

# Optimizing machine reliability and overall plant efficiency

SKF capabilities for the food and beverage industry



Addressing the industry drivers



*See inserts for more details  
about SKF solutions for food and  
beverage processing operations.*

The Power of Knowledge Engineering

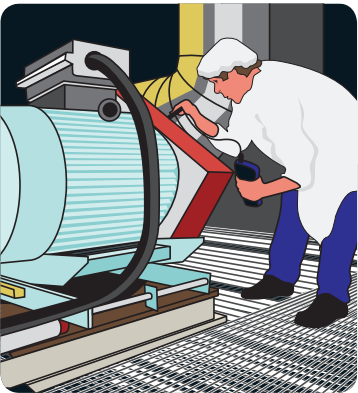




# Improving efficiency and reliability

SKF is helping manufacturers achieve greater efficiency and reliability through process improvements which, in turn, assists in reducing avoidable costs. With a host of product and service solutions, SKF can help you address the many challenges you face in your plant, starting with the critical ones discussed here.

## Operation and maintenance optimization



One of the main focuses of the food processing industry today is to improve plant efficiency and profitability. Total costs need to be reduced by optimizing operation processes and maintenance activities through continuously improved machine reliability and a proactive maintenance culture. Asset management programmes and automation systems can

significantly improve plant efficiency, product quality, profitability, safety, hygiene and the overall operator environment. However, few companies have the internal resources to implement the latest technologies. SKF has many ways to help.

- To optimize the efficiency of your maintenance programmes, SKF provides a Maintenance Strategy Review that helps to define the appropriate maintenance approach for each asset. By applying key performance indicators from the industry, SKF documents and periodically reviews plant progress to make sure it aligns with stated goals.
- SKF Proactive Reliability Maintenance helps maintenance teams capture knowledge that addresses machinery failures and prevents reoccurrences.



- SKF reliability engineers can look into root cause failure analysis and assist with alignment and balancing services, redesign of critical components, machine upgrades, lubrication routine reviews, and more.
- Utilizing SKF condition monitoring technologies, a predictive maintenance programme helps optimize plant planning and scheduling by automating data collection and tracking of asset conditions.
- Automation solutions for processes and operations enable increased production speeds while contributing to a safe and ergonomic working environment. Reliability is increased through automatic, precisely metered lubrication systems, enabling operators to perform more “value-added” tasks. In addition, SKF provides a full range of motion control solutions to automate process improvements such as lifting, tilting, positioning, dispensing, adjusting, cutting and forming, resulting in increased efficiency throughout your operation, from preparation to packaging.



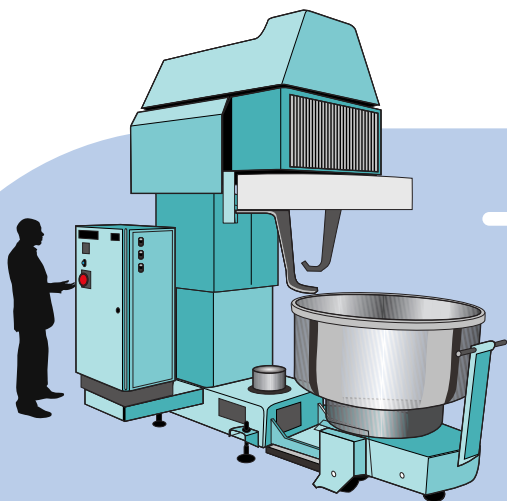
*The demanding conditions mentioned on these two pages are common to virtually every process and application in the food and beverage processing industries. See inside for more details on how SKF solutions can help you meet these challenges.*





# Every stage of your process can benefit

## Preparation



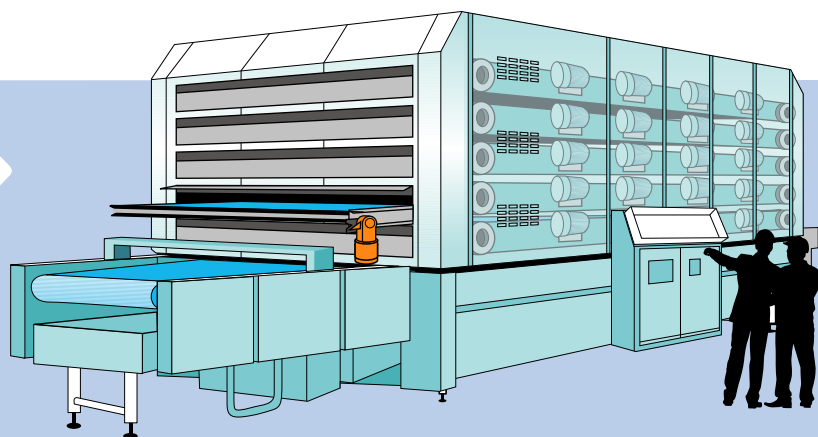
### Preparation

Various applications for washing, sorting, grading, peeling, separating, and blending make preparation areas wet, contaminated places. Large amounts of water or other liquids are often required, creating high humidity levels that can severely affect rotating equipment. Process materials can also enter the bearings, as can the water and caustic agents used during high-pressure washdowns.

