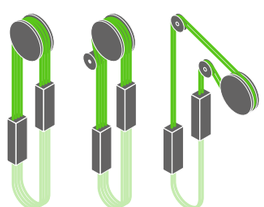
shaft sinking



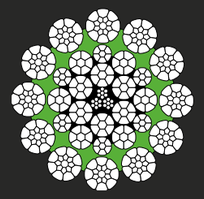
double drum winder



blair multi rope winder



koepe friction winder



VERO**ROCK 12**

provides good rotation resistance for mid-deep shafts with a strong abrasion resistance and high bending fatigue results.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	205,8	1,873	364,22	403,32	297,57	329,51
21	226,9	2,064	401,55	444,66	328,07	363,29
22	249,0	2,266	440,71	488,01	360,06	398,71
23	272,1	2,476	481,68	533,39	393,53	435,78
24	296,3	2,696	524,48	580,78	428,50	474,50
25	321,5	2,926	569,09	630,18	464,95	514,86
26	347,8	3,165	615,53	681,61	502,89	556,87
27	375,0	3,413	663,79	735,05	542,32	600,53
28	403,3	3,670	713,87	790,50	583,23	645,84
29	432,6	3,937	765,77	847,98	625,64	692,80
30	463,0	4,213	819,50	907,46	669,53	741,40
31	494,4	4,499	875,04	968,97	714,91	791,65
32	526,8	4,794	932,40	1032,49	761,77	843,55
33	560,2	5,098	991,59	1098,03	810,13	897,09
34	594,7	5,412	1052,60	1165,59	859,97	952,29
35	630,2	5,735	1115,43	1235,16	911,30	1009,13
36	666,7	6,067	1180,07	1306,75	964,12	1067,61
37	704,3	6,409	1246,54	1380,35	1018,43	1127,75
38	742,8	6,760	1314,84	1455,98	1074,22	1189,53
39	782,5	7,120	1384,95	1533,62	1131,50	1252,96
40	823,1	7,490	1456,88	1613,27	1190,27	1318,04
41	864,8	7,869	1530,64	1694,94	1250,53	1384,77
42	907,5	8,258	1606,21	1778,63	1312,28	1453,14
43	951,2	8,656	1683,61	1864,34	1375,51	1523,16
44	995,9	9,063	1762,83	1952,06	1440,23	1594,83
45	1041,7	9,480	1843,87	2041,80	1506,44	1668,15
46	1088,5	9,906	1926,73	2133,55	1574,14	1743,11
47	1136,4	10,341	2011,41	2227,32	1643,32	1819,72
48	1185,3	10,786	2097,91	2323,11	1713,99	1897,98
49	1235,2	11,240	2186,23	2420,91	1786,15	1977,89
50	1286,1	11,703	2276,38	2520,74	1859,80	2059,44
51	1338,0	12,176	2368,34	2622,57	1934,94	2142,64
52	1391,0	12,658	2462,13	2726,43	2011,56	2227,49
53	1445,1	13,150	2557,74	2832,30	2089,67	2313,99
54	1500,1	13,651	2655,17	2940,19	2169,27	2402,13
55	1556,2	14,161	2754,42	3050,09	2250,36	2491,92
56	1613,3	14,681	2855,49	3162,01	2332,93	2583,36

verope MINING

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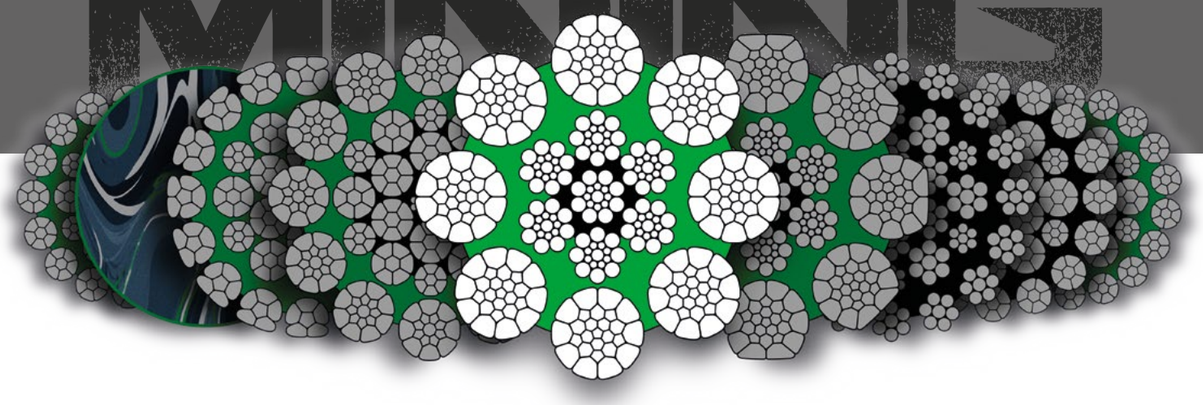
verope® MINING

