



# GEARS

- A longer lifetime for your crane
- The Konecranes promise of quality
- Maximizing safety with good design
- Technical details:  
Helical gear structure

# A LONGER LIFETIME FOR YOUR CRANE

We use a complete design model and look at the gear unit as a whole, taking into account the shaft, each individual tooth, and its bearings.

We design and manufacture all of our crane gear units, shafts, gear wheels and gear housings ourselves.

Less power consumption, less waste, less wear and fewer parts make for a more reliable crane and can help minimize downtime.

## LESS ENERGY CONSUMPTION. LESS WASTE. LESS EXPENSES.

- Our gearboxes have low inertia due to low mass of rotating parts resulting in **lower energy consumption**
- Due to the small size of our gearboxes they require lower oil volumes, meaning **less waste and less expenses**
- Low noise and almost no vibration comes from grinding the teeth after heat treatment, making them even **more power efficient**
- A Konecranes gearbox has fewer parts due to careful integration
- The traveling machinery has no additional couplings or shafts between motor and gear unit or units meaning less wear on your crane and better approach dimensions due to the compact size

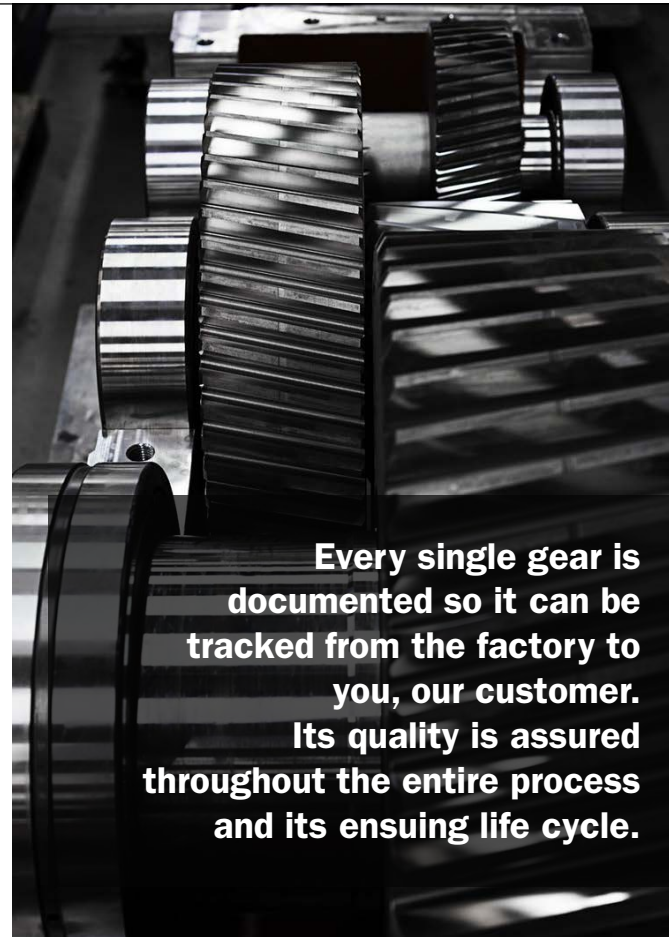


# THE KONECRANES PROMISE OF QUALITY

From the idea to the final product we comply with international standards (EN, ISO, AGMA) and then go beyond them to ensure each component complies with our own high quality standard. You can trust that quality, because all of our gear components are made in-house.

- We use the latest design and calculation technology for 3D modelling and dimensioning to help us achieve the **optimized performance and maximized reliability**
- During development gears are tested on their geometry, housing dimensions, hardness and surface roughness
- Assembly and test run of each gear unit is done at full speed to measure bearing temperatures, complete gearbox and gearing noise and vibrations
- Oil leakage is tested with air pressure
- Gear units are checked visually by the assembler to make sure that all the gears meet our quality targets
- We also work in cooperation with universities to keep in line with the future development of materials and technologies

Every single gear is documented so it can be tracked from the factory to you, our customer. Its quality is assured throughout the entire process and its ensuing life cycle.



# MAXIMIZING SAFETY WITH GOOD DESIGN

Our gears have been meticulously designed down to the smallest detail to avoid cracks, tooth fracture, stress and wear.

Case hardening makes the gears strong and durable enough for frequent, long-term use.

A smooth contact pattern minimizes pressure on parts, wear, and risk of damage.

We calculate, model and verify to make sure gears have the right distribution of tooth force, resulting in a very high safety coefficient against gear tooth fracture.

Our in-house design, manufacturing and testing continually maintains and develops the quality of all our gears.

# TECHNICAL DETAILS: HELICAL GEAR REDUCERS

- Gear load capacity calculations are based on standards ISO6336 (DIN3990) and AGMA 2001-D04
- Roller bearing lifetime calculation ISO 281:2007
- Gear shafts and wheels made of case-hardened steel 18CrNiMo7-6; surface hardness HRC 58-62
- Teeth ground with NC profile grinders to accuracy class ISO 5 (AGMA 13) or better
- High safety factor ( $SF=1.60$  / ISO6336) against gear tooth fracture (General SF 1.15-1.35)
- Power efficiency of our gear units is over 99% per stage
- Material certificates are collected and filed for tracking

