ArcelorMittal ROPES

ENGINEERING EXCELLENCE

ArcelorMittal

High performance **Hoisting Ropes** for the most demanding environments

HOISTING ROPES

Contents

ArcelorMittal ROPES

ENGINEERING EXCELLENCE

Productivity depends on efficiencies

ArcelorMittal ROPES is part of the ArcelorMittal Group – one of the largest steel producers in the world and the manufacturer of premium quality steel wire ropes for the hoisting, mining, ropeway and mooring sectors.

Recognised worldwide for the quality of its corrosion resistant products, ArcelorMittal manufactures and supplies some of the most technologically advanced steel wire ropes in the world.

Designed, developed and manufactured for strength, flexibility and endurance, ArcelorMittal ROPES delivers lasting value and safety for the most demanding environments.

ArcelorMittal ROPES will be recognised as the steel wire ropes service provider of choice across the hoisting, mining, ropeway and mooring markets.

Our 4 core markets are:

HOISTING ROPES

MINING ROPES

ROPEWAY ROPES

MOORING ROPES

ArcelorMittal

"Our vertically integrated business model enables us to efficiently track and trace the origins of the materials we use, improving quality controls and reducing costs"

Morten Breddam
Business Line Manager, ArcelorMittal ROPES

Vertical integration. Unparalleled value.

Our mining, steel production, wire rod handling, wire drawing and rope manufacture is all undertaken by ArcelorMittal.

Our fully integrated business model gives us complete control over the quality of our raw materials and the highest levels of confidence in our production methods and processes, saving us time and resources.

This, combined with our world class technical expertise, provides our customers with unparalleled value.

New levels of performance

Operating for all ArcelorMittal group units, ArcelorMittal ROPES benefits from the Group's worldwide research and development resources.

Research and development are the cornerstone of sustainable development and innovation and this ensures the continuous renewal of our product offer. Worldwide we have 1400 full time researchers and 13 research centres.

Working together with customers to optimise solutions

With increased focus on new product development, innovation and optimisation, our production and quality control teams work with our customers to deliver high performance solutions that meet their requirements. ArcelorMittal ROPES is your strategic partner. We offer much more than high quality, competitively priced steel wire ropes. Our purpose is to work with our customers to fulfil their technical requirements, quickly, safely and efficiently. Your success is our success.

ArcelorMittal ROPES
ENGINEERING EXCELLENCE

"We exist to manufacture steel wire ropes that exceed the expectations of our worldwide customer base."

Lorenzo Lasagna
Senior Sales Manager, ArcelorMittal ROPES

The Eiffel Tower is named after the engineer Gustave Eiffel. Constructed from 1887 to 1889 as the entrance to the 1889 World's Fair, it was never intended to be a permanent structure.

The Eiffel Tower has become a global icon of Paris, and one of the most recognisable structures in the world.

More than 7 million people visit the tower each year.

The Eiffel Tower has used our ropes for more than 20 years.

ArcelorMittal

Unrivalled technical experience

Established in 1906, our manufacturing capability is backed up by over 100 years experience, providing our customers with a complete manufacturing solution that creates optimum value.

We exist to manufacture steel wire ropes that exceed the expectations of our worldwide customer base.

Engineering Excellence is what ArcelorMittal ROPES stands for. Our commitment to quality and the highest product performance standards is based on our process of continuous improvement.

ArcelorMittal ROPES runs an internal DNV-Certified Quality Assurance System complying with the requirements of ISO 9001.

Our continuous improvement process means that we are certified ISO 45001 for safety management. Thanks to this commitment, our production plant can implement an optimised process control environment, creating world-class steel wire rope products.

Full traceability every step of the way

Improving quality and adding value.

Our vertically integrated business model enables us to efficiently track and trace the origins of the materials we use, improving quality controls and reducing costs.

From the sourcing of raw materials to the manufacture of our wire rod, and from the drawing of our steel wire to the manufacture of our ropes, we guarantee full traceability every step of the way.

ArcelorMittal ROPES
ENGINEERING EXCELLENCE

Helping our customers to exceed

Located in Bourg-en-Bresse, France, our specialist teams, comprising of more than 300 people, continue to build on our international reputation for engineering the highest quality wire ropes.

More than just a steel wire ropes company, our purpose is to help our customers deliver their projects quickly, safely and efficiently. We achieve this by working with our customers to identify, develop and deliver optimum solutions.

Why choose ArcelorMittal ROPES?

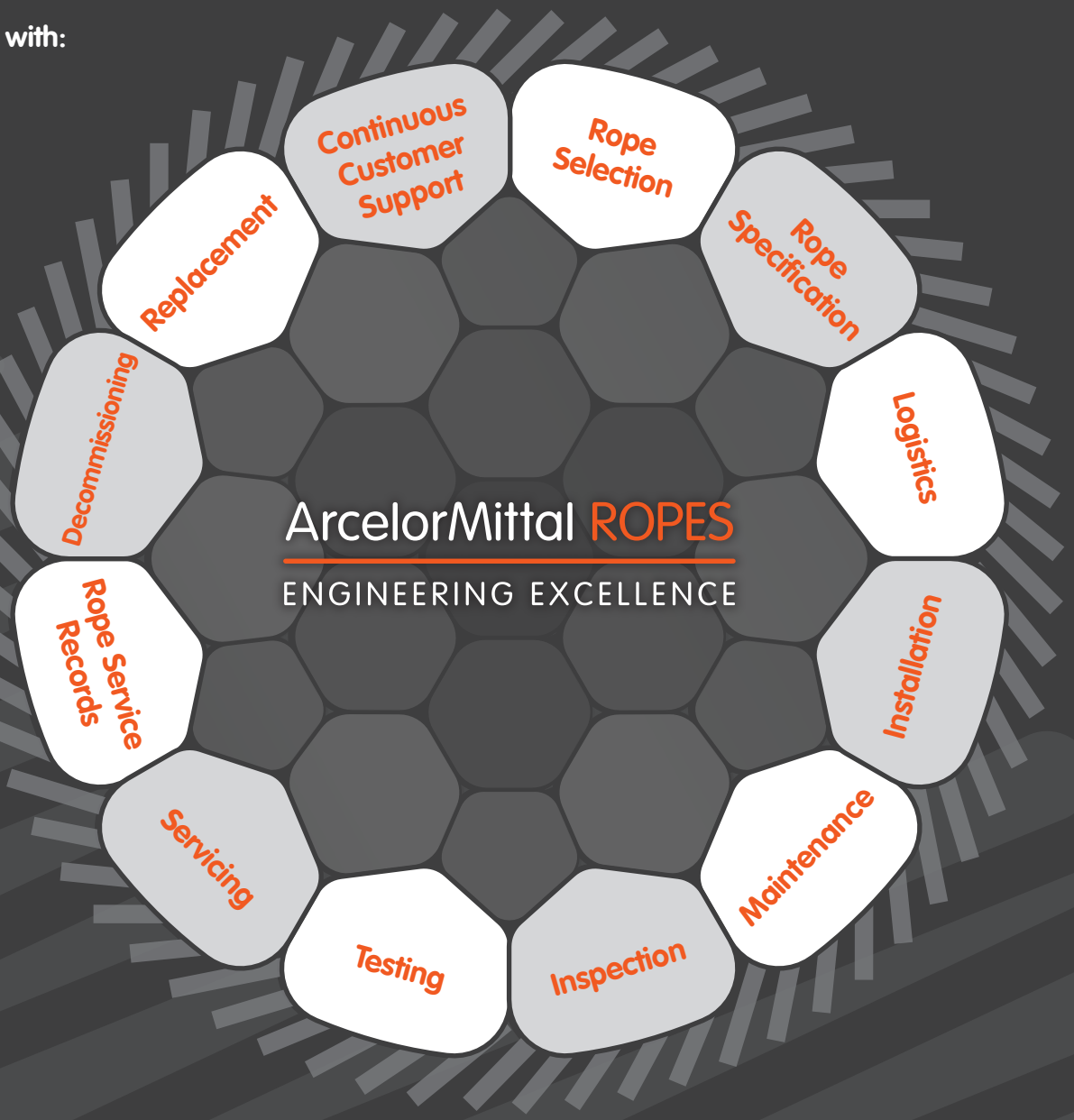
- Engineering Excellence
- Innovation
- Continuous investment in product innovation and development
- Comprehensive solutions
- Established for more than 100 years
- Delivering all around the world
- Vertically integrated business model
- Full materials traceability
- Your expert strategic partner
- Ongoing customer support

ArcelorMittal

Technical expertise and support for the longterm

ArcelorMittal ROPES provides a comprehensive support network for new and existing customers.

We can help you with:



Improving the effects of our activities on the environment

We recognise the importance for sustainable development and we continually aim to improve the environmental effect of our activities.

To help achieve our aims we:

- Meet, and wherever possible, improve upon relevant legislative, regulatory and environmental codes of practice.
- Develop objectives that target environmental improvements.
- Consider environmental issues in our decision-making processes.
- Develop our relationships with suppliers and contractors so that we all understand and recognise our environmental responsibilities.
- Educate employees so that they can carry out their activities in an environmentally responsible manner.
- Promote our environmental performance and achievements amongst customers, employees, suppliers, contractors and the public.

We make sure that we use resources efficiently by:

- Advising staff on how best to use energy and other utilities.
- Promoting waste minimisation, recycling and the creation of by-products.
- Promoting the efficient use of resources, energy and fuel throughout our manufacturing, processing, sales and distribution operations.

We are active participants who co-operate with:

- The communities in which we operate.
- The government, regulatory bodies and other interested parties who share our vision of being a responsible and trusted neighbour.

Wire Rope Properties

Every demanding situation requires a rope with particular performance characteristics. These requirements are determined by the physical environment and the level and type of usage.

Each of our wire ropes is engineered to perform safely, efficiently and for a very long time, whatever the conditions. We pride ourselves on manufacturing the highest quality steel wire ropes for all applications.

Using the latest technological processes and materials, we manufacture ropes to suit your individual requirements.

ArcelorMittal

Our commitment to health, safety and wellbeing

"Everyone has the right to good health and safety. Equally, everyone has the responsibility to make this happen at home and at work. Leaders, machinery operators, office workers, contractors – we all need to believe that Journey to Zero is achievable and to feel responsible for health and safety".

Lakshmi Mittal
Chairman and CEO, ArcelorMittal

The health, safety and wellbeing of all our employees and contractors is at the core of our commitment to produce high performance ropes.

Journey to Zero is the name of ArcelorMittal's ongoing campaign to work vigorously towards a sustainable goal of zero accidents and injuries.

We work every day in dangerous conditions, where accidents are always possible. With our Journey to Zero campaign to reduce workplace accidents, injuries and occupational health problems to zero, we have set ourselves the challenge of becoming the safest steel wire ropes manufacturer in the world.

Lubrication

Extends the life and increases rope performance.

Bending Fatigue Resistance

Ropes designed to cope with bending repeatedly under stress.

Plastic Impregnation

Thermoplastic sealing of inner core reducing friction.

Compaction

Smoother outer surface with increased strength and reduced wear.

Rotation Resistance

Resistance to spin and rotation whilst under load.

High Breaking Resistance

Ropes featuring a high breaking force.

Resistance to Crushing

Ropes designed to withstand or resist external forces.

ArcelorMittal ROPES
ENGINEERING EXCELLENCE

Rope Application Guide

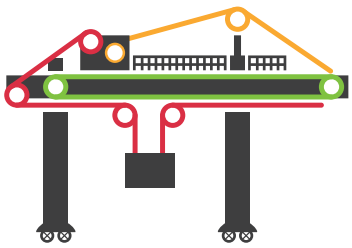
Which rope, which application?

Our steel wire ropes are widely used in lifting, lowering and hoisting applications.

When selecting a rope, several factors must be considered such as your requirements for strength, fatigue and abrasion resistance, crushing resistance, resistance to rotation and the operating conditions and physical environment. The kind of machinery you are using is, of course, a key consideration.

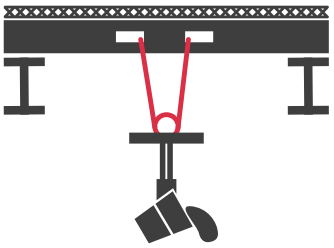
All our wire ropes have been engineered with safety, strength and longevity in mind. Using the right rope for your application will maximise operational performance and enhance productivity.

Container Crane



Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist	●	●	●			
Trolley	●	●	●			
Boom Luffing		●	●	●		
	PAGE 16	PAGE 22	PAGE 28	PAGE 34		

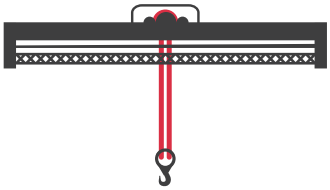
Steel / Paper Crane



Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist	●	●	●			
Intensive Hoist		●	●			
	PAGE 16	PAGE 22	PAGE 28			

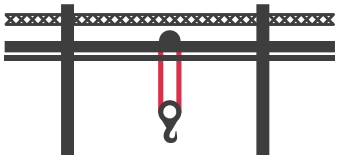
Overhead Crane

⊗ Plastic Impregnated only



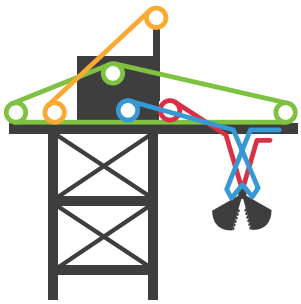
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
High Rise Hoist					⊗	⊗
Hoist	●	●	●			
	PAGE 16	PAGE 22	PAGE 28		PAGE 40	PAGE 46

Gantry Crane



Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist	●	●	●			
	PAGE 16	PAGE 22	PAGE 28			

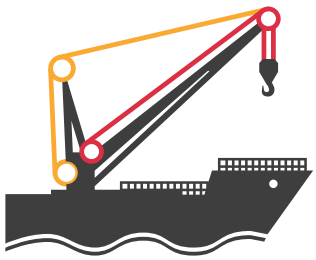
Mineral Crane



Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist		●	●			
Trolley	●	●				
Boom Luffing		●	●	●		
Grab		●	●			
	PAGE 16	PAGE 22	PAGE 28	PAGE 34		

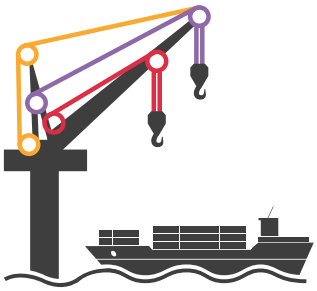
Which rope?
Which application? - Continued

Deck Cargo Crane



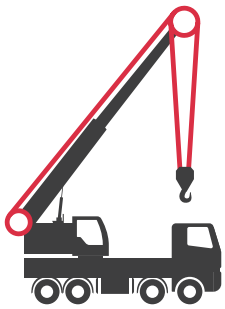
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Boom Luffing		●	●	●		
		PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Offshore Crane



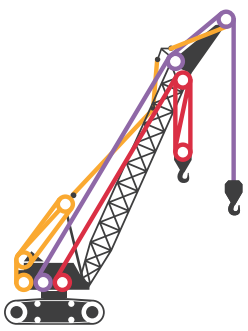
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Boom Luffing		●	●	●		
Auxiliary Hoist					●	●
		PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Mobile Crane



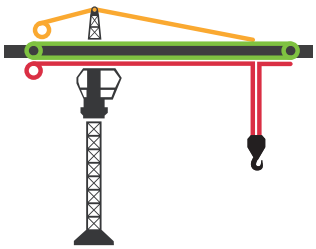
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
					PAGE 40	PAGE 46

Lattice Boom / Crawler Crane



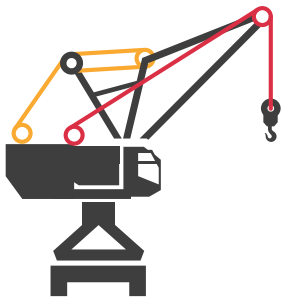
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Boom Luffing		●	●	●		
Auxiliary Hoist					●	●
		PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Tower / Tower Luffing Crane



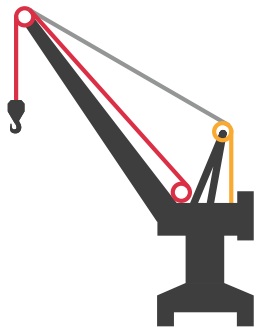
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Trolley	●	●	●			
Boom Luffing		●	●	●		
	PAGE 16	PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Harbour Crane



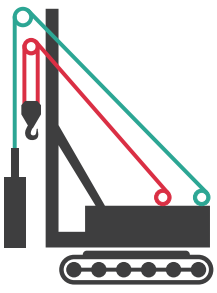
Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Boom Luffing		●	●	●		
		PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Boom Luffing Crane



Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Boom Luffing		●	●	●		
		PAGE 22	PAGE 28	PAGE 34	PAGE 40	PAGE 46

Drilling / Piling

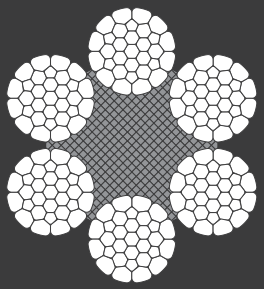


Rope Application	HDHP6	HP8P	Complast 9	Integral 8	NRHD 24 NRHD 24 C	Notor HP Notor HP Plast
Main Hoist (non rot.)					●	●
Pipe Handling	●	●				
	PAGE 16	PAGE 22			PAGE 40	PAGE 46

HDHP 6

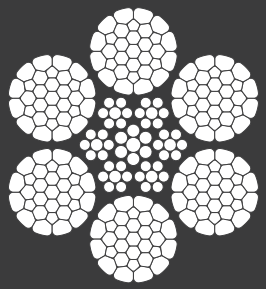
6 outer strands, steel or fibre core

A light use, regular or lang lay rope with 6 outer strands over a steel or fibre core. HDHP 6 can be used for applications such as pendant ropes, electric hoists, cranes, trolley ropes and drilling.



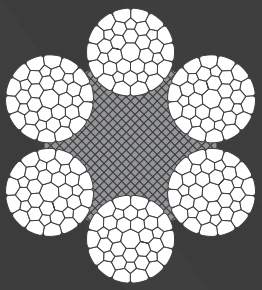
HDHP 6/6xK31WS

p.18



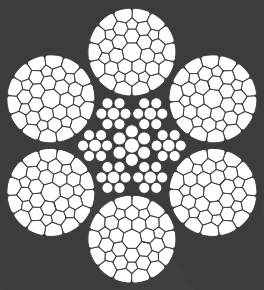
HDHP 6/6xK31WS

p.19



HDHP 6/6xK36WS

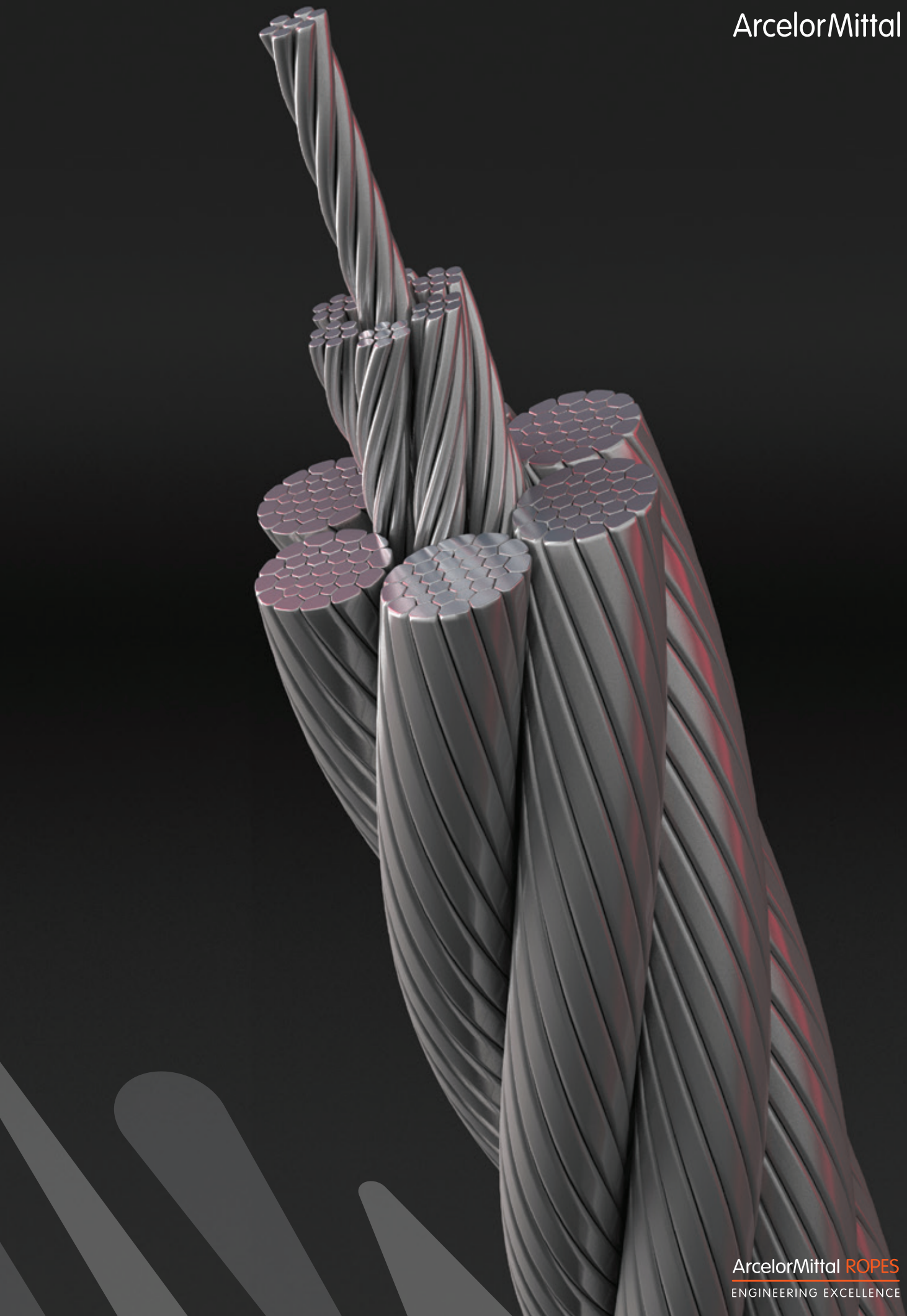
p.20



HDHP 6/6xK36WS

p.21

ArcelorMittal



ArcelorMittal ROPES

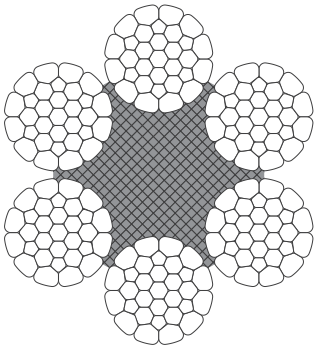
ENGINEERING EXCELLENCE

ArcelorMittal

HDHP 6/6xK31WS

6 outer strands with fibre core

HDHP 6/6xK31WS is a light use, regular lay rope with 6 outer strands over a fibre core. HDHP 6 can be used for applications such as pendant ropes, electric hoists, cranes, trolley ropes and drilling.



