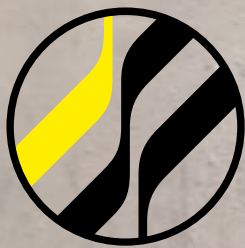


Kelvion



Food and Beverage Industry

**CLEAN,  
SAFE,  
RELIABLE**





**Kelvion –  
a tribute to  
Lord Kelvin**

**70 branches and  
sales partners  
worldwide**

**More than 4,000  
employees  
worldwide**

Lord Kelvin (1824 – 1907) formulated  
the laws of thermodynamics



# EXPERTS IN HEAT EXCHANGE – SINCE 1920

We are an internationally successful manufacturer of industrially used heat exchangers. Since 1920, we have been developing, producing, and marketing high-quality solutions for various requirements and sectors – since November 2015 under the new brand Kelvion.

**Our solutions for your applications:**

We offer our customers one of the world's largest product portfolios in the field of heat exchangers. It includes individual solutions for practically all conceivable applications and complex environmental conditions: plate heat exchangers, shell and tube heat exchangers, finned tube heat exchangers, modular cooling tower systems, and refrigeration heat exchangers.

**Your markets are our markets:**

The markets in which you and we together operate are among the most important in the world: the chemical industry, food and beverages, the heavy industry, climate and environment, marine applications, the oil and gas industry, energy, refrigeration technology, sugar and transportation. We provide every single market segment with solutions of outstanding efficiency, safety, and sustainability.

**We are highly committed to earning your trust:**

We want to win your trust with everything we do and convince you with the solutions we offer. With this high aim in mind, we invest our extensive know-how, our great precision, and our passion in everything we do: including product development, manufacturing, installation, and after-sales support.

**Marching to the heartbeat of our customers:**

Companies have confidence that we can provide effective assistance to increase their performance. We see meeting this expectation as our duty. All our thoughts and actions are aimed toward this goal. Your specific requirements count – nothing else. And that is exactly what our customers appreciate.

**We are at your service.**

Kelvion – Experts in Heat Exchange.

# EATING AND DRINKING ARE LIFE – AND ENJOYMENT



By 2050, the world's population is expected to reach 9.7 billion. The demand for meat will double by 2025, and milk consumption will rise by 23 per cent between 2013 and 2025. However, even today's demand is not being met: According to the Food and Agriculture Organization of the United Nations (FAO), 795 million people do not have enough to eat. The goal is to end hunger worldwide by 2030. The solution is seen in more efficient production, more equitable distribution, and a re-thinking of nutritional behavior.

No wonder, therefore, that the volume of the world market for systems and equipment for food production is growing along with the population: Based on population growth, sustained economic growth, orientation toward a Western lifestyle, and changes in social structures – sales are expected to rise from 50.5 to 73 billion US Dollars between 2014 and 2019.

At the same time, the challenges will increase: Global competition forces greater efficiency and differentiation. Increasingly stringent regulatory requirements put processes and methods to the test. Against this background, food processing technology has experienced a rapid transformation: New materials and material qualities make it possible to reach previously unheard of standards of hygiene and long transport times. New methods exploit the possibilities of digitalization for even greater safety and end-to-end transparency. Last but not least, today's requirements can respond specifically to the multifaceted trends in the food industry, for instance by enriching food with nutrients, extending their shelf life, or making them easier to eat.

### Nutrition to go

The complicated meal prepared on the stove at home is becoming increasingly less significant. Time pressures and convenience, as well as the disappearance of the large family, are increasingly making foods that offer long shelf life and quick preparation, that are healthy and provide a taste experience, the first choice. The key word is: convenience food. That includes smoothies as small meals as well as beverages enriched with vitamins and minerals.

### Eating with responsibility

On the other hand, organic food business is booming – not least owing to scandals, new scientific findings, orientation toward sustainability, and ethical concerns about livestock farming: In 2012, global sales of organic food totaled 64 billion US Dollars. And around the world, a billion people are already eating vegetarian-vegan. That is consistent with population development: According to the WWF, producing a kilogram of beef takes 50 square meters, while only one-fourth of a square meter is needed for the same amount of potatoes.

### Loss and waste

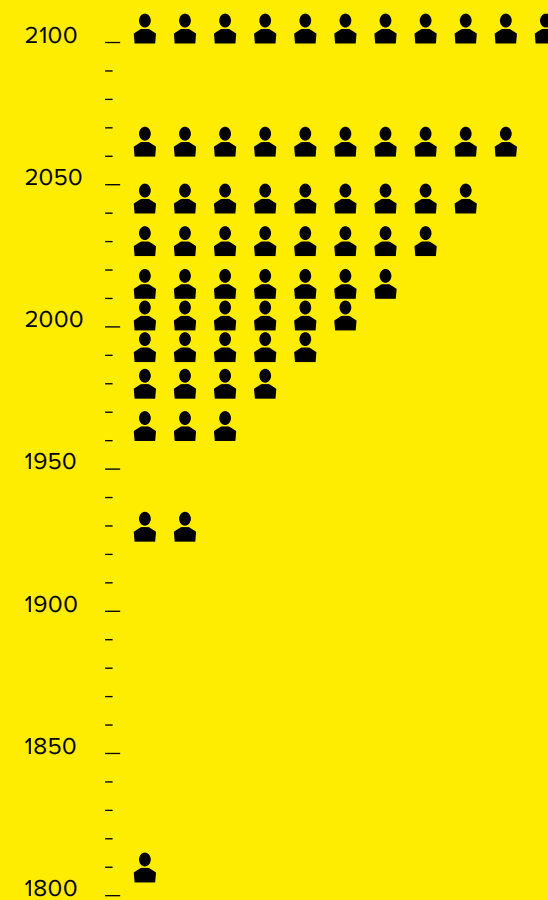
According to estimates by the FAO, about one-third of food is lost between the farmer's field and the consumer's plate. The causes include poor infrastructure, improper storage and transport, and poor hygiene. In addition, about 1.3 billion tons of consumable food is currently being thrown away.