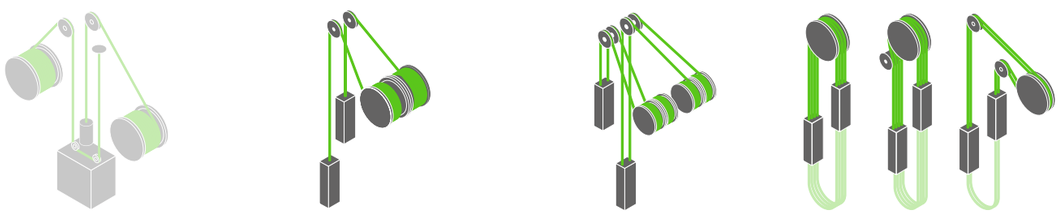


verodeep 8

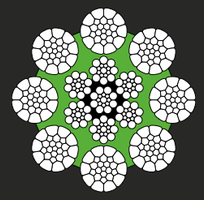
offers superb bending fatigue results and decreases down- and maintenance time. The allrounder in underground mining ropes.

- ➔ Non-rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
- ➔ Available in right hand and left hand
- ➔ Available in Lang's lay and ordinary lay
- ➔ Available with special lubrication on request
- ➔ The plastic layer offers certain construction advantages
- ➔ Available in 1770 N/mm², 1960 N/mm², 2160 N/mm², or upon customers request

Applications



shaft sinking | double drum winder | blair multi rope winder | koepe friction winder