Features:

- 6 outer strands on a fibre core
- Bright or galvanised steel wires

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

Regular Lay Rope

HDHP 6/6xK31WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm^2	kg/m	kN
				2160 MPa
10	-	46.3	0.41	87.5
11	7/16	56.1	0.50	106
12	-	66.7	0.60	127
13	1/2	78.3	0.70	149.5
14	9/16	90.8	0.82	174
16	5/8	118.6	1.03	219
18	-	150.1	1.34	287
19	-	167.3	1.48	316
20	-	185.4	1.62	346
22	7/8	224.3	1.99	425
24	-	266.9	2.38	503
25	-	289.6	2.60	547
26	1	313.2	2.78	586
28	1-1/8	363.3	3.26	680

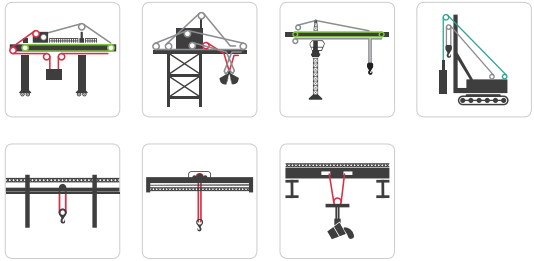
Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	**k** - Spinning Loss Factor
0.590	0.875

Indicative values - Tolerance on diameter: ArcelorMittal design (0, +4%)

Applications



KEY

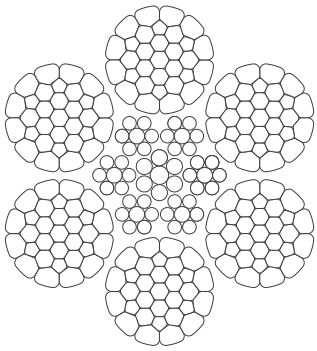
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

HDHP 6/6xK31WS

6 outer strands with steel core

HDHP 6/6xK31WS is a light use, regular lay rope with 6 outer strands over a steel core. HDHP 6 can be used for applications such as pendant ropes, electric hoists, cranes, trolley ropes and drilling.



HDHP 6/6xK31WS/2018/v1.0

Features:

- 6 outer strands on a steel core
- Bright or galvanised steel wires

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
10	-	51.6	0.47	91
11	7/16	62.5	0.56	110.8
12	-	74.4	0.67	130.8
13	1/2	87.3	0.79	154
14	9/16	101.2	0.91	179
15	-	116.2	1.05	205
16	5/8	132.2	1.19	233
17	-	145.7	1.27	255
18	-	163.3	1.43	296.2
19	-	166.9	1.44	329
20	-	168.2	1.45	375
22	7/8	203.5	1.74	454
24	-	305.8	2.67	533
25	-	331.8	2.90	579
26	1	358.9	3.13	626
28	1-1/8	416.2	3.63	726

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	k - Spinning Loss Factor
0.661	0.816

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

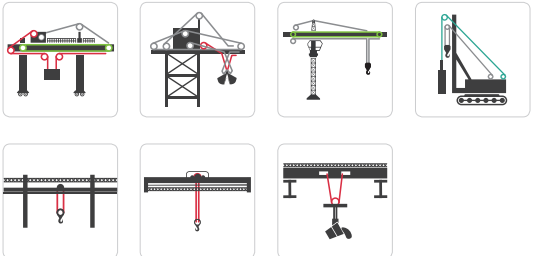
Lubrication

Compaction

Resistance to Crushing

Regular Lay Rope

Applications



KEY

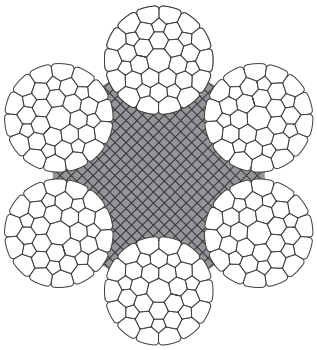
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

HDHP 6/6xK36WS

6 outer strands with fibre core

HDHP 6/6xK36WS is a light use, regular lay rope with 6 outer strands over a fibre core. HDHP 6 can be used for applications such as pendant ropes, electric hoists, cranes, trolley ropes and drilling.



Features:

- 6 outer strands on a fibre core
- Bright or galvanised steel wires

HDHP 6/6xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
32	1-1/4	474.5	4.22	883
34	1-3/8	535.7	4.87	1015
36	-	600.5	5.44	1130
38	1-1/2	669.1	6.02	1245
40	-	741.4	6.71	1388
42	1-5/8	817.4	7.26	1502

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	k - Spinning Loss Factor
0.590	0.865

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

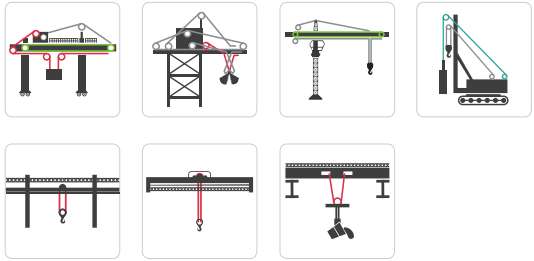
Lubrication

Compaction

Resistance to Crushing

Regular Lay Rope

Applications



KEY

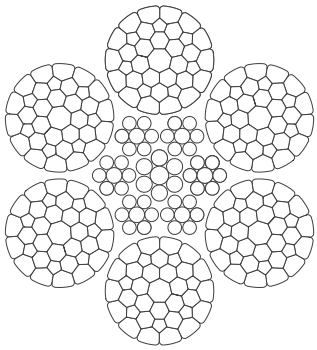
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

HDHP 6/6xK36WS

6 outer strands with steel core

HDHP 6/6xK36WS is a light use, regular lay rope with 6 outer strands over a steel core. HDHP 6 can be used for applications such as pendant ropes, electric hoists, cranes, trolley ropes and drilling.



Features:

- 6 outer strands on a steel core
- Bright or galvanised steel wires

HDHP 6/6xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
30	-	472.0	4.12	820
32	1-1/4	537.0	4.69	936
34	1-3/8	599.4	5.23	1037
36	-	671.9	5.86	1163
38	1-1/2	753.9	6.57	1302
40	-	841.1	7.34	1450
42	1-5/8	927.3	8.09	1598
44	1-3/4	1017.7	8.88	1754
46	-	1112.1	9.71	1804
48	1-7/8	1210.9	10.58	1964
50	2	1313.9	11.48	2131
52	-	1412.1	12.33	2266
54	-	1522.8	13.29	2443
56	-	1631.2	14.23	2617
58	-	1742.8	15.20	2796
60	-	1861.6	16.24	2994
62	-	1984.0	17.31	3198

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	k - Spinning Loss Factor
0.665	0.800

Properties

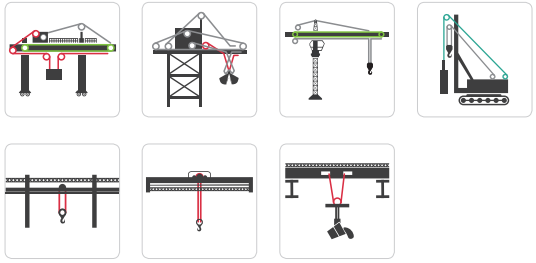
We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

Lubrication | Compaction | Resistance to Crushing

Regular Lay Rope

Applications



KEY

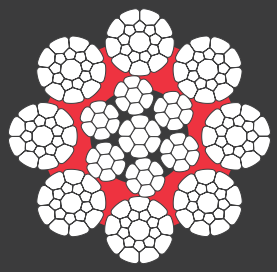
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

HP8P

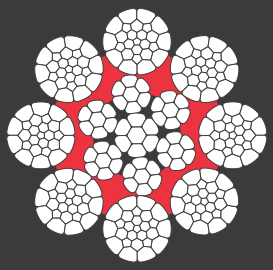
8 outer strands, plastic impregnation

Ideal for travelling and overhead cranes for steel or paper mill cranes, casting cranes, harbour container cranes, mineral gantry cranes, boom hoists and electric hoists.



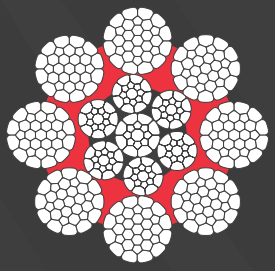
HP8P/8xK19S

p.24



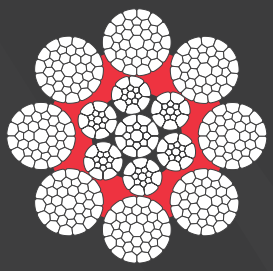
HP8P/8xK26WS

p.25



HP8P/8xK31WS

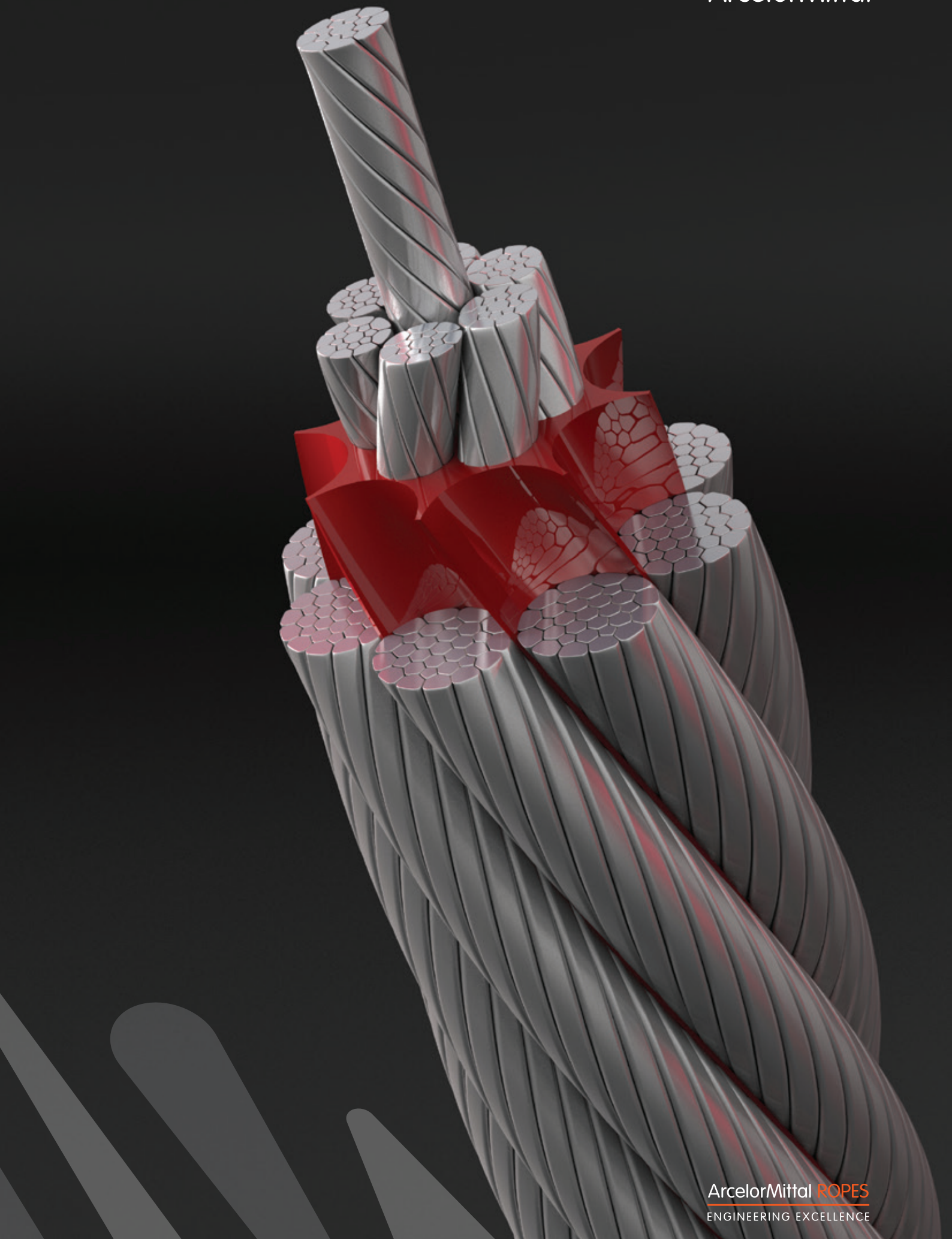
p.26



HP8P/8xK36WS

p.27

ArcelorMittal



ArcelorMittal ROPES

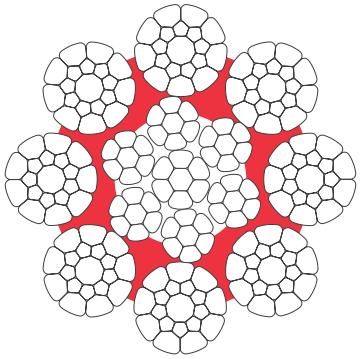
ENGINEERING EXCELLENCE

ArcelorMittal

HP8P/8xK19S

8 outer strands, plastic impregnation

HP8P/8xK19S has 8 outer strands with plastic impregnation. HP8P is for guided systems only and can be used for heavy duty applications including steel or paper mill cranes, casting cranes, harbour container cranes and mineral gantry cranes. HP8P can be used for twin hoist systems with one right hand lay and one left hand lay rope.



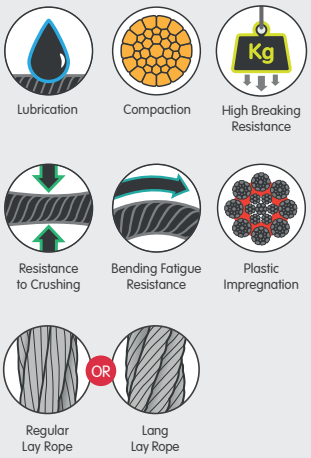
Features:

- 8 outer strands
- Plastic impregnation of the core between outer strands improving the rope behaviour in case of heavy duty applications (fleet angles, repetitive lifting cycles)
- Bright or galvanised steel wires

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



HP8P/8xK19S/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
6.5	-	23.5	0.20	-	41.8
7	-	27.3	0.24	-	48.5
7.2	-	28.9	0.26	-	51.6
8	5/16	35.8	0.32	-	65.6
9	-	45.6	0.41	-	83.5
10	-	56.9	0.51	-	104
11	7/16	69.9	0.63	-	128
12	-	82.0	0.73	-	150.5
13	1/2	95.8	0.86	-	175.5
14	9/16	110.4	0.99	-	202
15	-	127.5	1.14	-	233.4

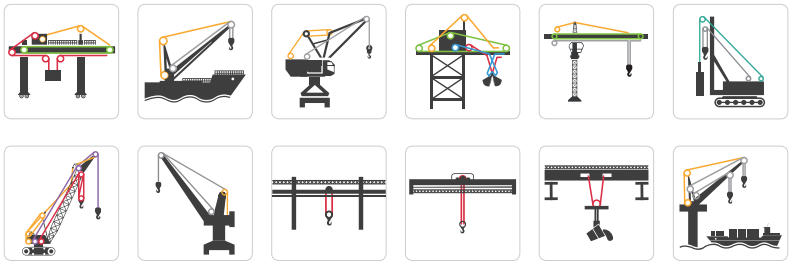
Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	k - Spinning Loss Factor	
0.720	-	0.845

Indicative values - Tolerance on diameter: ArcelorMittal design (0, +5%)

Applications



KEY

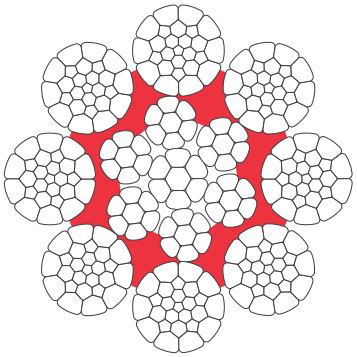
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

HP8P/8xK26WS

8 outer strands, plastic impregnation

HP8P/8xK26WS has 8 outer strands with plastic impregnation, HP8P is for guided systems only and can be used for heavy duty applications including steel or paper mill cranes, casting cranes, harbour container cranes and mineral gantry cranes. HP8P can be used for twin hoist systems with one right hand lay and one left hand lay rope.



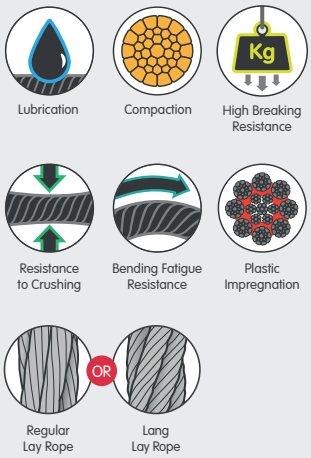
Features:

- 8 outer strands
- Plastic impregnation of the core between outer strands improving the rope behaviour in case of heavy duty applications (fleet angles, repetitive lifting cycles)
- Bright or galvanised steel wires

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Lubrication · Compaction · High Breaking Resistance

Resistance to Crushing · Bending Fatigue Resistance · Plastic Impregnation

Regular Lay Rope · Lang Lay Rope

HP8P/8xK26WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
16	5/8	140.1	1.26	231	245
18	-	177.3	1.59	292	310
19	3/4	197.5	1.77	326	345
20	-	218.9	1.96	361	382
22	7/8	264.8	2.37	437	463
23	-	291.2	2.60	481	503
24	-	317.1	2.83	523	548
25.4	1	355.2	3.17	586	614
26	-	372.1	3.32	614	643
27	-	401.3	3.58	655	685
28	1-1/8	420.8	3.72	705	737
29	-	451.4	3.99	756	790
30	-	483.1	4.27	809	846
32	1-1/4	549.6	4.86	920	962

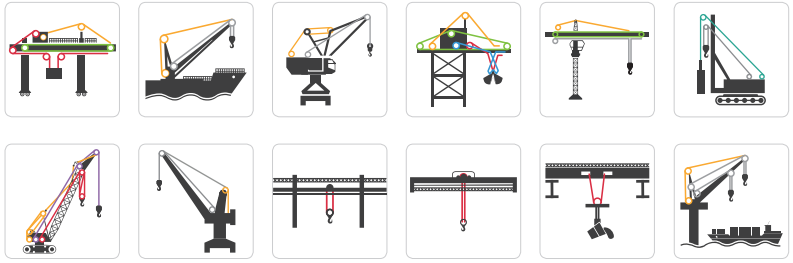
Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	k - Spinning Loss Factor	
0.695	0.845	0.810

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Applications



KEY

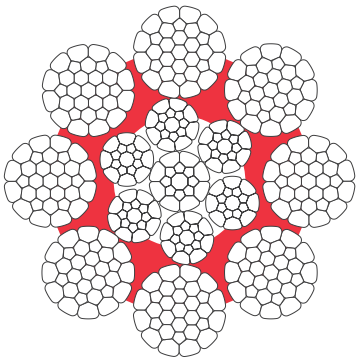
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

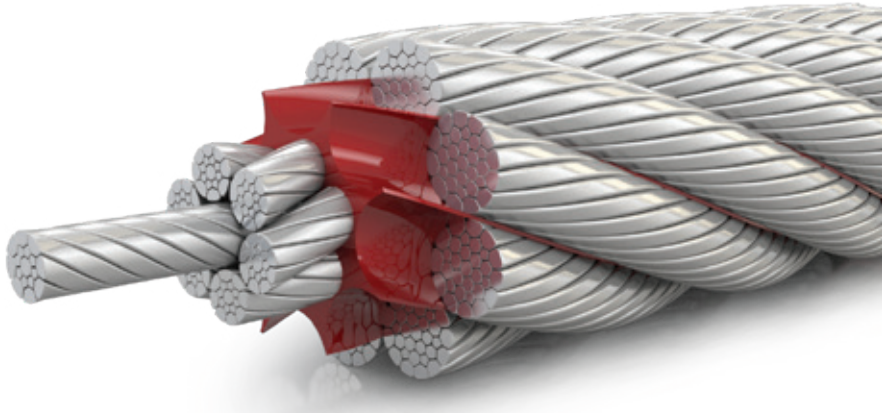
ArcelorMittal

HP8P/8xK31WS

8 outer strands, plastic impregnation

HP8P/8xK31WS has 8 outer strands with plastic impregnation, HP8P is for guided systems only and can be used for heavy duty applications including steel or paper mill cranes, casting cranes, harbour container cranes and mineral gantry cranes. HP8P can be used for twin hoist systems with one right hand lay and one left hand lay rope.