## Exploding demand:

# A GROWING WORLD POPULATION AND RISING COMPETITION ARE CHALLENGING THE FOOD INDUSTRY.

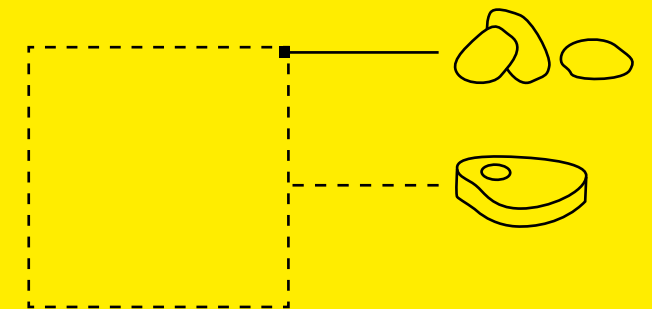
## Development of the world population in billions

World population reached the first billion in the year 1804. In 1927 it was 2 billion; 1974 4 billion. In the year 1999 world population went past the 6-billion mark – in a single century, the world's population increased nearly fourfold. In the year 2011, finally, the seven billionth person was born. Tendency: extreme increase!



## Meat needs space

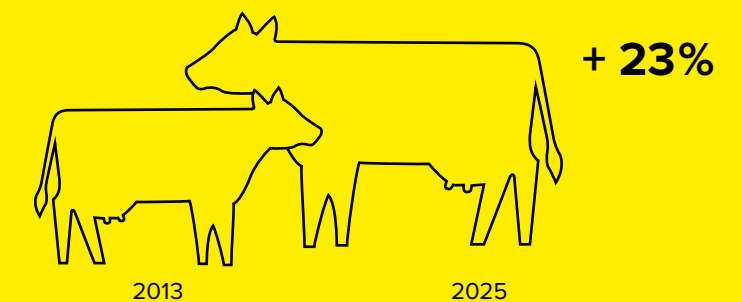
Producing a kilogram of beef takes 50 square meters, while only one-fourth of a square meter is needed for the same amount of potatoes.



Source: World Wide Fund For Nature (WWF)

## Global dairy market

Between 2013 and 2025, worldwide milk consumption is expected to rise by 23 per cent. That places great demands on the processing industry.



Source: FAO

## Global beer market

By 2020 the global beer market will reach a volume of about 688.4 billion dollars.



Source: alliedmarketresearch.com/beer-market

## The market drivers and challenges

- Food for a rapidly growing population
- Westernization of nutrition
- Innovation rate of convenience products
- Efficiency pressure due to new competitors from Asia
- Environmental pollution from food production

Source: Global Industry Analysts

Source: United Nations, World Population Prospects: The 2012 Revision, 2013



# EVERYTHING FOR HEAT EXCHANGE IN THE FOOD INDUSTRY – A SINGLE SOURCE FOR ALL YOUR NEEDS

More and more people can afford and want to have fresh food or food resulting from reliable, high-quality processing. Both options place high demands upon food processing technology, because without optimum cooling, shelf life, cleaning, and drying, the requirements cannot yet be met everywhere in the world.

At the same time, companies in the food and beverage industry are engaged in worldwide competition and have a responsibility to provide sustainable solutions. Quality, efficiency, and safety therefore go hand in hand.

We offer plate heat exchangers, finned tube heat exchangers, shell & tube heat exchangers, and modular cooling towers as key components for the food industry – a single source for highly standardized or individualized solutions. Wherever heating or cooling are involved, we can provide an integrated solution that integrates both your interests and those of your customers. We are your reliable partner along the entire value chain.





## Dairy

# MILK MAKES A LOT POSSIBLE – AND WE'RE INVOLVED

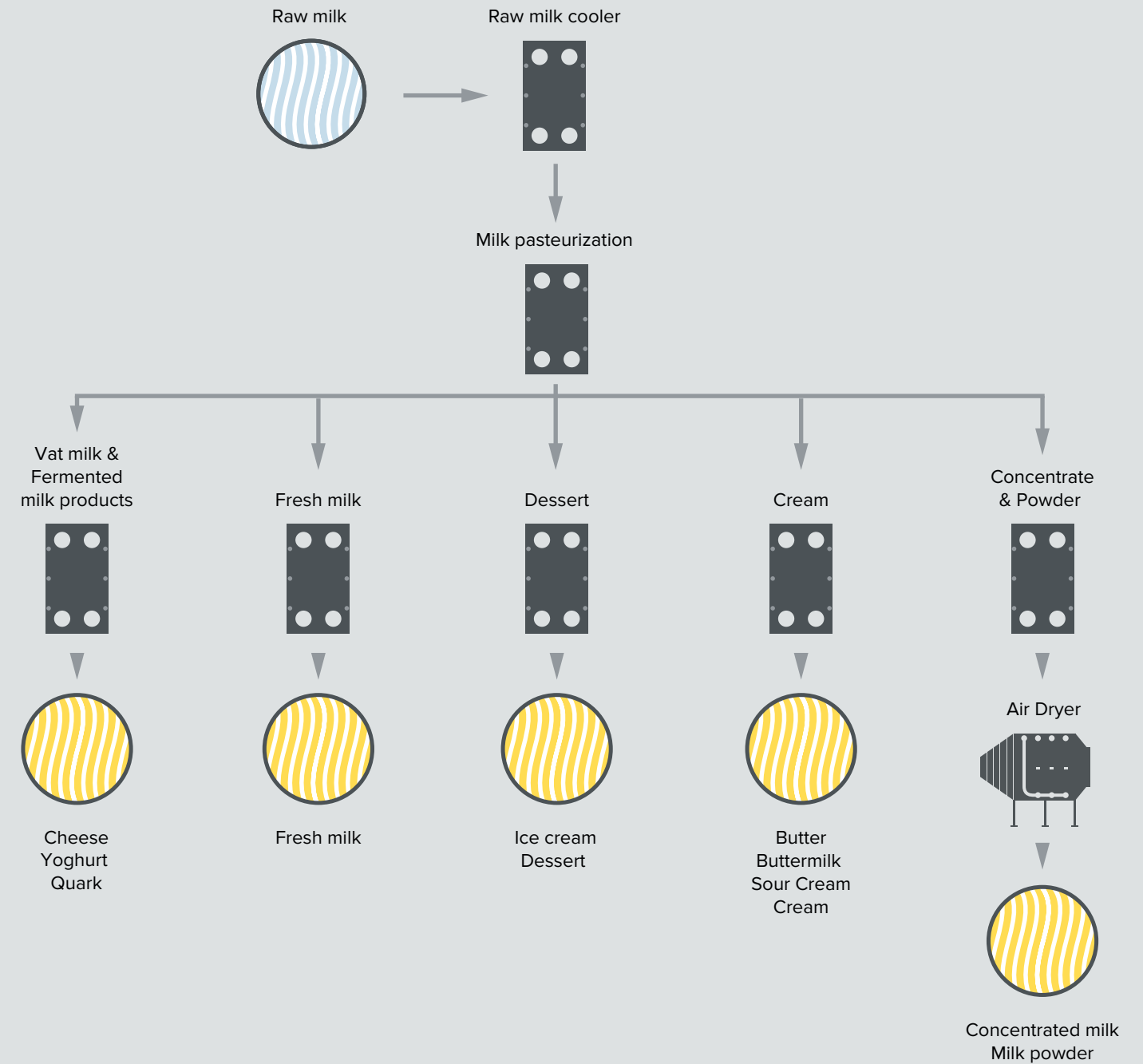
Despite rising demand for the basic food product milk, there is both excess and unused capacity. Wherever possible, therefore, the goal is to save, consolidate, standardize, differentiate, and re-position. The result is a highly complex portfolio of products such as drinking milk, ultrapasteurized milk, butter, cream, yoghurt, cheese, and quark, and even concentrates and baby food.

