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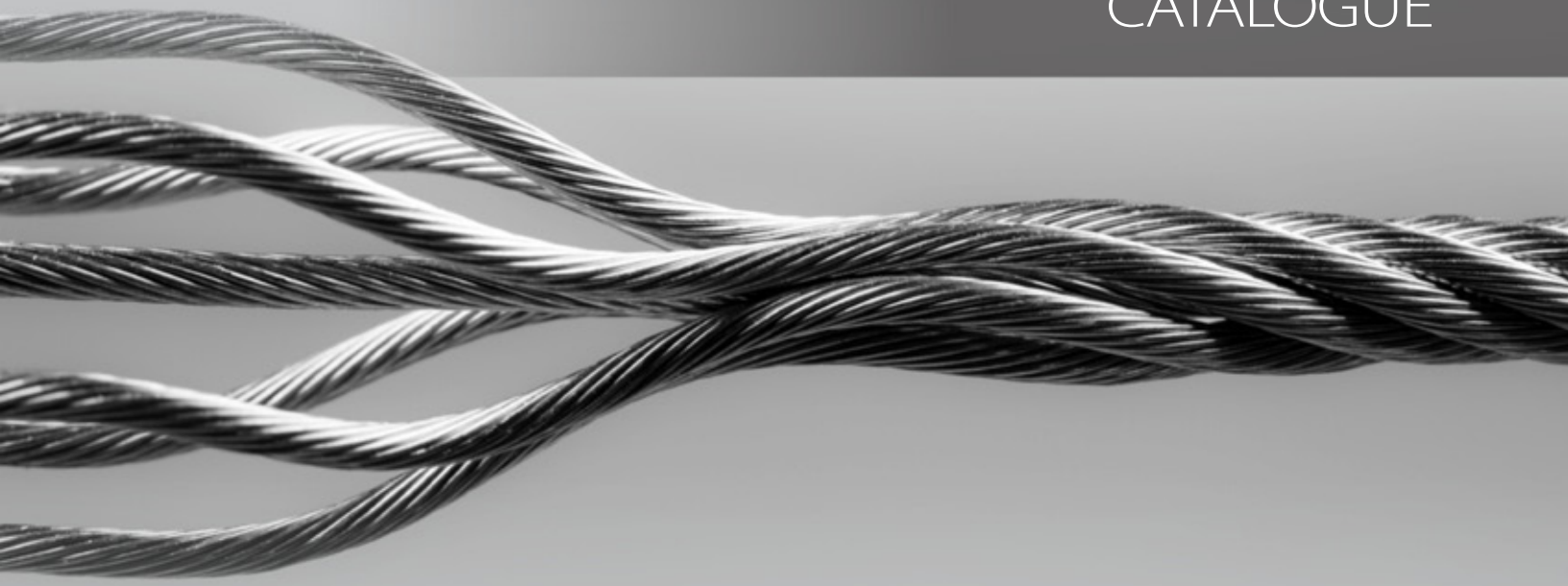
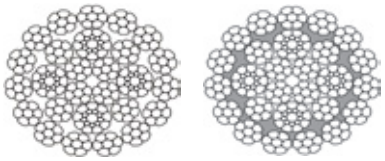
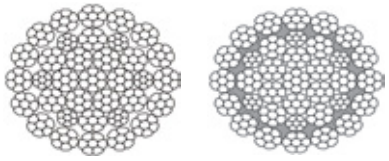
NORTHERN STRANDS

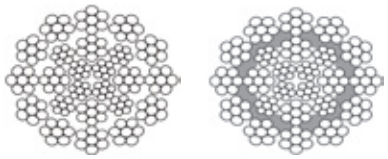
MINING WIRE ROPE
CATALOGUE

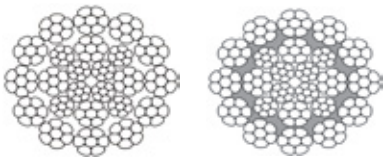


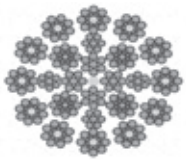
Rope Constructions

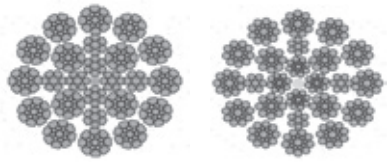


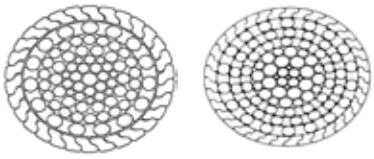


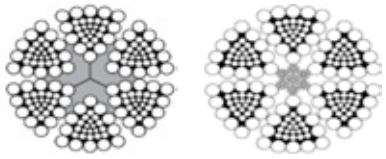


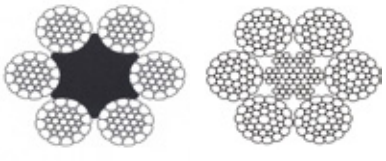


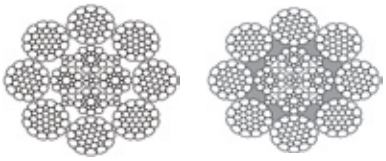


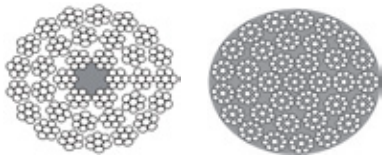


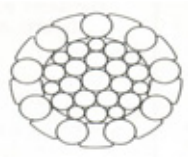






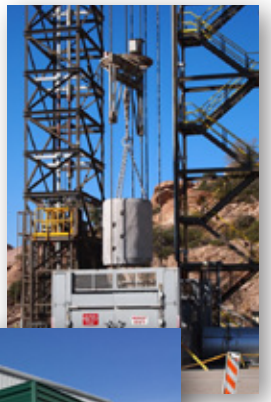






Introduction

With health and safety in mind, Northern Strands has been supplying industry since 1970, evolving into five major divisions that offer needed tools and technical knowledge in mine hoisting and attachments, general rigging, engineered fall protection, suspended access and training.