VERO**DEEP 8**

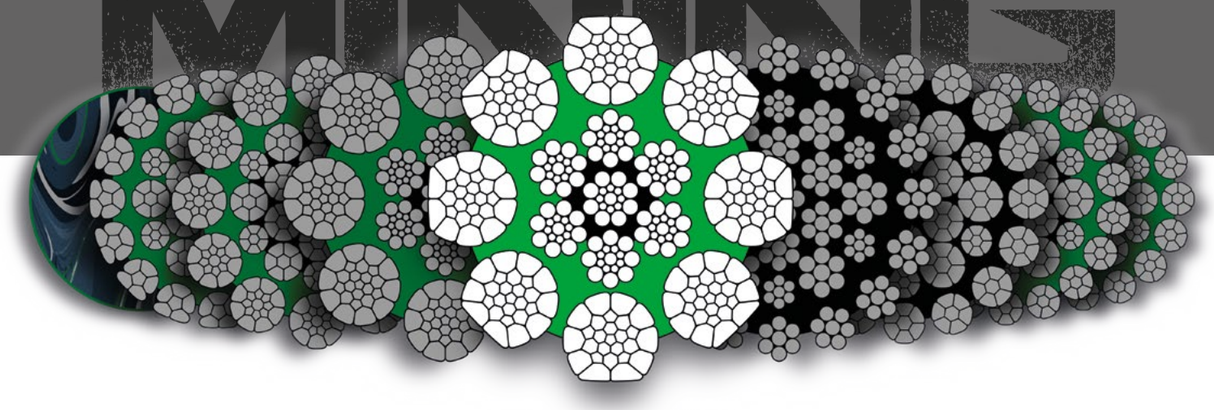
offers superb bending fatigue results and decreases down- and maintenance time. The allrounder in underground mining ropes.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	209,2	1,799	370,34	410,09	325,90	360,47
21	230,7	1,984	408,30	452,13	359,30	397,42
22	253,2	2,177	448,11	496,21	394,34	436,17
23	276,7	2,380	489,77	542,35	431,00	476,72
24	301,3	2,591	533,29	590,53	469,29	519,08
25	326,9	2,812	578,65	640,77	509,21	563,23
26	353,6	3,041	625,87	693,05	550,77	609,19
27	381,3	3,279	674,94	747,39	593,95	656,96
28	410,1	3,527	725,86	803,78	638,76	706,52
29	439,9	3,783	778,63	862,22	685,20	757,89
30	470,8	4,049	833,26	922,70	733,27	811,06
31	502,7	4,323	889,74	985,24	782,97	866,03
32	535,6	4,606	948,06	1049,83	834,30	922,80
33	569,6	4,899	1008,24	1116,47	887,25	981,38
34	604,7	5,200	1070,27	1185,16	941,84	1041,76
35	640,8	5,511	1134,16	1255,90	998,06	1103,94
36	677,9	5,830	1199,89	1328,69	1055,91	1167,92
37	716,1	6,158	1267,48	1403,54	1115,38	1233,71
38	755,3	6,496	1336,92	1480,43	1176,49	1301,30
39	795,6	6,842	1408,21	1559,37	1239,22	1370,69
40	836,9	7,198	1481,35	1640,36	1303,59	1441,88
41	879,3	7,562	1556,34	1723,41	1369,58	1514,87
42	922,7	7,935	1633,19	1808,50	1437,20	1589,67
43	967,2	8,318	1711,88	1895,65	1506,46	1666,27
44	1012,7	8,709	1792,43	1984,84	1577,34	1744,67
45	1059,2	9,109	1874,83	2076,09	1649,85	1824,88
46	1106,8	9,519	1959,08	2169,38	1723,99	1906,89
47	1155,5	9,937	2045,19	2264,73	1799,76	1990,70
48	1205,2	10,364	2133,14	2362,12	1877,17	2076,31
49	1255,9	10,801	2222,95	2461,57	1956,20	2163,72
50	1307,7	11,246	2314,61	2563,07	2036,85	2252,94
51	1360,5	11,700	2408,12	2666,62	2119,14	2343,96
52	1414,4	12,164	2503,48	2772,21	2203,06	2436,78
53	1469,3	12,636	2600,69	2879,86	2288,61	2531,40
54	1525,3	13,117	2699,76	2989,56	2375,79	2627,83
55	1582,3	13,608	2800,68	3101,31	2464,59	2726,05
56	1640,4	14,107	2903,44	3215,11	2555,03	2826,08

verope MINING

The rope data provided in the above table is for reference only and may be adjusted by applying slight changes to the rope design.

verope® MINING

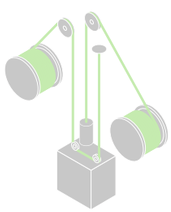


verodeep 8 RS

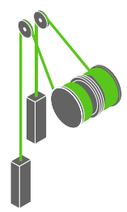
is the strongest non-rotation resistant rope in the portfolio with tremendous performance on drum winders.

- ➔ Non-rotation-resistant rope construction
- ➔ Available in galvanized and bright wire surface
- ➔ Available in right hand and left hand
- ➔ Available in Lang's lay and ordinary lay
- ➔ Available with special lubrication on request
- ➔ The plastic layer offers certain construction advantages
- ➔ The swaged surface offers higher breaking forces and a better contact behavior
- ➔ Available in 1770 N/mm², 1960 N/mm², 2160 N/mm², or upon customers request

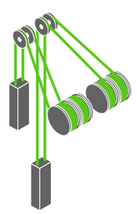
Applications



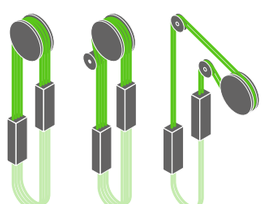
shaft sinking



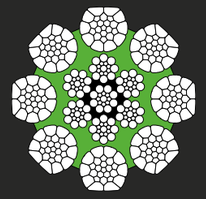
double drum winder



blair multi rope winder



koepe friction winder



VERO**DEEP 8 RS**

is the strongest non-rotation resistant rope in the portfolio with tremendous performance on drum winders.

