

AGRIFLEX®

Flour Cooling

$\Delta T - 20^{\circ}\text{C}$



Flour Cooling

Dough temperature control is a key factor in obtaining constant and ideal quality in the production of bakery products at industrial and small business level.

In fact, the cooling process of the flours allows slowing down the rising of the dough and adequately adjusting it to the times of each production line.

Among the methods currently used for this purpose, often with high costs and poor results, one of the most common and popular is that of lowering the dough temperature by adding ice. The limitation of this method is in the empirical approach used both to determine the amount of ice to be used in function of the detected temperature and the reduced quantity of water to pour in the dough since it is obtained by the melting of the ice.

Some people cool the dough by mixing liquid nitrogen, although this method is quite expensive and therefore impractical.

Others mix the flours using lamellar flows of cold air, but this is a poorly efficient method, due to the reduced specific heat of the air and the risk of changing its humidity.

Finally, another cooling method uses screw heat-exchangers: while conveying flours to the mixer, their movement mixes them with liquid nitrogen or CO₂ that is injected for cooling purposes.

Unfortunately, despite being excellent for flour conveying, the screw is not equally effective in mixing flour with the cooling means, which consequently are used in large quantities and increase both plant and operating costs due to the difficulty of cleaning and maintaining such cumbersome heat exchangers in efficient working order.

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The proposed method offers different, significant advantages:



GRIFLEX®



- **High energy efficiency** thanks to the direct exchange and consequently reduced operating costs;
- **High effectiveness** thanks to the considerable temperature reduction (**until 20°C**);
- **Complete system automation** that, thanks to the reduced thermal inertia and the absence of accumulations, ensures the **correct temperature of the dough, compensating the temperature variations of the other components and ambient temperature**;
- **Ease of maintenance** since all areas can be easily cleaned.



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