Thanks to the experience and expertise of our people, Northern Strands is able to deliver added value from the start of your project whether feasibility, upgrade or modification. The design and planning stages are where the greatest potential for profitability for our customers is found.

Northern Strands Mining, Wire Rope, Attachments & Equipment Division excels by providing a wide range of equipment and services, by being the best full service provider of wire ropes, attachments, equipment and service. Truly Mine Hoisting Solutions®.

Our Rigging Division is a full-service facility operating out of Saskatoon and Regina with the ability to fabricate custom chain and wire rope slings up to 1-1/2". We have a vast inventory of synthetic lifting slings, chain hoists, lever hoists, shackles, trolleys, winches (tuggers), and other general rigging hardware. Our network of suppliers and in-house expertise is leveraged for the benefit of our customers. We have vertical and horizontal test bed services. Northern Strands provides compliance certified equipment with documentation.

The Engineered Fall Protection Division offers a variety of fall protection systems, solutions and services. Custom-engineered solutions can be designed to suit specific requirements. Services and equipment include: Inspection and replacement services for overhead and vertical lifelines. Consulting, supply and installation services for single point anchors, guard rail systems, walkways and platforms and structural assessments.

Northern Strands has a large and diverse Suspended Access Division. Our suspended access solutions have been used on sloped roof buildings, glazing applications, sheeting, insulation and concrete restoration, surface and underground in the mining sector along with many other uses throughout Saskatchewan and Western Canada. All of our equipment goes through a rigorous inspection and recertification process each time before it leaves our shop to ensure that our equipment will provide the most dependable solution for your needs. We provide onsite technical assistance with all suspended access rigging and setup ranging from simple to highly engineered set-ups.

Northern Strands' Training Division offers several courses that aim to increase the workplace safety and make you compliant with the latest Saskatchewan OH&S legislation. Our instructors have been trained by industry leaders such as Crosby, Miller, and Capital Safety to name a few. Flexible scheduling [is] available, including evenings, nights and weekends. Courses are recognized province wide, and designed to educate you on legislation from The Occupational Health & Safety Regulations, 1996. Training courses offered: Fall Arrest, Crosby Rigging, Tugger Safety, Confined Space, Wirelock Socketing and First Aid/CPR-C.

Northern Strands Certifications and Associations:
COR Safety certified, Canadian Red Cross partner, ISNET, Mission Zero Charter Member, Canadian Dam Association Sustaining Member

What Rope Is Best For You?

By working with customers in the mining industry, the company has been able to provide products and technical assistance for some of the most difficult and complex hoist installations in the world. Northern Strands offer a full line of wire ropes, regardless of the hoist setup or stage of the mine development.

Wire Ropes for Mining

We have supplied wire ropes for Ground and Tower Mounted Friction (Koepe) Hoists, Drum Hoists, and Blair Hoists. When choosing a wire rope for your hoist, keep in mind that no wire rope can do it all. There are many factors to consider:

- **Resistance to Drum Crushing**
- **Resistance to Rotation**
- **Strength (also known as minimum breaking force)**
- **Resistance to Fatigue Wear**
- **Corrosion Resistance**
- **Service Life**
- **Rope Flexibility**
- **Rope Diameter**
- **Weight per foot**
- **and the list goes on.**

As you can see, it is not a simple task, so Northern Strands can help assess the situation and provide a rope solution that best suits your needs.

Sinking Ropes

For Sinking ropes, a rotation resistant rope is required. As the shaft gets deeper, the resistance to rotation becomes critical, so we can help design a rope that will perform as expected or better.

Friction (Koepe), Drum, and Blair Hoist Ropes

There are a variety of wire rope constructions that can be considered for your hoisting operation. Each of these offerings have their own characteristics and advantages.

- **35x7 (multi-strand) construction**
- **24x7 or 24x17 construction**
- **Flattened Strand**
- **6 strand or 8 strand**
- **Full Lock Coil.**

Slope Hoists and Surface Mining

Underground mining ropes are not our only business. Northern Strands can also supply wires ropes for Slope Hoists and Surface Mining. Flattened Strand, 6 strand, and 8 strand are the most common varieties here. The number of wires, level of compaction, and inclusion of plastic are all part of the design process. Because of all the variables, Northern Strands truly has a wide product range.

Balance (Tail) Ropes

If you have a Friction (Koepe) hoist and you need balance (or tail) ropes, Northern Strands can supply these if different constructions as well.

- **34x7 or 34x17 construction, both have option of plastic outer cover and plastic filled valley**
- **Flat balance ropes with rubber exterior and rubber between the wires**

Guide Ropes

For Guide Ropes, Half Lock Coil ropes are the most commonly used product. Full Lock Coil ropes are also a consideration in some circumstances. Northern Strands can help provide the best guide rope for the job depending on the rope diameter, breaking strength requirement, and the mine environment.

	APPLICATION					
ROPE CONSTRUCTION	**SHAFT SINKING ROPE**	**DRUM HOIST ROPE**	**FRICTION HOIST ROPE**	**SURFACE MINING ROPE**	**BALANCE OR TAIL ROPE**	**GUIDE ROPE**
35X7	X	X	X			
24X7		X	X			
24X17	X	X	X		X	
FULL LOCKED COIL	X		X			X
FLATTENED STRAND		X	X	X		
6 OR 8 STRAND		X	X	X		
34X7 OR 34X17					X	
FLAT BALANCE ROPE					X	
HALF LOCKED COIL						X

Rope Applications & Features

Rotation in Wire Rope

Rotation-resistant rope is defined as stranded rope designed to generate reduced levels of torque and rotation when loaded and comprised of two or more layers of strands laid helically around the center, with the direction of lay of the outers strands being opposite to that of the underlying layer. However, there are different levels of rotation resistance to consider.

Wire rope with the most resistance to rotation has at least 15 outer strands and at least 3 layers of strands. This rope is known as Non-Rotating and can be used where swivels are being used. Rope that has at least 10 outer strands and contains two or more layers of strands is known as Rotation Resistant or Low Rotation. Rope that has 9 outer strands or less and contains two layers of strands is known as Spin Resistant. Other than these, all other rope constructions are considered to be rotating ropes.

