

# Success Stories

- About OTFLOW
- Clients' Cases
- Research by Wageningen
- Exporters reviews
- Importers reviews
- VISA test
- Awards

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

**OTFLOW**



# About OTFLOW

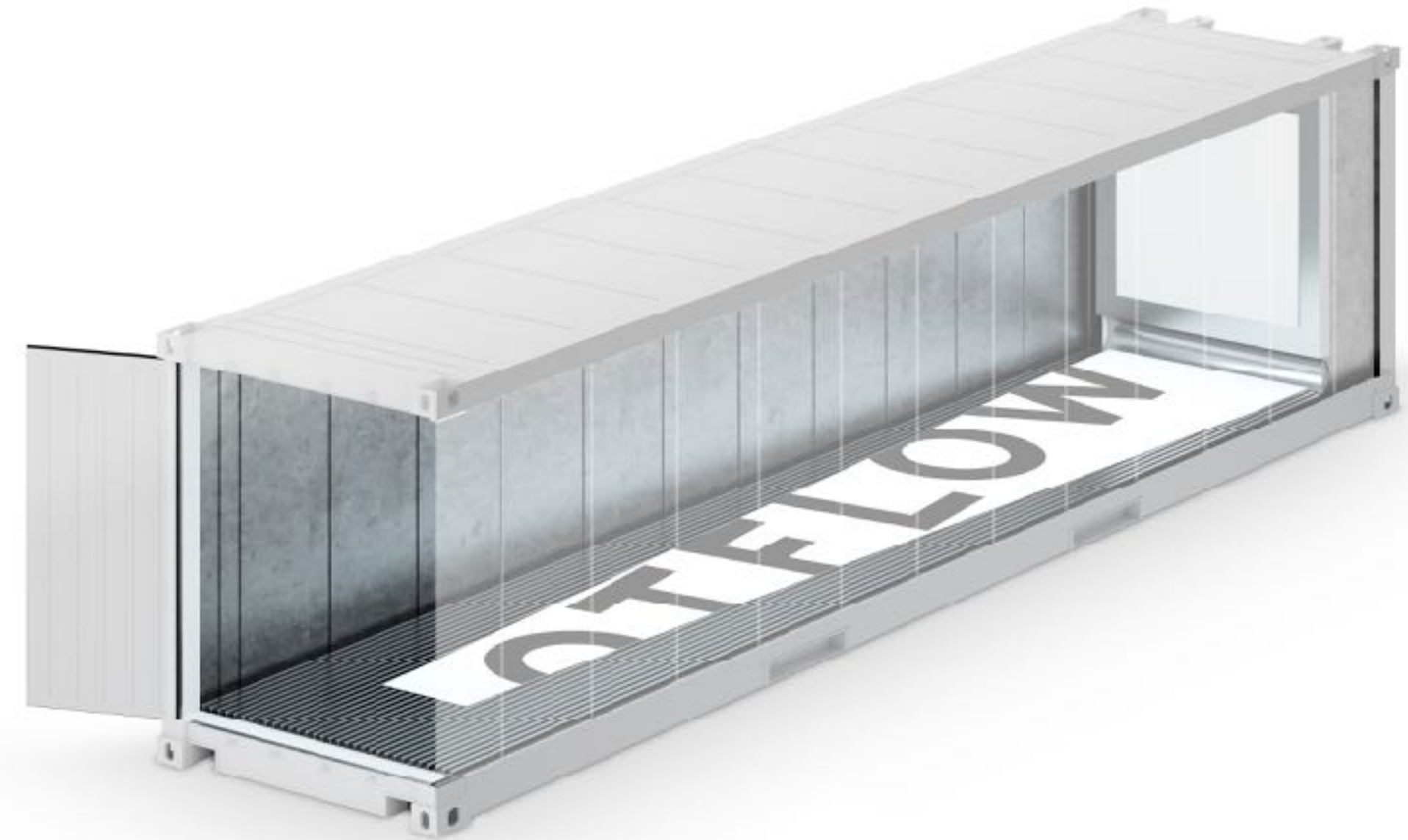
# What is OTFLOW?



Refrigerated containers enable fresh goods to be transported around the world. However, they often fail to keep the whole cargo at the required temperature, especially when the outside temperatures are high. That results in sub-standard products within a shipment upon arrival.

