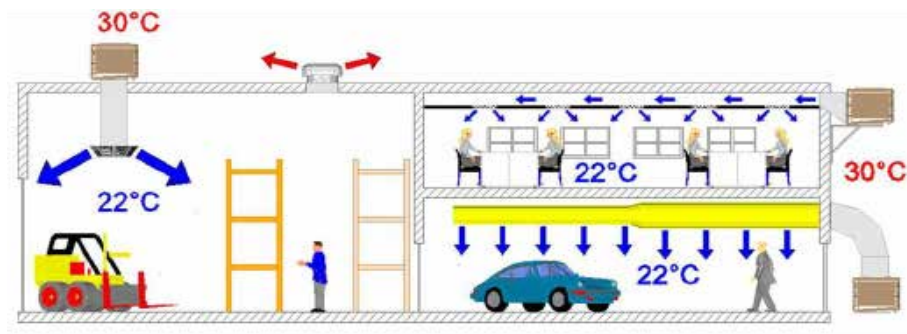


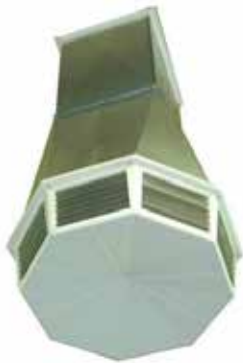
Bakeries Case Study Document

EcoCooling provide direct evaporative coolers which can be used as part of a mechanical ventilation system. The standard five speed control panel has the following modes:

- **Ventilation:** Fans move fresh air through the area being cooled to transport heat away.
- **Evaporative Cooling:** Air is moved over a wetted cooling pad, the air temperature is reduced as the water evaporates
- All ECP units are external. ECT units should be placed internally. The Standard ECP EcoCooler has a down-discharge air flow, to allow for more flexibility for installations the cooler can be converted upon request. The drawing below shows some installation types for the different models of the ECP08 unit.



Case Studies - Greggs Bakery, South Wales



When Greggs the Bakery in South Wales needed to keep their production areas cool where they bake for the whole of Mid and South Wales and the West Country, their Chief Engineer, John Oliver, contacted Celsius.

Problem

The production areas contain many heat emitting machines, Ovens, Fryers, Shrink Wrap Tunnels, Industrial Mixers etc. These combine to produce a very warm internal environment, with summer time temperatures regularly exceeding 35°C.

Solution

After surveying the area Celsius determined the likely internal heatload and designed a suitable ventilation system.

The area already contained a general ventilation system, extracting warm air at high level and introducing filtered fresh air through ducted roof inflow units. However, in the height of summer these proved ineffective against the warm external temperatures and plant heat. Additional cooling was required.

To provide the required additional cooling Celsius installed a system of Evaporative cooling units, these were mounted on the roof and ducted into the area to discharge over personnel around the area.

Evaporative coolers reduce the incoming temperature during the warmer months by as much as 10°C, they also filter the incoming air thus maintaining the high hygiene standards throughout the area.

Evaporative cooling is the most cost effective way of cooling industrial premises and also the most environmentally friendly as each unit only uses 1.5KW of electrical power, a standard water supply and no refrigerant gases.



How The AHU Systems Operates in Different Conditions

EcoCooling provide direct evaporative coolers which can be used as part of air handling solutions. The EcoCooling CREC control system automatically runs in different modes throughout the year to ensure a constant supply temperature:

- **Ventilation:** Energy efficient EC fans move fresh air through the area being cooled to transport heat away.
- **Attemperation:** The EcoCooling control system automatically mixes hot exhaust air with cold external air to supply air at a constant temperature.
- **Evaporative Cooling:** Air is moved over a wetted cooling pad, the air temperature is reduced as the water evaporates

This maximises the EcoCoolers' efficiency and performance and is a particularly attractive solution for buildings which have high internal heat loads and high usage. (e.g bakeries, and restaurants).

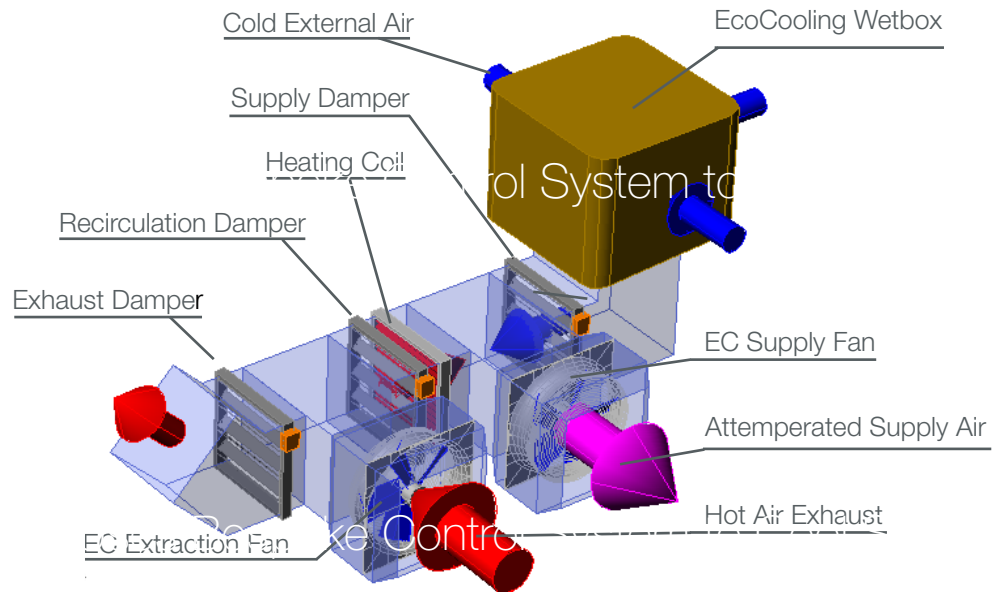
Product Ranges

ECP 60-02: 12,800m³phr

With over 3000 installations worldwide, the ECP range of coolers and wet boxes can be installed externally or inside a plant room. The standard unit is down flow however top and side discharge configurations are available.

ECP 60-01: 18,000m³phr

The ECP60-01 is only available as a wet box. Standard and EC fans and control systems can be purchased from EcoCooling to supplement the wet box as part of a mechanical ventilation system.



Subway Uses Bespoke Control System to Cool Store

The SUBWAY® system is committed to providing a wide range of great tasting, healthier food choices while reducing their environmental footprint and creating a positive influence in the communities we serve around the world”.

The Brief - The Subway at the Beehive centre in Cambridge was designated by the management as a test site to trial the provision of the most environmentally friendly retail site possible. The brief was to create as near as is possible a carbon neutral outlet employing the latest technologies.

EcoCooling were invited to look at the cooling of the unit. After careful analysis of the existing environment taking into account, heat generated, airflow and the comfort of both staff and customers, a complete air handling system was designed to provide both heating and cooling.

The Cambridge franchisee installed power usage monitors at both this site and a similar site. The Beehive site is now using 75% less power than the equivalent site and is being held up as a flag ship example of green technology for the whole of the Subway chain.

Subway stores bake bread three to four times each day so the EcoCooling system was designed to capture the surplus heat generated by both the ovens and the walk in fridges to provide heating for the whole shop and not just specific hot spots. This was done by redirecting the hot air into the shop to provide heating in the winter months. Evaporative cooling is then used to cool the store during the summer when the hot air from the ovens is extracted outside the building.

The temperature is maintained within the unit by thermostats. A bespoke control system provides a fresh environment at all times by continually circulating air. This also eliminates any condensation issues and prevents the formation of hot spots which previously caused uncomfortable conditions when the ovens were in use.

