



# PORTS

High performance steel wire ropes





# CONTENTS

Meet Teufelberger-Redaelli	<b>4</b>
Leading in high performance steel wire ropes with added value	4
Getting the best performance out of your port crane	5
Technology	<b>6</b>
High Performance Wire Ropes	<b>8</b>
High performance wire ropes at a glance	8
<b>EVOLUTION</b> QS 816 V	10
<b>KEEPPORT</b> ® 8KP	12
<b>EVOLUTION</b> Q8	14
<b>EVOLUTION</b> Q9XT	16
<b>EVOLUTION</b> Q 810 V	19
<b>PACK</b> ® 1P	20
<b>RED</b> 1	22
Our Services	<b>24</b>
Discard criteria of TEUFELBERGER / SIDIS app	25
The right end termination	26
We leave nothing to chance	27
Services along the way	28
soLITE® - The innovation for lifting applications	<b>29</b>
TEUFELBERGER	<b>30</b>
Teufelberger-Redaelli is part of something bigger	30

## **WARNING**

Using these products may prove hazardous. Therefore, never use our products for purposes other than those they were designed for. Customers must ensure that all persons using these products are familiar with their correct use and the related necessary safety precautions. Please bear in mind that any of these products may inflict harm when used incorrectly or subjected to excessive loads.

TEUFELBERGER®, 拖飞宝®, REDAELLI®, PLASTFILL®, SUPERFILL®, PACK® and KEEPPORT® are internationally registered trademarks of TEUFELBERGER Group. Subject to technical modifications, typesetting and printing errors.

# Teufelberger-Redaelli:

## Leading in High Performance Steel Wire Ropes with Added Value

### The essence of Teufelberger-Redaelli

We at Teufelberger-Redaelli understand your day-to-day challenges and solve them together with you. We develop and produce high performance steel wire ropes that create added value by enhancing the efficiency and safety of your applications. Expect more: of our innovative steel wire ropes, our services, our experienced experts in development, application engineering, and sales – all around the globe. Being a family enterprise, we attach great importance to successful, long-standing business relationships. Our commitment does not begin and end solely with the supply of premium quality steel wire ropes, but we also accompany you throughout your work processes when it comes to optimizing efficiency and costs.

### Service and support prior to and after steel wire rope selection

We know that high performance steel wire ropes are able to unleash their full potential only if crane systems have been set up optimally and if the ropes have been installed correctly. Therefore, we also provide support during project planning, installation, and subsequent careful handling to maximize rope lifetimes. After all, the purchasing costs are just the tip of the iceberg.

### Application-specific, field-proven expertise and product portfolio

At Teufelberger-Redaelli you don't need to worry about making the right choices, as we can handle that for you. Our specialists know what matters in connection with your application and are therefore able to provide you with a clear product recommendation. Every single application requires a specific, custom-tailored solution.

#### **Rotation-resistant and non-rotation-resistant high performance steel wire ropes from Teufelberger-Redaelli are used for a variety of applications such as:**

- heavy-duty lifting applications in construction, cargo handling in harbors and on ships, and in industrial niches
- cranes in offshore and onshore oil exploration
- mining
- ropeways for the transport of passengers and goods
- forestry cranes and winches
- personal protective equipment against falls from a height

Four manufacturing sites for steel wire ropes and a combined total of more than 425 years of rope-making experience tally up to a unique wealth of expertise and an unmatched and proven production standard. The resulting high degree of flexibility allows us to keep delivery times to a minimum.



# GETTING THE BEST PERFORMANCE OUT OF YOUR PORT CRANE

Day in, day out, port cranes make sure that goods are shipped from one place to another. Whether they move containers, bulk goods, or operate in a multi-purpose terminal, these cranes are inseparably linked to the world of ports. Port cranes can function efficiently and successfully only if also the installed ropes deliver the necessary performance.

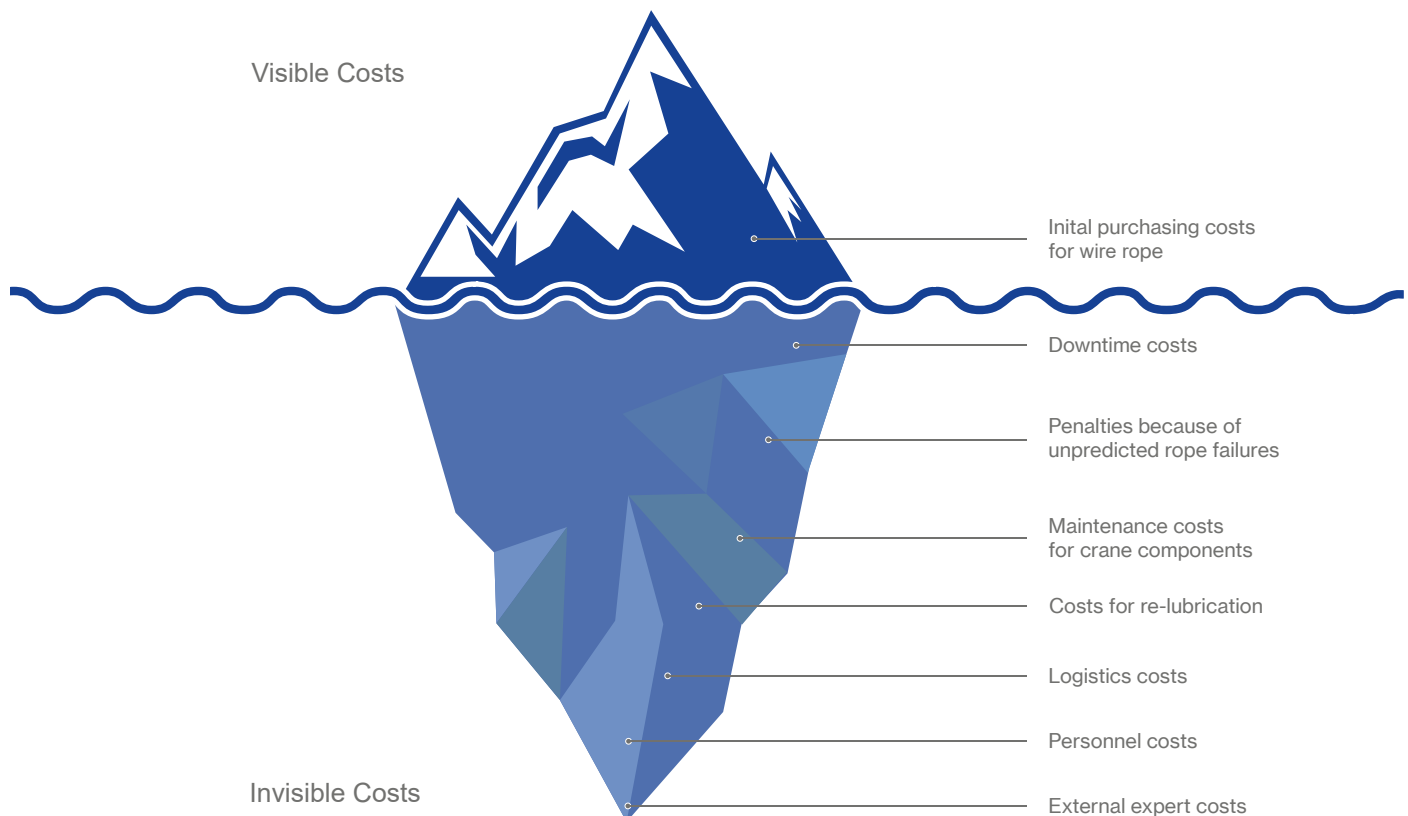
Customers from around the globe have, for many years and in various climatic conditions, relied on quality made by Teufelberger-Redaelli. Time and time again, we have modified and adapted the characteristics of our ropes in order to provide our customers with the best and most cost-effective solution.

