

# CXT hoist



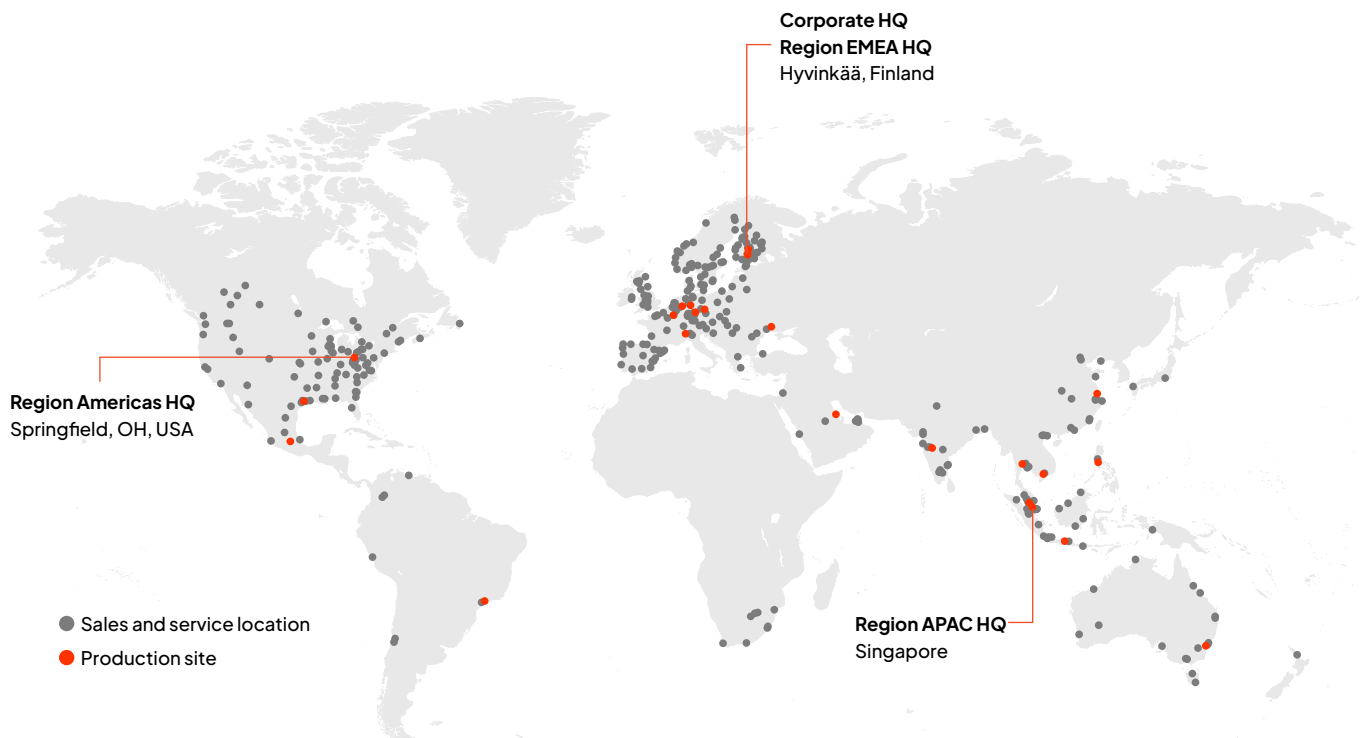
# General company information

**Konecranes is a global leader in material handling solutions, serving a broad range of customers across multiple industries.** Our knowledge and technologies, solutions and services constitute a key link in enabling the flow of essential material and goods. We support our customers' operations with innovative solutions that enhance their productivity, lower their emissions and drive their business forward.

Together with customers and business partners, our resourceful people make material handling more productive and sustainable. We maximize lifecycle value and eliminate waste of resources, energy and time throughout the whole value chain. Our culture is rooted on uncompromised safety,

high ethics and diversity and inclusion. We work for a decarbonized and circular world for customers and society.