nominal rope diameter	metallic cross section	rope weight	calculated breaking force		minimum breaking force	
			rope grade		rope grade	
			1770 N/mm²	1960 N/mm²	1770 N/mm²	1960 N/mm²
mm	mm²	kg/m	kN	kN	kN	kN
20	215,2	1,851	380,90	421,79	337,10	373,28
21	237,3	2,040	419,94	465,02	371,65	411,55
22	260,4	2,239	460,89	510,37	407,89	451,67
23	284,6	2,448	503,74	557,82	445,81	493,67
24	309,9	2,665	548,50	607,38	485,42	537,53
25	336,2	2,892	595,16	659,05	526,72	583,26
26	363,7	3,128	643,73	712,83	569,70	630,85
27	392,2	3,373	694,19	768,71	614,36	680,31
28	421,8	3,627	746,57	826,71	660,71	731,64
29	452,5	3,891	800,85	886,81	708,75	784,83
30	484,2	4,164	857,03	949,03	758,47	839,89
31	517,0	4,446	915,12	1013,35	809,88	896,82
32	550,9	4,738	975,11	1079,78	862,97	955,61
33	585,9	5,039	1037,01	1148,32	917,75	1016,27
34	621,9	5,349	1100,81	1218,97	974,22	1078,79
35	659,0	5,668	1166,51	1291,73	1032,36	1143,18
36	697,2	5,996	1234,12	1366,60	1092,20	1209,44
37	736,5	6,334	1303,64	1443,58	1153,72	1277,57
38	776,9	6,681	1375,06	1522,66	1216,93	1347,56
39	818,3	7,037	1448,38	1603,86	1281,82	1419,41
40	860,8	7,403	1523,61	1687,16	1348,39	1493,14
41	904,4	7,778	1600,74	1772,57	1416,66	1568,73
42	949,0	8,162	1679,78	1860,09	1486,60	1646,18
43	994,8	8,555	1760,72	1949,73	1558,24	1725,51
44	1041,6	8,957	1843,57	2041,46	1631,56	1806,70
45	1089,4	9,369	1928,32	2135,31	1706,56	1889,75
46	1138,4	9,790	2014,97	2231,27	1783,25	1974,67
47	1188,4	10,221	2103,53	2329,34	1861,63	2061,46
48	1239,5	10,660	2194,00	2429,51	1941,69	2150,12
49	1291,7	11,109	2286,37	2531,80	2023,43	2240,64
50	1345,0	11,567	2380,64	2636,19	2106,87	2333,03
51	1399,3	12,034	2476,82	2742,69	2191,98	2427,28
52	1454,7	12,511	2574,90	2851,30	2278,79	2523,40
53	1511,2	12,997	2674,89	2962,02	2367,28	2621,39
54	1568,8	13,492	2776,78	3074,85	2457,45	2721,24
55	1627,4	13,996	2880,57	3189,79	2549,31	2822,96
56	1687,2	14,510	2986,27	3306,84	2642,85	2926,55

verope MINING

The rope data provided in the above table is for reference only and may be adjusted by applying slight changes to the rope design.

Koepe friction winder data required for rope quotation (*) and for technical evaluation

Mine	Name of installation and shaft		
	Name of mine		
	* Type of installation		
	* Relevant standard (TAS, SABS, ISO ...)		
Head rope	* Type of shaft guides		
	* Number of head ropes		
	* Head rope construction used before		
	* Nominal head rope diameter used before		mm
	* Tensile grade used before (1770, 1960, …)		N/mm²
	* Lay type and direction of lay	☐ Ordinary ☐ Lang's ☐ Left ☐ Right	
	* Rope wire finish	☐ Bright ☐ Galvanized ☐ Zn+Al	
	* Total head rope length		m
	* Max suspended head rope length		m
	Length of wind		m
	* Mass of head rope		kg/m
	* Required head rope MBL		kN
	Type of lubrication used before		
	Mass of lubrication	☐ Light ☐ Medium ☐ Heavy	
	* Safety factor (design factor) required		
	* End connection		
Drum & sheave	Number of head ropes per Koepe drum		
	Distance between head ropes		mm
	Diameter of Koepe drum		mm
	Angle of wrap on Koepe drum		°
	Diameter of deflection sheave if installed		mm
	Angle of wrap on deflection sheave		°
	Distance of deflection sheave to Koepe drum		m
	Sheave diameter		mm
	Sheave maximum nominal tread pressure		Mpa
	Current average rope life		months

Please note that verope will keep your data confidential and will use it only for the purpose of producing a technically correct rope selection and quotation. verope needs the answers to the questions marked with an asterisk (*). Answers to the non marked questions are welcome but not absolutely necessary.