## What matters most?

- ✓ Higher efficiency
- ✓ Reduced costs
- ✓ High wear resistance
- ✓ High resistance to shock loads
- ✓ Robustness against twisting
- ✓ Fast availability
- ✓ Safety in use

## Know your costs along the way

The initial purchasing costs for a wire rope are just the tip of the iceberg. Teufelberger-Redaelli will help you limit costs that may arise along the way.



# TECHNOLOGY - THE BASIS OF FLAWLESS PERFORMANCE

In manufacturing, research & development, as well as marketing & sales, Teufelberger-Redaelli focuses exclusively on high quality special purpose steel wire ropes. Breakthrough technologies and top quality products form the basis for a long lasting, successful relationship. The following short summary gives you a glimpse of our in-depth knowledge and understanding of high performance wire ropes.

## PLASTFILL® INSERT

The lubricated steel core is covered in a tight synthetic coat. This provides the following advantages:

- Long service life due to the permanent lubrication and the reduction of friction between the rope's core and its outer strands
- Resistance to compression and lateral pressure as well as to environmental influences and the ingress of dirt
- Higher breaking forces due to reduced surface pressures in the rope
- Reduced internal abrasion thanks to the exact positioning of strands with consistent clearances between them

## ACTIVE CORE LUBRICATION

Temperature resistant special grease with significantly improved lubrication properties:

- Higher resistance against corrosion of the core
- Improved service life due to optimal lubrication and the reduction of friction of the rope core

## SUPERFILL® COMPACTION TECHNOLOGY

Each rope strand is compacted by a special process, which significantly improves the rope's properties:

- Up to 30 % greater breaking forces than non-compacted ropes
- Prolonged service life due to lower specific loading
- Less abrasion on the rope and on reels and drums due to the rope's smooth surface
- Resistance against crushing in multilayer operations

## GALVANIZED WIRES

Our steel wires are galvanized before they are drawn in order to achieve high wire precision. This ensures optimal stability and service life. In combination with the PLASTFILL® technology, this galvanization ensures exceptional corrosion resistance.





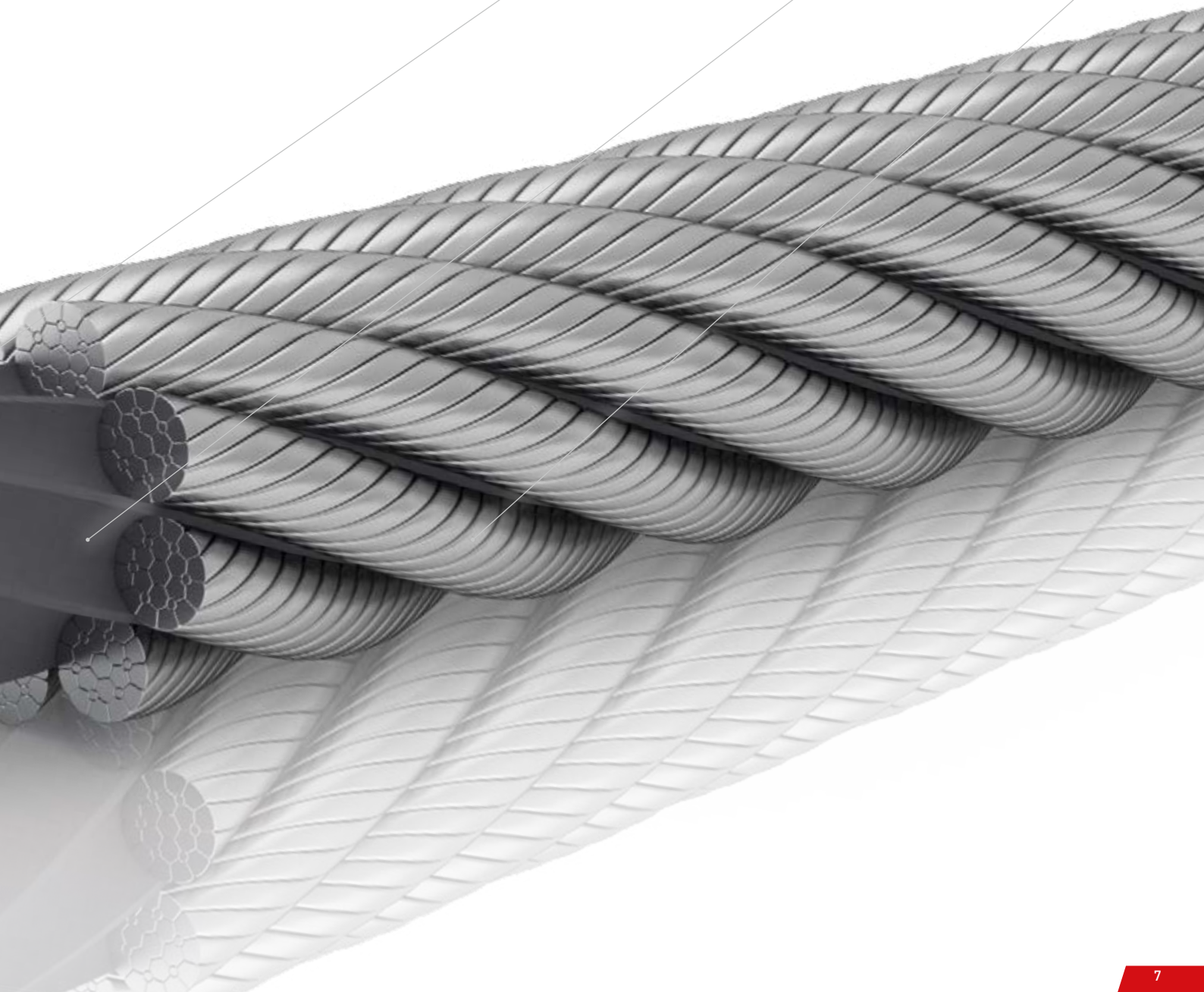
# Our technology. Your benefit.