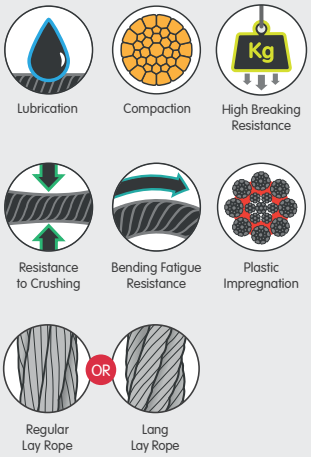
Features:

- 8 outer strands
- Plastic impregnation of the core between outer strands improving the rope behaviour in case of heavy duty applications (fleet angles, repetitive lifting cycles)
- Bright or galvanised steel wires

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



HP8P/8xK31WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
34	1-3/8	619.4	5.56	1030	1051
35	-	669.3	6.09	1091	1114
36	-	708.1	6.44	1161	1186
38	1-1/2	789.0	7.18	1294	1321
40	-	874.2	7.96	1434	1464
41.3	-	932.0	8.48	1529	1561
42	1-5/8	960.2	8.74	1578	1611
44	1-3/4	1053.8	9.60	1728	1765
44.5	-	1077.9	9.82	1768	1805
46	-	1151.8	10.49	1889	1929
48	1-7/8	1254.1	11.42	2057	2100
50	2	1342.3	12.15	2223	2269
51	-	1396.5	12.64	2303	2351
52	-	1451.8	13.14	2394	2444
54	2-1/8	1565.6	14.17	2582	-
56	-	1683.7	15.24	2776	-
58	2-1/4	1806.2	16.35	2978	-

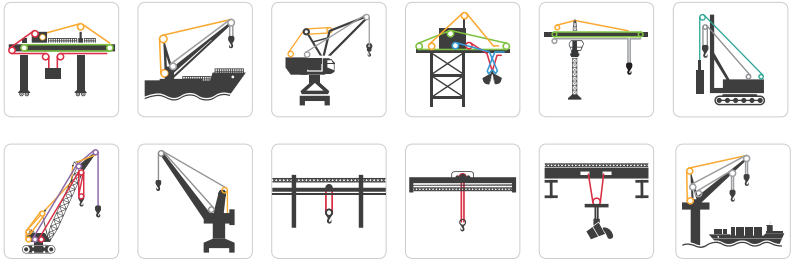
Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

f - Fill Factor	**k** - Spinning Loss Factor	
0.695	0.839	0.777

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Applications



KEY

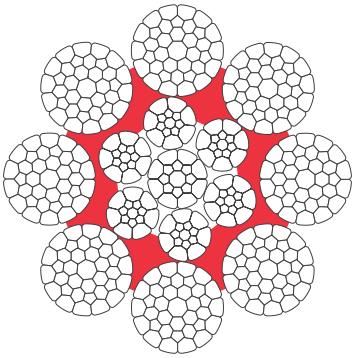
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

HP8P/8xK36WS

8 outer strands, plastic impregnation

HP8P/8xK36WS has 8 outer strands with plastic impregnation, HP8P is for guided systems only and can be used for heavy duty applications including steel or paper mill cranes, casting cranes, harbour container cranes and mineral gantry cranes. HP8P can be used for twin hoist systems with one right hand lay and one left hand lay rope.



Features:

- 8 outer strands
- Plastic impregnation of the core between outer strands improving the rope behaviour in case of heavy duty applications (fleet angles, repetitive lifting cycles)
- Bright or galvanised steel wires

HP8P/8xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				1960 MPa
60	2-3/8	1946.1	17.72	3192
62	-	2078.0	18.92	3408
64	-	2214.3	20.16	3632
65	-	2284.0	20.80	3746

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

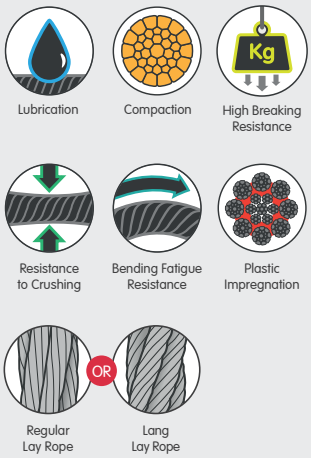
f - Fill Factor	**k** - Spinning Loss Factor
0.695	0.837

Indicative values - Tolerance on diameter: ArcelorMittal design (0;+4%)

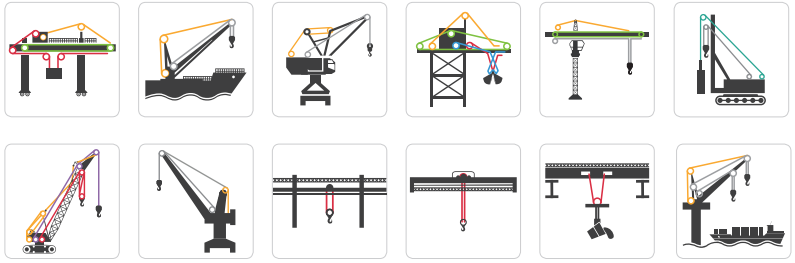
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



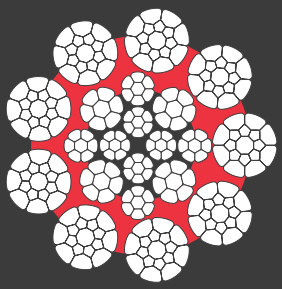
KEY

- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Complast 9

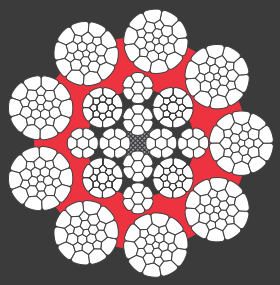
9 outer compacted strands, plastic impregnation

A high-performance rope with compacted strands and plastic impregnation for all heavy duty hoisting applications including mobile cranes, tower cranes, crawler cranes, offshore cranes, deck cranes, cargo cranes, foundation cranes and harbour cranes.



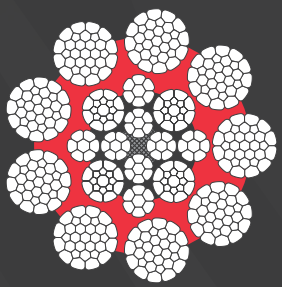
Complast 9/9xK17S

p.30



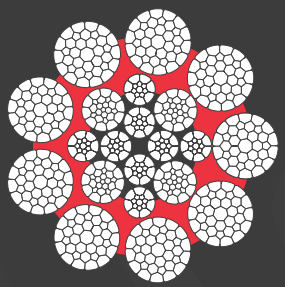
Complast 9/9xK26WS

p.31



Complast 9/9xK31WS

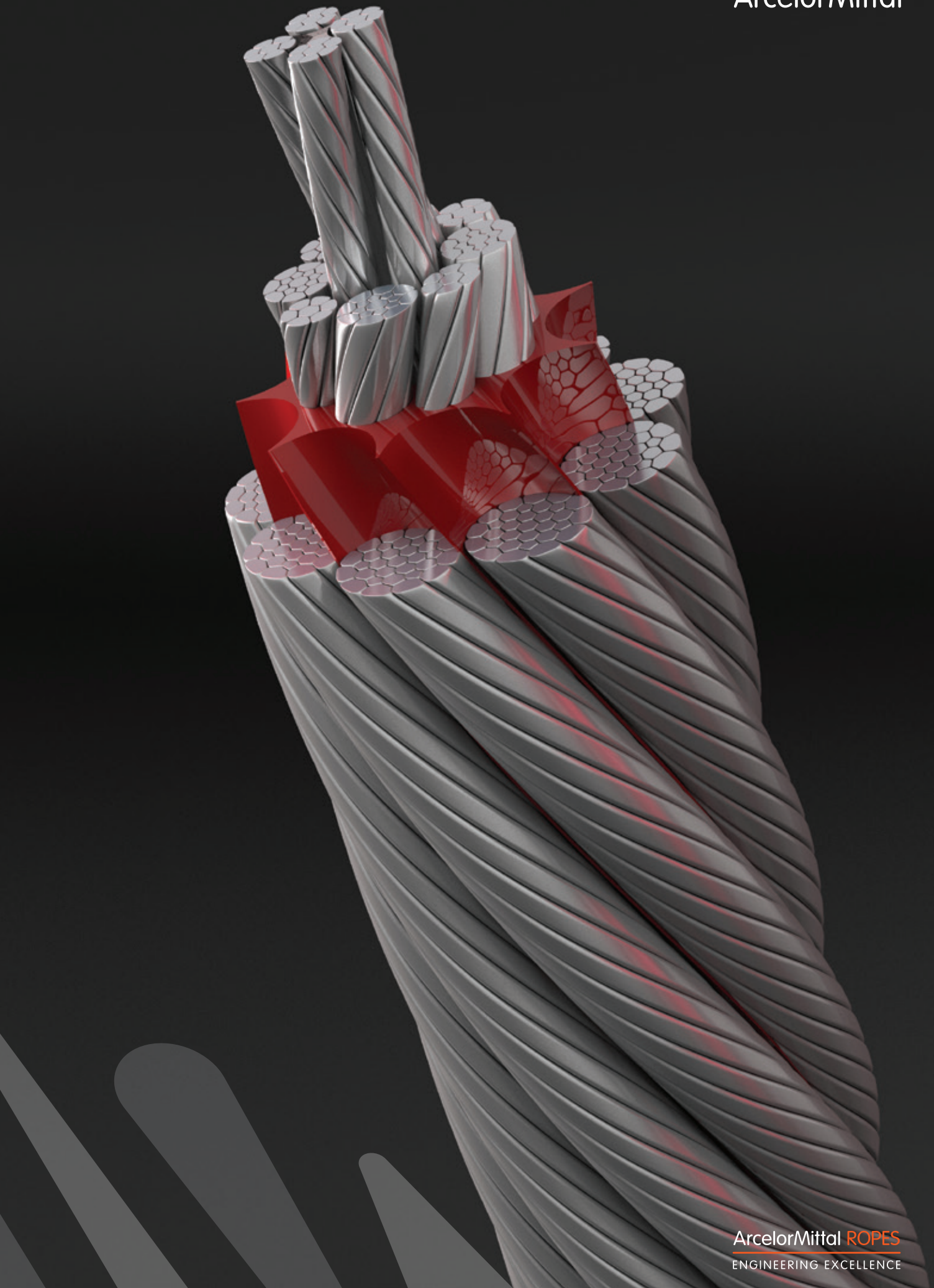
p.32



Complast 9/9xK36WS

p.33

ArcelorMittal



ArcelorMittal ROPES

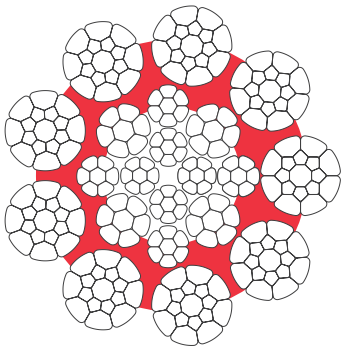
ENGINEERING EXCELLENCE

ArcelorMittal

Complast 9/9xK17S

9 outer compacted strands, plastic impregnation

Complast 9/9xK17S is a high-performance rope with compacted strands and plastic impregnation for all heavy duty hoisting applications including mobile cranes, tower cranes, crawler cranes, offshore cranes, deck cranes, cargo cranes, foundation cranes and harbour cranes.



Features:

- 9 outer strands, compacted strands
- Warrington core
- Drawn galvanised steel wires
- High cross-sectional metallic area

Complast 9/9xK17S/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
16	5/8	135.4	1.20	219	239
18	-	171.7	1.54	277	302
19	3/4	191.4	1.72	308	336

f - Fill Factor	**k** - Spinning Loss Factor	
0.675	0.830	0.815

Please note: Other diameters with other tolerances than those shown here can be made on studies.

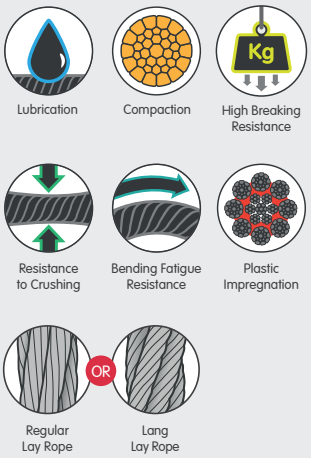
⚠ **Never use with swivel**

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

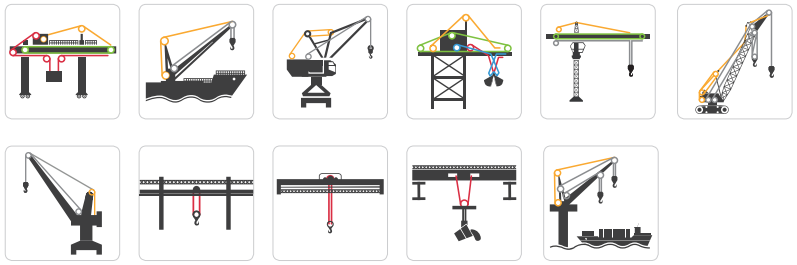


Lubrication · Compaction · High Breaking Resistance

Resistance to Crushing · Bending Fatigue Resistance · Plastic Impregnation

Regular Lay Rope · Lang Lay Rope

Applications



KEY

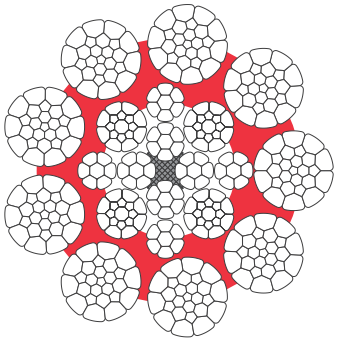
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Complast 9/9xK26WS

9 outer compacted strands, plastic impregnation

Complast 9/9xK26WS is a high-performance rope with compacted strands and plastic impregnation for all heavy duty hoisting applications including mobile cranes, tower cranes, crawler cranes, offshore cranes, deck cranes, cargo cranes, foundation cranes and harbour cranes.



Features:

- 9 outer strands, compacted strands
- Warrington core
- Drawn galvanised steel wires
- High cross-sectional metallic area

Complast 9/9xK26WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
20	-	213.5	1.92	346	375
22	7/8	255.2	2.31	416	450
24	-	303.1	2.74	493	534
25	-	334.1	3.02	545	586
25.4	-	350.3	3.17	569	611
26	-	362.7	3.28	592	631
28	1-1/8	415.6	3.75	677	721
28.6	-	430.3	3.89	700	746
30	-	469.9	4.25	763	814
32	1-1/4	534.6	4.84	868	926

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

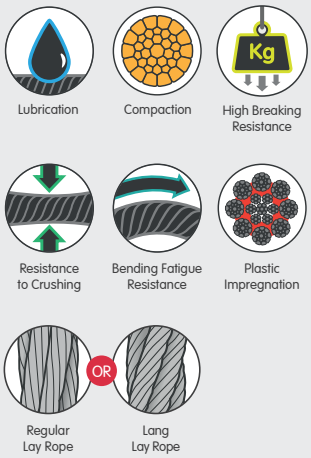
f - Fill Factor	**k** - Spinning Loss Factor	
0.675	0.830	0.815

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

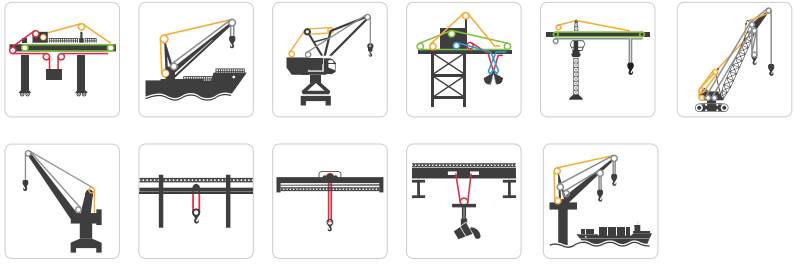
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

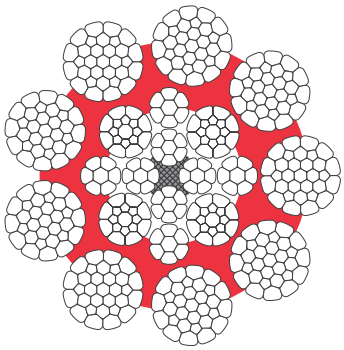
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

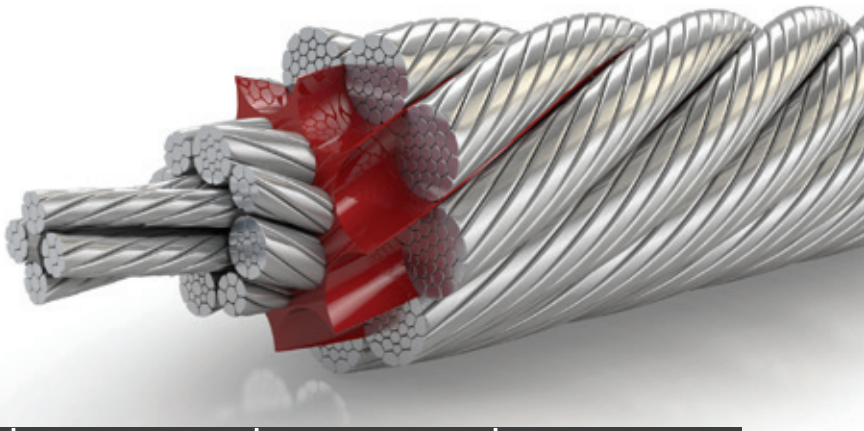
ArcelorMittal

Complast 9/9xK31WS

9 outer compacted strands, plastic impregnation

Complast 9/9xK31WS is a high-performance rope with compacted strands and plastic impregnation for all heavy duty hoisting applications including mobile cranes, tower cranes, crawler cranes, offshore cranes, deck cranes, cargo cranes, foundation cranes and harbour cranes.





Complast 9/9xK31WS/2018/v1.0

Features:

- 9 outer strands, compacted strands
- Warrington core
- Drawn galvanised steel wires
- High cross-sectional metallic area

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
34	1-3/8	617.5	5.56	1015	1075
35	-	652.9	5.88	1104	1155
36	-	689.2	6.21	1168	1222
38	1-1/2	763.9	6.90	1290	1362
40	-	857.6	7.76	1401	1487
41	-	918.4	8.24	1482	1558
42	-	953.8	8.73	1563	1631
44	-	1051.3	9.51	1716	1785
46	-	1142	10.31	1870	1945
48	-	1235.3	11.18	2030	2106
50	-	1343.2	12.17	2198	2272

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

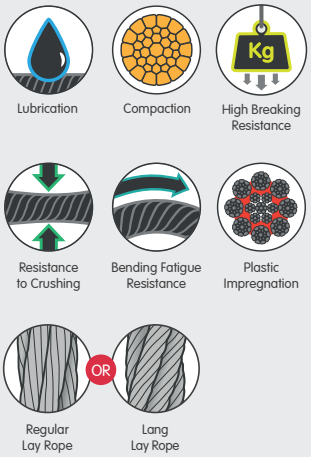
f - Fill Factor	k - Spinning Loss Factor	
0.675	0.830	0.815

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

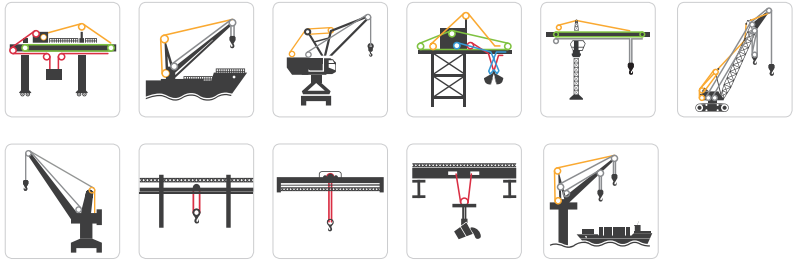
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

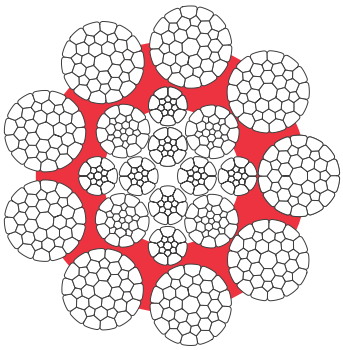
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Complast 9/9xK36WS

9 outer compacted strands, plastic impregnation

Complast 9/9xK36WS is a high-performance rope with compacted strands and plastic impregnation for all heavy duty hoisting applications including mobile cranes, tower cranes, crawler cranes, offshore cranes, deck cranes, cargo cranes, foundation cranes and harbour cranes.



