



EcoCooling  
EVAPORATIVE COOLING

# Legionnaires' Disease

# Contents

The Facts

Legislation

What is Legionnaires Disease

Pathway to Infection

Risk Assessment

Conclusion

# FAQ'S



*Can you catch Legionnaires' disease from an EcoCooling Evaporative Cooler?*

No, because the circulating water is less than 20°C and no droplets are formed.

*Has anyone ever caught Legionnaires' disease from an evaporative cooler?*

There have never been any cases of Legionnaires' disease attributed to a wetted media evaporative cooler. It is believed there are over 30 million installations world wide.

# Legionnaires Disease - Facts

Legionnaires' disease is a form of pneumonia. It is contracted by breathing in very small droplets of water contaminated by legionella bacteria.

It is estimated that there are over 30 million evaporative coolers world-wide <sup>[1]</sup> and there has never been a case of Legionnaires' disease attributed to a wetted media evaporative cooler <sup>[2]</sup>.

[1] - **Evaporative Air-Conditioning: Applications for Environmentally Friendly Cooling** by Ebel Dijkstra , Gert Jan Bom , Marja Tummers

[2] - *ASHRE Guideline 12-2000 Minimising the Risk of Legionellosis Associated with Building Water Systems*

# Legislation

UK legislation regarding Legionnaires' disease is contained in an HSC guide called **Approved Code of Practice (ACOP) Legionnaires' Disease: The control of legionella bacteria in water systems L8.**

**The key reasons why an EcoCooling evaporative cooler is safe are:**

Avoidance of stagnant water

◇ *The coolers automatically drain when not in use*

Low water operating temperature

◇ *The temperature of the water rarely goes above 20°C*

Avoidance of corrosion and scaling

◇ *There is a water management system which prevents scale*

◇ *All water contact surfaces are plastic*

Use of a biocide

◇ *There is the option of using bromine as a biocide*

No production of aerosols

◇ *The air velocity over the pads is too slow to create carry over*

Maintenance

◇ *The units are maintained by qualified personnel*

# Legislation

- ❖ ACOP L8 stipulates that a risk assessment must be carried out
- ❖ A risk assessment should look at each stage of the pathway to infection
- ❖ From this assessment a judgement can be made on the level of risk
- ❖ When a systematic risk assessment is carried out on an EcoCooler it is, if installed, commissioned, operated and maintained in accordance with EcoCooling instructions, considered a LOW RISK device

A wetted media evaporative cooler does not have to be registered with regard to the Notification of Cooling Towers and Evaporative Condensers Regulations. A wetted media evaporative does not fit into the classification of a Cooling Tower or Evaporative condenser.

- ❖ Definitions according to ACoP L8
- ❖ Cooling tower – an apparatus through which warm water is discharged against an air stream: in doing so part of the water is evaporated to saturate the air and this cools the water. The cooler water is usually pumped to a heat exchanger and recycled through the tower
- ❖ Evaporative condenser – A heat exchanger in which refrigerant is condensed by a combination of air movement and water sprays over its surface

# What is Legionnaires' Disease

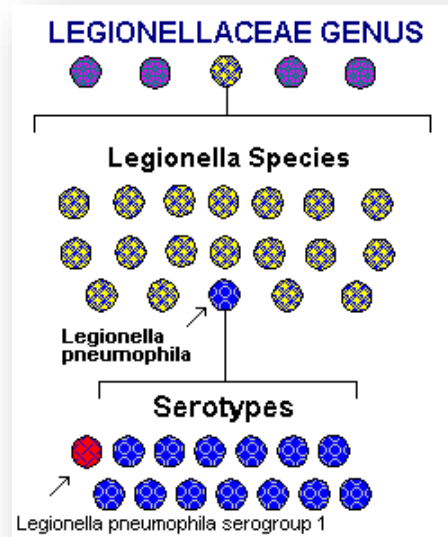
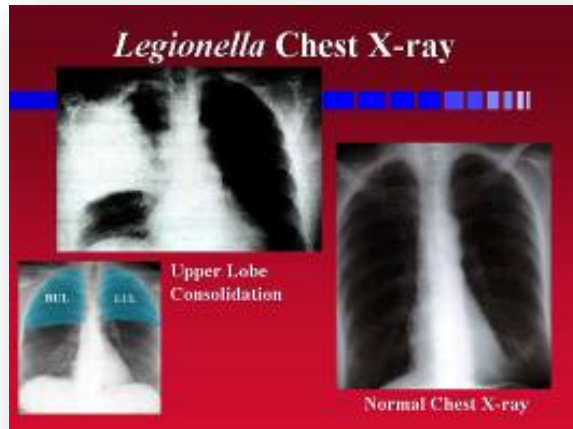
Legionnaires' disease is a type of pneumonia. It was named after an outbreak of severe pneumonia which affected a meeting of the American Legion in 1976. It is an uncommon but serious disease.