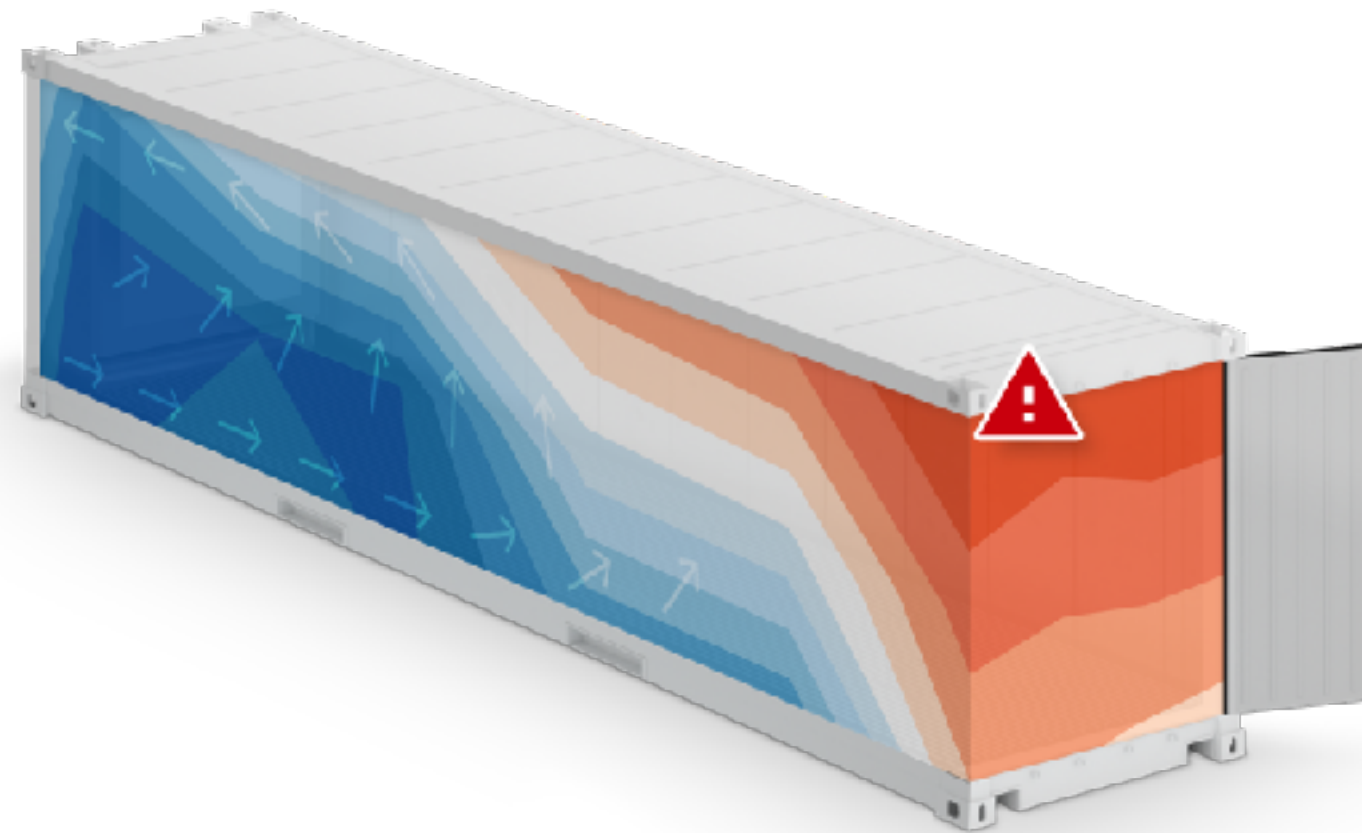
OTFLOW is a specially designed floor cover that optimises the airflow throughout the container to ensure the entire shipment arrives intact. An improved airflow means less (food) waste and fewer financial losses during shipping.

**More information? Visit [otflow.com](https://otflow.com)**



# Improving the air flow.

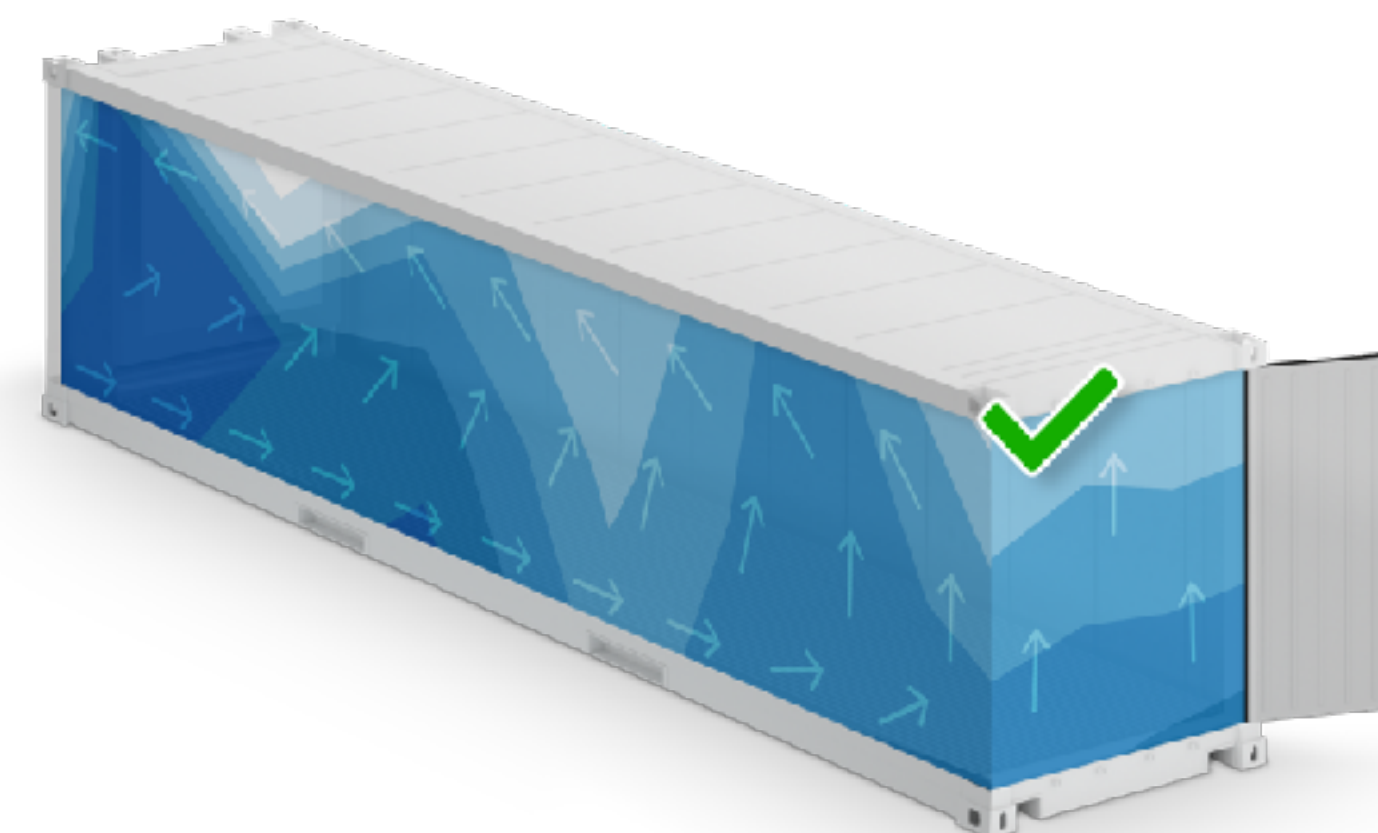
Keeping your cargo cool.



