

# Successful incubation without condensation

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Traditional incubators use cooling water temperature between 10 and 15°C.

Emka's Teggnologic27, more commonly known as the 'Dry Hatch', cools with water of 27°C. This is a water temperature above the incubator dew point.

The dew point is the temperature at which the water vapour in a sample of air at constant barometric pressure condenses into liquid water at the same rate at which it evaporates.

At temperatures below the dew point, water will leave the air. The condensed water is called dew when it forms on a solid surface.

At the dew point all traditional incubators will produce water/condensation. It is a characteristic of traditional incubators especially in the hatcheries.

The result in a traditional incubator is:

- Fungal and bacterial growth.
- Unwanted extra ventilation.
- Unstable temperature.
- Unstable humidity.
- A machine that is always fighting to correct itself.

Teggnologic27 and its resulting 'Dry Hatch' is only possible through a combination of having a larger surface area and more/larger tubing.

## How it works

Every incubator needs to remove the same excess amount of energy from exothermic eggs. This is done by using either air or water. With water the best affordable heat exchanger is copper.

An outdoor cooling unit (chiller if needed) produces incubator cooling water at a temperature of 27°C.

As with traditional incubators, this cooling water absorbs the heat produced by the growing embryos, keeping them at a steady temperature of 100°F. The cooling water leaves the incubator at a temperature of ±32°C and returns to the cooling unit. The results are twofold. There are unique financial and incubational advantages to incubation without condensation.

## Financial advantages

Substantial financial advantage through extreme energy savings compared to a traditional incubator cooling system.

The outgoing water needs to be cooled back from 32°C to only 27°C ≠ 5°C (traditional incubator ≠ 15°C). It is the small difference in temperature and not the volume of water that gives the advantage. More natural energy from free-cooling chillers, ground water or cooling towers give real financial advantage

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Fig. 1. Ground water available – open tank.

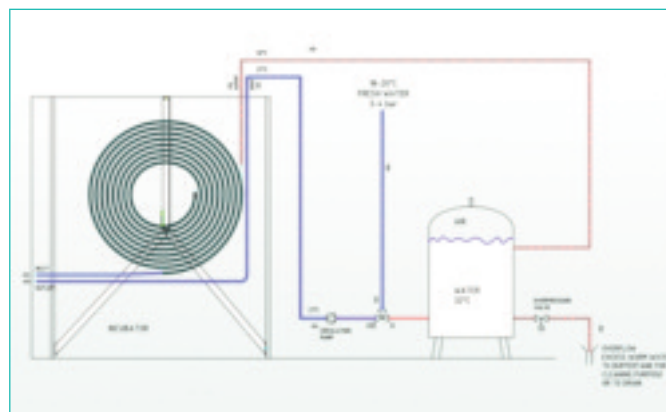
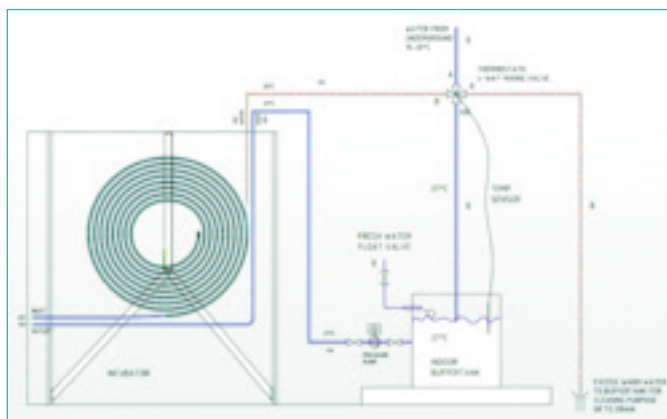


Fig. 2. Ground water available – pressurised tank.