Compacted Strands

Many of our hoist and sinking ropes come with compacted strands on the outer layer, inner layers, or all layers. When compared to round strands with the same diameter, compacted strands have the following advantages:

- **higher metallic area**
- **higher breaking force**
- **more resistance to side pressure, wear, and abrasion,**
- **better spooling performance and resistance to crushing.**

When designing rope, strand compaction can be altered to meet certain requirements.

Plastic Encased Core

In hoist ropes with plastic encased core, a plastic sheathing is inserted between the outer layer of strands and the inner layer(s) of strands. This plastic filler reduces potential sliding of the various components while still allowing necessary movement. The plastic also fills the free space between the exterior strands which noticeably prevents friction wear damages. But perhaps the biggest advantage of this product is its ability to seal the lubrication in the inner strands and keep out the polluting agents that lead to corrosion.

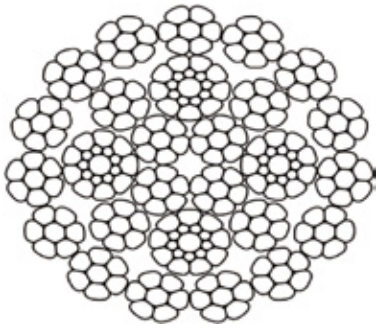
Rope Finish – Bright, Galvanized, or Aluminum-Zinc?

Corrosion resistance can be obtained by using different rope finishes. In a dry environment, ropes are made with bright steel. In a wet environment, ropes made with galvanized wires are recommended. In a corrosive environment, the use of wires coated in an Aluminum Zinc alloy (also known as Galfan) is the best choice.

Contact us to discuss this option on each rope construction.

	FEATURES							
ROPE CONSTRUCTION	**NON-ROTATING ***	**ROTATION RESISTANT**	**ROTATING**	**COMPACT OUTER STRANDS**	**PLASTIC ENCASED CORE**	**PLASTIC OUTER COVER**	**STRANDS SEPARATED BY RUBBER**	**SHAPED WIRES**
35X7	X			OPTIONAL	OPTIONAL			
24X7		X		OPTIONAL	OPTIONAL			
24X17		X		OPTIONAL				
FULL LOCKED COIL	X							X
FLATTENED STRAND			X					
6 OR 8 STRAND			X	OPTIONAL	OPTIONAL	OPTIONAL		
34X7 OR 34X17	X				OPTIONAL	OPTIONAL		
FLAT BALANCE ROPE							X	
HALF LOCKED COIL								X

* Non-rotating ropes can be used with a swivel.



Compacted 35x7 Hoist Rope

Features:

- For Use on Friction, Drum, or Blair Hoist
- Non-rotating
- 35x7 Class
- Compacted Inner and Outer Strands
- High Load Capacity
- High Wear Resistance
- High Resistance to Fatigue

Grade Options

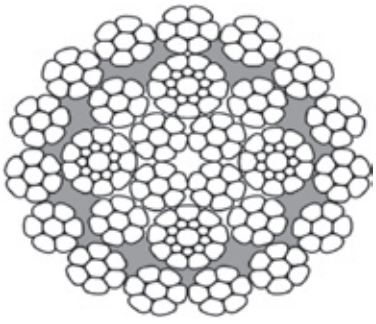
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

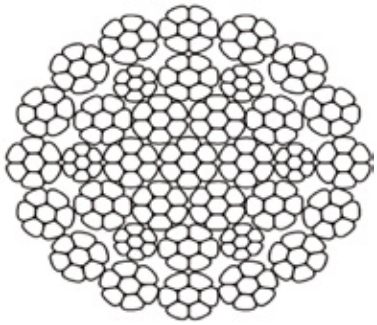
Plastic Encased Core



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.70	1.15	314	70,600
20		1.89	1.27	348	78,200
22		2.28	1.54	421	94,700
	7/8	2.33	1.57	430	96,600
24		2.72	1.83	501	113,000
25		2.95	1.98	544	122,000
	1	3.05	2.05	561	126,000
26		3.19	2.14	588	132,000
28		3.70	2.49	682	153,000
	1-1/8	3.85	2.59	710	160,000
30		4.25	2.85	783	176,000
	1-1/4	4.76	3.20	877	197,000
32		4.83	3.25	891	200,000
34		5.46	3.67	1010	226,000
35	1-3/8	5.76	3.87	1060	239,000
36		6.12	4.11	1130	253,000
38	1-1/2	6.82	4.58	1260	282,000
40		7.55	5.07	1390	313,000
41	1-5/8	8.04	5.40	1480	333,000
42		8.33	5.60	1530	345,000
44		9.14	6.14	1680	379,000
	1-3/4	9.33	6.27	1720	386,000
46		9.99	6.71	1840	414,000
48	1-7/8	10.9	7.31	2000	451,000
50		11.8	7.93	2180	489,000
	2	12.2	8.19	2250	505,000
52		12.8	8.58	2350	529,000
54	2-1/8	13.8	9.30	2540	570,000
56		14.8	9.95	2730	613,000
58	2-1/4	15.9	10.7	2930	658,000
60	2-3/8	17.2	11.5	3170	712,000
64	2-1/2	19.3	13.0	3560	801,000
65		19.9	13.4	3680	826,000

Minimum Breaking Strengths shown are for 1960 Grade.



