INTELLIGENT CRANES

KONECRANES®

Our knowledge and ability at your service

By choosing Konecranes, you can apply our extensive knowledge to improve your productivity and lift not only your steel, but your entire business as well.

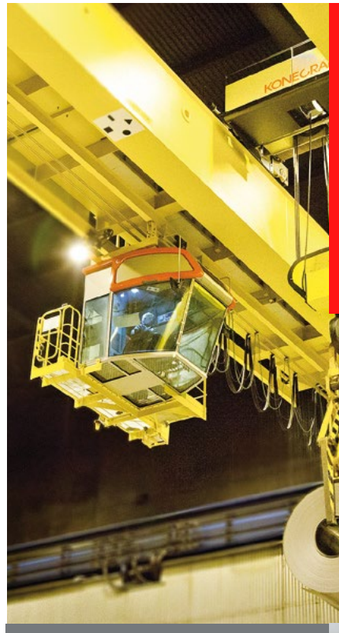
Lifting through every process in the mill
We work with you to lift heavy and dangerous items throughout your operation, from moving iron ore and recycled steel to pouring hot metal and shaping products in the rolling mill.

In-house analysis and engineering
Our own expertise and experience are available to you. We do not outsource our skill. Many of our engineers have worked in steel production. They know how steel is made, from raw material to the finished product and beyond.

Using the latest technology
Konecranes is known worldwide for creating and advancing new lifting technology. Smart Features such as Load Control, Sway Control, Target Positioning and Protected Areas, help reduce operator error. Our unique energy-saving technology uses regenerative network braking to reduce electricity costs and environmental impact.

Keeping your crane running
We train your people to operate and take care of your crane. Specialized maintenance services applied to your equipment are recommended throughout its lifetime. Maintenance done properly is an investment, not a cost.

Working together, our goal is to keep your steel-making lifting equipment working safely and efficiently for a long time to come.



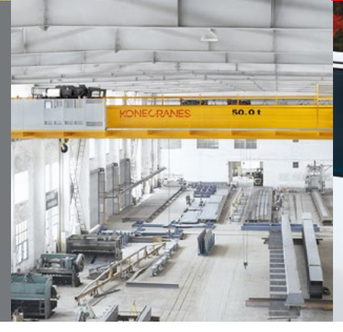
WE KNOW THE STEEL MAKING PROCESSES

OVER 600 SERVICE LOCATIONS WORLDWIDE

OVER 1000 HEAVY-DUTY PROCESS CRANE INSTALLATIONS

100´s OF SERVICE AGREEMENTS WITH STEEL CUSTOMERS

THE RESOURCES TO DELIVER, INSTALL AND MAINTAIN CRANES ON EVERY CONTINENT



ACTIVE IN ALMOST 50 COUNTRIES

Safety first, last and everywhere

At Konecranes there is no job so important and no service so urgent that we cannot take the time to perform our work safely and correctly.

Safety in a steel works
Open flame, molten steel, severe heat, dust, continuous production, huge and potentially dangerous loads. Scrapyard, melt shop, rolling mill, storage areas. In each environment and every process, safety must be built into the design, operation, and maintenance of your cranes.

