



Refrigerated Food Display Cabinets:

Humidity management matters to your ROI

This document explores the topic of humidity in refrigerated food display cabinets.

It looks at why this is important for food retailers and food service.

We expand on this theme by looking at FPG refrigerated cabinets and their superior performance attributes due to their high humidity levels.



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For Life.**



Key points

A natural consequence of refrigeration is the removal of moisture. It dries out food quicker which has detrimental consequences including reducing shelf life and impacting the customer experience.

Conversely, high humidity inside refrigerated display cabinets contributes to ROI:

SAVE MORE: High levels of humidity decrease operational costs by:

1. Reducing food wastage
2. Increasing the efficiency of the refrigeration system
3. Increasing energy efficiency

SELL MORE: High levels of humidity increase sales by:

1. Extending shelf life
2. Making food look attractive
3. Improving the customer experience when they eat your products
4. Encouraging repeat customers

FPG has engineered a solution to retain moisture so that fresh cooled humid air is cycled into the cabinet. FPG's tests cabinets in climate-controlled test labs. The test results provide evidence for:

- Refrigeration system efficiency
- Energy efficiency
- Tight temperature management
- High humidity
- Gentle airflow

These all contribute to the ROI of a refrigerated food display cabinet, with humidity levels and gentle airflow directly contributing to holding food fresher for longer.

How much longer depends on a wide range of variables such as product ingredients and operational practices. The best way to determine this is to try FPG cabinets for yourself.





Why humidity management matters to your ROI

Have you ever placed fresh food in your fridge at home only for it to shrivel up overnight? Then you have experienced firsthand the dehydration effects caused by refrigeration.

Food is dried out, visually unappealing, and unappetising. Imagine that in your commercial food display cabinet. Customers would leave and sales would fall. Not a recipe for success.

For food retailers and food service, humidity levels in refrigerated food display cabinets matter.

Future Products Group

Let's recap why humidity is so important.

1. To preserve food freshness

High humidity helps maintain the texture and freshness of food.

2. To improve appearance

Hydrated food looks more appealing to your customers.

3. To slow spoilage

High humid environments help to extend the shelf life of food and reduce waste.

4. To deliver temperature stability

High humidity has the effect of reducing temperature peaks and troughs which is better for maintaining food quality.

5. To improve the efficiency of the refrigeration system

Humid air makes it easier for the refrigeration system to remove heat.

6. To improve energy efficiency

Increasing the efficiency of the refrigeration system improves the energy efficiency of the cabinet.





Why humidity management matters to your ROI

To summarise, cabinets with high humidity improve your ROI. High humidity contributes to savings, and it contributes to selling more.

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High humidity levels in refrigerated food display cabinets contribute to savings and sales. It has a positive impact on the ROI of your cabinets.

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FPG Humidity Management

A natural consequence of refrigeration is the dehydration of fresh food.

FPG's challenge:

To engineer our refrigerated cabinets to hold fresh food better for longer by retaining humidity.

Result:

We achieved our goal - the humidity in FPG enclosed refrigerated cabinets is typically high at an average of 75%RH.

How did we achieve this?

First off, we need to understand the role of the Evaporator Coil in the refrigeration system. The Evaporator Coil's primary function is to absorb heat from the air that is circulating within the cabinet, causing the refrigerant to evaporate (changing from liquid state to gas state) and in so doing creating a cooling effect. This cold air is then circulated throughout the enclosed display cabinet to keep food at the desired temperature.