## Without OTFLOW

The flow of air should circulate throughout the entire container. Unfortunately, without OTFLOW®, the internal airflow is not that effective.

Resulting in 'Hot/ Cold Spots' that lowers the quality of your cargo, often paired with big (financial) losses.



## With OTFLOW

With OTFLOW the cold air reaches all corners of the container, keeping the temperature equal from front to back (tested by Wageningen Research).

Better flow means less food waste and less financial losses and a higher product quality.



# The three benefits of cooler cargo

## **Save Money**

Cut financial losses from claims upon arrival

## **Reduce food waste**

Prevent unnecessary food waste and contribute to the environment

## **Maintain quality**

Consistent quality also means higher profits for your company



*OTFLOW is designed to keep your cargo cool, even when the outside temperatures are very high.*

# Clients' Cases



# Less dried out fruit, longer shelf life.

Client review | The Greenery | The Netherlands



Under the right conditions, pears can be stored for a long time before being sold in the store. But if the conditions are not good, the fruit can show all kinds of defects, such as drying. When that happens you get wrinkled fruit that you usually cannot store.

With good climate conditions, you can better control the shelf life of pears. That is why we now work with OTFLOW® for our pear export to China. After all, there are strict requirements on the import of fruit and vegetables in China.

The feedback from our Chinese customers is very positive. The quality of the fruit is measurably higher throughout the entire container. Fewer fruits get dried out and it all has a longer shelf life.

The biggest advantage is that it almost doesn't matter whether the fruit is in the front or back of the container, near or far from the cooling unit.

Since the air flows are better regulated, the chance is considerably greater that the entire load is of perfect quality. We now intend to use OTFLOW® on other overseas lines, such as for our mangos.

Certainly for The Greenery, where sustainability and quality are of paramount importance, it is important that the ventilation in the containers is increasingly optimized.



The Greenery is the Netherlands' largest fruit and vegetable trade cooperative.

**Review by Ton de Weert,  
Quality Control Manager of The  
Greenery**

# OTFLOW makes a significant difference

Client review | Jaguar, The Fresh Company | The Netherlands



The six back pallets, which is almost a third of the load, are often the handling agent's biggest worry. This is especially the case with the types of fruit that have to be transported cool; one degree warmer or colder makes a big difference with, for example, pears, peaches, nectarines, plums, and kiwis.

And some types of fruit produce a lot of heat themselves, such as mangos. With these, the rear part of the loads almost always arrives in poorer condition than the front part. This is because the temperature is not constant throughout the entire container.

That is why I advise our forwarders to work with OTFLOW® for these types of fruit. OTFLOW® makes a significant difference in the ventilation in the container, as a result of which the quality of the entire container and in particular the rear part of the load is retained much better.

The ripeness is better, and healthy fruits stay healthy. With OTFLOW® you not only get better quality for the consumer, but also you can keep the fruit longer after shipping. Thus you can sell the fruit when the market demands it. It is more sustainable and commercially attractive.



Jaguar Fruits is a global exporter and importer of fruit and has branches in the Netherlands and China.

**Review by Sven Thomas,  
Special Projects Manager of Jaguar  
Fruits.**



# An effective new tool for fruit shipping.

Client review | Global Fresh Solutions | The Netherlands



In my job, I provide post-harvest advice to farmers, importers, and retailers, and I specialize in cold chain management. I tested OtfLOW for the first time in the Morocco – Middle East trade link, a journey overseas that takes more than two weeks for one of the biggest blueberry producers worldwide.

The transport of blueberries involves an increased risk of contamination. One degree of temperature fluctuation can affect the condition of the berries enormously. For the delicate berries, this would most likely lead to a huge loss of value. As a result, the farmer would not get the price he deserved.

The results don't lie. The quality of the berries was visibly higher and more consistent over the entire load. Nowadays, I advise using OtfLOW for longer trade links overseas, especially when delicate products are being transported.

OtfLOW proves to have a positive effect on air circulation. It is a unique product that I have not seen before, and I think it is an important new tool to improve the chain value, farmer to consumer. Every stakeholder has more certainty on the shelf life and quality of their transported goods, which results in better products and more certainty about the quality of the goods.



Global Fresh Solution offers expertise, knowledge, and innovative supply chain solutions for the fruit industry.

**Review by Harm Verpaalen,  
Cold Chain Specialist at Global Fresh Solutions**

# Research Wageningen



# Scientific Research

Scientific Research | Wageningen University | The Netherlands

OTFLOW is developed and tested by Wageningen University. In 2016, Dr. Ir. Leo Lukasse from the Wageningen Biobased Research Facility initiated research to find out how to reduce the temperature differences inside cooled containers by covering the floor.



Wageningen Food & Biobased Research is the Dutch leading facility for sustainable innovations in healthy food, fresh food chains and biobased products.