With our broad range of heat exchangers, we offer the milk processing industry an integrated solution for the entire process of value creation – from cooling the freshly milked milk, to pasteurization, drying, air conditioning systems, and cooling towers. As different as the requirements for the various applications are: With Kelvion you can depend on maximum hygiene and gentle product processing along with high profitability.

### Your benefits at a glance:

- Quality, reliability, and efficiency – the hallmarks of our heat exchangers for more than 85 years
- Custom-tailored solutions for special requirements, such as long production times, high product safety, long service intervals, high flexibility, and adaptability to process changes
- Specific product series, for example for shear-sensitive food products, such as yoghurt and cream
- Sealing materials that conform to food regulations, specifically tested for dairy products

## Process example – Dairy



### ADDITIONAL KELVION PRODUCTS

#### Hot water preparation & Cleaning in place (CIP)

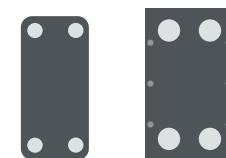


Plate Heat Exchangers  
Braze | Gasketed



Shell & tube  
heat exchangers

#### Cooling media



Wet cooling  
towers

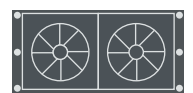


Radiators

#### Cold storage



Condensers



Air coolers





## Brewery

# WHEN THINGS ARE BREWING – WE KEEP CONTROL

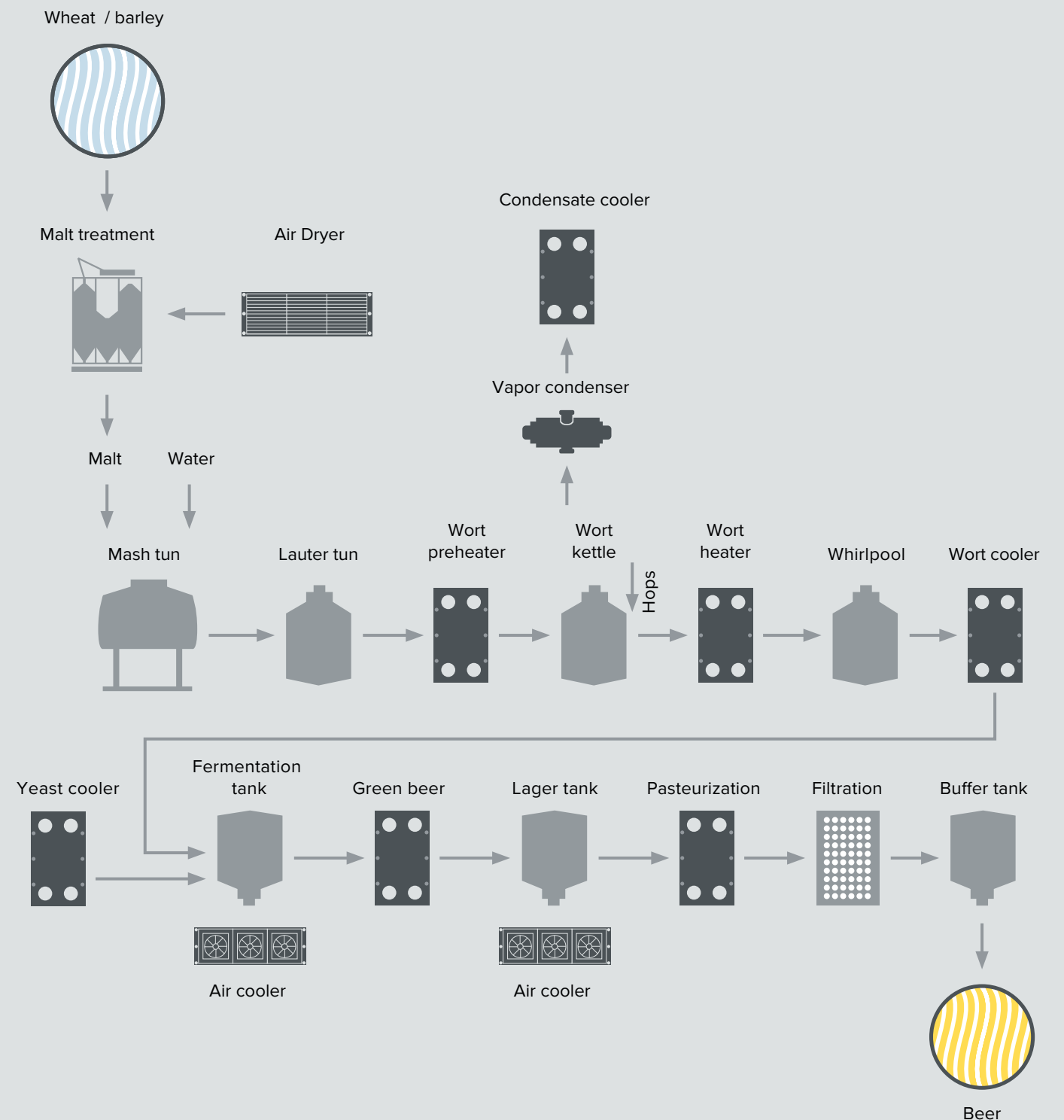
Beer and spirits were known even in ancient Egypt. Real breweries and distilleries have existed for only about 1000 years. A long time, in which complex processes have developed and the joy in beer and spirits has spread around the world – with China and its total consumption of more than 50 billion liters of beer each year at the top and Africa as an interesting future sales market. Behind all this is a gigantic, highly industrialized market with an output of nearly two billion hectoliters of beer worldwide. Starting from North America, craft breweries have established an opposite, worldwide trend, based on artisanal production and extraordinary taste varieties – including a renaissance for the can. Even in the distillation of spirits, there has been an increase in the number of craft breweries, offering many different taste variants to compete with the industrial producers.

