

**nephos**  
+ swiss fogging system



**Dust and temperature control  
on construction sites and in industry**

[www.nephos.ch](http://www.nephos.ch)



Nebulising nozzle detail

## Nephos

Nephos started out in 2005 in Nicola Colombo's mechanical and metalsmith workshop, where fog was created for stage sets and to cool down outdoor environments like terraces, restaurants, public and private spaces.

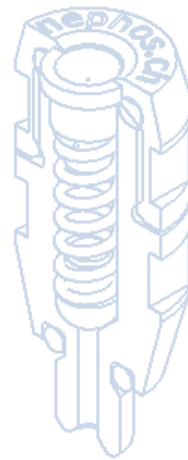
The ecological and innovative spirit of the Nephos team soon drove them to study and come up with new applications. Nephos fog, in fact, is an extremely efficient tool for **industrial pre-cooling** and for **dust and gaseous vapour control**.

## Technique

Nephos designs and constructs high range nebulisation plants in Switzerland.

Water, taken to a pressure of 100 Bar by piston pumps, circulates through appropriate pipes and connectors and is then nebulised into droplets that vary in size, between 15 and 40 microns - only special nozzles can do this.

The impact on the environment is minimal, with very low water and energy consumption.



Boehringer Ingelheim, Bioggio 2008



## Temperature control

Water nebulisation-evaporation triggers the adiabatic air cooling process.

On hot days, when even powerful air conditioning plants fail and voltage is lowered due to over-consumption, Nephos pre-cooling systems achieve their greatest efficiency.

The temperature of the air entering the condensers is reduced by more than 15°C ( $\Delta t^\circ$ ), energy consumption goes down to 20% and the reliability of the plants is increased because they work at a lower regime.



## Dust control

Dust is generally hygroscopic, which means that its mass increases with the water it absorbs, to the point that a little humidity can be enough to make it fall to the ground. The micro particles of water diffused in the air tend to lump the more or less fine dust together, and form clusters of bigger and bigger particles until drops are created. Dust itself triggers and encourages this process.

The nebulised water droplets capture, accumulate and drag the solid particles present in the air along with them. Their small size makes it possible to leverage the dipolar electric nature of the water molecule, attracting the electrostatically charged dust particles.

The negative ionization of nebulised water further reinforces the action of the electrostatic-hydraulic filter. What is more, nebulisation considerably improves the surface-to-volume ratio of the drops. Just think: a drop of water with a diameter of 4 mm corresponds to 8 million nebulised droplets with a diameter of 20 micron, which have a contact surface area as much as 200 times higher than a single drop.

The formation of a blanket of fog makes it possible to take effective measures against dust, to control and lower gaseous vapours and to cool off the environment, thus creating a damp, but not muddy layer that stops dust from rising again.

Alptransit, lotto Sigirino 2011



## History

### 2007

Nephos creates the first industrial pre-cooling systems for air conditioning and heating plants in Switzerland.

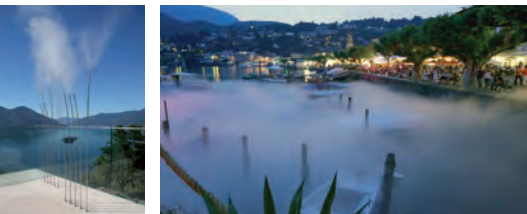
### 2010

The company tackles dust control in the Alptransit tunnel, the construction site of the century.

### 2011

Nephos effectively controls dust at the modern waste incineration centre of the Canton Ticino (ICTR).

It creates combined and modular dust and temperature control plants for the tunnelling fronts of the Alp-transit construction site at Sigirino.



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