Compacted 35x7 Sinking Rope

Features:

- Recommended for Sinking
- Recommended for Multiple Layer Winding
- Non-rotating
- Compacted Inner and Outer strands
- Extremely High Breaking Force
- High Radial Stiffness
- Excellent Rotational Stability

Grade Options

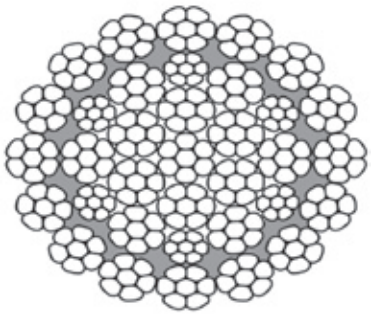
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

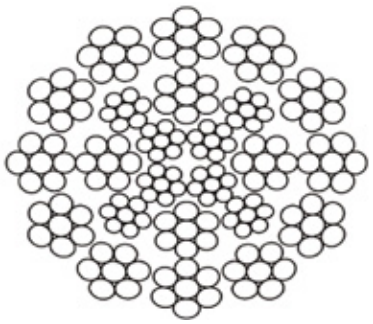
Plastic Encased Core



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.84	1.23	347	77,900
20		2.04	1.37	384	86,300
22		2.46	1.66	465	104,000
	7/8	2.51	1.69	474	107,000
24		2.93	1.97	553	124,000
25		3.18	2.14	600	135,000
	1	3.28	2.21	619	139,000
26		3.44	2.31	649	146,000
28		3.99	2.68	753	169,000
	1-1/8	4.16	2.79	784	176,000
30		4.58	3.08	864	194,000
	1-1/4	5.13	3.45	968	218,000
32		5.21	3.50	983	221,000
34		5.88	3.95	1110	249,000
35	1-3/8	6.21	4.17	1170	263,000
36		6.60	4.43	1240	280,000
38	1-1/2	7.35	4.94	1390	312,000
40		8.14	5.47	1540	345,000
41	1-5/8	8.67	5.83	1640	368,000
42		8.98	6.03	1690	381,000
44		9.85	6.62	1860	418,000
	1-3/4	10.1	6.76	1900	426,000
46		10.8	7.24	2030	457,000
48	1-7/8	11.7	7.88	2210	497,000
50		12.7	8.55	2400	540,000
	2	13.1	8.83	2480	557,000
52		13.8	9.25	2600	584,000
54	2-1/8	14.8	9.97	2800	629,000
56		16.0	10.7	3010	677,000
58	2-1/4	17.1	11.5	3230	726,000
60	2-3/8	18.5	12.4	3490	785,000
64	2-1/2	20.8	14.0	3930	884,000
65		21.5	14.5	4060	912,000

Minimum Breaking Strengths shown are for 1960 Grade.



24x7 Construction Hoist Rope

Features:

- For Use on Friction, Drum, or Blair Hoist
- Rotation Resistant
- 24x7 Construction
- Good Rotational Stability
- High Flexibility
- Good Handling Properties

Grade Options

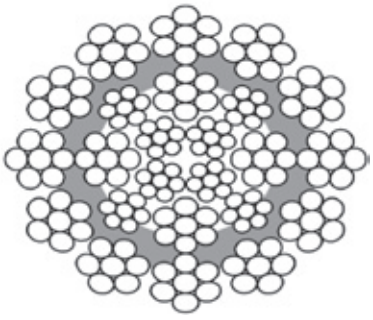
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

Plastic Encased Core



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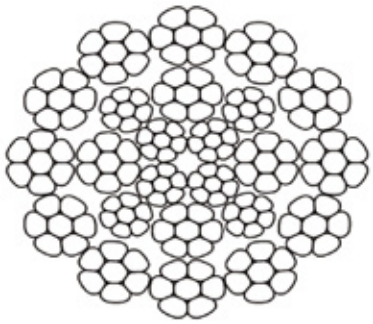
NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.49	1.00	265	59,600
20		1.65	1.11	294	66,100
22		2.00	1.34	356	80,000
	7/8	2.04	1.37	363	81,600
24		2.38	1.60	423	95,200
25		2.58	1.73	459	103,000
	1	2.66	1.79	474	107,000
26		2.79	1.88	497	112,000
28		3.24	2.18	576	130,000
	1-1/8	3.37	2.27	600	135,000
30		3.72	2.50	662	149,000
	1-1/4	4.16	2.80	741	167,000
32		4.23	2.84	753	169,000
34		4.77	3.21	850	191,000
35	1-3/8	5.04	3.39	897	202,000
36		5.35	3.60	953	214,000
38	1-1/2	5.96	4.01	1060	239,000
40		6.61	4.44	1180	264,000
41	1-5/8	7.04	4.73	1250	281,000
42		7.29	4.90	1300	291,000
44		8.00	5.37	1420	320,000
	1-3/4	8.16	5.48	1450	326,000
46		8.74	5.87	1560	350,000
48	1-7/8	9.52	6.39	1690	381,000
50		10.3	6.94	1840	413,000
	2	10.7	7.16	1900	426,000

Minimum Breaking Strengths shown are for 1960 Grade.



Compacted 24x7 Hoist Rope

Features:

- For Use on Friction, Drum, or Blair Hoist
- Rotation Resistant
- 24x7 Construction
- Compacted Inner and Outer strands
- Good Rotational Stability
- Good Radial Stiffness
- Good Resistance to Corrosion

Grade Options

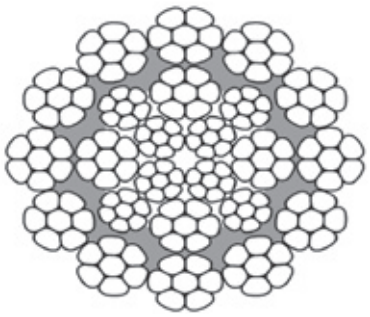
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

Plastic Encased Core



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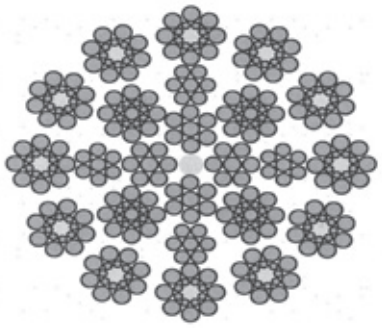
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.70	1.14	305	68,600
20		1.88	1.27	338	76,000
22		2.28	1.53	409	91,900
	7/8	2.33	1.56	417	93,800
24		2.71	1.82	487	109,000
25		2.94	1.98	528	119,000
	1	3.04	2.04	545	123,000
26		3.18	2.14	571	128,000
28		3.69	2.48	662	149,000
	1-1/8	3.85	2.58	690	155,000
30		4.24	2.85	761	171,000
	1-1/4	4.75	3.19	852	191,000
32		4.82	3.24	865	195,000
34		5.44	3.66	977	220,000
35	1-3/8	5.75	3.86	1030	232,000
36		6.10	4.10	1100	246,000
38	1-1/2	6.80	4.57	1220	274,000
40		7.54	5.06	1350	304,000
41	1-5/8	8.02	5.39	1440	324,000
42		8.31	5.58	1490	335,000
44		9.12	6.13	1640	368,000
	1-3/4	9.31	6.25	1670	375,000
46		9.97	6.70	1790	402,000
48	1-7/8	10.9	7.29	1950	438,000
50		11.8	7.91	2110	475,000
	2	12.2	8.17	2180	490,000

Minimum Breaking Strengths shown are for 1960 Grade.