In both cases, beer brewing and distilling, the process is similar and is marked above all by substantial regulation of temperature and pressure. That makes the efficient utilization of energy a core topic – along with performance and reliability. Both industrial and craft production utilize above all our plate heat exchangers, but also the air dryers and shell & tube heat exchangers: They all guarantee maximum cost effectiveness by virtue of effective through heat recovery and convenient handling, as well as gentle product handling and maximum hygiene.

### Your benefits at a glance:

- Complete heat exchanger product portfolio, including air dryers for malt drying, malt drying, plate heat exchanger, for wort and beer treatment, and bundled pipe vapor condenser
- Lower investment costs through highly efficient product series
- Pressure-resistant product series for applications containing CO<sub>2</sub>
- Sealing materials that conform to food regulations, specifically tested for alcoholic beverages

## Process example – Brewery



### ADDITIONAL KELVION PRODUCTS

#### Hot water preparation & Cleaning in place (CIP)

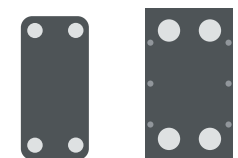


Plate Heat Exchangers  
Brazed | Gasketed



Shell & tube  
heat exchangers

#### Cooling media



Wet cooling  
towers

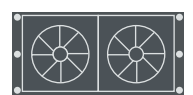


Radiators

#### Cold storage



Condensers



Air coolers



## Beverages

# HEALTHY – ALSO BECAUSE WE ARE SO CAREFUL

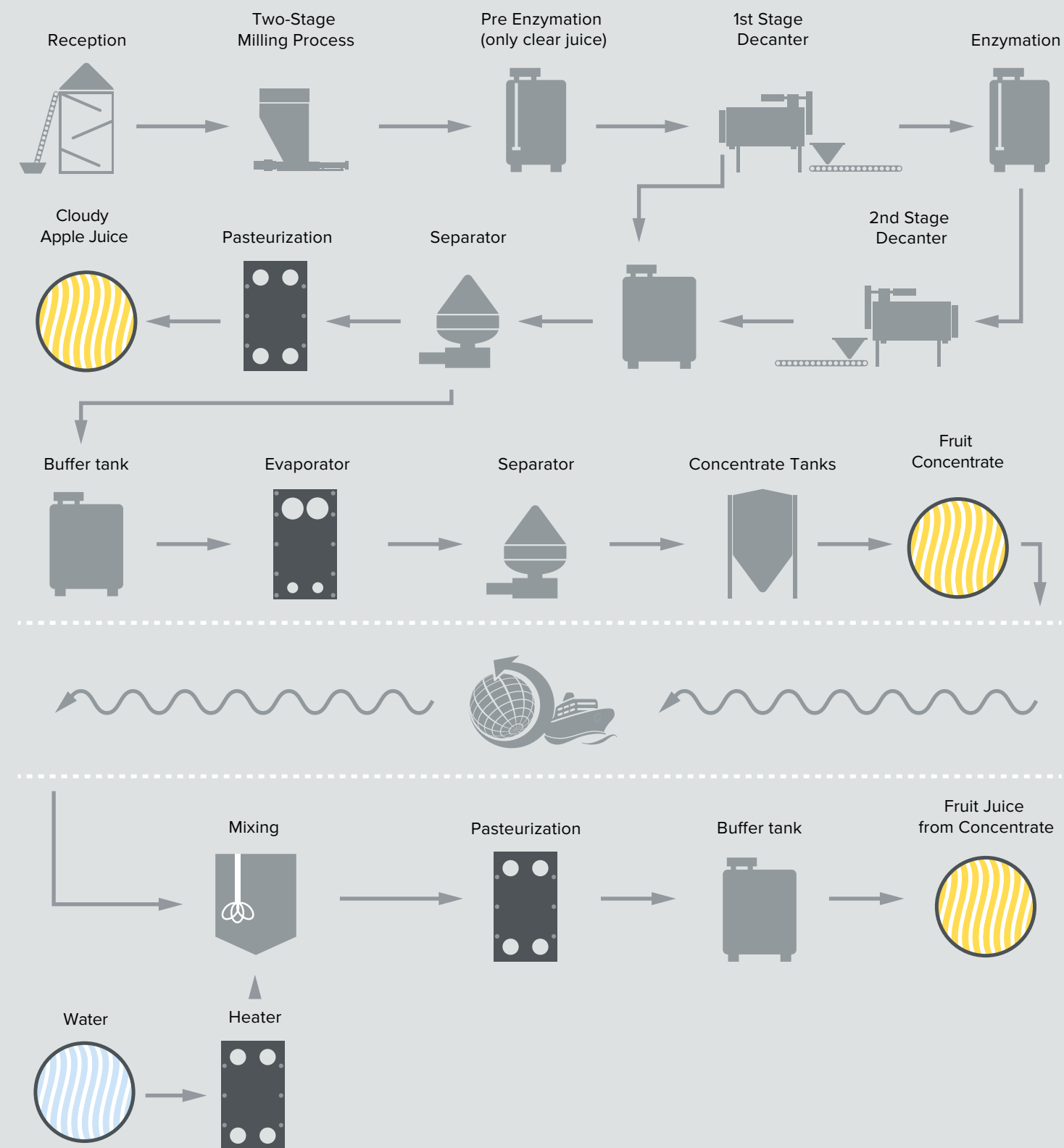
The trend toward a more conscious and healthy life has changed the drinking behavior of the population. The winners in this transformation are above all packaged water, water with added flavors or vitamins, and juices. The offerings are diverse and creative – consider the now global reach of the smoothie, water with the addition of fruit or vegetable notes, and the increasingly popular coconut water, just to mention a few. At the same time this is a good example of the increasing challenges to process technology. These products have to be processed not only economically, but above all carefully, because they change their color and lose nutrients and taste upon contact with oxygen.