Features:

- 9 outer strands, compacted strands
- Warrington core
- Drawn galvanised steel wires
- High cross-sectional metallic area

Complast 9/9xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
52	-	1443.4	12.99	2343	2405
54	-	1556.6	14.01	2527	2594
56	2-1/8	1674.0	15.07	2716	2789
58	-	1784.2	16.03	2934	3012
60	-	1914.6	17.24	3160	3244
62	2-3/8	2080.0	18.75	3402	3492
64	-	2186.4	19.98	3625	3721

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

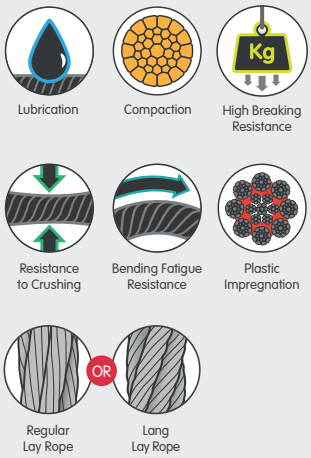
f - Fill Factor	k - Spinning Loss Factor	
0.675	0.830	0.790

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

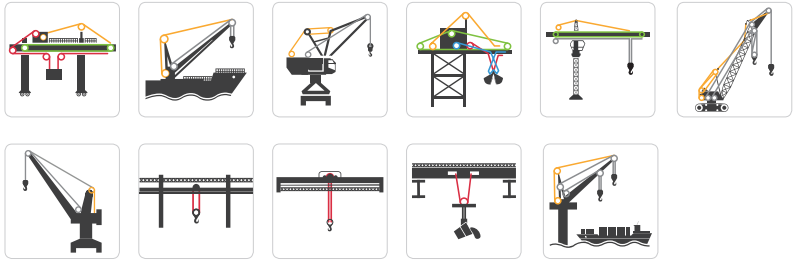
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



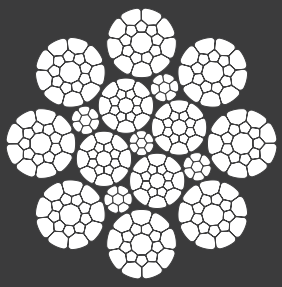
KEY

- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Integral 8

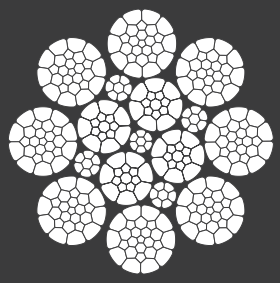
8 outer strands parallel closed rope

A parallel closed rope with 8 outer strands for applications where a very high breaking strength is required.



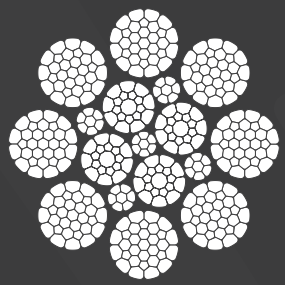
Integral 8/8xK19S

p.36



Integral 8/8xK26WS

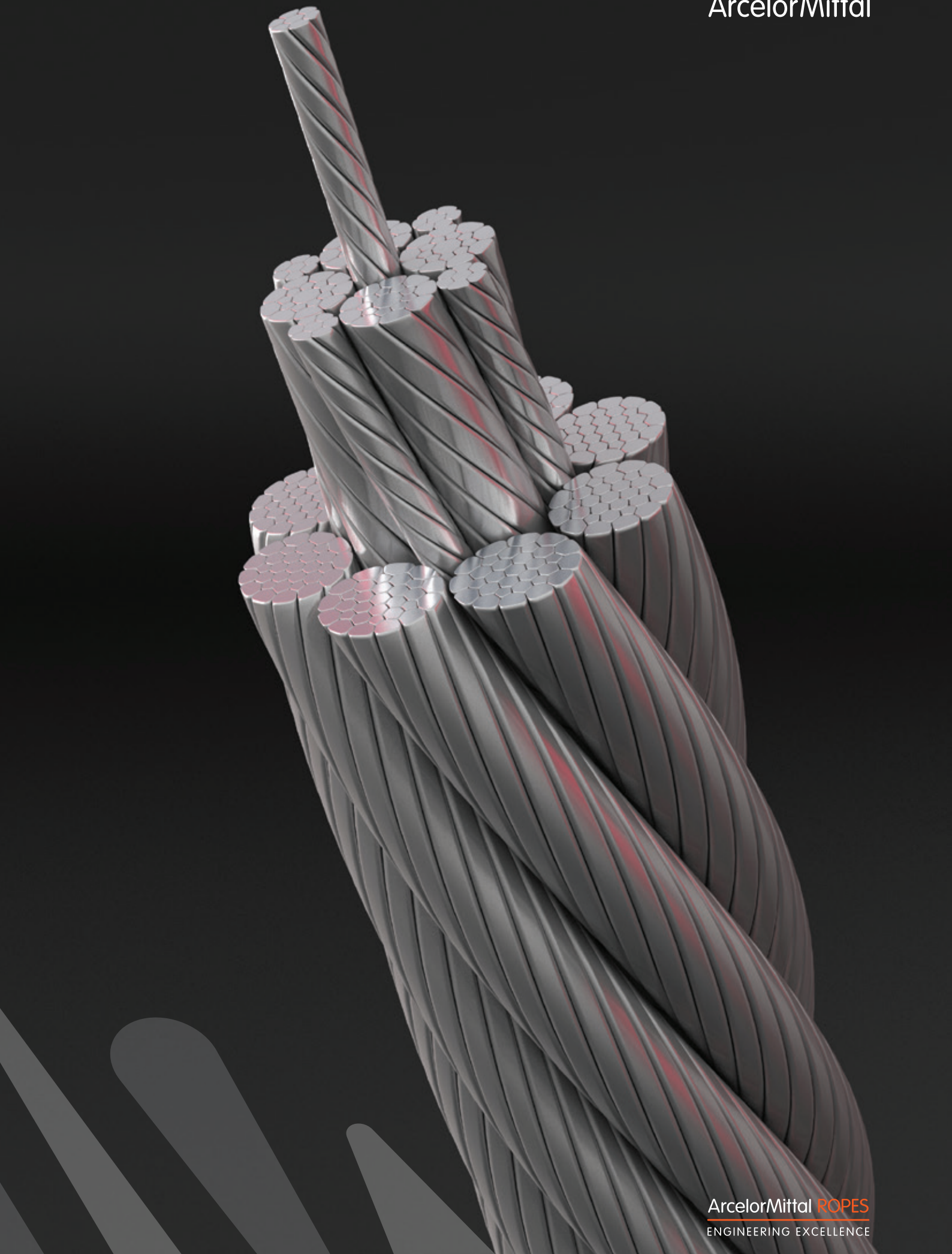
p.37



Integral 8/8xK31WS

p.38

ArcelorMittal



ArcelorMittal ROPES

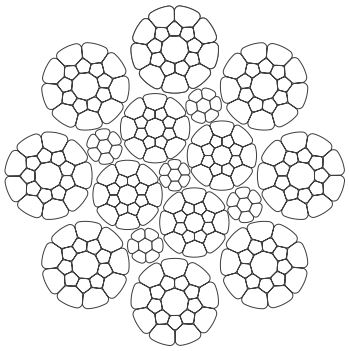
ENGINEERING EXCELLENCE

ArcelorMittal

Integral 8/8xK19S

8 outer strands parallel closed rope

Integral 8/8xK19S is a parallel closed rope with 8 outer strands for applications where a very high breaking strength is required.



Features:

- 8 outer strands, parallel closed rope
- Extremely high breaking load (high fill factor)
- Drawn galvanised steel wires 2160 N/mm²

- Due to its parallel closed geometry, this rope should only be used with both ends prevented from rotating and under a significant tension.

Integral 8/8xK19S/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
6.4	-	23.7	0.20	43
7	-	28.3	0.25	51
7.2	-	29.9	0.26	54
8	5.16	36.8	0.32	67
9	-	46.6	0.40	85
10	-	57.1	0.50	105
11	7/16	69.1	0.60	126.4
12	-	82.1	0.71	150
13	1/2	95.9	0.83	175
14	9/16	112.2	0.97	205
15	-	130.0	1.13	238.6

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

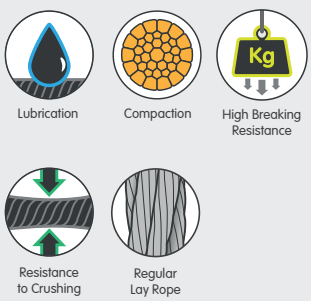
f - Fill Factor	k - Spinning Loss Factor
0.733	0.845

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

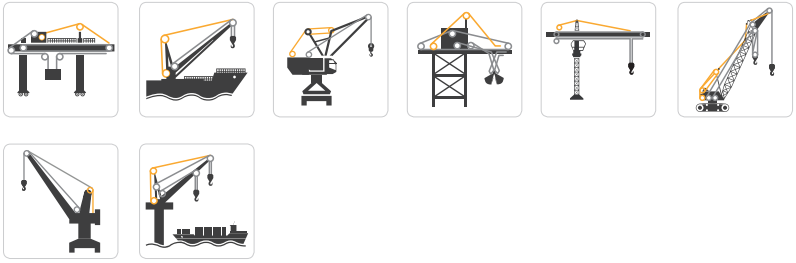
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

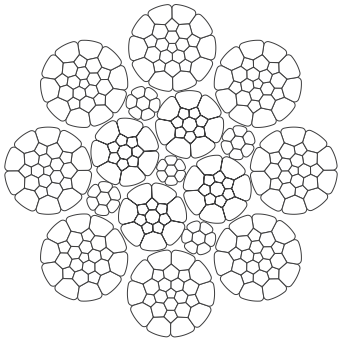
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Integral 8/8xK26WS

8 outer strands parallel closed rope

Integral 8/8xK26WS is a parallel closed rope with 8 outer strands for applications where a very high breaking strength is required.



Features:

- 8 outer strands, parallel closed rope
- Extremely high breaking load (high fill factor)
- Drawn galvanised steel wires 2160 N/mm²

- Due to its parallel closed geometry, this rope shall only be used with both ends prevented from rotating and under a significant tension.

Integral 8/8xK26WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
16	5/8	149.1	1.31	273
18	-	187.4	1.64	343
19	3/4	208.8	1.83	382
20	-	231.3	2.02	423
22	7/8	279.9	2.45	512
24	-	333.2	2.92	609
25	-	361.5	3.16	661
26	-	379.9	3.32	703
28	1-1/8	454.0	3.96	821
28.6	-	473.7	4.13	856

f - Fill Factor	**k** - Spinning Loss Factor
0.733	0.845

Please note: Other diameters with other tolerances than those shown here can be made on studies.

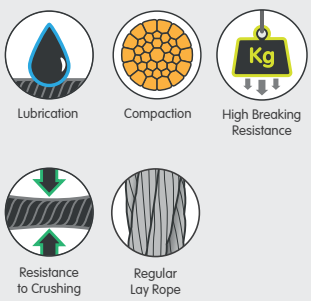
⚠ **Never use with swivel**

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

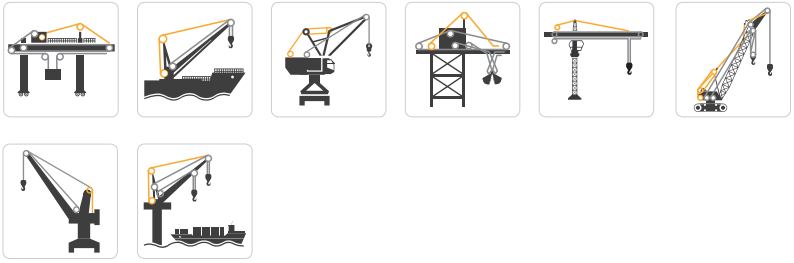
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

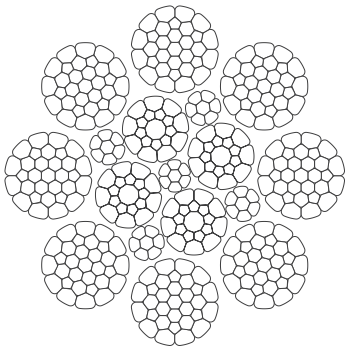
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Integral 8/8xK31WS

8 outer strands parallel closed rope

Integral 8/8xK31WS is a parallel closed rope with 8 outer strands for applications where a very high breaking strength is required.



Integral 8/8xK31WS/2018/v1.0

Features:

- 8 outer strands, parallel closed rope
- Extremely high breaking load (high fill factor)
- Drawn galvanised steel wires 2160 N/mm²

- Due to its parallel closed geometry, this rope shall only be used with both ends prevented from rotating and under a significant tension.

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
30	-	521.2	4.55	942
32	1-1/4	602.8	5.29	1086
34	1-3/8	680.5	5.97	1226
36	-	762.9	6.69	1375
38	1-1/2	842.2	7.38	1495
40	-	943.3	8.27	1658
42	1-5/8	1040.0	9.12	1828
44.5	-	1117.1	9.74	2003
46	-	1193.7	10.41	2140
48	1-7/8	1296.6	11.35	2309
50	2	1406.9	12.32	2505
50.8	-	1452.3	12.71	2586
52	-	1521.7	13.32	2710

Please note: Other diameters with other tolerances than those shown here can be made on studies.

⚠ **Never use with swivel**

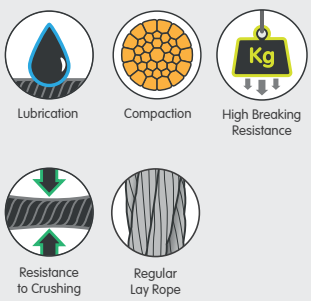
f - Fill Factor	k - Spinning Loss Factor
0.733	0.830

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

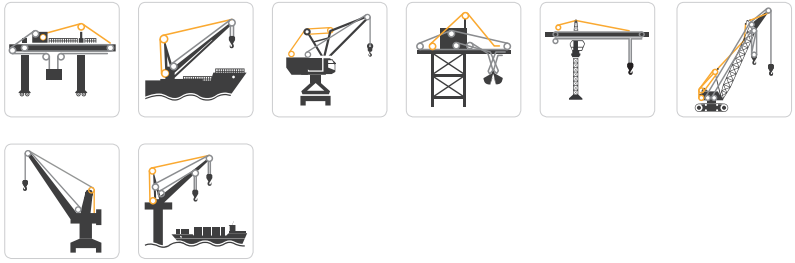
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Nuclear power station construction, Turkey

The high anchor crane used for the construction of this nuclear power station in Turkey was installed in the centre of where the chimney was to be built. With a requirement for the crane boom to turn through 360° throughout the construction process, it was necessary to stabilise the crane with COMPLAST 9 Ø26mm linking the crane tower to the chimney structure. As the built structure increased in height, the stabilising ropes were raised through a system of pneumatics.

NOTOR HP Ø16mm was used for main hoist up to 160 metres.

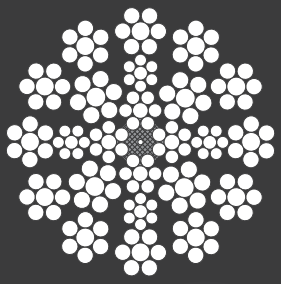
NRHD 24/24 C

Rotation resistant hoist rope/compacted hoist rope

NRHD 24 is a rotation resistant rope for a broad spectrum of applications including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes. Excellent performance on multiple layer coiling winches along with a high resistance to bending fatigue.

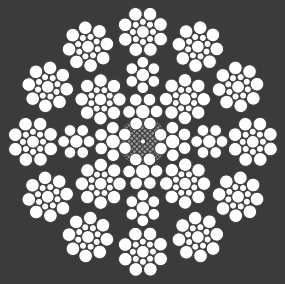
The NRHD 24 C is a rotation resistant, compacted hoisting rope for a broad spectrum of uses including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes.

PLEASE NOTE: NRHD 24 is available with plastic impregnation which improves the rope behaviour in case of fleet angles and repetitive lifting cycles, and is recommended for high rise heavy duty and intensive use. Average minimum breaking load is 2% lower.



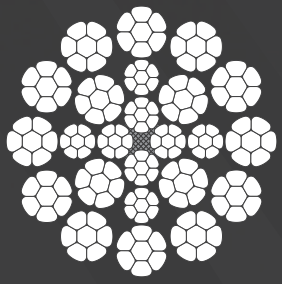
NRHD 24/24(W)x7

p.42



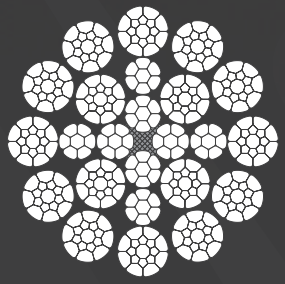
NRHD 24/24(W)x17

p.43



NRHD 24 C/24(W)xK7

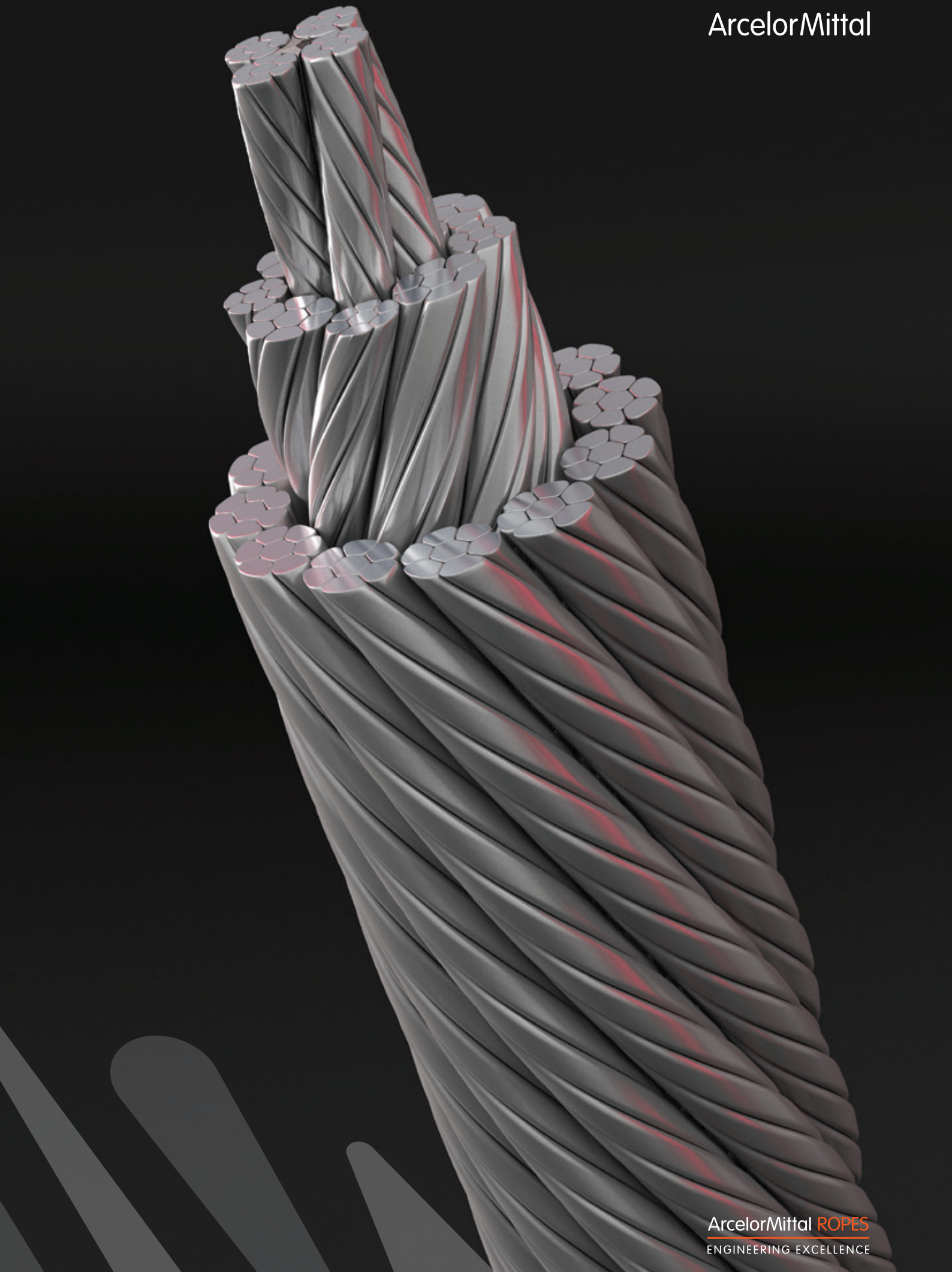
p.44



NRHD 24 C/24(W)xK17

p.45

ArcelorMittal



ArcelorMittal ROPES

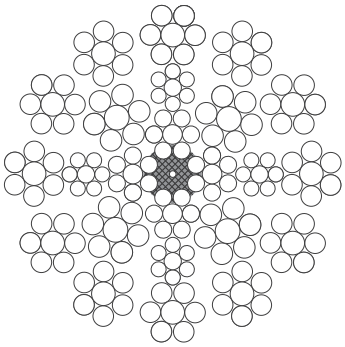
ENGINEERING EXCELLENCE

ArcelorMittal

NRHD 24/24(W)x7

Rotation resistant hoist rope

NRHD 24/24(W)x7 is a rotation resistant rope for a broad spectrum of applications including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes. Excellent performance on multiple layer coiling winches along with a high resistance to bending fatigue.