24x17 Construction Friction Hoist Rope

Features:

- For Use on Friction Hoists (>36mm)
- Rotation Resistant
- 24x17 Construction
- High Service Life
- High Resistance to Fatigue
- Low Stretch

Grade Options

- 1770 N/mm^2
- 1960 N/mm^2
- 2060 N/mm^2

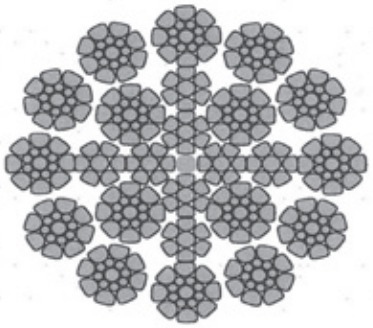
Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
36		4.94	3.32	914	205,000
38	1-1//2	5.51	3.71	1023	229,000
40		6.12	4.12	1138	255,000
42	1-5/8	6.76	4.54	1259	283,000
44		7.43	4.99	1385	311,000
45	1-3/4	7.77	5.22	1450	326,000
46		8.12	5.46	1517	341,000
48	1-7/8	8.83	5.93	1653	371,000
50		9.57	6.43	1794	403,000
51	2	9.94	6.68	1866	419,000
52		10.32	6.93	1939	435,000
54	2-1/8	11.09	7.45	2089	469,000
56		11.88	7.98	2241	503,000
57	2/1/4	12.28	8.25	2319	521,000
58		12.68	8.52	2397	538,000
60		13.49	9.06	2556	574,000
61	2-3/8	13.90	9.34	2637	592,000
62		14.31	9.62	2718	611,000
64	2-1/2	15.14	10.17	2882	647,000

Minimum Breaking Strengths shown are for 1960 Grade.



Construction 24x17 Hoist, Sinking, or Balance Rope

Features:

- For Use on Drum or Blair Hoists
- For Use on Friction Hoist (up to 35mm)
- Use as Sinking Rope
- Use as Balance Rope when Not Compacted
- Rotation Resistant
- High Breaking Strength
- Very High Resistance to Fatigue

Grade Options

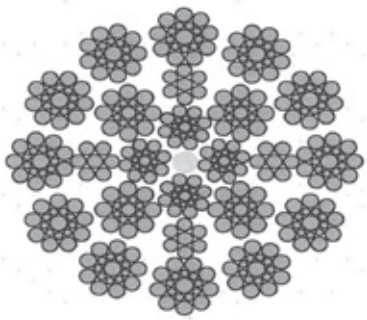
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

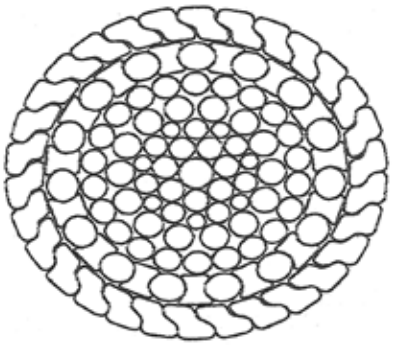
Non-compacted Balance Rope



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
30		4.32	2.90	767	172,000
32	1-1/4	4.91	3.30	872	196,000
34		5.55	3.73	984	221,000
36	1-1/2	6.22	4.18	1104	248,000
38		6.94	4.66	1230	276,000
40		7.69	5.17	1364	306,000
42	1-5/8	8.49	5.70	1506	338,000
44		9.33	6.27	1654	371,000
46		10.21	6.86	1810	406,000
48	1-7/8	11.13	7.48	1974	443,000
50		12.09	8.13	2145	482,000
52		13.10	8.80	2323	522,000
54	2-1/8	14.16	9.51	2510	564,000
56		15.25	10.25	2704	607,000
58		16.39	11.01	2906	653,000
60		17.58	11.81	3116	700,000
62		18.81	12.64	3334	749,000
64	2-1/2	20.08	13.50	3560	800,000
66		21.41	14.38	3794	852,000
68		22.77	15.30	4036	907,000
70	2-3/4	24.19	16.25	4287	963,000

Minimum Breaking Strengths shown are for 1960 Grade.



Full Locked Coil Hoist, Sinking, or Guide Rope

Features:

- For Use on Friction Hoist
- Use as Sinking Rope on Deep Shafts
- Can be Designed for Use as Guide Rope
- Non-rotating, Low Stretch, High Strength
- Round Smooth Outer Surface
- Z-lock Shaped Wires on Outer Layer
- Combination of Z-lock, X Lock, or Round Wires for Inner Layers
- Available in Various Grade Options

Grade Options

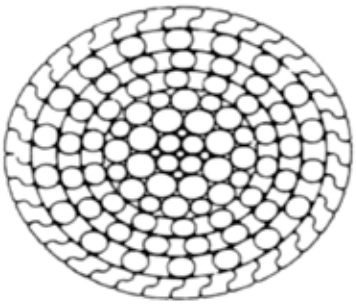
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized

Option:

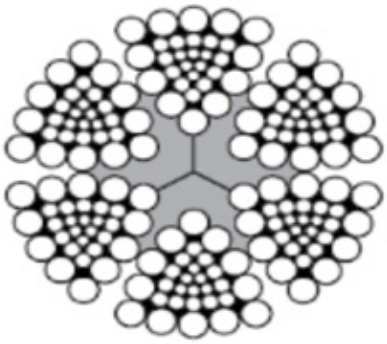
3 inner X-lock layers



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
22	7/8	2.85	1.92	446	100,200
26	1	4.02	2.70	697	156,700
29	1-1/8	4.95	3.33	776	174,400
32	1-1/4	5.65	3.80	875	196,700
35	1-3/8	7.24	4.87	1186	266,600
38	1-1/2	8.45	5.68	1487	334,300
42	1-5/8	10.63	7.14	1634	367,300
45	1-3/4	11.68	7.85	1930	433,800
48	1-7/8	13.45	9.04	2187	491,600
51	2	15.10	10.15	2503	562,600
54	2-1/8	16.95	11.39	2805	630,500
57	2-1/4	18.85	12.67	3125	702,500
61	2-3/8	21.75	14.62	3585	805,900

Values shown are for Full Locked Coil ropes with the following design:
Z wires in 1570 Grade, OX wires in 1660 Grade, and Round Wires in 1960 Grade



Flattened Strand Hoist or Surface Mining Rope

Features:

- For use on Drum, or Blair Hoist
- Use on Friction Hoist (Depth < 1000m)
- Use for Surface Mining and Drag
- Various Wire Configurations Available
- Reduces Wear on Sheaves and Drums
- Higher Breaking Strength than 6 Strand
- High Resistance to Crushing and Distortion

Grade Options

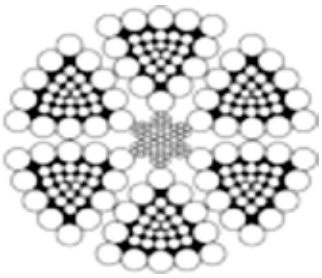
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized

Option:

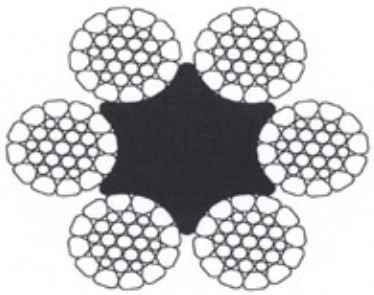
Independent Wire Rope Core (IWRC)



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
21		1.77	1.19	321	72,100
22		1.94	1.30	352	79,100
23		2.13	1.43	385	86,500
24		2.32	1.56	419	94,200
25		2.53	1.70	454	102,000
26		2.74	1.84	500	112,400
27		2.95	1.98	551	123,900
28		3.17	2.13	586	131,800
29		3.43	2.30	639	143,500
30		3.63	2.44	673	151,300
32		4.14	2.78	763	171,600
33		4.38	2.94	817	183,700
34		4.68	3.14	869	195,300
35	1-3/8	4.94	3.32	915	205,600
36		5.23	3.51	959	215,500
37		5.55	3.73	1029	231,300
38	1-1/2	5.84	3.92	1086	244,200
39		6.20	4.17	1147	257,800
40		6.40	4.30	1161	260,900
41		6.83	4.59	1237	278,100
42		7.10	4.77	1295	291,200
43		7.48	5.03	1361	305,900
44		7.81	5.25	1407	316,200
45		8.19	5.50	1464	329,000
46		8.53	5.73	1563	351,300
47		8.90	5.98	1621	364,400
48		9.30	6.25	1666	374,600
49		9.77	6.57	1737	390,500
50		10.09	6.78	1818	408,600
51	2	10.49	7.05	1882	423,000
52		10.93	7.34	1952	438,800
53		11.24	7.55	2019	453,800
54	2-1/8	11.72	7.88	2103	472,700

Minimum Breaking Strengths shown for 1960 Grade with Fiber Core.



Compacted 6 Strand Hoist or Surface Mining Rope

Features:

- For Use on Friction, Drum, or Blair Hoist
- Use for Surface Mining and Drag
- Good Resistance to Wear
- Good Resistance to Corrosion
- Available with Fiber Core or IWRC
- Available with Plastic Encased IWRC
- Available with Plastic Outer Cover

Grade Options

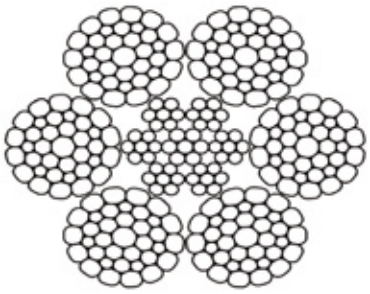
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

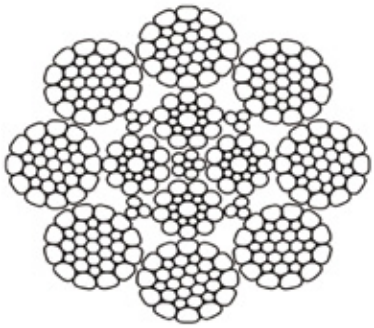
6x36 with IWRC



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.64	1.10	307	69,000
20		1.81	1.22	340	76,400
22		2.19	1.47	411	92,500
	7/8	2.24	1.50	420	94,400
24		2.61	1.75	490	110,000
25		2.83	1.90	531	119,000
	1	2.92	1.96	548	123,000
26		3.06	2.06	575	129,000
28		3.55	2.39	666	150,000
	1-1/8	3.70	2.49	694	156,000
30		4.08	2.74	765	172,000
	1-1/4	4.57	3.07	857	193,000
32		4.64	3.12	870	196,000
34		5.24	3.52	983	221,000
35	1-3/8	5.53	3.71	1040	233,000
36		5.87	3.95	1100	248,000
38	1-1/2	6.54	4.40	1230	276,000
40		7.25	4.87	1360	306,000
41	1-5/8	7.72	5.19	1450	326,000
42		7.99	5.37	1500	337,000
44		8.77	5.89	1650	370,000
	1-3/4	8.95	6.01	1680	378,000
46		9.59	6.44	1800	404,000
48	1-7/8	10.4	7.01	1960	440,000
50		11.3	7.61	2130	478,000
	2	11.7	7.86	2190	493,000
52		12.2	8.23	2300	517,000
54	2-1/8	13.2	8.88	2480	557,000
56		14.2	9.55	2670	599,000
58	2-1/4	15.2	10.2	2860	643,000
60	2-3/8	16.5	11.1	3090	695,000
64	2-1/2	18.6	12.5	3480	783,000
65	2-1/8	19.1	12.9	3590	807,000

Minimum Breaking Strengths shown are for 1960 Grade with IWRC.