# What is Legionnaires' Disease

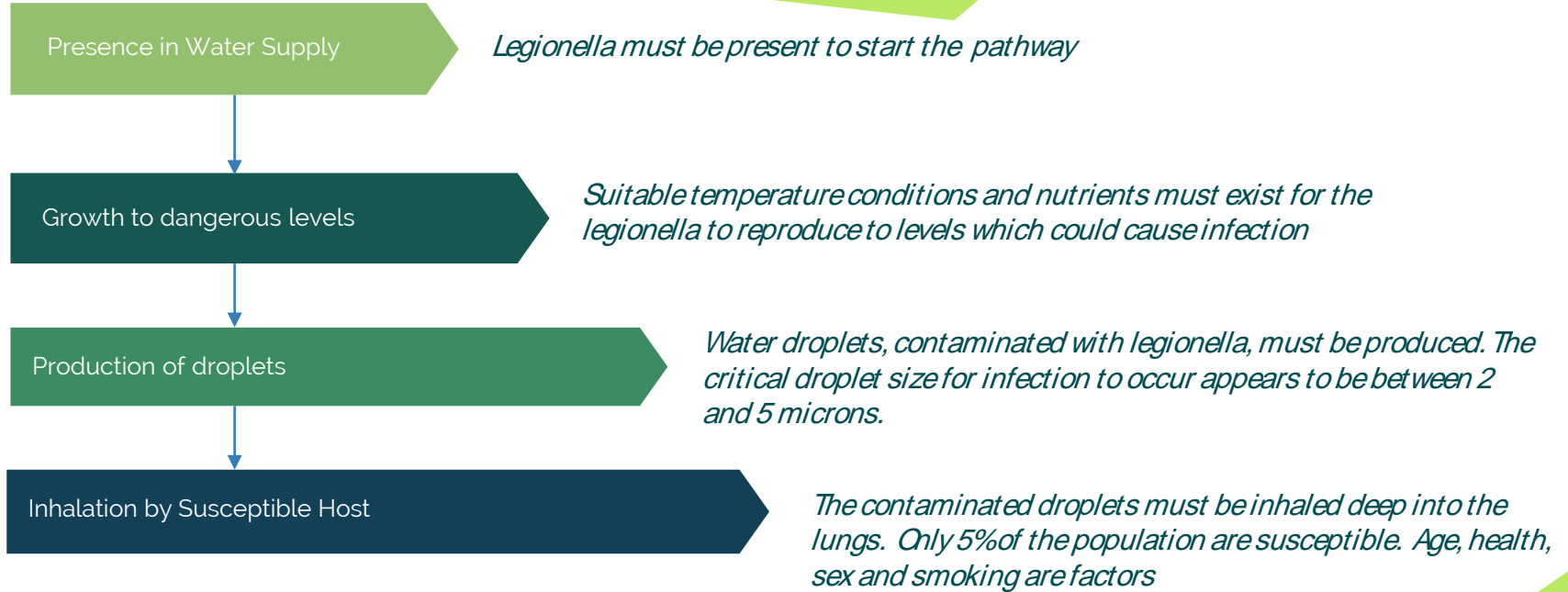
## How do people catch it?

- ❖ The germ which causes legionnaires' disease is a bacterium called Legionella Pneumophila.
- ❖ People catch legionnaires' disease by inhaling small droplets of water suspended in the air which contain the Legionella bacterium.





# The Pathway to Infection



# Risk Assessment

1. To perform a risk assessment each stage of the pathway should be examined.

2. From this examination an assessment should be made of the possibility of the pathway being viable.

3. This risk assessment should take into account the standard prevention and control measures inherent in the process design of an EcoCooler.