Our ambition is to provide our customers with sustainable solutions and services while preventing and minimizing emissions and waste. We design our products with their complete lifecycle in mind. Usability, eco-efficiency, and safety are our guiding principles in product design, along with lifecycle thinking. Our aim is to maximize the lifecycle value of our products. We do this through innovative product design and by offering preventive maintenance as part of our Lifecycle Services concept, supported by TRUCONNECT Remote Service.





This EPD is based on ISO 14021: Self-declared environmental claims, type II. Life Cycle Assessment (LCA) calculations are carried out following the ISO standards 14040–44. Internal expert review has been carried out for EPD and LCA.

# Product description and application

Konecranes offers a wide range of industrial hoists for different applications. The CXT hoist is meant for industrial use in setting like assembly workshops and industrial plants. The equipment is designed to perform lifting, lowering and traveling operations, within the limits specified by its duty class. Due to the range in sizes, possible configurations and manufacturing locations, environmental impact may vary.

The CXT is designed for maximum performance and increased lifetime, lowering lifecycle costs. With long-lasting, durable components and carefully selected raw materials, customers get a hoist with a lifecycle that can extend for decades, helping them reduce the overall climate impact of their operations.

Our range of Smart Features—like Sway Control, Hook Centering and Snag Prevention—are a special combination of crane components and software designed specifically to improve the safety and productivity of our customers' operations.

## Product description of the CXT hoist used in this EPD

Load	5000 kg
Reeving	4 falls
HOL (height of Lift)	6 m
Duty class	M5
Hoisting speed with stepless A3 motor (min/nominal/max) 50Hz network	0.3/2.5/7.5 m/min
Hoisting speed with stepless A3 motor (min/nominal/max) 60Hz network	0.3/3/7.5 m/min
Hoist traversing speed 50 Hz network (max)	20 m/min
Hoist traversing speed 60 Hz network (max)	24 m/min
Hoist weight	313 kg

This Environmental Product Declaration (EPD) applies to the CXT 5-ton hoist (CXT4) with low-headroom trolley, utilizing a variable speed hoisting motor.

# Environmental impact of the CXT hoist

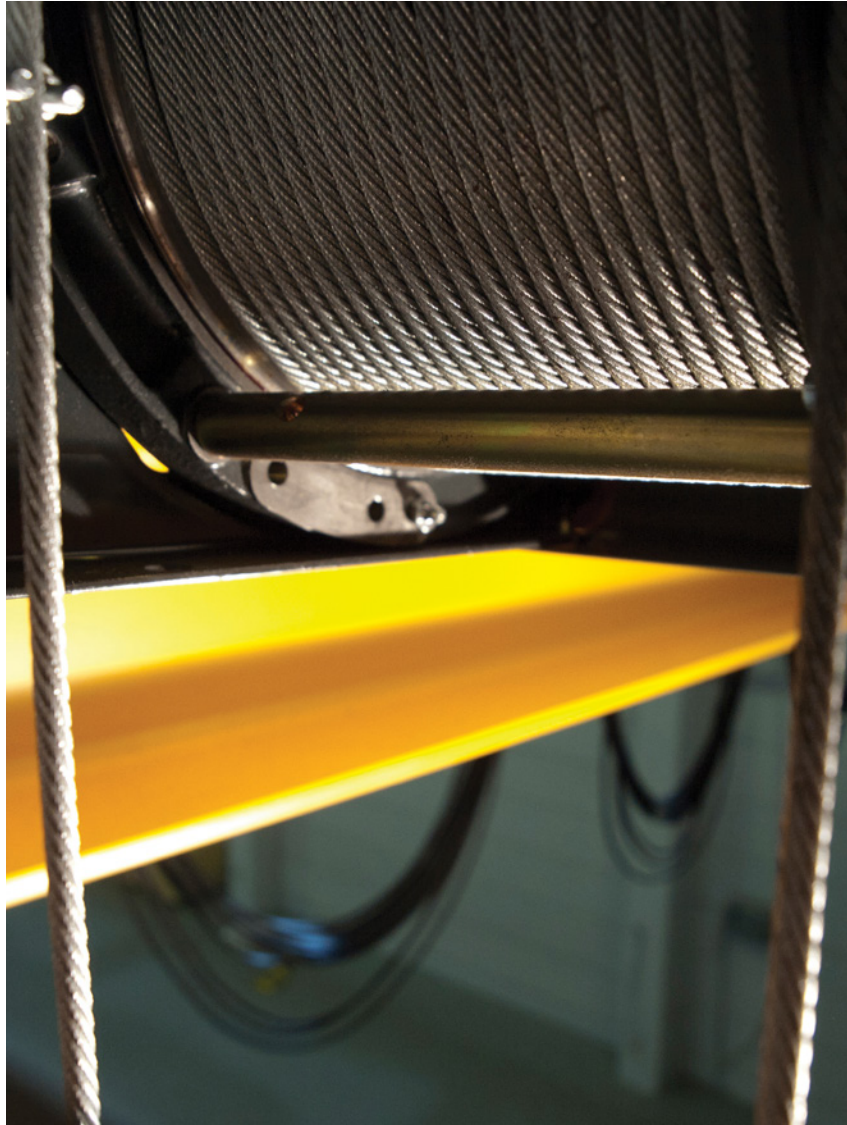
At Konecranes, we are committed to supporting our customers in reaching their low-carbon targets with our offering. Decisions made at the design phase critically determine a product's overall environmental impact. Therefore, we can significantly improve the environmental performance by taking the environmental impacts into consideration early in the product development process.

