

A person wearing a white long-sleeved shirt is shown from the chest down, pouring a large amount of yellow cornflakes from their cupped hands. The flakes are falling through the air, creating a dynamic scene. A thin yellow arc graphic curves across the lower half of the image. The background is plain white.

# geelen counterflow

cool and dry

The laws of nature can't be changed.  
Gravity, thermodynamics, aerodynamics.  
They guide our continuous development  
of the world's best dryers and coolers.  
They are the foundation of our team's  
expertise and top-rated service.

They help us to dry and cool your  
product with a minimum of energy  
and moving parts. And with the best  
possible food safety.

The laws of nature can't be changed.  
They make us reconsider how we treat  
our limited natural resources.

They make us strive for 100%  
sustainability in everything we do.

The laws of nature can't be changed.  
They must be respected.

living the  
laws of nature

## Towards 100% sustainable drying and cooling of feed & food

In 1980, my uncle Pierre Geelen  
invented the counterflow cooler  
for animal feed. Our company has  
focused exclusively on development  
of the best dryers and coolers for feed  
and food. In 2018 we supplied the  
10 000<sup>th</sup> unit. The keys for success  
are still the same as in 1980: energy  
efficiency, uniformity of drying and  
cooling, and highest food safety  
standards.

Our goal is to make drying and cooling  
100% sustainable. We owe that to the  
generations that come after us. The  
most important key to achieving that  
goal is continuous improvement of  
energy efficiency. That is exactly what  
our Counterflow Innovation Centre is  
focused on.

With our nearly 40 years of experience  
we can help you reduce the cost of  
drying and cooling. Once installed we  
will keep the dryer and cooler running  
efficiently through our worldwide  
network of service engineers and our  
advanced remote monitoring systems.

We look forward to work with you!

**Sander Geelen**  
*Managing Director*



'You can control not only cooling, but also moisture evaporation'



## Counterflow Coolers

Counterflow is the most efficient method to transfer heat. It also minimizes product temperature shock and layout footprint.

Using vertical gravity flow provides low mechanical complexity, low maintenance, high up-time and a low risk of cross contamination between production runs.

By accurately controlling air volume and retention time you can control product discharge temperature and/or create conditions to maximize or minimize final product moisture content.

Geelen Counterflow coolers are available in hundreds of models and configurations to suit your product and process specifications, but also your requirements for quick-change-overs, fast inspection, CIP cleaning, fire detection, fire suppression etc. We build hundreds of cooler lines every year for customers around the world, including their cyclones/filters, fans and controls.



'At least 24% lower energy consumption than alternatives'



## Counterflow Dryers

Counterflow is not only the most efficient method to transfer heat, but also moisture. When combined with the recovery and re-use of energy from the cooler and the lower dryer decks, this means that counterflow dryers can achieve energy savings of at least 24% (\*), when compared to best available alternatives. When replacing existing dryers, savings of up to 50% have been achieved. For most extruded petfood or aquafeed the energy requirement for drying is below 2600 kJ per liter of evaporated water.

Vertical compact design means lowest required floor space for installation. Gravity flow instead of mechanical product transport guarantees low complexity, low maintenance, high up-time and smallest possible risk of cross contamination.

Accurate control of drying time and drying air volume, temperature and relative humidity assures the best moisture uniformity and unmatched energy efficiency. Advanced PLC controls enable a fully automated process, supported by drying recipes for every individual product.

With every dryer we install we include a 10 year service agreement which ensures continued safety and efficiency of the equipment through scheduled inspection visits by our service engineers.



\* René P.J.M. Houben, Marcel A.M. Geboers, Piet J.A.M. Kerkhof, (2011), Performance of two industrial dryers for Fish Feed, Drying Technology, 29:12, 1472-1480

'An additional  
65% reduction  
in energy  
consumption'



## Counterflow Electric Dryers

The Geelen Counterflow Electric Dryer is what our Counterflow Innovation Centre has worked on since 2014. Following a year of 1:8 scale testing in a commercial petfood factory, the Electric Dryer was introduced to the market in 2018.