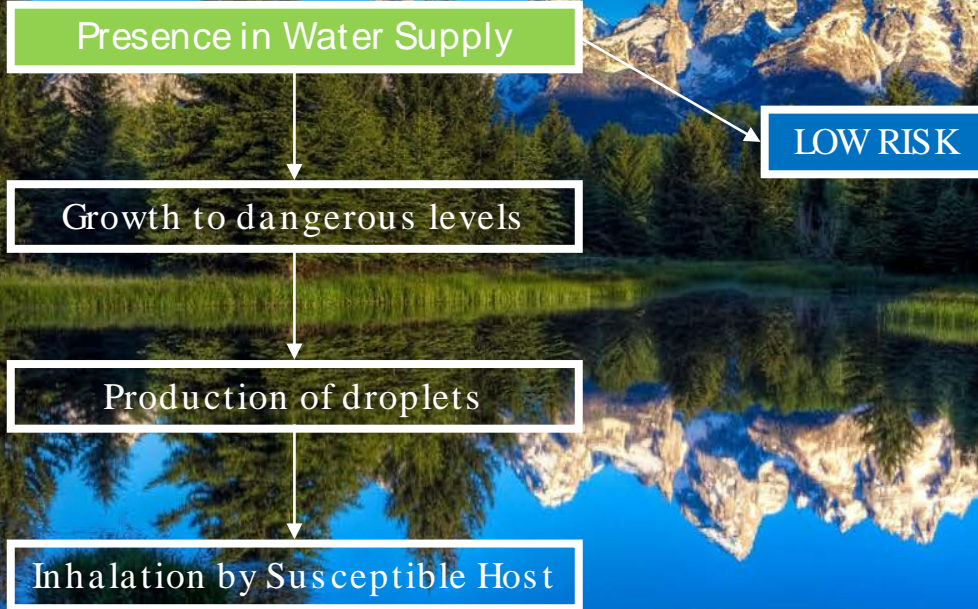
# Risk Assessment

## Stage 1 – Presence in Water Supply

- ❖ Always use potable mains water
- ❖ Do not use any water which may be contaminated
  - Rainwater
  - Reclaimed water
- ❖ From the above it can be concluded that this stage is **LOW RISK** as the level of ‘seeding’ of the system is low.



# Risk Assessment





# Risk Assessment

## Stage 2 – Growth to dangerous levels

- ❖ Legionella bacteria need the correct temperature and nutrients to grow

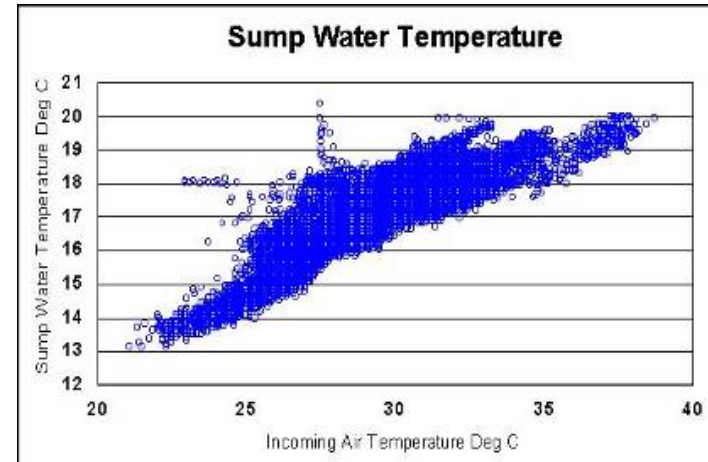
### Temperature

- ❖ The water in an EcoCooler circulates at the 'Wet Bulb' temperature of the air
- ❖ In the UK this rarely approaches 20°C
- ❖ Below 20°C legionella is considered dormant

## Stage 2 – Growth to dangerous levels

### Temperature

- ❖ Below is a temperature sampling of an Evaporative cooler in the UK
- ❖ It can be seen that the water temperature does not reach dangerous levels – even at very high ambient temperatures