Konecranes' Design for Environment (DfE) concept aims to reduce the environmental impact of the product's lifecycle. The concept focuses on repair-ability, durability, material selection and energy efficiency.

Environmental considerations are realized in our CXT hoist in the following ways:

- Substances of very high concern (SVHCs) in product design are minimized.
- Component design aims to optimize the use of raw materials, while also ensuring re-usability and repair-ability to enable high durability and a long lifetime.
- PVC- and halogen-free variants are offered to customers.
- The hoist packaging design was renewed to optimize material usage and the package delivered from our central factory is reusable.
- Energy consumption is optimized with our purpose-designed Core of Lifting components—gears, motors and controls—specifically intended for crane use and lifting motions.

We also assessed the product's carbon footprint during its lifecycle with Life Cycle Assessment (LCA) calculations for the CXT4 hoist.







## Material breakdown

The material breakdown relates to the total weight of the 5 ton CXT hoist with a maximum lifting height of 6 meters and frequency-controlled hoisting. The weight can vary slightly, depending on which CXT features are selected for the hoist.

The total weight of the hoist is 313 kg.

In this particular CXT hoist, 94% of the hoist materials are metals including steel, steel alloys, cast iron, aluminum alloys and copper, which are fully recyclable at the end of hoist's life span.

The CXT hoist does not contain any chemical substances that would be non-conforming to our [Restricted Substances List](#), based on legal requirements in the EU and in other selected countries.

Any factory-installed lubricants in the product are industrial hydrocarbons. Coatings are applied on-site, or the work is outsourced to a subcontractor\*. Coatings that are used on the CXT are mostly solvent-borne epoxy binder paints and

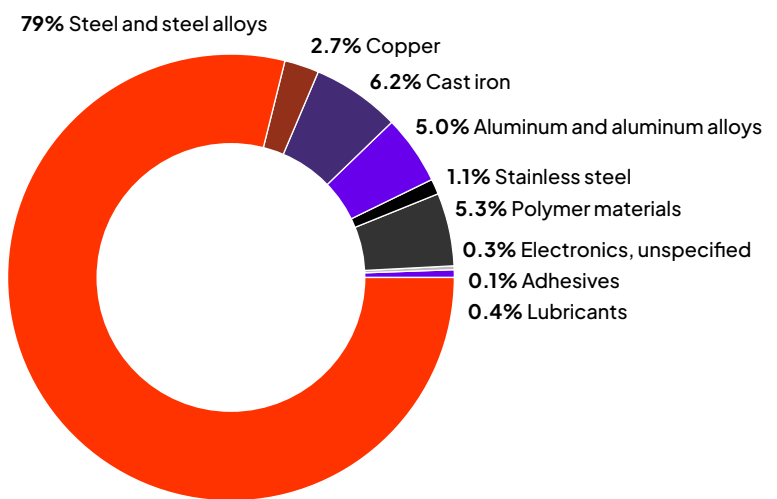


Figure 1. Material breakdown of selected CXT4 hoist without optional parts

zinc-nickel electrocoating. Paints are pigmented with iron oxides and electrocoating uses trivalent chromium.

