



AISBERG

EFFECTIVE
MEAT TRADE
TECHNOLOGIES

**CROSS
COOLING
SYSTEM**



CUBE CS refrigerated cabinet with cross cooling system, Cyprus

Cross cooling system[©]

Cold stability is the basis of product quality

The sanitary quality of food depends on many factors and, of course, on the storage regime.

High-quality storage of products at low temperatures is possible if you continuously use low-temperature mode as a preservative.

At any, even short-term, increase in temperature vital activity of microorganisms on a product surface becomes more active.

A common problem of all refrigerated cabinets that are operating in the range of $-1/+4$ °C - moistening of the product in the thawing mode, when the temperature in the working volume is $+12/+14$ °C. The increase in product temperature lags significantly behind the increase in air temperature, which leads to condensation. The higher temperature in the cabinet, and the stronger humidity, the more actively microorganisms develop.

If products are packed in film or clear plastic (for example, in self-service cabinets), the packaging is sweating. Sales of such products are declining sharply.



Ellipse CS refrigerated cabinet with cross cooling system, METRO Cash&Carry, Ukraine

Aisberg has developed and patented a cross cooling system[©], which allows to sharply limit the level of temperature rise of products in the thawing mode not higher than +6 °C.

ADVANTAGES OF CROSS SYSTEM[©]:

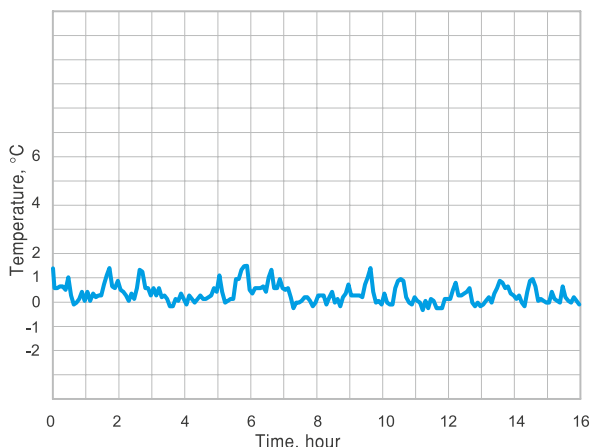
- the quality of products is preserved
- increases the shelf life of products
- write-offs of perishable products are reduced.

Products in the cross system display are cooled by two evaporators, which are thawed alternately. Management of each evaporator is individual.

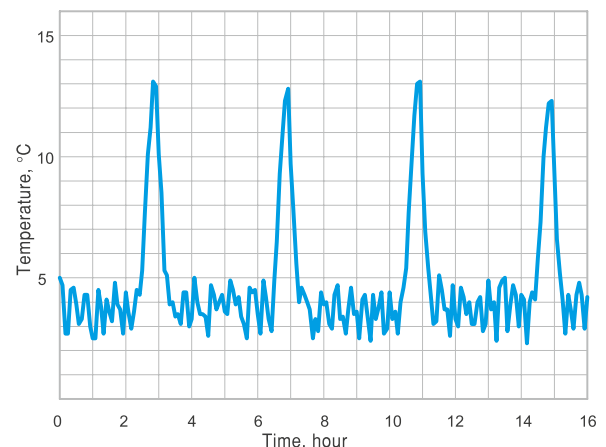
When one of evaporators is in a state of thawing, the other works on cooling, minimizing the rise air temperature in the display.

Cross cooling system is used in gastronomic and wall displays. Cabinets are equipped with heating elements, a modified system of automation and aerodynamics. This solution is especially effective for the sale of meat products and gastronomy.

Temperature fluctuation in the refrigeration cabinet within time



Cabinet with CROSS COOLING SYSTEM



Standard cabinet with forced cooling system

The effectiveness of the cross cooling system is confirmed by laboratory studies

of Department of Biochemistry, Microbiology and Physiology of Nutrition in Odessa National Academy of Food Technologies. M.V. Lomonosov.

The growth rate of the microflora was studied on the example of the most perishable foods - salads, minced fish and cooked sausage.