Ultimately, these operating conditions can lead to additional costs due to lubrication loss, increased maintenance, quality, and hygiene problems. To help prevent these issues common to aggressive preparation environments, SKF offers several technologies.

- SKF maintenance-free Y-bearing units offer the protection of composite housings and stainless steel inserts.
- SKF sealing solutions use specially developed materials for critical sealing purposes.
- Excellent for heavy-duty applications such as mills and conveyors, SNL housings are easy to maintain and can operate with a range of food-compatible lubricants.

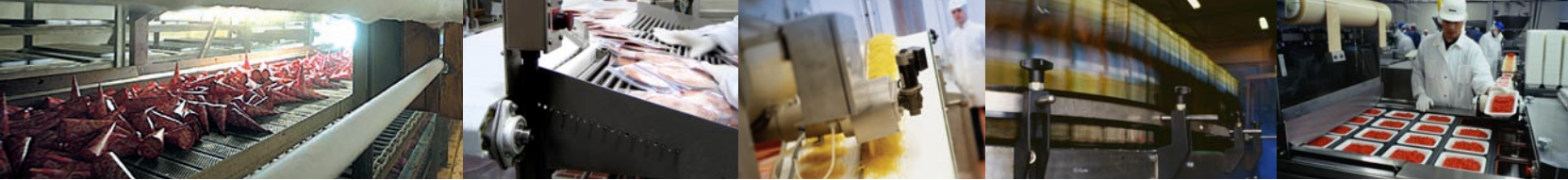
## Heating



### Processing by application of heat

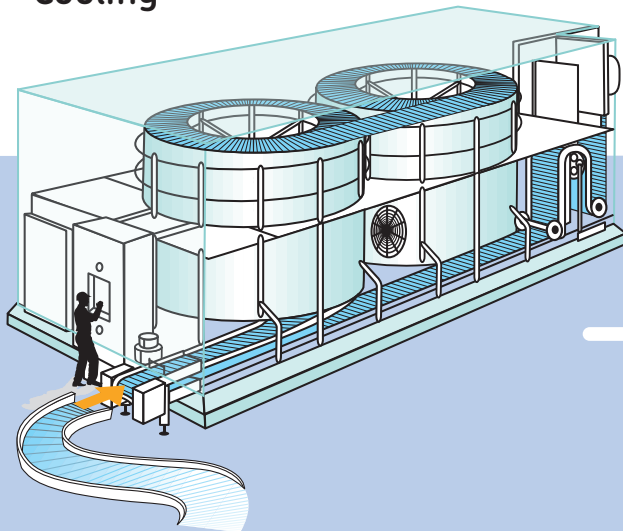
With temperatures ranging from 120 to 300 °C (250 to 570 °F), processes such as baking, frying, roasting, and sterilization contribute to high operating costs for rotating machinery. High temperatures require frequent bearing relubrication, which can cause grease leakage with possible risk of foreign bodies contaminating the process. Waste management cleanup costs are also a consideration. Fortunately, SKF has a range of solutions to handle extreme temperature challenges.

- High-temperature bearing units can operate at temperatures up to 350 °C (660 °F), eliminating relubrication demands and related grease and labour costs.
- To manage the combination of heat resistance and thermal expansion, SKF sealing systems help to ensure optimal functionality and long service life.
- SKF lubrication systems can automate and optimize lubrication in various extreme temperature processes.
- SKF also provides maintenance products such as high-temperature gloves to help protect operators, plus thermo laser technologies to help optimize processes.

