

Ropes 360[®]

We know the ropes.

Rope inspection

Rope maintenance

Training

Installation



Ropes 360 Services



Contents

- 05 Our services offerings**

We offer many services for both steel & synthetic ropes to extend your service life and maximise your safety.
- 06 Working safely with ropes**

We offer training, supervision and support on rope installation, maintenance, and inspection. With sufficient training and knowledge, rope users make the correct decisions leading to longer rope life.
- 08 Lubrication**

The correct use of lubrication can help protect ropes, machines, and lives.
- 09 Our technology centre**

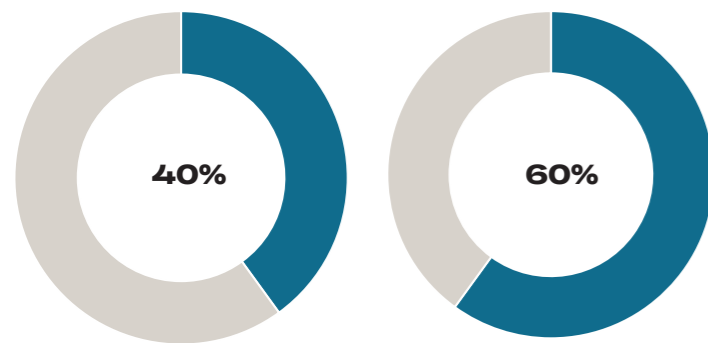
The Bridon-Bekaert Technology Centre (BBtec) is a world leading centre of excellence for rope technology development, testing, analysis, and verification.
- 10 Inspection**

Inspection is the number one preventive measure against issues and the number one attribute to safety. Inspecting devices are written into laws and regulations all over the world for a variety of machines.
- 12 Advanced inspections**

The main methods of advanced rope inspection we offer are Magnetic rope testing, VisionTek, and drones . These devices can be offered as one-time inspections, or as permanent continuous testing devices.



Advanced services



Rope issues

Machine maintenance

Rope issues

Maintenance and installation

Ropes 360 looks for opportunities to extend your service life. The majority of issues found on ropes globally relate to maintenance issues on the system, or with the rope installation. Ropes 360 can prevent these issues from happening. With reasonable rates and a global reach, we provide support with all aspects of rope and rope service.

Due to the factors affecting rope life, Bekaert endeavours to be on the forefront of technology, diversifying and investing in people and technology to address all the customers' needs. We believe that a combination of both traditional services and advanced services, including continuous monitoring are the future of rope service.

Our capabilities are split into five fields, including installation, inspection, maintenance, training, and reporting.

In recent years, we have been focused on full packages and developing expertise in other aspects affecting rope life. These now include sheaves, welding, drums, and even addressing application design issues. The full preventative maintenance package starts with a pre-inspection, and ends with full satisfaction and stress relief for the customer as their asset is safe and working well.

Maximizing performance is an integral part of our services offering. Having ropes work safely is our top priority, however, also achieving the longest potential service life ensures that the customer maximises their profit and efficiency.

Our offerings

We offer the following services for both **steel and synthetic rope**:

Installation & Training

We offer installation on a variety of applications and training courses for rope installation, inspection, and socketing, to ensure optimum rope performance.

Inspection

We offer a wide range of inspection systems.

Maintenance

Maintenance of ropes are as important as the maintenance of a car engine. Lack of maintenance results in premature failures and compromised safety.