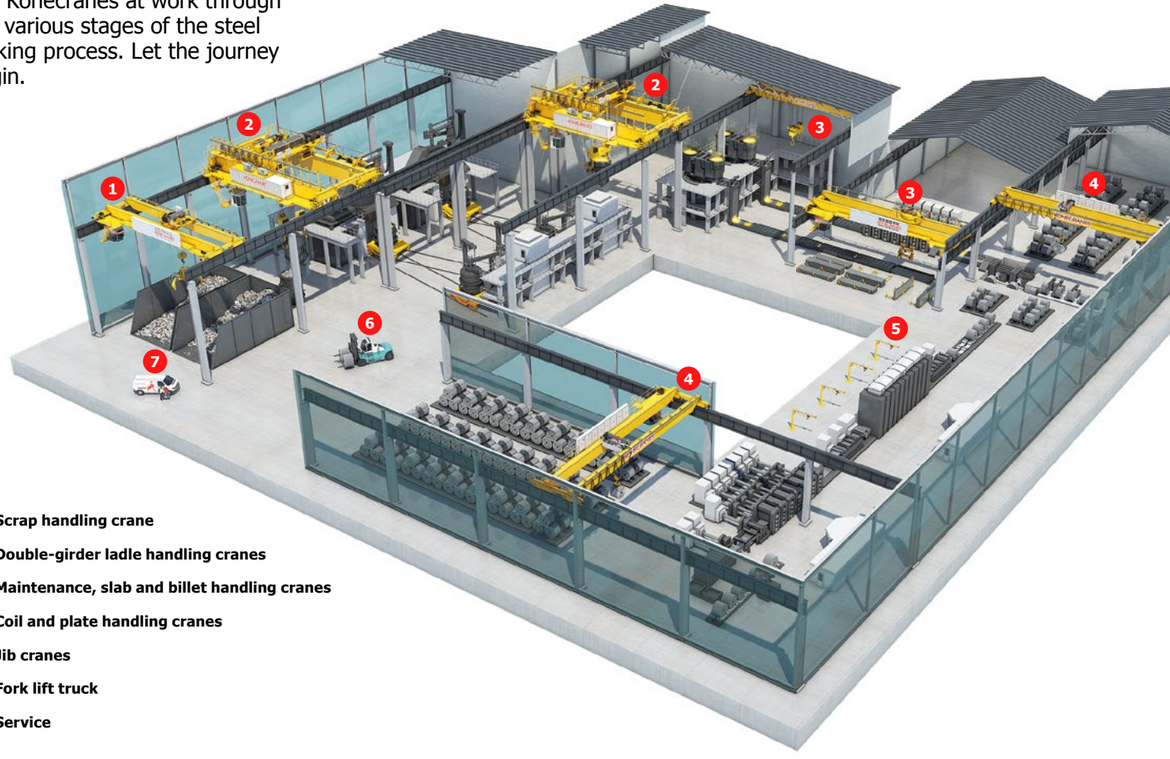
Safety in design
Does your crane provider adhere to the international and local standards applicable in your jurisdiction? What about design for complex processes, environmental risks, human error, component failure, maintenance, and ergonomics? Our long experience in the steel industry equips us to know what works and what doesn't.

Safety in operation
A safe crane is the product of a good design, regular maintenance and safe use. Take advantage of our expert training, so that your operators work with skill and confidence. Features such as Overload Protection, Sway Control, Target Positioning and Protected Areas can make valuable contributions to safety when used correctly.

Safety in maintenance
The better a crane is maintained, the safer it will be. We prefer to take care of your cranes across their entire working lives and will recommend a Konecranes service contract as an investment in the continuous productive and safe use of your cranes.

We know the steel making process

In the pages that follow, you will see Konecranes at work through the various stages of the steel making process. Let the journey begin.



1. **Scrap handling crane**
2. **Double-girder ladle handling cranes**
3. **Maintenance, slab and billet handling cranes**
4. **Coil and plate handling cranes**
5. **Jib cranes**
6. **Fork lift truck**
7. **Service**

A safe crane is the product of a good design, regular maintenance and safe use

Trash and treasure

THE SCRAPYARD

Scrap metal can arrive at a steel mill by sea, rail or road. A crane is needed that can reach into the delivery vehicle and unload it. Speed is vital: the faster the vehicle is unloaded, the sooner it can depart.

When your crane fits the size of the vehicles that supply your scrapyard, efficiency can be maximized. Unloading is then continuous, with little sway and side movement, keeping each duty cycle short. Scrap is a difficult material, with no defined shape for a hook or tong to fit onto. A claw grab picks up anything it can work its teeth around. A magnet pulls complete pieces of metal onto its surface. We recommend unloading attachments that can be changed easily. The choice of attachment will be determined by what is being moved: a claw grab is needed for non-magnetic materials.

Sometimes more scrap is received than can be processed immediately. And it will often be mixed, needing to be sorted before smelting. You might have a large storage area, and your crane must be able to reach all parts of this area to access the right materials quickly. Delays are costly: a fast, reliable crane will deliver the right metal to the smelter on time.

A **scrap unloading crane** for ships is built on the basic design of a **ship-to-shore (STS) crane**. Once onshore, a scrap crane is usually an **overhead traveling crane** for unloading a train or road vehicle, sorting the material, and loading the scrap bucket in readiness for the furnace.

Both crane types can be adapted for your load types and site conditions, and equipped with a level of automation that fulfills your requirements.

Some like it hot

THE MELT SHOP

Steel-making is a continuous process. The melt shop is a hazardous environment of extreme heat, choking dust, hot metal, and naked flame. Melt shop cranes must be able to lift and carry buckets of liquid metal safely.