Storage was carried out in an experimental Ellipse CS display with a cross cooling system and displays with standard cooling system from other manufacturers.

Because of low initial number of bacteria in products, the differences between samples can be found within the error of the experiment (+/- 5%), additional experiments with microbial loading were performed.

To do this, samples of products containing a suspension of daily cultures of *Bacillus mesentericus* and *Streptococcus* were placed in parallel for storage.

Microbiological control of products was carried out by taking into account mesophilic aerobic and facultative anaerobic microorganisms (MAFAM), and in studies with the addition of microflora took into account the number of streptococci. The results were expressed by the number of colony-forming units (CFU) in 1g of product.

The obtained experimental data indicate that **the growth rate of pathogenic microflora in displays with a cross system is reduced by 2-3 times compared to standard cabinets.**

Storage duration, days	The number of microorganisms (CFU/g) while storing in cabinet			
	Cabinet with standard refrigeration system, -1/+4 °C		Ellipse cabinet with cross cooling system, -1/+4 °C	
	MAFAM 10 ³	Streptococcus 10 ³	MAFAM 10 ³	Streptococcus 10 ³
<i>Growth of microflora in minced fish</i>				
0	56.3	16.3	56.3	16.3
2	1900	34.0	700	30.0
3	4840	188.0	1820	57.0
<i>Growth of microflora in cooked sausage</i>				
0	160 (+/-5)	78.6	160 (+/-5)	78.6
1	170 (+/-5)	78.6	160 (+/-5)	78.6
2	420 (+/-10)	82.8	165 (+/-5)	78.8
3	690 (+/-10)	90.4	168 (+/-10)	82.4



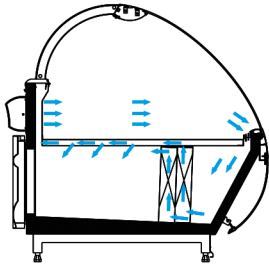
Experimental cabinet with standard cooling system (European manufacturer)



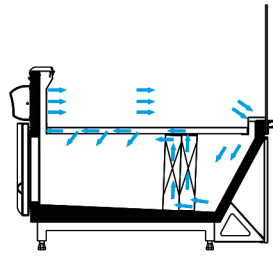
Experimental cabinet Ellipse CS with cross cooling system (Aisberg)

Scheme of air-flow going in displays with cross cooling system

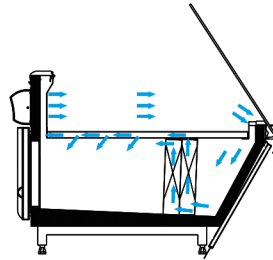
Ukrainian patent of invention №77925 from 17.01.2007



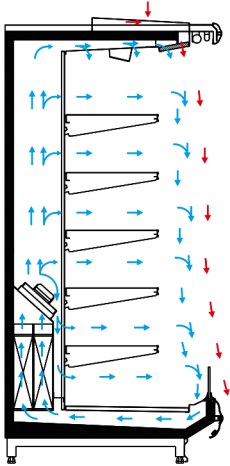
ELLIPSE CS
with cross cooling system



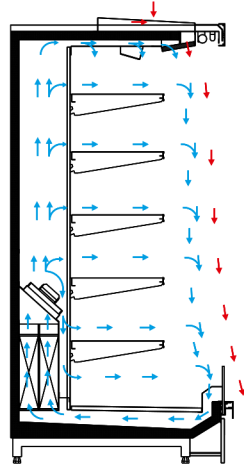
CUBE CS
with cross cooling system



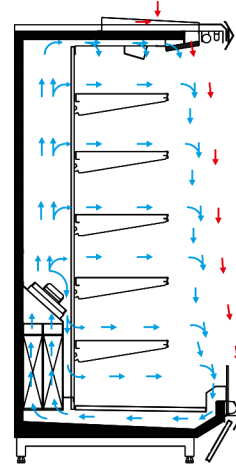
DIAGONAL CS
with cross cooling system



MEDUSA CS
with cross cooling system



MEDUSA CUBE CS
with cross cooling system



MEDUSA DIAGONAL CS
with cross cooling system



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