



## Improving the performance of Air Cooled Chillers, Dry Coolers and Refrigeration Plants



EcoMESH is a unique mesh and water spray system that **improves performance, reduces energy consumption, eliminates problems, is virtually maintenance free and can payback in one cooling season.**

# Introduction

## The origins of the EcoMESH technology

The Ancient Romans were known to have circulated aqueduct water through the walls in houses to cool them. In the Middle East wet hessian was placed across windows to help cool the breezes and for centuries water fountains have been used to make courtyards cooler. Medieval Persia had buildings with cisterns and used wind towers to cool the buildings during the hotter seasons.

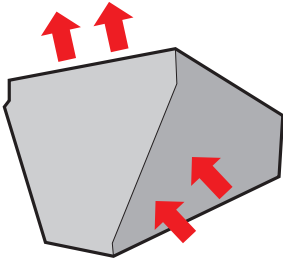
The significant cooling achieved by water has been used throughout history to great effect, EcoMESH is based around this proven principle.

## How does it work

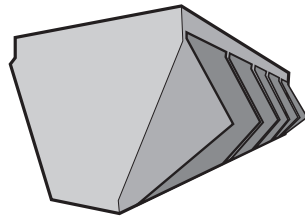
The EcoMESH concept is based on spraying water onto a mesh placed in front of the heat rejection surface. The water spray is triggered by an ambient sensor or refrigeration head pressure override i.e. condensing pressure limit. The water on the mesh provides an adiabatic cooling effect on the incoming air, reducing the temperature before it has even reached your heat rejection coil and reducing power consumption by as much as 30-40%.

Additional air cooling provided by EcoMESH reduces the refrigeration cycle head pressure and discharge temperatures. Reduced discharge pressures and lower temperatures significantly increases the compressor life. The reduction in the excessive high discharge pressure and temperatures for the refrigeration cycle, reduce the mechanical stress on the system which provides reliable operation and much less maintenance.

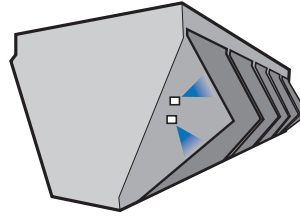
Standard installation



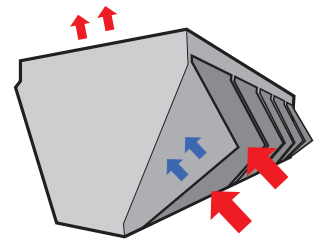
EcoMESH installation



Water spray



Reduced heat discharge



## Why you should install the EcoMESH system

### Increased Capacity

The combination of cooler incoming air, the shading from the mesh and a cleaner coil can result in as much as **20-30% output increase for most systems**.

As long as the refrigeration machinery such as chillers, rooftops, dry coolers or refrigeration condensers matches the designed peak ambient duty EcoMESH offers the possibility of increasing system overall capacity without adding any additional refrigeration machinery.

### Improved Compressor Life

Additional air cooling provided by EcoMESH reduces the refrigeration cycle head pressure and effectively discharge temperatures. Reduced discharge pressures and lower temperatures significantly increase the compressor life. As EcoMESH significantly reduces the excessive high discharge pressure and temperatures for the refrigeration cycle and therefore the mechanical stress over the system can be reduced significantly which provides **reliable operation and reduced maintenance**.

### Reduced Maintenance & Increased Reliability

EcoMESH will help to keep the condenser coil clean, providing lower discharge temperature and pressure. The overall system maintenance frequency and **emergency call outs can be reduced** significantly.

### Reduced Running Cost

By reducing the incoming air temperature and keeping the coil clean EcoMESH turns your summer electricity bill to spring. Peak savings can be as much as 30-40% with **annual savings of 15-25%** depending on the location, application and operational patterns of the refrigeration and air conditioning system.

# EcoMESH Performance

Water spray duration and frequencies are constantly adjusted by the controller, optimising performance and minimising water consumption. Spray duration and frequency increase to match the ambient temperature conditions. Once the low ambient set point is reached the spray operation is automatically terminated.

The adiabatic cooling process is entirely driven by the incoming air humidity. Table-1 indicates the incoming air cooling capability of an EcoMESH system based on humidity ratios against the ambient conditions.

It is equally important to minimise the water wastage and the EcoMESH controller's intelligent intermittent spray operation, together with set point limit, minimises the water consumption as much as 70-90% in comparison to a comparable cooling tower, evaporative or any other adiabatic air cooling units.

Table-2 shows the average water consumption per kW of unit cooling capacity in various operational conditions. Hot Climate generally refers to Middle East and Mediterranean countries, Temperate Climate refers to moderate Central European type climatic conditions. Head Pressure Control refers to high pressure override conditions which occur only during very high ambient in order to overcome HP manual safety shut-down for the refrigeration system.

Table-1

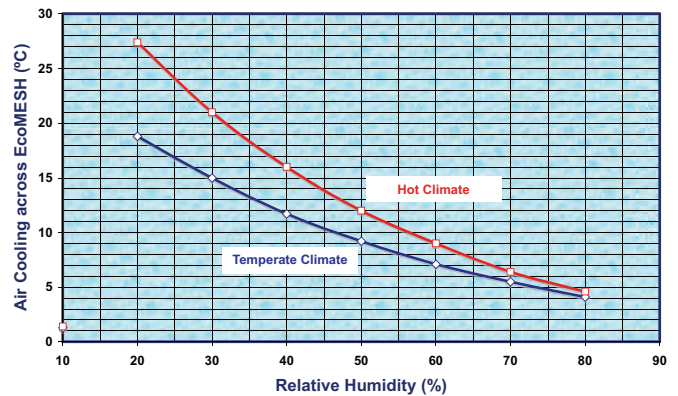
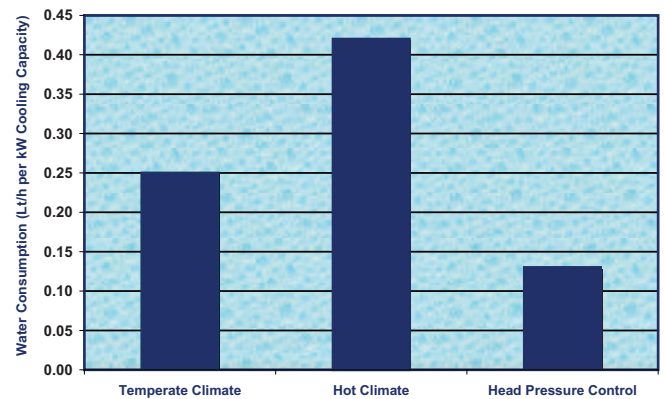