The ingredients for steel come from two main sources: raw materials and scrap. Because they are different substances, they are treated separately. Iron ore and coking coal are combined in a direct reduction process to produce solid metallic iron. A **ladle crane** lifts the melted iron for mixing with scrap to create molten steel.

The scrap coming from the scrapyard is loaded in the furnace with an **overhead charging crane**. The main hoisting machinery lifts the bucket to the furnace for melting. An **auxiliary hoist** on the crane opens and closes the bucket during loading. Depending on the facilities, a basic oxygen furnace or an electric arc furnace could be used.

From the initial furnace blast in the steel creation process, a **teeming crane** helps to mix the molten metal in the right proportions. Once the mix is right, liquid steel is then cast into shape. **Tundish cranes** are typically utilized in tundish maintenance and handling.

The charging crane, ladle crane, teeming crane, and tundish crane are all quite similar and can be defined by their location and function in the plant. They are usually **overhead traveling cranes** that are fitted with special attachments to lift the giant ladles that contain liquid metal. Auxiliary hoists can be attached for scrap charging and maintenance functions, such as cleaning the empty ladles or lifting the furnace shell.

Every Konecranes hot metal crane is designed specifically for the unique challenges of this environment. Increased working coefficients, a differential gear reducer, redundancy in all critical systems, and motion limiters are just some of the technologies we employ to ensure our cranes for this application are reliable. Automation of repetitive movements and an air-conditioned, ergonomic cabin keep the driver comfortable and able to concentrate on the task at hand.

Every konecranes hot metal crane is designed specifically for the unique challenges of this environment

Keep on rolling

ROLLING AREA

The slabs and billets that come out of the melt shop are white-hot and malleable. They can be put through rolling presses and turned into any shape required. Sometimes this is done immediately. Sometimes they are placed in a storage area to be processed later. Because the melt shop environment is so hazardous, the presses are usually some distance away from it. Cranes are needed to move the cooling, yet still hot, malleable shapes from casting to the rolling mill.

A **billet or slab crane is usually an Electric Overhead Traveling (EOT) crane** that is very maneuverable. It needs to travel the long distance between the melt shop and the rolling area. It can move the hot, soft metal from the casting area into storage if needed. It should be able to feed the billets or slabs into the rollers when required. Perhaps the steel needs to be reheated in another furnace before shaping continues. The same crane can move the steel that has been shaped to another conveyor for further processing, or take it to a storage area.

The wide variety of products and shapes that come off the rollers means that the cranes need **special load handling devices.** Mechanical or hydraulic tongs can pick up slabs, magnets can take slabs, billets or coils, and c-hooks can lift coils and smaller billets. Because the steel needs to be warm for shaping, there is some radiated heat, and the grabs need heat protection.

Every factory has a limited amount of floor space. A rotating trolley or lifting beam helps operators position steel more accurately onto the conveyors that feed the rollers or storage areas. Auxiliary hoists assist in positioning longer objects and in maintenance tasks.

Konecranes slab or billet cranes are typically equipped with a number of Smart Features such as Sway Control, Slack Rope Prevention, Soft Touchdown and Load Positioning. These Smart Features reduce the wear on your crane, extending its lifetime and lowering repair and maintenance costs. They also help drivers to complete difficult tasks easily, so the crane performs better. These cranes can even be fully automated, taking your factory that one critical step further.

Staying in and moving out

STORAGE AREA

When steel products come off the production line, some of them might be shipped immediately. Others must be taken to a storage facility.

Cranes in the warehouse are usually Electric Overhead Traveling (EOT) cranes installed above the main storage areas. These areas are not very hot or dusty, but some heat protection is still required. A smaller facility, without the room for a gantry or bridge crane, might use wall console cranes instead. In a very big operation, these are also handy as auxiliary cranes. Fork lift trucks give the ability to move steel products anywhere a crane can't go. Reach stackers can reach higher than fork lifts, allowing you to build and use extra-high storage racks.

Nobody likes to wait: customers want their orders filled without delay. Operators need to quickly find the right products for the right customers in a big storage area. Some facilities run around the clock, and all the cranes must work continuously.

Konecranes makes the lifting equipment you need for reliable and efficient steel warehousing. Whether you are running a large steel warehouse alongside a steel mill, a small regional distribution office, or anything in between, we can help you make your warehousing operation more efficient.

Our EOT cranes can be equipped with a number of Smart Features. For example Load Positioning, Sway Control, and Overload Protection not only shorten handling times, but also reduce wear and tear on the crane, extending its life. Automation eases the work of your crane operators while speeding up the work flow. The Konecranes Warehouse Management System helps organize your storage area and makes finding the right product for your customer a simple and straightforward process.