Available with plastic impregnation

Features:

- High service life performance
- High level performance on multiple layer coiling systems thanks to lang lay and linear links between components
- 12 outer strands over a Warrington steel core
- Lang lay for improved coiling and fatigue properties
- Drawn galvanised wires 2160 N/mm² (bright steel available on request)
- Rope nominal diameter from 8 to 82 mm.

NRHD 24/24(W)x7/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
8	5/16	30.5	0.27	56
9	-	37.8	0.34	68.5
10	-	47.8	0.43	86
11	7/16	56.8	0.51	104
12	-	68.0	0.61	124.5
13	1/2	81.6	0.72	145
14	9/16	96.5	0.86	175
15	-	106.2	0.94	190
16	5/8	125.5	1.12	220
17	-	140.8	1.25	248
18	-	158.2	1.41	275
19	3/4	173.3	1.53	310

Please note: Other diameters with other tolerances than those shown here can be made on studies.

f - Fill Factor	**k** - Spinning Loss Factor
0.610	0.830

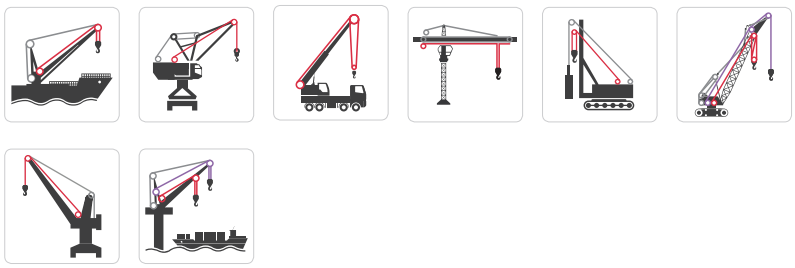
Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

Applications



KEY

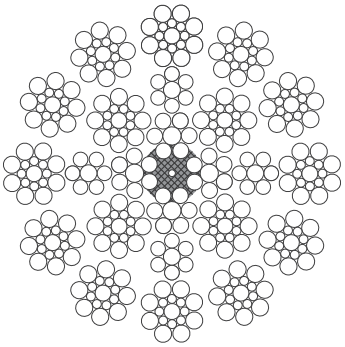
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

NRHD 24/24(W)x17

Rotation resistant hoist rope

NRHD 24/24(W)x17 is a rotation resistant rope for a broad spectrum of applications including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes. Excellent performance on multiple layer coiling winches along with a high resistance to bending fatigue.



Available with plastic impregnation

Features:

- High service life performance
- High level performance on multiple layer coiling systems thanks to Lang lay and linear links between components
- 12 outer strands over a Warrington steel core
- Lang lay for improved coiling and fatigue properties
- Drawn galvanised wires 2160 N/mm² (bright steel available on request)
- Rope nominal diameter from 8 to 82 mm.

NRHD 24/24(W)x17/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
20	-	188.5	1.67	335
21	-	213.4	1.89	368
22	7/8	235.3	2.09	415
24	-	281.0	2.50	495
25.4	1	309.8	2.75	560
28	1-1/8	384.9	3.42	675
29	-	408.2	3.63	712
30	-	446.0	3.95	765
32	1-1/4	507.4	4.49	870
34	1-3/8	572.8	5.07	983
36	-	643.6	5.73	1095
38	1-1/2	717.1	6.38	1215
40	-	795.6	7.08	1345
42	-	877.2	7.81	1485
44	-	962.7	8.57	1630
82	-	3343.7	29.75	5652

Please note: Other diameters with other tolerances than those shown here can be made on studies.

f - Fill Factor	k - Spinning Loss Factor
0.625	0.800

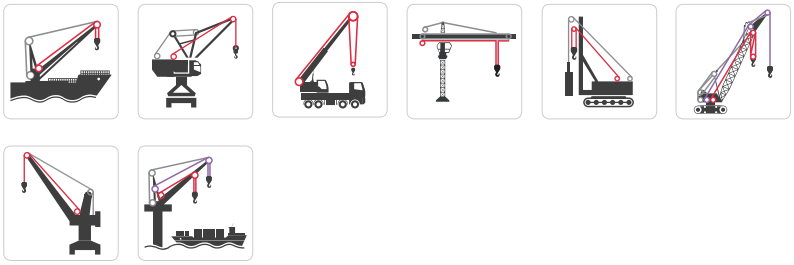
Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

Applications



KEY

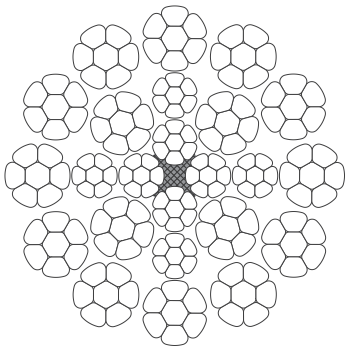
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

NRHD 24 C/24(W)xK7

Rotation resistant compacted hoist rope

NRHD 24 C/24(W)xK7 is a rotation resistant, compacted hoisting rope for a broad spectrum of uses including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes.



Available with plastic impregnation

NRHD 24 C/24(W)xK7/2018/v1.0

Features:

- Higher breaking load with same diameter
- Excellent behaviour for multilayer coiling winches thanks to lang lay and strands compaction
- Drawn galvanised wires 1960 N/mm² (bright steel available on request)
- Optional plastic impregnation of the interface between outer strands and core improving the rope behaviour in case of heavy duty applications (load, fleet angles, repetitive lifting cycles).

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				1960 MPa
8	5/16	34.4	0.31	56
9	-	43.6	0.39	71
10	-	53.8	0.48	88
11	7/16	65.1	0.58	107.4
12	-	77.5	0.69	127
12.5	-	84.1	0.75	138
13	1/2	91.0	0.81	147
14	9/16	106.0	0.94	175
15	-	121.1	1.07	197
16	5/8	137.8	1.22	224
18	-	174.4	1.54	283
19	3/4	194.3	1.72	315
20	-	215.3	1.91	350
21	-	237.3	2.10	385
22	7/8	260.5	2.31	423

Please note: Other diameters with other tolerances than those shown here can be made on studies.

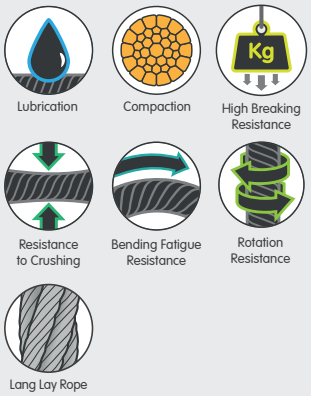
f - Fill Factor	k - Spinning Loss Factor
0.685	0.832

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

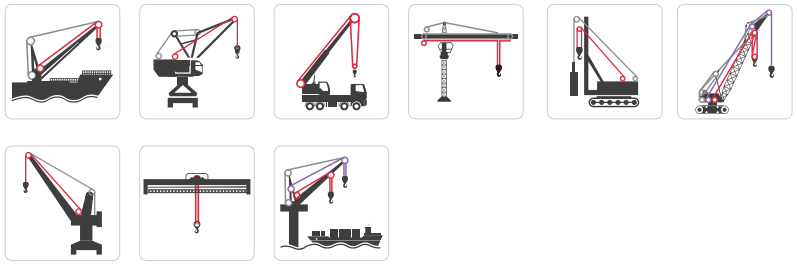
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

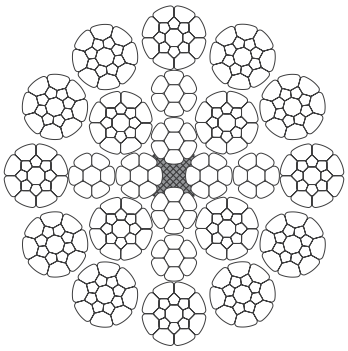
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

NRHD 24 C/24(W)xK17

Rotation resistant compacted hoist rope

NRHD 24 C/24(W)xK17 is a rotation resistant, compacted hoisting rope for a broad spectrum of uses including tower cranes, mobile cranes, crawler cranes, high lift hoisting devices and deck cargo cranes.



Available with plastic impregnation

Features:

- Higher breaking load with same diameter
- Excellent behaviour for multilayer coiling winches thanks to Lang lay and strands compaction
- Drawn galvanised wires 1960 N/mm² (bright steel available on request)
- Optional plastic impregnation of the interface between outer strands and core improving the rope behaviour in case of heavy duty applications (load, fleet angles, repetitive lifting cycles).

NRHD 24 C/24(W)xK17/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				1960 MPa
24	-	314.1	2.87	507
25.4	1	351.9	3.21	568
28	1-1/8	427.6	3.90	690
30	-	490.8	4.48	792
32	1-1/4	558.5	5.09	901
34	1-3/8	630.5	5.75	1017
36	-	697.5	6.23	1105
38	1-1/2	777.1	6.94	1231
40	-	850.9	7.63	1364
42	-	949.3	8.48	1503
44	-	1041.9	9.30	1650

f - Fill Factor	k - Spinning Loss Factor
0.689	0.817

Please note: Other diameters with other tolerances than those shown here can be made on studies.

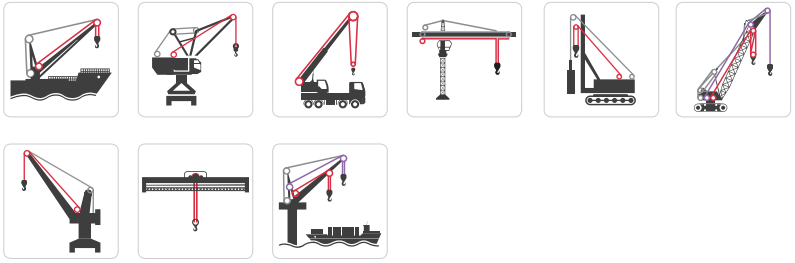
Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.

Applications



KEY

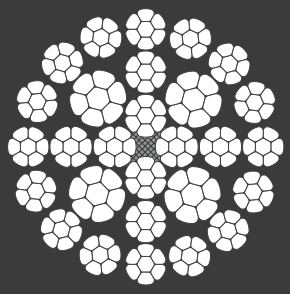
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Notor HP

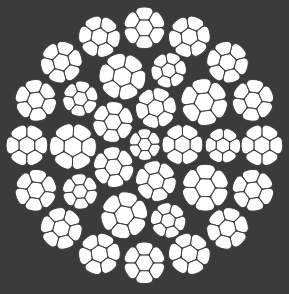
Rotation resistant hoist rope

A rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.

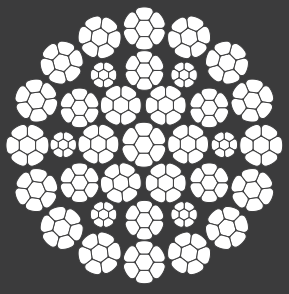
PLEASE NOTE: Notor HP is available with plastic impregnation which improves the rope behaviour in case of fleet angles and repetitive lifting cycles, and is recommended for high rise heavy duty and intensive use. Average minimum breaking load is 2% lower.



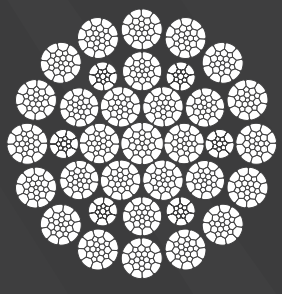
NOTOR HP
/28(W)xK7
p.48



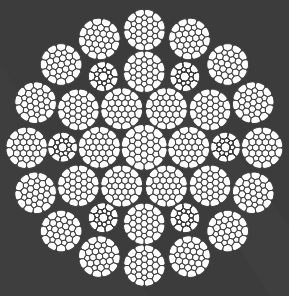
NOTOR HP
/32(W)xK7
p.49



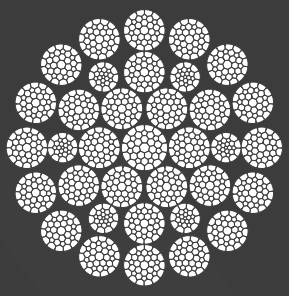
NOTOR HP
/35(W)xK7
p.50



NOTOR HP
/35(W)xK26WS
p.52

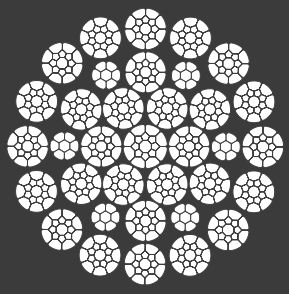


NOTOR HP
/35(W)xK31WS
p.54



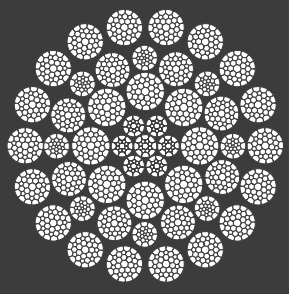
NOTOR HP
/35(W)xK36WS
p.55

ArcelorMittal



NOTOR HP
/35(W)xK17S

p.51



NOTOR HP
/49(W)xK36WS

p.56

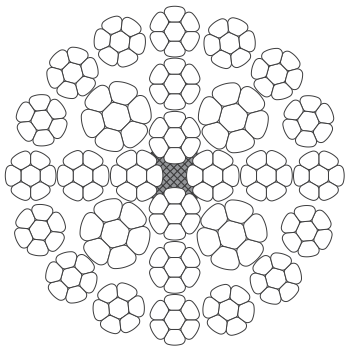
ArcelorMittal ROPES
ENGINEERING EXCELLENCE

ArcelorMittal

Notor HP/28(W)xK7

Rotation resistant hoist rope

Notor HP/28(W)xK7 is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/28(W)xK7/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
10	-	55.3	0.49	89.1	99
11	7/16	66.9	0.59	107.8	119.8
12	-	79.6	0.71	128.3	142.6
13	1/2	93.4	0.83	150	167.3
14	9/16	108.3	0.96	174.6	194.0
15	-	124.3	1.10	200	222.8
16	5/8	141.4	1.25	228.1	253.4
17	-	159.7	1.42	260	286.1

Please note: Other diameters with other tolerances than those shown here can be made on studies.

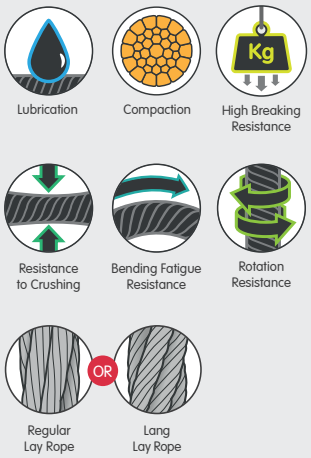
f - Fill Factor	k - Spinning Loss Factor	
0.700	0.823	0.830

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

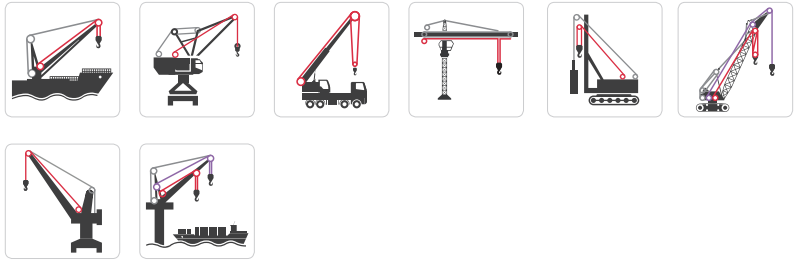
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

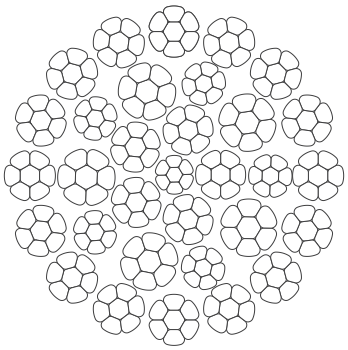
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/32(W)xK7

Rotation resistant hoist rope

Notor HP/32(W)xK7 is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/32(W)xK7/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2160 MPa**
18	-	177.2	1.59	286	317.6
19	3/4	197.4	1.77	319	356
20	-	218.8	1.96	353	392.2
21	-	241.2	2.16	389	432.4
22	7/8	264.7	2.38	427	474.5
23	-	289.3	2.60	467	518.6
24	-	315.0	2.83	508	564.7
25	1	341.8	3.07	551	612.7
26	-	369.7	3.32	596	662.7

Please note: Other diameters with other tolerances than those shown here can be made on studies.

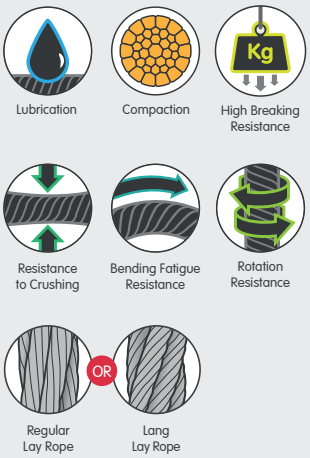
f - Fill Factor	**k** - Spinning Loss Factor	
0.700	0.823	0.830

Indicative values - Tolerance on diameter: ArcelorMittal design (0, +4%)

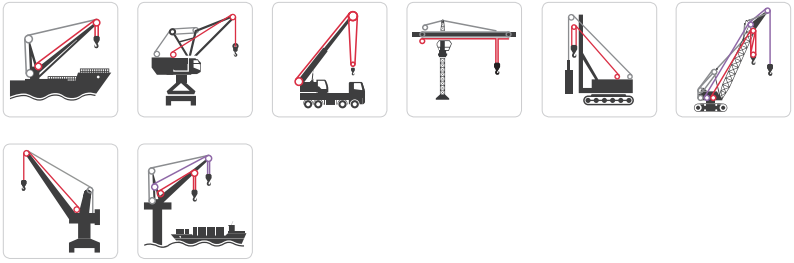
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

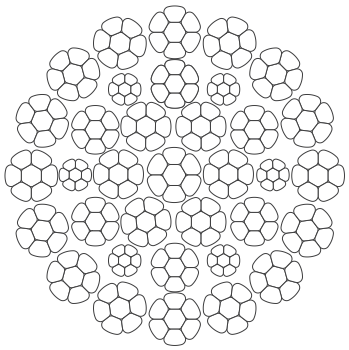
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/35(W)xK7

Rotation resistant hoist rope

Notor HP/35(W)xK7 is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Notor HP/35(W)xK7/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	2160 MPa
28	1-1/8	433.1	3.87	698	760.8
29	-	464.6	4.15	749	816
30	-	497.2	4.44	801	873
32	-	565.7	5.05	912	994
34	1-3/8	638.6	5.71	1029	1122
36	-	715.9	6.40	1154	1258
38	1-1/2	797.7	7.13	1285	1401
40	-	883.8	7.90	1424	1553
42	1-5/8	974.4	8.71	1570	1712
44	-	1069.4	9.56	1723	1879
46	-	1168.9	10.45	1884	2053
48	1-7/8	1272.7	11.37	2051	2236

Please note: Other diameters with other tolerances than those shown here can be made on studies.

f - Fill Factor	k - Spinning Loss Factor	
0.700	0.823	0.813

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

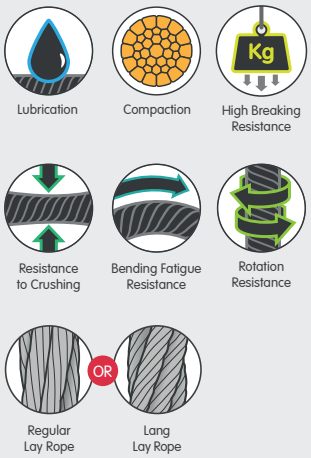
Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

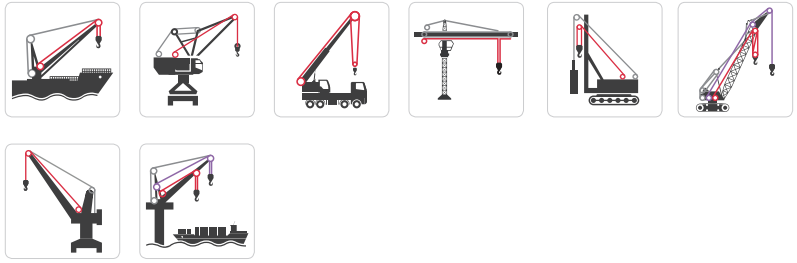
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

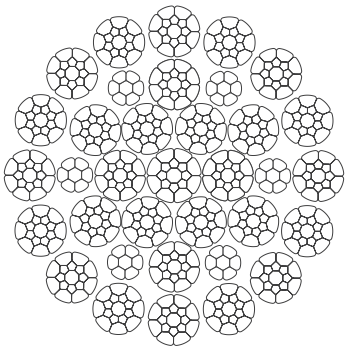
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/35(W)xK17S

Rotation resistant hoist rope

Notor HP/35(W)xK17S is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/35(W)xK17S/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
50.8	2	1425.9	12.68	2402
52	-	1494.1	13.29	2516
54	-	1611.2	14.33	2714
56	-	1732.8	15.41	2919
58	-	1858.8	16.53	3131
60	-	1989.2	17.69	3350
62	-	2124.0	18.89	3577
64	2-1/2	2263.3	20.13	3812
66	-	2451.8	22.07	4100

Please note: Other diameters with other tolerances than those shown here can be made on studies.