1

Installation / Training

- Installation
- Winch hire
- Socketing training
- Inspection training

2

Inspection

- Visual inspection
- VisionTek inspection
- MRT inspection
- Drone inspection
- Ultrasonic inspection

3

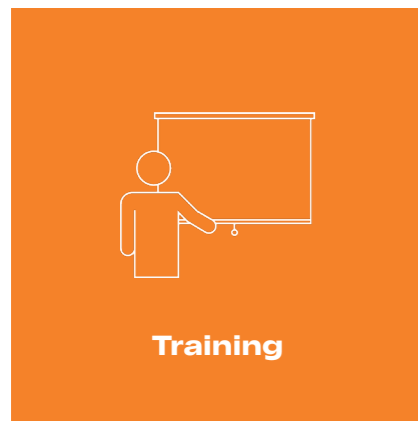
Maintenance

- Relubrication
- Repairing
- Socketing
- Retensioning
- Splicing

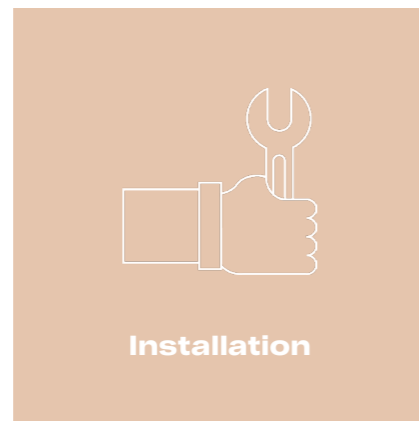
Working safely with ropes

Ropes 360 offer training, supervision and support on rope installation, maintenance and inspection. With sufficient training and knowledge, our customers can make the correct decisions, leading to maximised rope life.

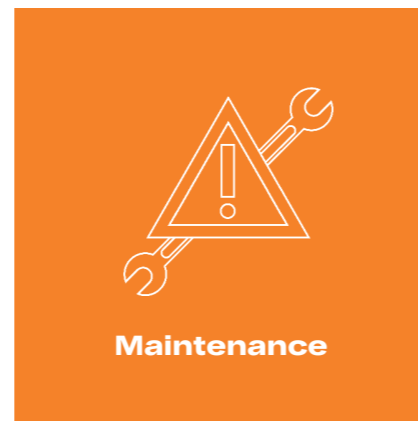
In specific applications, occasional tasks call for a tailored strategy. In such instances, our collaborative approach involves harnessing our expertise and leveraging the deep system knowledge of our clients. Together we can achieve the desired safety and performance every time. That is the advantage of the Ropes 360 model.



Training



Installation



Maintenance

Training

Training is essential for understanding ropes and how to maintain them. Bekaert offers a variety of courses across many applications.

- Introduction to wire rope course - learn all the basics of rope manufacturing, inspection, laws, and more.
- Wire rope handling and inspection course - inspection training tailored to the application in question.
- Socketing inspection - both theoretical and practical courses.
- Lifting equipment inspection.
- Deep shaft mining inspection and maintenance.

Installation

We offer proven procedures and expert consultancy to ensure the installation of your rope is right first time, every time. Correct installation is vital for ropes to work to their full potential.

- Supervision Services - use our knowledge with your people, creating a great knowledge and training platform.
- Spooling Capabilities (up to 450T weight capacity with associated back tension).
- On site rope connections including splicing, welding and socketing.

Maintenance

Maintenance encompasses a wide range of tasks aimed at extending the product's lifespan. A vital element in ensuring safety and efficiency of your equipment.

- Rope Maintenance -Relubrication, Reterminating, and rope repairs.
- Monitoring - vibrations, tensions, and rope condition
- Rope Splicing - create a new rope of any length, repair a damaged rope, or alter an existing rope to suit a changing application.
- Ropes 360 also has a range of products to help you maintain the system, including sheave gauges, verniers, lubricants and relubrication devices.

Bridon-Bekaert Technology Centre (BBtec)

The Bridon-Bekaert Technology Centre (BBtec) is a world leading centre of excellence for rope technology development, testing, analysis, and verification. BBtec is equipped with unique equipment capable of testing steel/synthetic ropes and wires. With extensive forensic analysis laboratory facilities and specialists capable of conducting detailed forensic evaluation of new, retired or samples of in-service ropes, BBtec is an integral part of the Ropes 360 program.