Long service life, flexibility, quality, perfect spooling, rotation resistance, breaking force, safe and reliable in use.



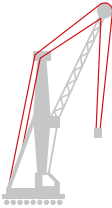
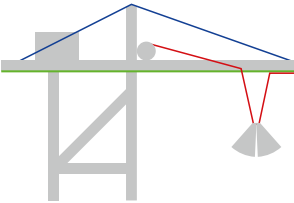
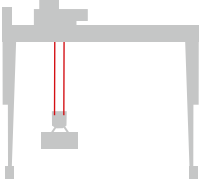
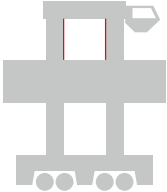
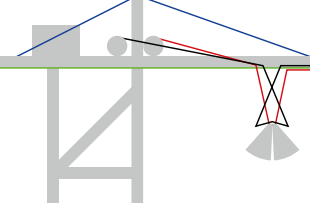
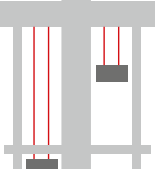
GALVANIZED WIRES

PLASTFILL®

SUPERFILL®



# High Performance Wire Ropes at a Glance

Crane type	Application	Ropes	
		 EVOLUTION QS 816 V	 KEEPPORT® 8KP
Mobile harbor cranes 	Hoist rope	X	X
	Closing rope	X	X
Ship to shore cranes 	Hoist rope	X	X
	Boom hoist rope	X	X
	Trolley rope	X	X
ASC, RTG, RMG 	Hoist rope		
	Anti-Sway		
Straddle carriers 	Hoist rope		
Ship unloaders 	Hoist rope	X	X
	Closing rope	X	X
	Boom hoist rope	X	X
	Trolley rope	X	X
Shiplifter 	Hoist rope	X	





EVOLUTION Q8



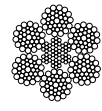
EVOLUTION Q9XT



EVOLUTION Q 810 V



PACK® 1P



RED 1

EVOLUTION Q8	EVOLUTION Q9XT	EVOLUTION Q 810 V	PACK® 1P	RED 1
X	X			
X	X			
X	X	X	X	
X			X	X
X	X		X	
	X	X		
			X	X
X	X	X		
X	X	X	X	
X	X	X	X	
X			X	X
X	X	X	X	

# EVOLUTION QS 816 V

Extreme resistance to negative external influences distinguishes this rope from others. SUPERFILL® compaction technology developed by Teufelberger-Redaelli provides high breaking forces and highest safety in use. Compaction in the core and a PLASTFILL® insert ensure stability against lateral pressure.

## ULTIMATE BREAKING FORCE

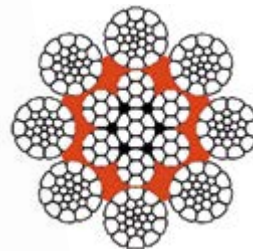
### Specifications

- Ordinary lay or lang's lay, right or left lay
- 12 – 42mm: 8 x K26WS – EPIWRC (K), RCN 09
- 44 – 50mm: 8 x K31WS – EPIWRC (K), RCN 11
- 50.8 – 60.33 mm: 8 x K42WS – EPIWRC (K), RCN >13
- Use without rope swivel

- ✓ SUPERFILL®
- ✓ PLASTFILL®

### Benefits

- Reliability and safety during operation: extremely high breaking forces and high safety factor
- Less abrasion: highest degree of compaction in the market
- Improved permanent lubrication: PLASTFILL® impregnation leads to less wear in the core



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK26WS- EPIWRC(K)	12		0.67	0.45	120	27,002	133	29,900
	14		0.91	0.61	163	36,752	181	40,697
	16	5/8	1.19	0.80	214	48,003	236	53,156
	18		1.51	1.01	270	60,754	299	67,275
	19	3/4	1.68	1.13	302	67,692	335	74,958
	20		1.86	1.25	334	75,005	369	83,056
	21		2.06	1.38	374	82,693	414	91,569
	22		2.26	1.52	408	90,756	451	100,498
	22.23	7/8	2.30	1.55	412	92,621	456	102,564
	24		2.68	1.80	480	108,007	532	119,601
	25		2.91	1.96	521	117,195	577	129,775
	25.40	1	3.01	2.02	538	120,975	596	133,961
	26		3.15	2.12	564	126,758	624	140,365
	28		3.65	2.46	656	147,009	726	162,790
	28.58	1 1/8	3.81	2.56	681	153,109	754	169,544
	29		3.92	2.63	701	157,697	777	174,625
	30		4.39	2.95	764	168,760	846	186,876



Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK26WS-EPIWRC(K)	31.75	1 1/4	4.92	3.30	841	189,023	931	209,314
	32		4.99	3.36	864	192,012	957	212,623
	34		5.64	3.79	964	216,763	1,068	240,032
	36		6.32	4.25	1,081	243,015	1,197	269,101
	38	1 1/2	7.04	4.73	1,222	270,767	1,354	299,832
	40		7.80	5.24	1,342	300,018	1,486	332,224
	42		8.60	5.78	1,482	330,770	1,641	366,277
8xK31WS-EPIWRC(K)	44		9.36	6.29	1,615	363,022	1,768	395,291
	44.45	1 3/4	9.55	6.42	1,648	370,486	1,794	403,418
	46		10.23	6.87	1,765	396,774	1,949	432,043
	48		11.14	7.49	1,922	432,027	2,093	470,429
	50		12.09	8.12	2,085	468,779	2,271	510,448
8xK42WS-EPIWRC(K)	50.80	2	12.43	8.35	2,117	475,835	2,344	526,913
	52		13.02	8.75	2,218	498,581	2,456	552,101
	54	2 1/8	14.04	9.43	2,392	537,671	2,648	595,387
	56		15.10	10.15	2,572	578,236	2,850	640,306
	57.15	2 1/4	15.73	10.57	2,679	602,228	2,966	666,874
	58		16.20	10.88	2,759	620,276	3,055	686,859
	60		17.33	11.65	2,953	663,791	3,270	735,045
	2 3/8	17.52	11.77	2,985	671,001	3,305	743,030	

# KEEPORT® 8KP

The allrounder within the Teufelberger-Redaelli product range for port applications. Perfect performance because of high breaking forces, high wear resistance, and high crushing resistance. KEEPORT® guarantees consistent performance, and high stability and load capacity.