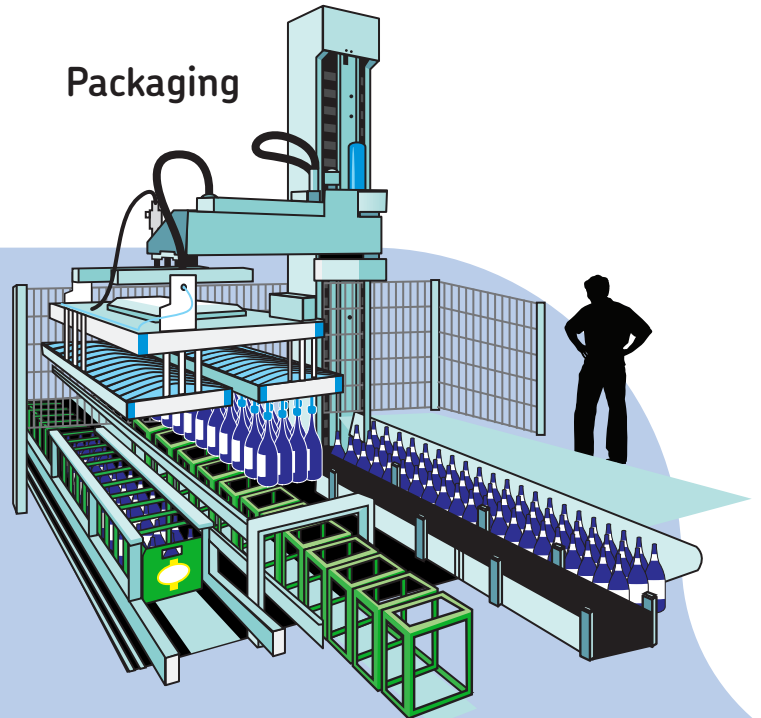


# from SKF knowledge engineering

## Cooling



## Packaging



### Processing by removal of heat

The sub-zero temperatures of freezing, chilling, and cooling processes demand frequent maintenance. During clean-ups, temperatures can move quickly from sub-zero to 40 °C, causing air expansion inside the bearings. These “breathing” problems can cause water or moisture to enter the bearings, often resulting in corrosion and grease emulsification. In extreme cases, frozen water droplets can fracture bearing rings. Relubrication to purge this moisture can contaminate the process. SKF low-temperature solutions can help.

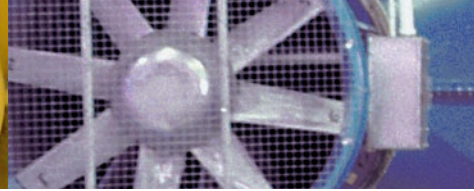
- Featuring a solid oil lubricant that fills the free spaces inside the bearing, SKF maintenance-free bearings eliminate breathing problems, relubrication demands, and airborne particle intrusions.
- SKF sealing materials can cope with sudden temperature shifts and prevent ingress of aggressive media.

### Post processing

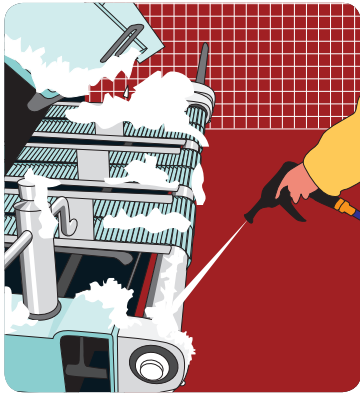
Unplanned stops in filling, sealing, and labeling lines can delay deliveries and impact profitability. Frequent washdowns – and related issues such as bearing re-lubrication, corrosion, and potential grease leakage and product contamination – can significantly slow post processing. In palletizing areas, heavy loads and shock loads can lead to component failures that drive up costs and disrupt deadlines.

SKF can help keep post-processing lines moving reliably.

- SKF dry lubrication systems for bottle conveyors can heavily reduce water usage, ensuring high levels of hygiene and quality of processed products.
- SKF Y-bearing units can help withstand heavy loads and shock loads, while increasing reliability and productivity. SKF lubrication systems and sealing technologies can also contribute to increased reliability and productivity.
- Electromechanical actuators can reduce noise by eliminating use of high pressure pipes and improve operator work conditions.



## Wet, contaminated and abrasive environments



Maintaining proper hygiene is key to compliance with HACCP and other product safety requirements. Given the industry's typical operating environments, it can be very challenging. High-pressure washdowns can wash away bearing lubrication for rotating equipment. This often leads to corrosion that severely limits bearing life, increases maintenance costs, and creates flaking-related hygiene problems. SKF offers a range of technologies to help prevent these and other issues common to aggressive environments.

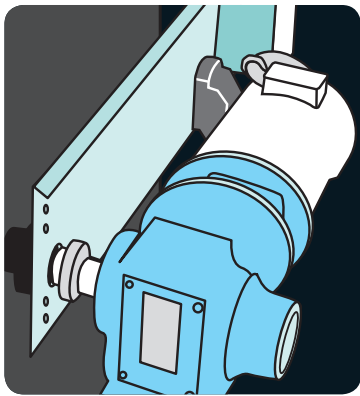
SKF offers a range of technologies to help prevent these and other issues common to aggressive environments.