\*Konecranes has clear processes in place to mitigate sustainability-related risks both in the supplier selection phase and during the business relationship. The [Konecranes Supplier Code of Conduct](#) includes the minimum requirements for suppliers on topics such as human rights, health and safety, environmental management, anti-corruption and compliance with laws and regulations. Konecranes Restricted Substances List describes our key requirements for the use of harmful substances.

# CXT 4 lifecycle assessment

We analyzed the environmental impact of the CXT4 hoist with the Life Cycle Assessment (LCA) method and standards ISO 14040 – ISO 14044. The lifecycle of a CXT hoist was divided into the following stages: raw materials, component production and final assembly, packaging, delivery to customer, usage at customer site, maintenance at customer site and dismantling and recycling. The logistics required during or between each stage to move the hoist from one place to another were included. Only the components specifically relevant to the CXT hoist were under examination, excluding all the other parts of the crane.

The functional unit for the LCA study was the entire lifecycle of a hoist across 20 years (approximately 70,000 duty cycles). The CXT4 hoist under examination has a maximum lifting height of six meters and an A-model hoisting motor using a frequency converter. The use profile was based on median usage data representing an average customer in the European Union area (EU28).

The impact focus was set on climate impact (global warming potential) and the calculations based on emission factors from The Intergovernmental Panel on Climate Change (IPCC) dating back to 2013 using a 100-year time horizon and excluding biogenic carbon. At the time of the study, there was no product specific LCA guideline (product category rules) available for CXT rope hoists.

We used both average and specific data for the LCA. Specific data was collected on the product structure and materials of the CXT4 hoist, in-house production processes, selected first-tier suppliers (i.e., suppliers with which we have a direct business relationship) and its use phase. This data was especially crucial for the use phase because usage levels can vary significantly between individual hoists depending on customer needs.



We analyzed data such as the number of lifting cycles, loading levels, power-on time, and hoisting times from 1,300 individual wire rope hoists from 2011–2019 collected with TRUCONNECT Remote Monitoring. This data helped define load spectrum, hoisting cycle length and the number of hoisting cycles for each loading level. These, together with expert calculations, gave a representative figure for median duty cycles and median electricity consumption.

We used a professional LCA software tool (GaBi 8: GaBi Software-System and Database for Life Cycle Engineering, Service Pack 39. Thinkstep AG) for our LCA calculations and analyses. Life cycle inventory databases (Professional and Electronics Extension, Service Pack 39) incorporated into the software tool gave us an up-to-date source of secondary data.

# CXT4 climate impact results

The most significant part of the climate impact in the lifecycle of a CXT4 hoist comes from the processing of raw materials which is done for the manufacturing of the hoist components. Steel production in particular causes a high amount of value chain emissions.

The second largest amount of climate impact of the hoist lifecycle is created when the hoist is in actual operation (median use), mostly due to the greenhouse gas (GHG) emissions related to electricity production, used for powering the hoist.

Maintenance, including service technicians' visits to customers and spare parts production, is the third

most significant source of emissions. The dismantling and recycling phase has a net negative value because recovered metals (e.g., steel scrap) can replace virgin materials (e.g., iron ore), which in calculations can be considered a benefit.

Konecranes offers general overhaul, retrofitting and modernization services that can extend the life of the hoist and thus reduce its environmental impact. These, however, were excluded from the LCA analysis, as we focused on the basic product configuration. Customers can also lower their operational climate impact further by using electricity from renewable sources at their site.