## ALLROUNDER

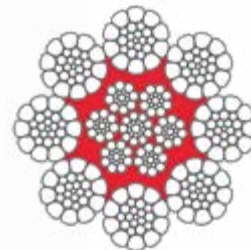
### Specifications

- Ordinary lay configuration, right and left hand lay
- 16 – 60 mm: 8 x K26WS – EPIWRC, RCN 09
- Galvanized finish
- Intensive lubrication for maritime applications
- Use without rope swivel

- ✓ SUPERFILL®
- ✓ PLASTFILL®

### Benefits

- Reliable lifetime results: plastification reduces internal friction and internal wear of the rope components
- High stability against fleet angles: extremely balanced rope design
- Optimum balance between flexibility and resistance: ideal degree of compaction
- Perfectly applicable on RTG and STS cranes: right mixture of bending fatigue and robustness



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK26WS-EPIWRC	16	5/8	1.18	0.79	204	45,763	225	50,675
	20		1.84	1.23	318	71,504	352	79,180
	22		2.23	1.50	385	86,520	426	95,808
	22.23	7/8	2.27	1.53	393	88,299	435	97,778
	24		2.65	1.78	458	102,966	507	114,019
	25.40	1	2.97	2.00	513	115,329	568	127,709
	26		3.11	2.09	538	120,842	595	133,814
	28		3.61	2.42	623	140,149	690	155,193
	28.58	1 1/8	3.75	2.52	649	145,964	719	161,632
	30		4.14	2.78	716	160,885	792	178,155
	31.75	1 1/4	4.63	3.11	802	180,202	888	199,546
	32		4.71	3.17	814	183,051	902	202,701
	34		5.31	3.57	919	206,648	1,018	228,830
	36		5.96	4.00	1,031	231,674	1,141	256,543
	38	1 1/2	6.64	4.46	1,148	258,131	1,271	285,840
	40		7.36	4.94	1,272	286,018	1,409	316,720





KEEPORT® is the result of in-depth research and a thorough field analysis on the customers' level of satisfaction with commercially available products. The customer-driven development represents a perfect balance between outstanding product reliability and the fulfillment of customer needs.

Maurizio Meleddu - Head of R&D, Teufelberger-Redaelli

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK26WS-EPIWRC	42		8.12	5.45	1,403	315,334	1,553	349,184
	44		8.90	5.98	1,539	346,081	1,705	383,231
	44.45	1 3/4	9.08	6.10	1,571	353,196	1,740	391,110
	46		9.73	6.54	1,683	378,258	1,863	418,862
	48		10.60	7.12	1,832	411,865	2,029	456,077
	50		11.49	7.72	1,988	446,902	2,201	494,875
	50.80	2	11.87	7.98	2,052	461,318	2,272	510,838
	52		12.43	8.36	2,150	483,370	2,381	535,257
	54	2 1/8	13.41	9.01	2,319	521,267	2,568	577,222
	56		14.42	9.69	2,494	560,594	2,761	620,771
	57.15	2 1/4	15.02	10.09	2,597	583,855	2,876	646,529
	58		15.47	10.39	2,675	601,352	2,962	665,904
	60		16.55	11.12	2,863	643,540	3,170	712,620
	60.33	2 3/8	16.74	11.25	2,894	650,530	3,204	720,361

# EVOLUTION Q8

EVOLUTION Q8 – the high performance hoisting rope for harbor mobile cranes – impresses with its exceptionally long service life and high breaking strength due to its innovative SUPERFILL® compaction. EVOLUTION Q8 lasts much longer!

## ENDURANCE IS EVERYTHING

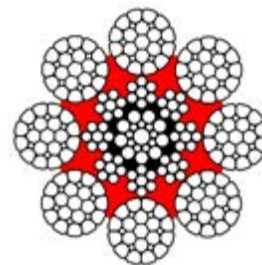
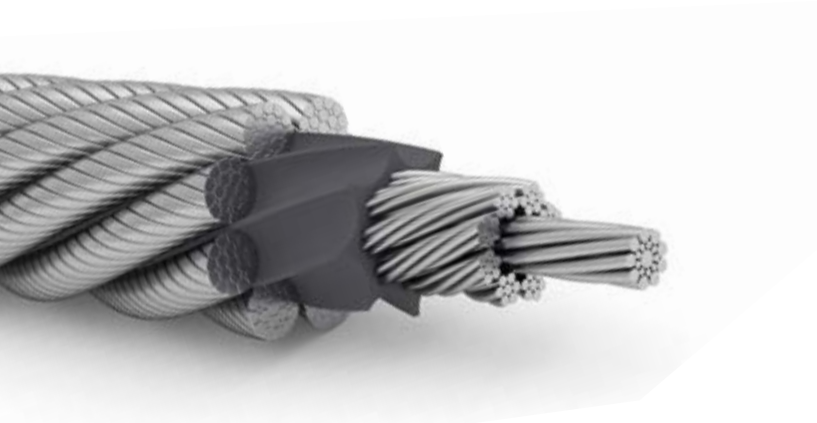
### Specifications

- Ordinary lay, right or left lay
- 14 – 54 mm: 8 x K25F – EPIWRC, RCN 06
- Use without rope swivel

- ✓ SUPERFILL®
- ✓ PLASTFILL®

### Benefits

- This rope caters exactly to market requirements: OEM approved for several years
- Increased flexibility: filler construction improves bending capacities
- Reduced inner wire breaks: 8 uncompact core strands increase flexibility of center
- Improved permanent lubrication: PLASTFILL® impregnation leads to less wear in the core



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK25F-EPIWRC	14		0.86	0.58	150	33,721	166	37,318
	16	5/8	1.13	0.76	196	44,063	217	48,784
	18		1.42	0.95	247	55,528	274	61,598
	20		1.76	1.18	306	68,792	339	76,210
	21		1.94	1.30	337	75,802	373	83,938
	22		2.13	1.43	370	83,179	410	92,172
	22.23	7/8	2.17	1.46	378	84,903	418	94,017
	24		2.54	1.71	441	99,141	502	112,854
	25		2.74	1.84	478	107,459	529	118,924
	25.40	1	2.84	1.91	493	110,894	546	122,798
	26		2.97	2.00	517	116,226	572	128,591
	28		3.45	2.32	600	134,885	664	149,273
	28.58	1 1/8	3.59	2.41	624	140,350	691	155,416
	30		3.99	2.68	688	154,669	762	171,304
	31.75	1 1/4	4.47	3.00	771	173,271	853	191,871
	32		4.54	3.05	783	176,025	867	194,909



Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK25F-EPIWRC	34		5.15	3.46	882	198,281	977	219,638
	36		5.73	3.85	999	224,584	1,097	246,615
	38	1 1/2	6.40	4.30	1,104	248,203	1,223	274,846
	40		7.09	4.77	1,223	275,017	1,355	304,539
	42		7.82	5.26	1,349	303,206	1,494	335,754
	44		8.64	5.81	1,480	332,717	1,639	368,462
	44.45	1 3/4	8.82	5.93	1,511	339,612	1,673	376,067
	46		9.44	6.35	1,618	363,710	1,792	402,752
	48		10.23	6.87	1,762	396,113	1,951	438,602
	50		11.15	7.49	1,912	429,835	2,117	475,921
	50.80	2	11.52	7.74	1,973	443,575	2,185	491,190
	52		12.07	8.11	2,067	464,779	2,289	514,670
	54	2 1/8	13.00	8.74	2,230	501,324	2,469	555,053



# EVOLUTION Q9XT

A recent development from Teufelberger-Redaelli, the EVOLUTION Q9XT high performance steel wire rope unleashes its full functionality especially on cranes used to handle bulk goods. Its novel, revolutionary structure – with its 4 core strands – makes it extremely durable and long-lived.

## ABSOLUTELY SHOCK LOAD RESISTANT

### Specifications

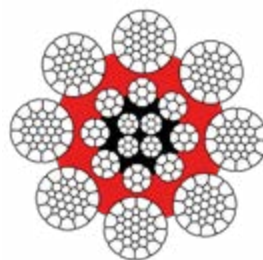
- Ordinary lay, right or left lay
- 20 – 54 mm: 8 x K31WS – EPIWRC, RCN 11
- Use without swivel

- ✓ Radial elastic core
- ✓ SUPERFILL®
- ✓ PLASTFILL®



### Benefits

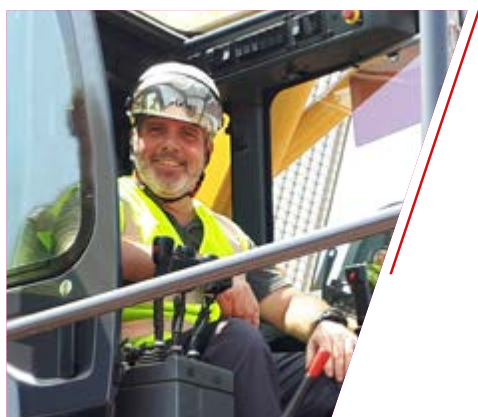
- Trouble-free operation: excellent absorption of shock loads due to eliminated king strand
- Extremely long lifetime: high RCN number allows a big amount of outer wire breaks
- Improved visibility of discard state from outside: four center strands reduce the risk of damage to the rope core
- Improved permanent lubrication: PLASTFILL® impregnation leads to less wear in the core



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbf/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK31WS- EPIWRC(K)	20		1.82	1.22	311	70,004	345	77,519
	22		2.20	1.48	377	84,705	417	93,798
	22.23	7/8	2.24	1.51	385	86,447	426	95,726
	24		2.62	1.76	448	100,806	497	111,627
	25		2.84	1.91	487	109,382	539	121,123
	25.40	1	2.93	1.97	502	112,910	556	125,030
	26		3.07	2.06	526	118,307	583	131,007
	28		3.56	2.39	610	137,208	676	151,937
	28.58	1 1/8	3.71	2.49	636	142,902	704	158,241
	30		4.09	2.75	701	157,510	776	174,418
	31.75	1 1/4	4.58	3.08	785	176,422	869	195,360
	32		4.65	3.12	797	179,211	883	198,448
	34		5.25	3.53	900	202,312	997	224,030
	36		5.88	3.95	1,009	226,814	1,117	251,161
	38	1 1/2	6.56	4.41	1,124	252,716	1,245	279,843
	40		7.26	4.88	1,246	280,017	1,379	310,076
42		8.01	5.38	1,373	308,719	1,521	341,858	





"EVOLUTION Q9XT is the latest high performance steel wire rope of Teufelberger-Redaelli for ports. Its innovative steel core ensures trouble-free operation."

Günter Jakaubek - Application Engineer

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbf/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8xK31WS- EPIWRC(K)	44		8.79	5.91	1,507	338,821	1,669	375,191
	44.45	1 3/4	8.97	6.03	1,538	345,787	1,703	382,905
	46		9.61	6.46	1,647	370,323	1,824	410,075
	48		10.46	7.03	1,794	403,225	1,986	446,509
	50		11.35	7.63	1,946	437,527	2,155	484,493
	50.80	2	11.72	7.87	2,009	451,640	2,225	500,121
	52		12.28	8.25	2,105	473,229	2,331	524,028
	54	2 1/8	13.24	8.90	2,270	510,331	2,514	565,113



# EVOLUTION Q 810 V

Optimizes the absorption of shock loads, knocks and vibrations due to its especially developed rope construction with the 4-strand core. The PLASTFILL® insert provides permanent lubrication of the steel core and results in an extremely long service life

## COUNTLESS BENDINGS

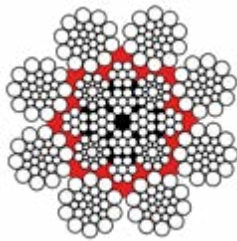
### Specifications

- Ordinary lay, right or left lay
- 12 – 32 mm: 8 x 26WS – EPIWRC, RCN 09
- Use without rope swivel

- ✘ Multilayer spooling
- ✘ SUPERFILL®
- ✔ PLASTFILL®

### Benefits

- Optimized absorption of shock loads, impacts and vibrations: no core protrusion because of special steel core
- Outstanding bending fatigue resistance: enabled by uncompacted rope design
- Perfect fit on complex reeving systems: excellent resistance against short bending cycles and counter-bendings



### Technical data

	Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
8x26WS-EPIWRC	12		0.62	0.42	105	23,605	116	26,078
	14		0.82	0.55	140	31,473	155	34,845
	16	5/8	1.09	0.73	188	42,264	208	46,760
	18		1.35	0.91	230	51,706	253	56,877
	20		1.68	1.13	281	63,171	311	69,916
	22	7/8	2.00	1.34	349	78,458	386	86,776
	24		2.41	1.62	413	92,846	457	102,738
	26		2.82	1.89	483	108,583	535	120,273
	28		3.28	2.20	569	127,916	630	141,630
	30		3.67	2.47	628	141,180	695	156,242
	32	1 1/4	4.39	2.95	729	163,886	807	181,421

# PACK<sup>®</sup> 1P

Flexibility, resistance to mechanical wear and high breaking force: these are the qualities a compacted 6-strand wire rope with plastified steel core must possess. This 6-strand rope with SUPERFILL<sup>®</sup> compaction technology and a PLASTFILL<sup>®</sup> insert combines all these characteristics for the smooth operation of port cranes.