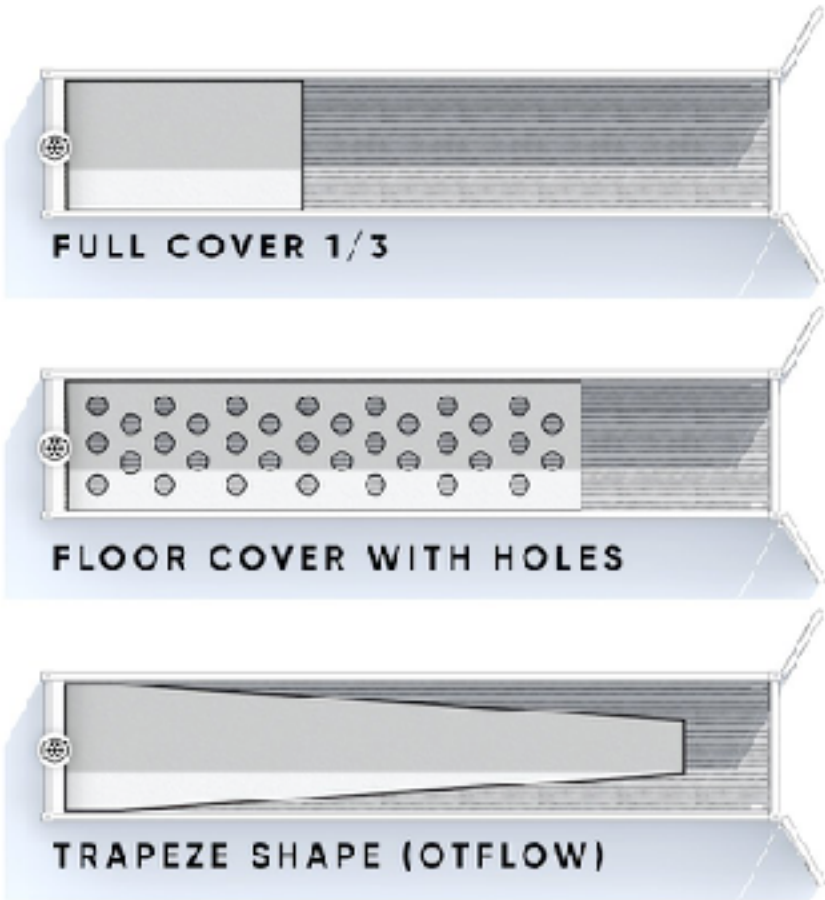
**Scientific Research by Dr. ir. (Leo) Lukassen, Researcher Wageningen Food & Biobased Research.**

## Research Stage 1

### Floor cover shapes

First, it was needed to be determined what shape works best to have an even distribution of the cold air. The test was performed with a 40" cooled container inside the brand new climate chamber of the research facility, able to create a constant outer temperature of 50 Celsius.

After months of research on multiple floors covering shapes, OTFLOW® proved to have the most effect on keeping the optimal temperatures inside the container unit.



## Research Stage 2

### Field test with Grapes

For the second stage (the field test), a shipment of grapes from South Africa to the Netherlands, 186 temperature recorders constantly monitored the internal temperatures of six containers.

To compare the effect on the temperature difference, the team equipped only 3 of 6 containers with OTFLOW. The research concluded an amazing 30% improvement in temperature difference with OTFLOW.







## A powerful improvement

### Research conclusion and report

Temperature maps from Wageningen's research conclusion show that containers with OTFLOW benefit from improved temperature difference; eliminating harmful hot/cold spots.

When the temperatures reached their highest point during the shipment, the temperature map shows that containers with OTFLOW® benefit from an improvement of 30%; eliminating hot/cold spots and keeping fruit fresh.



“The OTFLOW® floor cover reduces the temperature difference between warmest and coldest location in shipments of precooled grapes by approx. 30%.”

Dr. ir. (Leo) Lukassen | Researcher Wageningen Food & Biobased Research.



Wageningen Food & Biobased Research is the Dutch leading facility for sustainable innovations in healthy food, fresh food chains and biobased products.

**Scientific Research by Dr. ir. (Leo) Lukassen,  
Researcher Wageningen Food & Biobased  
Research.**



# Exporters reviews

5/5



"Sometimes we had 4 to 6°C difference. This happened due to the short circuits of the cold air flow inside the container.

Since we use OTFLOW (started in 2018), our temperatures are a lot more stable. We have always ordered OTFLOW since, and will continue to do so."

**Grape exporter**

Exporting from India to Norway



5/5



"We did numerous shipments to different destinations; all very successful!

One of these stands out, a shipment of stone-fruit to India... as a result of the covid-19 problems the shipment was delayed, after 46 days and 3 trans-shipments the cargo arrived in India and still received GREEN status on the quality report."

Stone fruit exporter

Exporting from South Africa to India



5/5



"To really put OtfLOW to the test, we did one shipment of blueberries with modified atmosphere with some half pallets.

The trial went to the UK and was received in very good condition. This result is exceptional as produce was from different growing areas and from different pack dates."

Blueberry exporter

Exporting from South Africa to United Kingdom





5/5



"Before using Otflow, last season (2018/2019) we had a 6% probe failure on our cold treatment shipments to Israel.

This season (2020) we started using Otflow and although we did fewer shipments we had 0% probe failures. We will definitely reorder for next year."

Grape exporter

Exporting from South Africa to Israel



5/5



"Conclusion:

The OtfLOW works by distributing the air throughout the container, this can be seen highlighted in position 20 (near the doors) which is the most difficult location to maintain the programmed temperature."

Avocado exporter

Exporting from Peru to Rotterdam



5/5



"After experiencing the benefits of using OtfLOW on other shipping destinations we also did a successful trial on our problematic shipments (cold damage) to the US.

As a result, non of the containers equipped with OtfLOW arrived with any signs of cold damage."

**Grape exporter**

Exporting from South Africa to US



5/5



“Regarding the results of the test that we carried out, the temperature remained within the established ranges, throughout the journey.”

Asperges exporter  
Exporting from Peru to US





5/5



"OTFLOW helps to standardize the Temperature and Relative Humidity throughout the container, these conditions are more stable during transit than without.