Forensic Services

BBtec can perform detailed forensic examinations on wire ropes returned from the field to support customers with "slip and cut" activities or to provide a post service assessment. Controlled rope disassembly provides qualitative and quantitative information on rope performance including evaluation of lubrication, corrosion, wear, and other degradation mechanisms. Results from the evaluation can be assessed against international (such as ISO4309) or customer standards to provide valuable information on the service life and performance of the rope.

Mechanical Testing

BBtec is equipped with mechanical testing equipment to determine test data in accordance with international standards. Destruction tests can be conducted to determine the actual breaking load of the rope; modulus tests and load diameter data can also be recorded. Mechanical testing of individual wires (post spin testing) determines the residual properties of the individual elements of the wire rope.

Application and Technology Specialists

The Applications team specialise in understanding how wire ropes integrate onto the end user's equipment by using information obtained from investigations.



Lubrication

Protecting ropes, machines, and lives

A wire rope or strand is manufactured by twisting wires around a core in a helical pattern. Each individual wire needs to be free to move during rope useage, similar to an engine in a car. Compacted strands, although designed to act as one, also need to be well lubricated to get the best out of the rope.

A rope without lubricant will fail internally due to increased friction and internal abrasion which occurs with steel to steel contact. Externally, rope life can be heavily affected by many factors, including the operating environment. Both internally and externally, lubrication is of paramount importance to rope life.

Lubrication can be split into two categories, build lubricant and service dressing. The build lubricant in the majority of the market is wax based, however different components are combined to give improved characteristics. The mixing of incompatible ingredients can affect factors such as the viscosity of the lubricant. which is why chosing the correct service dressing affects the rope life

There are three specific characteristics of rope lubrication which have to be considered, including the following:

- No melt lubrication - for hot works crane
- Good wash off resistance - for offshore or marine purpose
- Friction lubricant - for friction driven systems such as minehoists and elevators.

The type of service lubricant and frequency of application varies by the rope construction, the operating conditions, and its functional application. Using the incorrect service lubricant can be significantly detrimental to the assets performance. Bekaert's unequalled experience in the world of wire rope manufacture and many years spent in the development of service lubricants have been used in the formulation of the Brilube product range.



Case study

Location
Brescia, Italy

Application
Hot works ladle crane

Temperatures
Average 80° c
Highest >350° c

Previous rope
6x36 IWRC using wax based
lubricant drop point 110°C

Comments
Rope becomes dry after one month and wires begin to loop

Life time
2.2 months

New rope
Same construction,
relubricated with
Brilube HR

Comments
Ropes relubricated once a month and no issues found

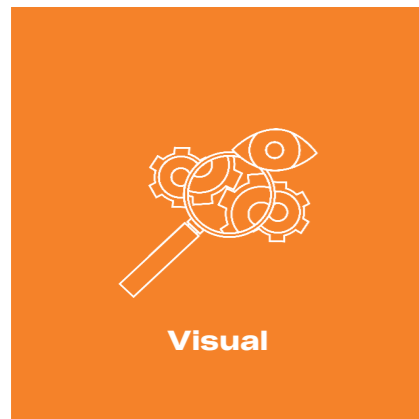
Life time
3.5 months

Lubrication Type	NLGI Grade	Corrosion Resistance	Operating Temperature	Description
Brilube 30	Solvent liquid	-	-30°C to +60°C	Semi-dry thin film lubricant for surface cranes
Brilube 40	Solvent liquid	-	-55°C to +40°C	Synthetic lubricant for friction driven installations
Brilube 70	0	Pass	-40°C to +70°C	Medium offshore lubricant w/ high corrosion properties
Brilube Ultra 2	2	Pass	-40°C to 120°C	Hybrid EAL compliant with US EPA VFP permit
Brilube HR	1	Pass	0°C to >400°C	Specific for resistance to high temperatures

Inspection

Inspections are written into laws and regulations all over the world for a variety of equipment including winches, stay cables, mines, cranes, anchor lines etc. In some case a simple inspection made visually is enough to judge the condition of the system; and in some cases more advanced methods and technology have been adapted to inspect more accurately. Inspection is both a preventative measure and a problem identifier aiding in the reduction of issues and improving safety.