Konecranes provides attachments needed for easy handling of different loads of steel. Be it plates, tubes, rolls, coils, or any other product, we have all the specialized hook extensions you need, or we can design one just for you. Our lift trucks can be similarly equipped as needed.

SATISFIED CUSTOMERS

Here are some examples of how steel-makers around the world are using our lifting equipment in their own unique ways.

"Konecranes technology is very good for safety, reliability and the environment, but what is important to us also is their local team behind the technology."

Piya Chairat
Chief Engineer
Assistant Project Manager
Siam Yamato Steel

"The greatest contribution to safety is that the cranes are reliable. With the reliability of the cranes being so high, we're not on the cranes nearly as much."

Tommy Massey
Maintenance Manager
Nucor Steel

"I am truly happy about the product, service and expertise provided. The crane is so smart. It is beyond our dreams."

Peter Terrison
Maintenance Supervisor
Bluescope Steel

"When you have people with experience from a similar project, you don't need to explain the process to them. They know."

Esa Prokkola
Project Manager
Rautaruukki Corporation

Agd grab unloader

The Konecranes Grab Unloader with Advanced Grab Drive (AGD) transfers solid bulk cargoes from the ship's hold to the material handling system on the jetty or wharf. The cargo is unloaded with a mechanical grab which is operated by four wire ropes. The Advanced Grab Drive (AGD) system uses four separate but identical winches for the grab ropes. Thanks to a free running trolley and a simple reeving arrangement of the grab ropes, the Konecranes AGD Grab Unloader does not require separate trolley traversing machinery, traversing ropes or a compensating trolley.

ALTERNATIVE LIFTING DEVICE

Grab

Scrap handling cranes

Scrap handling cranes work in the scrap yard, loading scrap into buckets that are transported to the melt shop. These cranes are typically high-duty, high-speed cranes. Special attention is paid to the crane operator's environment because of the high dust, noise and vibration levels that are typical in the scrap yard environment.

Four-girder charging cranes

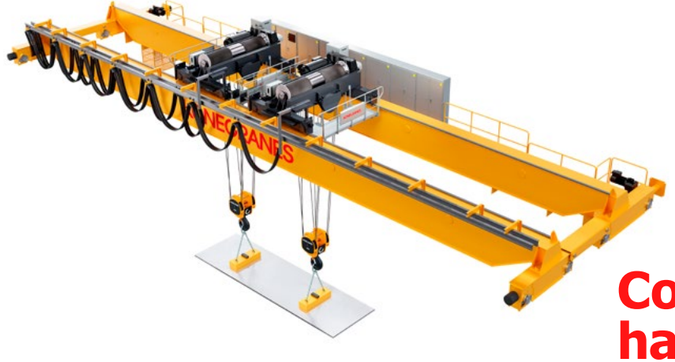
The charging crane transports scrap and liquid steel to the furnace. The same crane can work as backup to the ladle crane if needed. Konecranes charging cranes are well-protected from the flames and radiated heat, as well as the brief, intense heat of the charge itself. These cranes are a critical part of production and, since the load is molten steel, safety and reliability are the key words in the crane design.

Double-girder ladle handling cranes

The ladle handling crane transports ladles filled with molten iron to the basic oxygen furnace (BOF), or molten steel from the BOF and electric arc furnace to the continuous casting machine. It can also be used for teeming and casting. As with the charging crane, safety and reliability come first with this crane since it is used to transport molten steel.

Slab and billet handling cranes

These heavy-duty cranes take hot slabs, billets or blooms from the continuous casting machine conveyor, transport them to the storage area, or feed them to the rolling mill. They are high-speed production cranes designed with the same concern for safety and reliability as our charging and ladle cranes.



Coil and plate handling cranes

These cranes are used to transport bars, plates, or coils in the rolling area. They are high-speed cranes that can be equipped with a variety of lifting devices depending on the material to be handled. They will often be equipped with Smart Features to make them more productive.

General-purpose and maintenance cranes

The Konecranes steel industry offering includes standard cranes and hoists that are suited for the lifting work you need to do in the steel mill and warehouse. Our field-proven designs are constantly updated with the latest lifting technology to provide devices that are fitted for the task at hand.

Jib cranes
Konecranes jib cranes are very easy to install, use, and even relocate in your work environment. Their standard load capacity is up to 2 tons, so their application can adapt to your changing needs.