With our long-lasting and highly efficient plate heat exchangers, we are there in every step of the process – including vapor condensation of fruit juices, pasteurization of fruit and direct juices, pasteurization and cooling of soft drinks, as well as hot or cold filling. The results are tasty, high-quality products with a long shelf life.

### Your benefits at a glance:

- Product series with continuously wide flow channels for media that contain particles
- Sealing materials that conform to food regulations, specifically tested for the fruit juice industry
- Austenitic stainless steels or titanium materials facilitate a long service life for thermal treatment of salty juices or energy drinks
- Pressure-resistant product series for applications containing CO<sub>2</sub>

## Process example – Beverages



### ADDITIONAL KELVION PRODUCTS

#### Hot water preparation & Cleaning in place (CIP)

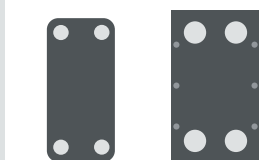
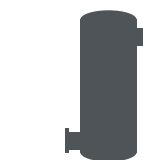


Plate Heat Exchangers  
Braze | Gasketed



Shell & tube  
heat exchangers

#### Cooling media



Wet cooling  
towers

Radiators

#### Cold storage



Condensers

Air coolers





## Viscous foods and edible oils

# EVERYTHING FLOWS – ALSO WHEN VISCOUS MEDIA ARE INVOLVED

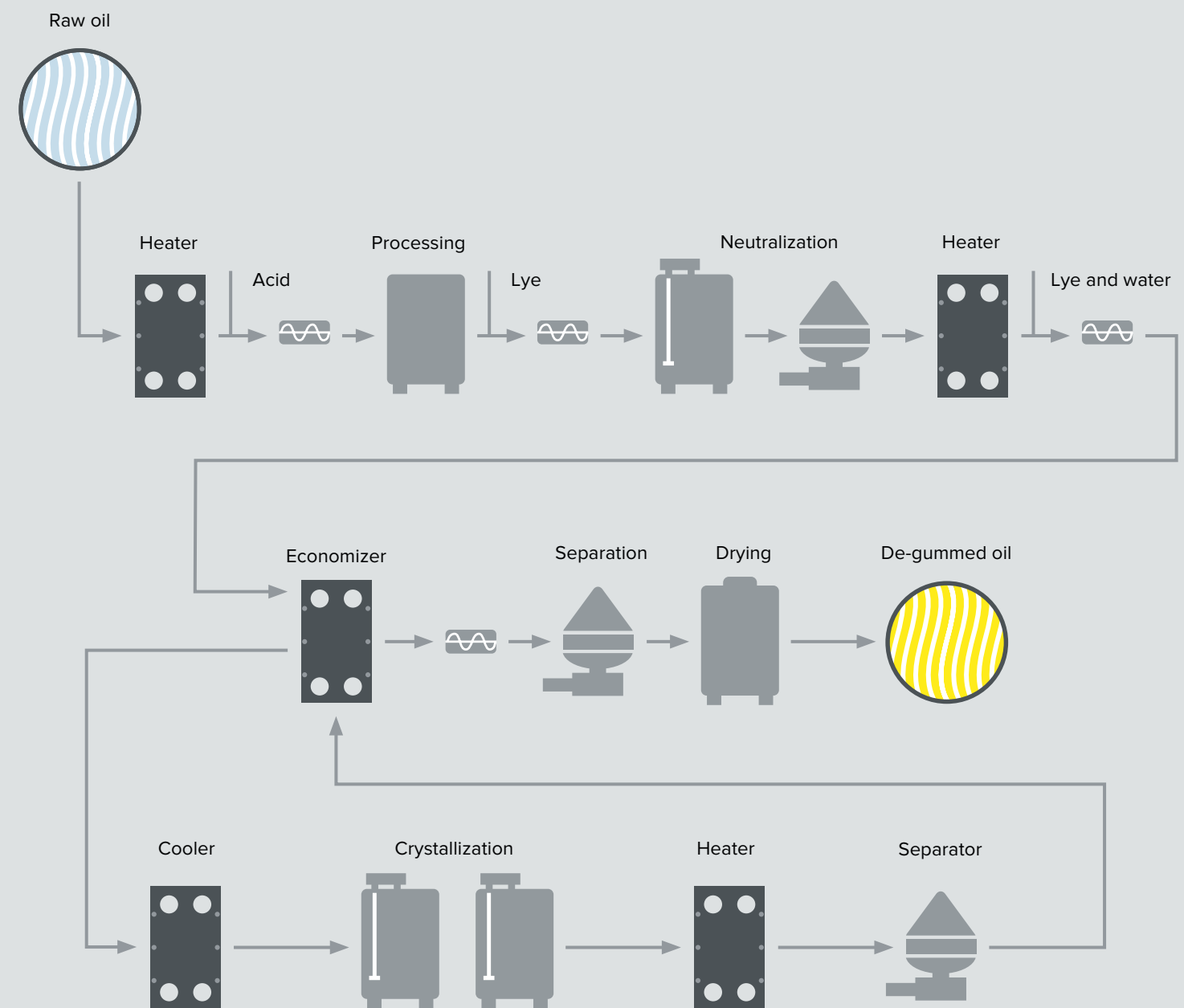
Ketchup, mayonnaise, honey, and liquid egg have a common quality characteristic: their specific viscosity. In addition, there are high expectations for taste and appearance. For edible oils, for example, the specific taste characteristics and valuable ingredients have to be maintained; in contrast, cloudy materials, fatty acids, colorants and contaminants, as well as components affecting taste and odor have to be removed.