In RA-containers, OTFLOW standardizes Dehydration and Maturity, while in CA-containers it also reduces Dehydration in all positions."

Mango exporter

Exporting from Peru to Rotterdam



5/5



"In position 20 (near the door) the treatment has lowered the temperature by 0.8 degrees at the highest peak of the trip."

Blueberry exporter  
Exporting from Peru to Rotterdam



5/5



"We had to do a CT (Cold Treatment) for Citrus in The Netherlands. This was done in a stationary reefer container.

To ensure the temperature was stable we placed an OtfLOW in the container. The result was very positive, even the Dutch authorities were impressed."

Citrus exporter

Stationary test in The Netherlands



# Importers reviews



5/5



**"Keeping temperature at level  
benefits the quality of pineapple.  
OtfLOW shows to be efficient in  
maintaining the right temperature."**

**Leander van Bellen**

General Manager / Surveyor at Fruitify Experts

Quality control company of







5/5



**"The containers with OTFLOW arrived in good conditions; it had homogenous fruit throughout the entire container.**

**Without OTFLOW had a difference fruit quality near the doors, the fruit was riper."**

Orlando dal Bosco

Italfrutta Di Manno S.R.L, Italy



5/5



"We observed that the fruit with OTFLOW showed a better external and internal state than the control containers (without an OTFLOW)."

Diego de los Reyes González  
Cargo Surveyor of Mercadona



Research 2021 Costa Rica

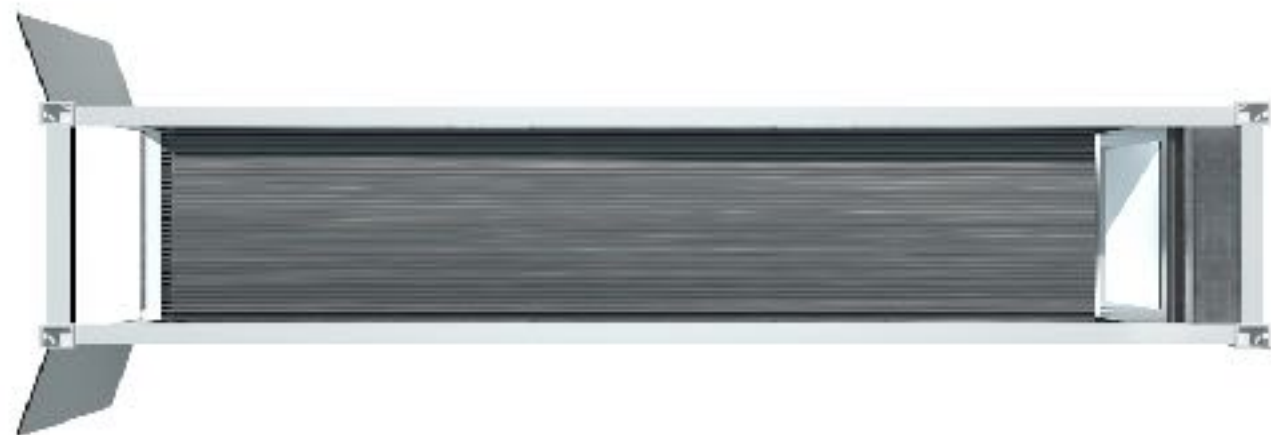
# **VISA S.A. test**



How do we test the efficiency?