SMARTON®
SMARTON is an excellent choice for end-product handling and maintaining heavy production equipment. When load and cycle requirements are high, SMARTON and its Smart Features, such as Sway Control and Protected Areas, improve productivity and contribute to safety. Lifting capacity with a single trolley is 6.3–250 tons. Lifting capacity with two trolleys is 250–500 tons. Duty classes range from assembly use to the heaviest process use.

C- series
Konecranes C- series chain hoists are flexible and durable in industrial applications. With variable speeds and a lifting capacity ranging from 60 kg to 5,000 kg, they are extremely versatile and long-lasting.

M series
The M-series is the most compact and modular big winch in the business. Built in various sizes upto 63T for even the most demanding needs, with Konecranes reliability. More power in a smaller build with new dimensions in lifting capacity, lifting height, optimized approach dimensions. Duty classes range from assembly use to the heaviest process use.

CXT®
The Konecranes CXT crane is used in workshops and as a maintenance crane for production equipment. When load and cycle requirements are low, CXT cranes are also suitable for end-product handling, particularly coils and plates. In addition, CXT hoists are often used as auxiliary hoists for hot metal cranes.

Fork lift trucks

Konecranes forklifts are built for your world. With a tight turning radius and excellent maneuverability, our forklifts provide an efficient way to move your steel products around your warehouse and out to the customer. Combined with a strong lift mast and easily adaptable, heavy-duty forks, any material handling needs can be fulfilled. Konecranes fork lift trucks are currently available in a capacity range of 10 to 65 tons.

With our Smart Connected Lift Trucks, you are able to track the efficiency and needs of your reach stackers through a remote connection. Monitor the efficiency, increase the productivity and safety of your operation, and plan your maintenance based on facts instead of predefined intervals.

TRUCONNECT Remote Monitoring and Reporting provides you with actual usage data that enables you to optimize maintenance activities. The data gives you the confidence to plan your actions and make informed decisions regarding maintenance investments and productivity.

Reach stackers

Konecranes reach stackers are built for your world. They are ideal for moving heavy steel products around storage areas where space is limited, or the weight exceeds what a forklift is designed to carry. Electronic overload protection increases the safety of your load, your storage facility and your drivers. Konecranes reach stackers for industrial handling have a lifting capacity ranging from 35–80 tons, and we offer a full range of industrial handling attachments.

With our Smart Connected Lift Trucks, you are able to track the efficiency and needs of your reach stackers through a remote connection. Monitor the efficiency, increase the productivity and safety of your operation, and plan your maintenance based on facts instead of predefined intervals.

Expert service close to you

Through a network of more than 600 service locations in almost 50 countries Konecranes brings you highly skilled and localized service wherever your steel facility is located.

And the cost?
By investing in regular inspections, routine maintenance and timely repairs, you should save money in the long run. Well-maintained equipment breaks down less frequently and produces more steel.

What does an inspection entail?
Periodic inspections, from condition checks to lifetime inspections, follow standardized procedures right down to the component level. Comprehensive reports identify the inspection findings so that actions can be taken and decisions made.

After the inspection, what happens next?
Our full range of services includes preventive maintenance, modernizations, repairs, planning, mechanical and electrical system upgrades, testing and commissioning, working independently or alongside your own maintenance crew.

What if my crane is not from Konecranes?
Konecranes Service is not limited to the Konecranes brand. We can service any make, model and design across the industry. Globally, hundreds of thousands of cranes of other brands are enjoying the benefit of Konecranes Service.

Spare parts?
We provide a vast range of consumable, commodity and custom manufactured parts. Through our global network of distribution centers, we offer quick shipment, 24/7 ordering and expedited delivery options.

Consider a Konecranes service contract for some or all of your lifting equipment. It's an investment in improved productivity, increased safety and reduced total cost of ownership.

Service done properly is not an expense, but an investment

Plan future actions with better information

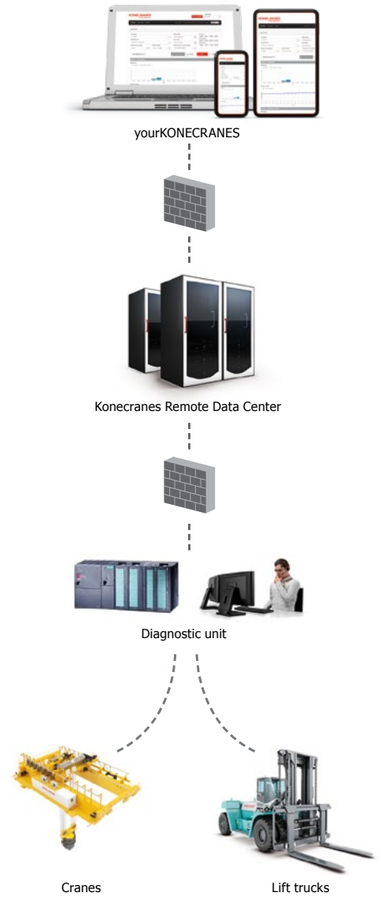
TRUCONNECT® is a suite of remote service products and applications to support maintenance operations and drive improvements in safety and productivity. It is an important building block in delivering Lifecycle Care in Real Time.