You can also find this sheet digitally by scanning the QR code.

Koepe friction winder data required for rope quotation (*) and for technical evaluation

Balance rope	* Number of balance ropes		
	* Balance rope construction used before		
	* Nominal balance rope diameter used before		mm
	* Tensile grade used before (1770, 1960, …)		N/mm²
	* Lay type and direction of lay	☐ Ordinary ☐ Lang's ☐ Left ☐ Right	
	* Rope wire finish	☐ Bright ☐ Galvanized ☐ Zn+Al	
	* Total balance rope length		m
	* Suspended balance rope length with skip in loading station		m
	* Suspended balance rope length with skip in unloading position		m
	* Mass of balance rope		kg/m
	* Required balance rope MBL		kN
	Type of lubrication use before (brand)		
	Mass of lubrication (light / medium / heavy)	☐ Light ☐ Medium ☐ Heavy	
	* Safety factor (design factor) required		
	* End connection		
	* D/d ratio of balance rope loop		
	Current average rope life		months
Application	Tower or ground mounted Koepe drum		
	Mass of empty skip and attachments [kg]		kg
	Payload of skip [kg]		kg
	Skip factor (empty skip mass: payload)		
	How is rope tension monitored	☐ Manual ☐ Load Cell	
	Max rope speed		m/sec
	Acceleration / deceleration		m/sec²

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Shaft sinking data required for rope quotation (*) and for technical evaluation

Mine	Name of installation and shaft		
	Name of mine		
	* Relevant standard (TAS, SABS, ISO, ...)		
Stage rope	* Number of ropes		
	* Rope construction (/ non-rotation resistant)	Rotation resistant Non-rotation resistant	
	* Nominal rope diameter		mm
	* Tensile grade (1770, 1960, …)		N/mm²
	* Lay type and direction of lay	Ordinary Lang's Left Right	
	* Rope wire finish	Bright Galvanized Zn+Al	
	* Total rope length		m
	* Max suspended rope length		m
	* Required MBL		kN
	Mass of lubrication (light / medium / heavy)	Light Medium Heavy	
	* Safety factor (design factor) required		
	* End connection		
	Max rope speed		m/sec
Drums, sheaves & stage	Drum diameter		mm
	Pitch of grooving		mm
	Type of drum grooving (e.g. LeBus®, helicoidal, flat)		
	Type of drum cross over	Grooved Non grooved	
	Maximum number of rope layers on drum		
	Sheave diameter		mm
	* Drawing of reeving system		
	Mass of stage and attachments		kg

Please note that verope will keep your data confidential and will use it only for the purpose of producing a technically correct rope selection and quotation. verope needs the answers to the questions marked with an asterisk (*). Answers to the non marked questions are welcome but not absolutely necessary.

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Shaft sinking data required for rope quotation (*) and for technical evaluation

Kibble rope	* Number of ropes		
	* Rope construction	Rotation resistant Non-rotation resistant	
	* Nominal rope diameter		mm
	* Tensile grade (1770, 1960, …)		N/mm²
	* Lay type and direction of lay	Ordinary Lang's Left Right	
	* Rope wire finish	Bright Galvanized Zn+Al	
	* Total rope length		m
	* Max suspended rope length		m
	* Required MBL		kN
	Mass of lubrication	Light Medium Heavy	
	* Safety factor (desing factor) required		
	* End connection		
	Max rope speed		m/sec
Drums, sheaves & stage	* Drum diameter		mm
	Pitch of grooving		mm
	Type of drum grooving (e.g. LeBus®, helicoidal, flat)		
	Maximum number of rope layers on drum		
	Sheave diameter		mm
	* Drawing of reeving system		
	Mass of emtpy kibble and attachments		kg
	Payload of kibble		kg

Please note that verope will keep your data confidential and will use it only for the purpose of producing a technically correct rope selection and quotation. verope needs the answers to the questions marked with an asterisk (*). Answers to the non marked questions are welcome but not absolutely necessary.