Compacted 8 Strand Hoist or Surface Mining Rope

Features:

- For Use on Friction, Drum, or Blair Hoist
- Use for Surface Mining and Drag
- High Resistance to Wear
- High Resistance to Corrosion
- Available with IWRC or Special Hybrid Core
- Available with Plastic Encased IWRC
- Available with Plastic Outer cover

Grade Options

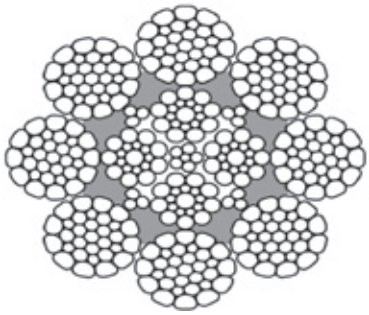
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

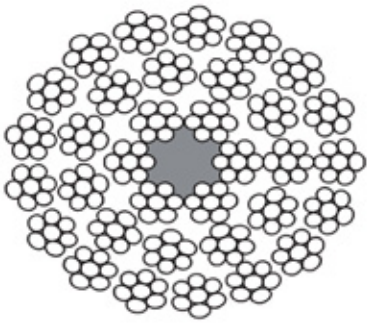
Plastic Encased IWRC



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.69	1.14	318	71,400
20		1.88	1.26	352	79,100
22		2.27	1.53	426	95,800
	7/8	2.32	1.56	435	97,700
24		2.70	1.82	507	114,000
25		2.93	1.97	550	124,000
	1	3.03	2.03	568	128,000
26		3.17	2.13	595	134,000
28		3.68	2.47	690	155,000
	1-1/8	3.83	2.57	719	162,000
30		4.22	2.84	792	178,000
	1-1/4	4.73	3.18	887	199,000
32		4.80	3.23	901	203,000
34		5.42	3.64	1020	229,000
35	1-3/8	5.72	3.84	1070	241,000
36		6.08	4.08	1140	256,000
38	1-1/2	6.77	4.55	1270	286,000
40		7.50	5.04	1410	317,000
41	1-5/8	7.99	5.37	1500	337,000
42		8.27	5.56	1550	349,000
44		9.08	6.10	1700	383,000
	1-3/4	9.27	6.23	1740	391,000
46		9.92	6.67	1860	419,000
48	1-7/8	10.8	7.26	2030	456,000
50		11.7	7.88	2200	495,000
	2	12.1	8.13	2270	511,000
52		12.7	8.52	2380	535,000
54	2-1/8	13.7	9.19	2570	577,000
56		14.7	9.88	2760	620,000
58	2-1/4	15.8	10.6	2960	666,000
60	2-3/8	17.1	11.5	3200	720,000
64	2-1/2	19.2	12.9	3600	810,000
65	2-1/8	19.8	13.3	3720	836,000

Minimum Breaking Strengths shown are for 1960 Grade with IWRC.



34 Strand Construction Balance Rope

Features:

- Balance Rope when Friction Hoist Used
- Rotation Resistant
- 34x7 or 34x17 Construction
- High Flexibility
- High Torsional Stability
- Customizable Mass

Grade Options

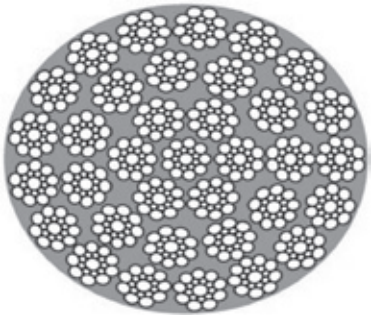
- 1770 N/mm^2
- 1960 N/mm^2
- 2160 N/mm^2

Wire Finishes

- Bright
- Galvanized
- Zinc Aluminum Alloy

Option:

Plastic Filled and Coated 34x17



For other diameters, weights, or strength requirements, please contact us. Other designs available upon request.

NOMINAL DIAMETER		NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in	kg/m	lb/ft	Force (kN)	Load (lbs)
19	3/4	1.45	0.98	225	50,600
20		1.61	1.08	249	56,000
22		1.95	1.31	302	67,800
	7/8	1.99	1.34	308	69,200
24		2.32	1.56	359	80,700
25		2.52	1.69	389	87,500
	1	2.60	1.75	402	90,400
26		2.72	1.83	421	94,700
28		3.16	2.12	488	110,000
	1-1/8	3.29	2.21	509	114,000
30		3.63	2.44	561	126,000
	1-1/4	4.06	2.73	628	141,000
32		4.13	2.77	638	143,000
34		4.66	3.13	720	162,000
35	1-3/8	4.92	3.30	760	171,000
36		5.22	3.51	807	182,000
38	1-1/2	5.82	3.91	900	202,000
40		6.45	4.33	1000	224,000
41	1-5/8	6.87	4.61	1060	239,000
42		7.11	4.78	1100	247,000
44		7.80	5.24	1210	271,000
	1-3/4	7.96	5.35	1230	277,000
46		8.53	5.73	1320	296,000
48	1-7/8	9.29	6.24	1440	323,000
50		10.1	6.77	1560	350,000
	2	10.4	6.99	1610	361,000
52		10.9	7.32	1680	379,000
54	2-1/8	11.8	7.90	1820	408,000
56		12.6	8.49	1950	439,000
58	2-1/4	13.6	9.10	2100	471,000
60	2-3/8	14.7	9.90	2270	510,000
64	2-1/2	16.5	11.1	2550	574,000
65	2-1/8	17.0	11.4	2630	592,000

Minimum Breaking Strengths shown are for 1960 Grade.