# Risk Assessment

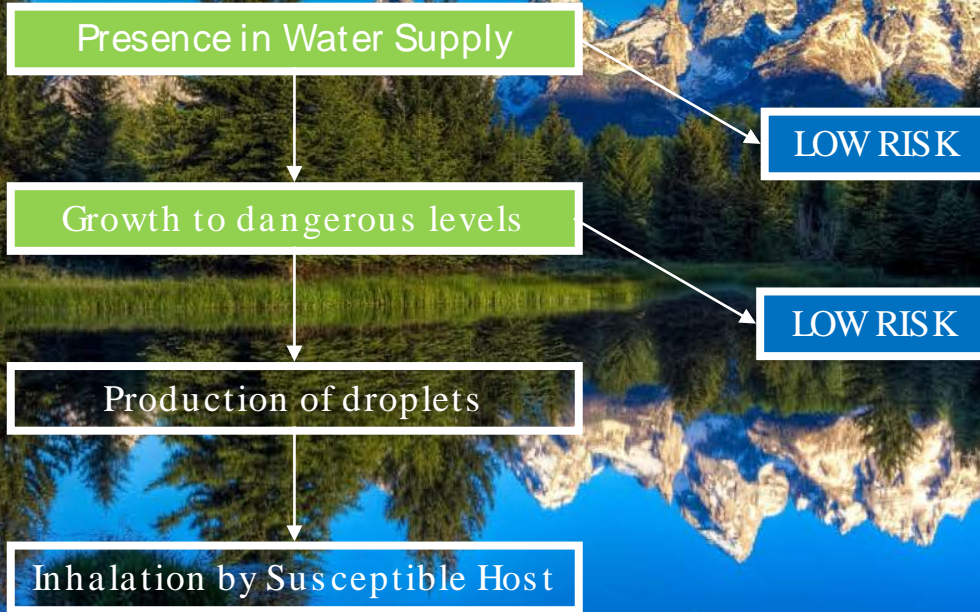
## Stage 2 – Growth to dangerous levels

### Nutrients

- ❖ All wetted surfaces, with the exception of the CELdek pads, are plastic and so do not degrade to create nutrients
- ❖ The pads are treated to stop rotting
- ❖ During operation the cooler is regularly drained and flushed to remove particles which have been filtered out of the air
- ❖ A salinity control system prevents scale formation. Scale breakdown could provide nutrition and so this is avoided