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Drum winder data required for rope quotation (*) and for technical evaluation

Mine	Name of installation and shaft		
	Name of mine		
	* Type of installation		
	* Type of shaft guides		
	* Relevant standard (TAS, SABS, ISO ...)		
Rope	* Rope construction used before		
	* Nominal rope diameter used before		mm
	* Tensile grade used before (1770, 1960 ...)		N/mm²
	* Lay type and direction of lay	☐ Ordinary ☐ Lang's ☐ Left ☐ Right	
	* Rope wire finish	☐ Bright ☐ Galvanized ☐ Alumar	
	* Total rope length		m
	* Max suspended rope length		m
	Max length of wind		m
	* Mass of rope		kg/m
	* Required MBL		kN
	Type of lubrication (brand)		
	Mass of lubrication (light / medium / heavy)	☐ Light ☐ Medium ☐ Heavy	
	* Safety factor (design factor) required		
	* End connection		
Drum & Sheave	Number of ropes per drum		
	Diameter of drum		mm
	Type of drum grooving (e.g. LeBus®, helicoidal, flat)		
	Pitch of grooving		mm
	Type of drum cross over (grooved / non grooved)	☐ Grooved ☐ Non grooved	
	Maximum number of rope layers on drum		
	Sheave diameter		mm
	Sheave maximum nominal tread pressure		MPa
Application	Mass of skip and attachments as per winder certificate		
	Payload as per winder certificate		kg
	Skip factor (empty skip mass: payload)		
	Max rope speed		m/sec
	Acceleration / deceleration		m/sec²
	Current average rope life		months

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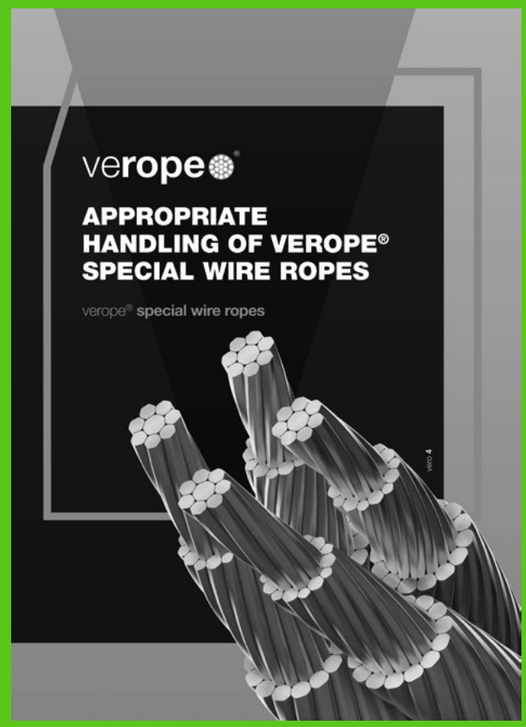
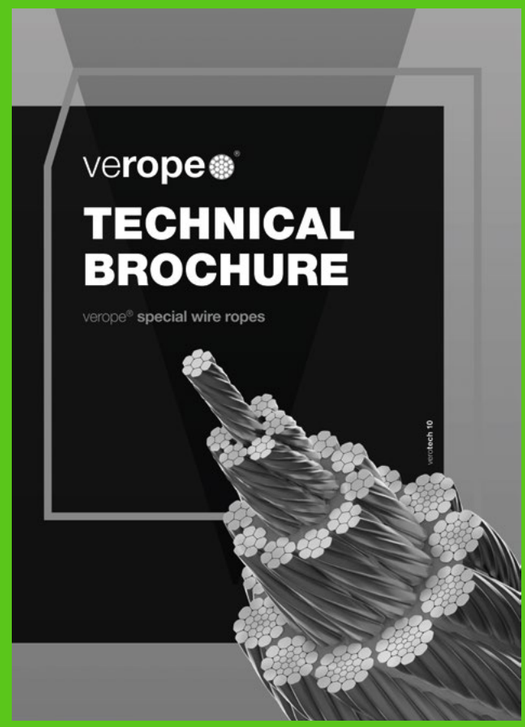
More technical information

For more technical information please take a look in our state-of-the-art technical brochure with a lot of information about special steel wire ropes.

If you are interested in “how to use, maintain and handle verope special wire ropes”, our brochure about proper handling contains a lot of helpful information around these topics.