Our plate heat exchangers offer an optimized balance of stamping depth and plate profile to ensure gentle processing as well as uniform, rapid, blockade-free flow – even for media with high viscosity, particles, or even pieces. For recipes that contain salt, special materials are available, such as austenitic stainless steel and titanium. For you that means: great taste, no discoloration due to oxidation, no fouling.

### Your benefits at a glance:

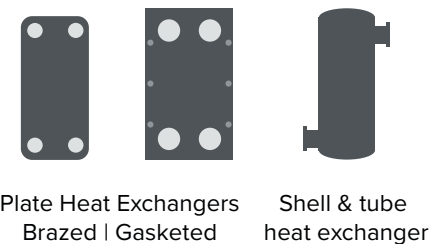
- Pressure-resistant product series and specific stamping for shear-sensitive products
- Large selection of gasketed plate heat exchangers in various sizes and thermal lengths for pinpoint design – the result for you: low investment costs
- Gaskets that conform to foodstuff specifications, even in the high-temperature range
- Long shelf life in the thermal treatment of salty sauces or liquids through the use of austenitic stainless steel or titanium materials

## Process example – Edible oil

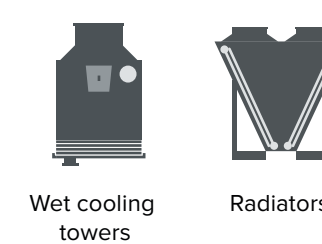


### ADDITIONAL KELVION PRODUCTS

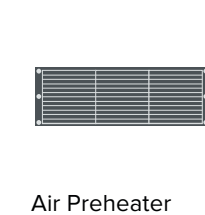
#### Hot water preparation & Cleaning in place (CIP)



#### Cooling media



#### Drying of stillage





## Overview of our products for the food and beverage industry

# THE ENTIRE PROGRAM – FROM **HOT TO COLD** AND VICE VERSA

There is hardly any other company in the world with a similarly broad product range of heat exchangers and such a comprehensive service offering, from planning to installation, repair, and service, including after-sales service. This is made possible by our unique competency, our know-how, which has been built up over decades, and our high standards for ourselves: To make you more successful through solutions and services custom-tailored to your specific requirements.

### Plate heat exchangers

Depending on the design, a distinction is made among gasketed, fully welded, and soldered plate heat exchangers. Kelvion represents an extensive program of plate heat exchangers. Within the three production groups, process-optimized model series make up a product range that is unmatched in breadth and depth and can therefore be adapted in an especially individualized way to the needs of OEMs, systems engineers, or end consumers.



### Fully welded plate heat exchangers

Our fully welded plate heat exchangers offer convincing performance in applications with increased temperature and pressure requirements as well as evaporators and condensers. They are particularly robust and require very little maintenance. The design advantages are of particular importance where not only performance but also robustness and cleanability are desired. Each model series has its own specific advantages and areas of application.



### Brazed plate heat exchangers

Our soldered plate heat exchangers consist of an individually defined number of high-quality, stamped stainless steel plates, which are connected together permanently in a special vacuum brazing process using copper or nickel and an additional stainless steel solder. They are hermetically sealed, without the use of gaskets, and thus permit high operating pressures and temperatures. Because of their low investment costs, they are a popular choice for hot water treatment in pasteurization processes.



### Gasketed plate heat exchangers

The great advantages of our gasketed plate heat exchangers lie in their ease of servicing and the flexibility to adapt to any production requirement. Thanks to the different plate corrugations, a variety of possible nominal connection widths, and different thermal lengths, we always have the right solution for your application. The optimized plate corrugation (OptiWave Design) ensures uniform media distribution over the entire width of the plate. This enhances the self-cleaning effect of the medium and reduces the formation of deposits. This increases the service life of the equipment, thus lowering operating costs. At the same time, high heat transfer rates are achieved, which reduces overall investment costs. Our gasket materials meet the requirements of different international standards in the food industry. An extensive selection of single and multi-stage stainless steel and coated casework conforming to the popular connection standards used around the world, means that we offer a complete product portfolio for the food industry.

Overview of our products for the food  
and beverage industry

# THE ENTIRE PROGRAM – FROM **HOT TO COLD** AND VICE VERSA



## Shell & tube heat exchangers

Our shell & tube heat exchangers combine high performance with compact design: Multiple smaller inner pipes are arranged inside a jacket pipe. This tube bundle, which can be extracted from both sides, is double-sealed on both ends and is protected from stress cracking. The results are compact design, high efficiency, simple installation and disassembly, as well as low operating and maintenance costs. Our shell & tube heat exchangers are used above all to heat water. However, their highly reliable seal also makes them interesting for applications such as the heating of alkaline and acidic solutions for Cleaning-In-Place (CIP) processes.