It uses high temperature industrial heat pumps with counterflow heat exchangers to condense the moisture in the dryer's exhaust air and recover most of the energy and water that would normally be discharged to ambient. This reduces net energy consumption of the drying process by another 65% compared to counterflow dryers on gas or steam. For most extruded petfood or aquafeed, the energy requirement for drying can therefore be reduced to less than 1000 kJ per liter of evaporated water.

Optionally, hybrid air systems with both heat pumps and gas burners can be employed for maximum flexibility. The air/water heat exchanger employs CIP (Cleaning in Place) systems to stay clean.

The modular design of the hybrid air system allows a producer to install heat pump technology step by step, keeping all options open for drying with gas only, electricity only or a mixture of the two.

Please check out "Geelen Counterflow Electric Dryer" on Youtube for an animated explanation.



# Applications

## food



Breakfast cereals, coffee beans, almonds & nuts, couscous, chocolate, etc.

## petfood



Dry petfood kibbles, high protein-, high meat petfood, co-extruded pockets, etc.

## aquafeed



Extruded aquatic feeds, all sizes and each buoyancy, pelleted shrimpfeed, etc.

## feed

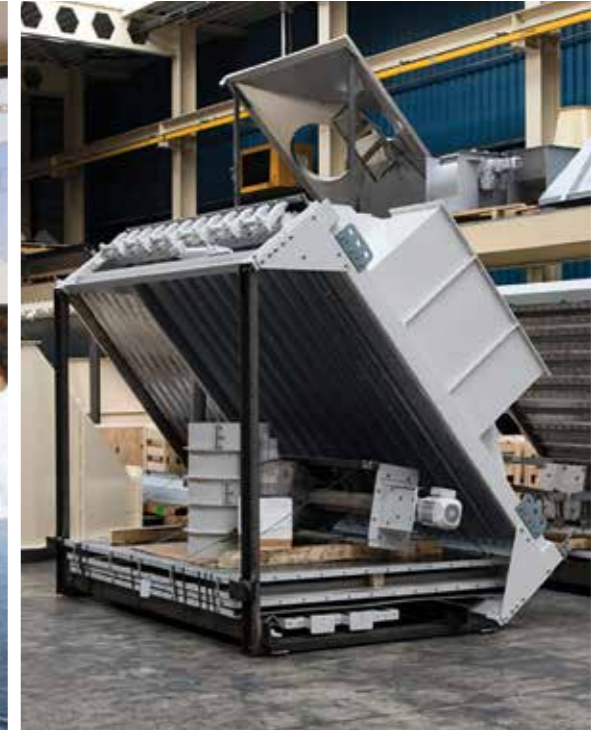


Pelleted, extruded, expanded, flaked, conditioned mash, etc.

## oil seeds



Soya, rapeseed, sunflower seed, collets, meal, pellets, cake, etc.





living the  
laws of nature

## Values

### Commitment

Long term success in the relationship with our customers leads to long term success for our company and its stakeholders. We strongly prefer slow solid growth over fast opportunities.

### Efficiency

We minimize the waste of time, materials and energy, both in our own processes and for our customers. We minimize the environmental footprint of our operations and those of our customers.

### Responsibility

We take our responsibilities seriously and we expect our suppliers and employees to take theirs serious as well. We are fully responsible for the effects of our activities on the community and the environment.

### Independence

We are a healthy family business with no involvement of external shareholders, banks or financial institutions. To guarantee continued independence we spread our activities over multiple applications, continents and customers.

### Specialization

Focusing on counterflow drying and cooling for feed and food leads to superior know-how, quality and service. Our market leadership is the result of our in-house research & development, listening carefully to our customers, continuous improvement and worldwide sales and service network. Our specialization allows us to work with facts, measurements and calculations, rather than assumptions.







## Dedication to energy efficiency

In 2015 our new head office was awarded the highest rating ever worldwide under the international BREEAM certification system for sustainability and health. More than 500.000 buildings worldwide have been rated before. Our's scored 99,94%. It is constructed out of wood from sustainably managed forests in Southern Germany and its solar panels generate 50% more energy than the office consumes. This excess solar power is utilized on site for the equipment fabrication processes. Rainwater is collected and re-used.

For more details, please google (in English pages):  
"Breeam Geelen Counterflow Case"



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