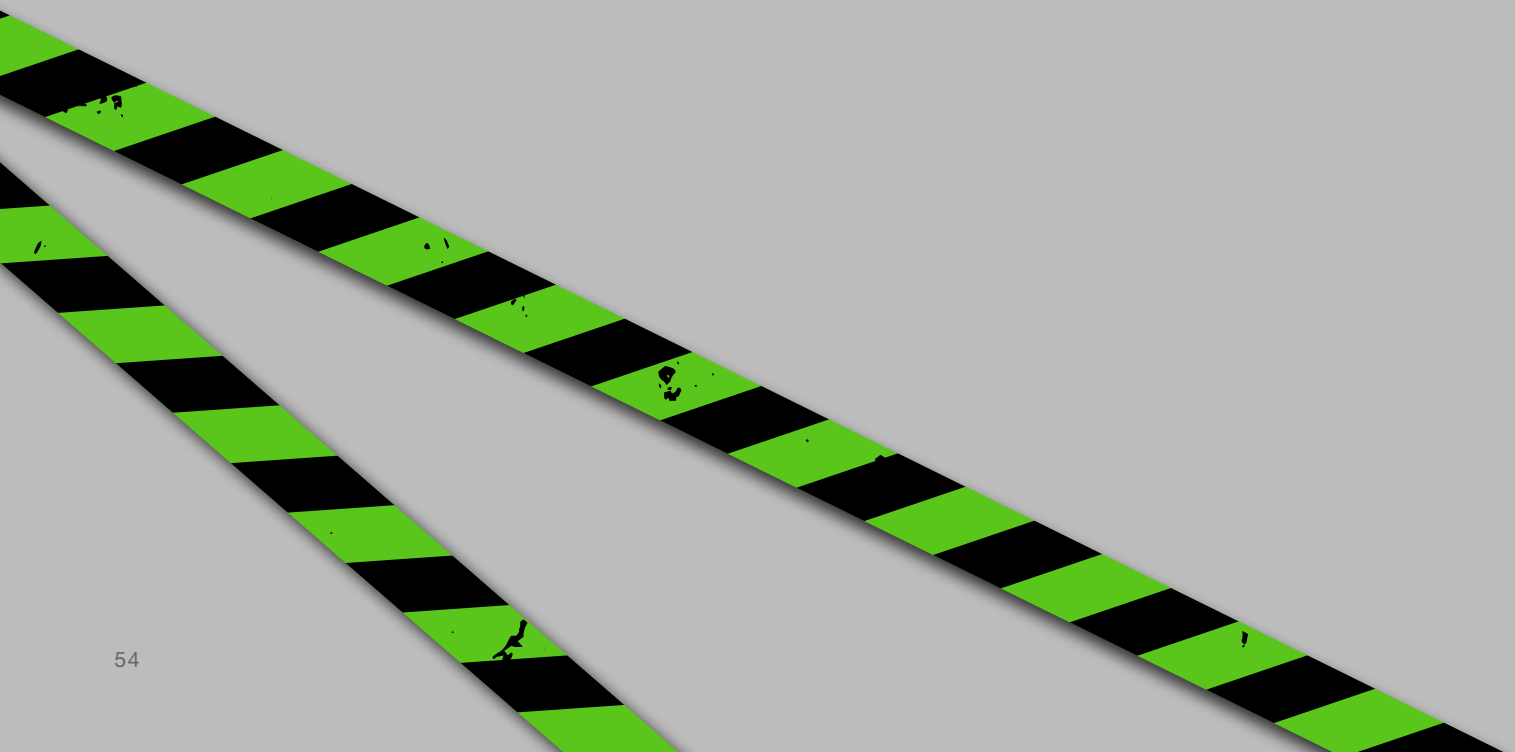




Questions or comments?
Get in touch with underground mining specialists at verope!

verope keeps inventing

Mines getting deeper and deeper, capacity getting higher and higher and the speed of the winders increasing at the same time. Therefore, verope and the KV R&D keeps developing and inventing new rope constructions for the underground mining business to match the customers' requirements. This pocket will be filled from time to time with new rope constructions, or other important additional information for the underground mining rope business.



VEROPE MINING
Edition July 2022

Printed on environmentally friendly FSC® paper.

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