# The Field Test setup

'Control' reefer



25x

Nr. of Containers

OTFLOW Original

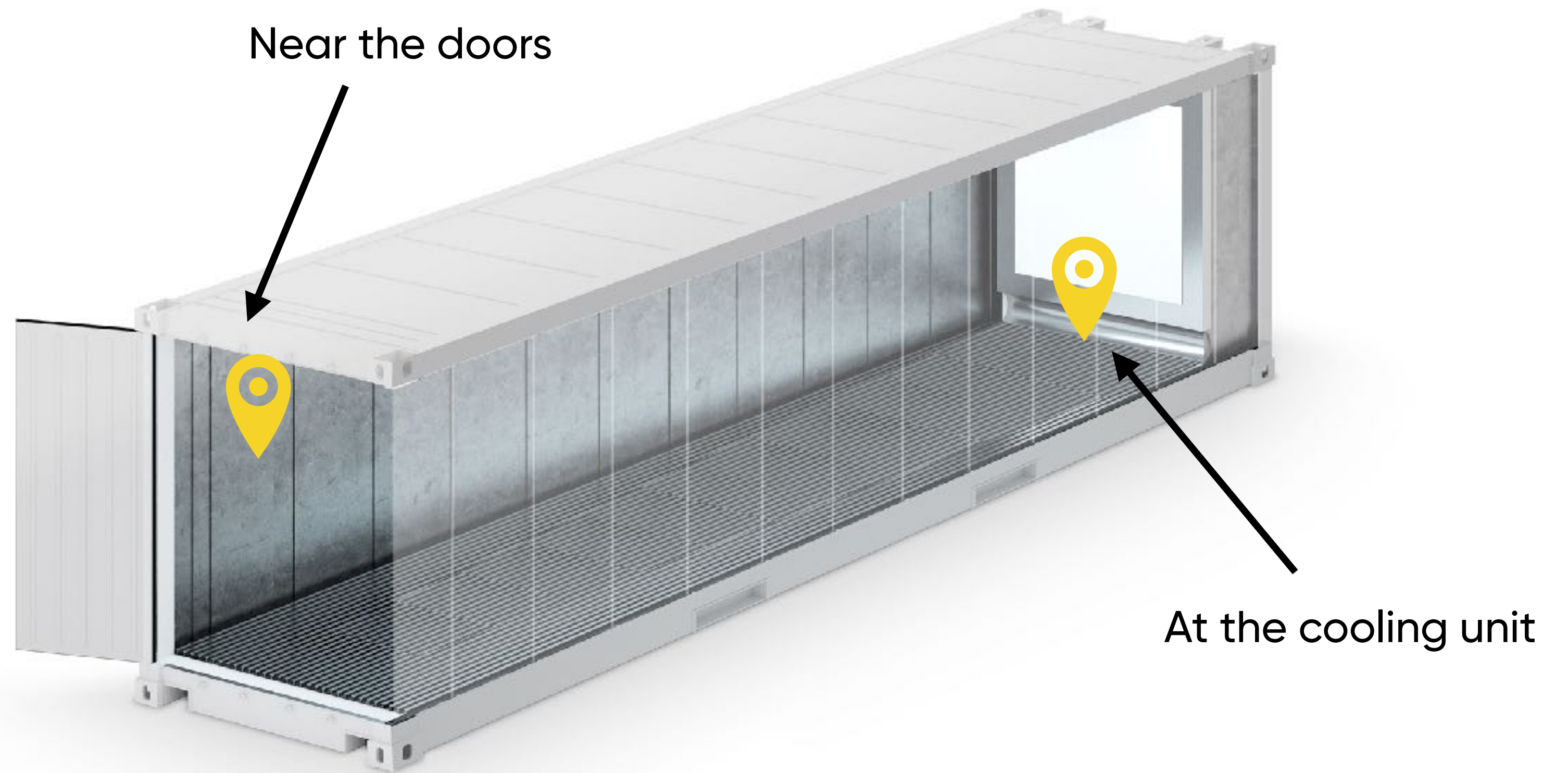


25x

Nr. of Containers

# Placement of temperature recorders

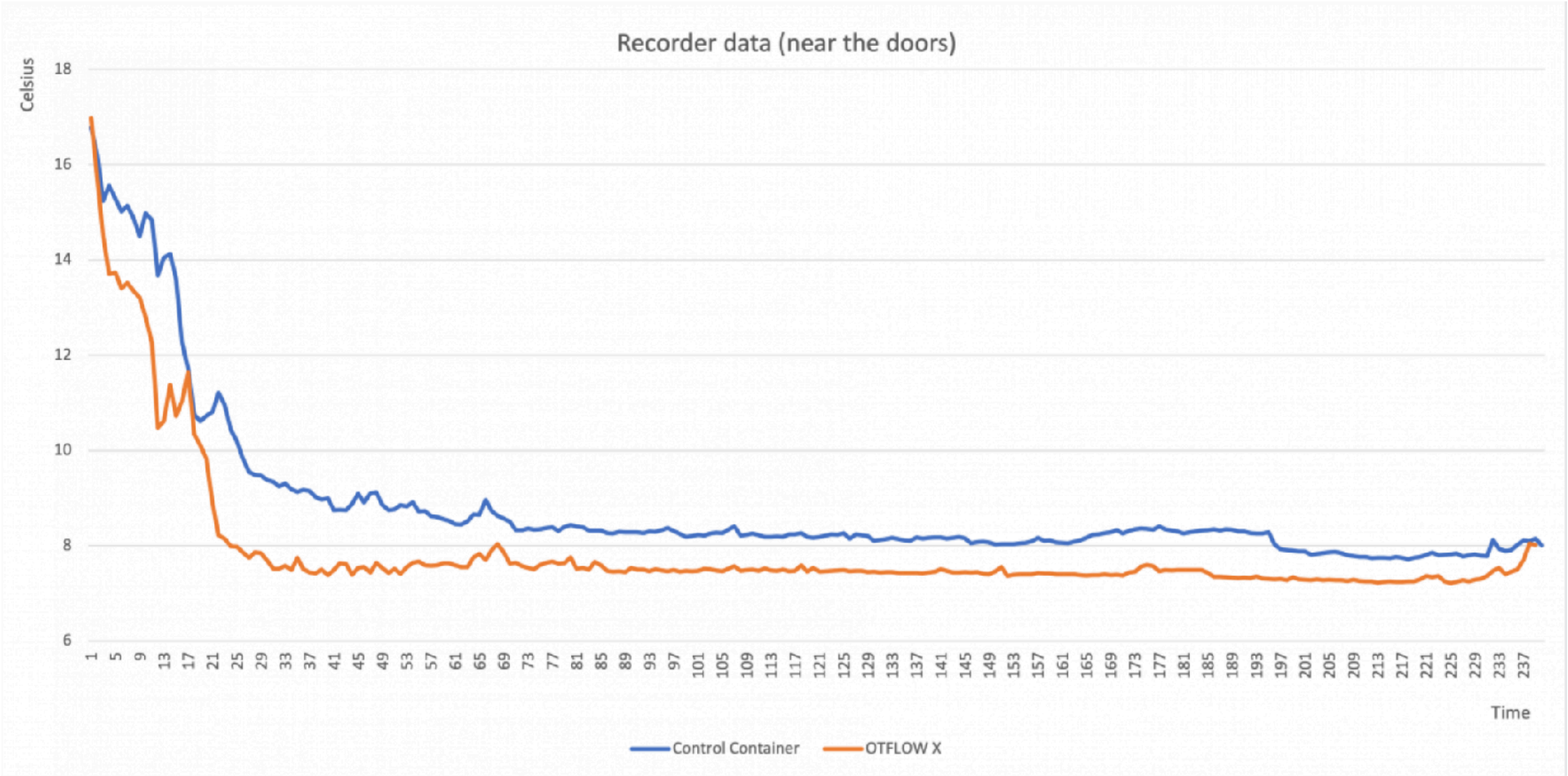
We use 2G thermographs in each of the test containers. One on pallet number 3 or 4 (near the refrigeration unit area) and one on pallet number 20 or 21 (last pallets, container doors area).