## SIMPLY STRONG

### Specifications

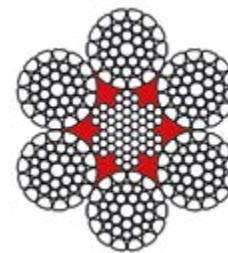
- Ordinary lay, right or left lay
- 16 – 30 mm: 6 x K26WS – EPIWRC, RCN 06
- 32 – 40 mm: 6 x K31WS – EPIWRC, RCN 08
- 42 – 56 mm: 6 x K41WS – EPIWRC, RCN 11
- Use without rope swivel

- ✓ SUPERFILL<sup>®</sup>
- ✓ PLASTFILL<sup>®</sup>



### Benefits

- Consistent product quality: state of the art manufacturing standard
- Reduced wear of sheaves and drums: due to internal and external lubrication
- Comparatively high breaking force: SUPERFILL<sup>®</sup> technology increases metallic cross section
- Reduced internal wear: PLASTFILL<sup>®</sup> technology protects steel core



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
6xK26WS-EPIWRC	16		1.18	0.79	192	43,203	213	47,840
	18		1.49	1.00	243	54,678	269	60,548
	19	3/4	1.66	1.11	271	60,922	300	67,462
	20		1.84	1.23	300	67,504	333	74,750
	22		2.22	1.49	363	81,680	402	90,448
	22.23	7/8	2.27	1.52	371	83,359	411	92,307
6xK31WS-EPIWRC	24		2.68	1.80	432	97,206	479	107,641
	25.40	1	3.01	2.02	484	108,877	536	120,565
	26		3.15	2.12	507	114,082	562	126,328
	28		3.65	2.45	572	128,633	634	142,441
	28.58	1 1/8	3.81	2.56	596	133,970	660	148,351
	30		4.19	2.82	657	147,665	727	163,516
	31.75	1 1/4	4.70	3.16	736	165,395	815	183,150
	32		4.77	3.21	747	168,010	828	186,045
	34		5.39	3.62	844	189,668	934	210,028
	36		6.04	4.06	946	212,638	1,047	235,464
	38	1 1/2	6.73	4.52	1,054	236,921	1,167	262,353
	40		7.46	5.01	1,168	262,516	1,293	290,696





Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
6xK41WS-EPIWRC	42		8.22	5.52	1,256	282,257	1,390	312,556
	44		9.02	6.06	1,378	309,779	1,526	343,032
	44.45	1 3/4	9.21	6.19	1,406	316,148	1,557	350,085
	46		9.86	6.63	1,506	338,581	1,668	374,926
	48		10.74	7.21	1,640	368,663	1,816	408,237
	50		11.65	7.83	1,779	400,025	1,970	442,965
	50.80	2	12.03	8.08	1,837	412,928	2,034	457,253
	52		12.60	8.47	1,925	432,667	2,131	479,111
	54	2 1/8	13.59	9.13	2,075	466,589	2,298	516,674
	56		14.61	9.82	2,232	501,791	2,472	555,655

# RED 1

The general-purpose wire rope (6x36-class) within the Teufelberger-Redaelli product portfolio. It fulfills the demand for highest reliability and constant quality by being made entirely of wires produced in Europe. Reliable and easy to handle. Suitable for all common rope applications.

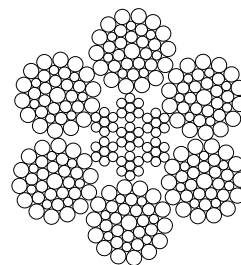
## FIT FOR PURPOSE

### Specifications

- Ordinary lay configuration, right and left hand lay
- 10 – 40 mm: 6 x 36WS – IWRC, RCN 09
- 42 – 54 mm: 6 x 41WS – IWRC, RCN 11
- Available on demand: version with plasticised steel core - Red1P
- Use without rope swivel

### Benefits

- Constant quality: European manufacturing standards
- First choice for boom hoist ropes: made of high-class wires
- Reduced installation and maintenance efforts: heavy lubrication during each production step



### Technical data

Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
6x36WS-IWRC	16	5/8	1.09	0.73	177	39,762	196	44,031
	18		1.38	0.93	224	50,324	248	55,726
	19	3/4	1.53	1.03	249	56,071	276	62,090
	20		1.70	1.14	276	62,129	306	68,798
	22		2.06	1.38	334	75,176	370	83,246
	22.23	7/8	2.10	1.41	341	76,721	378	84,957
	24		2.45	1.65	398	89,466	441	99,069
	25.40	1	2.74	1.84	446	100,208	494	110,964
	26		2.87	1.93	467	104,998	517	116,269
	28		3.33	2.24	542	121,772	600	134,844
	28.58	1 1/8	3.47	2.33	564	126,825	625	140,439
	30		3.83	2.57	622	139,790	689	154,796
	31.75	1 1/4	4.28	2.88	696	156,574	771	173,382
	32		4.35	2.92	707	159,050	783	176,123
	34		4.91	3.30	779	175,217	863	194,026
36		5.51	3.70	874	196,437	968	217,524	





Construction	Nominal Ø		Weight		Minimum breaking force at rope grade			
	mm	inch	kg/m	lbs/ft	1770 N/mm <sup>2</sup>		1960 N/mm <sup>2</sup>	
					kN	lbs	kN	lbs
6x36WS-IWRC	38	1 1/2	6.14	4.13	974	218,870	1,078	242,364
	40		6.80	4.57	1,079	242,515	1,195	268,548
	42		7.50	5.04	1,160	260,757	1,290	289,969
	44		8.23	5.53	1,273	286,183	1,416	318,243
	44.45	1 3/4	8.40	5.64	1,299	292,066	1,445	324,786
6x41WS-IWRC	46		8.99	6.04	1,391	312,790	1,547	347,831
	48		9.79	6.58	1,515	340,581	1,685	378,735
	50		10.60	7.12	1,644	369,554	1,828	410,954
	50.80	2	11.00	7.39	1,697	381,474	1,887	424,210
	52		11.50	7.73	1,778	399,710	1,977	444,488
	54	2 1/8	12.40	8.33	1,800	404,620	2,015	453,099





# DISCARD CRITERIA

The discard criteria for special steel wire ropes of Teufelberger-Redaelli are defined according to:

- ISO 4309
- API 2D FIFTH EDITION

This includes: reduction of rope diameter, corrosion and wire breaks. For assessing the discard condition based on wire breaks, the rope category number (RCN) is used. For special steel wire ropes of Teufelberger-Redaelli, this number is listed in the following tables.

