



**Success story**

## No more machinery downtime at Ferrarelle CAREL's in-room solution

Ferrarelle SpA deals with the bottling and distribution of mineral waters, both nationally and internationally. At its Darfo Boario Terme plant, problems were found in the production lines due to excessively low relative humidity. The chosen solution was an in-room humidification system, which both meets the requirements and achieves the desired objectives.



### Where

- Ferrarelle S.p.A
- Darfo Boario Terme – Italy
- www.ferrarelle.it

### What

- humiFog Direct installation with two zones
- Direct humidification with five blower units

### Why

- Increased production efficiency by avoiding downtime
- Easy installation
- Blower units for in-room humidification



Fig. 1.a

Founded in January 2005, when it brought the natural sparkling water par excellence back to Italy, Ferrarelle SpA is the owner of Ferrarelle, Vitasnella, Fonte Essenziale, Boario, Santagata, Natia and Roccafina brands of mineral water and the Le Linfe di Vitasnella brand of functional water, as well as being the exclusive Italian distributor of the Evian brand. In August 2017, the group also brought the Amedei brand back to Italy, a symbol of excellence in the chocolate sector.

Today, Ferrarelle SpA has around 370 employees based in Milan, in its sales and marketing department, in Riardo (Caserta), home to its admin and operations HQ as well as the Ferrarelle, Santagata and Natia sources, in Darfo Boario Terme (Brescia), where the Boario, Acqua Vitasnella and Fonte Essenziale sources are located, and finally Pontedera (Pisa), the headquarters of Amedei.

The company has also completed a new recycled PET production plant in Presenzano, in Caserta province, where it will manufacture PET containers using materials deriving from separate waste collection and make new bottles containing 50% recycled PET.

This industrial production process requires relative humidity to remain above a certain threshold, so as to prevent evaporation of the water contained in the lubricant used to run the bottles along the conveyor belts. If humidity is too low, the water evaporates, causing the bottles to fall off the lines. This means machine downtime and a consequent decline in efficiency.

## From collection to delivery of the water

The various stages in the process include the production of plastic bottles using PET (polyethylene terephthalate) preforms, bottling and closing, labelling, packaging and storage.

Special conveyor belts move the products between the different stations on the production line; these are constantly lubricated so as to ensure correct flow of the bottles, placed upright and close to each other. If humidity is low, the properties of the lubricant degrade and the bottles overturn; the machinery then needs to be stopped so as to return them to the correct position.

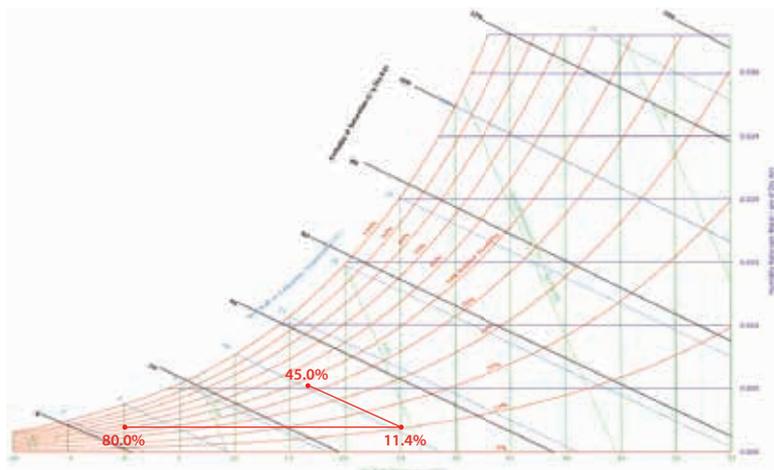
Consequently, it is essential to maintain relative humidity above 35%, to avoid production line stoppages.

## In-room adiabatic humidification

The plant covers an area of about 50 x 70 m. The AHUs installed for air change have fabric distribution ducts (Fig.1.a), and therefore a ducted humidification system was not possible.

CAREL thus proposed an in-room system, comprising a pumping station with a capacity of 80 l/h, and five blowers, divided into two zones. The required set point is around 45% for relative humidity and between 15-18°C for the temperature. The winter months are the most critical, as outside temperatures are low and relative humidity falls significantly due to the air being heated before entering the production area.

This is therefore the period with the highest humidification load needed to reach the desired conditions. A typical thermodynamic transformation is shown below.



The humidifier can be controlled remotely via BMS, and receives a relative humidity signal from a sensor that was already installed in the plant. The humidifier only starts when the air handling unit is operating. The set point was set at 45%, with a 5% band, with humidity production thus modulated close to the set point so as to guarantee excellent precision. The water is atomised into small droplets that evaporate naturally when coming into contact with the air; the end result is humidification of the air until reaching the desired conditions.

## Complete and efficient solution

As humidification is direct, correct design of the installation is essential, and was carefully evaluated by CAREL personnel. The humidification system was installed in the most critical area of the plant, where the main production lines are located (Fig. 1.b).

The pumping station (Fig. 1.c), on the other hand, was installed close to the equipment compartment for convenience in terms of installation, wiring and maintenance.

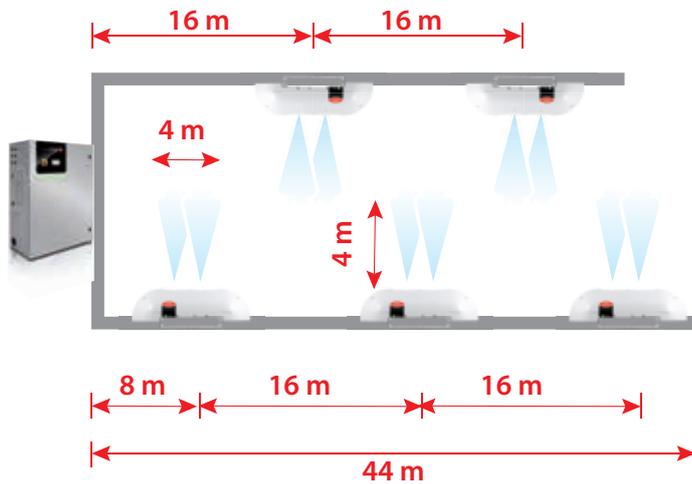


Fig. 1.c



Fig. 1.d

Quantity	Description	Part number
1	humiFog master pumping station, 80 l/h, 230 V, 50 Hz (maximum production of 56 l/h due to the total capacity of the blowers)	UA080DD200
5	Blower, 4 nozzles (each with a capacity of 2.8 l/h), 230 V, 50 Hz	DLA04DF200
5	Blower support	UAKVC10000
5	Kit of clamps for mounting the blower to the ceiling	UAKHC40000
1	System commissioning	+HCOMM0000

Tab. 1.a

## Conclusions

The humiFog Direct humidifier allows the specific requirements to be met without significant structural requirements for installation. The five blowers distribute the humidification load according to actual needs. The desired environmental conditions are achieved with low operating and maintenance costs. Electronic control guarantees high performance and flexibility, making humiFog Direct the best solution for the case in question.



Fig. 1.e - Images of the plant after work was completed

### Headquarters ITALY

CAREL INDUSTRIES HQs  
Via dell'Industria, 11  
35020 Brugine - Padova (Italy)  
Tel. (+39) 0499 716611  
Fax (+39) 0499 716600  
carel@carel.com

### For more information

CAREL Asia - [www.carel.com](http://www.carel.com)  
CAREL Australia - [www.carel.com.au](http://www.carel.com.au)  
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