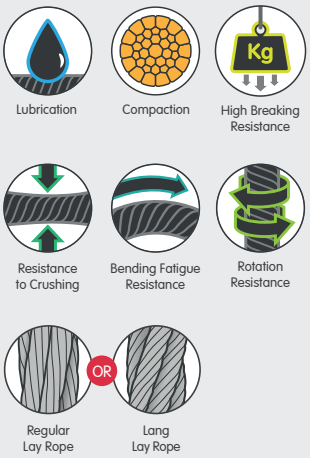
f - Fill Factor	**k** - Spinning Loss Factor
0.700	0.780

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

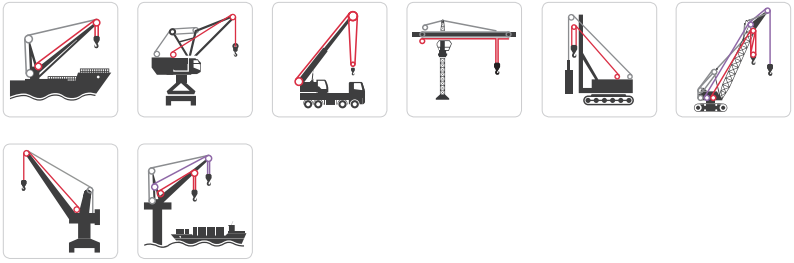
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

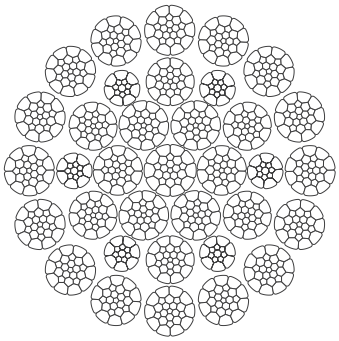
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/35(W)xK26WS

Rotation resistant hoist rope

Notor HP/35(W)xK26WS is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/35(W)xK26WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2160 MPa
68	-	2602.7	23.42	4352
70	-	2758.0	24.82	4611
72	-	2917.9	26.26	4879

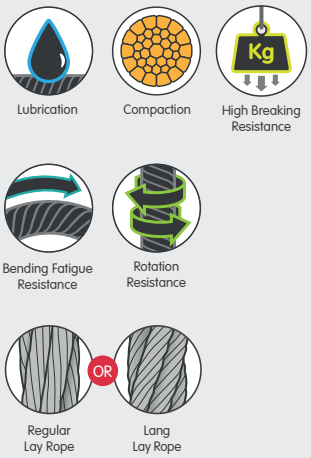
Please note: Other diameters with other tolerances than those shown here can be made on studies.

f - Fill Factor	**k** - Spinning Loss Factor
0.717	0.774

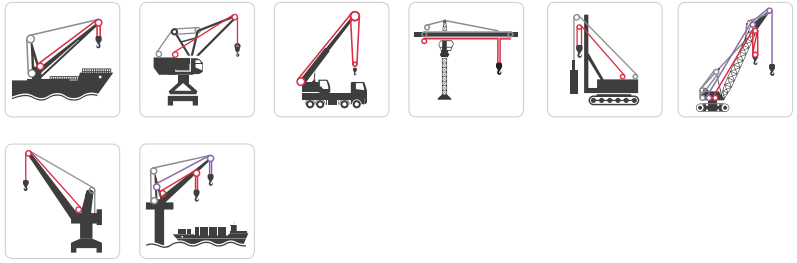
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

Manitowoc use Notor HP for the Millau Viaduct

The Millau Viaduct is a cable-stayed bridge that spans the gorge valley of the Tarn near Millau in southern France. It is one of the tallest bridges in the world, with one mast's summit at 343 metres above the base of the structure. In a French-British partnership, it was designed by the English architect Sir Norman Foster and French structural engineer Michel Virlogeux, and as of May 2017 it is the twenty-second highest bridge deck in the world, being 270 metres between the road deck and the ground below.

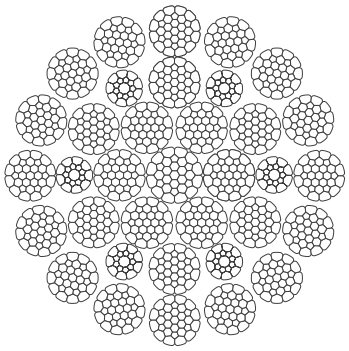
The bridge was constructed using 7 Manitowoc K5/50 C cranes (one crane per pile) with a hook height of 95.5 to 264.4 metres. More than 1000 metres of Notor HP were used for the construction.

ArcelorMittal

Notor HP/35(W)xK31WS

Rotation resistant hoist rope for offshore cranes

Notor HP/35(W)xK31WS is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP Plast/35(W)xK31WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load	
mm	inch	mm²	kg/m	kN	kN
				1960 MPa	**2060 MPa**
74	-	3040.2	27.37	-	5046
76	3	3206.8	28.87	-	5322
78	-	3377.8	30.41	-	5606
80	-	3553.2	31.99	-	5897
82	-	3718.5	33.47	-	6172
84	-	3825.2	34.20	-	6410
86	-	4009.5	35.85	-	6719
89	3-1/2	4294.1	38.40	-	7196

Please note: Other diameters with other tolerances than those shown here can be made on studies.

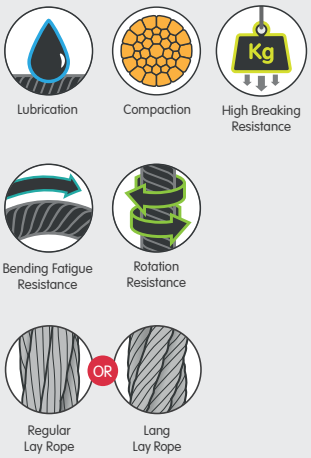
f - Fill Factor	k - Spinning Loss Factor	
0.724	0.850	0.742

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

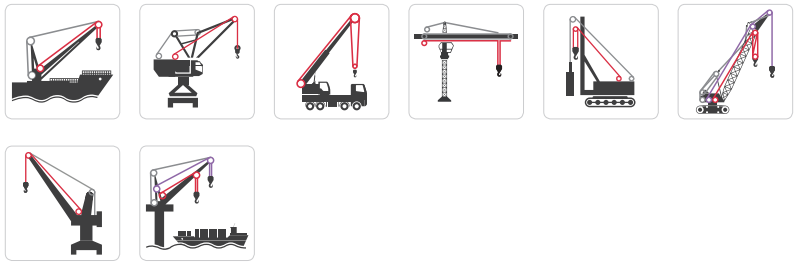
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

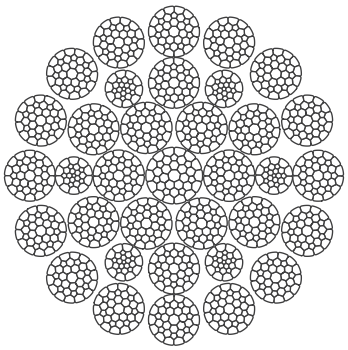
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/35(W)xK36WS

Rotation resistant hoist rope for offshore cranes

Notor HP/35(W)xK36WS is a rotation resistant hoist rope for high rise applications including tower cranes, mobile cranes, crawler cranes, offshore operating cranes or any high lift hoisting device requiring high rotation resistance.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/35(W)xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2060 MPa
93	-	4706.6	42.01	8043
97	-	5120.2	45.70	8750
100	-	5441.8	48.57	9299
102	-	5661.7	50.54	9675
109	-	6331.4	56.81	10800

Please note: Other diameters with other tolerances than those shown here can be made on studies.

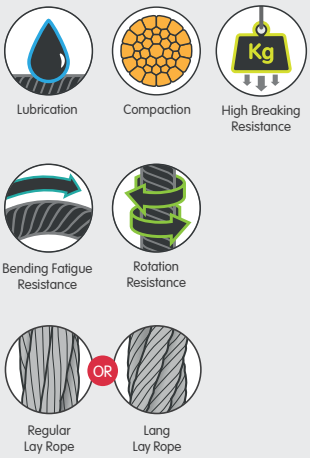
f - Fill Factor	**k** - Spinning Loss Factor
0.690	0.870

Indicative values - Tolerance on diameter: ArcelorMittal design (0, +4%)

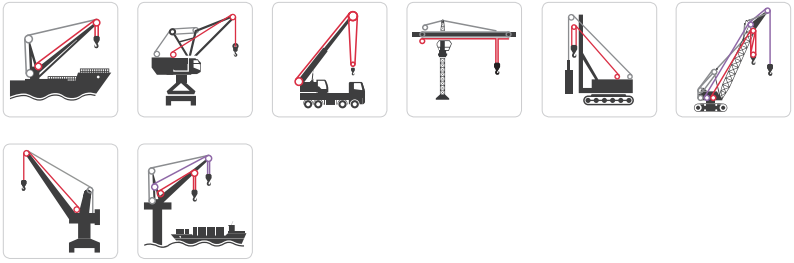
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

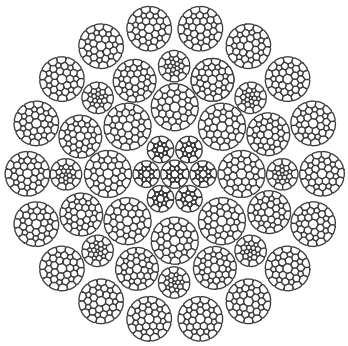
- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

ArcelorMittal

Notor HP/49(W)xK36WS

Rotation resistant hoist rope for offshore cranes

Notor HP/49(W)xK36WS is a rotation resistant rope with conventional strands and a rope core covered with a plastic layer ideal for harbour container cranes, mineral gantry cranes, boom hoist and electric hoists.



Available with plastic impregnation

Features:

- High service life performance
- 16 outer strands over a Warrington steel core
- Compacted inner and outer strands
- Drawn galvanised wires 1960 or 2160 N/mm²

Notor HP/49xK36WS/2018/v1.0

Diameter		Section	Mass	Minimum breaking load
mm	inch	mm²	kg/m	kN
				2060 MPa
113	4-1/2	6804.7	61.05	11607
118	-	7420.2	66.57	12657
121	-	7802.3	70.00	13309
125	-	8326.6	74.71	14204

f - Fill Factor	k - Spinning Loss Factor
0.680	0.870

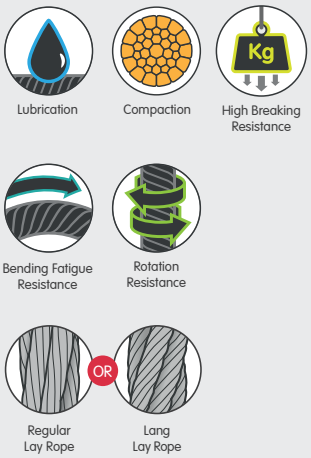
Please note: Other diameters with other tolerances than those shown here can be made on studies.

Indicative values - Tolerance on diameter: ArcelorMittal design (0; +4%)

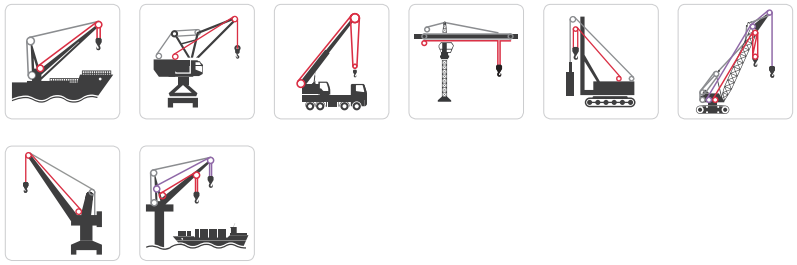
Properties

We pride ourselves in designing and manufacturing the highest quality steel ropes for all applications.

Using the latest technology we make ropes to suit your individual requirements and to the highest specifications.



Applications



KEY

- Hoist
- Trolley
- Boom Luffing
- Grab
- Auxiliary Hoist
- Pipe Handling

An optimised solution for Orange Marine

Orange Marine's cable ship Descartes is a versatile, high technology vessel, designed to lay, repair and survey submarine fibre optic systems.

The Descartes combines the benefits of a unique design, modern equipment and the expertise of internationally recognised teams and suppliers of specialist equipment including ArcelorMittal ROPES.

ArcelorMittal ROPES provided Orange Marine with consultancy on the optimum solution for their requirements and supplied 10km of Notor HP.

Sagrada Família, Barcelona, Spain

The Basílica i Temple Expiatori de la Sagrada Família is the renowned unfinished Roman Catholic Church in Barcelona, designed by Catalan architect Antoni Gaudí.

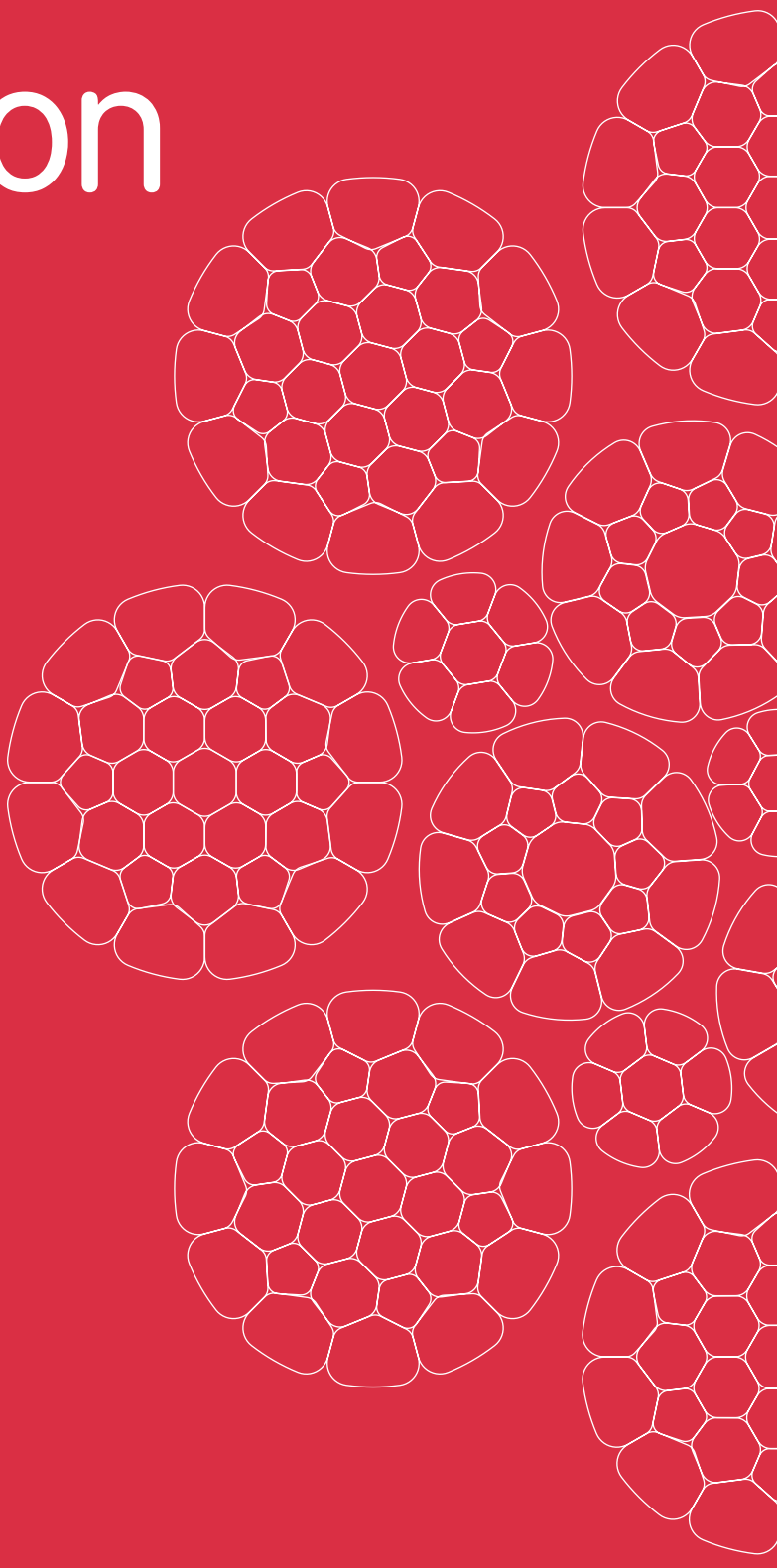
First started in 1883, Gaudí's work on the building is part of a UNESCO World Heritage Site. Relying solely on private donations, the completion of the Sagrada Familia is a long and slow process.

Manitowoc MD560B cranes, used in the ongoing construction of the church, were equipped with NRHD24 Ø20mm.

Some of the project's greatest challenges remain, including the construction of further spires. It is anticipated that the building will be completed by 2026 - the centenary of Antoni Gaudí's death.

ArcelorMittal

Technical Information



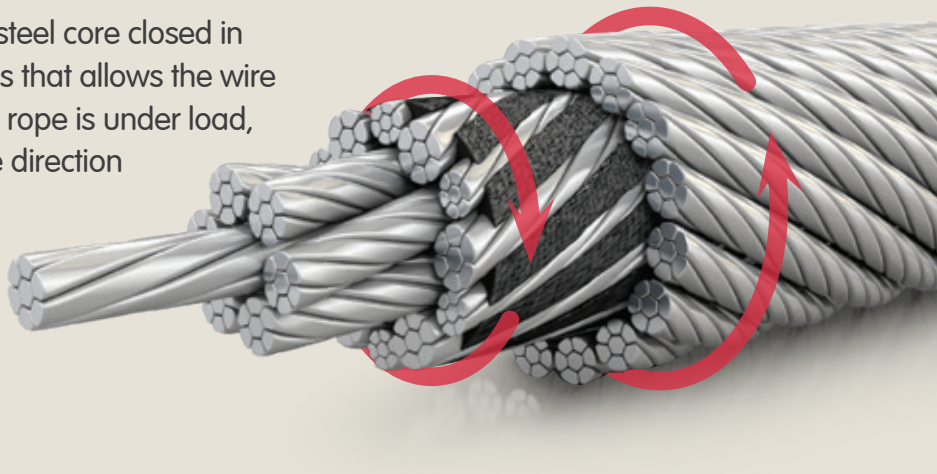
ArcelorMittal ROPES

ENGINEERING EXCELLENCE

Technical Information

Non-rotating properties

Non-rotating ropes are designed with a steel core closed in the opposite direction to the outer strands that allows the wire rope to be well balanced. When the wire rope is under load, the strands of the core are twisted in one direction while the outer strands tend to rotate in the opposite direction.