Table-2



## Reduced Environmental Impact

The EcoMESH system typically uses 70-90% less water consumption in comparison with other adiabatic cooling systems such as atomised air inlet cooling, pad cooling, cooling towers and evaporative condensers. Combined with reduced peak power means EcoMESH can help and **support your Environmental goals.**

## Easy Retrofit

EcoMESH is supplied as a D.I.Y kit and it can be installed to new and existing machinery, for any make or model of air conditioning and refrigeration units. It can be applied externally without having any impact or modifications on the internal circuits and therefore **does not affect the manufacturers warranty.**

## Self-cleaning filter protects your unit against snow or sand

The EcoMesh will **protect your units** from sand, dirt and general rubbish as well as snow and other weather elements.

## No Water Treatment

EcoMESH utilises city mains water directly without any tank, reservoir or pump. It does not require any water treatment and there is no requirement to report the installation to local Authorities unlike Cooling Towers or Evaporative Condensers.

The water spray is coarse rather than atomised and the droplets are almost 20-50 times larger than critical diameter for inhalation, which is considered to be the main risk for legionella.

# Installation

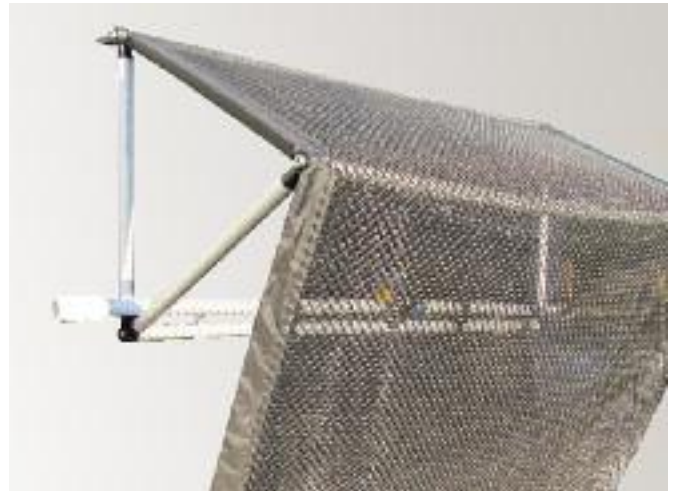
## The components

The kit is sold with all the necessary items to build and install the EcoMESH system and can be fitted to an existing or new installation without affecting the manufacturers warranty.

Our unique fixing brackets allow for variable positioning of the fixing points and the mesh angle. The bottom of EcoMesh system simply rests on the unit and is secured by bungees.

The water spray frequency and duration are set by a PLC control unit to suit the ambient conditions and this reduces water usage. The system can also be used in remote mode and triggered by head pressure for maximum flexibility.

**Our unique bracketing system allows precise positioning during the installation.**



## Adiabatic Cooling

Intermittently wetting the EcoMESH, using mains water, results in a **cooling of the incoming air** by as much as 28°C. Water is only sprayed over the mesh so the condenser coil remains dry and the additional air cooling provided by EcoMESH provides 30-40% peak power reduction for the refrigeration machinery.

## The Shading Effect

With EcoMESH in front of the heat rejection coil natural shade is provided and this instantly **reduces the solar radiation impact**.

By blocking direct sun light the shading provided by EcoMESH results in 3-8°C cooling for the incoming air.

## EcoMESH customers

Axima, BAA, EDF, Emerson, Equinox, Friends Providence, GEA, GSK, Geest, Honeywell, KFC, Lloyds/TSB, McDonalds, Suzuki Maruti, Sainsbury, Tesco, T-Mobile

## OEM, manufacturers supplying EcoMESH as a factory fitted option

Climaveneta (Italy), Coolers Condensers (UK), Fritherm (Turkey), Heatcraft (France/Australia), International Coil Company (India)

# Applications



**We have installed the EcoMESH system, with great success, across the world.**

## **Airports**

Heathrow, Gatwick, Edinburgh, Macau

## **Supermarkets**

Tesco, Sainsbury's, Safeway, Morrison, ASDA, Budgens, Waitrose

## **Datacentres**

Lloyds/TSB, T-Mobile, Equinox, Sungard

## **Power/Industrial Plants**

Suzuki MARUTI, Dubal and many other CHP & Power Plant heat rejection applications

## **Air Conditioning**

Variety of chiller and dry cooler applications for offices, banks, schools, shops

## **Refrigeration**

All the way from a single condenser to large industrial installations like Ocado, Hays Distribution, Dawnfresh

## **Unitary**

Variety of rooftop and mini-split applications



## EcoMESH Adiabatic Systems

AD - OffGrid Group of Companies

UAN: +971 800 6487552

TEL: 971 4 2647990

Info: [info@offgrid.ae](mailto:info@offgrid.ae)

web: [www.offgrid.ae](http://www.offgrid.ae)

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