Flat Balance Rope

Features:

- Balance Rope when Friction Hoist Used
- Guaranteed Service Life
- NDT Suitable
- Very High Cycle Life
- < 18:1 D:d ratio
- Strands Separated by Rubber
- Galvanized Wires

DESCRIPTION	MINIMUM BREAKING STRENGTH (KN)		
in	1370 N/mm²	1570 N/mm²	1670 N/mm²
Parameters of rope with cables diameter 12mm			
Min 2, 5-60 x 22/2 x 12	158	183	193
Max 4, 0-105 x 22/2 x 12			
Parameters of rope with cables diameter 14mm			
Min 3, 2-60 x 29/2 x 14	224	250	274
Max 13, 5-212 x 35/8 x 14	896	1000	1000
Parameters of rope with cables diameter 16mm			
Min 4, 1-60 x 29/2 x 16	300	344	365
Max 17, 3-212 x 35/8 x 16	1200	1376	1460
Parameters of rope with cables diameter 18mm			
Min 4, 5-60 x 29/2 x 18	366	419	446
Max 19, 0-212 x 35/8 x 18	1464	1679	1784
Parameters of rope with cables diameter 20mm			
Min 13, 2-170 x 35/4 x 20	858	984	1046
Max 17, 8-212 x 35/6 x 20	1287	1476	1569
Parameters of rope with cables diameter 22mm			
Min 14, 8-170 x 35/4 x 22	1138	1302	1387
Max 20, 5-212 x 35/6 x 22	1707	1953	2080
Parameters of rope with cables diameter 24mm			
Min 21, 5-197 x 35/6 x 24	2017	2242	2460

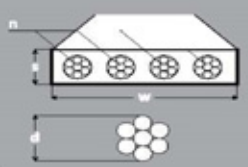
Other sizes available upon request.

SAG VS COMPETITOR

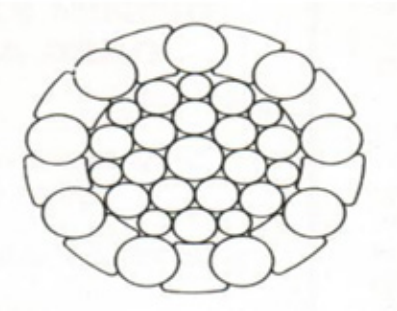
SAG M - w x s / n x d - Rr, where:

SAG – steel-rubber rope
M – nominal mass of 1 rope metre (kg/m)
w – rope width (mm)
s – rope thickness (mm)
n – number of vulcanized steel ropes inside SAG type rope
d – nominal diameter of steel ropes inside SAG type rope (mm)
R – wires strength (N/mm2)
$F_{e.c.min}$ – aggregate minimum summary breaking load of rope (kN)
A – metallic cross-section (mm2)
F_{min} – minimal breaking load of SAG rope (kN)

$$F_{min} = 0.82 \times F_{e.c.min}$$



Tolerances:
- M (-2%, +2.5%)
- w (+/- 5%)
- s (+/- 5%)



Half Locked Coil Guide Rope

Features:

- Smooth Outer Surface Minimizes Vibration and Conveyance Slipper Wear
- Customized to Particular Use
- Low Residual Torque
- Different Number of Outer Wires Depending on Diameter
- Available in Various Grade Options

NOMINAL DIAMETER		NUMBER OF PAIRS X-R	WIRE DIAMETER (MM)	NOMINAL WEIGHT		MINIMUM BREAKING STRENGTH	
mm	in			kg/m	lb/ft	Force (kN)	Load (lbs)
29	1-1/8	7	6.5	4.85	3.26	575	129,200
32	1-1/4	7	8	5.90	3.96	726	163,200
35	1-3/8	7	8	6.96	4.68	892	200,500
38	1-1/2	7	8	8.50	5.71	1100	247,200
42	1-5/8	8	8	9.92	6.67	1345	302,300
45	1-3/4	9	8	11.34	7.62	1640	368,600
48	1-7/8	10	8	13.12	8.82	1835	412,500
51	2	11	8	14.60	9.81	2050	460,800
54	2-1/8	12	8	16.00	10.75	2260	508,000

Wire Finishes

- Bright
- Galvanized

For other diameters, weights, or strength requirements, please contact us.

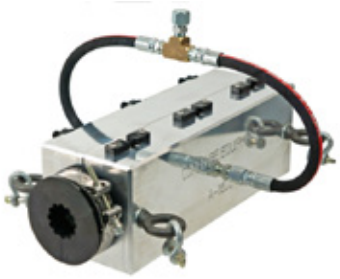
Other designs available upon request.

Wire rope lubricant, attachments and Liners

Wire rope lubrication

Lubrication of wire rope is important. It is required during manufacturing, installation, and ongoing maintenance. Different hoists and applications require different types of lubrication. With Northern Strands' knowledge of wire rope, we can recommend and supply appropriate lubrication products and suggest the best lubrication methods.

Northern Strands is the North American Distributor for CoreLube wire rope lubrication equipment and cleaners.



A Full Range of Wire Rope Attachments

Northern Strands offers a full range of attachments for all mining ropes, as well as a comprehensive inventory of installation equipment for purchase or rental, along with installation crews. All attachments are designed and engineered to national coal board standards, as well as government regulations. Northern Strands attachments are manufactured to a high-quality standard, governed by ISO 9001. All are wet mag particle tested, ultrasonic tested (UT) and proof loaded, and come with certified welder (c/w) test certificates. The major advantage of manufacturing in-house is that the company can control costs and delivery.

Hoist Drum Liners

Northern Strands is an international supplier of Becorit liners. The Becorit hoist drum liners guarantee a very high friction coefficient, excellent abrasion resistance and a high permissible surface pressure. The Becorit liners can be made to suit any drum or sheave, and recommendations will be made for the right material for your specific job.

Contact us or visit our website to learn more about Northern Strands wire rope lubricants, attachments and hoist drum liners.

NORTHERN STRANDS

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