CXT4 hoist total climate impact result was up to 2022 CO<sub>2</sub> eq. kg considering all the lifecycle phases and use for 20 years

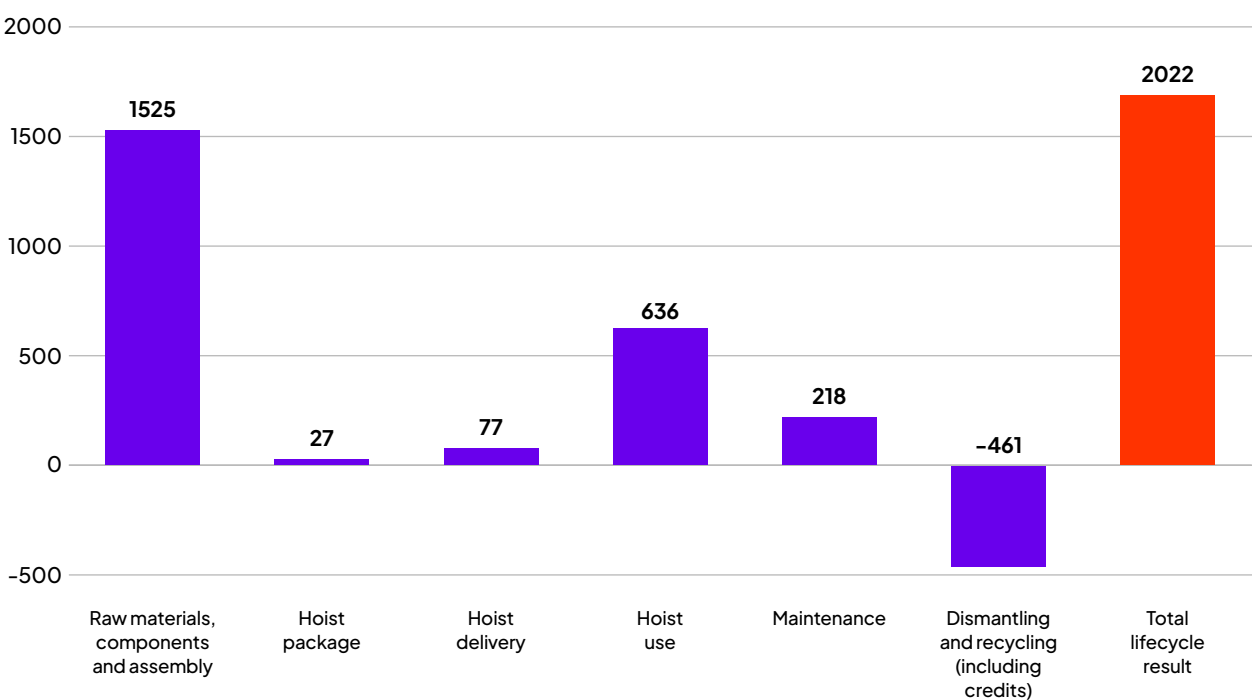


Figure 2. CXT4 lifecycle climate impact results in kg CO<sub>2</sub> eq.\* representing 20 years use age in workshop application, use in Europe

\* Impact assessment methods: CML2001, update 2016. The term "Global Warming Potential (GWP 100a)" is used instead of climate impact in CML methodology.

# Use phase energy consumption and climate impact

Hoists are electrically powered, mostly by supply from a main outlet. We analyzed the power consumption and climate impact on a 5-ton CXT4 hoist in median usage, using a default cycle as the basis of the calculations.

The default cycle in typical use utilized in the LCA consists of:

1. 0.85 m of load lifting (from usage data)
2. 2 m of horizontal traversing movement (estimated)
3. 0.85 m of load lowering

The number of yearly cycles in median (typical use) is approximately 3,500.

A median use CXT4 hoist running an A-hoisting motor with frequency-controlled hoisting and traversing movements uses about 1,550 kWh of electricity in 20 years. All hoist usage states have been considered in the calculations, including hoisting with a load as well as an empty hook, and trolley traversing consumption, together with the standby and idle power consumed by the trolley and hoist electrics when not actively hoisting or traversing.

The way customers use the hoist can change the energy usage and climate impact results significantly. When we only look at the hoist use phase, hard usage of the CXT4 hoist consumes more energy and the climate impact of its use phase is estimated to be five times more compared to median usage.

Figure 3 shows how the climate impact of the use phase changes in different (geographical) regions by using different ways to produce energy (e.g., hydro, nuclear and fossil fuels). The demand for electricity stays the same in every case.