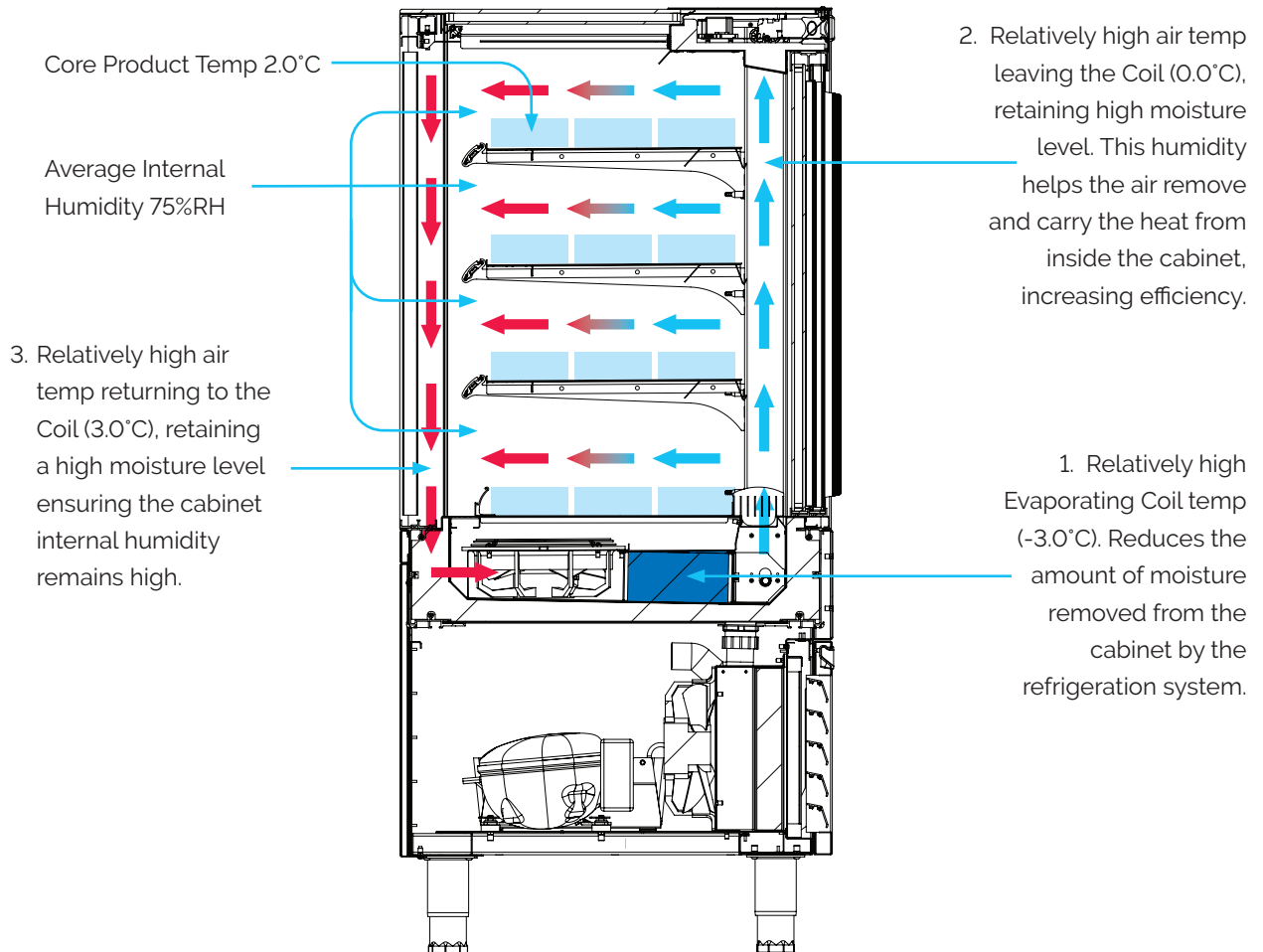
The key to retaining humidity within an enclosed refrigeration system is to reduce the temperature spread between the temperature of the air leaving the Evaporator Coil and the temperature inside the cabinet display area (or core product temperature). The tighter the gap, the more moisture is retained in the air. Because the air is already moisture-laden, the dehydration of food is significantly reduced and occurs over a longer period. For food retailers and food service, that means extended shelf life of food and reduced food wastage, amongst other benefits.

In the diagram of the FPG Encore Refrigerated serve-over cabinet on the following page, the temperature at the Evaporating Coil is only -3.0°C whilst the temperature inside the cabinet is $+2.0^{\circ}\text{C}$. This means a small spread of only $+5.0^{\circ}\text{C}$. And it is this small spread that is critical in achieving and maintaining high humidity.





FPG Humidity Management



FPG Encore Refrigerated Freestanding Tilt Front Cabinet





FPG environmental testing

FPG tests its refrigerated cabinets in environmental test labs set for Climate Class 3 (+25°C/60% RH).

During cabinet testing, FPG records environmental conditions, core product temperatures and energy usage. We can also monitor the humidity levels.

For some products such as chocolate and icing which need a drier interior, FPG can reduce the humidity circulating inside the cabinet.