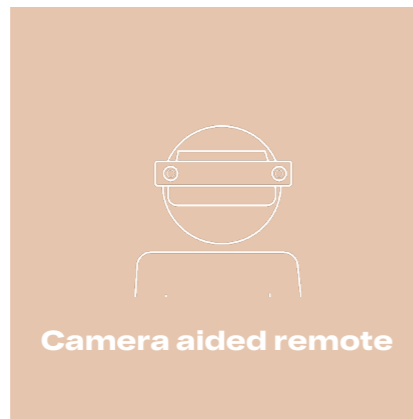
Our visual inspections can be complimented with additional aids to help get the correct images in order to make a judgement on condition of the rope.



Visual inspection

Although advanced systems exist in the market to inspect individual components. There is no better way to inspect a full system than by having an expert look over it.

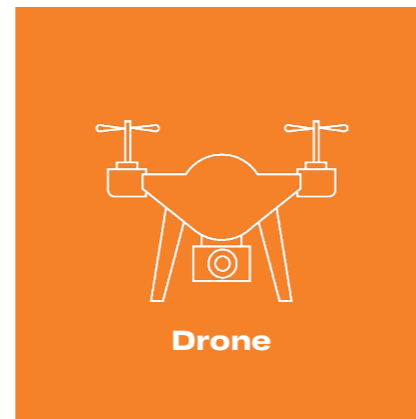
- Inspect rope using traditional tools.
- Inspect sheaves and drums using traditional tools.
- Ability to measure system issues such as fleet angles or sockets.
- Ability to reach areas that advanced measurements cannot.



Remote inspection

Remote inspection is a way to bring visual inspection to the customer without bringing the personnel.

- Quick response on rope issues.
- Can be leased out for applications where inductions and certification can often be time consuming.
- Expert opinion without the cost of transporting the expert.

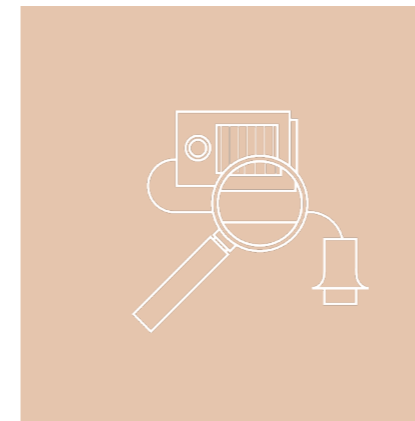


Drone Inspection

Drone inspection allows an accurate observation of ropes and equipment in hard to reach and confined places.

- Ability to check hard to reach places without climbing, or creating access platforms.
- Ideal for boom hoists and structural ropes to make a quick check for rope surface issues or rope slippage.
- Different point of view of the rope.

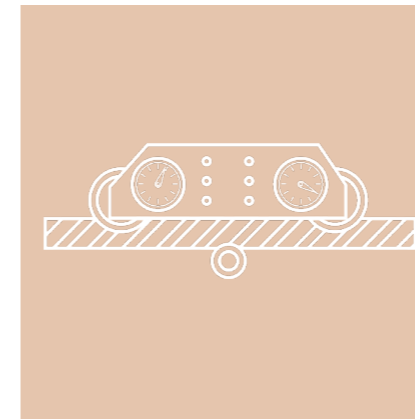
UT Inspection



Ultrasonic inspection allows us to inspect the inside of sockets for potential wire breaks.

- Excellent test results up to 100mm into socket neck
- Mostly used for structures and fixed ropes, but can be used on any termination with larger wired strands/rope

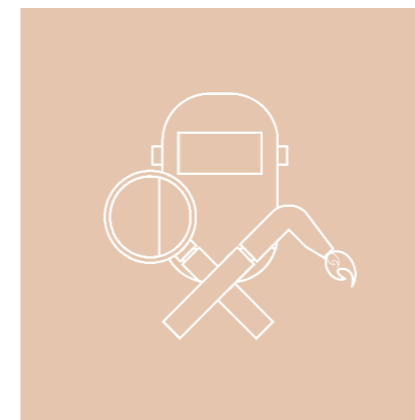
Tension Measuring



Tension Measuring ensures that the ropes are using even tensions. This is of paramount importance in applications where multiple ropes are being used for hoisting.