Type of design	Diameter range mm	RCN*	n**
EVOLUTION QS 816 V	12 - 42	09	208
	44 - 50	11	248
	50.8 - 60.33	> 13	336
KEEPPORT® 8KP	16 - 60	09	208
EVOLUTION Q8	14 - 54	06	200
EVOLUTION Q9XT	20 - 54	11	248
EVOLUTION Q 810 V	12 - 32	09	208
PACK® 1P	16 - 30	06	156
	32 - 40	08	186
	42 - 56	11	246
RED1	10 - 40	09	216
	42 - 54	11	246

\* RCN = Rope Category Number \*\*n = Number of outer strands and total number of load-bearing wires in the outer layer of strands in the rope

## DETERMINING THE RIGHT POINT OF DISCARD WITH THE SIDIS APP

SIDIS (Simply Discard) provides assistance in determining the current condition of a crane rope and calculates the level of wear according to the discard criteria stipulated in ISO 4309. This makes the app an ideal tool for inspectors, maintenance managers and all those who inspect steel wire ropes for companies.

Save time and costs with a quick and comfortable crane rope inspection:

- Quick entry of the required rope data
- Convenient inspection of all crane rope types by means of stored RCN numbers – Teufelberger-Redaelli steel wire ropes can be added easily via a selection list
- Easy determination of the point of discard by means of traffic light system
- Support of your controlling department through rope related evaluations
- Processing of rope evaluations by exporting the data as PDF or sending them by e-mail

Download it for free now!



# THE RIGHT END TERMINATION

A true high quality rope must always include the right end termination. Teufelberger-Redaelli offers a large range of standard end terminations made in casting or swaging processes according to EN 13411. Apart from conventional terminations, our assembling departments are also equipped to process crane specific terminations.

## Teufelberger-Redaelli Pull-Eye

The first reeving aid with a guaranteed WLL (Working Load Limit) for Teufelberger-Redaelli steel wire ropes. A large number of crane ropes are provided with a so called "reeving aid" at their outer end in order to facilitate their installation on the winch drum of the crane or other mechanical handling devices. In most cases, these end terminations are welded, swaged, or otherwise fitted to the rope. Typically, rope end terminations, such as Becket Loops, Becket Eyes, welded chain links, pulling sleeves and the like, will also include a thinner pulling rope. It should be clearly understood that the use of these end terminations introduces a risk of damage or personal injury if not properly controlled and fitted to the wire rope in a competent manner.

The Teufelberger-Redaelli Pull-Eye helps: Teufelberger-Redaelli is one of the first rope manufacturers providing the weld-connected pull-eye corresponding to the requirements of ISO 16841 with guaranteed WLL (working load limit). Each rope end fitted with the Teufelberger-Redaelli Pull-Eye is provided with a safety tag in the form of a pictogram indicating the WLL. This ensures that the person who installs the rope will know for sure what the applicable maximum load is.

## WLL Teufelberger-Redaelli Pull-Eye

Nominal Size	Rope Ø [mm]	WLL [t]
5	15 – 19	0.35
6	20 – 24	0.5
7	25 – 27	0.75
8	28 – 35	1
10	36 – 45	1.5
13	46 – 56	2.5
16	57	5



# WE LEAVE NOTHING TO CHANCE

People's safety - and sometimes even their lives - depend on the reliability of steel wire ropes. For the selection of a high performance steel wire rope, reliable specifications such as breaking force, discard criteria, but also rotating characteristics, service life, and spooling characteristics are key for multilayer spooling use. Each parameter has a direct impact on the total operating costs.

If you notice certain behavior of a rope when using it on site, it will be too late. Therefore, we at Teufelberger-Redaelli consider all conceivable aspects like design, ambient temperatures, reeving systems, as well as specific applications right from the start when developing a rope. Using one-of-a-kind and state-of-the-art systems for testing and analyzing allows us to thoroughly examine every detail of the rope. This is how we develop premium high performance steel wire ropes excelling in each specific application.

- ✓ Precise planning: CAD
- ✓ Service life under scrutiny: bending fatigue testing machines
- ✓ Turning the inside out: the MRT-method (Magnetic Rope Testing)
- ✓ Precision with a big impact: electronic measuring equipment for efficiency testing
- ✓ Determining breaking forces and analyzing torsional behavior: tensile testing machines

## Rope end terminations subjected to endurance testing: dynamic fatigue tests and tensile testing machines

By means of dynamic fatigue tests and tensile testing machines, we analyze the influence of rope end terminations on the breaking forces of our high performance steel wire ropes. Our unique technical equipment allows us to carry out tests up to 3000 kN. Only suitable and correctly mounted rope end terminations make a rope complete. The information obtained ensures that the different rope types manufactured by Teufelberger-Redaelli work safely and reliably in combination with the right termination.

## Excelling through partnerships

Intensive partnerships with a sizable number of key users are clear examples of our focus on our customers' needs. Also, the long-standing cooperation with universities and research institutions ensures the lively exchange of ideas toward the development of new and existing products.



# SERVICES ALONG THE WAY - WE GLADLY SHARE OUR EXPERTISE

The quality of the right solution is usually not only driven by the technical features of the high performance wire rope itself, but also by the services that come with it. Teufelberger-Redaelli supports you right from the beginning when you are looking for the perfect solution by providing calculations and technical advice to make sure that the rope fits your entire crane system.

Teufelberger-Redaelli's network of experts provides competent support close to you. We share our expertise during installation, but also when maintenance work is necessary.

**24 h Hotline: +43 (0) 7242 615 1388**

## On and off field trainings

Your everyday challenge is to ensure the smooth performance of your equipment at predictable costs. More than 425 years of experience in the manufacture, installation and inspection of ropes has made Teufelberger-Redaelli what it is today - the best in rope handling.

In concise, yet comprehensive training, our experienced field engineers will share their expertise with you. Training sessions are vivid lessons offering theoretical and practical knowledge. The skills you can develop in this training are e.g.:

- Understand rope types and constructions to make the right choice
- Profound knowledge about installing ropes properly
- Know when the rope has to be discarded according to ISO 4309
- Know how to store the rope appropriately
- Improve your rope handling experience through practical lessons
- Socketing training
- Key insights into multilayer spooling
- Troubleshooting according to your needs

## Become a certified rope specialist





# soLITE® - THE INNOVATION FOR LIFTING APPLICATIONS

TEUFELBERGER, the mother company of Teufelberger-Redaelli, is the only rope specialist worldwide that is leading in both, the wire rope and the fiber rope world. In a joint effort spanning several years, TEUFELBERGER and Liebherr, one of the world's leading crane manufacturers, developed soLITE®, a ground breaking, innovative high strength fiber rope for challenging lifting applications, especially for use on tower, mobile, and crawler cranes.