From the above it can be concluded that this stage is **LOW RISK**

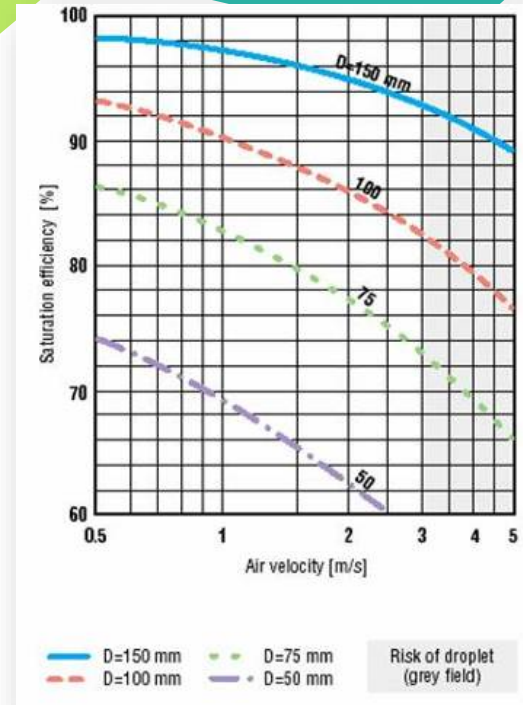
# Risk Assessment



# Risk Assessment

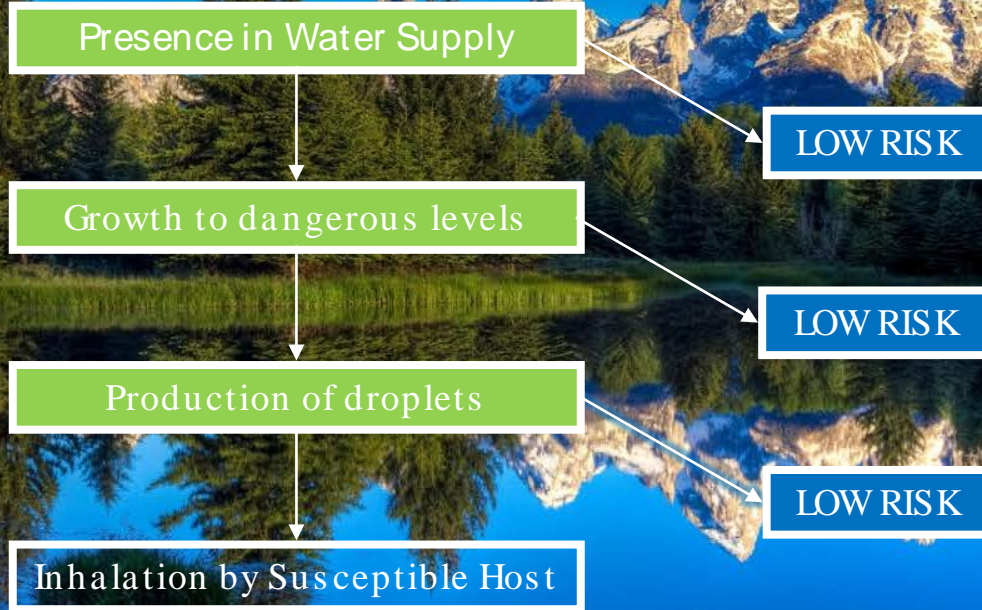
## Stage 3 – Production of Droplets

- ❖ A wetted media evaporative cooler does not create droplets provided the air velocity over the pads does not exceed a set limit
- ❖ For Munters CELdek pads the maximum face velocity is 3m/s
- ❖ An EcoCooler maximum face velocity is 1.7m/s
  
- ❖ The design of an EcoCooler ensures no droplets are produced
- ❖ Fan or Pad specifications must not be changed without being validated
- ❖ From the above it can be concluded that this stage is **LOW RISK**





# Risk Assessment



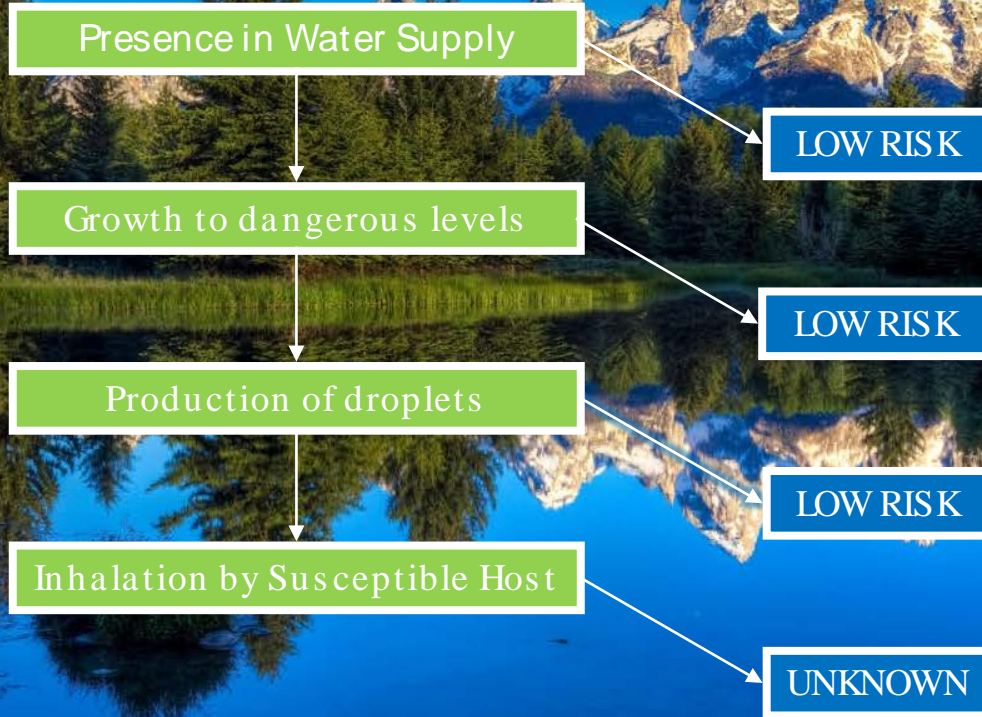
# Risk Assessment

## Stage 4 – Inhalation by Susceptible Host

- ❖ It is impossible to determine which areas of the population may be exposed to an evaporative cooler.
- ❖ It is therefore impossible to perform a risk assessment on this stage.



# Risk Assessment



# Risk Assessment – Conclusion

## Generic Risk Assessment

- ❖ Since the first three stages of the pathway can be considered low risk then the total risk can be assessed as low
- ❖ This is only valid if the EcoCooler is installed, commissioned, operated and maintained in accordance with EcoCooling Guidelines

# For more information...

## Contact

[www.ecocooling.co.uk](http://www.ecocooling.co.uk)

01284 810 586

[sales@ecocooling.co.uk](mailto:sales@ecocooling.co.uk)

## Supporting Documents

### EcoCooler Risk Assessment

- *Detailed risk assessment of the hardware and software.*
- *Authored by Dr Tom Makin, co-author of ACoPL8 and NHS guidelines*

### EcoCooling Risk Assessment Information Pack

- *Support ACoPL8 nominated 'Responsible Person' in performance of a site-specific risk assessment*