The following are example test reports for the Encore Counter Refrigerated 1200mm cabinet:

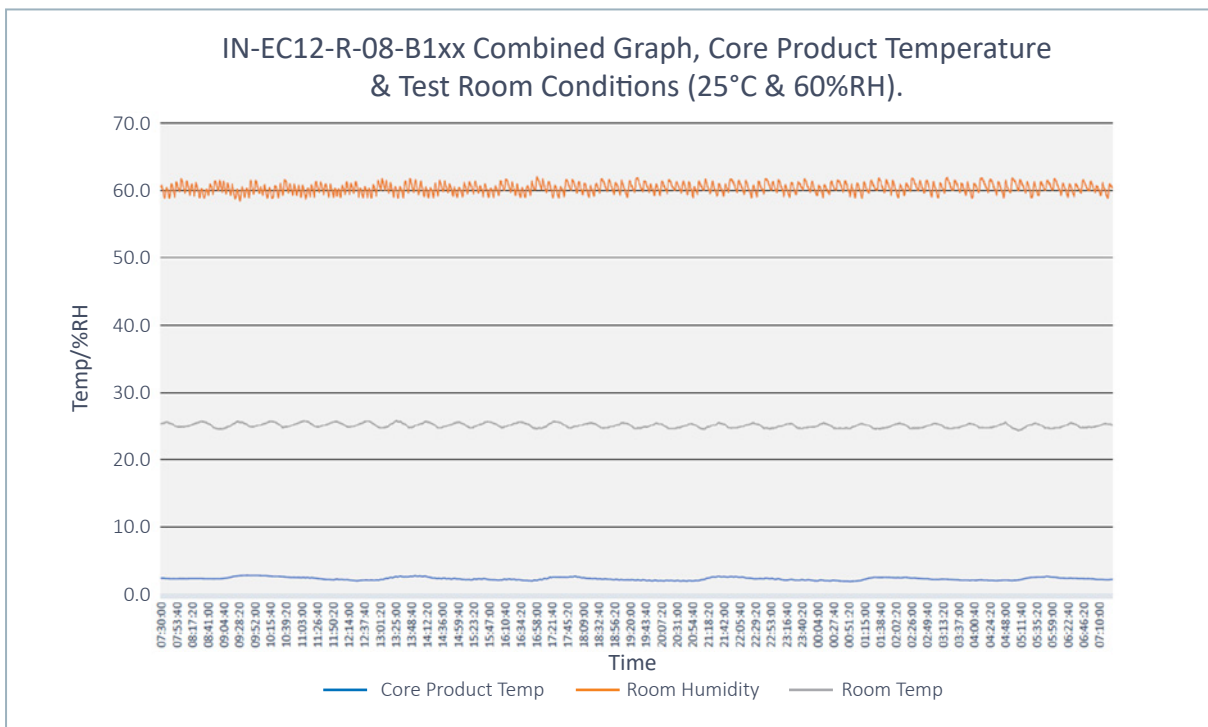


Chart 1: Tracking of the test lab Climate Class 3 temperature and humidity settings together with the cabinet core product temperature.