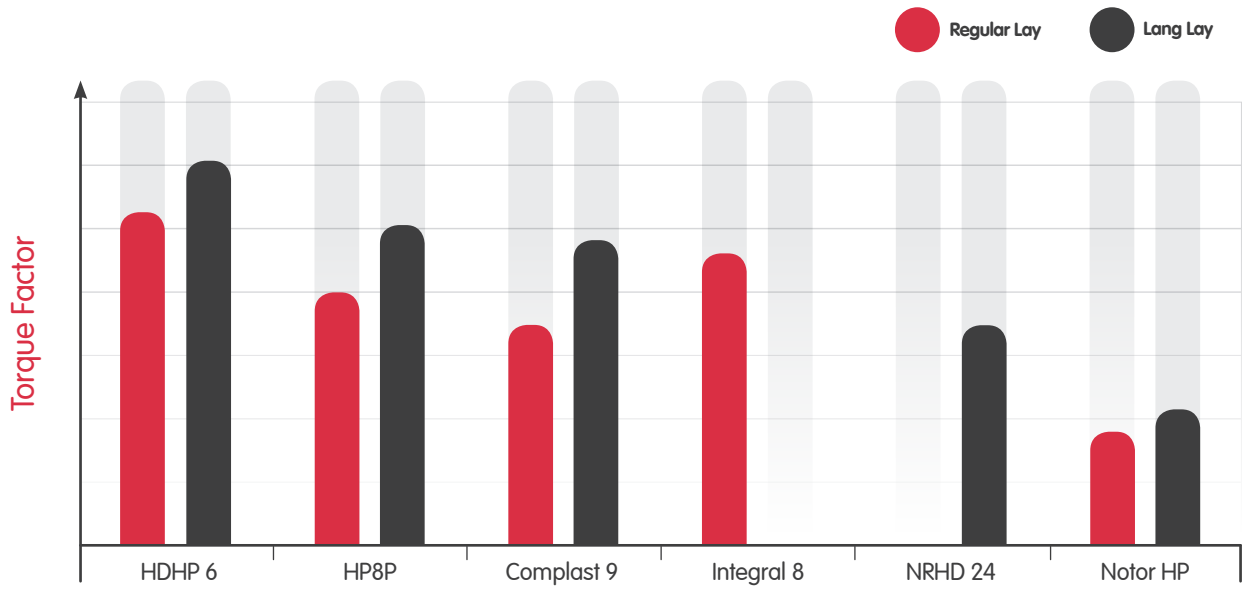


Torque factor

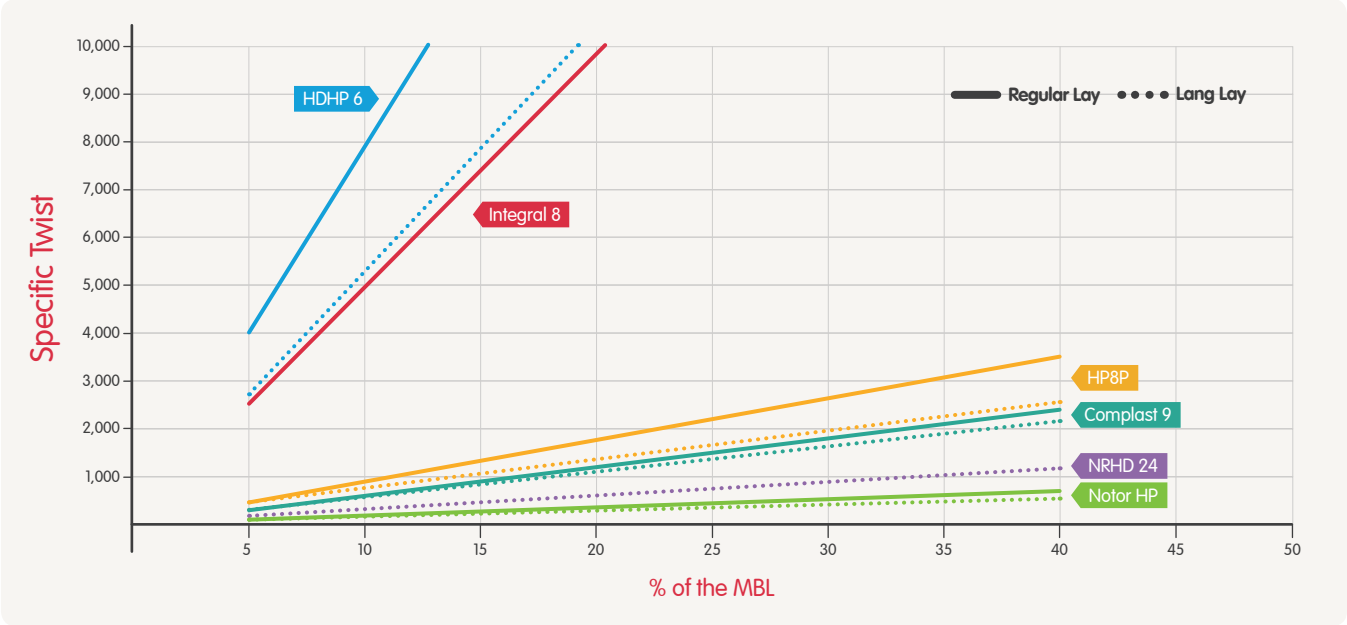
$$ftorque = \frac{C}{F \; x \; d}$$

With:

- ftorque = torque factor [Nm/mm/kN]
- C = moment of torsion [N.m]
- F = load [kN]
- d = rope diameter [mm]



Specific twist

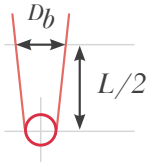


Stability of blocks

The boundary condition of stability with rotation of the block of an angle α corresponds to a maximum work height L:

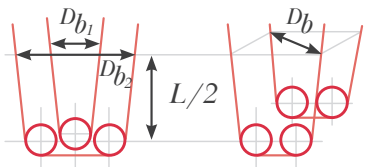
For 2 falls:

$$L_{2\ falls} \leq \frac{D_b^2 \times \sin \alpha}{4000 \times d \times f_{torque}}$$



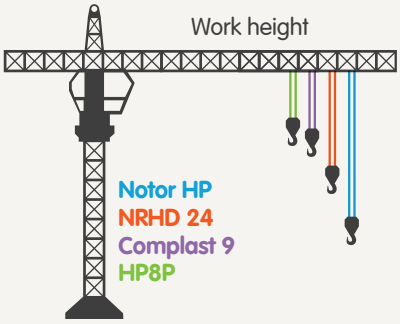
For 4 falls:

$$L_{4\ falls} \leq \frac{D_b^2 \times \sin \alpha}{8000 \times d \times f_{torque}}$$



With:

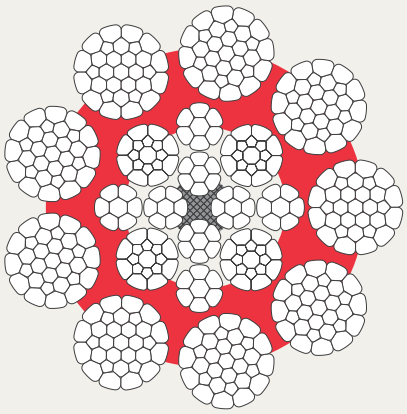
- D_b = distance between the falls [mm] (for 4 falls in the same plane, $D_b=(D_{b1}+D_{b2})/2$)
- α = admissible rotation angle [°] (generally equal to 56°)
- d = nominal rope diameter with 0/+4% tolerances [mm]
- f_{torque} = rope torque factor [Nm/mm/kN]



Technical Information

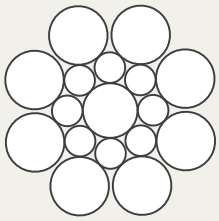
Plastic impregnation

The plastic impregnation couples the core and the outer strands, which delays the appearance of basket deformation/bird cage when the fleet angle is higher than 1.5°. Moreover, the wire rope behaviour is more homogenous, because the pressure between the core and the outer strands is slightly decreased.

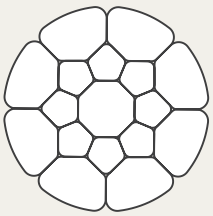


Compaction

Thanks to the rope compaction, the metallic section is increased, which leads to a higher breaking load than a non compacted wire rope of the same diameter. The outside strand area is also increased and smoother, which decreases the contact pressure between the rope and the drum/sheaves, and thus increases the fatigue properties.



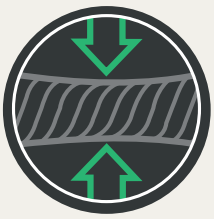
Round Wire Rope



Compacted Rope

Crush resistance

Crushing is the effect of external pressure on a rope which damages the rope by distorting the cross-sectional shape of the rope, its strands or core or all three. Crush resistant ropes withstand or resist external forces.



Regular Lay or Lang Lay

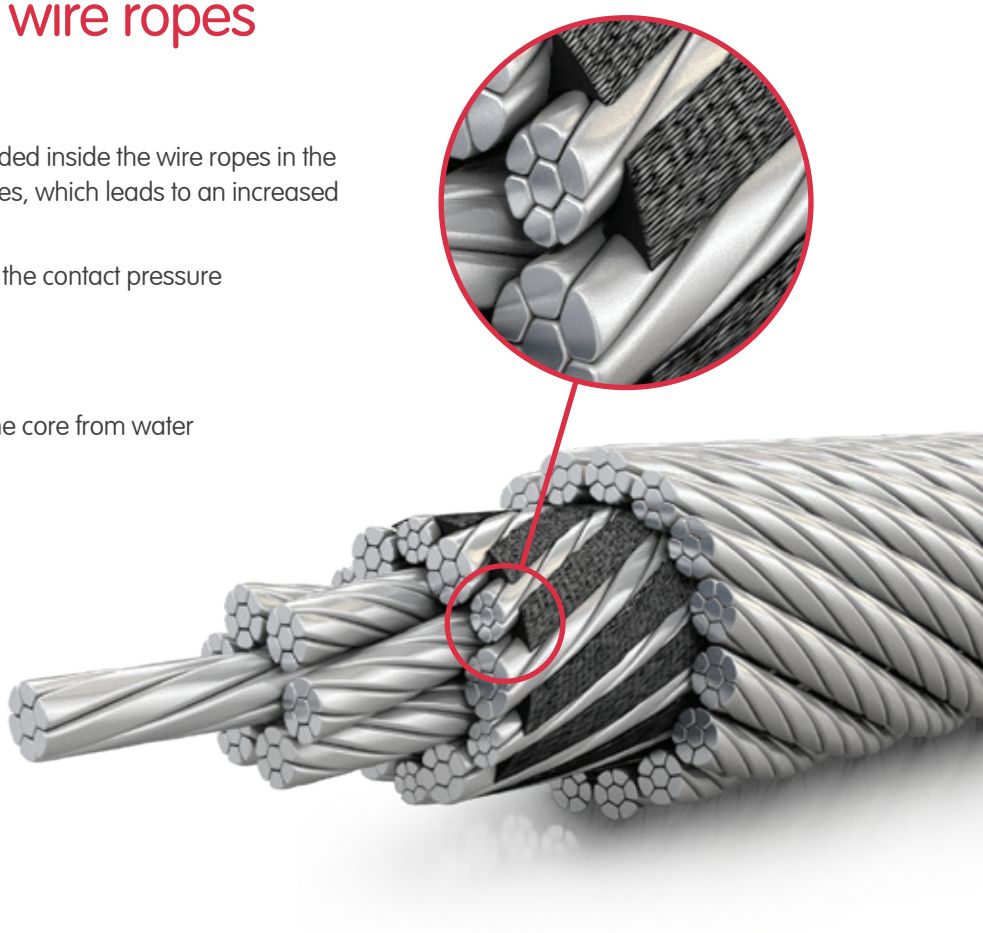
	Lang Lay	Regular Lay
		
Advantage	Wear resistance Flexibility	Core sensitivity Non-rotation property
Disadvantage	Core sensitivity Non-rotation property	Wear resistance

Textile strands inside wire ropes

In Notor HP and NRHD, textile strands are added inside the wire ropes in the core valleys. These strands bring 2 advantages, which leads to an increased lifetime of the rope:

- A densification of the core, that decreases the contact pressure generated by the outer strands.
- A lubricant tank.

Moreover it is also noticed that they protect the core from water ingress and consequently against corrosion.

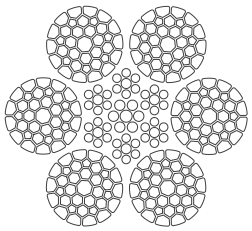
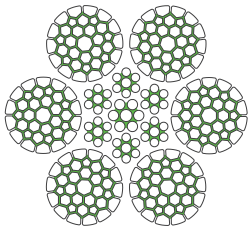
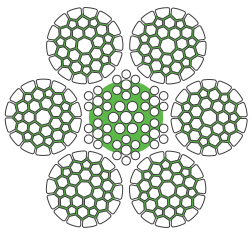
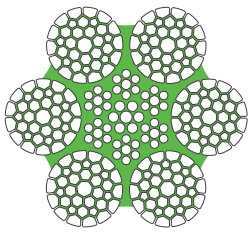
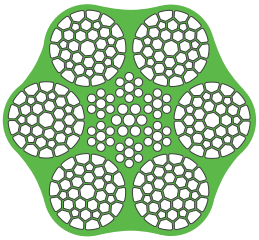


ArcelorMittal ROPES
ENGINEERING EXCELLENCE

Technical Information

Lubrication and coatings

Lubrication types on ArcelorMittal steel wire ropes

Type of Lubrication	Lubrication Method		% mass	Note	Illustration
Dry	Closing	No grease slight oil only	0.0	For stainless wire ropes and specific demands (oil is applied to avoid trouble in the die during assembly)	
	Core				
	Stranding				
A-1	Closing	No grease, oil only	0.5	For ropeway ropes, mining ropes on Koepe sheave and plastified wire ropes	
	Core	No lubrication			
	Stranding	Lubrication + tight wipe			
A-2	Closing	No grease, oil only	0.75	Specific demands on plastified ropes	
	Core	Lubrication + tight wipe			
	Stranding	Lubrication + tight wipe			
A-3	Closing	Lubrication + wipe	1.5 - 1.75	Hoisting applications	
	Core	Lubrication + wipe			
	Stranding	Lubrication + wipe			
A-4	Closing	Lubrication + no wipe	2.0 - 2.5	Not available direct from the mill. (Can be performed by our distributors on specific demand)	
	Core	Lubrication + no wipe			
	Stranding	Lubrication + no wipe			

3 Grades of grease are available:

- Classic grease for onshore standard applications
- Improved grease for special applications
- Premium grease for aggressive environments

Groove characteristics for sheaves and grooved drums

Grooves in sheaves and drums should be circular and smooth.

Sheaves

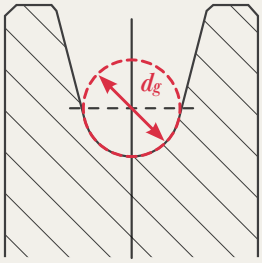
To ensure good support, the rope must contact the groove for approx 130-140° of arc, which leads to the following recommendation for the groove diameter:

$$1.05d < d_g < 1.1d$$

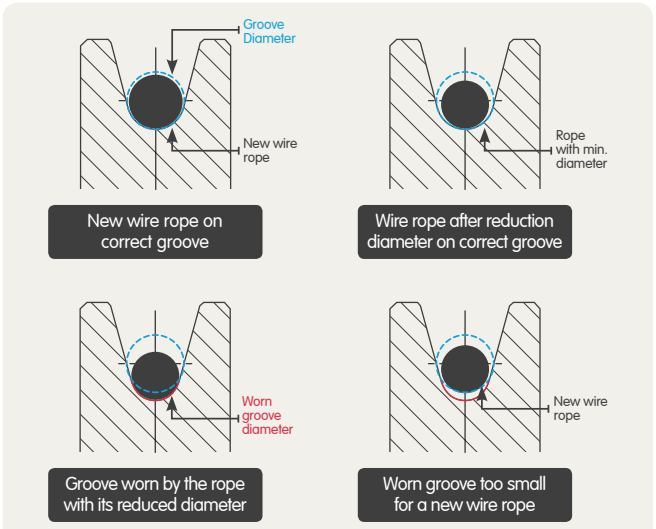
Optimal value = 1.075

With:

- d = nominal rope diameter with 0/+4% tolerances;
- d_g = groove diameter.



During a wire rope's lifetime, the rope diameter will decrease. This is due to first the elongation of the rope and then the wear on the rope wires. This diameter variation begins quickly but then slows down. The wire rope will create a new groove in the sheave which corresponds to the reduced diameter. If a new wire rope is installed in a worn sheave, without resurfacing, the new rope will wear more quickly. The lifetime can be divided by 10.



Grooved drums

The groove diameter d_g and the pitch diameter p must comply with the following criteria:

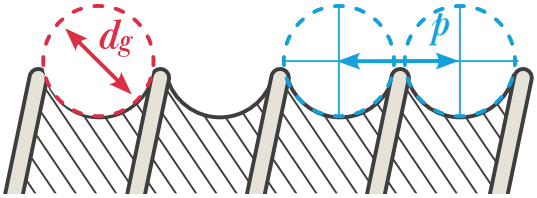
$$d_g = 1.0173d$$

$$1.035dg < p < 1.09dg$$

Optimal value = 1.06

With:

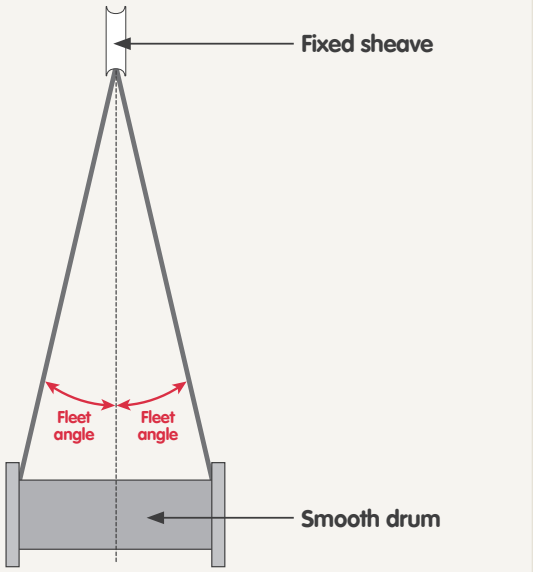
- d = rope diameter under tension of 5%MBL
- d_g = groove diameter
- p = pitch between 2 grooves



Technical Information

Fleet angles

When the wire rope comes from a drum to pass over a sheave, there is an angle between the rope and the centre line of the sheave.



It is recommended that the fleet angle stays in the optimal range in green and doesn't exceed the red values in the following table.

Fleet angle [°]

	1.5	1.75	2	2.25	2.5	2.75	3	3.25	3.5	3.75	4
HP8P											
Complast 9											
Integral 8											
HDHP6											
NRHD 24											
NRHD 24C											
Notor HP											

Recommendations

Discard criteria

A steel wire rope is a sensitive flexible safety element. It has to be followed up and regularly inspected by a competent person. Our ropes must be inspected and discarded using the ISO 4309 standard: **Cranes – Wire ropes – Care and maintenance, Inspection and discard.**

Particular attention should be paid to:

- Broken wires
- Decreasing rope diameter (local/general)
- Fracture of strands
- Corrosion
- Wire rope deformations (e.g. waviness, baskets, core or strand protrusion or distortion, wire protrusion, flattened portions of rope, kinks).

ISO 4309 is a document which cannot be dissociated. It shall be carefully studied and applied.

Visual inspection is necessary to help determine the overall condition of the rope.

- Local reduction is the result of a core break – **discard immediately**
- Visual signs: local damage, basket or bird cage, deformations of one or several strands, wire protrusion, kinks, looped wires – **discard immediately**
- Severe corrosion – **discard immediately**.