- Vital inspection for some applications
- Often forgotten after initial installation
- Different sizes available for different ropes

Weld Inspection



Weld inspection, including MPI (Magnetic Particle Inspection), is available across all equipment from lifting gear to supporting structures.

- Increased safety of structures and fittings
- Increase the usage and life of lifting appliances

Advanced Inspections

We invest heavily in finding the best inspection methods to suit our customers' needs. The advanced service portfolio is always growing with bespoke solutions. The main methods of advanced rope inspection we offer are Magnetic rope testing and VisionTek. These devices can be offered as one-time inspections, or as permanent continuous testing devices.

Magnetic rope testing

Magnetic rope testing (MRT) is a method of checking for defects and deterioration in steel wire ropes. Many ropes deteriorate from the inside, which means a traditional visual examination is not sufficient. MRT is recognised across many safety critical industries as an appropriate method for aiding the condition assessment of ropes. MRT uses Magnetic Flux Leakage techniques to identify loss of metallic area (LMA) or wire breaks as local faults (LF) in ropes in service.

VisionTek

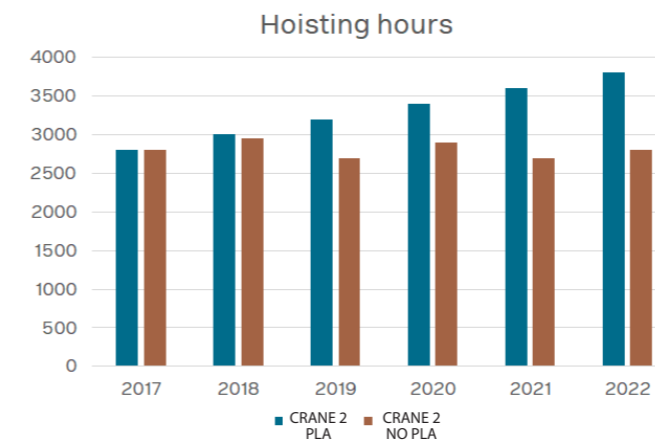
VisionTek inspects rope parameters and the external surface of the wire rope. The rope passes through a camera system where diameter and lay length are measured. Algorithms are used to detect defects such as lubrication amount, wire breaks, and heavy abrasion. Vision Tek has the capability to remove the need for visual inspections with a much more accurate faster solution, creating a safer and more efficient asset.

Feature	MRT	Visiontek	
		Measure	Surface Analysis
Diameter		•	
Lay length		•	
Roundness		•	
Waviness		•	
Axis Alignment		•	
Surface Condition			•
Image Recording			•
Loss of Metallic Area	•		
Internal Broken Wires	•		
External Broken Wires	•	•	•
Abrasion	•		•
Lubrication			•
Internal Corrosion	•		
External Corrosion	•		•

Mid/post life analysis

Although advanced inspections can test the working length of the rope, the best way to fully maintain and recertify a rope is to run it through our mid life recertification. A rope is run onto a winch and can be immediately reinstalled or optionally a second rope can be installed. A report is produced and the recertified for reuse.

Post-life analysis is part of our MORE program, in which a rope is taken off an application slightly early and analysed down to extreme details to find where the deterioration is starting. The next rope can then be modified to increase life. This process can be taken in steps, giving the safest and most reliable way to better rope life.



Conclusion

The crane with PLA and inspections made by ropes 360 resulted in increased hoisting hours and a much more stable life.



Bespoke model

There are many things that can affect the rope life and therefore many things we can inspect. We make suggestions on what can go wrong with the rope. These issues can be application and sometimes rope-type specific.