**Operational climate impact of the CXT4 hoist in three different geographical regions over 20 years of median usage**

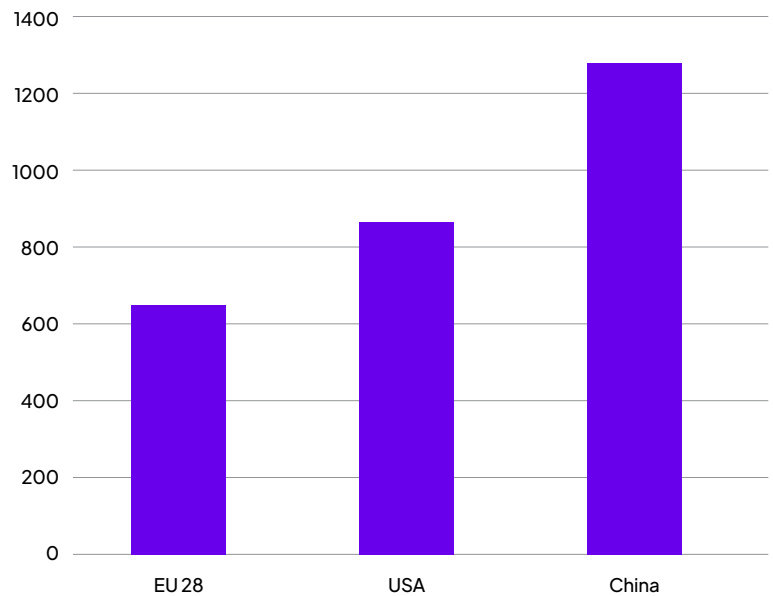


Figure 3. The operational climate impact of the CXT4 hoist in three different geographical regions over 20 years of median use. Operational electricity demand is the same in all three regions.





# Manufacturing and logistics

Konecranes is committed to science-based targets (validated by the Science Based Targets initiative) for reducing emissions (scope 1, 2 & 3) by 50% by 2030. These targets are aligned with the ambition of the Paris Climate Agreement of limiting global warming to 1.5°C. We work to decarbonize our own operations by continuously improving the energy efficiency of our manufacturing operations while maximizing the share of renewable energy sources, and—for example—we already use renewable electricity in all our factories.

We're also improving the fuel efficiency of our service vehicle fleet. In 2022, we managed to reach the science-based target of halving the emissions from our own operations (scope 1 & 2), and now we have set a new, more ambitious target of reaching carbon neutral own operations by 2030.

Our Hämeenlinna factory in Southern Finland, one of the factories manufacturing the CXT hoist among others, has received the CarbonNeutral® building certification, in accordance with The CarbonNeutral Protocol—the leading global framework for carbon neutrality. The certification is the result of the factory's actions in reducing its greenhouse gas emissions by using renewable energy and improving energy efficiency, as well as purchasing carbon credits to compensate for the emissions that cannot be eliminated yet. Work continues to further reduce the remaining emissions, for example through electrifying the majority of the diesel lift trucks operating in the factory yard.

We follow our internal guiding principles for chemical handling, energy and emission management,

and waste and resource management globally—setting the company standard for environmental management. The majority of our factories have an ISO 14001:2015 Environmental Management System in place, requiring continuous development, solid risk management and annual targets.

We expect high ethical standards of ourselves and our business partners. And as we work with companies around the world who provide materials and components for Konecranes we expect all of our suppliers and subcontractors to commit to the same ethical, environmental and labor-related principles that we ourselves apply. To help mitigate risk in our supply chains, we ask our suppliers to follow our Supplier Code of Conduct which describes the standards we expect from our business partners.

In addition, we pay attention to efficiency in logistics and packaging. With our global factory network, we are able to optimize the delivery chain for CXT hoists and other products. The hoist is packed on a wooden pallet, surrounded with corrosion inhibitor packaging film and placed in a foldable wooden container. The packaging is reusable, allowing it to be returned to the central factory for reutilization. The hoist package was re-designed to be resource efficient and optimized for purpose, providing the best possible protection to the product with minimized use of packaging materials.