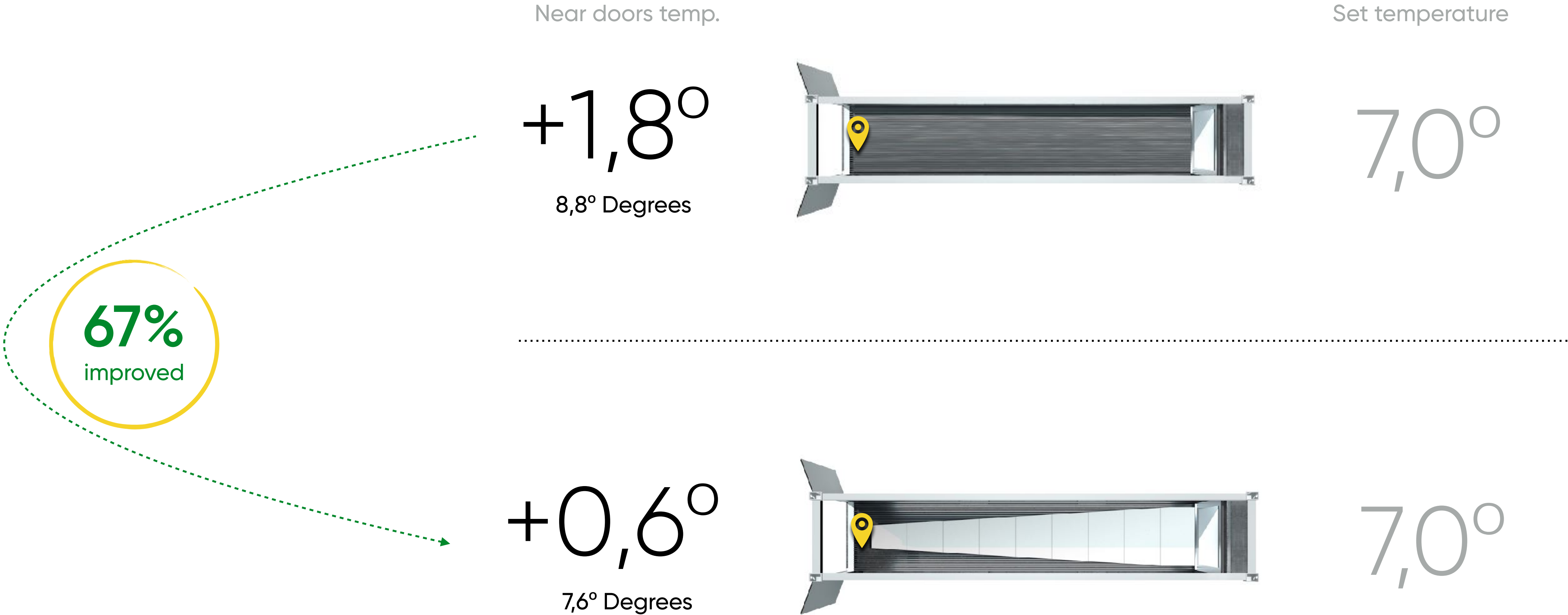


Results 1/2

# Average temperature difference







Results 2/2

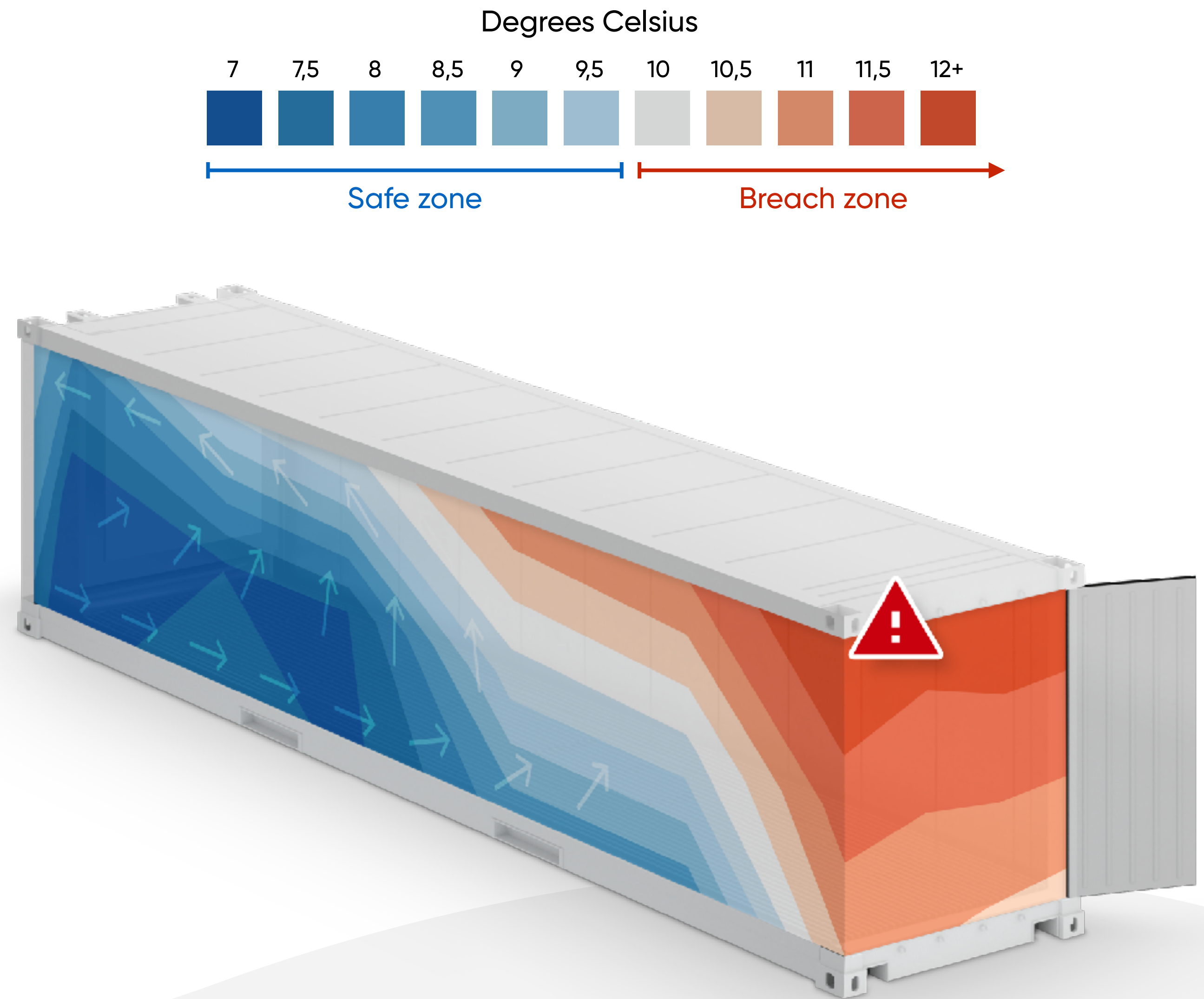
# Temperature breaches



# What is a 'breach'?

A breach is when the temperature is measured beyond the optimal temperature range, affecting the preservation of the quality of the cargo.

"For pineapples, the optimal storage temperature is between 7° and 10° Celsius. Any