Improved safety and optimized crane maintenance
TRUCONNECT Remote Monitoring uses sensors to collect data – such as running time, motor starts, work cycles and emergency stops. Brake and inverter monitoring is also available. This data and other crane usage information is visible on the yourKONECRANES.com customer portal.

Remote Monitoring provides asset usage and operating information that is used to assess crane condition. Notification of hoist overloads, emergency stops and over-temperature occurrences are sent through text or email alerts, allowing for prompt response.

Remote Monitoring also gives you an estimation of the remaining design working period (DWP) of selected components, such as hoist brakes and structures.

Global network of crane know-how
TRUCONNECT Remote Support provides 24/7 access to a global network of crane experts and specialists, offering problem solving and troubleshooting to help reduce unplanned downtime. In controlled circumstances, two-way communication with the machines and their operators can be established in order to expedite corrective action.



Do you know your crane inside and out?

In addition to inspections and preventive maintenance, Konecranes offers consultation and advanced diagnostic services, including the Crane Reliability Study, RailQ Runway Survey assessment and RopeQ Magnetic Rope Inspection wire rope analysis. These services provide information that is invaluable when planning future maintenance activities.

Crane Reliability Study

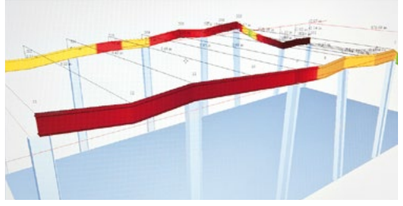
The Crane Reliability Study (CRS) is an engineering assessment that studies the current condition of your crane and provides a theoretical estimate of its remaining design life. The study looks at structures, mechanical components and electrical systems, and highlights possible maintenance and modernization needs.

RailQ Runway Survey

RailQ is an industry-leading rail analysis. It delivers accurate alignment information of your rail and expert recommendations for corrective action. RailQ uses a remotely operated robot combined with a visual inspection to provide you with an in-depth view of the alignment and condition of your crane rail. RailQ measurements include span, straightness, elevation and rail-to-rail elevation.

RopeQ Magnetic Rope Inspection

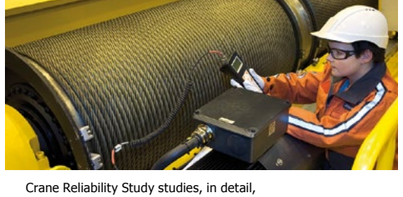
During a typical inspection, only the outer wires and strands of the wire rope can be visually inspected. Konecranes RopeQ technology and non-destructive testing methodology analyzes the condition of the internal wires, strands and wire rope core that are not typically visible. Recommended for process cranes in steel mills, steel service centers, and foundries, and for cranes with long wire ropes, or with ropes that are known to have an increased risk of inner core damage.



The results of the RailQ analysis are depicted in clear and understandable tables, graphs and 3D images.

RailQ reduces runway surveying time from days to hours.

RopeQ detects internal broken wires that are not visible to the eye and would be missed by traditional inspection methods.



Crane Reliability Study studies, in detail, the current condition of the crane.

Intelligent Cranes: Smart, Intuitive and Connected

Technology is revolutionizing products into intelligent, connected systems. In today's world our cranes are not solely composed of mechanical and electrical parts, they have transformed into intelligent products, reshaping the industry boundaries and lifting businesses to the next level. With a century of experience, we have simplified applications and systems with the combination of sensors, microprocessors, software, and connectivity in myriad ways. Konecranes cranes with added intelligence and connectivity, across industries, help unlock limitless possibilities: increased uptime, reduced costs and improved workforce efficiency, real-time feedback to enable continuous improvement.

Konecranes Intelligent cranes and services offering provides smart, Intuitive, and safe user experience across material handling industry.

konecranes.com

KONECRANES®

Get connected