Different variants are available. If you need more performance, special insulation, or special counterflanging, we can offer these features in the context of an individualized solution.



## Modular cooling towers

Our modular cooling towers have a variety of advantages: maximum water savings, heat pollution of surface waters that is far below the legal thresholds, and substantially lower climate-control costs. Thanks to these factors, our individual cooling towers offer particularly long service lives and low service costs. We construct cooling tower modules that meet the requirements of our customers precisely. Our sales engineers provide you with expert consulting, analyze your specific wishes, and assume personal responsibility to the delivery – with the result that our execution of your order will meet your specifications fully and exactly.



## Air dryers

With our air dryers, air is heated in a multi-stage process and – depending on requirements – is dehumidified, in order to produce the desired climate: After filtering, the hot air is routed to a spray drying tower, in order to dry products such as milk concentrate, whey concentrate, or concentrated baby formula. Or they are used in malt production to dry cracked, soaked barley and to split the starch molecules into sugar.

Our air dryers offer the optimum prerequisites for this purpose: Manufactured of stainless steel finned tubes, they meet the stringent hygienic requirements of the food industry, can be used in aggressive environments, and offer long service lives without performance losses. Of course, they are certified under all the relevant standards and are subjected to continuous quality control by the German Technical Standards Association (TÜV) and other official monitoring organizations.



Overview of our products for the food  
and beverage industry

# THE ENTIRE PROGRAM – FROM **HOT** TO **COLD** AND VICE VERSA



## Dry coolers

Our dry coolers meet all your technical requirements and are also distinguished by competitive prices and short delivery times. Thanks to the outstanding rates of heat transfer, the advanced Kelvion finned tube technology ensures both high system reliability and cooling capacity. All the popular designs are available: Flatbed (induced draft or forced-air ventilation), V-bank or vertical for all variants. Based on the flexibility of the products, the dimensions of the systems can be custom-tailored to your requirements. Thanks to high-efficiency fan technology – AC fans with frequency inverters or variable-rpm EC fans – the Kelvion dry coolers offer excellent sound characteristics and reduce energy consumption.



## Heat exchangers for refrigeration systems

Shopping centers, supermarkets, industrial kitchens, and cold storage facilities need powerful and above all efficient refrigeration technology, because it is the greatest cost factor in the storage area. Our reliable finned tube heat exchangers for refrigeration technology ensure that the ecological footprint of the cold chain is as small as possible and that consumers can enjoy a rich offering of fresh fruit and vegetables, cold drinks, or ready-made meals – thanks to optimum, targeted application of cooling technology.

Our air coolers are based on decades of experience and stand for trendsetting solutions for a variety of applications – including fruit and vegetable storage, slaughterhouses, large sales centers, air-conditioned high-bay storage facilities, and small refrigerated rooms. Furthermore, they are known for their high energy efficiency, optimum cold distribution, trouble-free thawing, effective heat transfer, and top reliability.

We develop and produce air-cooled condensers, systems, and solutions for customers, for which refrigeration technology is an essential component of their primary processes. Our condensers offer you a greater selection than ever before – including equipment in flatbed or V-bank design, one or double-row configurations, and different module lengths.

A large industrial facility with a worker in a yellow safety vest walking past a large blue tank. The scene is brightly lit by large windows in the background. The text 'OUR SERVICE IN THREE WORDS:' is overlaid in the top left corner in a large, bold, black font. Below it, the words 'PEACE OF MIND' are written in a large, bold, yellow font.

# OUR SERVICE IN THREE WORDS:

# PEACE OF MIND

Developing and delivering products and solutions is one part of the business. Comprehensive after-sales and other services are the other. It's always about meeting your requirements. This principle has made us a dependable service specialist. Our dense worldwide network of locations enables us to provide 24/7 service to support the maximum availability of your systems anywhere, anytime. Day-in, day-out, we're on the move for you. The service work we perform adds continuously to our knowledge and experience, which we incorporate into valuable new improvements. In this way, we optimize our performance continuously: whether in precise assembly, in-company or on-site troubleshooting, visual inspection as part of proactive maintenance, repair or cleaning, new pipe installation, provision of replacement parts, or chemical preparation of product components in our own workshops. .

And no matter what we do, our services are always based on concrete values:

#### **Quality and safety**

With individual customer consulting and precise work, we reach the heights of service quality.

#### **Innovation**

Innovative service solutions help us meet your requirements.

#### **Efficiency**

Our parts and services increase profitability: We optimize operational procedures and maximize the availability of our systems for you.

#### **Expertise**

You benefit from the knowledge and experience of decades of service activity.

#### **Trust**

Our service employees act in a reliable, responsible, and transparent manner. To earn your trust.

#### **The multi-stage model – the service of your choice**

Our after-sales and other service offerings are based on a multi-stage model in which the agreed services are part of an individualized customer service contract. The clearly delineated contents of the various modules ensure reliable cost transparency. All the service modules can be combined as desired to create an individualized service agreement. Custom-tailored to your individual needs, you put together your own personal service package: from provision of replacement parts to personnel training, a help desk, and continuous on-site service.



# FAIRNESS FIRST: FOR CUSTOMERS, EMPLOYEES, COMPETITORS, AND THE ENVIRONMENT

Companies such as Kelvion that are internationally active are obliged to conform to internationally accepted conventions: of social, political, and legal nature. Our corporate code of conduct describes the principles and procedures behind our corporate actions. This code applies to all our employees worldwide. We ensure compliance with the regulations in a working environment that is characterized by integrity, respect, fairness, and responsibility.

## **We respect and observe the law.**

The basis for all action at Kelvion is the observation of all applicable laws and other regulations. We supplement these rules with especially designed, particularly strict internal guidelines and training with regard to certain aspects of the law.