Straightforward process

Step 1

Clean the rope - vital step in identifying issues on the rope

Step 2

VisionTek - external condition assessment with rope parameter analysis

Step 3

MRT - internal condition assessment specifically targeting corrosion and wire breaks

Step 4

Termination - check condition of the rope terminations, both visually and with Ultrasonic testing if applicable

Step 5 - MLA only

Relubricate the rope - pressure lubrication is the only way to get lubricant beyond the outer layer - reterminate rope if necessary

Step 6

Take a sample - 2-5m sample needed to be able to do a break test and check the tensile condition of the rope

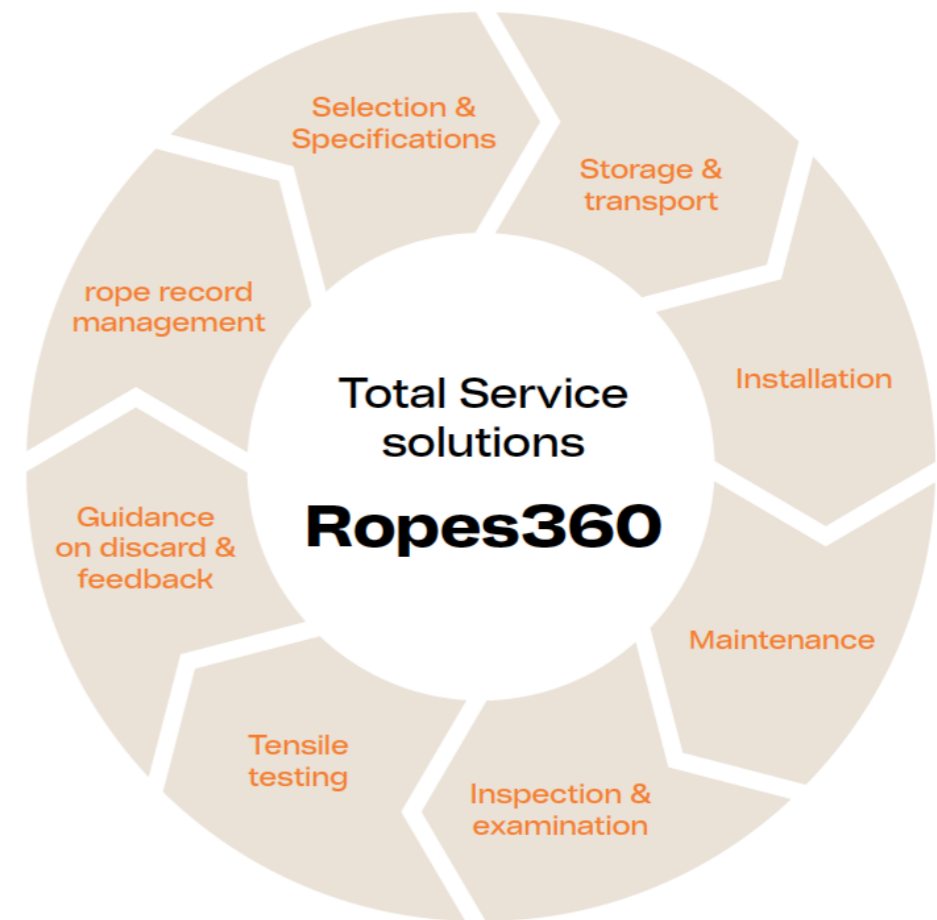
Step 7 - PLA only

Take samples of the rope in worst affected areas, perform strip down assessment and forensic test identifying areas and cause of deterioration

Ropes 360 source and stock inspection equipment and parts to make your life easier. Plated verniers, steel and synthetic sheave gauges, and lubricant all in stock. Sourcing of wire rope sheaves, drums, pressure rollers, lubrication devices, anti-slag systems, and terminations all available on request.



Notes



Contact us
ropes360@bekaert.com

A large, white, stylized letter 'B' centered on the page. The background features a blurred, diagonal pattern of dark brown and black lines, suggesting a rope or cable structure.

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