higher and the quality of the product is going to be affected." says Otto de Groot, fruit surveyor since 1971.



Based on 90 min. time stamp

Control  
reefer



788  
x Breaches

Original  
OTFLOW X



311  
x Breaches

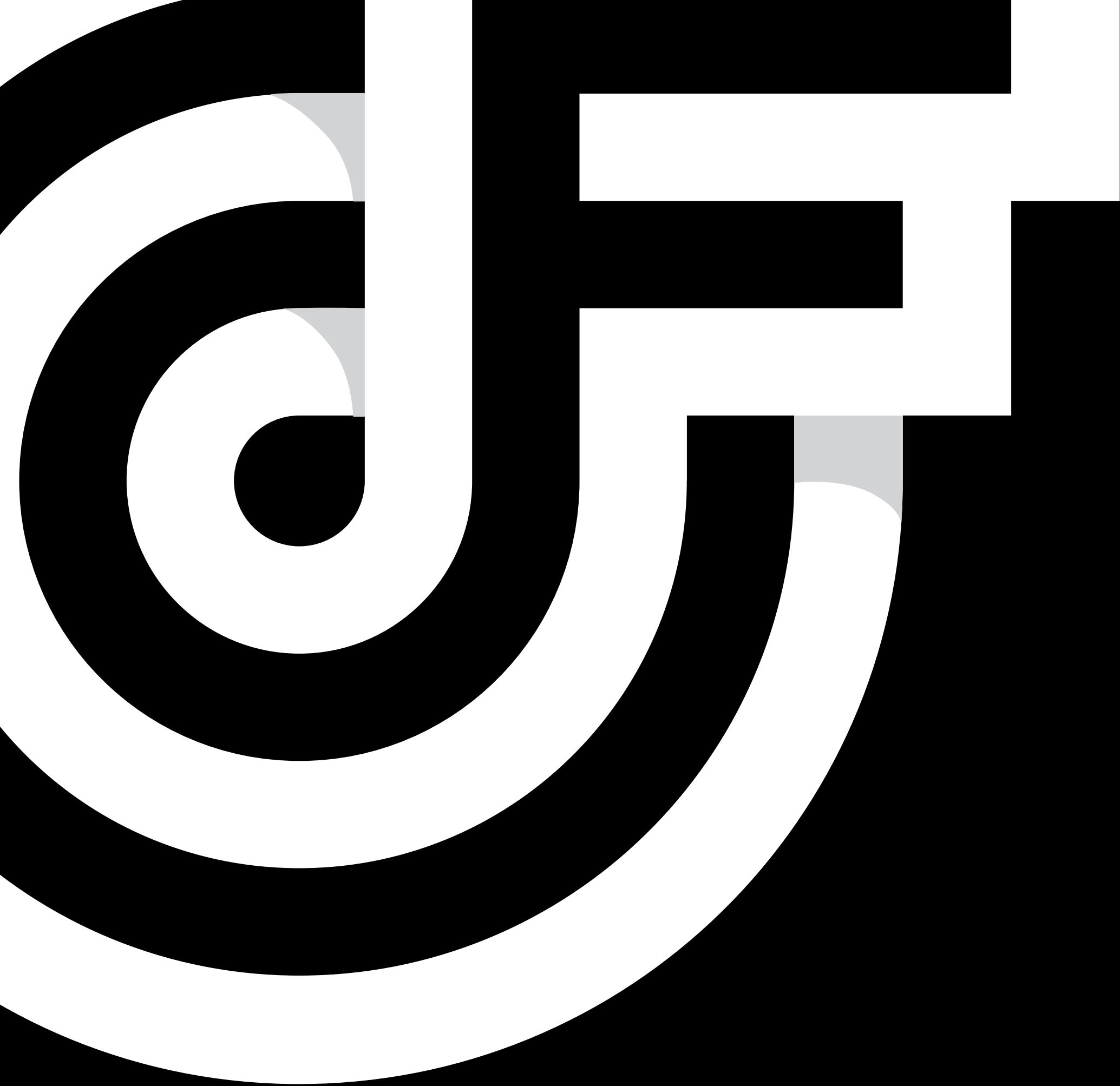
61%  
improved

# Awards









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Just say hello!



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