We reduce the GHG emissions across the lifecycle of the hoist by choosing fewer and lighter materials and components. These emission reductions multiply during delivery as there is less physical mass to transport.

# Maintenance

Well planned and executed maintenance not only helps increase safety and reduce downtime, but it can also extend equipment life, optimize energy use and reduce environmental impact.

Material handling equipment that is not properly inspected and maintained can experience premature wear on components resulting in breakdowns. More service calls and downtime mean more time on the road for technicians, more parts consumed, and more product wasted.

When carefully maintained, a crane can last for decades. With Lifecycle Services, smart technology, and our digital ecosystem, Konecranes can provide services to maintain equipment reliability and efficiency and optimize maintenance planning.

Inspections and preventive maintenance are key to keeping equipment and components in use. Inspections identify risks and improvement opportunities and preventive maintenance tasks such as adjusting and lubricating help keep equipment productive and minimize downtime. Frequently needed parts can be kept on site with a parts package reducing the need for transport. Parts can also be refurbished or rebuilt helping reduce waste.

Predictive maintenance utilizes condition monitoring, advanced inspections and data analytics to help us make informed component-specific predictions and prioritize recommendations and actions. This means maintenance can be carried out based on actual condition and planned around production schedules, making repairs more targeted and resource efficient. Predictive maintenance also supports the planning of retrofits, overhauls, modernizations or outright replacements when needed.

When equipment begins to age instead of replacing the entire hoist or crane, retrofits and modernizations can bring the benefits of more efficient and updated



technology and improve equipment performance. A general overhaul can also extend the useful life of your crane when the remaining hoist service life falls under 10% by replacing parts before they wear out and thereby contribute to equipment failures.

These services can not only improve energy efficiency and performance, but save a great deal of raw materials, reduce emissions from the transportation of new equipment, and decrease the energy used in manufacturing. The CXT hoist can be retrofitted, re-manufactured and modernized to extend its life span and recycled when it can no longer be used, greatly reducing its environmental impact. Reliability increases with less unscheduled maintenance and repairs, and its climate impact goes down.



# Dismantling and end of life

The CXT hoist can be recycled to a high extent as more than 90% of the hoist materials are recyclable metals. Most hoist parts can be refurbished, and the hoist modernized to lengthen its life span. The customer is responsible for taking care of the equipment when it reaches the end of its life span. When that happens, the hoist materials can be utilized for a new purpose, or they can be recycled based on available infrastructure. Waste material from installation, maintenance or dismantling should be taken care of by the customer according to local regulations.

Dismantling should always be planned and executed by licensed professionals. Regulations and methods vary regionally, but we expect that our customers always use licensed waste-handling companies for industrial waste disposal and/or recycling of recyclable materials.

We use marked fumigated wood for packaging and special anticorrosive packaging film to prevent rust during transport. The wood package and the packaging film can be reused or recycled. All our packaging materials comply with the EU packaging material directive (EU) 2018/852. The wood material used in packaging is delivered according to ISPM 15 of the International Plant Protection Convention, to prevent the spread of disease and insects that could adversely affect plants or ecosystems.




## Proposed waste handling methods\*

MATERIAL	HANDLING METHOD
Metals	Materials recycling, multi-metal scrap recycling
Plastics	Recycling, if applicable or incineration as energy
Elastomer parts	Recycling
Electrical and electromechanical components	Recycling, e-waste management
Lubricants (gear oil, bearing grease)	Oils should be removed from the hoist before end-of-life recycling, oil can be regenerated or treated as hazardous waste

\* We encourage waste handling to be based on the EU Waste Framework Directive (EU) 2018/851.



Konecranes is a global leader in material handling solutions, serving a broad range of customers across multiple industries. We consistently set the industry benchmark, from everyday improvements to the breakthroughs at moments that matter most, because we know we can always find a safer, more productive and sustainable way. That's why, with around 16,600 professionals in over 50 countries, Konecranes is trusted every day to lift, handle and move what the world needs. In 2023, Group sales totaled EUR 4.0 billion. Konecranes shares are listed on Nasdaq Helsinki (symbol: KCR).

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