- Maintenance-free Y-bearing units feature a hygienic design that includes composite housings and stainless steel inserts pre-filled with food-grade grease. Y-bearing units also feature a unique, multi-lip labyrinth seal that withstands up to 120 bar pressure and prevents detergent creep.



- Specific RSH seals have been developed for deep groove ball bearings to enable units to withstand water ingress.
- For applications with bushings that demand corrosion resistance, SKF offers many innovative stainless steel designs, including some that use PTFE coatings as a lubricant.

## Auxiliary equipment



Auxiliary rotating equipment is crucial to production, whether it operates on or off the primary processing lines. But due to certain peaks in usage, the reliability of auxiliary equipment such as compressors, fans, motors, generators, and service pumps can suffer, requiring different maintenance strategies than those used for main processing line assets. SKF can

help you improve reliability of this equipment, often reducing maintenance costs and energy consumption as well.

- SKF performs rotating machinery assessments and offers proposals for improving auxiliary asset efficiency and reliability. These include machine upgrades, asset redesigns, and condition-based maintenance approaches.
- For fan applications, SKF can upgrade traditional spherical roller bearing arrangements with the CARB toroidal bearing solution in the non-locating position, significantly reducing temperature and vibration levels while increasing system reliability.



- For the kinematics chain, SKF offers solutions over the entire power transmission system, including recalculation of pulley-belt systems to reduce size, plus precision alignments to cut energy consumption.
- SKF lubrication systems automate and optimize lubrication, while SKF online condition monitoring systems help ensure safety for auxiliary machines and operators alike.



# Equipment design

## Trends and challenges

While developing equipment for food or beverage processing operations, today's manufacturers must meet customer expectations for more modular, automated, and energy efficient equipment that brings greater overall simplicity to the operation. New equipment designs must also meet the industry's latest safety and hygiene standards.