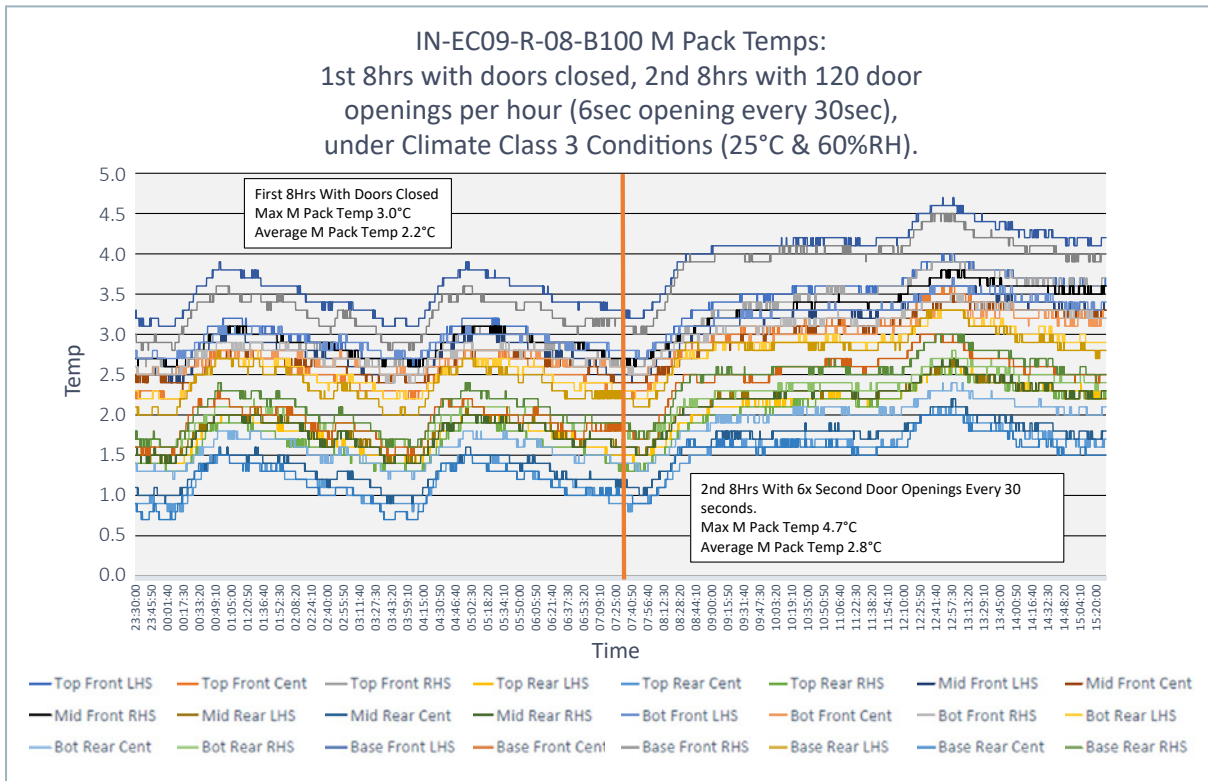


Chart 2:

Tracking core product temperatures throughout the cabinet. During the first 8 hours the doors are closed. In the second 8 hours there are 120 door openings per hour. Test lab conditions set for Climate Class 3.

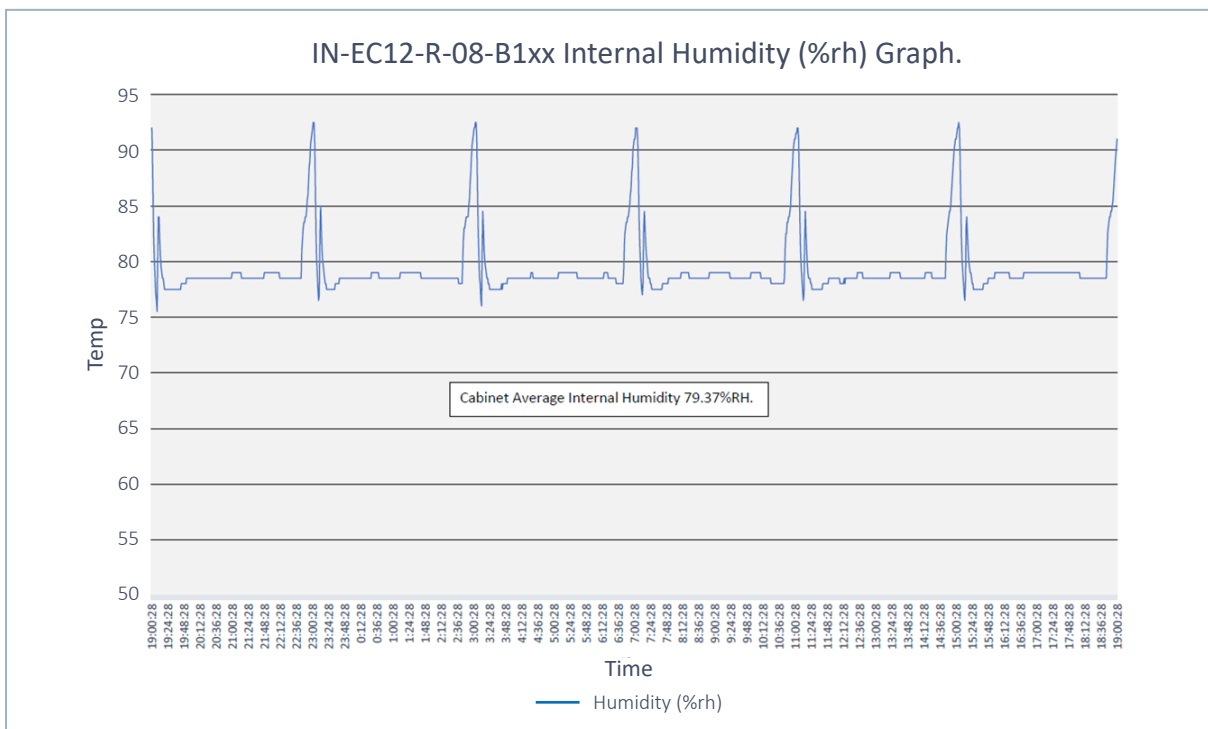


Chart 3:

Tracking the humidity inside the cabinet display area.