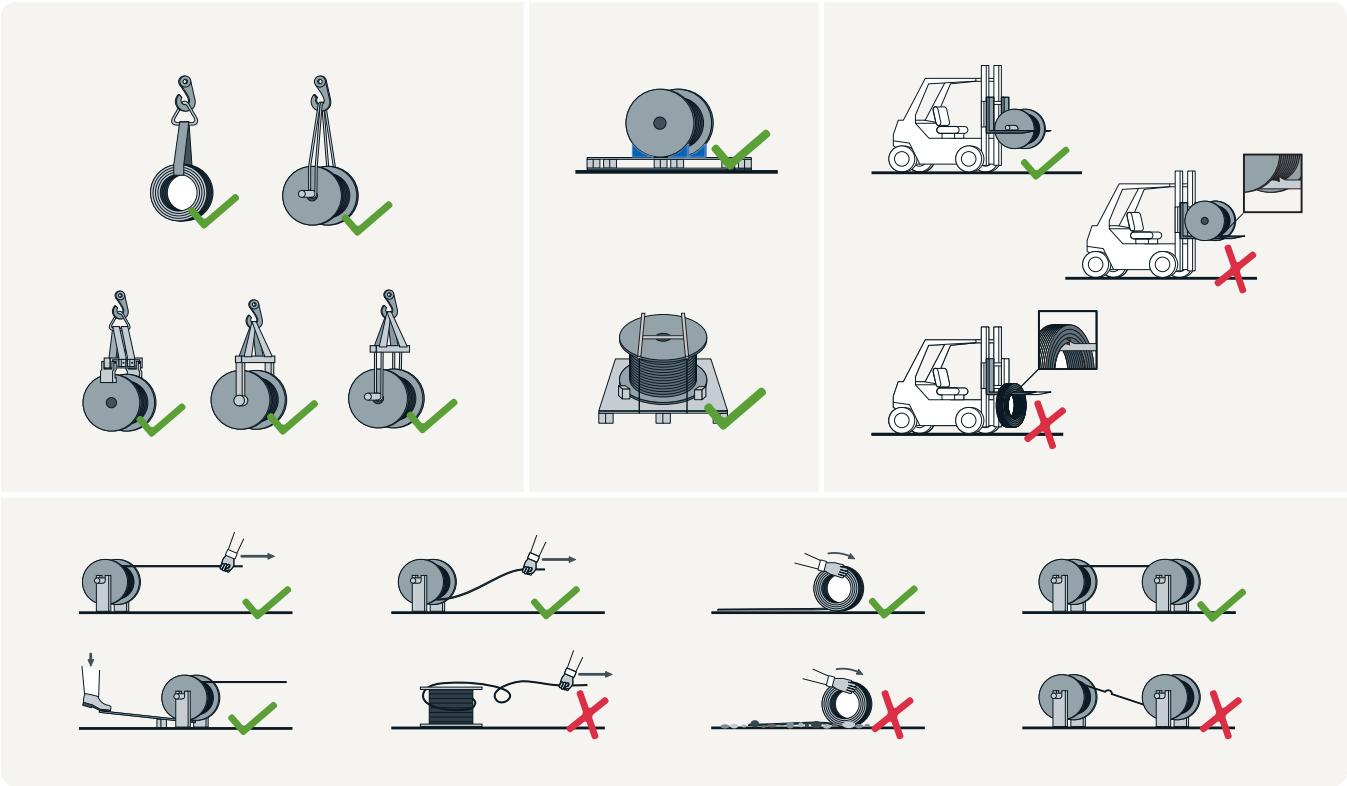
Recommendations

Storage and maintenance

The rope must be adequately maintained and regularly lubricated, as often as it is necessary, but at least when the rope works in extreme conditions and before/after prolonged inactivity. The lubricant must be compatible with the original grease. Before re-lubrication, the wire rope must be dry and cleaned by scraping. Cleaning by cloth, cryogenic spray, high pressure cleaner and solvents are forbidden.

When stored, the rope should be kept in a dry and ventilated environment with no direct contact with the floor and an air flow under the reel. Visual inspection is necessary before the use of a stored wire rope. In case of doubt of the quality of the wire rope, we can help you to find and make additional inspection analysis.

EWRIS handling recommendations



At all times, contact of the rope with any metallic pieces should be avoided to prevent early damage.

EWRIS
European Federation of Steel Wire Rope Industries

ArcelorMittal ROPES
ENGINEERING EXCELLENCE

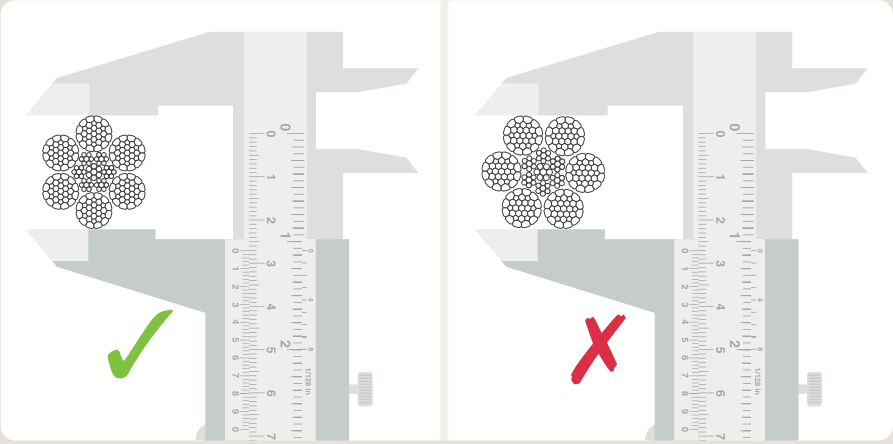
Technical Information

Dimensional control

Diameter (NF EN 12385-1)

The diameter must be measured with an appropriate measuring instrument covering at least 2 strands.

Measurements must be made at two positions spaced at least one metre apart and for each position, 2 measurements must be taken at right angles.



Lay Length

The lay length must be ideally measured on 5 lay lengths minimum.

Stick a paper strip on the rope, draw a straight line on it and pass a chalk stick to reveal the track. Then make the measurement directly on the paper strip.

Test resources

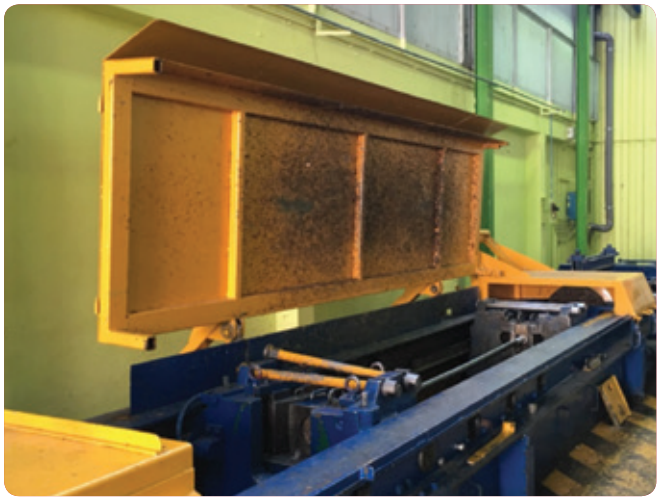
Wire

Prior to the manufacture of our ropes, a sample is taken from each wire spool and tested according to the international standards:

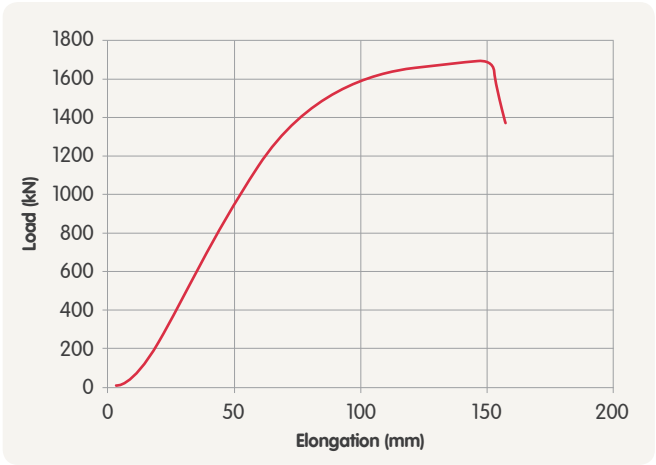
- Tensile test
- Torsion test
- Bending test

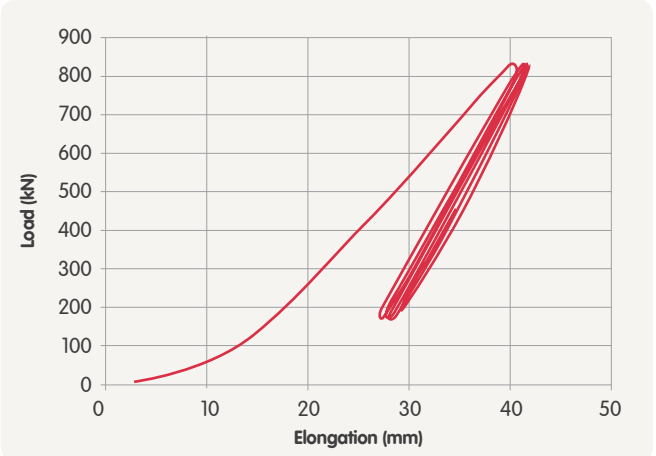
Wire rope

For each manufactured wire rope, the breaking load is checked with a test. During this test, the stress/strain curve is recorded and a modulus measurement can be made on request.



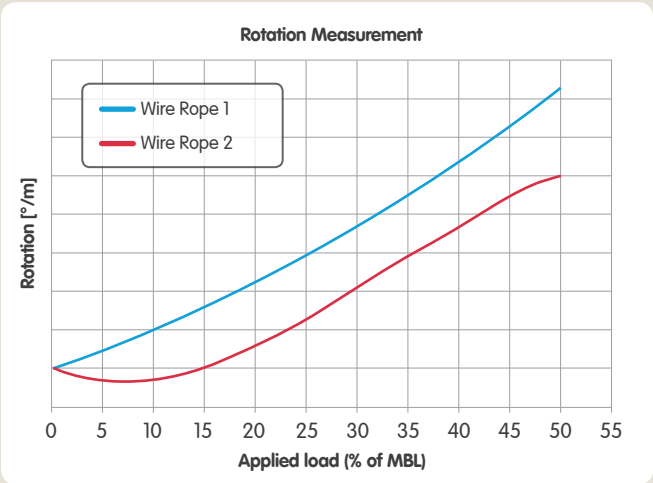
The Bourg-en-Bresse site has 3 test benches: 200 tons, 350 tons and 1500 tons.

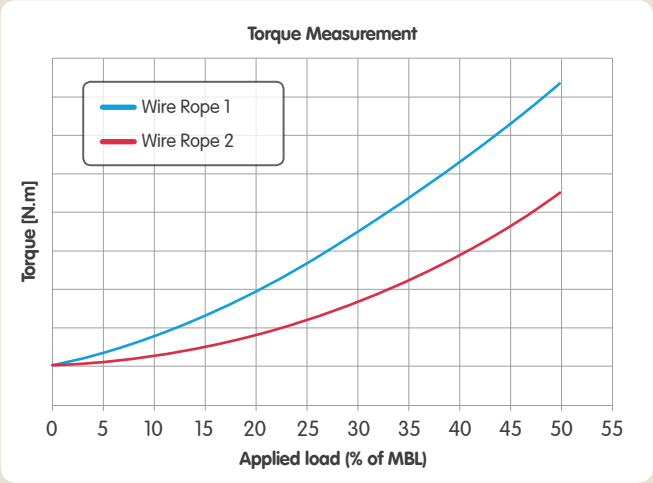


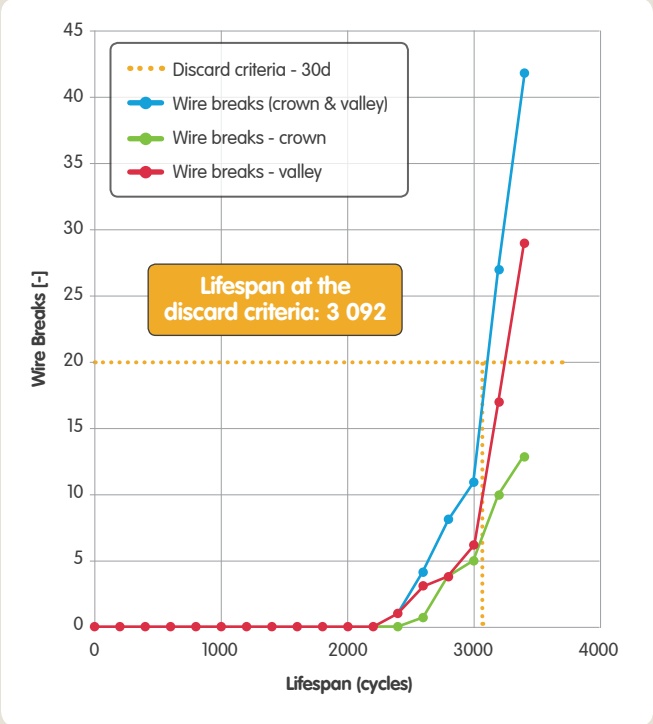


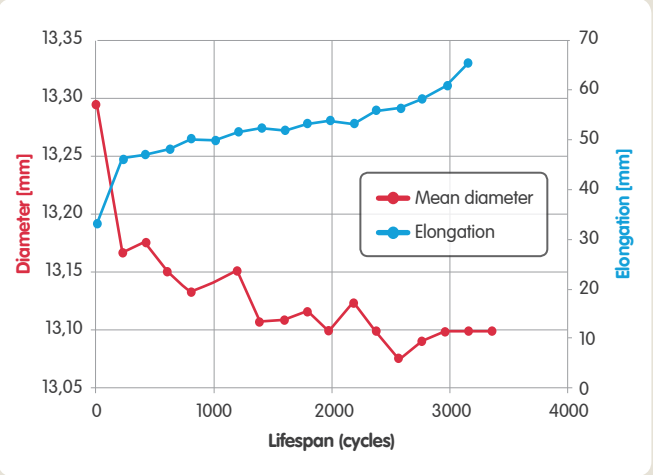
Test resources - continued

Wire Rope









On wire ropes, it is also possible to make:

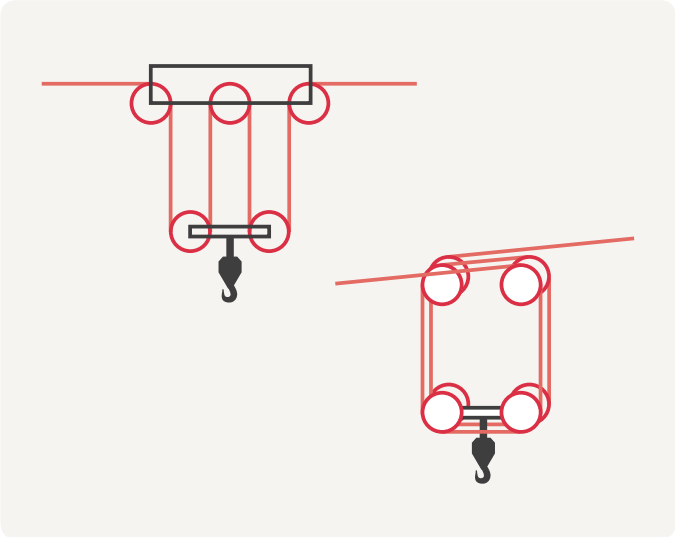
- Rotating test to determine the torque factor and the specific twist
- Bending fatigue test based on the discard criteria given in ISO 4309.

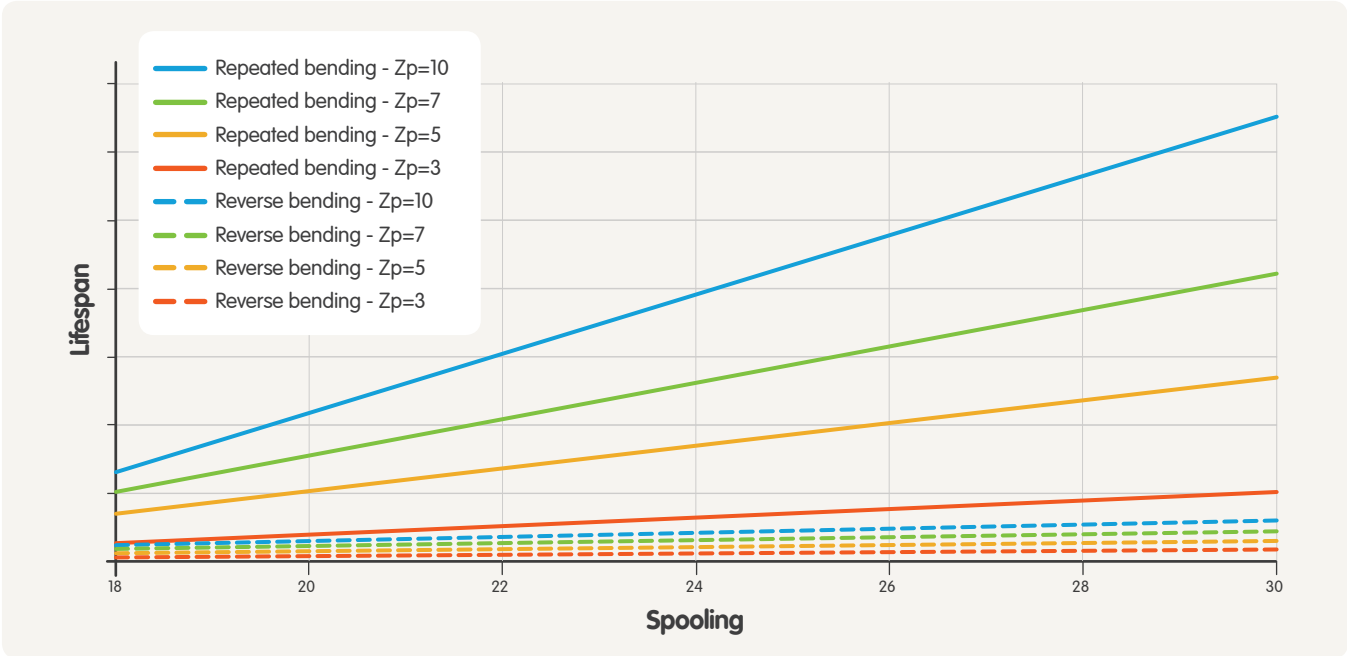
Bending fatigue properties

Fatigue resistant ropes are capable of bending repeatedly under stress. Increased fatigue resistance is achieved in a rope using a combination of several parameters in the rope construction.

The wire rope lifespan depends on many parameters. The most important parameters being:

- Spooling ratio D/d
- Type of bending: repeated or reverse
- Load characteristics: safety coefficient (Zp)



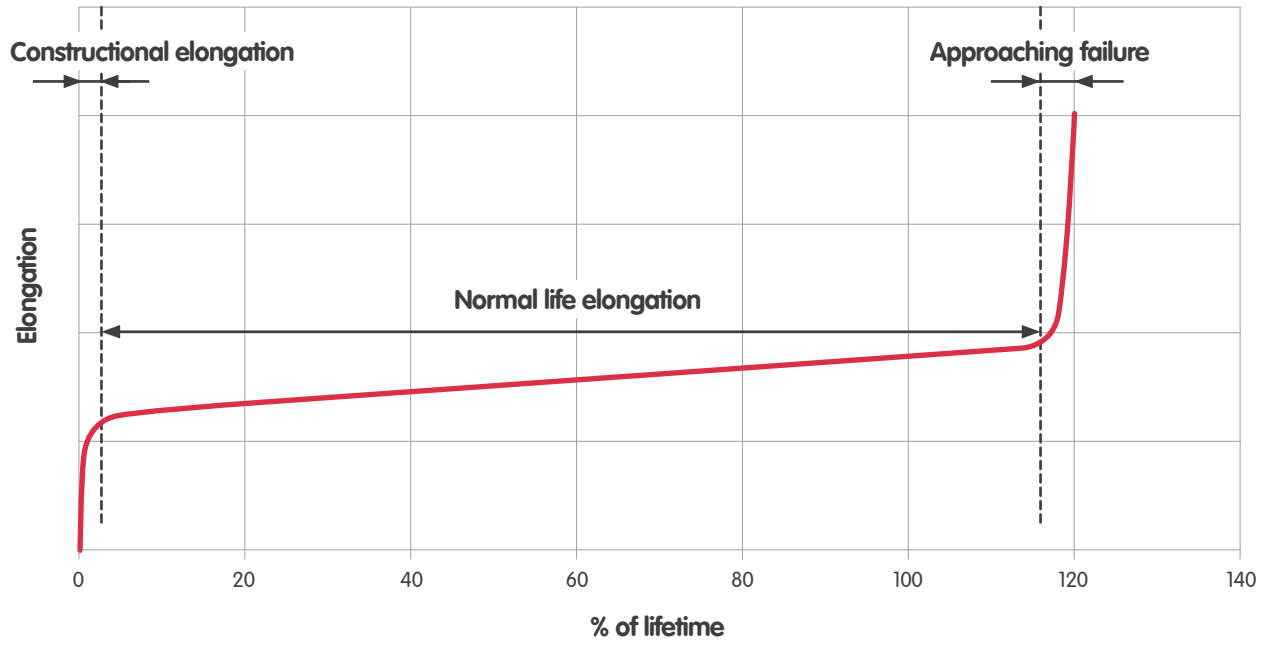


Pseudo-static properties

Elasticity modulus

	Orders of magnitude (±10 000 MPa)
Wires	210 000 MPa
Strands	170 000 MPa
Wire ropes	110 000 MPa

Elongation



Worldwide Market

From our manufacturing base in Bourg-en-Bresse, France, ArcelorMittal ROPES distributes its premium quality Hoisting Ropes around the world.

Algeria
Andorra
Angola
Argentina
Australia
Austria
Belgium
Brazil
Bulgaria
Chile
China
Denmark
Egypt
Finland
France
Germany
Greece
Guadeloupe
Hong Kong
Hungary
India
Indonesia
Ireland
Italy
Japan
Jordan
Latvia
Lebanon
Luxembourg
Martinique
Morocco
Netherlands
New Caledonia
New Zealand
Norway
Peru
Poland
Portugal
Reunion
Russia
Senegal
Singapore
South Africa
South Korea
Spain
Sweden
Switzerland
Turkey
United Kingdom
USA
Venezuela

ArcelorMittal ROPES
ENGINEERING EXCELLENCE

Notes

ArcelorMittal ROPES

ENGINEERING EXCELLENCE

25 Avenue de Lyon, BP 38
F-01002 Bourg-en-Bresse Cedex

T: +33 4 74 32 82 12
F: +33 4 74 32 81 05
E: lifting.ropes@arcelormittal.com

www.arcelormittal.com/wireropes