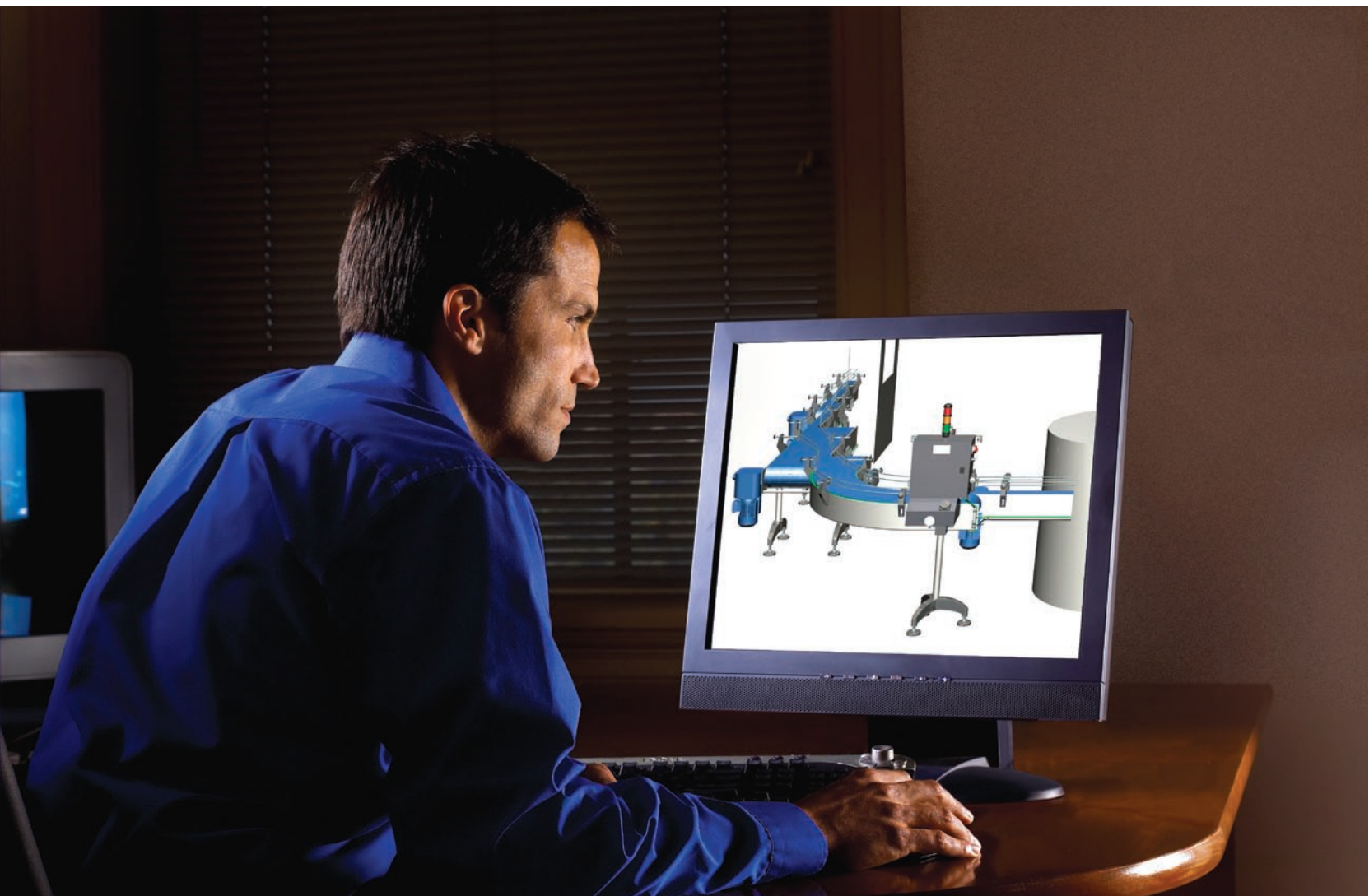
## SKF solutions

SKF brings a unique understanding of the applications and challenges of the end user's process environments to the table.

With knowledge of the industry requirements and expertise in bearings and units, seals and lubrication systems, we are able to take a systems approach to hygiene design, providing complete solutions that improve equipment reliability and flexibility in use.

Using advanced simulation software, SKF engineers enable OEM designers to optimize equipment design. Benefits include:

- **Reduced time to market** – SKF can streamline and unify the design process.
- **Greater flexibility** – Explore the merits of various design options while still in the prototype stage.
- **Improved reliability** – SKF software functions as a virtual test rig, enabling designers to evaluate machine performance under real-world conditions to build in more reliability.
- **Reduced total cost of ownership (TCO)** – Reduced and simplified maintenance, longer service intervals, improved reliability and longer service life all combine to reduce TCO for end users.





# that impact your plant profitability

Few industrial environments can match the diverse and difficult operating conditions found in the food and beverage processing industries. Extreme temperatures and moist, contamination-prone environments. Frequent washdowns that degrade equipment and cause lubricant leakage. Repetitive tasks and hazardous work environments.

All of these factors combine to make an impact on machinery and productivity. With continuous pressure to reduce prices and comply with strict health and safety, environmental regulations, and rising costs for energy and labour, the need is greater than ever to optimize equipment reliability to maximize uptime and productivity.



## SKF can help

Our ambition is to understand your process challenges and develop solutions that can reduce your total cost of ownership. In addition, these solutions can help you meet your sustainability goals. Benefits include:

### Higher efficiency

Maximize output from equipment by extending mean time between failures and solving challenging application problems.

### Improved hygiene

Help eliminate conditions that foster food-borne illnesses and meet the requirements in accordance with ISO 22000 on food safety.

### Operator safety

Reduce risk of injuries from repetitive manual tasks, heavy loads, and slippery environments.

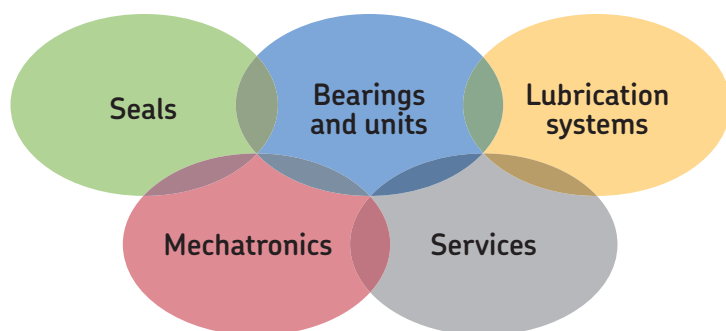
### Waste reduction

Satisfy tough new environmental regulations by reducing waste, water and lubricant usage, as well as the impact of washdowns on local ecosystems.

### Energy savings

Improve efficiency of machinery and auxiliary equipment, from electric motors and pumps to refrigeration systems.

SKF can help you achieve these benefits by drawing upon our expertise with bearings, bearing units, power transmission, sealing and lubrication systems, linear motion technologies, plus a wide range of consulting and reliability services.



### The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management services. A global presence provides SKF customers uniform quality standards and universal product availability.

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