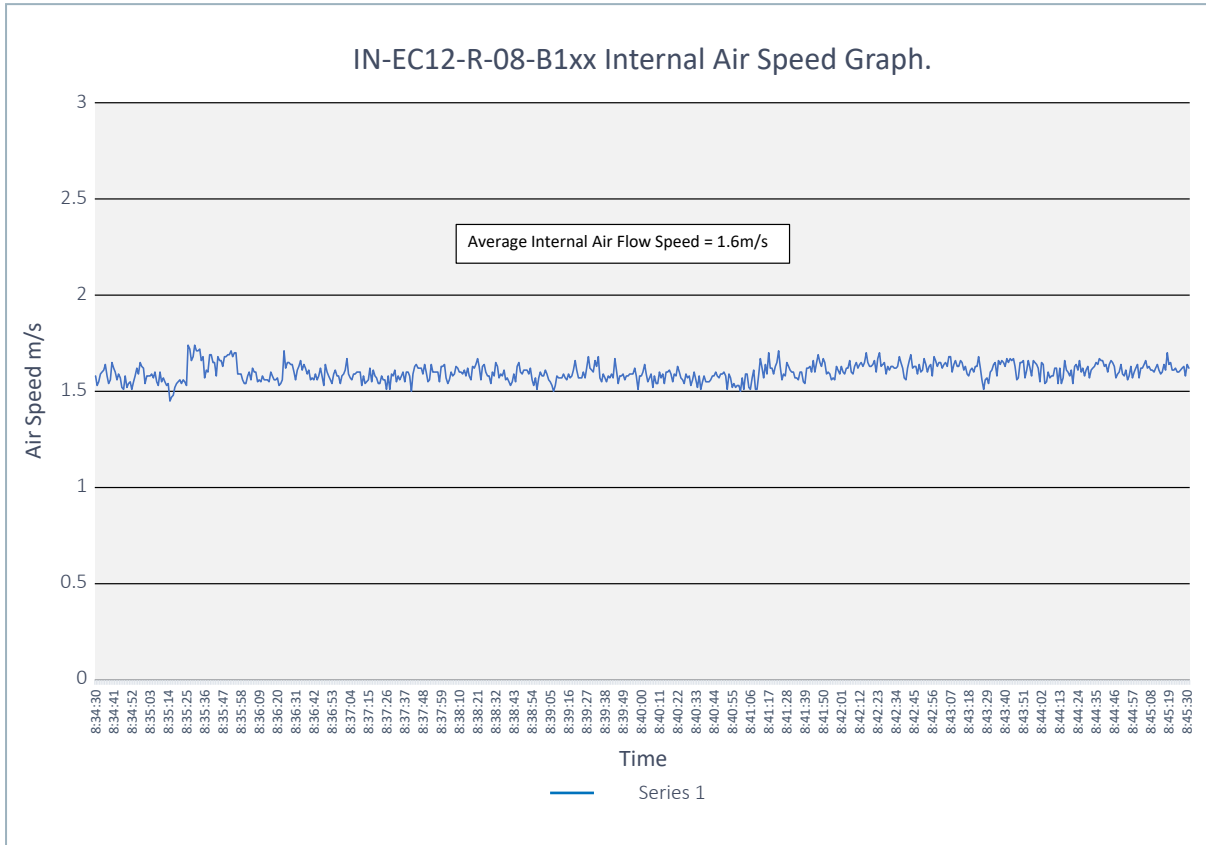


Chart 4:
Tracking the airspeed inside the cabinet display area.