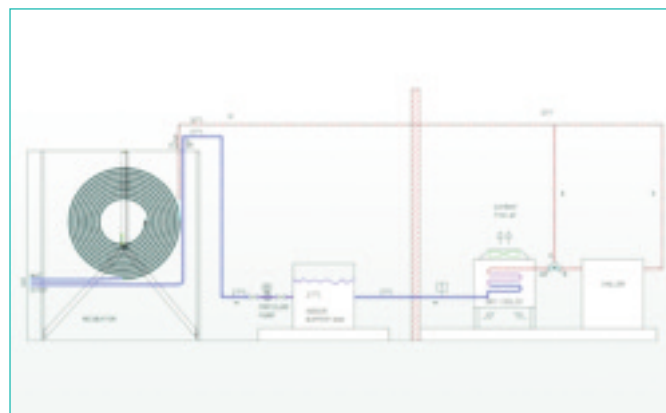
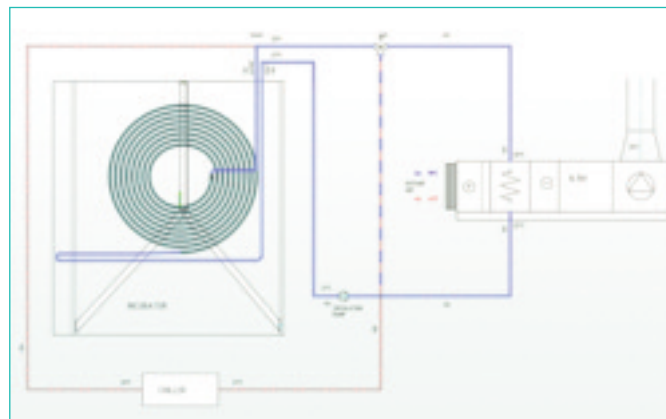


Fig. 3. Cooling tower/dry cooler/free cooling option on chiller being used.

Fig. 4. Heat recovery/heat exchange with air handling unit for cold climate.





**Fig. 5. An example of Dry Hatch. There is no condensation, no fluff and the area is dry and clean.**

Continued from page 25  
not achievable through traditional cooling systems. Some different set-ups are shown in Figs 1-4.

### Incubational advantages

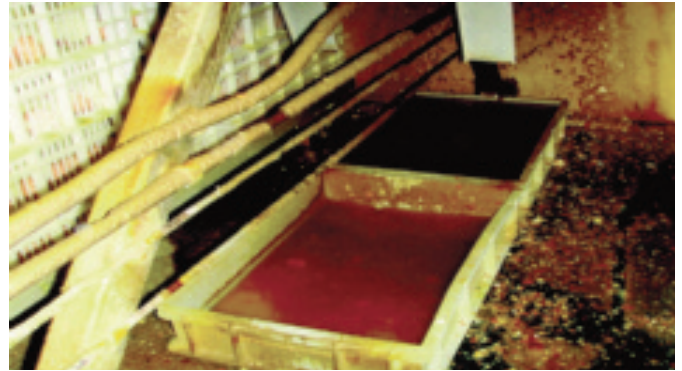
The first real Dry Hatch results in these remarkable outcomes:

- Physically and visually no condensation on cooling tubes means no, or reduced fungal, bacteriological or mould growth.
- The incubators, especially the hatcher's end their cycle dry and easy to clean.
- Due to the better and more stable control over ventilation, humid-

ity and temperature, the day old chicks dry faster, have no open navels and result in dry and healthy hatches.

- Due to the simple but innovative use of fluff bags, the plenum (fluff tunnel) remains clean and free from fluff with less dispersion of the *Aspergillus* spores.
- There is no fluff in the hatcher's leading to less fluff inhalation by the day old chicks, which in turn results in markedly better early lung development and better breathing. This influences the FCR (feed conversion rate) and further diminishes first week mortality.

A visual comparison, as can be seen in Figs 5-7, says it all. ■



**Fig. 6. An example of traditional incubation. There is a lot of condensation, bacteria and mould and the area is not clean.**



**Fig. 7. Using unique fluff bags in a fluff tunnel prevents condensation and fluff in the hatcher.**