## **We act internationally.**

Kelvion strictly observes as binding the statutory regulations that apply to our products and services involved in international commerce. We observe all applicable bans on exports and imports and observe all official authorization procedures.

## **We wholly reject corruption.**

Kelvion rejects any type of commercial corruption, both domestically and on foreign markets. In order to underline this fact, we have drawn up our own anti-corruption guidelines that enforce rules of proper conduct to which we adhere at all times. These rules apply both in our dealings with officials and with the bodies and employees of other companies.

## **We support fair competition.**

In a spirit of fair competition, we work hard, orient this work to our customers' needs and ensure the quality of our products and services. We observe all applicable domestic, supranational, and foreign anti-trust laws as well as any laws pertaining to unfair competition. We also expect this level of fairness from our competitors.

## **We ensure socially acceptable working conditions.**

We are committed to the principles of social responsibility towards our employees and society. Kelvion offers its employees fair working conditions worldwide. We reject any form of discrimination, with respect to gender, sexual orientation, origin, skin color, or any other personal characteristics. We see ourselves as a socially responsible employer that treats its employees with respect.

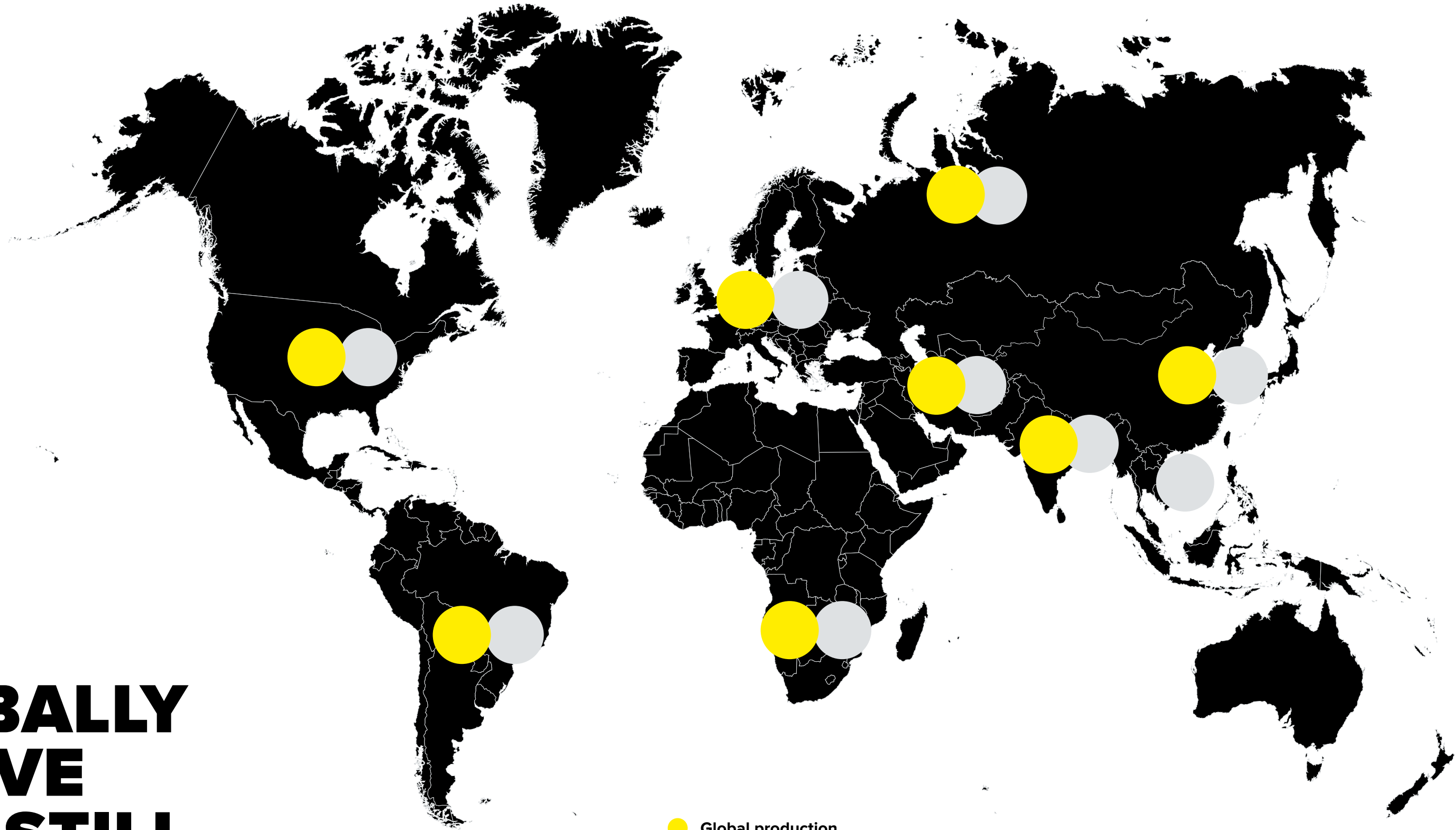
## **We protect the environment.**

From development, to manufacturing, and to the sale of our products, we protect the environment throughout each of these phases. This principle applies not only to the energy we employ, but also to the protection of our natural environment at every workplace worldwide.

## **We ensure product safety.**

For our customers, we develop innovative, high-quality products and processes – and product safety enjoys top priority.





# GLOBALLY ACTIVE AND STILL CLOSE BY

No matter where your market is, regardless of country, we are never far away. We are always happy to answer any questions you may have and meet your requirements. Even the largest, most successful project begins with an initial, profitable conversation. We look forward to hearing from you.

-  Global production footprint
-  Global sales and service



Just scan this QR code with your smartphone or visit our website at: [www.kelvion.com](http://www.kelvion.com) – there you will find a highly competent contact in your immediate vicinity.



[www.kelvion.com](http://www.kelvion.com)