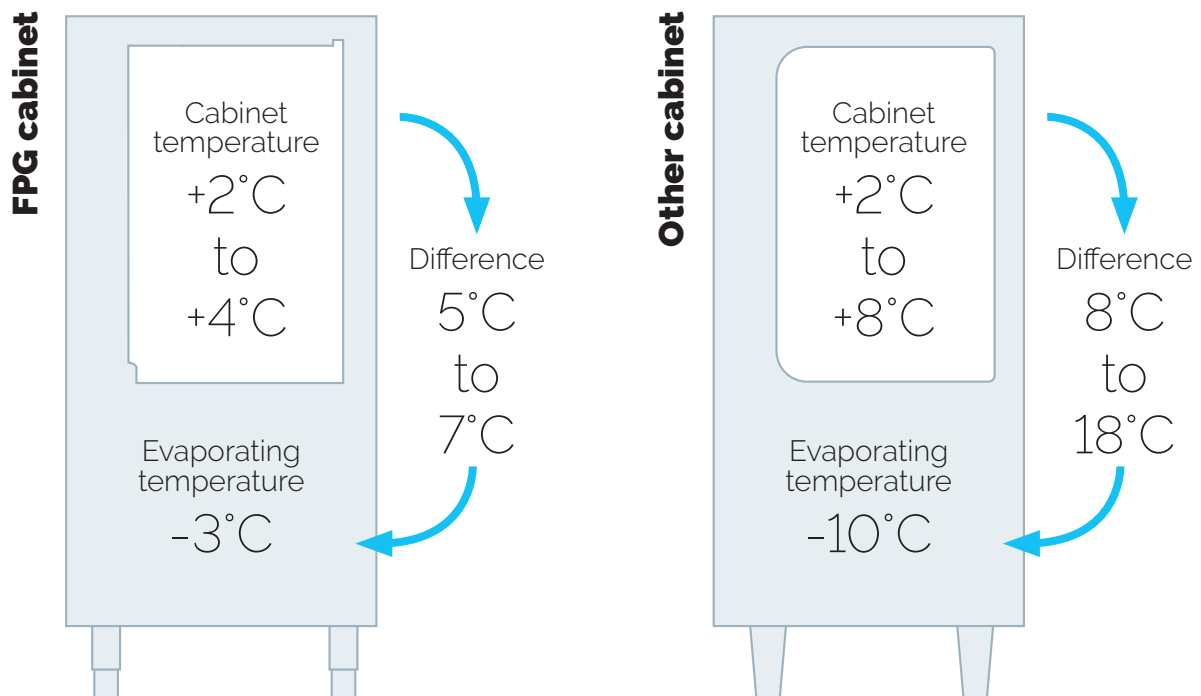
When it comes to humidity management, are FPG refrigerated cabinets better than others?

FPG engineers and manufactures premium food display cabinets. But when it comes to humidity management and extending shelf life, how do we know that FPG cabinets are better than other brands?

We base our assessment on scientific observations.

Scientific Observation 1:

The smaller the difference between the evaporating temperature and the temperature inside the cabinet, the greater the efficiency of the refrigeration system.



Takeout:

The FPG cabinet:

- ✓ Refrigeration system is much more efficient which contributes to energy efficiency
- ✓ Core product temperature range is much tighter across all display levels.





Scientific Observation 2:

Food presents and tastes better when it is held in high humidity environments.

FPG cabinet	
Humidity	70% to 80%

Other cabinets	
Humidity	50%

Takeout:

The FPG cabinet retains air humidity:

- ✓ Shelf life is extended.
- ✓ Food looks fresher.
- ✓ Food condition is better – customers will taste the difference.



Scientific Observation 3:

The stronger the airflow inside the cabinet, the faster food dries out.

FPG cabinet
Gentle refrigerated air flows over the shelves.
Faster air flow at the front creates the air curtain.
Internal air speed: 1.6m/s

Other cabinets
Because of the wide spread of temperatures, faster air flow is used to meet refrigerated temperature requirements.

Takeout:

The FPG cabinet has gentle air flows:

- ✓ Reduces the dehydration of food.
- ✓ Shelf life is extended.
- ✓ Food looks fresher.
- ✓ Food condition is better for longer – customers will taste the difference.





Variables

There are many variables in assessing shelf life and the impact of humidity management:

- Types of food products
- Ingredients used
- The store location of the cabinet
- The wider environment
- The condition of the food before it was placed in the cabinet
- Operational practices

The list goes on.

It's impractical for cabinet manufacturers to test every scenario.

So, what do FPG customers say?

More than 80% of FPG's cabinet sales are from repeat customers, with many of them having long standing relationships with FPG of 20 years or more.

The way which FPG cabinets hold food supports the brand positions of many of our customers. They want repeat customers. They want to maximise their ROI. It's why astute global brands chose FPG.

The best proof to confirm FPG cabinets are superior?

Compare the results from our test reports and try our cabinets for yourself.