## Patented soLITE® construction

soLITE® is a fiber rope featuring a unique, innovative, and patented fiber-rope based steel wire rope construction. We designed soLITE® by using the best, extremely lightweight, high strength synthetic fiber. The impressive result is a combination of the advantages of a high performance steel wire rope with those of a high strength fiber rope.

## soLITE® sets standards in determining point of discard for fiber ropes

While the point of discard for steel wire ropes can be determined reliably based on the number of broken wires, damage symptoms, or corrosion, this has so far not been possible for fiber ropes. For soLITE®, the point of discard can be determined redundantly through the defined wear of cover and a bending cycle counter on the crane.

In effect since 2017, the FEM 5.024 standard defines guidelines, particularly regarding the point of discard for the safe use of high performance fiber ropes on cranes. At the time when the point of discard has been reached, soLITE®, thanks to its construction, still has 100 % of its breaking load. This makes soLITE® even safer than a steel wire rope.

## soLITE® convinces in the wire rope world

High performance steel wire ropes are undoubtedly a good solution for many use scenarios. However, soLITE® offers you unbeatable advantages for many challenging lifting applications such as on tower, mobile, or crawler cranes.

- ✓ 80 % lower rope weight. Hence, lighter hook block and thus 10 % greater loading capacity than with steel wire rope
- ✓ Environmentally friendly – no lubricants
- ✓ No wear on crane components such as sheaves and drums
- ✓ Many times longer rope lifetime
- ✓ Higher crane availability
- ✓ Easy detection of point of discard
- ✓ Great ease of handling

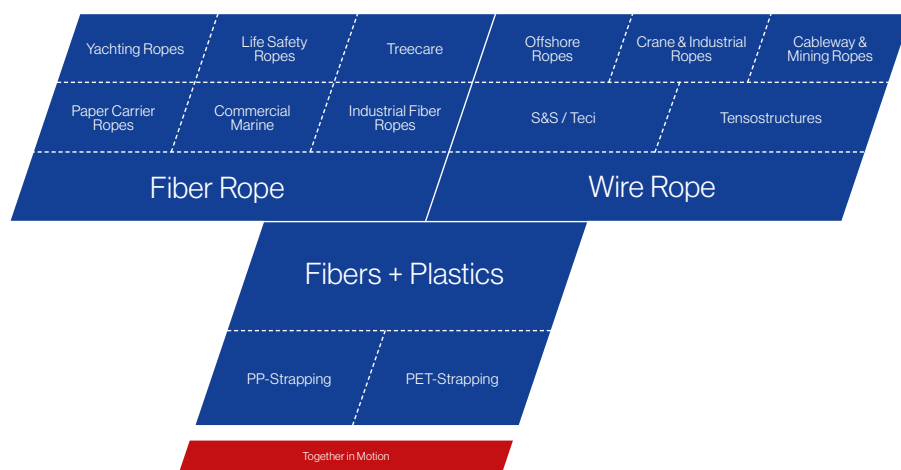


# TEUFELBERGER-REDAELLI IS PART OF SOMETHING BIGGER

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

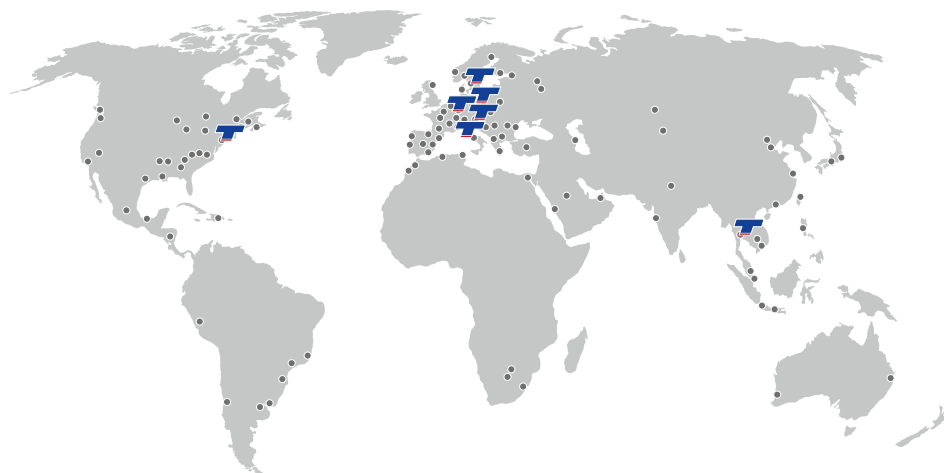
## Great diversity

TEUFELBERGER's products and services are destined for a wide variety of applications ranging from cranes and marine applications to packaging and through to personal protection. The continuity and stability of a family enterprise makes us a reliable partner who, competently and effectively, supports you in mastering your day-to-day challenges.



## Global presence ensures customer proximity

Manufacturing operations in various countries allow us to meet local quality and certification standards as well as customer requirements without difficulty. From our sites in Austria, the Czech Republic, the U.S., Italy, Sweden, and Thailand, and backed by a close-knit global network of distribution partners, we continue to satisfy the expectations of our customers.



## Innovative solutions through synergies

TEUFELBERGER is a leading specialist for fiber and steel wire ropes as well as strapping. The spectrum of technologies in TEUFELBERGER's portfolio generates various synergies between the extrusion of thermoplastics, the braiding of high performance fibers, and the processing of wires into ropes and strapping.

Especially fiber and steel wire products have brought about valuable synergies with regard to both application and manufacturing technologies, which have benefited our customers tremendously. This makes TEUFELBERGER your ideal partner right from the project planning phase.

5% of TEUFELBERGER's employees are active in research and development and make sure that our customers have access to the latest innovative rope technologies. 10% of the entire investment volume is committed to development and quality assurance.





**REDAELLI TECNA SPA**

Via Alessandro Volta, 16  
20093 Cologno Monzese (MI), Italy  
Telephone: +39 0225307381  
wireropes@redaelli.com

**TEUFELBERGER Seil Ges.m.b.H.**

Böhmerwaldstraße 20  
4600 Wels, Austria  
Telephone: +43 (0) 7242 615-0  
Fax: +43 (0) 7242 605-01  
wirerope@teufelberger.com

[www.teufelberger-redaelli.com](http://www.teufelberger-redaelli.com)

